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First Aid and Medical Treatment (site specific)

Joe R. Jones Construction, Inc. provides a First Aid Kit on the premises. Each job supt. will be responsible for keeping the remote sites in compliance. It is there for employee's use in the treatment of minor scratches, burns, headaches, nausea, etc. All employees shall know the location of the First Aid Kit and shall notify their supervisor if they need to use the First Aid Kit.

If an employee has a work related injury or illnesses that requires professional medical assistance, they shall notify their supervisor and let him/her know before they receive this assistance. If they fail to notify their supervisor, they may be ineligible for Worker's Compensation, benefits to pay for doctor's bills, and/or lost wages.

Billy Shipley has a valid certificate in first aid training, and shall be contacted to render first aid, as necessary.

The Job Site Supervisor shall inspect First Aid Kits at beginning of job and on a weekly basis to insure that they are filled and complete

FIRST AID PROCEDURES AND INSTRUCTIONS

In all cases requiring emergency medical treatment, immediately call, or have a co-worker call, to request emergency medical assistance.

EMERGENCY PHONE NUMBERS*

Safety and Health Manager: Mike Lowe (817) 596-3513 ext. 205 office / (817) 939-1481 mobile :

Emergency Phone: 911

Administrative Phone: 817-596-9600

FAX: 817-596-0596

Poison Control: 1-800-222-1222

Web: www.poisoncenter.org

First Aid: (Billy Shipley)

Fire Department: * 911

Ambulance: * 911

Police: * 911

Medical Clinic: (817) 599-1643 (Weatherford Regional)

From the main office phones press "LOOP" (any of the 3) or 9 + 911. Job supt. shall edit this document to reflect the correct information for their location

Minor First Aid Treatment

First aid kits shall be stored at the job site trailer. If an employee sustains an injury or are involved in an accident requiring minor first aid treatment, they shall:

- Inform their supervisor.
- Administer first aid treatment to the injury or wound.
- If a first aid kit is used, indicate usage on the accident investigation report.
- Access to a first aid kit is not intended to be a substitute for medical attention.
- Provide details for the completion of the accident investigation report.

Non-Emergency Medical Treatment

For non-emergency work-related injuries requiring professional medical assistance, management must first authorize treatment. If an employee sustains an injury requiring treatment other than first aid, they shall:

- Inform your supervisor.
- Proceed to the posted medical facility. Your supervisor will assist with transportation, if necessary.
- Provide details for the completion of the accident investigation report.

Personal Eye Wash from first aid kit (Quick Drenching/ Flushing Facility) shall be used in the event an employee accidentally spills or splashes injurious chemicals or liquids on their clothing or body. Employees shall notify their supervisor if they use the Quick Drenching/Flushing Facility.

Emergency Medical Treatment

If an employee sustains a severe injury requiring emergency treatment:

- Call for help and seek assistance from a co-worker.
- Use the emergency telephone numbers and instructions posted next to the telephone in your work area to request assistance and transportation to the local hospital emergency room.
- Provide details for the completion of the accident investigation report.

First Aid Training

Each employee will receive training and instructions from his or her supervisor on the following Company first aid procedures.

First Aid Procedures

WOUNDS:

Minor: Cuts, lacerations, abrasions, or punctures-

- Wash the wound using soap and water; rinse it well.
- Cover the wound using clean dressing.

Major: Large, deep and bleeding

- Stop the bleeding by pressing directly on the wound, using a bandage or cloth.
- Keep pressure on the wound until medical help arrives.

BROKEN BONES:

- Do not move the victim unless it is absolutely necessary.
- If the victim must be moved, "splint" the injured area. Use a board, cardboard, or rolled newspaper as a splint.

BURNS:

Thermal (Heat)

Rinse the burned area, without scrubbing it, and immerse it in cold water; do not use ice water.

Blot dry the area and cover it using sterile gauze or a clean cloth.

Chemical

Flush the exposed area with cool water immediately for 15 to 20 minutes.

EYE INJURY:

Small particles

Do not rub the eyes.

Use the corner of a soft clean cloth to draw particles out, or hold the eyelids open and flush the eyes continuously with water.

Large or stuck particles

If a particle is stuck in the eye, do not attempt to remove it.

Cover both eyes with bandage.

Chemical

Immediately irrigate the eyes and under the eyelids, with water, for 30 minutes.

NECK AND SPINE INJURY:

If the victim appears to have injured his or her neck or spine, or is unable to move his or her arm or leg, do not attempt to move the victim unless it is absolutely necessary.

HEAT EXHAUSTION:

Loosen the victim's tight clothing.

Give the victim "sips" of cool water.

Make the victim lie down in a cooler place with the feet raised.

CPR (Cardiopulmonary Resuscitation)

Alternative names: Rescue breathing, chest compressions - for adults; resuscitation, cardiopulmonary - for adults

Definition: CPR is a combination of rescue breathing (which provides oxygen to the victim's lungs) and chest compressions (which keep the victim's heart circulating oxygenated blood).

Considerations: CPR can be lifesaving, but it is best performed by those who have been trained in a CPR course. The procedures described here are not a substitute for CPR training.

Time is very important when dealing with an unconscious who is not breathing. Death can occur in 8 to 10 minutes and brain death begins after 4 to 6 minutes without oxygen.

Causes: Cardiopulmonary arrest is a combination of 2 life-threatening conditions: absence of breathing and no heartbeat.

Symptoms:

- No Breathing
- No pulse
- Unconsciousness

DO NOT:

- DO NOT give chest compressions if there is a heartbeat; doing so may cause the heart to stop beating.
- DO NOT move the victim's head or neck to check for breathing if a spinal injury is suspected.

Call immediately for emergency medical assistance if:

- You are not alone; have one person call the local emergency number while another person begins CPR.
- You are alone, shout for help and administer CPR.

FIRST AID:

1. Check for consciousness. Shake or tap the victim gently. See if the victim moves or makes a noise. Shout, "Are you OK?"

2. If there is no response, shout for help.

3. Position the victim on his or her back on a hard surface, keeping the back in a

straight line, supporting the head and neck. Unfasten the victim's clothing if necessary to gain access to the victim's chest.
4. Kneel next to the victim's chin. Tilt the head back and lift the jaw forward to move the tongue away from the windpipe. If a spinal injury suspected, pull the jaw forward without moving the head or neck. Don't let the victim's mouth close.
5. Place your ear close to the victim's mouth and watch for chest movement. For 10 seconds, look, listen, and feel for breathing.
6. If the victim is not breathing, begin rescue breathing. Maintain the head position, close the victim's nostrils by pinching them with your thumb and index finger, ~~and cover the victim's mouth tightly with your mouth~~. **IF POSSIBLE MOUTH PIECES AND RESUSCITATION BAGS ARE TO BE USED FOR ALL RESUSCITATION PROCEDURES.**
Give 2 slow, full breaths, with a pause in between.
7. If the chest does not rise, reposition the head and give 2 more breaths. If the chest still doesn't rise, the victim's airway is blocked. Follow instructions for chocking

Chocking Symptoms:

- unconscious
- lack of breathing
- inability to move air into the lungs with mouth-to-mouth resuscitation

DO NOT:

- DO NOT try to grasp an object that is lodged in the victim's throat. This might push it farther down the airway. If the object is visible in the mouth, it may be removed.
- DO NOT begin the chest compressions of CPR (if heartbeat has stopped) until the airway is cleared.

FIRST AID:

1. Roll the victim onto their back on a hard surface, keeping their back in a straight line, firmly supporting their head and neck. Expose the victim's chest.
2. Open the victim's mouth with your thumb and index finger, placing your thumb over his tongue and your index finger under his chin. If the object is visible and loose, remove it.
3. Lift the victim's chin while tilting the head back to move the tongue away from the windpipe. If a spinal injury is suspected, pull the jaw forward without moving the head or neck. Don't let the mouth close.
4. If the victim is not breathing, begin rescue breathing. Maintain the head position, close the victim's nostrils by pinching them with your thumb and index finger, and cover the victim's mouth tightly with your mouth. Give 2 slow, full breaths, with a pause in between.
5. If the victim's chest does not rise, reposition the head and give 2 more breaths.
6. If the victim's chest still doesn't rise, begin abdominal thrusts, as follows. Kneel at the victim's feet or astride the thighs (or to the side if the victim is obese or pregnant). Place the heel of your hand in the middle of the abdomen just above the navel, well below the tip of their breastbone. (If the victim is obese or pregnant, place the heel of your hand in the middle of the victim's breastbone. Do not place your hand on the ribs or on the tip of the breastbone.) Place your other hand on top of the first hand.
7. Give 6 to 10 quick thrusts compressing the victim's chest about 2 inches, pressing your hands inward and upward. Do not press to either side. Each thrust is a separate attempt to clear the victim's airway by forcing air out through the windpipe.
8. Open the victim's mouth with your thumb and index finger. If the object is visible and loose, remove it. Observe the victim's breathing. If the infant stops breathing, begin CPR.
9. If the object is not dislodged, give 2 breaths, 6 to 10 abdominal thrusts, and then check for the object. Repeat this sequence until the object is dislodged or help arrives.

8. If the victim's chest does rise, place 2 fingers on the victim's Adam's apple. Slide your fingers into the groove between the Adam's apple and the muscle on the side of their neck to feel for a pulse for 5 to 10 seconds.

9. If the victim has a pulse, give 1 breath every 5 seconds. Check the pulse after every 12 breaths.

10. Be sure the local emergency number has been called. Have someone else make the call if possible. Continue giving breaths and checking the pulse.

11. If the victim has no pulse, begin chest compressions. Maintain the head position and place the heel of your hand 2 finger-widths above the lowest notch of the victim's breastbone (where the lower edge of the ribcage meets in the middle). Place the heel of your other hand directly over the heel of the first hand. Interlock your fingers; don't let them touch the victim's chest. Lock your elbows straight. Lean your shoulders over your hands, and firmly press down about 2 inches into the victim's chest. Repeat the compressions 15 times. Give the compressions in a smooth, rhythmic manner, keeping your hands on the victim's chest. Don't rock back and forth - push straight down. Don't pause between compressions.

12. Give the victim 2 breaths, followed by 15 chest compressions. Repeat this sequence 4 times. Count aloud as you pump in a regular rhythm. You should pump at a rate of about 80 to 100 times a minute. Count 1 and 2 and 3 and 4 and...15 and (breathe, breathe).

13. Recheck the victim's pulse for 5 to 10 seconds.

14. Repeat steps 12 and 13 until the victim's pulse resumes or help arrives. If the pulse resumes, go to step 9.

15. Once pulse and respiration resume role the person onto his side taking care to move the body as a whole unit. This is called the recovery position, but it should not be used if you suspect there might be a neck or spinal injury. Stay by the person until help arrives.

Prevention:
Be prepared and use good judgment.

General Shop and Work Area Safety

Policy:

Accepted safety and health precautions will be practiced in the use of general shop machines, fixed and portable power tools, and other hand held equipment so that all employees using such equipment will be protected against personal injury. It is also Company policy to institute practices which will minimize the danger of injury to non-operators or user personnel who may be in the area and to minimize the risk to visitors.

Responsibilities:

Supervisors must recognize those factors in the workplace with accident potential. The supervisor shall provide frequent inspections of job sites, work methods, and materials/equipment used. Any unsafe equipment/material shall be tagged and rendered inoperative or physically removed from its place of operation. The supervisor shall permit only qualified personnel to operate equipment and machinery according to safe work practices.

a. Supervisors

1. Ensuring safe working conditions
2. Providing necessary protective equipment
3. Ensuring that required guards and protective equipment are provided, used, and properly maintained.
4. Ensuring that tools and equipment are properly maintained and used.
5. Planning the workload and assigning employees to jobs which they are qualified to perform. Ensuring that the employees understand the work to be done, the hazards that may be encountered, and the proper procedure for doing the work safely.
6. Taking immediate action to correct any violation of safety rules observed or reported to them.
7. Ensuring workers exposed or potentially exposed to hazardous chemicals/materials have access to appropriate Material Safety Data Sheets (MSDS).
8. Of a shop or any area where fixed or portable powered or unpowered machines and tools are located, is responsible for being familiar with all procedures for safe use and guarding of machines, personal protective equipment required,

shielding against possible injury to other employees or visitors. Enforces safe practices.

9. Trains new employees by providing and requiring manuals to be studied, personally instructing and requesting the assistance of veteran employees already familiar with required safety precautions.

10. Posts signs indicating the use of powered machines by "Authorized Personnel Only" and requires the employees under his/her supervision to assist in the enforcement of this policy. No one is allowed to use fixed or portable powered shop machines or welding equipment without sufficient training to the supervisor’s satisfaction.

11. Designates a person to be responsible for general management of a specific shop area and notifies the Safety and Health Manager of the person selected.

12. Designates a qualified person to be responsible for each major fixed, powered machine or tool, posts the name on or near the apparatus, and notifies the Safety and Health Manager accordingly.

13. Coordinates with the Safety and Health Manager to plan and conduct safety meetings with employees as often as needed and warranted. Topics to be discussed at each session will be selected to fit current operations and any unsafe trends. Leads the discussion and encourages each employee to participate. May assign one employee on a rotating basis to make a short presentation of the topic to get discussion started.

14. Provides appropriate marking of shop floor areas to identify restricted work areas or "approved operator only" yellow floor lines.

15. Makes periodic inspections of shop areas and other industrial areas. Notes all deficiencies and initiates corrective actions.

16. Ensures that all painting operations or other operations are conducted in well ventilated areas. Asks assistance from the Safety and Health Manager in making this determination and to provide necessary protective equipment and respirators, when appropriate.

b. Employees

Employees shall be thoroughly trained in the use of protective equipment, guards, and safeguards for chemicals and safe operation of equipment, machines, and tools they use or operate. Only employees who have been trained and those undergoing supervised on-the-job training (OJT) shall be allowed to use shop equipment, machines, and tools.

Employee's responsibilities:

1. Complies with OSHA standards, Company policies and good safe practices when using fixed and portable power tools, equipment and hand held equipment.

2. Cleans up when finished using equipment.

3. Maintains the tools, equipment and work area in an orderly and safe manner.

4. Properly trains new users of equipment for which he/she is responsible.

5. Shares responsibility with the supervisor for identifying and marking shop floor areas.

6. Will not use or permit use of defective equipment or tools in disrepair. Malfunctioning equipment and damaged hand tools will be reported and repair made before using the equipment or tools. If repairs are not possible the equipment or tools will be discarded.

c. Safety and Health Manager

1. Ensures OSHA standards, Company policies and good safe practices are carried out.

2. Assists supervisor and employee in defining hazards and designating safe practices.

3. Conducts routine and periodic inspection of shop areas for compliance to OSHA standards and NIEHS policies.

4. Conducts periodic inspections of employees hand tools and portable power tools.

5. Assists the supervisor in planning and conducting safety meetings.

General Shop and Work Area Safety:

A. Shop Procedures:

a. All portable and fixed powered shop machines and tools will be equipped with approved guarding devices. Guards are to be in place while using the machine. Equipment must also be properly electrically grounded before use.

b. Proper personal protective equipment will be provided (safety glasses, goggles, shields) and used during grinding or other work that may produce flying particles (e.g. drill press, power saws, etc.). Company approved dust respirators will be used for work that produces airborne dust particles. Eye protection is required during electrical or electronic hardware repair, installation and/or open front operation.

c. Approved face, eye and body protection will be used during any burning or welding operation. Also, sufficient shielding that provides protection to others in the immediate area will be used.

d. No flammable materials (paints, solvents, chemicals, etc.) will be stored within the immediate area of any burning or welding operation. Flammable materials must be stored in OSHA and Company approved cabinets.

e. Any employee using portable fixed tools (drill press, jig or band saw, etc.) must not wear loose clothing. Anyone with long hair must tie back the hair or wear acceptable hair protection while operating equipment. All stock must be clamped down (attempting to hold stock with hands will not be permitted).

f. Before any employee performs service or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be made safe. This will be accomplished by locking out and tagging out energy isolating devices, and otherwise disabling the machines or equipment. (see Lockout/Tagout Policy).

g. Clean-up after using powered equipment or hand tools must be done immediately following use of the power tool.

h. Before any work is started in an area posted with a "Radioactive Materials" label, the supervisor or the Safety and Health Manager will be contacted for instructions so that the work may be safely performed.

i. Before any work is started in an area designated as "Restricted" (e.g. high hazard, carcinogens, etc.,) the area must be inspected by the Safety and Health Manager and permission to proceed given to the supervisor.

j. Before any work is started in any laboratory area, a request will be made to the Laboratory Supervisor, principal investigator and/or Safety and Health Manager to ensure that there will be no danger from hazardous materials in the immediate area of work.

k. All burning or welding operations outside the shops area requires a Hot Work permit from the Safety and Health Manager.

l. Good housekeeping will be maintained in the shop area. Material will be stored in such a manner that there is no danger from sliding, falling or presenting a hazard by striking against or cutting. Scrap stock must be cleaned from floor and work benches following each job or at the end of each day.

B. Personal Protective Equipment

Personal protective equipment (PPE) is not a substitute for engineering controls or feasible work or administrative procedures. While these controls are being implemented, or if it has been determined that control methods are not feasible, personal protective equipment is required whenever there are hazards that can do bodily harm through absorption, inhalation, or physical contact. This equipment includes respiratory and hearing protective devices, special clothing, and protective devices for the eyes, face, head, and extremities. All PPE shall be of a safe design and constructed for the work to be performed and shall be maintained in a sanitary and reliable condition.

1. Eye protection is required when there is a possibility of injury from chemicals or flying particles. Examples of operation requiring the use of eye protection include, but are not limited to:
    - •Chipping, grinding, and impact drilling.
    - •Breaking concrete, brick, and plaster.
    - •Welding or helping in welding of any type.
    - •Cleaning with compressed air.
    - •Tinning or soldering lugs or large joints.
    - •Riveting, grinding, or burning metals.
    - •Handling chemicals, acids, or caustics.

2. Face shields shall be thoroughly washed with soap and water before being worn by another person.

3. Hearing Protection - Appropriate hearing protection shall be used where employees are in designated hazardous noise areas with operating noise sources, or using tools or equipment which are labeled as hazardous noise producers. The Office of Health and Safety shall be contacted for noise level surveys and guidance on the type of hearing protection required.

4. Hand Protection

   a. Rubber protective gloves shall be worn by personnel working in battery shops or where acids, alkalies, organic solvents, and other harmful chemicals are handled.

   b. Electrical worker's gloves are designed and shall be used to insulate electrical workers from shock, burns, and other electrical hazards. These gloves shall NOT be the only protection provided and will never be used with voltages higher than the insulation rating of the gloves.

   c. Multi-use gloves shall be worn to protect the hands from injuries caused by handling sharp or jagged objects, wood, or similar hazard-producing materials. These gloves are usually made of cloth material with chrome leather palms and fingers or synthetic coating. All-leather gloves are also acceptable.

5. Foot Protection - Non-skid shoes shall be worn where floors may be wet or greasy. Where there is reasonable probability of foot or toe injury from impact and compression forces, safety footwear shall be worn.

6. Respiratory Protection - There are various airborne hazards, e.g., organic vapors, particulates, fumes, etc., that personnel may encounter and respiratory protection may be required. The Safety and Health Manager shall be consulted for guidance on the type of protection required.

7. Head Protection - Hard hats shall be worn by all personnel working below other workers and in areas where sharp projections or other head hazards exist.

8. Body Protection - Natural or synthetic rubber or acid-resisting rubberized cloth aprons shall be worn by personnel handling irritating or corrosive substances. Aprons shall normally be worn with acid sleeves and gloves for greater body protection against skin injuries.

9. Insulated Matting - Insulating matting shall be used by workers for additional resistance to shock where potential shock hazards exist, such as:

   •Areas where floor resistance is lowered due to dampness.
   •Areas where high voltages (above 600 bolts) may be encountered.
   •Areas with electrical repair or test benches.

10.Other

a. Shop supervisors shall ensure that shop personnel use the protective clothing and equipment that will protect them from hazards of the work they perform. It is the responsibility of workers to keep their PPE in a clean, sanitary state of repair and use the equipment when required.

b. Workers shall keep their hands and face clean, change clothes when they are contaminated with solvents, lubricants, or fuels, and keep their hands and soiled objects out of their mouth. No food or drink shall be brought into or consumed in areas exposed to toxic materials, chemicals, or shop contaminants. Workers shall wash their hands before eating or smoking after exposure to any contaminant.

c. Workers shall not wear rings, earrings, bracelets, wristwatches, or necklaces in the vicinity of operating machinery and power tools. Additionally, long full beards, unrestrained long hair, and loose clothing can become caught in tools or machinery and cause serious personal injury. Highly combustible garments or coveralls made of material such as nylon shall not be worn in or around high temperature equipment or operations such as boiler operations, welding, and any other work with open flame devices.

C. Shop Layout

Proper layout, spacing, and arrangement of equipment, machinery, passageways, and aisles are essential to orderly operations and to avoid congestion.

1) Equipment and machinery shall be arranged to permit an even flow of materials. Sufficient space should be provided to handle the material with the least possible interference from or to workers or other work being performed. Machines should be placed so it is not necessary for an operator to stand in a passageway or aisle. Additionally, machine positioning should allow for easy maintenance, cleaning, and removal of scrap. Clear zones shall be established and should be of sufficient dimensions to accommodate typical work. Marking of machine clear zones may be yellow or yellow and black hash-marked lines, 2 to 3 inches wide. Machines designed for fixed locations shall be securely anchored. If pieces of stock to be worked exceeds workplace/clear zone floor markings, rope/stanchions may be used to temporarily extend the workplace. Machines with shock mounting pads shall be securely anchored and installed according to manufacturer's instructions.

2) Passageways/aisles shall be provided and marked to permit the free movement of employees bringing and removing material from the shop. These passageways are independent of clear zones and storage spaces. They shall be clearly recognizable.

3) Where powered materials handling equipment (forklift) is used, facility layout shall provide enough clearance in aisles, on loading docks, and through doorways to permit safe turns. Aisles shall be at least 3 feet wider than the widest vehicle used or most common material being transported.

D. Illumination

Adequate illumination shall be provided to ensure safe working conditions.

1) Portable lamps shall have UL approved plugs, handles, sockets, guards, and cords for normal working conditions.

2) For work in boilers, condensers, tanks, turbines, or other grounded locations that are wet or may cause excessive perspiration, a low voltage lighting system should be used, either from a battery system or low-voltage lighting unit. In situations where these lighting systems are not available, a vapor-proof 110 volt lighting system shall be used.

3) Flashlights for use near energized electrical equipment and circuitry shall have insulated cases.

4) At least 50 foot-candles of illumination shall be provided at all work stations. However, fine work may require 100 foot-candles or more. This can be obtained with a combination of general lighting plus supplemental lighting.

E. Exits and Exit Markings

1. Every exit shall have "EXIT" in plain legible letters not less than 6 inches high with the strokes of the letters not less than three-quarters of an inch wide.

2. Doors, passageways, or stairways which are neither exits nor ways to an exit (but may be mistaken for an exit) shall be clearly marked "NOT AN EXIT" or by a sign indicating their actual use, for example: "STORAGE ROOM" or "BASEMENT."

3. When the direction to the nearest exit may not be apparent to an occupant, an exit sign with an arrow indicating direction shall be used.

4. Exit access shall be arranged so it is unnecessary to travel toward any area of high hazard potential in order to reach the nearest exit (unless the path of travel is effectively shielded by suitable partitions or other physical barriers).

5. Exit signs shall be clearly visible from all directions of egress and shall not be obstructed at any time. If occupancy is permitted at night, or if normal lighting levels are reduced at times during working hours, exit signs shall be suitably illuminated by a reliable light source.

6. A door from a room to an exit or to a way of exit access will be the side-hinged swinging type. It will swing out in the direction of travel if 50 or more persons occupy the room or the exit is from an area of high hazard potential.

7. Areas around exit doors and passageways shall be free of obstructions. The exit route shall lead to a public way. No lock fastening device shall be used to prevent escape from inside the building.

8. Where occupants may be endangered by the blocking of any single exit due to fire or smoke, there shall be at least two means of exit remote from each other.

9. Exits, exterior steps, and ramps shall be adequately lighted to prevent mishaps. Separate lighting will not be required if street or other permanent lighting gives at least one foot-candle of illumination on the exit, steps, or ramp.

F. Housekeeping

Good housekeeping shall be maintained in all shops, yards, buildings, and mobile equipment. Supervisors are responsible for good housekeeping in or around the work they are supervising. As a minimum, the following requirements shall be adhered to:

1. Material shall not be placed where anyone might stumble over it, where it might fall on someone, or on or against any support unless the support can withstand the additional weight.

2. Aisles and passageways shall be kept clear of tripping hazards.

3. Nails shall be removed from loose lumber or the points turned down.

4. Ice shall be removed from all walkways and work areas where it may create a hazard or interfere with work to be done. If ice cannot be removed readily, sand or other approved materials shall be applied.

5. Trash and other waste materials shall be kept in approved receptacles. Trash shall not be allowed to accumulate and shall be removed and disposed of as soon as practicable, at least once per shift (or more often if needed).

6. Disconnect switches, distribution panels, or alarm supply boxes shall not be blocked by any obstruction which may prevent ready access.

7. Machinery and equipment shall be kept clean of excess grease and oil and (operating conditions permitting) free of excessive dust. Pressure gauges and visual displays shall be kept clean, visible, and serviceable at all times. Drip pans and wheeled or stationary containers shall be cleaned and emptied at the end of each shift.

G. Fire Prevention

All shop services personnel shall receive fire prevention training as part of their general training.

1. Supervisors in charge of operations where fuels, solvents, or other flammable liquids are used shall be constantly alert for hazards and unsafe acts. Fuels such as gasoline shall never be used to clean floors or clothing, and open solvent or gasoline containers shall not be kept near electrical equipment. The use of low flashpoint petroleum solvents shall be avoided whenever possible. Open flames, open element heaters, equipment not properly grounded, and nonexplosion-proof electrical equipment used in the presence of flammable or combustible liquids shall be avoided.

2. Fire extinguishers of at least 20 BC or greater rating shall be installed in shop areas. The number of extinguishers depends upon the size and layout of the facility. Fire extinguishers shall meet the following OSHA requirements:

    a. Be kept fully charged and in their designated area.
    b. Be located along normal paths of travel.
    c. Not be obstructed or obscured from view.
    d. Be visually inspected at least monthly to ensure that they:

    1) Are in their designated places.

    2) Have not been tampered with or actuated.

    3) Do not have corrosion or other impairments.

    4) Are accessible and not obstructed.

5) Be examined at least yearly and/or recharged or repaired to ensure operability and safety.

6) Be hydrostatically tested.

7) Be placed so the maximum travel distance, unless there are extremely hazardous conditions, does not exceed 75 feet for Class A or 50 feet for Class B locations.

3. Supervisors shall ensure that employees remove construction debris and rubbish from the job site upon completion of the job, or daily if extended beyond one day. Hazardous materials shall not be left at job sites unless properly stored. Work being performed on job sites shall not endanger building occupants (e.g., exits blocked, fire alarm devices disconnected, etc.).

H. Material Storage

All unnecessary accumulation of materials and supplies in the shop area shall be avoided. The presence of unnecessary material in the shop could cause such incidents as tripping, falling, or slipping. This could be especially hazardous around equipment that is in operation. The only material in the shop area shall be that actually in work. The only places that materials should accumulate in quantities are in storerooms and material holding areas.

1. The storage of materials shall not, of itself, create a hazard. Materials stored in tiers shall be stacked, strapped, blocked or interlocked, and limited in height so they are stable and secure against sliding or collapse. Storage racks shall have sufficient capacity to bear the loads imposed on them.
2. Stored materials shall not obstruct fire extinguishers, alarm boxes, sprinkler system controls, electrical switch boxes, machine operations, emergency lighting, first aid or emergency equipment, or exits.
3. Heavy materials and equipment should be stored low and close to the ground or floor to reduce the possibility of injury during handling.
4. All passageways and storerooms shall be maintained clean, unobstructed, dry, and in sanitary condition. Spills will be promptly removed.
5. Where mechanical handling equipment, such as lift trucks are used, safety clearance shall be provided for aisles at loading docks, through doorways, and wherever turns or passages must be made. No obstructions that could create a hazard are permitted in aisles.

I. Use of Tools

1. Hand tools

a. Incidents at the job site involving hand tools are usually the result of misuse. Hand tools are precision tools capable of performing many jobs when used properly. Prevention of incidents involving hand tools on the job site becomes a matter of good instruction, adequate training, and proper use.

b. Hand tool safety requires that the tools be of good quality and adequate for the job. All tools shall be kept in good repair and maintained by qualified personnel.

c. Racks, shelves, or tool boxes shall be provided for storing tools which are not in use.

d. When personnel use hand tools while they are working on ladders, scaffolds, platforms, or work stands, they shall use carrying bags for tools which are not in use. Workers shall not drop tools.

2. Supervisors shall frequently inspect all hand tools used in the operation under their supervision. Defective tools shall be immediately removed from service. Some common tool defects are:

a. Handles

When handles of hammers, axes, picks, or sledges become cracked, split, broken, or splintered, they shall be immediately replaced. Tool handles shall be well-fitted and securely fastened by wedges or other acceptable means.

Wedges, always used in pairs, shall be driven into the handle when repairing a sledgehammer or maul, to prevent the head from accidentally flying off if the handle shrinks.

b. Tangs

Files, wood chisels, and other tools with tangs shall be fitted and used with suitable handles covering the end of the tang. Ends of the handles shall not be used for pounding or tapping.

c. Mushroom Heads

Cold chisels, punches, hammers, drift pins, and other similar tools have a tendency to mushroom from repeated poundings. They shall be dressed down as soon as they begin to crack and curl.

1. When dressing tools, a slight bevel of about three-sixteenths of an inch shall be grounded around the head. This will help prevent the heads from mushrooming.
2. When tool heads mushroom, the material is highly crystallized and, with each blow of the hammer, fragments are likely to break off.

3. Portable Power Tools

Portable power tools increase mobility and convenience but are frequently more hazardous to use than their stationary counterparts. Personnel who are required to use portable power tools in their work shall be thoroughly trained in safe operating practices. Safe operating procedure shall be set up for each type of tool consistent with the manufacturer's instructions.

J. Use of Compressed Air Sources

1. Compressed air has the appearance of a relatively harmless gas. However, to avoid accidents, compressed air must be used correctly. The improper or inadvertent connection of items not designed for shop air pressure, i.e., equipment, storage vessels, or containers, to a shop air supply may cause serious personal injury and more than likely will damage the item being connected.
2. The maximum air pressure approved for general use in the shops and laboratories is 30 psi (pounds per square inch). This pressure is sufficient for most shop and laboratory operations and is not significantly hazardous. Use discretion and good judgment when using compressed air, even at this low pressure.
3. The following rules and practices are suggested to avoid personal injury, equipment damage, and potential environmental impact:

a. All personnel assigned to shops with air compressors shall be familiar with compressor operating and maintenance instructions.
b. Compressed air is not to be used to blow dirt, chips, or dust from clothing.
c. Air compressors shall be maintained strictly in accordance with the manufacturer's instructions.
d. Do not use compressed air to transfer materials from containers when there is a possibility of exceeding the safe maximum allowable working pressure of the container.
e. The maximum working pressure of compressed air lines shall be identified in psi. Pipeline outlets shall be tagged or marked showing maximum working pressure immediately adjacent to the outlet.

f. Do not use compressed air to transfer materials from standard 55-gallon drums. Use a siphon with a bulk aspirator on a pump.

WARNING

It is dangerous to pressurize any container not designed for that purpose.

g. Never use compressed air where particles can be accelerated by the air stream.
h. Do not use compressed air to clean machinery or parts unless absolutely necessary. Where possible, use a brush. If necessary, use a minimum pressure and provide barriers or clear the area of personnel. Wear goggles to protect your eyes.
i. Never apply compressed air to any part of a person's body.
j. Do not use a compressed air line that does not have a pressure regulator for reducing the line pressure.
k. Keep the hose length between tool housing and the air source as short as possible.
l. Where possible, attach a short length of light chain between the hose and the housing on air-operated tools. This keeps the hose from whipping should the hose-tool coupling separate.
m. Inspect air supply and tool hoses before using. Discard and label unfit hoses. Repair hoses where applicable.
n. Turn valve off and vent pressure from a line before connecting or disconnecting it. Never work on a pressurized line.
o. Do not connect air supply respirators or supplied-air suits to the compressed air supply system of any building. Such compressed air is unsafe to breathe.
p. Do not attach pneumatic tools, process, or control instruments to breathing air lines. The potential contamination to personnel and systems is hazardous.

K. Barricades

Whenever a common area is disturbed by maintenance, repair, or construction operations and presents a hazard to personnel working in or near, or traveling through the area, care shall be taken to warn these personnel and other engineering services personnel of the potential hazard. Appropriate barriers shall be erected around excavations, open manholes, open electrical panels, etc., whenever they are to be left unattended.

Personal Protective Equipment Program

Policy:

Protective clothing will be provided whenever it is necessary by reason of hazards, processes or environmental conditions. Joe R. Jones Construction, Inc. requires that protective clothing be used when chemical hazards, radiological hazards, or mechanical irritants are encountered in a manner capable of causing injury or impairment through absorption, inhalation, or physical contact.

References

20 CFR 1910.134 Subpart I - Personal Protective Equipment

Responsibilities:

The Safety and Health Manager will be responsible for assessing the hazards and exposures that may require the use of PPE, determining the type of equipment to be provided, and purchasing the equipment. Input from managers, supervisors, and employees will be obtained and considered in selecting appropriate equipment.

Managers/supervisors will be responsible for training employees in the use and proper care of PPE, ensuring that all employees are assigned appropriate PPE, and ensuring that PPE is worn by employees when and where it is required.

Employees are responsible for following all provisions of this program and related procedures. They are expected to wear PPE when and where it is required.

Purpose:

The purpose of this program is to protect our employees by ensuring that Personal Protective Equipment (PPE) is provided, used, and maintained in a sanitary and reliable condition whenever it is necessary due to hazards from processes or in the work environment. To the extent that it is possible and feasible, Joe R. Jones Construction, Inc. will remove or eliminate hazards or exposures through engineering means to eliminate the need for PPE.

This program covers eye and face protection, head protection, foot protection, hand protection, and electrical protection. Respiratory hazards and hearing hazards are covered by other programs, but they will also be included in the Hazard Assessment described below. This program covers the responsibilities of managers, supervisors and workers,

assessment of hazards, selection and use of personal protective equipment (PPE), and training.

Procedures:

a. Personal protective clothing is to include approved lab coats, surgical caps, masks, gloves, special shirts, trousers, overalls, jumpsuits, safety shoes, hard hats, coats and smocks. As a minimum, Company furnished lab coats should always be worn during laboratory work.

b. Requests for all personal protective clothing not available as Company stock items are generated by the supervisor and are approved by the Safety and Health Manager. The protective clothing must be worn by the employees and visitors as dictated by Company policy. The clothing will be available only in compromise sizes (i.e. small, medium, and large).

c. Personal protective clothing may not be worn in the break room or other food consumption areas, conference rooms, picnic areas or off campus.

d. Sandals, and open-toed shoes, are prohibited in laboratory, shop, warehouse, and animal housing areas.

e. Safety shoes should be worn by all shop, warehouse and maintenance personnel as dictated by the nature of the work. Safety shoe areas are recommended by the supervisor and approved by the Safety and health Manager. The user will be responsible for the proper cleaning, maintenance and use of the safety shoes.

g. Hard hats should be worn in all posted areas (e.g., locations in warehouses, shops, and building construction or renovation areas) and when performing work in which the supervisor Safety and Health Manager decides such hazards exist.

Hazard Assessment:

Joe R. Jones Construction, Inc. will perform an assessment of the workplace to determine if hazards are present, or likely to be present, which necessitate the use of personal protective equipment (PPE). This assessment will consist of a survey of the workplace to identify sources of hazards to workers. Consideration will be given to hazards such as impact, penetration, laceration, compression (dropping heavy objects on foot, roll-over, etc.), chemical exposures, harmful dust, heat, light (optical) radiation, electrical hazards, noise, etc. Where such hazards are present, or likely to be present, Joe R. Jones Construction, Inc. will:

- Select, and have each affected employee use, the types of PPE that will protect the employee from the hazards identified in the hazard assessment.
- Communicate equipment selection decisions to each affected employee
- Select PPE that properly fits each affected employee
- Train employees in the use and care of PPE as described elsewhere in this program

Joe R. Jones Construction, Inc. will verify that the workplace hazard assessment has been performed by conducting a written certification. This certification will be dated and signed by the Safety and Health manager or person conducting the assessment. Whenever there is a change in process or in the workplace that might introduce or change an exposure or hazard, Joe R. Jones Construction, Inc. will perform an assessment to determine if there needs to be additional PPE or a change in the PPE provided. These supplemental hazard assessments will also be documented, signed and dated by the person performing the assessment. Joe R. Jones Construction, Inc. will review and update the workplace hazard assessment on an annual basis.

SELECTION OF PERSONAL PROTECTIVE EQUIPMENT (PPE):

Personal protective equipment (PPE) will be selected on the basis of the hazards to which the workers' are exposed or potentially exposed. All selections will be made by with input from managers, supervisors and workers.

Personal protective equipment will meet the following standards:

- Eye & Face Protection devices - ANSI Z87.1-1989 "American National Standard Practice for Occupational and Educational Eye and Face Protection"
- Head Protection devices - ANSI Z89.1-1986 "American National Standard for Personal Protection - Protective Headwear for Industrial Workers"
- Foot Protection devices - ANSI Z41-1991 "American National Standard for Personal Protection - Protective Footwear"
- Hand Protection - No national standard available - Selection will be based on task performed, conditions present, duration of use, and the hazards and potential hazards identified.

- Electrical Protective equipment - No national standard - Equipment will be tested electrically before first use and every 6 months thereafter or upon indication that insulating value is suspect.

Training:

Each employee who is required to use PPE will be trained in the following:

- Why PPE is necessary
- When PPE is necessary
- What PPE is necessary and any alternative choices of equipment
- How to properly don, doff, adjust, and wear PPE
- The proper care, maintenance, storage, useful life, and disposal of PPE

The training will include an opportunity for employees to handle the PPE and demonstrate that they understand the training and have the ability to use the PPE properly. Training will be provided by the manager or supervisor of the affected employees. Training will be documented in writing with the documentation including the names of each employee trained, the date(s) of the training, and the subject matter covered.

If an employee, who has been trained, demonstrates a lack of knowledge or behavior which leads the supervisor to believe the employee does not have a proper understanding of the PPE involved, that employee will be retrained. If there are changes in the workplace or processes that change the exposures or type of PPE to be used, all affected employees will be retrained.

Care Of Personal Protective Equipment:

Whenever practical, PPE will be assigned to individual workers for their exclusive use. Employees will be responsible for the PPE equipment assigned to them or used by them.

PPE will be regularly cleaned, inspected and stored according to instructions given during the training sessions or as directed by supervisors or managers. Defective or damaged PPE shall not be used. Employees are to report any defective or damaged equipment to their supervisor for repair or replacement.

Personal Protective Equipment:

Engineering controls shall be the primary methods used to eliminate or minimize hazard exposure in the workplace. When such controls are not practical or applicable, personal protective equipment shall be employed to reduce or eliminate personnel exposure to hazards.

Personal protective equipment (PPE) will be provided, used, and maintained when it has been determined that its use is required and that such use will lessen the likelihood of occupational injuries and/or illnesses. The Safety and Health Manager will recommend and/or provide necessary protective equipment where there is a reasonable probability that the use of the equipment will prevent or reduce the severity of injuries or illness.

Equipment Specifications and Requirements-

All personal protective clothing and equipment will be of safe design and construction for the work to be performed. Only those items of protective clothing and equipment that meet National Institute of Occupational Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards will be procured or accepted for use.

Eye and Face Protection-

The majority of occupational eye injuries can be prevented by the use of suitable/approved safety spectacles, goggles, or shields. Approved eye and face protection shall be worn when there is a reasonable possibility of personal injury. Supervisors, with assistance from the Safety and Health Manager, determine jobs and work areas that require eye protection and the type of eye and face protection that will be used.

Typical hazards that can cause eye and face injury are:

- Splashes of toxic or corrosive chemicals, hot liquids, and molten metals;
- Flying objects, such as chips of wood, metal, and stone dust;
- Fumes, gases, and mists of toxic or corrosive chemicals; and
- Aerosols of biological substances.

Prevention of eye accidents requires that all persons who may be in eye hazard areas wear protective eyewear. This includes employees, visitors, researchers, contractors, or others passing through an identified eye hazardous area. To provide protection for these personnel, activities shall procure a sufficient quantity of heavy duty goggles and/or plastic eye protectors which afford the maximum amount of protection possible.

If these personnel wear personal glasses, they shall be provided with a suitable eye protector to wear over them.

Specifications-

Eye and face protectors procured, issued to, and used by Company personnel must conform to the following design and standards:

a) Provide adequate protection against the particular hazards for which they are designed

b) Fit properly and offer the least possible resistance to movement and cause minimal discomfort while in use.

c) Be durable.

d) Be easily cleaned or disinfected for or by the wearer.

e) Be clearly marked to identify the manufacturer.

f) Persons who require corrective lenses for normal vision, and who are required to wear eye protection, must wear goggles or spectacles of one of the following types:

1) Spectacles with protective lenses which provide optical correction.

2) Goggles that can be worn over spectacles without disturbing the adjustment of the spectacles.

3) Goggles that incorporate corrective lenses mounted behind the protective lenses.

Description and Use of Eye/Face Protectors

a) Safety Spectacles. Protective eye glasses are made with safety frames, tempered glass or plastic lenses, temples and side shields which provide eye protection from moderate impact and particles encountered in job tasks such as carpentry, woodworking, grinding, scaling, etc.

b) Single Lens Goggles. Vinyl framed goggles of soft pliable body design provide adequate eye protection from many hazards. These goggles are available with clear or tinted lenses, perforated, port vented, or non-vented frames.

Single lens goggles provide similar protection to spectacles and may be worn in combination with spectacles or corrective lenses to insure protection along with proper vision.

c) Welders/Chippers Goggles. These goggles are available in rigid and soft frames to accommodate single or two eye piece lenses.
Welders goggles provide protection from sparking, scaling or splashing metals and harmful light rays. Lenses are impact resistant and are available in graduated shades of filtration.

Chippers/grinders goggles provide eye protection from flying particles. The dual protective eye cups house impact resistant clear lenses with individual cover plates.

d) Face Shields. These normally consist of an adjustable headgear and face shield of tinted/transparent acetate or polycarbonate materials, or wire screen. Face shields are available in various sizes, tensile strength, impact/heat resistance and light ray filtering capacity. Face shields will be used in operations when the entire face needs protection and should be worn to protect eyes and face against flying particles, metal sparks, and chemical/ biological splash.

e) Welding Shields. These shield assemblies consist of vulcanized fiber or glass fiber body, a ratchet/button type adjustable headgear or cap attachment and a filter and cover plate holder. These shields will be provided to protect workers' eyes and face from infrared or radiant light burns, flying sparks, metal spatter and slag chips encountered during welding, brazing, soldering, resistance welding, bare or shielded electric arc welding and oxyacetylene welding and cutting operations.

The Safety and Health Manager maintains a supply of various eye and face protective devices. Personnel requiring prescription safety glasses must contact the Safety and Health Manager.

Emergency Eyewash Facilities-

Emergency eyewash facilities meeting the requirements of ANSI Z358.1-1981 shall be provided in all areas where the eyes of any employee may be exposed to corrosive materials. All such emergency facilities shall be located where they are easily accessible to those in need.

Hearing Protection-

Hearing protection devices are the first line of defense against noise in environments where engineering controls have not reduced employee exposure to safe levels. Hearing protective devices can prevent significant hearing loss, but only if they are used properly.

The most popular hearing protection devices are earplugs which are inserted into the ear canal to provide a seal against the canal walls. Earmuffs enclose the entire external ears inside rigid cups. The inside of the muff cup is lined with acoustic foam and the perimeter of the cup is fitted with a cushion that seals against the head around the ear by the force of the headband.

Preformed earplugs and earmuffs should be washed periodically and stored in a clean area, and foam inserts should be discarded after each use. It is important for you to wash hands before handling pre-formed earplugs and foam inserts to prevent contaminants from being placed in the ear which may increase your risk of developing infections.

Also, check hearing protective devices for signs of wear or deterioration.

Replace devices periodically.

The Safety and Health Manager maintains a supply of a variety of disposable foam ear inserts and earmuffs.

Respiratory Protection-

Respiratory hazards may occur through exposure to harmful dusts, fogs, fumes, mists, gases, smoke, sprays, and vapors. The best means of protecting personnel is through the use of engineering controls, e.g., local exhaust ventilation. Only when engineering controls are not practical or applicable shall respiratory protective equipment be employed to reduce personnel exposure.

The Safety and Health Manager is responsible for the Respiratory Protection Program at Joe R. Jones Construction, Inc. Workers requiring the use of

respirators must first obtain medical approval from Joe R. Jones Construction, Inc. physician to wear a respirator before a respirator can be issued. The Safety and Health Manager conducts respirator training and fit tests and is responsible for determining the proper type of respiratory protection required for the particular hazard.

Adherence to the following guidelines will help ensure the proper and safe use of respiratory equipment:

- Wear only the respirator you have been instructed to use. For example, do not wear a self-containing breathing apparatus if you have been assigned and fitted for a half-mask respirator.
- Wear the correct respirator for the particular hazard. For example, some situations, such as chemical spills or other emergencies, may require a higher level of protection than your respirator can handle. Also, the proper cartridge must be matched to the hazard (a cartridge designed for dusts and mists will not provide protection from vapors)
- Check the respirator for a good fit before each use. Positive and negative fit checks should be conducted.
- Check the respirator for deterioration before and after use. Do not use a defective respirator.
- Recognize indications that cartridges and canisters are at their end of service. If in doubt, change cartridges/ canisters before using respirator.
- Practice moving and working while wearing the respirator so that you can get used to it.
- Clean the respirator after each use, thoroughly dry it and place the cleaned respirator in a seal-label plastic bag.
- Store respirators carefully in a protected location away from excessive heat, light, and chemicals.

Head Protection-

Hats and caps have been designed and manufactured to provide workers protection from impact, heat, electrical and fire hazards. These protectors consist of the shell and the suspension combined as a protective system. Safety hats and caps will be of nonconductive, fire and water resistant materials. Bump caps or skull guards are constructed of lightweight materials and are designed to provide minimal protection against hazards when working in congested areas.

Head protection will be furnished to, and used by, all employees and contractors engaged in construction and other miscellaneous work in head-hazard areas. Head protection will also be required to be worn by engineers, inspectors, and visitors at construction sites. Bump caps/skull guards will be issued to and worn for protection against scalp lacerations from contact with

sharp objects. They will not be worn as substitutes for safety caps/hats because they do not afford protection from high impact forces or penetration by falling objects.

Hand Protection-

Skin contact is a potential source of exposure to toxic materials; it is important that the proper steps be taken to prevent such contact. Gloves should be selected on the basis of the material being handled, the particular hazard involved, and their suitability for the operation being conducted. One type of glove will not work in all situations.

Most accidents involving hands and arms can be classified under four main hazard categories: chemicals, abrasions, cutting, and heat. There are gloves available that can protect workers from any of these individual hazards or any combination thereof.

The first consideration in the selection of gloves for use against chemicals is to determine, if possible, the exact nature of the substances to be encountered. Read instructions and warnings on chemical container labels and MSDSs before working with any chemical. Recommended glove types are often listed in the section for personal protective equipment.

All glove materials are eventually permeated by chemicals. However, they can be used safely for limited time periods if specific use and glove characteristics (i.e., thickness and permeation rate and time) are known. The Safety and Health Manager can assist is determining the specific type of glove material that should be worn for a particular chemical.

Gloves should be replaced periodically, depending on frequency of use and permeability to the substance(s) handled. Gloves overtly contaminated should be rinsed and then carefully removed after use.

Gloves should also be worn whenever it is necessary to handle rough or sharp-edged objects, and very hot or very cold materials. The type of glove materials to be used (in these situations) includes leather, welder's gloves, aluminum-backed gloves, and other types of insulated glove materials.

Careful attention must be given to protecting your hands when working with tools and machinery. Power tools and machinery must have guards installed or incorporated into their design that prevent the hands from contacting the point of operation, power train, or other moving parts. To protect the hands from injury due to contact with moving parts, it is important to:

- Ensure that guards are always in place and used.

• Always lock out machines or tools and disconnect the power before making repairs.
• Treat a machine without a guard as inoperative; and
• Do not wear gloves around moving machinery, such as drill presses, mills, lathes, and grinders.

The Safety and Health Manager can help the supervisor identify appropriate glove selections for their operations. The Safety and Health Manager also maintains a selection of gloves for various tasks.

Safety Shoes-

Safety shoes shall be worn in the shops, warehouses, maintenance and other areas as determined by the Health and Safety Branch. Recommendations for safety footwear shall be approved by the Health and Safety Branch. All safety footwear shall comply with American National Standards Institute (ANSI) Standard ANSI Z41-1991, "American National Standard for Personal Protection - Protective Footwear. Protective footwear purchased before July 5, 1994, shall comply with ANSI Standard Z41.1-1967. Please check with Safety Manager for approval on safety shoes.

Responsibilities-

Supervisor –

a) Reviews employees work situation and recommends safety footwear as appropriate in accordance with established Institute policy.
b) Requests safety shoes from the Safety and Health manager for new employees or as indicated for replacement.
c) Ensures that all employees under his supervision use and maintain safety footwear.
d) Makes determination on the need for replacement or repair of safety shoes.

Employee –

- Wears approved safety shoes in all areas requiring safety footwear as determined by the supervisor and the Health and Safety Manager.

Health and Safety Manager –

- Consults with supervisors concerning safety shoe requirements and approves types of safety shoes.

Procedures-

If an employee is unable to find appropriate safety footwear at the designated vendors, he or she should check with the Health and Safety Manager for alternate procedures.

Employees who want to have their footwear repaired, should be encouraged to do so. Some footwear is designed to be repaired, and some is not. Repairs would include such items as new soles and heels.

Hearing Personal Protective Equipment

Hearing protective devices (ear plugs, muffs, etc.) shall be the permanent solution only when engineering or administrative controls are considered to be infeasible or cost prohibitive. Hearing protective devices are defined as any device that can be worn to reduce the level of sound entering the ear. Hearing protective devices shall be worn by all personnel when they must enter or work in an area where the operations generate noise levels of:

•Greater than 80 dBA sound levels, or
•120 dB peak sound pressure level or greater

Types of Hearing Protective Devices Hearing protective devices include the following:

a. Insert Type Earplugs

A device designed to provide an air-tight seal with the ear canal. There are three types of insert earplugs – pre-molded, formable, and custom earplugs.

1. Pre-molded Earplugs

Pre-molded earplugs are pliable devices of fixed proportions. Two standard styles, single flange and triple flange, come in various sizes, and will fit most people. Personnel responsible for fitting and dispensing earplugs will train users on proper insertion, wear, and care. While pre-molded earplugs are reusable, they may deteriorate and should be replaced periodically.

2. Formable

Formable earplugs come in just one size. Some are made of material which, after being compressed and inserted, expands to form a seal in the ear canal. When properly inserted, they provide noise attenuation values that are similar to those from correctly fitted pre-molded earplugs. Individual units may procure approved formable earplugs. Supervisors must instruct

users in the proper use of these earplugs as part of the annual education program. Each earplug must be held in place while it expands enough to remain firmly seated. A set of earplugs with a cord attached is available. These earplugs may be washed and therefore are reusable, but will have to be replaced after two or three weeks or when they no longer form an airtight seal when properly inserted.

3. Custom Molded Earplugs

A small percentage of the population cannot be fitted with standard pre-molded or formable earplugs. Custom earplugs can be made to fit the exact size and shape of the individual's ear canal. Individuals needing custom earplugs will be referred to an audiologist.

b. Earmuffs

Earmuffs are devices worn around the ear to reduce the level of noise that reaches the ear. Their effectiveness depends on an air tight seal between the cushion and the head.

Selection of Hearing Protective Devices

Employees will be given the opportunity to select hearing protective devices from a variety of suitable ones provided by job supt. In all cases the chosen hearing protectors shall have a Noise Reduction Ratio (NRR) high enough to reduce the noise at the ear drum to 80 dBA or lower.

Issuance of Hearing Protective Devices

The issuance of hearing protective devices is handled through the job supt. The job supt. will issue and fit the initial hearing protective devices (foam inserts, disposables). Instruction on the proper use and care of earplugs and earmuffs will be provided whenever HPDs (hearing protective devices) are dispensed. Personnel requiring earmuffs in addition to earplugs will be informed of this requirement and educated on the importance of using proper hearing protection. The job supt. will dispense ear muffs when necessary and will maintain a supply of disposable earplugs.

Use of Hearing Protective Devices

Always use and maintain HPDs as originally intended and in accordance with instructions provided.

Earmuff performance may be degraded by anything that compromises the cushion-to-circumaural flesh seal. This includes other pieces of personal protective equipment such as eyewear, masks, face-shields, and helmets.

Maintenance of Hearing Protective Devices

Reusable earplugs, such as the triple flange or formable devices should be washed in lukewarm water using hand soap, rinsed in clean water, and dried thoroughly before use. Wet or damp earplugs should not be placed in their containers. Cleaning should be done as needed.

Earmuff cushions should be kept clean. The plastic or foam cushions may be cleaned in the same way as earplugs, but the inside of the muff should not get wet. When not n use, ear muffs should be placed in open air to allow moisture that may have been absorbed into the cups to evaporate.

Hearing Protection Performance Information

The maximum of sound attenuation one gets when wearing hearing protection devices is limited by human body and bone conduction mechanisms. Even though a particular device may provide outstanding values of noise attenuation the actual noise reductions may be less because of the noise surrounding the head and body bypasses the hearing protector and is transmitted through tissue and bone pathways to the inner ear.

The term “double hearing protection” is misleading. The attenuation provided from any combination earplug and earmuff is not equal to the sum of their individual attenuation values.

PERSONAL PROTECTIVE EQUIPMENT (site specific)

HAZARD ASSESSMENT FORM

Date of Hazard Assessment: _____

Person Performing Hazard Assessment: _____

Location Job	Task/Position	Hazards	PPE Required
(EXAMPLE)			
(Molding Dept).	*(Press Operator)*	*(Flying particles)*	*(Safety Glasses)*

PERSONAL PROTECTIVE EQUIPMENT

CERTIFICATION OF HAZARD ASSESSMENT

I certify that a hazard assessment of the workplace was performed at our facility located at _____. This assessment consisted of a review of prior injury and illness records and a walk-through inspection of all work areas. The purpose of this assessment was to identify sources of hazards to employees that are present, or are likely to be present, in the workplace which necessitate the use of personal protective equipment (PPE).

Workplace Evaluated:
(Insert address of the facility and a listing of all departments or areas of the facility that were inspected.)

Person Certifying Hazard Assessment:

Name: _____ Title: _____

Date(s) of Hazard Assessment: _____

Attachments: Hazard Assessment Forms

Prevention and Control of Workplace Hazards

Policy:

Section 19(a) of the Occupational Safety and Health Act (OSHA) requires that employees be provided with a safe and healthful place of employment. Identification of hazardous conditions may be accomplished at the planning and design stage, as a result of workplace inspections, or by employee reports.

All recognized safety and health hazards shall be eliminated or controlled as quickly as possible, subject to priorities based upon the degree of risk posed by the hazards. The preferred method of hazard abatement shall be through application of engineering controls or substitution of less hazardous processes or materials.

Total reliance on personal protective equipment is acceptable only when all other methods are proven to be technically and/or economically infeasible.

Principles:

Safety and Health Hazards shall be eliminated or controlled by one of the following methods:

Substitution-

The risk of injury or illness may be reduced by replacement of an existing process, material, or equipment with a similar item having more limited hazard potential Some examples include: brush painting instead of spray painting to reduce inhalation hazards, welding instead of riveting to reduce noise levels, use of safety cans instead of bottles to store flammable liquids, etc. Care must be exercised in any substitution to ensure that the substitute materials are technically acceptable and to avoid introducing new or unforeseen hazards.

Isolation-

Hazards are controlled by isolation whenever an appropriate barrier or limitor is placed between the hazard and an individual who may be affected by the hazard. This isolation can be in the form of physical barriers, time separation, or distance. Examples include machine guards, electrical insulation, glove boxes, acoustical containment, and remote controlled equipment.

Ventilation-

The control of a potentially hazardous airborne substance by ventilation can be accomplished by one or two methods: diluting the concentration of the substance by mixing with uncontaminated air or capturing and removing the

substance at its source or point of generation. Local exhaust ventilation is generally the preferred and more economical method of hazard control. However, dilution ventilation can be very effective for the removal of large volumes of heated air or for the removal of low concentrations of non-toxic or low toxicity contaminants from minor and decentralized sources.

Administrative Control-

This method of hazard mitigation depends on effective operating practices that reduce the exposure of individuals to chemical or physical hazards. These practices may take the form of limited access to high hazard areas, preventive maintenance programs to reduce the potential for leakage of hazardous substances, or adjusted work schedules which involve a regimen of work in high hazard and low hazard areas. Adjusted work schedules are appropriate only when the hazard is recognized as having a limit below which nearly all workers may be repeatedly exposed without adverse effect.

Personal Protective Equipment-

This method of hazard control is least preferred because personal protective devices may reduce a worker's productivity, while affording less effective protection against the recognized hazard than other methods of control. Nevertheless, there are instances where adequate levels of risk reduction cannot be achieved through other methods, and personal protective devices must be used, either alone or in conjunction with other protective measures.

Application of Hazard Control Principles:

Hazardous conditions in the workplace may be prevented through appropriate actions when facilities are designed, when operating procedures are developed, and when equipment is purchased. Notwithstanding these preventive measures, hazards will arise as a result of the dynamics of the workplace environment. Once hazards are identified, whether through inspection or complaint, immediate action shall be taken to avoid unreasonable danger.

1. Design Reviews.

Safety and occupational health issues shall be considered, designed, and engineered into all facilities which are acquired or constructed for use by Company employees. To ensure

that appropriate hazard control techniques are applied, the Safety and Health Manager shall participate in the review of plans and specifications for construction and renovation projects. Recommendations shall be submitted in writing. Projects that involve potential health hazards such as toxic material, radiation, noise, or other health hazard shall be designed in accordance with established principles of good safety and industrial hygiene engineering.

2. Operating Procedures.

Standard operating procedures or similar directives developed by the supervisor that are issued to direct the manner in which work is performed shall include appropriate health and safety requirements. Supervisors are encouraged to submit standard operating procedures to the Safety and Health Manager for review. Recommendations for changes/additions to the procedures for safety and health purposes shall be submitted in writing to the originating supervisor.

3. Purchasing Procedures.

Many hazards can be avoided by incorporating appropriate specifications for purchased equipment/material and contracted efforts that involve work at Company facilities. Company organizations responsible for developing specifications for such purchases should coordinate with cognizant Safety and Health Manager to insure that health and safety requirements are considered in these specifications. Similarly, contracts that require work to be performed by host contract personnel at Company facilities should be coordinated with the Safety and Health Manager.

4. Interim Hazard Abatement Measures.

During the time needed to design and implement permanent hazard control measures, immediate, temporary measures are needed. Where engineering controls are not immediately applicable, administrative controls and/or personal protective equipment are appropriate for use as interim hazard abatement measures.

5. Permanent Hazard Abatement.

Engineering control methods are the preferred method of hazard control, followed by administrative control and personal protective equipment. Feasible engineering controls shall be used to reduce hazardous exposure, even when only partial reduction of exposure is possible through engineering methods.

Two criteria may be applied to determine whether engineering controls are feasible. First, a control is technologically feasible if it is available “off the shelf” or if technology exists

which can be adapted to the hazard in question. Second, a control is economically feasible if it can be shown that the cost of the control is justified by the benefit it produces. On the other hand, if the expected reduction of the hazard through implementation of engineering control is insignificant in terms of increased protection, and the cost of implementing the control is great, then the control is economically infeasible.

Development of Hazard Control Recommendations:

The following possible actions will be considered when recommendations are developed for prevention or reduction of hazards:

1. Avoiding, eliminating, or reducing deficiencies by engineering design, material selection or substitution;

2. Isolating hazardous substances, components, and operations from other activities, areas, personnel, and incompatible materials;

3. Incorporating "fail-safe" principles where failures would disable the system or cause a catastrophe through injury to personnel, damage to the equipment, or inadvertent operation of critical equipment;

4. Relocating equipment/components so that personnel access during operation, maintenance, repair or adjustment shall not result in exposure to hazards such as chemical burns, electrical shock, electromagnetic radiation, cutting edges, sharp points, or toxic atmospheres;

5. Providing suitable warning and notes of caution concerning required personnel protection in operation, assembly, maintenance, and repair instructions;

6. Providing distinctive markings on hazardous components, equipment, or facilities;

7. Requiring use of personal protective equipment when other controls do not reduce the hazard to an acceptable level;

8. Monitoring exposure to insure that engineering controls effectively reduce the hazard; and

9. Training employees to recognize hazards and take appropriate precautionary measures.

Hazard Reporting:

Identification and reporting of potentially unsafe or unhealthful working conditions is the responsibility of all Company employees. All Company employees are encouraged to

report unsafe or unhealthful working conditions to their immediate supervisor who will promptly investigate the situation and take appropriate corrective actions. Supervisors will contact the Safety and Health Manager for assistance as necessary. Supervisors will keep the reporting employee informed of all actions taken.

Any employee (or employee representative) may submit a written report of an unsafe or unhealthful working condition directly to the Safety and Health Manager.
The Safety and Health Manager will investigate all reports of hazards brought to its attention. The Safety and Health Manager will provide an interim or complete response in writing to the originator of the report of hazard. If the investigation validates the reported hazard, the complete response shall include a summary of the action taken for abatement. If no hazard is found to exist, the reply shall include the basis for that determination.

If the originator of the report of a hazardous condition is dissatisfied with the assessment of the alleged hazard made by the Safety and Health Manager or with actions taken to abate a confirmed hazard, he/she shall be encouraged to confer with the Safety and Health Manager to discuss the matter further.

Personal Protective Equipment: See page 23-38 Personal Protective Equipment

Chemical Safety Plan- HAZCOM for Non Laboratories

Purpose:

This Hazard Communication requires Joe R. Jones Construction, Inc. to provide information about the hazardous chemicals that employees will be exposed to, chemical product labels and other forms of warning, material safety data sheets related to the chemicals, appropriate training, and a written hazard communication program. The Safety and Health Manager has the specific responsibility for implementing the plan. Supervisors of employees have the responsibility to insure the Safety Plan is carried out. The Safety and Health Manager is also responsible for providing consultation and specific training when needed.

Remember: This standard applies to those employees who do not work in a laboratory. (Employees that DO work in a laboratory are covered by standards on the 5th page of this chapter.)

Supervisors who have employees who work in areas where hazardous chemicals are stored, handled or used are responsible for:

(1) creating and maintaining an inventory of all hazardous chemicals;
(2) ensuring proper labeling of all hazardous chemicals;
(3) acquiring and maintaining material safety data sheets for all hazardous chemicals located in the work area;
(4) informing employees of
    (i) any operations in their work area where hazards chemicals are present, and
    (ii) the location and availability of the written hazard communication program, the chemical inventory, and material safety data sheets; and training employees about hazardous chemicals used in the work area.

Hazardous Chemicals Inventory:

Supervisor(s), or his/her designee, is required to maintain a list of all hazardous chemicals known to be present in each work area (e.g. shop area, section, etc.) and to update the list as necessary. This inventory list must identify each hazardous chemical by the primary name on the label AND the manufacturer or distributor of the chemical. The inventory list must be kept in the work area and accessible to anyone requesting it. A suggestion is in a 3 ring binder, with the cover clearly labeled "**HAZARDOUS CHEMICALS**.

This inventory shall list all hazardous chemicals found in the work area. This is to include:

(1) laboratory chemicals
(2) janitorial supplies
(3) compressed gases
(4) cleaning products
(5) materials found in the maintenance departments (such as lubricating oils, solvents, etc.)
(6) specialty chemicals used by ANYONE!.

Labeling Requirements:

Supervisors must ensure that all hazardous chemicals in his/her area of responsibility are properly labeled. Labels should list at least the chemical identity, appropriate hazard warnings and the name and address of the manufacturer, importer or other responsible party. Portable containers of working solutions must be labeled appropriately unless they are intended for immediate use by the employee who prepares it. The contents of all vessels (containing chemicals or products such as cleaning solutions) must be identified by name on the container.

Chemicals stored in bulk quantities, pipelines, and storage tanks are required to be adequately labeled. Storage tanks or drums can be labeled collectively rather than labeling individual containers if they are not removed from the labeled area and if the hazards are the same. It is the responsibility of Joe R. Jones Construction, Inc., the laboratory or the manufacturing entity synthesizing the product to develop this label.

Material Safety Data Sheets (MSDS):

Supervisors are responsible for acquiring and updating material safety data sheets for all hazardous chemicals found in their work area. The material safety data sheets should be reviewed (before using the chemical) and kept in the work area so that they are readily accessible to all.

To obtain specific material safety data sheets, the supervisor shall procure them from the Safety and Health Manager.

Only the most current MSDS for a hazardous chemical from the same manufacturer will be kept on file. All Supervisors will check the date of all MSDS's and use the most current one for each chemical, while discarding all other out of date MSDS's. To obtain further information or assistance in interpreting Material Safety Data Sheets, contact the Safety and Health Manager.

Employee Training and Information:

A. Training

It is the responsibility of Supervisors to recognize when training is needed for his/her employees and to arrange for such training. Supervisors are not responsible to provide any training (in the sense that he must develop and present the training program) but rather must recognize the need for training and arrange for his employees to receive it.

This training is available in several formats:

- •A presentation arranged or presented by the local Safety Committee
- •A video presentation from Joe R. Jones Construction, Inc. library
- •A presentation arranged or presented by the Safety and Health Manager or staff
- •A presentation arranged or presented by the Supervisor

Employees must be trained on the proper safeguards, safe use, and physical and health hazards of hazardous chemicals used on the job before beginning work with those chemicals or whenever a new hazardous chemical or procedure is introduced into their work area. Also, it is recommended that employees receive annual training updates.

Training will include at least the following topics:

- Physical and health hazards of chemicals in the work area;
- Methods and observation techniques used to detect the presence or release of a hazardous chemical;
- How to lessen or prevent exposure to these hazardous chemicals through usage of controls, work practices and personal protective equipment;
- How to use material safety data sheet information;
- How to read and understand labels; and
- Contingency plans for medical and chemical accident response.

All training shall be documented by recording the training session subject(s), date, attendees, and providing a copy of the outline for the training session. The Supervisor shall maintain these records and provide copies of all records to the Safety and Health Manager.

B. New Employees

Information about Joe R. Jones Construction, Inc.'s Hazard Communication Program will be disseminated to all new employees in the Employee Safety Handbook (page 16). All new employees must be trained by their supervisor about hazardous chemicals in their work area at the time of their initial assignment and whenever a new hazard is introduced into the work area.

Non-routine Tasks:

Employees performing non-routine tasks can be exposed to chemicals from unusual and unsuspected sources. Written procedures shall be developed for every non-routine task by the supervisor of the employees who will perform the task. The information will include chemical hazards associated with the performance of the tasks and appropriate protective measures required to perform the task safely. The procedures shall be included in the local copy of the Hazard Communication Program. The Safety and Health Manager will provide advice and guidance upon request.

Use Of Corridors And Outside Walkways

Policy and Purpose:

Joe R. Jones Construction, Inc. will ensure that corridors in all buildings and outside walkways be maintained in such a manner that they are free of obstructions.

Fire codes and building regulations establish requirements for safe and adequate means of egress from buildings during emergencies. A fundamental principle of these codes and regulations is to maintain an exit path (i.e., corridors) which is free of obstructions and hazards. This principle is usually interpreted as prohibiting the storage of materials or operation of equipment in building corridors, even though corridor widths are greater than code-specified minimum widths.

This section establishes Company policy for the safe use of corridors in buildings occupied by Company employees. The intent of this policy is to ensure that corridors provide for:

- a readily apparent, safe and adequate means by which building occupants may exit a building in the event of a fire or other serious emergency;
- adequate access and use by emergency personnel;
- the safe movement of people during normal daily use of the building; and
- the safe transportation of goods and materials.

Responsibility:

a. Supervisor

1. Ensures that all employees under his/her direction are aware of and conform to this policy.
2. Ensures that corridors and outside walkways in the vicinity of his/her workplace and staff are free of obstructions and are not used for storage unless prior written authorization is issued by the Safety and Health Manager.

b. Employee

1. Uses appropriate areas and locations for the storage of equipment/supplies that will not impede safe movement of material or personnel.
2. Completes all necessary forms and follows procedures for submitting surplus or excess equipment.

c. Safety and Health Manager

1. Enforces the corridor and outside walkway policy.

2. Provides guidance or interpretation of the provisions of this policy.

3. Conducts periodic inspections of Company corridors for the purpose of advising each Supervisor of conditions requiring corrective action.

4. Approves/disapproves requests for exceptions under this policy.

General Provisions:

Corridors, hallways and outside walkways, aside from serving as passageways for personnel, equipment and supplies, function as avenues for building evacuation in the event of fire or other emergencies, quick admission of emergency personnel, and as convenient sites for fire alarm boxes, extinguishers, safety showers, eyewash stations, and other emergency equipment.

a. No equipment or material shall be placed or stored in any corridor or outside walkway without first obtaining written permission from the Health and Safety Branch.

b. When exceptions are granted, no material shall be located in such a manner which blocks or impedes access to doorways or other exits, telephone and electrical switch gear panels, safety showers, fire extinguishers, or fire alarm boxes.

c. Compressed gas cylinders, empty or full, shall not be stored in any corridor.

d. Items to be disposed of by the janitorial service should not be placed in corridors until the late afternoon, just prior to the end of the normal work day. They should be clearly marked as "TRASH".

e. No hazardous material (i.e., chemicals, radioactive materials) or hazardous wastes shall be placed or stored in corridors. Yellow bags are reserved for hazardous wastes and should never be placed in the corridors.

f. Surface mounted fire extinguishers, bulletin or chalkboards, or similar items may extend into the clear space; however, displays which extend into the clear space by more than 4 inches are not permitted. Items shall have no sharp edges which could cause injury.

Elevator Lobbies-

While elevator lobbies represent considerable unused space, these areas are a part of the path leading to the stairwell exits and are not to be used for general storage.

Exceptions-

a. Permanent - Any request for a permanent exception to the provisions of this policy shall be in the form of a memorandum to the Safety and Health Manager. The memorandum shall identify the specific items(s) for which the exception is requested (including the size, if appropriate); the proposed storage/use location; and the reason why the policy requirement should be waived. The Safety and Health Manager will approve or disapprove in writing. Any appeals should be made to Joe R. Jones Construction, Inc. President.

b. Temporary - Where a temporary exception is needed for storage in corridors or walk-ways due to alterations or scheduled moves, a request for temporary exception (not to exceed 30 days) shall be in the form of a memorandum from the responsible individual to the Safety and Health Manager.

The memorandum should identify the specific item(s); the length of time for storage; and the reason why the items cannot be retained in their present location. The Safety and Health Manager will approve/deny the request.

Penalties:

Material or equipment found in violation of the provisions of this issuance will be subject to removal from the building by authorized personnel. All confiscated items will be removed to the warehouse or other location and released only on a written request by the Safety and Health Manager.

Abandoned Property:

a. Abandoned property is defined as any property which is in an inappropriate location and has no known user. It can cause space, security, and safety problems.

b. Supervisors are responsible for keeping abandoned property from cluttering corridors and building areas. Company Management officials may require that abandoned property be moved when it impedes the normal flow of traffic, creates a hazard, or for other reasons.

c. Abandoned property to be moved will be identified with a sticker or form that indicates the property will be removed within one week if not claimed by the owner. Individuals marking abandoned property for movement must coordinate with the Safety and Health Manager concerning the safety of the abandoned property.

Back-lifting Safety

Policy:

Joe R. Jones Construction, Inc. will ensure that potential back injury risk factors within the facility are evaluated and controlled. This standard practice instruction is intended to address comprehensively the issues of; evaluating and identifying back injury hazards, evaluating engineering controls, work practices, administrative controls, and establishing appropriate procedures.

Responsibility:

The Safety and Health Manager is responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program. The Safety and Health Manager will develop written detailed instructions covering each of the basic elements in this program, and is the sole person authorized to amend these instructions. The Safety and Health Manager is authorized to halt any operation of the company where there is danger of serious personal injury.

Joe R. Jones Construction, Inc. Workplace Back Safety:

Written Program- Joe R. Jones Construction, Inc. will review and evaluate this standard practice instruction:

- On an annual basis
- When changes occur to 29 CFR, that prompt revision of this document
- When facility operational changes occur that require a revision of this document
- When there is an accident or close-call that relates to this area of safety
- Review the program any time these procedures fail

Effective implementation of this program requires support from all levels of management within Joe R. Jones Construction, Inc. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals and objectives.

Training

Supervisors will determine whether training required for specific jobs will be conducted in a classroom or on-the-job. The degree of training provided shall be determined by the complexity of the job and the associated hazards.

Initial Training - Prior to job assignment, Joe R. Jones Construction, Inc. shall provide training to ensure that the hazards associated with pre-designated job skills are understood by employees and that the knowledge and skills required for the safe application and usage of work place procedures and equipment, are acquired by employees. The training shall include the following:

- Each affected employee shall receive training in the recognition of back injury hazards involved with a particular job, and the methods and means necessary for safe work.
- Training course content. All new and current workers, who work in areas where there is reasonable likelihood of back injury, will be kept informed through continuing education programs. Initial and refresher training will, as a minimum, cover the following:

    - Back hazards associated with the job.
    - Lifting techniques.
    - Potential health effects of back injury.
    - Back injury precautions.
    - Proper use of protective clothing and equipment.
    - Use of engineering controls.

- Responsibility - Employees are responsible for following proper work practices and control procedures to help protect their health and provide for the safety of themselves and fellow employees, including instructions to immediately report to their supervisor of any significant back injury.

Refresher Training - Scheduled refresher training will be conducted on a (n) bi-annual basis.

Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in equipment or processes that present a new hazard, or when their work takes them into other hazard areas.

Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever Joe R. Jones Construction, Inc. has reason to believe, that there are deviations from or inadequacies in the employee's knowledge of known hazards, or use of equipment or procedures.

The retraining shall reestablish employee proficiency and introduce new equipment, new lifting procedures or revised control methods and procedures, as necessary.

Training Certification - Joe R. Jones Construction, Inc. shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain a synopsis of the training conducted, each employee's name, and dates of training.

Back Disorder Risk Factors - Identification of hazards will be based on risk factors such as, conditions of a job process, work station, or work methods that contribute to the risk of developing problems associated with back disorders. Not all of these risk factors will be present in every job containing stressors, nor is the existence of one of these factors necessarily sufficient to cause a back injury. Supervisors will use the following known risk factors to isolate and report suspected problem areas:

- Back Disorder Risk Factors.
    - Repetitive and/or prolonged activities
    - Bad body mechanics such as
        - Continued bending over at the waist
        - Continued lifting from below the knuckles
        - Continued lifting above the shoulders
        - Twisting at the waist
        - Twisting at the waist while lifting
        - Lifting or moving objects of excessive weight
        - Lifting or moving object of asymmetric size
        - Prolonged sitting with poor posture
        - Lack of adjustable
            - Chairs
            - Footrests
            - Body supports
            - Work surfaces at work stations
        - Poor grips on handles
        - Slippery footing
        - Frequency of movement
        - Duration and pace
        - Stability of load
        - Coupling of load
            - Type of grip
        - Reach distances
        - Work height

Safe Lifting Techniques - Employees shall use a pushcart or other material-handling device as necessary. They shall also ask a co-worker for help if no device is available. The following situations show basic lifting techniques to avoid injury:

Employees shall be trained using the following lifting and placing of load strategies:

Lifting or lowering from a high place

- Stand on a platform instead of a ladder
- Lift the load in smaller pieces, if possible
- Slide the load as close to ones self as possible before lifting
- Grip firmly and slide it down
- Get help when they need it to avoid injury

Lifting from hard-to-get-at places

- Get as close to the load as possible
- Keep the back straight, stomach muscles tight
- Push buttocks out behind you
- Bend the knees
- Use leg, stomach, and buttock muscles to lift -- not the back

Lifting drums, barrels, and cylinders

- Use mechanical assists
- Be aware that loads can shift
- Get help if load is too heavy

Awkward objects

- Bend the knees with feet spread
- Grip the top outside and bottom inside corners
- Use the legs to lift, keeping back straight

Shoveling

- Make sure their grip and balance are solid
- Tighten the abdomen as they lift
- Keep the shovel close to the body
- Use the strength of the thigh muscles to bring them to an upright position
- Increase their leverage by keeping their bottom hand low and toward the blade

General safety tips

- Don’t lift objects over their head
- Don’t twist the body when lifting or setting an object down
- Don’t reach over an obstacle to lift a load
- Pace ones self to avoid fatigue

Excavation and Trenching Program

Excavation

Background:

Excavation cave-ins cause serious and often fatal injuries to workers in the United States. An analysis by OSHA of workers' compensation claims suggests that excavation cave-ins caused about 1,000 work-related injuries each year. Of these, about 140 result in permanent disability and 75 in death. Thus, this type of incident is a major cause of deaths associated with work in excavations and accounts for nearly 1% of all annual work-related deaths in the nation.

Policy:

OSHA standards require that walls and faces of all excavations in which workers are potentially exposed to danger from moving ground be guarded by a shoring system, safe sloping of the ground, or equivalent means of protection such as trench shield or boxes. In addition, OSHA standards require additional shoring and bracing procedures when excavations or trenches are located adjacent to previously backfilled excavations or where excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, or other sources.

As an obvious first step in preventing any injury or fatality in the future, Joe R. Jones Construction, Inc. concludes that all such excavation operations shall be done only in full compliance with existing OSHA standards.

Therefore, Joe R. Jones Construction, Inc. requires that the following procedures are observed and will be followed without exception:

- Joe R. Jones Construction, Inc. will have all utilities marked before digging. Joe R. Jones Construction, Inc. will call utility companies and shut off all electricity, gas, and water pipes in the trench.
- Shoring systems or sloping of the walls be used in all excavations 5 to 20 feet deep in any type of soil, except solid, stable rock.
- Appropriate shoring, shielding, or sloping requirements for all excavations deeper than 20 feet shall be determined by an engineer qualified to make these determinations.
- Materials must not be placed four feet or less from the edge of the excavation.
- Stop logs or barriers will be placed where vehicles and /or equipment that operate near the excavation do not accidentally fall into the excavation.
- Dirt generated from the excavated hole will not be stockpiled closer than 6 feet from the open hole

Trenches

Background:

Most trenches are dug to lay pipe, utilities, or place footings. It is easy to try to work fast in a trench and get out without taking safety steps. Each year, more than 40 construction workers are killed in trenches.

The Hazards:

A trench is a confined space with many special problems. Most deaths in trenches are from cave-ins. Other risks are falls, electrocution, being struck by falling objects, and bad air. Bad air can hurt your breathing, help cause a fire, or poison you. Many workers die trying to rescue other workers.

Policy:

OSHA has special rules to protect workers in trenches. Employees will follow the OSHA rules unless:

- The trench is in stable rock, or
- The trench is less than 5 feet deep and Joe R. Jones Construction, Inc. Supervisor/Manager finds no reason to expect a cave-in.

A Company Supervisor/ Manager will inspect a trench:

- Before every shift
- If bad air is expected — such as, the trench is in a sewer or near a dump or stored chemicals
- After anything that can increase hazards, such as:
  - Every rainstorm
  - The trench wall moves, causing cracking, scaling, or bulging
  - A heavy load near the trench moves or gets heavier.

Before Employees enter a trench they shall:

- Have it inspected by Joe R. Jones Construction, Inc.'s Supervisor/Manager.

- Make sure all equipment is in good condition. This includes water pumps and ventilators.

- Have a way to get out fast, like a ladder, if the trench is 4 feet deep or more.

Joe R. Jones Construction, Inc. will have all utilities marked before digging. Joe R. Jones Construction, Inc. will call utility companies and shut off all electricity, gas, and water pipes in the trench. Employee's will NOT use a boom near overhead power lines. If they

must operate a boom, they shall ask Joe R. Jones Construction, Inc. Supervisor/Manager to make sure power has been cut off and the lines have been grounded.

If bad air is expected, Joe R. Jones Construction, Inc. Supervisor/Manager will have a rescue plan and rescue equipment on the job site. If bad air is expected, Joe R. Jones Construction, Inc. Supervisor/Manager must test the air to meet the below OSHA Standards:

- The air must have 19.5 to 23.5% oxygen.
- Substances that can burn or explode — like gasoline or methane — should be at less than 20% of the lower explosive limit (or lower flammability limit).
- Check the air for toxics like chlorine, carbon monoxide, sewer gases, and hydrogen sulfide. These toxics can kill. (Carbon monoxide has no smell. Hydrogen sulfide smells like rotten eggs).

The Company Supervisor/Manager will decide if blowers can keep the air safe.

Joe R. Jones Construction, Inc. Supervisor/Manager will also check the soil. This check helps Joe R. Jones Construction, Inc. Supervisor/Manager choose the right worker-protection system:

- A trench can be in stable rock, or type A, type B, or type C soil. Stable rock and type A soils are the safest. Most soils are type B. Sand and trenches with water are type C soils.
- Water in a trench means workers are in danger.
- Clay can be type A, B, or C soil; it depends on how much water is in the clay. (**Many cave-ins happen in clay, because people think it looks safe**.)

Trench Work Procedures:

The following procedures will be followed while digging trenches:

Sloping, benching, or shoring will be performed to help prevent cave-ins.

Keep the spoil pile 2 feet or more from the edge of the trench.

Prevent materials, rocks, or soil from falling into the trench; use barriers, if needed.

Joe R. Jones Construction, Inc. Supervisor/Manager should test the air as often as needed to make sure it is safe.

IF A TRENCH CAVES IN:

Get out of the trench. Call 911 (or emergency services). Help your co-workers from outside the trench, if you can.

Never go into a trench that is caving in or has bad air — even to rescue co-workers. You can be killed.

NOTE: Trenches over 4 feet in depth are considered excavations. Any items marked NO on this form MUST be remediated prior to any employees entering the excavation.

Excavation > 4 feet deep? ___Yes ___No. If YES, fill out a Confined Space Permit PRIOR to ANY person entering the excavation.

Excavation, Trenching and Shoring Procedures

Scope and Application:

This policy sets forth the official practices required for excavations made by Joe R. Jones Construction, Inc. employees on any project site that excavation practices must be done.

Definitions:

Aluminum hydraulic shoring means an engineered shoring system comprised of aluminum hydraulic cylinders (cross braces), used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such a system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

Benching means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Cave-in means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Competent person means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. All competent persons must complete the 4-hour Physical Plant trenching and shoring class, successfully pass the exam, and be certified for successful completion of the class. A competent person should have and be able to demonstrate the following:

Training, experience, and knowledge of:
- Soil analysis,
- Use of protective systems, and
- Requirements of 29 CFR 1926 Subpart P.

Ability to detect:
- Conditions that could result in cave-ins,
- Failures in protective systems,
- Hazardous atmospheres, and
- Other hazards including those associated with confined spaces.

Authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work when required.

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

Registered professional engineer means a person who is registered as a professional engineer.

Shield (shield system) means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees with the structure. Shields can be permanent structure or can be designed to be portable and moved along as work progresses. Also known as trench box or trench shield.

Shoring (shoring system) means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sloping (sloping system) means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Trench (trench excavation) means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.

General Requirements:

All excavations shall be made in accordance with the rules, regulations, requirements, and guidelines set forth in 29 CFR 1926.650, .651, and .652; the Occupational Safety and Health Administration's standard on Excavations, except where otherwise noted below.

Procedures:

Joe R. Jones Construction, Inc. Supervisor or a competent person chosen by Job Site Supervisor shall be placed in charge of all excavations. Underground utilities must be located and marked before excavation begins. Employees are not allowed in the excavation while heavy equipment is digging.

Inspections:

The Joe R. Jones Construction, Inc. Supervisor/competent person shall conduct inspections:

1) Daily and before the start of each shift by using the "DAILY EXCAVATION CHECKLIST" found at the end of this chapter, as dictated by the work being done in the trench.
2) After every rain storm
3) After other events that could increase hazards, such as snowstorm, windstorm, thaw, earthquake, dramatic change in weather, etc.
4) When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur.
5) When there is a change in the size, location, or placement of the spoil pile.
6) When there is any indication of change or movement in adjacent structures.

(For excavations 4 feet or greater in depth, a trench inspection form shall be filled out for each inspection.)

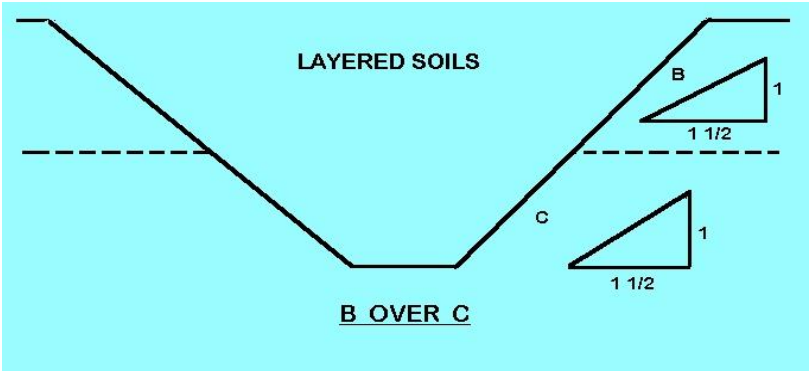
Soil Types:

Type A - Most stable: clay, silty clay, and hardpan (resists penetration). No soil is Type A if it is fissured, is subject to vibration of any type, has previously been disturbed, or has seeping water.

Type B - Medium stability: silt, sandy loam, medium clay and unstable dry rock; previously disturbed soils unless otherwise classified as Type C; soils that meet the requirements of Type A soil but are fissured or subject to vibration.

Type C - Least stable: gravel, loamy sand, soft clay, submerged soil or dense, heavy unstable rock, and soil from which water is freely seeping.

Layered geological strata (where soils are configured in layers) - The soil must be classified on the basis of the soil classification of the weakest soil layer. Each layer may be classified individually if a more stable layer lies below a less stable layer, i.e. where a Type C soil rests on top of stable rock.



Testing Methods

The competent person in charge of the excavation shall be responsible for determining whether the soil is Type B or C. The competent person shall use a visual test coupled with one or more manual tests.

Visual test

In addition to checking the items on the trench inspection form, the competent person should perform a visual test to evaluate the conditions around the site. In a visual test, the entire excavation site is observed, including the soil adjacent to the site and the soil being excavated. The competent person also checks for any signs of vibration.

During the visual test, the competent person should check for crack-line openings along the failure zone that would indicate tension cracks, look for existing utilities that indicate that the soil has been previously disturbed, and observe the open side of the excavation for indications of layered geologic structuring.

This person should also look for signs of bulging, boiling, or sloughing, as well as for signs of surface water seeping from the sides of the excavation or from the water table.

In addition, the area adjacent to the excavation should be checked for signs of foundations or other intrusions into the failure zone, and the evaluator should check for surcharging and the spoil distance from the edge of the excavation.

Manual tests

Thumb penetration test - Attempt to press the thumb firmly into the soil in question. If the thumb penetrates no further than the length of the nail, it is probably Type B soil. If the thumb penetrates the full length of the thumb, it is Type C. It should be noted that the thumb penetration test is the least accurate testing method.

Dry strength test- Take a sample of dry soil. If it crumbles freely or with moderate pressure into individual grains it is considered granular (Type C). Dry soil that falls into clumps that subsequently break into smaller clumps (and the smaller clumps can only be broken with difficulty) it is probably clay in combination with gravel, sand, or silt (Type B).

Plasticity or Wet Thread Test- Take a moist sample of the soil. Mold it into a ball

and then attempt to roll it into a thin thread approximately 1/8 inch in diameter by two inches in length. If the soil sample does not break when held by one end, it may be considered Type B.

A pocket penetrometer, shearvane, or torvane may also be used to determine the unconfined compression strength of soils.

Spoil

Temporary spoil shall be placed no closer than 2 feet from the surface edge of the excavation, measured from the nearest base of the spoil to the cut. This distance should not be measured from the crown of the spoil deposit. This distance requirement ensures that loose rock or soil from the temporary spoil will not fall on employees in the trench.

Spoil should be placed so that it channels rainwater and other run-off water away from the excavation. Spoil should be placed so that it cannot accidentally run, slide, or fall back into the excavation.

Permanent spoil should be placed some distance from the excavation.

Surface Crossing of Trenches

Surface crossing of trenches should not be made unless absolutely necessary. However, if necessary, they are only permitted under the following conditions:

1) Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.
2) Walkways or bridges must: have a minimum clear width of 20 inches, be fitted with standard rails, and extend a minimum of 24 inches past the surface edge of the trench.

Ingress and Egress

Trenches 4 feet or more in depth shall be provided with a fixed means of egress.

Spacing between ladders or other means of egress must be such that a worker will not have to travel more than 25 feet laterally to the nearest means of egress.

Ladders must be secured and extend a minimum of 36 inches above the landing.

Metal ladders should be used with caution, particularly when electric utilities are present.

Exposure to Vehicles

Employees exposed to vehicular traffic shall be provided with and required to wear reflective vests or other suitable garments marked with or made of reflectorized or high-visibility materials.

Trained flag persons, signs, signals, and barricades shall be used when necessary.

Exposure to Falling Loads

All employees on an excavation site must wear hard hats.

Employees are not allowed to work under raised loads.

Employees are not allowed to work under loads being lifted or moved by heavy equipment used for digging or lifting.

Employees are required to stand away from equipment that is being loaded or unloaded to avoid being struck by falling materials or spillage.

Equipment operators or truck drivers may remain in their equipment during loading and unloading if the equipment is properly equipped with a cab shield or adequate canopy.

Warning Systems for Mobile Equipment

The following steps should be taken to prevent vehicles from accidentally falling into the trench:

1) Barricades must be installed where necessary,
2) Hand or mechanical signals must be used as required,
3) Stop logs must be installed if there is danger of vehicles falling into the trench.
4) Soil should be graded away from the excavation; this will assist in vehicle control and channeling of run-off water.
5) Trenches left open overnight shall be fenced and barricaded

Hazardous Atmospheres and Confined Spaces

Employees shall not be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:

- Less than 19.5% oxygen,
- A combustible gas concentration greater than 20% of the lower flammable limit, and,
- Concentrations of hazardous substance that exceed those specified in the "Threshold Limit Values" for airborne contaminants established by the ACGIH.

All operations involving such atmospheres must be conducted in accordance with OSHA requirements for occupational health and environmental controls for personal protective equipment and for lifesaving equipment. Engineering controls (such as ventilation) and respiratory equipment may be required.

Testing for Atmospheric Contaminants

If there is any possibility that the trench or excavation could contain a hazardous atmosphere, atmospheric testing must be conducted prior to entry. Conditions that might warrant atmospheric testing would be if the excavation was made in a landfill area or if the excavation was crossed by, was adjacent to, or contained pipelines containing a hazardous material (for example, natural gas lines).

Testing should be conducted before employees enter the trench and should be done regularly to ensure that the trench remains safe. The frequency of testing should be increased if equipment is operating in the trench.

Testing frequency should also be increased if welding, cutting, or burning is done in the trench.

Employees required to wear respiratory protection must be trained, fit-tested, and enrolled in a respiratory protection program.

Some trenches qualify as confined spaces. When this occurs, compliance with the Company's Confined Space Program is also required.

Standing Water and Water Accumulation

Methods for controlling standing water and water accumulation must be provided and should consist of the following if employees must work in the excavation:

1) Use of special support or shield systems approved by a registered professional engineer.
2) Water removal equipment, such as well pointing, used and monitored by a competent person.
3) Safety harnesses and lifelines used in conformance with 29 CFR 1926.104.
4) Employees removed from the trench during rainstorms
5) Trenches carefully inspected by a competent person after each rain and before employees are permitted to re-enter the trench.

Benching, Sloping, Shoring, and Shielding Requirements

All excavations or trenches 4 feet or greater in depth shall be appropriately benched, shored, or sloped according to the procedures and requirements set forth in OSHA's Excavation Standard, 29 CFR 1926.650, .651, and .652.

Excavations or trenches 20 feet deep or greater must have a protective system designed by a registered professional engineer.

Excavations under the base of footing of a foundation or wall requires a support system designed by a registered professional engineer.

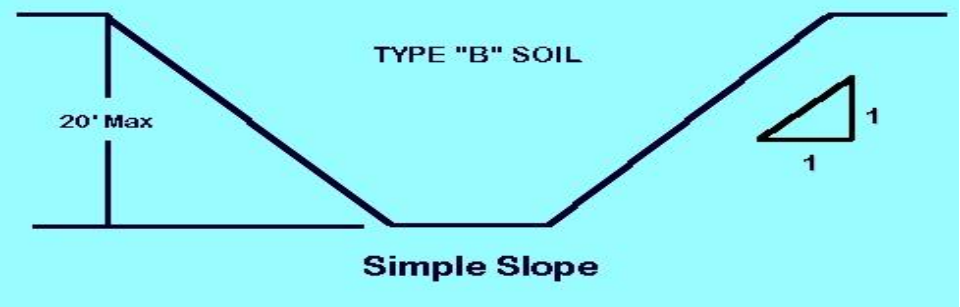
Sidewalks and pavement shall not be undermined unless a support system or another method of protection is provided to protect employees from their possible collapse.

Sloping

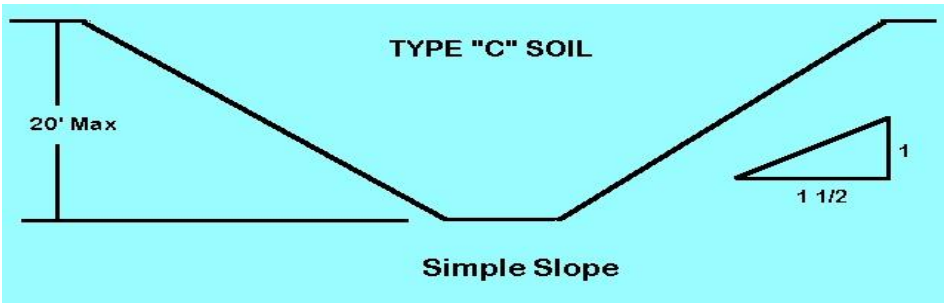
Maximum allowable slopes for excavations less than 20' based on soil type and angle to the horizontal are as follows:

Soil Type	Height/depth ratio	Slope angle
Type B	1:1	45 degrees
Type C	1 1/2:1	34 degrees

A 10-foot-deep trench in Type B soil would have to be sloped to a 45-degree angle, or sloped 10 feet back in both directions. Total distance across a 10-foot-deep trench



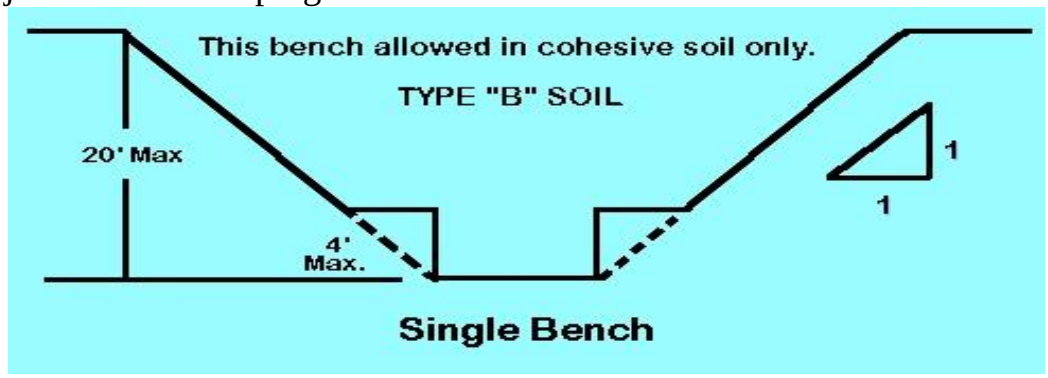
would be 20 feet, plus the width of the bottom of the trench itself. In Type C soil,



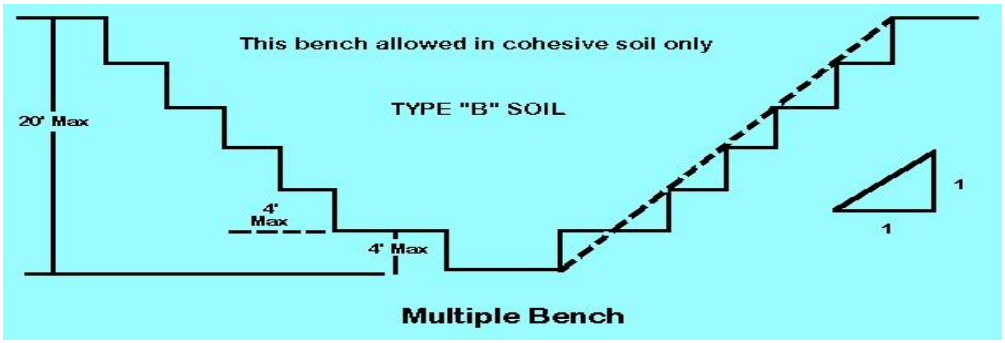
the trench would be sloped at a 34-degree angle, or 15 feet back in both directions for at least 30 feet across, plus the width of the bottom of the trench itself. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.

Benching

There are two basic types of benching~ single and multiple, which can be used in conjunction with sloping.



All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1. In Type B soil, the vertical height of the benches must not exceed 4 feet. Benches must be below the maximum allowable slope for that soil type. In other words, a 10-foot deep trench in Type B soil must be benched back 10 feet in each direction, with the maximum of a 45-degree angle.



Benching is not allowed in Type C soil.

Shoring

Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. There are two basic types of shoring, timber and aluminum hydraulic.

Hydraulic shoring provides a critical safety advantage over timber shoring because workers do not have to enter the trench to install them. They are also light enough to be installed by one worker; they are gauge-regulated to ensure even distribution of pressure along the trench line; and they can be adapted easily to various trench depths and widths. However, if timber shoring is used, it must meet the requirements of 29 CFR 1926.650, .651, and .652.

All shoring shall be installed from the top down and removed from the bottom up. Hydraulic shoring shall be checked at least once per shift for leaking hoses and/or cylinders, broken connections, cracked nipples, bent bases, and any other damaged or defective parts.

The top cylinder of hydraulic shoring shall be no more than 18 inches below the top of the excavation.

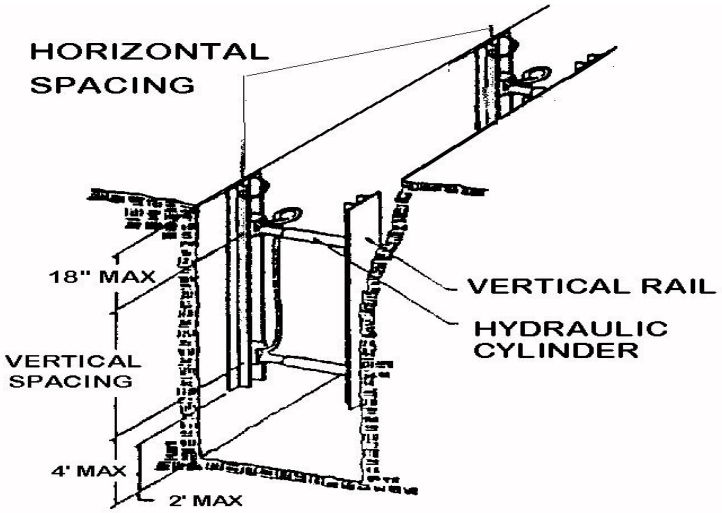
The bottom of the cylinder shall be no higher than four feet from the bottom of the excavation. (Two feet of trench wall may be exposed beneath the bottom of the rail or plywood sheeting, if used.)

Three vertical shores, evenly spaced, must be used to form a system.

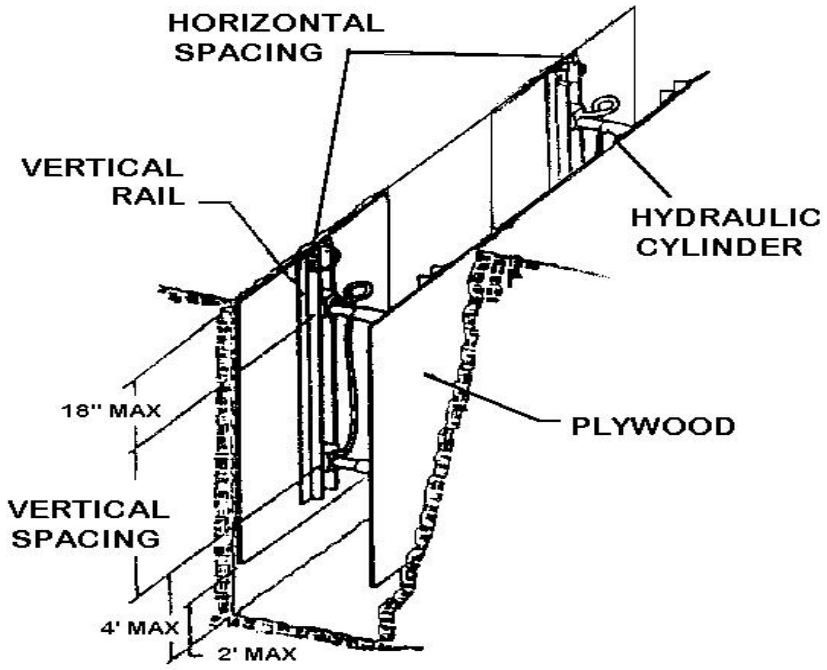
Wales are installed no more than two feet from the top, no more than four feet from the bottom, and no more than four feet apart, vertically.

Here are some typical installations of aluminum hydraulic shoring:

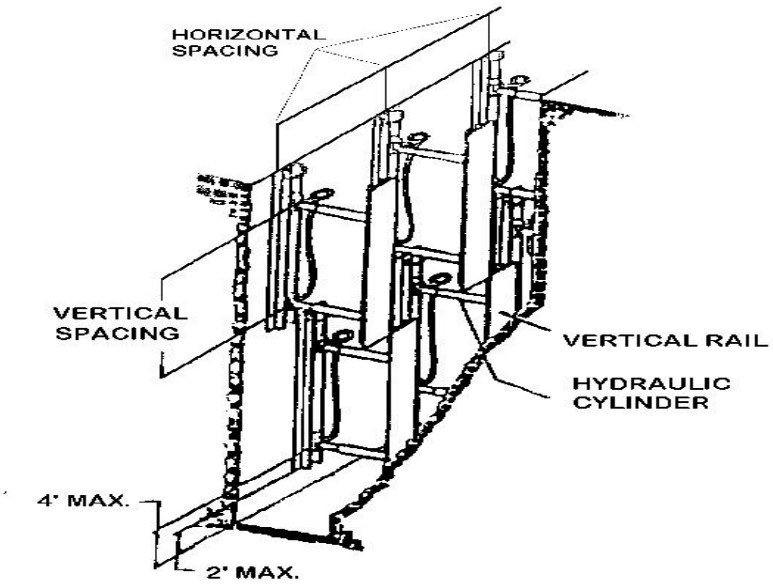
- Vertical aluminum hydraulic shoring (spot bracing)



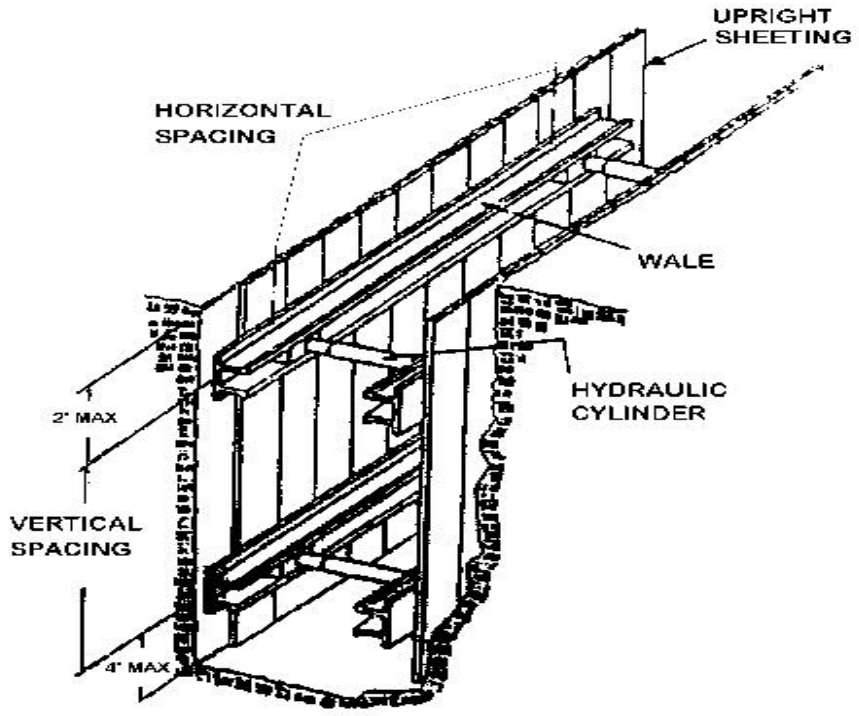
- Vertical aluminum hydraulic shoring (with plywood)



- Vertical aluminum hydraulic shoring (stacked)



- Aluminum hydraulic shoring waler system (typical)



Shielding

Trench boxes are different from shoring because, instead of shoring up or otherwise supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents.

The excavated area between the outside of the trench box and the face of the trench should be as small as possible. The space between the trench box and the excavation side must be backfilled to prevent lateral movement of the box. Shields may not be subjected to loads exceeding those which the system was designed to withstand.

Trench boxes are generally used in open areas, but they also may be used in combination with sloping and benching.

The box must extend at least 18 inches above the surrounding area if there is sloping toward the excavation. This can be accomplished by providing a benched area adjacent to the box.

Any modifications to the shields must be approved by the manufacturer.

Shields may ride two feet above the bottom of an excavation, provided they are calculated to support the full depth of the excavation and there is no caving under or behind the shield. .**Workers must enter and leave the shield in a protected manner, such as by a ladder or ramp. Workers may not remain in the shield while it is being moved.**

SOIL ANALYSIS CHECKLIST

Client		Date	
Project Name		Job Number	
Project Location		Weather	
Competent Person			
Where was the sample taken from			
Excavation length, depth and width	L:	D:	W:

VISUAL TEST					
Particle type	Fine Grained (Cohesive)		Granular (sand/silt or gravel)	Other:	
Water Conditions	Wet	Dry	Seeping Water	Surface Water present	Submerged
Notes					

Yes	No	N/A	Description
			Layered Soils Dipping Into excavation? If yes, describe:
			Excavation exposed to vibrations? If yes, describe:
			Previously disturbed soils?
			Crack like openings or sprawlings observed?
			Underground utilities? If yes, what type:
			Layered soils? (Note: the least stable layer controls the soil type)

MANUAL TEST					
Plasticity	Cohesive	Non-cohesive	Dry Strength	Cohesive (broken w/ difficulty)	Granular
Wet Shake	Water comes to surface (granular material)		Surface remains dry (clay material)		

THUMB TEST Note: Used to estimate unconfined compression strength of cohesive soil.			
Test Performed	Yes	No	N/A, Explain:

Soil indented by thumb with very great effort?	Type A
Soil indent by thumb with some effort?	Type B
Soil easily penetrated several inches by thumb with little or no effort. NOTE: If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.	Type C

PENETROMETER or SHEARVANE TEST Note: Used to estimate unconfined compressive strength of cohesive soils.			
Test Performed	Yes	No	Device Used / Serial Number:

Soil with unconfined compressive strength of 1.5 tsf of greater	Type A
Soil with unconfined compressive strength of greater than 0.5 tsf and less than 1.5 tsf.	Type B
Soil with unconfined compressive strength of 0.5 tsf or less. Note: if the soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.	Type C

No soil is Type A if fissured, subject to vibration, previously disturbed, layered dipping into excavation on a slope of 4h:1v

SOIL CLASSIFICATION			
Stable Rock	Type A	Type B	Type C
SELECTION OF PROTECTIVE SYSTEM (Refer to Appendix F of 29CFR1926)			
Sloping (Appendix B) Specify angle:	Timber Shoring (Appendix C)	Trench Shield Max depth in this soil:	Hydraulic Shoring (Appendix D)

Keep one copy of each Soil Analysis Checklist on site for project duration - Forward original to the Safety Director at the Main Office

Client		Date	
Project Name		Approximate Temp.	
Project Location		Approximate Wind Direction	
Job Number		Safety Rep	
Excavation Depth and Width		Soil Classification	
Protective System Used			
Activities in Excavation			
Competent Person			

YES	NO	N/A	DESCRIPTION
			GENERAL
			Employees protected from cave-ins & loose rock/soil that could roll into the excavation
			Spoils, materials & equipment set back at least 2 feet from the edge of the excavation
			Engineering designs for sheeting &/or manufacturer's data on trench box capabilities on site
			Adequate signs posted and barricades provided
			Training (toolbox meeting) conducted w/ employees prior to entering excavation
YES	NO	N/A	UTILITIES
			Utility company contacted & given 24 hours notice &/or utilities already located & marked
			Overhead lines located, noted and reviewed with the operator
			Utility locations reviewed with the operator, & precautions taken to ensure contact does not occur
			Utilities crossing the excavation supported, and protected from falling materials
			Underground installations protected, supported or removed when excavation is open
			WET CONDITIONS
			Air in the excavation tested for oxygen deficiency, combustibles, other contaminants
			Ventilation used in atmospheres that are oxygen rich/deficient &/or contains hazardous substances
			Ventilation provided to keep LEL below 10 %
			Emergency equipment available where hazardous atmospheres could or do exist
			Safety harness and lifeline used
			Supplied air necessary (if yes, contact safety department)
			ENTRY & EXIT
			Exit (i.e. ladder, sloped wall) no further than 25 feet from ANY employee
			Ladders secured and extend 3 feet above the edge of the trench
			Wood ramps constructed of uniform material thickness, cleated together @ the bottom
			Employees protected from cave-ins when entering or exiting the excavation

KEEP 1 COPY OF EACH DAILY EXCAVATION CHECKLIST ON SITE FOR THE PROJECT DURATION, AND FORWARD THE ORIGINAL TO THE SAFETY MANAGER

Confined Spaces

Policy:

It is the policy of Joe R. Jones Construction, Inc. to protect the health and welfare of all employees whose work assignments may require entering or working in permit-required confined spaces. Only persons with appropriate aptitudes and physical competence shall be employed in confined space work. Training of selected persons to carry out confined space work shall include:

- Emergency entry and exit procedures
- Use of appropriate respiratory protective equipment
- First aid, including Cardio-Pulmonary Resuscitation (CPR)
- Lock Out and Isolation procedures
- The use of safety equipment
- Rescue drills
- Fire protection
- Communications
- Aspects essential for maintaining the safety of the breathing environment
- Recognition of any hazards specific to the operation/activity.

Purpose:

To establish the policy and procedures regarding Management and employee response and actions to a working in confined spaces. Working in confined spaces can lead to injury or even death if adequate precautions are not taken. Only trained persons may enter or work in confined spaces.

Confined spaces can include storage tanks, process vessels, boilers, silos, storage bins, pits, and pipes, sewers, tunnels and shafts. Any place of work where the atmosphere is liable to be contaminated at any time by dust, fumes, mist, vapor, gas or other harmful substance, or is liable at any time to be oxygen deficient is defined as a confined space. When any work area is not subject to good natural ventilation, people can be readily exposed to harmful vapors. They can then suffer lack of oxygen, and collapse as a result. People entering the same space to rescue colleagues may become the next victims.

Joe R. Jones Construction, Inc. will ensure that our employees are protected from the potential hazards involved in entering confined spaces. We will make every effort to comply with the OSHA Permit-Required Confined Space Standard (CFR 1910.146) and to exceed those requirements when necessary to ensure the safety of our workers.

For the purposes of this program the following definitions will apply:

- Confined Space - A confined space has limited or restricted means of entry or exit, is large enough for an employee to enter and perform assigned work, and is not designed for continuous occupancy by the employee. These spaces may include, but are not limited to, underground vaults, manholes, tanks, storage bins, pit areas, vessels, and silos.

- Permit-Required Confined Space - A "permit-required confined space" is one that meets the definition of a confined space and has one or more of these characteristics:
  (1) Contains or has the potential to contain a hazardous atmosphere
  (2) Contains a material that has the potential for engulfing an entrant
  (3) Has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section
  (4) Contains any other recognized serious safety or health hazards.

Definitions:

a. Acceptable entry conditions means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

b. Attendant means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

c. Authorized entrant means an employee who is authorized by the employer to enter a permit space.

d. Blanking or blinding means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

e. Confined space means that:

• It is large enough and so configured that an employee can bodily enter and perform assigned work; and

• Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and

• Is not designed for continuous employee occupancy.

f. Double block and bleed means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

g. Emergency means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

h. Engulfment means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

i. Entry means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

j. Entry permit (permit) means the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in paragraph (g) of this section.

k. Entry supervisor means the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

> NOTE: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

l. Hazardous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);

- Airborne combustible dust at a concentration that meets or exceeds its LFL;

> NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.

- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

- Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information such as Material Safety Data Sheets that comply with the Hazard Communication Standard, §1910.1200, published information and internal documents can provide guidance in establishing acceptable atmospheric conditions.

m. Host employer means any employer who arranges to have the employees of another employer (contractor) perform work for them. Our Company is the host employer for the on-site Operations Maintenance Contractor who may also be a host employer.

n. Hot work permit means the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

o. Immediately dangerous to life or health (IDLH) means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

NOTE: Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possible fatal collapse 12 - 72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

p. Inerting means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.

q. Isolation means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

r. Line breaking means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

s. Non-permit confined space means a confined space that does not contain, or with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

t. Oxygen-deficient atmosphere means an atmosphere containing less than 19.5 percent oxygen by volume.

u. Oxygen-enriched atmosphere means an atmosphere containing more than 23.5 percent oxygen by volume.

v. Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere.
2. Contains a material that has the potential for engulfing an entrant;
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-sections; or
4. Contains any other recognized serious safety or health hazard.

w. Permit-required confined space program (permit space program) means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

x. Permit system means the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

y. Prohibited condition means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

z. Rescue service means the personnel designated to rescue employees from permit spaces.

aa. Retrieval system means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

ab. Testing means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

> NOTE: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.

References:

American National Standards Institute "Safety Requirements for Working in Tanks and other Confined Spaces".

NIOSH "Criteria for a Recommended Standard...Working in Confined Spaces."

U.S. Department of Labor, OSHA regulations, 29 CFR 1910.146, "Permit-Required Confined Spaces."

Identification and Evaluation of Confined Spaces:

An inspection of Joe R. Jones Construction, Inc.’s premises has identified the following spaces as confined spaces and permit-required confined spaces:

Confined Spaces: (N/A)

Permit-Required Confined Spaces: (N/A)

All Permit-Required Confined Spaces have been marked with warning signs reading:

"Danger - Permit-Required Confined Space - Authorized Entrants Only".

Procedure:

Work involving entry to a confined space must be planned. An assessment of likely hazards should be made prior to commencing the work. Precautions must be taken to avoid exposure to harmful substances or oxygen deficient atmospheres. Some thought should also be given to handling possible emergencies.

ENTRY INTO PERMIT-REQUIRED CONFINED SPACES:

Prior to entry into any permit-required confined space, the employee's supervisor will issue a permit that specifies the location, type, and duration of the work to be done, and the date. The permit will certify that all existing hazards have been evaluated by the supervisor and that necessary protective measures have been taken for the safety of workers. It will provide documentation of the atmospheric testing that has been done. It will assign entry and attendant duties to specific persons.

Before issuing an entry permit, the employee's supervisor will be responsible for the following:

- Identify all hazards and potential hazards associated with the confined space, such as the danger of explosion, asphyxiation, toxic gases/fumes, engulfment or entrapment, electrical or mechanical hazards, etc.
- Isolate the space from potential hazards, if possible, to provide for safe entry.
- Purge, inert, flush, ventilate to eliminate atmospheric hazards.
- Provide external barriers and warning signs.
- Perform pre-entry oxygen, flammable gas and toxicity air tests. All test results are to be recorded on the entry permit. If potential hazards cannot be isolated, continuous monitoring is required. If potential hazards can be isolated, periodic monitoring is required.
- Provide at least one trained attendant outside of each confined space that will be entered.
- Ensure that rescue and emergency services and equipment are in place as noted in this policy.
- Ensure that all required equipment is provided, maintained and properly used. This includes air monitoring equipment, forced air ventilation equipment, communications equipment, personal protective equipment (PPE), lighting, external barriers and warning signs, ladders, and rescue equipment.

If hazardous conditions are detected during entry, employees will immediately leave the space and the supervisor will determine the cause of the hazardous atmosphere and take corrective actions before allowing re-entry.

RESCUE & EMERGENCY SERVICES:

If proper protective measures are taken to eliminate and control any possible hazards in the confined space (i.e., ventilation, purging, monitoring, lock out/tag out, etc.), rescue

operations should not be necessary. Nonetheless, Joe R. Jones Construction, Inc. will be prepared for the worst case scenario.

An attendant for the confined space will have access to a telephone and know the proper procedure for alerting the proper personnel in the event of an emergency, including the fire department, paramedics, police, and others as necessary.

Provisions will be made and equipment provided to ensure timely extraction of an unconscious or injured worker from the confined space. This will include a body harness with a lifeline attached to a tripod and rescue winch. Under no circumstances is the attendant to enter the space to effect rescue; rescue operations must be left to trained personnel.

Training:

Employees involved with permit-required confined space work will be trained to assure the knowledge, understanding, and skills necessary for the safe performance of their duties. Foremen will be trained in the identification and evaluation of confined space hazards and in the proper precautions to be taken to assure safe entry and work in confined spaces. Employees entering confined spaces will be trained in the hazards and potential hazards involved and how to protect themselves from those hazards. They will be trained to never enter a confined space until a permit is issued and they have been authorized to enter by the foreman. Attendants will be trained in their duties and responsibilities and the actions to be taken in the event of an emergency.

Employees will receive a written certification following their training to document that they have been properly trained in their respective duties and the hazards and safety precautions involved in confined space entry.

Contractors:

a. When Joe R. Jones Construction, Inc. arranges to have employees of another employer (contractor) perform work that involves permit space entry, the host employer shall:

> i. Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the OSHA regulations;
>
> ii. Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space;

iii. Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;

iv. Coordinate entry operations with all contractors (including on-site contractors), when any combination of host employer personnel and/or contractor personnel will be working in or near permit spaces, as required by paragraph (f-8); and

v. Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

b. In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

i. Obtain any available information regarding permit space hazards and entry operations from the host employer;

ii. Coordinate entry operations with the host employer, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required; and

iii. Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

Sample Permit #1 (site specific)
Confined Space Entry Permit

Date and Time Issued: _____ Date and Time Expires: _____
Job site/Space I.D.: _____ Job Supervisor:_____
Equipment to be worked on: _____ Work to be performed: _____

Stand-by personnel: _____ _____ _____

1. Atmospheric Checks: Time _____
Oxygen _____%
Explosive _____% L.F.L.
Toxic _____PPM

2. Tester's signature: _____

3. Source isolation (No Entry):	N/A	Yes	No
Pumps or lines blinded,	( )	( )	( )
disconnected, or blocked	( )	( )	( )

4. Ventilation Modification:	N/A	Yes	No
Mechanical	( )	( )	( )
Natural Ventilation only	( )	( )	( )

5. Atmospheric check after isolation and Ventilation:
Oxygen _____% > 19.5 %
Explosive _____% L.F.L < 10 %
Toxic _____PPM < 10 PPM H(2)S
Time _____
Testers signature: _____

6. Communication procedures: _____
_____

7. Rescue procedures: _____
_____
_____
_____

8. Entry, standby, and back up persons:	Yes	No
Successfully completed required training?	( )	( )

Is it current?		( )	( )
9. Equipment:	N/A	Yes	No
Direct reading gas monitor - tested	( )	( )	( )
Safety harnesses and lifelines for entry and standby persons	( )	( )	( )
Hoisting equipment	( )	( )	( )
Powered communications	( )	( )	( )
SCBA's for entry and standby persons	( )	( )	( )
Protective Clothing	( )	( )	( )
All electric equipment listed Class I, Division I, Group D and Non-sparking tools	( )	( )	( )

10. Periodic atmospheric tests:

Oxygen	____%	Time ____	Oxygen	____%	Time ____
Oxygen	____%	Time ____	Oxygen	____%	Time ____
Explosive	____%	Time ____	Explosive	____%	Time ____
Explosive	____%	Time ____	Explosive	____%	Time ____
Toxic	____%	Time ____	Toxic	____%	Time ____
Toxic	____%	Time ____	Toxic	____%	Time ____

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor)_____
Approved By: (Unit Supervisor)_____
Reviewed By (Cs Operations Personnel) :

_____ _____

(printed name) (signature)

This permit is to be kept at the job site. Return job site copy to Safety Office following job completion.

Copies: White Original (Safety Office)-- Yellow (Unit Supervisor)-- Hard (Job site).

Sample Permit #2 (site specific)
Confined Space Entry Permit

PERMIT VALID FOR 8 HOURS ONLY. ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

Date: _____ Site Location and Description _____
PURPOSE OF ENTRY
_____
SUPERVISOR(S) in charge of crews Type of Crew Phone #
_____
_____
COMMUNICATION PROCEDURES
_____
RESCUE PROCEDURES (PHONE NUMBERS AT BOTTOM)
_____
_____

* BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED AND REVIEWED PRIOR TO ENTRY*

REQUIREMENTS COMPLETED	DATE	TIME
Lock Out/De-energize/Try-out	____	____
Line(s) Broken-Capped-Blanked	____	____
Purge-Flush and Vent	____	____
Ventilation	____	____
Secure Area (Post and Flag)	____	____
Breathing Apparatus	____	____
Resuscitator - Inhalator	____	____
Standby Safety Personnel	____	____
Full Body Harness w/"D" ring	____	____
Emergency Escape Retrieval Equip	____	____
Lifelines	____	____
Fire Extinguishers	____	____
Lighting (Explosive Proof)	____	____
Protective Clothing	____	____
Respirator(s) (Air Purifying)	____	____
Burning and Welding Permit	____	____

Note: Items that do not apply above, enter N/A in the blank.

RECORD CONTINUOUS MONITORING RESULTS EVERY 2 HOURS

****CONTINUOUS MONITORING****

Permissible _____

TEST(S) TO BE TAKEN	Entry Level	
PERCENT OF OXYGEN	19.5% to 23.5%	___ ___ ___ ___ ___ ___ ___ ___
LOWER FLAMMABLE LIMIT	Under 10%	___ ___ ___ ___ ___ ___ ___ ___
CARBON MONOXIDE	+35 PPM	___ ___ ___ ___ ___ ___ ___ ___
Aromatic Hydrocarbon	+ 1 PPM * 5PPM	___ ___ ___ ___ ___ ___ ___ ___
Hydrogen Cyanide	(Skin) * 4PPM	___ ___ ___ ___ ___ ___ ___ ___
Hydrogen Sulfide	+10 PPM *15PPM	___ ___ ___ ___ ___ ___ ___ ___
Sulfur Dioxide	+ 2 PPM * 5PPM	___ ___ ___ ___ ___ ___ ___ ___
Ammonia	*35PPM	___ ___ ___ ___ ___ ___ ___ ___

* Short-term exposure limit: Employee can work in the area up to 15 minutes.

+ 8 hr. Time Weighted Avg.: Employee can work in area 8 hrs (longer with appropriate respiratory protection).

REMARKS:_____

GAS TESTER NAME & CHECK #	INSTRUMENT(S) USED	MODEL &/OR TYPE	SERIAL &/OR UNIT #
_____	_____	_____	_____
_____	_____	_____	_____

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

Safety Standby Person(s)	CHECK #	CONFINED SPACE ENTRANT(S)	CHECK#	CONFINED SPACE ENTRANT(S)	CHECK #
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

SUPERVISOR AUTHORIZING –ALL CONDITIONS SATISFIED_____

DEPARTMENT/PHONE _____

AMBULANCE _____ FIRE _____

Safety Coordinator _____

Concrete and Masonry Construction

Background:

Concrete is composed of cement, sand, aggregate (sized stones), and water. When mixed in the correct amounts, concrete is a stable and versatile building medium which can be used in a variety of applications ranging from roads, bridges and buildings, to septic tanks and even countertops for household use. The versatility in building application is accomplished by altering the proportions of air and other variables in the mixture. Strengthening materials such as re-bar, fiberglass strands, and plastic rods are then added.

Scope and application: This chapter sets forth requirements to protect all construction employees from the hazards associated with concrete and masonry construction operations performed in workplaces covered under 29 CFR Part 1926. In addition to the requirements in Subpart Q, other relevant provisions in Parts 1910 and 1926 apply to concrete and masonry construction operations.

Definitions: The following definitions apply to this chapter.

(1) "Bull float" means a tool used to spread out and smooth concrete before it has taken it's initial set. Normally a large, magnesium or aluminum tool that is affixed to hand poles and is pushed back and forth across the horizontal surface of wet concrete.
(2) "Formwork" means the total system of support for freshly placed or partially cured concrete, including the mold or sheeting (form) that is in contract with the concrete as well as all supporting members including shores, re-shores, hardware, braces, and related hardware.
(3) "Lift slab" means a method of concrete construction in which floor, and roof slabs are cast on or at ground level and, using jacks, lifted into position.
(4) "Limited access zone" means an area alongside a masonry wall, which is under construction, and which is clearly demarcated to limit access by employees.
(5) "Precast concrete" means concrete members (such as walls, panels, slabs, columns, and beams) which have been formed, cast, and cured prior to final placement in a structure.
(6) "Reshoring" means the construction operation in which shoring equipment (also called reshores or reshoring equipment) is placed, as the original forms and shores are removed, in order to support partially cured concrete and construction loads.
(7) "Shore" means a supporting member that resists a compressive force imposed by a load.
(8) "Vertical slip forms" means forms which are jacked vertically during the placement of concrete.
(9) "Jacking operation" means the task of lifting a slab (or group of slabs) vertically from one location to another (e.g. from the casting location to a temporary (parked) location, or from a temporary location to another temporary location, or to its final location in the structure), during the construction of a building/structure where the lift-slab process is being used.

General Requirements:

It is the policy of Joe R. Jones Construction, Inc. that all concrete pour operations be conducted under the direct supervision of a competent supervisor. This includes an on site pre-safety briefing to all employees, inspection of forms, bracing and troughs, and the inspection of all Personal Protective Equipment that will be used during the operation

(a) Construction loads. No construction loads shall be placed on a concrete structure or portion of a concrete structure unless the employer determines, based on information received from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.

(b) Reinforcing steel. All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement.

(c) Post-tensioning operations.

(1) No employee (except those essential to the post-tensioning operations) shall be permitted to be behind the jack during tensioning operations.
(2) Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.

(d) Riding concrete buckets. No employee shall be permitted to ride concrete buckets.

(e) Working under loads.

(1) No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position.
(2) To the extent practical, elevated concrete buckets shall be routed so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

(f) Personal protective equipment. No employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

Responsibilities:

Management

- Ensure all equipment is routinely serviced and maintained in a safe condition
- Conduct periodic on-site inspection of operations
- Provide operation and safety training for affected employees

- Ensure access to operation areas are controlled

Supervisors

- Provide continuous operation safety observation and control
- Provide immediate corrective training for all unsafe acts
- Conduct pre-pour inspections

Employees

- Follow all safety and operational procedures
- Wear all Personal Protective Equipment during the concrete operation to include,
- Rubber gloves and boots
- Face Shields or goggles
- Hard Hats
- Immediately notify supervisor of all unsafe condition

Supervisor Oversight Requirements:

Conduct a safety meeting with the workers at the beginning of each shift to review that hazards that each person may encounter and give instructions for hazard elimination and/or protection.

Inspect all tools and equipment at least daily before use.

Workers mixing dry contents of concrete, or making saw cuts or other dust raising actions with concrete, may be exposed to dust inhalation. Workers should use approved respiratory protection when exposed to silica dust above the threshold limits. Implement dust control measures during sawing, grinding and mixing operations.

Ensure backup alarms work on all equipment and/or require all equipment to be escorted into position. Keep workers out of the backing-up path of mixing trucks.

Be aware of the swing radius of the concrete chutes, pinch points and the handling of chutes. Fingers caught in chute pinch points may be amputated.

Permit one person trained with standard crane hand signals to signal the crane operator swinging the cement bucket. Ensure the swing path of the cement bucket is NOT over any personnel.

Check for overhead power lines and avoid contact with float handles, pump booms and other tools and equipment.

If electrical lines are too close for safe float and finish work, the concrete pour should be reconfigured to avoid potential contact hazards.

Protect all moving parts of batch plants, mixers, portable mixers and other equipment with the appropriate safety guards or barriers. Keep fingers, hands, loose clothing and hair away from pinch and catch points.

Prior to workers entering mixing drums, batch plants, excavations, storage bins or other similar spaces:

Determine the confined space requirements. If the space is considered to be a confined space by OSHA definition, then follow approved confined space procedures.

Use proper Lockout-Tagout (LOTO) procedures when cleaning, performing maintenance and repairing batch plants, mixers and other equipment.

Inspect all hand-held electrically powered tools and cords before use and keep them plugged into Circuit Interrupters (GFCIs).

Provide and require the use of approved fall protection when workers are exposed to a fall greater than six (6) feet or more.

Use approved tied-off ladders and stairs to access all excavations and elevated heights.

Review Material Safety Data Sheets (MSDS) with the employees concerning the ingredients of the concrete, both the basic and additive ingredients, and other items such as curing compounds and sealants.

Secure the work area to keep the curious members of the public and other untrained personnel out. The risk of injury increases dramatically when your workers are distracted by outside hazards.

<u>Facilities and Equipment:</u>

(a) Bulk cement storage.

(1) Bulk storage bins, containers, and silos shall be equipped with the following:

(i) Conical or tapered bottoms; and
(ii) Mechanical or pneumatic means of starting the flow of material.

(2) No employee shall be permitted to enter storage facilities unless the ejection system has been shut down, locked out, and tagged to indicate that the ejection system is not to be operated.

(b) Concrete mixers. Concrete mixers with one cubic yard (.8 m^3) or larger loading skips shall be equipped with the following:

(1) A mechanical device to clear the skip of materials; and

(2) Guardrails installed on each side of the skip.

(c) Power concrete trowels. Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

(d) Concrete buggies. Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

(e) Concrete pumping systems.

(1) Concrete pumping systems using discharge pipes shall be provided with pipe supports designed for 100 percent overload.

(2) Compressed air hoses used on concrete pumping system shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized.

(f) Concrete buckets.

(1) Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or accidental dumping.

(2) Concrete buckets shall be designed to prevent concrete from hanging up on top and the sides.

(g) Tremies. Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials in addition to the regular couplings or connections.

(h) Bull floats. Bull float handles, used where they might contact energized electrical conductors, shall be constructed of nonconductive material or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

(i) Masonry saws.

(1) Masonry saws shall be guarded with a semicircular enclosure over the blade.

(2) A method for retaining blade fragments shall be incorporated in the design of the semicircular enclosure.

(j) Lockout/Tagout Procedures.

(1) No employee shall be permitted to perform maintenance or repair activity on equipment (such as compressors, mixers, screens or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged.

(2) Tags shall read **Do Not Start** or similar language to indicate that the equipment is not to be operated.

Requirements For Cast-In-Place Concrete

(a) General requirements for formwork.

(1) Formwork shall be designed, fabricated, erected, supported, braced and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork. Formwork which is designed, fabricated, erected, supported, braced and maintained in conformance with the Appendix to this section will be deemed to meet the requirements of this paragraph.

(2) Drawings or plans, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite.

(b) Shoring and reshoring.

(1) All shoring equipment (including equipment used in reshoring operations) shall be inspected prior to erection to determine that the equipment meets the requirements specified in the formwork drawings.

(2) Shoring equipment found to be damaged such that its strength is reduced to less than that required shall not be used for shoring.

(3) Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete placement.

(4) Shoring equipment that is found to be damaged or weakened after erection, such that its strength is reduced, shall be immediately reinforced.

(5) The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load.

(6) All base plates, shore heads, extension devices, and adjustment screws shall be in firm contact, and secured when necessary, with the foundation and the form.

(7) Eccentric loads on shore heads and similar members shall be prohibited unless these members have been designed for such loading.

(8) Whenever single post shores are used one on top of another (tiered), the employer shall comply with the following specific requirements in addition to the general requirements for formwork:

(i) The design of the shoring shall be prepared by a qualified designer and the erected shoring shall be inspected by an engineer qualified in structural design.
(ii) The single post shores shall be vertically aligned.
(iii) The single post shores shall be spliced to prevent misalignment.
(iv) The single post shores shall be adequately braced in two mutually perpendicular directions at the splice level. Each tier shall also be diagonally braced in the same two directions.

(9) Adjustment of single post shores to raise formwork shall not be made after the placement of concrete.

(10) Reshoring shall be erected, as the original forms and shores are removed, whenever the concrete is required to support loads in excess of its capacity.

(c) Vertical slip forms.

(1) The steel rods or pipes on which jacks climb or by which the forms are lifted shall be:

(i) Specifically designed for that purpose; and
(ii) Adequately braced where not encased in concrete.

(2) Forms shall be designed to prevent excessive distortion of the structure during the jacking operation.

(3) All vertical slip forms shall be provided with scaffolds or work platforms where employees are required to work or pass.

(4) Jacks and vertical supports shall be positioned in such a manner that the loads do not exceed the rated capacity of the jacks.

(5) The jacks or other lifting devices shall be provided with mechanical dogs or other automatic holding devices to support the slip forms whenever failure of the power supply or lifting mechanism occurs.

(6) The form structure shall be maintained within all design tolerances specified for plumb during the jacking operation.

(7) The predetermined safe rate of lift shall not be exceeded.

(d) Reinforcing steel.

(1) Reinforcing steel for walls, piers, columns, and similar vertical structures shall be adequately supported to prevent overturning and to prevent collapse.

(2) Employers shall take measures to prevent unrolled wire mesh from recoiling. Such measures may include, but are not limited to, securing each end of the roll or turning over the roll.

(e) Removal of formwork.

(1) Forms and shores (except those used for slabs on grade and slip forms) shall not be removed until the employer determines that the concrete has gained sufficient strength to support its weight and superimposed loads. Such determination shall be based on compliance with one of the following:

(i) The plans and specifications stipulate conditions for removal of forms and shores, and such conditions have been followed, or
(ii) The concrete has been properly tested with an appropriate ASTM standard test method designed to indicate the concrete compressive strength, and the test results indicate that the concrete has gained sufficient strength to support its weight and superimposed loads.

(2) Reshoring shall not be removed until the concrete being supported has attained adequate strength to support its weight and all loads in place upon it.

Requirements For Precast Concrete:

(a) Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.

(b) Lifting inserts which are embedded or otherwise attached to tilt-up precast concrete members shall be capable of supporting at least two times the maximum intended load applied or transmitted to them.

(c) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.

(d) Lifting hardware shall be capable of supporting at least five times the maximum intended load applied or transmitted to the lifting hardware.

(e) No employee shall be permitted under precast concrete members being lifted or tilted into position except those employees required for the erection of those members.

Requirements For Lift-Slab Construction Operations:

(a) Lift-slab operations shall be designed and planned by a registered professional engineer who has experience in lift-slab construction. Such plans and designs shall be implemented by the employer and shall include detailed instructions and sketches indicating the prescribed method of erection. These plans and designs shall also include provisions for ensuring lateral stability of the building/structure during construction.

(b) Jacks/lifting units shall be marked to indicate their rated capacity as established by the manufacturer.

(c) Jacks/lifting units shall not be loaded beyond their rated capacity as established by the manufacturer.

(d) Jacking equipment shall be capable of supporting at least two and one-half times the load being lifted during jacking operations and the equipment shall not be overloaded. For the purpose of this provision, jacking equipment includes any load bearing component which is used to carry out the lifting operation(s). Such equipment includes, but is not limited, to the following: threaded rods, lifting attachments, lifting nuts, hook-up collars, T-caps, shearheads, columns, and footings.

(e) Jacks/lifting units shall be designed and installed so that they will neither lift nor continue to lift when they are loaded in excess of their rated capacity.

(f) Jacks/lifting units shall have a safety device installed which will cause the jacks/lifting units to support the load in any position in the event any jack/lifting unit malfunctions or loses its lifting ability.

(g) Jacking operations shall be synchronized in such a manner to ensure even and uniform lifting of the slab. During lifting, all points at which the slab is supported shall be kept within 1/2 inch of that needed to maintain the slab in a level position.

(h) If leveling is automatically controlled, a device shall be installed that will stop the operation when the 1/2 inch tolerance set forth in paragraph (g) of this section is exceeded or where there is a malfunction in the jacking (lifting) system.

(i) If leveling is maintained by manual controls, such controls shall be located in a central location and attended by a competent person while lifting is in progress. The competent person must be experienced in the lifting operation and with the lifting equipment being used.

(j) The maximum number of manually controlled jacks/ lifting units on one slab shall be limited to a number that will permit the operator to maintain the slab level within specified tolerances of paragraph (g) of this section, but in no case shall that number exceed 14.
(k)

(1) No employee, except those essential to the jacking operation, shall be permitted in the building/structure while any jacking operation is taking place unless the building/structure has been reinforced sufficiently to ensure its integrity during erection. The phrase "reinforced sufficiently to ensure its integrity" used in this paragraph means that a registered professional engineer, independent of the engineer who designed and planned the lifting operation, has determined from the plans that if there is a loss of support at any jack location, that loss will be confined to that location and the structure as a whole will remain stable.

(2) Under no circumstances, shall any employee who is not essential to the jacking operation be permitted immediately beneath a slab while it is being lifted.

(3) For the purpose of paragraph (k) of this section, a jacking operation begins when a slab or group of slabs is lifted and ends when such slabs are secured (with either temporary connections or permanent connections).

(l) When making temporary connections to support slabs, wedges shall be secured by tack welding, or an equivalent method of securing the wedges to prevent them from falling out of position. Lifting rods may not be released until the wedges at that column have been secured.

(m) All welding on temporary and permanent connections shall be performed by a certified welder, familiar with the welding requirements specified in the plans and specifications for the lift-slab operation.

(n) Load transfer from jacks/lifting units to building columns shall not be executed until the welds on the column shear plates (weld blocks) are cooled to air temperature.

(o) Jacks/lifting units shall be positively secured to building columns so that they do not become dislodged or dislocated.

(p) Equipment shall be designed and installed so that the lifting rods cannot slip out of position or the employer shall institute other measures, such as the use of locking or blocking devices, which will provide positive connection between the lifting rods and attachments and will prevent components from disengaging during lifting operations.

Requirements For Masonry Construction:

(a) A limited access zone shall be established whenever a masonry wall is being constructed. The limited access zone shall confirm to the following:

(1) The limited access zone shall be established prior to the start of construction of the wall.

(2) The limited access zone shall be equal to the height of the wall to be constructed plus four feet, and shall run the entire length of the wall.

(3) The limited access zone shall be established on the side of the wall which will be unscaffolded.

(4) The limited access zone shall be restricted to entry by employees actively engaged in constructing the wall. No other employees shall be permitted to enter the zone.

(5) The limited access zone shall remain in place until the wall is adequately supported to prevent overturning and to prevent collapse unless the height of wall is over eight feet, in which case, the limited access zone shall remain in place until the requirements of paragraph (b) of this section have been met.

(b) All masonry walls over eight feet in height shall be adequately braced to prevent overturning and to prevent collapse unless the wall is adequately supported so that it will not overturn or collapse. The bracing shall remain in place until permanent supporting elements of the structure are in place.

Carpentry & Lumber Handling

Policy:

Personnel performing duties in carpentry and lumber handling are potentially exposed to a wide variety of hazards in many different environments and locations. Potential hazards include exposures to flammable and combustible adhesives, dusts, hazardous noise, eye hazards, working at heights above ground level, lifting hazards, electric and pneumatic power tools, and working with unfinished material which could expose them to splinters. Many tasks are performed in areas of high pedestrian traffic; therefore, an additional hazard of possible distraction from the job task arises. Potential physical and health hazards can be effectively controlled by proper work procedures and controls, and by using required personal protective equipment.

Procedures:

Personal protective equipment worn while operating machinery, equipment, and saws within the shop and on job sites normally consists of eye protection, safety-toe shoes, and hearing protection. Other safety related personal protective equipment are dust masks where workers are exposed to dust at the point of operation. The Safety and Health Manager shall be consulted to determine the need for dust masks.

Hard hats are required on job sites where the potential exists from being struck by falling object(s), e.g., roofing and construction.

Workers shall not leave a woodworking machine running unattended nor shall they attempt to clear, clean, or repair the machine while it is operating.

When maintenance is necessary, the machine shall be completely shut down, its control switches locked and tagged in the “OFF” position.

Supervisors shall ensure that periodic inspections are accomplished on all shop equipment.

Chips or dust shall never be removed from machinery by hand. Machine guards shall not be removed or made inoperative except for authorized maintenance. When guards are removed during machine repair, power control switches shall be locked in the “OFF” position and properly tagged. The machine shall remain locked until the guards are replaced.

Safety Precautions:

Table Saw Operations-

Keep hands out of the line of cut when feeding table saws. Use a push stick when close to the blade.

Adjust saw to expose the least amount of saw blade above table and material being cut.

Always stand out of line of stock being ripped.

Hold stock being cut against a gauge when cutting with a circular table saw.

Always use the appropriate saw for the cut (it would be unsafe to rip with a crosscut saw or to crosscut with a rip saw).

Avoid crosscutting long boards on a table saw.

Never adjust the saw or fence gauge while the saw is operating.

Designate the line of cut on the table top with a permanent mark when setting the gauge of a table saw without removing the guards.

Always use a brush or stick to clean or scrape sawdust from a saw.

Ventilation Systems:

Application-

Machines that develop fine dust or other airborne contaminants shall be equipped with effective industrial exhaust ventilation. In shops where small numbers of installed machines are not continuously in operation, portable collection systems may be used.

Exhaust Ducts and Pipes-

These shall be constructed and sized to minimize clogging. They shall discharge into an enclosed container.

Refuse-

Refuse shall be removed daily in all operations that are not required to have an exhaust system or where the refuse cannot be handled by an exhaust system.

Storage and Handling of Lumber:

Storage areas for lumber and other building materials can be potentially hazardous. For example, when lumber is stored upright, precautions shall be taken to prevent it from falling into aisles or passageways. Lumber stored in tiers shall be stacked, blocked, and interlocked and the stacks shall be limited in height so they are stable and secure against sliding or collapse. Furthermore, storage areas shall be kept free of accumulations of materials that constitute tripping, fire, or explosion hazards.

When heavy stock cannot be safely handled by workers, suitable mechanical lifting devices shall be used.

Gloves shall be worn by workers to reduce injury potential to the hands from splinters or from being pinched between the stacks. The accidental movement of the stacked material can cause serious injuries. Caution shall be taken not to disturb other tiers when removing partial stacks for use.

Manual handling is relatively safe if the proper lifting and carrying positions are used. Balanced handling is the key to safe handling.

Crane & Hoist Safety

Purpose:

Many types of cranes, hoists, and rigging devices are used at Joe R. Jones Construction, Inc. for lifting and moving materials. It is Joe R. Jones Construction, Inc.'s policy is to maintain a safe workplace for its employees; therefore, it cannot be overemphasized that only qualified and licensed individuals shall operate these devices.

The safety rules and guidance in this chapter apply to all operations at Joe R. Jones Construction, Inc. that involve the use of cranes and hoists installed in or attached to buildings and to all Company employees, supplemental labor, and subcontractor personnel who use such devices.

Responsibilities:

Supervisors are responsible for:

- Ensuring that Crane and Hoist Operators are properly trained and licensed.
- Evaluating crane and hoist equipment on job site to ensure proper rigging equipment is used
- Evaluating Crane and Hoist Operators safe use of equipment.

Crane and Hoist Operators are responsible for:

- Operating hoisting equipment safely.
- Conducting functional tests prior to using the equipment.
- Selecting and using rigging equipment appropriately.
- Having a valid operator's license on their person while operating cranes or hoists.
- Participating in the medical certification program, as required.
- Equipment will not be operated within 10 feet of energized electrical transmission lines or distribution lines.
- Ensuring that a fire extinguisher, rated at least 5 BC, shall be located in the cab of the crane

Maintenance Department is responsible for:

- Performing annual maintenance and inspection of all Company cranes and hoists that are not covered by a program with maintenance responsibility.
- Conducting periodic and special load tests of cranes and hoists.

- Maintaining written records of inspections and tests, and providing copies of all inspections and test results to facility managers and building coordinators who have cranes and hoists on file.
- Inspecting and load testing cranes and hoists following modification or extensive repairs (e.g., a replaced cable or hook, or structural modification.)
- Scheduling a non-destructive test and inspection for crane and hoist hooks at the time of the periodic load test, and testing and inspecting before use new replacement hooks and other hooks suspected of having been overloaded. The evaluation, inspection, and testing may include, but are not limited to visual, dye penetrant, and magnetic particle techniques referenced in ASME B30.10 (Hooks, Inspection and Testing.)
- Maintaining all manuals for cranes and hoists in a central file for reference.

Safety Department is responsible for:

- Conducting training for all Crane & Hoist Operators
- Issuing licenses to Crane and Hoist Operators
- Periodically verifying monthly test and inspection reports.
- Interpreting crane and hoist safety rules and standards.

Safe Operating Requirements:

All workers who use any Company crane or hoist shall have an operator's license. The Company issues licenses for authorized employees who have been specifically trained in crane and hoist operations and equipment safety.

Crane and Hoist Operators

To be qualified as a Crane and Hoist Operator, the candidate shall have received hands-on training from a licensed, qualified crane and hoist operator designated by the candidate's supervisor. Crane Operator's supervisor will issue license according to their company's procedures. Crane and Hoist Operators must renew their license every three years by satisfying the requirements described above.

Crane and Hoist Safety Design Requirements:

Following are the design requirements for cranes and hoists and their components:

- The design of all commercial cranes and hoists shall comply with the requirements of ASME/ANSI B30 standards and Crane Manufacturer's Association of America standards (CMAA-70 and CMAA-74). Joe R. Jones Construction, Inc.'s fabricated

lifting equipment shall comply with the requirements in Chapter 2.2 (Lifting Equipment) of Mechanical Engineering Design Safety Standards (latest edition).

- All crane and hoist hooks shall have safety latches.
- Hooks shall not be painted (or re-painted) if the paint previously applied by the manufacturer is worn.
- Crane pendants shall have an electrical disconnect switch or button to open the main-line control circuit.
- Cranes and hoists shall have a main electrical disconnect switch. This switch shall be in a separate box that is labeled with lockout capability.
- Crane bridges and hoist monorails shall be labeled on both sides with the maximum capacity.
- Each hoist-hook block shall be labeled with the maximum hook capacity.
- Directional signs indicating N-W-S-E shall be displayed on the bridge underside, and a corresponding directional label shall be placed on the pendant.
- A device such as an upper-limit switch or slip clutch shall be installed on all building cranes and hoists. A lower-limit switch may be required when there is insufficient hoist rope on the drum to reach the lowest point.
- All cab and remotely operated bridge cranes shall have a motion alarm to signal bridge movement.
- All newly installed cranes and hoists, or those that have been extensively repaired or rebuilt structurally, shall be load tested at 125% capacity prior to being placed into service. If an overload device is installed, a load test to the adjusted setting is required.
- Personnel baskets and platforms suspended from any crane shall be designed in accordance with the specifications in 29 CFR 1926.550(g).

General Safety Rules:

Operators shall comply with the following rules while operating the cranes and hoists:

- Do not engage in any practice that will divert your attention while operating the crane.
- Respond to signals only from the person who is directing the lift, or any appointed signal person. Obey a stop signal at all times, no matter who gives it.

- Do not move a load over people. People shall not be placed in jeopardy by being under a suspended load. Also, do not work under a suspended load unless the load is supported by blocks, jacks, or a solid footing that will safely support the entire weight. Have a crane or hoist operator remain at the controls or lock open and tag the main electrical disconnect switch.

- Ensure that the rated load capacity of a crane's bridge, individual hoist, or any sling or fitting is not exceeded. Know the weight of the object being lifted or use a dynamometer or load cell to determine the weight.
- Check that all controls are in the OFF position before closing the main-line disconnect switch.
- If spring-loaded reels are provided to lift pendants clear off the work area, ease the pendant up into the stop to prevent damaging the wire.
- Avoid side pulls. These can cause the hoist rope to slip out of the drum groove, damaging the rope or destabilizing the crane or hoist.
- To prevent shock loading, avoid sudden stops or starts. Shock loading can occur when a suspended load is accelerated or decelerated, and can overload the crane or hoist. When completing an upward or downward motion, ease the load slowly to a stop.

Operation Rules:

Pre-operational Test

At the start of each work shift, operators shall do the following steps before making lifts with any crane or hoist:

1. Test the upper-limit switch. Slowly raise the unloaded hook block until the limit switch trips.
2. Visually inspect the hook, load lines, trolley, and bridge as much as possible from the operator's station; in most instances, this will be the floor of the building.
3. If provided, test the lower-limit switch.
4. Test all direction and speed controls for both bridge and trolley travel.
5. Test all bridge and trolley limit switches, where provided, if operation will bring the equipment in close proximity to the limit switches.
6. Test the pendant emergency stop.
7. Test the hoist brake to verify there is no drift without a load.
8. If provided, test the bridge movement alarm.
9. Lock out and tag for repair any crane or hoist that fails any of the above tests.

Moving a Load

- Center the hook over the load to keep the cables from slipping out of the drum grooves and overlapping, and to prevent the load from swinging when it is lifted. Inspect the drum to verify that the cable is in the grooves.
- Use a tag line when loads must traverse long distances or must otherwise be controlled. Manila rope may be used for tag lines.
- Plan and check the travel path to avoid personnel and obstructions.
- Lift the load only high enough to clear the tallest obstruction in the travel path.
- Start and stop slowly.
- Land the load when the move is finished. Choose a safe landing.
- Never leave suspended loads unattended. In an emergency where the crane or hoist has become inoperative, if a load must be left suspended, barricade and post signs in the surrounding area, under the load, and on all four sides. Lock open and tag the crane or hoist's main electrical disconnect switch.

Parking a Crane or Hoist

- Remove all slings and accessories from the hook. Return the rigging device to the designated storage racks.
- Raise the hook at least 2.1 m (7 ft) above the floor.
- Store the pendant away from aisles and work areas, or raise it at least 2.1 m (7 ft) above the floor.
- Place the emergency stop switch (or push button) in the OFF position.

Rigging:

General Rigging Safety Requirements

Only select rigging equipment that is in good condition. All rigging equipment shall be inspected annually; defective equipment is to be removed from service and destroyed to prevent inadvertent reuse. The load capacity limits shall be stamped or affixed to all rigging components.

Company policy requires a minimum safety factor of 5 to be maintained for wire rope slings. The following types of slings shall be rejected or destroyed:

- Nylon slings with
  - Abnormal wear.
  - Torn stitching.
  - Broken or cut fibers.
  - Discoloration or deterioration.

- Wire-rope slings with
  - Kinking, crushing, bird-caging, or other distortions.
  - Evidence of heat damage.
  - Cracks, deformation, or worn end attachments.
  - Six randomly broken wires in a single rope lay.
  - Three broken wires in one strand of rope.
  - Hooks opened more than 15% at the throat.
  - Hooks twisted sideways more than 10deg. from the plane of the unbent hook.

- Alloy steel chain slings with
  - Cracked, bent, or elongated links or components.
  - Cracked hooks.
  - Shackles, eye bolts, turnbuckles, or other components that are damaged or deformed.

Rigging a Load

Do the following when rigging a load:

- Determine the weight of the load. Do not guess.
- Determine the proper size for slings and components.
- Do not use manila rope for rigging.
- Make sure that shackle pins and shouldered eye bolts are installed in accordance with the manufacturer's recommendations.
- Make sure that ordinary (shoulderless) eye bolts are threaded in at least 1.5 times the bolt diameter.
- Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.
- Pad sharp edges to protect slings. Remember that machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load. Wood, tire rubber, or other pliable materials may be suitable for padding.
- Do not use slings, eye bolts, shackles, or hooks that have been cut, welded, or brazed.
- Install wire-rope clips with the base only on the live end and the U-bolt only on the dead end. Follow the manufacturer's recommendations for the spacing for each specific wire size.
- Determine the center of gravity and balance the load before moving it.
- Initially lift the load only a few inches to test the rigging and balance.

Crane Overloading:

Cranes or hoists shall not be loaded beyond their rated capacity for normal operations. Any crane or hoist suspected of having been overloaded shall be removed from service by locking open and tagging the main disconnect switch. Additionally, overloaded cranes shall be inspected, repaired, load tested, and approved for use before being returned to service.

Working at Heights on Cranes or Hoists:

Anyone conducting maintenance or repair on cranes or hoists at heights greater than 1.8 m (6 ft) shall use fall protection. Fall protection should also be considered for heights less than 1.8 m. Fall protection includes safety harnesses that are fitted with a lifeline and securely attached to a structural member of the crane or building or properly secured safety nets.

Use of a crane as a work platform should only be considered when conventional means of reaching an elevated worksite are hazardous or not possible. Workers shall not ride a moving bridge crane without an approval from the Safety Office, which shall specify the following as a minimum:

- Personnel shall not board any bridge crane unless the main disconnect switch is locked and tagged open.
- Personnel shall not use bridge cranes without a permanent platform (catwalk) as work platforms. Bridge catwalks shall have a permanent ladder access.
- Personnel shall ride seated on the floor of a permanent platform with approved safety handrails, wear safety harnesses attached to designated anchors, and be in clear view of the crane operator at all times.
- Operators shall lock and tag open the main (or power) disconnect switch on the bridge catwalk when the crane is parked.

Hand Signals

Signals to the operator shall be in accordance with the standard hand signals unless voice communications equipment (telephone, radio, or equivalent) is used. Signals shall be discernible or audible at all times. Some special operations may require addition to or modification of the basic signals. For all such cases, these special signals shall be agreed upon and thoroughly understood by both the person giving the signals and the operator, and shall not be in conflict with the standard signals.

Inspection, Maintenance, and Testing:

All tests and inspections shall be conducted in accordance with the manufacturer's recommendations. Joe R. Jones Construction, Inc. requires owner/operator of Crane to be responsible for using safely tested and inspected machinery. Should Joe R. Jones Construction, Inc. employee become aware of a Crane operator / or the machinery itself that is unsafe they will notify Field Supervisor and Crane / Crane Operator will be removed from job site.

Electrical Installations, Equipment, and Electric Safety

Policy:

All electrical work will be conducted in a manner consistent with existing regulations and with good standard practices. This section establishes standards for electrical operations. Because electrical work has the potential for personnel electrocution and the potential hazard of catastrophic property damage, extreme caution must be exercised when working with electricity and electrical equipment. Electrical equipment can also cause fire because of its potential as an ignition source for causing fire or explosion.

Fire is frequently caused by short circuits, overheating equipment and failure of current limiters, thermal sensors, and other safety devices. Explosions may occur when flammable liquids, gases, and dusts are exposed to ignition sources generated by electrical equipment.

Requirements:

1. Electrical installations and utilization equipment will be in accordance with the current edition of the National Electrical Code, National Fire Protection Association (NFPA 70); American National Standards Institute (ANSI) Standard C1. This code will also apply to every replacement, installation, or utilization equipment.

2. Equipment or facilities designed, fabricated for, and intended for use by Company personnel will be procured to meet the requirements of the National Electric Code.

3. Frames of all electrical equipment, regardless of voltage shall be grounded.

4. Exposed non-current carrying metal parts of electrical equipment that may be come energized under abnormal conditions shall be grounded in accordance with the National Electrical Code.

5. Wires shall be covered wherever they are joined, such as: outlets, switches, junction boxes, etc.

6. Parts of electrical equipment which in ordinary operation produce arcs, sparks, etc., shall not be operated or used in explosive atmospheres or in close proximity to combustible materials.

7. Equipment connected by flexible extension cords shall be grounded either by a 3-wire cord or by a separate ground wire (except double insulated equipment).

1. Ground fault circuit interrupters (GFCI) shall be used on all 120-volt, single-phase, 15- and 20-ampere receptacle outlets at job sites when the receptacles are not a part of the permanent wiring of the building or structure. Receptacles on a two wire,

single-phase portable or vehicle-mounted generator rated not more than 5 kilowatt, where the circuit conductors of the generator are insulated from the generator frame and all or the grounded surfaces, need not be protected with GFCI's.

Inspections:

Supervisors will insure that work areas are inspected for possible electrical hazards.

Sufficient workspace shall be provided and maintained around electric equipment to permit safe operations and maintenance of such equipment.

Responsibilities:

a. Supervisors

1. All work hazards must be anticipated and all safeguards utilized.

2. Ensures that all employees are properly trained and instructed in the safe operation of electrical equipment and aware of all hazards associated with the use of these electrical devices.

3. Initiates any necessary administrative action required to enforce safety practices.

4. Requests assistance from Company Management regarding equipment operation which require unique safety practice instructions.

b. Employees

1. Follows Joe R. Jones Construction, Inc.'s electrical safety policies and procedures and instructions of responsible Supervisors and the Safety and Health Manager.

2. Brings to the attention of the supervisor and/or Health and Safety Branch potential hazardous situations such as discrepancies between instruction, procedures, policies and manual, faulty equipment, misapplication of device, etc.

3. Electrical equipment known to be malfunctioning must be repaired or replaced before use. The repair must be initiated as soon as possible after the malfunction is noted.

c. Safety and Health Manager

1. Assists supervisors in defining hazardous operations, designating safe practices and selecting proper application of devices.

2. When necessary, obtains from the principle supervisor, standard operating procedure for electrical equipment and devices in use.

3. In coordination with Company Management and other supervisors, reviews and approves standard operating procedures.

4. Evaluates potential electrical hazards during facility inspections to insure compliance with existing Company policy and other safety guidelines.

5. Requests support from Company Management on hardware and equipment testing, tagging out of unserviceable equipment, and taking corrective action where necessary.

3. Electrical Safety Practices

The following practices are to be followed by all employees:

a. Individual

1. The user is responsible for obtaining necessary tools and safety equipment from the designated storage area, checking it for discrepancies, returning it to storage in good condition and identifying any faulty equipment to his/her supervisor. It shall be the Supervisor’s immediate responsibility to replace any faulty safety equipment and notify the Safety and Health Manager.

2. Eye protection is required during any electronic or electrical hardware repair, installation and/or open front operation.

3. Electrical safety shoes, long sleeve non-polyester, low flammability shirts and insulating gloves will be worn when operating or testing 600 volt or higher equipment.

4. Protective apron will be worn over polyester or other highly flammable clothing during soldering operations.

b. Laboratory Requirements

1. All electrical and electronic laboratory equipment must be inspected for electrical hazards before using.

2. All electrical equipment must be grounded through power cords, frame grounding and/or grounding through wiring in conduit system. NOTE: Some power tools and instruments are now double insulated and do not require or need three pronged plugs. Contact the Safety and Health Manager where the discrepancy or hazard exists.

3. Laboratory equipment will be kept clear of electrical panelboards with the following clearances: 36 inches for 120/208 volts and 42 inches for 277/480 volts and up to 600 volt equipment.

4. Operation of panelboard circuit breakers by laboratory personnel is prohibited except in case of personal emergency.

5. Switching devices which are tagged and locked shall not be operated until tag is removed by issuer.

6. When work is to be performed on electrical equipment, care must be taken to make sure the electrical source is turned off, rendered inoperative, tagged and locked. (Re: Lock out/Tag out). Working on live parts of 50 volts or more shall not be done except in an emergency and with proper procedure and/or qualified "Buddy" with appropriate safety equipment.

7. Extension cords are intended only for temporary use with portable appliances, tools, and similar equipment that are not normally used at one specific location. Extension cords are not to be used as a substitute for fixed wiring.

c. Emergency Procedures

In the event of a medical emergency (shock etc.) contact a member of Management, contact local Emergency Rescue Units (911), and direct Emergency Rescue Units to the scene. If there is a person nearby who has received First Aid/CPR training, he/she should be contacted immediately to give assistance.

d. Emergency Removal or Tag and Lock

In the event of an emergency in which the person responsible for removing the tag and lock cannot be located, the General Foreman may remove the device in the presence of a member of the Health and Safety Branch. Details for removal are given in the Lock out/Tag out Policy

e. Hazards

The extreme hazard of electrical equipment is the potential for personnel electrocution from contacting energized systems. Electrical equipment can also cause catastrophic property damage because of its potential as an ignition source for causing fire or explosion.

Control of Hazardous Energy (Lock-Out/Tag-Out)

The procedures specified in this section comply with the requirements for the isolation or control of hazardous energy sources set forth in the OSHA standard (29 CFR 1910.147 – proposed). The accidental release of energy during maintenance work can and frequently does cause severe injuries, amputations, and death. Energy can be present in the form of electricity, potential energy (due to gravity) stored in elevated masses, chemical corrosivity, chemical toxicity, or pressure.

The only exceptions (allowed by OSHA to these requirements) are those situations involving "hot tap" operations. For this exception to be valid, Company personnel involved must demonstrate that the continuity of services is essential, that shutdown of the energy source is impractical, and that documented (written) procedures and special equipment have been implemented that will provide proven effective protection.

These procedures apply to all maintenance or installation operations conducted on Company premises.

1. Tag-out Devices

   Tags affixed to energy isolating devices are warning devices that do not provide the physical restraint on those devices that a lock would provide. Any tag so attached to an energy isolating device must not be removed without authorization of the person attaching it, and it must never be bypassed, ignored, or otherwise defeated. Tags must be legible and understandable in order to be effective. Tags must be made of materials which will withstand environmental conditions encountered in the workplace. When utilized, tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use. Tag-out devices must be substantial enough to prevent inadvertent or accidental removal.

   Tag-out devices must warn against hazardous conditions if the machine or equipment is energized and must include appropriate warnings such as:

   •DO NOT START •DO NOT ENERGIZE

   •DO NOT OPEN •DO NOT OPERATE •DO NOT CLOSE

2. Lock-out Devices

Lockout devices and practices vary by nature and function. Several effective lockout devices and practices are listed as follows:

a. Padlocks. Key operated padlocks are recommended and should be assigned individually.

b. Multiple lock adapters will enable more than one worker to place their own padlock on the isolating device to guarantee that the machine or equipment will remain deactivated until each and every employee completes their own task, and only then will the last padlock be removed.

c. Chains or other commercially available devices should be used to prevent valves from being opened or, in some cases, closed. The principle of multiple lock adapters still applies even when chains or other devices are used on operations requiring more than one employee.

3. Procedures

a. General

If energy-isolating devices are not capable of being locked out, they must be modified so that they are capable of being locked out whenever major replacement, repair, renovation, or modification of the machine or equipment takes place. Whenever new machines or equipment are installed, energy-isolating devices for such machines or equipment must be designed to accept a lockout device.

If an isolating device cannot be locked out for any reason, then additional steps must be taken to assure full employee protection such as removing fuses, blocking switches, blanking off lines, etc.

If the machine or equipment is not capable of being locked out, a tag-out procedure must be documented and utilized. The tag-out procedure must provide full employee protection equivalent to a lockout system. For full employee protection, when a tag-out device is used on an energy-isolating device, the device must be attached at the same location that the lockout device would have been attached, and must demonstrate that the tag-out device will provide a level of safety that is equivalent to that of a lockout system.

b. Plug/Cord and Hose-Connected Type Equipment

When servicing or installing plug/cord or hose connected electrical, pneumatic, or hydraulically powered equipment, the cord or hose shall be disconnected from the

equipment to be worked on, prior to starting the work. A tag warning against reconnecting the plug or hose shall be affixed to the plug or hose end.

Any stored energy (e.g., capacitor voltage, hydraulic pressure) shall be safely released prior to the start of maintenance or installation work.

c. Electrically Powered Equipment

Electrically powered equipment shall be de-energized and their source of electricity manually disconnected from them prior to the removal of protective covers or the start of other maintenance or installation work. It is important to recognize that locking and tagging on/off switches is often not sufficient to prevent accidental start up or prevent voltage from being present in the equipment. If the equipment is not wired properly (i.e., the polarity is reversed) or the switch is of the single pole type, voltage can be present even if the operating switch is in the off position. For these reasons, manual disconnects must be placed in the off position and/or the equipment's power fuses removed from the motor control center.

The lock-out/tag-out procedure is as follows:

a. Each person working on the circuit or piece of equipment shall place a padlock and warning tag on the electrical isolation device (e.g., disconnect switch).
b. Each person working on the circuit or piece of equipment shall attempt to energize or start the piece of equipment prior to starting work. Each on/off switch capable of energizing the equipment must be "tried."
c. If the try step reveals that the equipment is capable of being energized, the proper disconnects must be located and locked out and the try step repeated.
d. As each person completes his or her task, they shall remove their padlock and tag from the energy isolating device.
e. All protective covers or panels shall be securely re-attached prior to energizing the equipment after work is completed. In the event that protective covers must be removed to make adjustments on energized equipment, appropriate guards must be constructed and attached in such a manner as to prevent employee contact with live circuitry capable of causing human injury. Such guards must be of durable construction, adequate to prevent injurious contact, and remain in place at all times that the equipment is energized.

• Chemical and/or Pressurized Lines

Prior to working on any pressurized line or a line containing a toxic, flammable, reactive, or corrosive material, the following procedure must be implemented:

a. The line to be serviced must have two block valves upstream of the work area or device to be serviced or installed, placed in the closed position and tagged. The

bleed valve (between the two block valves) shall be opened and tagged so that leakage of the valve upstream would be readily obvious. The line shall be depressurized or drained in a safe manner. Lines shall be broken in such a

b. manner as to release pressure away from the employee. All solids or liquids drained shall be safely collected. This procedure is called "double block and bleed."

Prior to working on any pressurized line or a line containing a toxic, flammable, reactive, or corrosive material, the following procedure must be implemented: (continued)

c. If it is possible for pressure or line material to enter the work area from more than one direction, the line in each direction of travel shall be "double blocked and bled" as described above.

d. In the event that "double block and bleed" procedures are infeasible (i.e., the line is not provided with adequate valving), alternative measures shall be implemented. One alternate measure is to place a solid "blind" in a flange located between the available upstream valve and the work area. If blinds are used they shall be sufficiently corrosion and pressure-resistant to ensure that if the valve leaks, the blind will stop the material or pressure from reaching the work area.

• **Stored Mechanical Energy**

In situations where equipment to be worked on has stored mechanical energy (e.g., in a flywheel or drop hammer), the stored energy must be released or blocked in a safe manner before starting maintenance or installation work. Effective blocking practices may include the installation of safety blocks or adequate supports. Under no circumstances will "bumper jacks" or "scissor jacks" be considered to be adequate blocks.

E. Training

The purpose in providing training to employees is to ensure that they understand the purpose and function of the lock-out/tag-out program and procedures, and that they have the knowledge and skills required for the safe application, usage, and removal of energy controls.

1. Personnel who work around electrical equipment but who do not perform a primary duty of electrical system installation or maintenance will be briefed by their supervisor on the hazards of electricity and the proper precautions to observe.

2. Each authorized employee who will use a lock-out/tag-out procedure must receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for isolation and control.

Employees must be retrained whenever there is a change in their job assignment; a change in machines, equipment, or processes that present a new hazard; or when there is a change in the lock-out/tag-out procedures.

ELECTRICAL and GROUND FAULT

GENERAL INTRODUCTION.

This Chapter addresses electrical safety requirements that are necessary for the practical safeguarding of employees involved in construction work and is divided into four major divisions and applicable definitions as follows:

(a) Installation safety requirements. Included in this category are electric equipment and installations used to provide electric power and light on jobsites.

(b) Safety-related work practices. In addition to covering the hazards arising from the use of electricity at jobsites, these regulations also cover the hazards arising from the accidental contact, direct or indirect, by employees with all energized lines, above or below ground, passing through or near the jobsite.

(c) Safety-related maintenance and environmental considerations.

(d) Safety requirements for special equipment.

(e) Definitions.

INSTALLATION SAFETY REQUIREMENTS

(a) Covered. This section contain installation safety requirements for electrical equipment and installations used to provide electric power and light at the jobsite. These sections apply to installations, both temporary and permanent, used on the jobsite; but these sections do not apply to existing permanent installations that were in place before the construction activity commenced.

(b) Not covered. This section does not cover installations used for the generation, transmission, and distribution of electric energy, including related communication, metering, control, and transformation installations. (However, these regulations do cover portable and vehicle-mounted generators used to provide power for equipment used at the jobsite.) See Chapter V of this Part for the construction of power distribution and transmission lines.

GENERAL REQUIREMENTS.

(a) Approval. All electrical conductors and equipment shall be approved.

(b) Examination, installation, and use of equipment.

(1) Examination. Joe R. Jones Construction, Inc. Electrical Job Site Supervisor shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(i) Suitability for installation and use in conformity with the provisions of this Chapter. Suitability of equipment for an identified purpose may be evidenced by listing, labeling, or certification for that identified purpose.

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(iii) Electrical insulation.

(iv) Heating effects under conditions of use.

(v) Arcing effects.

(vi) Classification by type, size, voltage, current capacity, specific use.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(2) Installation and use. Listed, labeled, or certified equipment shall be installed and used in accordance with instructions included in the listing, labeling, or certification.

(c) Interrupting rating. Equipment intended to break current shall have an interrupting rating at system voltage sufficient for the current that must be interrupted.

(d) Mounting and cooling of equipment.

(1) Mounting. Electric equipment shall be firmly secured to the surface on which it is mounted. Wooden plugs driven into holes in masonry, concrete, plaster, or similar materials shall not be used.

(2) Cooling. Electrical equipment which depends upon the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room air flow over such surfaces is not prevented by walls or by adjacent installed equipment. For equipment designed for floor mounting, clearance between top surfaces and adjacent surfaces shall be provided to dissipate rising warm air. Electrical equipment provided with ventilating openings shall be installed so that walls or other obstructions do not prevent the free circulation of air through the equipment.

(e) Splices. Conductors shall be spliced or joined with splicing devices designed for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device designed for the purpose.

(f) Arcing parts. Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

(g) Marking. Electrical equipment shall not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment and unless other markings are provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

(h) Identification of disconnecting means and circuits. Each disconnecting means required by this Chapter for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or over-current device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

(i) 600 Volts, nominal, or less. This paragraph applies to equipment operating at 600 volts, nominal, or less.

(1) Working space about electric equipment. Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(i) Working clearances. Except as required or permitted elsewhere in this Chapter, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive shall not be less than indicated in Table 1. In addition to the dimensions shown in Table 1, workspace shall not be less than 30 inches (762 mm) wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Walls constructed of concrete, brick, or tile are considered to be grounded. Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

Chapter 2 TABLE 1 WORKING CLEARANCES

Nominal voltage to ground	Minimum clear distance for conditions [1]		
	(a)	(b)	(c)
	Feet[2]	Feet[2]	Feet [2]
0 - 150	3	3	3
151 - 600	3	3 ½	4

[1] Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. (c) Exposed live parts on both sides of the workspace (not guarded as provided in Condition (a)) with the operator between.

[2] **NOTE:** For International System of Units (SI): one foot = 0.3048 m.

(ii) Clear spaces. Working space required by this Chapter shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be guarded.

(iii) Access and entrance to working space. At least one entrance shall be provided to give access to the working space about electric equipment.

(iv) Front working space. Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet (914 mm).

(v) Headroom. The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6 feet 3 inches (1.91 m).

(2) Guarding of live parts.

(i) Except as required or permitted elsewhere in this Chapter, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

(A) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(B) By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

(C) By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.

(D) By elevation of 8 feet (2.44 m) or more above the floor or other working surface and so installed as to exclude unqualified persons.

(ii) In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.

(iii) Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

(j) Over 600 volts, nominal.

(1) General. Conductors and equipment used on circuits exceeding 600 volts, nominal, shall comply with all applicable provisions of paragraphs (a) through (g) of this section and with the following provisions which supplement or modify those requirements. The provisions of paragraphs (j)(2), (j)(3), and (j)(4) of this section do not apply to equipment on the supply side of the service conductors.

(2) Enclosure for electrical installations. Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are considered to be accessible to qualified persons only. A wall, screen, or fence less than 8 feet (2.44 m) in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8-foot (2.44-m) fence. The entrances to all buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

(i) Installations accessible to qualified persons only. Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the applicable provisions of paragraph (j)(3) of this section.

(ii) Installations accessible to unqualified persons. Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed switch-gear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(3) Workspace about equipment. Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches (1.98 m) high (measured vertically from the floor or platform), or less than 3 feet (914 mm) wide (measured parallel to the equipment). The depth shall be as required in Table 2. The workspace shall be adequate to permit at least a 90-degree opening of doors or hinged panels.

(i) Working space. The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in Table 2 unless otherwise specified in this Chapter. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from

locations other than the back. Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of 30 inches (762 mm) horizontally shall be provided.

TABLE 2 MINIMUM DEPTH OF CLEAR WORKING SPACE IN FRONT OF ELECTRIC EQUIPMENT

Nominal voltage to ground	Conditions [1]		
	(a)	(b)	(c)
	Feet[2]		Feet[2]
601 to 2,500	Feet [2]		
2,501 to 9,000	3	4	5
9,001 to 25,000	4	5	6
25,001 to 75 kV	5	6	9
Above 75 kV	6	8	10
	8	10	12

[1] Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick or tile are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace (not guarded as provided in Condition (a)) with the operator between.

[2] **NOTE:** For SI units: one foot = 0.3048 m.

(ii) Lighting outlets and points of control. The lighting outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that persons are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(iii) Elevation of unguarded live parts. Unguarded live parts above working space shall be maintained at elevations not less than specified in Table 3.

TABLE 3 ELEVATION OF UNGUARDED ENERGIZED PARTS ABOVE WORKING SPACE

Normal voltage between phases	Minimum elevation
601 - 7,500	8 feet 6 inches [1]
7,501 - 35,000	9 feet
Over 35 kV	9 feet + 0.37 inches per kV above 35 kV

[1] **NOTE:** For SI units: one inch = 25.4 mm; one foot = 0.3048 m.

(4) Entrance and access to workspace. At least one entrance not less than 24 inches (610 mm) wide and 6 feet 6 inches (1.98 m) high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches (1.22 m) in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to such entrance, they shall be guarded.

WIRING DESIGN AND PROTECTION.

(a) Use and identification of grounded and grounding conductors.

(1) Identification of conductors. A conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors. A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

(2) Polarity of connections. No grounded conductor shall be attached to any terminal or lead so as to reverse designated polarity.

(3) Use of grounding terminals and devices. A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug shall not be used for purposes other than grounding.

(b) Branch circuits.

(1) Ground-fault protection.

(i) General. Joe R. Jones Construction, Inc. Electrical Job Site Supervisor shall use either ground fault circuit interrupters as specified in paragraph (b)(1)(ii) of this section or an assured equipment grounding conductor

program as specified in paragraph (b)(1)(iii) of this section to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

(ii) Ground-fault circuit interrupters. 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. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5 kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

(iii) Assured equipment grounding conductor program. Joe R. Jones Construction, Inc. Electrical Job Site Supervisor shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:

(A) A written description of the program, including the specific procedures adopted by Joe R. Jones Construction, Inc., shall be available at the jobsite for inspection and copying by the Assistant Secretary and any affected employee.

(B) Joe R. Jones Construction, Inc. Electrical Supervisor shall designate one or more competent persons to implement the program.

(C) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

(D) The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:

(1) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(2) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

(E) All required tests shall be performed:

(1) Before first use;

(2) Before equipment is returned to service following any repairs;

(3) Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and

(4) At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

(F) Joe R. Jones Construction, Inc. Electrical Job Site Supervisor shall not make available or permit the use by employees of any equipment which has not met the requirements of this paragraph (b)(1)(iii) of this section.

(G) Tests performed as required in this paragraph shall be recorded. This test record shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the Assistant Secretary and any affected employee.

(2) Outlet devices. Outlet devices shall have an ampere rating not less than the load to be served and shall comply with the following:

(i) Single receptacles. A single receptacle installed on an individual branch circuit shall have an ampere rating of not less than that of the branch circuit.

(ii) Two or more receptacles. Where connected to a branch circuit supplying two or more receptacles or outlets, receptacle ratings shall conform to the values listed in Table 4.

(iii) Receptacles used for the connection of motors. The rating of an attachment plug or receptacle used for cord- and plug-connection of a motor to a branch circuit shall not exceed 15 amperes at 125 volts or 10 amperes at 250 volts if individual overload protection is omitted.

TABLE 4 RECEPTACLE RATINGS FOR VARIOUS SIZE CIRCUITS

Circuit rating amperes	Receptacle rating amperes
15	Not over 15
20	15 or 20
30	30
40	40 or 50
50	50

(c) Outside conductors and lamps.

(1) 600 volts, nominal, or less. Paragraphs (c)(1) (i) through (c)(1)(iv) of this section apply to branch circuit, feeder, and service conductors rated 600 volts, nominal, or less and run outdoors as open conductors.

(i) Conductors on poles. Conductors supported on poles shall provide a horizontal climbing space not less than the following:

(A) Power conductors below communication conductors – 30 inches (762 mm).

(B) Power conductors alone or above communication conductors: 300 volts or less – 24 inches (610 mm); more than 300 volts – 30 inches (762 mm).

(C) Communication conductors below power conductors: with power conductors 300 volts or less – 24 inches (610 mm); more than 300 volts – 30 inches (762 mm).

(ii) Clearance from ground. Open conductors shall conform to the following minimum clearances:

(A) 10 feet (3.05 m) – above finished grade, sidewalks, or from any platform or projection from which they might be reached.

(B) 12 feet (3.66 m) – over areas subject to vehicular traffic other than truck traffic.

(C) 15 feet (4.57 m) – over areas other than those specified in paragraph (c) (1)(ii)(D) of this section that are subject to truck traffic.

(D) 18 feet (5.49 m) – over public streets, alleys, roads, and driveways.

(iii) Clearance from building openings. Conductors shall have a clearance of at least 3 feet (914 mm) from windows, doors, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet (914 mm) away.

(iv) Clearance over roofs. Conductors above roof space accessible to employees on foot shall have a clearance from the highest point of the roof surface of not less than 8 feet (2.44 m) vertical clearance for insulated conductors, not less than 10 feet (3.05 m) vertical or diagonal clearance for covered conductors, and not less than 15 feet (4.57 m) for bare conductors, except that:

(A) Where the roof space is also accessible to vehicular traffic, the vertical clearance shall not be less than 18 feet (5.49 m), or

(B) Where the roof space is not normally accessible to employees on foot, fully insulated conductors shall have a vertical or diagonal clearance of not less than 3 feet (914 mm), or

(C) Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches (102 mm) in 12 inches (305 mm), the clearance from roofs shall be at least 3 feet (914 mm), or

(D) Where the voltage between conductors is 300 volts or less and the conductors do not pass over more than 4 feet (1.22 m) of the overhang portion of the roof and they are terminated at a through-the-roof raceway or support, the clearance from roofs shall be at least 18 inches (457 mm).

(2) Location of outdoor lamps. Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for re-lamping operations.

(d) Services.

(1) Disconnecting means.

(i) General. Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(ii) Simultaneous opening of poles. Each service disconnecting means shall simultaneously disconnect all ungrounded conductors.

(2) Services over 600 volts, nominal. The following additional requirements apply to services over 600 volts, nominal.

(i) Guarding. Service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.

(ii) Warning signs. Signs warning of high voltage shall be posted where unauthorized employees might come in contact with live parts.

(e) Overcurrent protection.

(1) 600 volts, nominal, or less. The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

(i) Protection of conductors and equipment. Conductors and equipment shall be protected from overcurrent in accordance with their ability to safely conduct current. Conductors shall have sufficient ampacity to carry the load.

(ii) Grounded conductors. Except for motor-running overload protection, over-current devices shall not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.

(iii) Disconnection of fuses and thermal cutouts. Except for devices provided for current-limiting on the supply side of the service disconnecting means, all cartridge fuses which are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means. This disconnecting means shall be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the over-current device.

(iv) Location in or on premises. Over-current devices shall be readily accessible. Overcurrent devices shall not be located where they could create an employee safety hazard by being exposed to physical damage or located in the vicinity of easily ignitible material.

(v) Arcing or suddenly moving parts. Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise injured by their operation.

(vi) Circuit breakers.

(A) Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.

(B) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position.

(C) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers shall be marked **"SWD."**

(2) Over 600 volts, nominal. Feeders and branch circuits over 600 volts, nominal, shall have short-circuit protection.

(f) Grounding. Paragraphs (f)(1) through (f)(11) of this section contain grounding requirements for systems, circuits, and equipment.

(1) Systems to be grounded. The following systems which supply premises wiring shall be grounded:

(i) Three-wire DC systems. All 3-wire DC systems shall have their neutral conductor grounded.

(ii) Two-wire DC systems. Two-wire DC systems operating at over 50 volts through 300 volts between conductors shall be grounded unless they are rectifier-derived from an AC system complying with paragraphs (f)(1)(iii), (f)(1)(iv), and (f)(1)(v) of this section.

(iii) AC circuits, less than 50 volts. AC circuits of less than 50 volts shall be

grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(iv) AC systems, 50 volts to 1000 volts. AC systems of 50 volts to 1000 volts shall be grounded under any of the following conditions, unless exempted by paragraph (f)(1)(v) of this section:

(A) If the system can be so grounded that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts;

(B) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

(C) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(D) If a service conductor is uninsulated.

(v) Exceptions. AC systems of 50 volts to 1000 volts are not required to be grounded if the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, provided all of the following conditions are met:

(A) The system is used exclusively for control circuits,

(B) The conditions of maintenance and supervision assure that only qualified persons will service the installation,

(C) Continuity of control power is required, and

(D) Ground detectors are installed on the control system.

(2) Separately derived systems. Where paragraph (f)(1) of this section requires grounding of wiring systems whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system, paragraph (f)(5) of this section shall also apply.

(3) Portable and vehicle-mounted generators.

(i) Portable generators. Under the following conditions, the frame of a portable generator need not be grounded and may serve as the grounding electrode for a system supplied by the generator:

(A) The generator supplies only equipment mounted on the generator and/or cord- and plug-connected equipment through receptacles mounted on the generator, and

(B) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

(ii) Vehicle-mounted generators. Under the following conditions the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

(A) The frame of the generator is bonded to the vehicle frame, and

(B) The generator supplies only equipment located on the vehicle and/or cord-and plug-connected equipment through receptacles mounted on the vehicle or on the generator, and

(C) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame, and

(D) The system complies with all other provisions of this section.

(iii) Neutral conductor bonding. A neutral conductor shall be bonded to the generator frame if the generator is a component of a separately derived system. No other conductor need be bonded to the generator frame.

(4) Conductors to be grounded. For AC premises wiring systems the identified conductor shall be grounded.

(5) Grounding connections.

(i) Grounded system. For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the grounded circuit conductor on the supply side of the

service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(ii) Ungrounded systems. For an un-grounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(6) Grounding path. The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.

(7) Supports, enclosures, and equipment to be grounded.

(i) Supports and enclosures for conductors. Metal cable trays, metal raceways, and metal enclosures for conductors shall be grounded, except that:

(A) Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; and

(B) Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and non-metallic- sheathed cable need not be grounded if all of the following conditions are met:

(1) Runs are less than 25 feet (7.62 m);

(2) Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

(3) Enclosures are guarded against employee contact.

(ii) Service equipment enclosures. Metal enclosures for service equipment shall be grounded.

(iii) Fixed equipment. Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:

(A) If within 8 feet (2.44 m) vertically or5 feet (1.52 m) horizontally of ground or grounded metal objects and subject to employee contact.

(B) If located in a wet or damp location and subject to employee contact.

(C) If in electrical contact with metal.

(D) If in a hazardous (classified) location.

(E) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method.

(F) If equipment operates with any terminal at over 150 volts to ground; however, the following need not be grounded:

(1) Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;

(2) Metal frames of electrically heated appliances which are permanently and effectively insulated from ground; and

(3) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet (2.44 m) above ground or grade level.

(iv) Equipment connected by cord and plug. Under any of the conditions described in paragraphs (f)(7)(iv)(A) through (f)(7)(iv)(C) of this section, exposed noncurrent-carrying metal parts of cord- and plug-connected equipment which may become energized shall be grounded:

(A) If in a hazardous (classified) location

(B) If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.

(C) If the equipment is one of the types listed in paragraphs (f)(7)(iv)(C)*(1)* through (f)(7)(iv)(C)*(5)* of this section. However, even though the equipment may be one of these types, it need not be grounded if it is exempted by paragraph (f)(7)(iv)(C)*(6)*.

(1) Hand held motor-operated tools;

(2) Cord- and plug-connected equipment used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;

(3) Portable and mobile X-ray and associated equipment;

(4) Tools likely to be used in wet and/or conductive locations;

(5) Portable hand lamps.

(6) Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded.
(6) continued If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.

(v) Nonelectrical equipment. The metal parts of the following nonelectrical equipment shall be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand-operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over IkV between conductors.

(8) Methods of grounding equipment.

(i) With circuit conductors. Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this Chapter, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(ii) Grounding conductor. A conductor used for grounding fixed or movable equipment shall have capacity to conduct safely any fault current which may be imposed on it.

(iii) Equipment considered effectively grounded. Electric equipment is considered to be effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment in paragraph (f)(8)(i) of this section. Metal car frames supported by metal hoisting cables attached

to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

(9) Bonding. If bonding conductors are used to assure electrical continuity, they shall have the capacity to conduct any fault current which may be imposed.

(10) Made electrodes. If made electrodes are used, they shall be free from nonconductive coatings, such as paint or enamel; and, if practicable, they shall be embedded below permanent moisture level. A single electrode consisting of a rod, pipe or plate which has a resistance to ground greater than 25 ohms shall be augmented by one additional electrode installed no closer than 6 feet (1.83 m) to the first electrode.

(11) Grounding of systems and circuits of 1000 volts and over (high voltage).

(i) General. If high voltage systems are grounded, they shall comply with all applicable provisions of paragraphs (f)(1) through (f)(10) of this section as supplemented and modified by this paragraph (f)(11).

(ii) Grounding of systems supplying portable or mobile equipment. Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, shall comply with the following:

(A) Portable and mobile high voltage equipment shall be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral shall be derived.

(B) Exposed noncurrent-carrying metal parts of portable and mobile equipment shall be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(C) Ground-fault detection and relaying shall be provided to automatically de-energize any high voltage system component which has developed a ground fault. The continuity of the equipment grounding conductor shall be continuously monitored so as to de-energize automatically the high voltage feeder to the portable equipment upon loss of continuity of the equipment grounding conductor.

(D) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected shall be isolated from and separated in the ground by at least 20 feet (6.1 m) from any other

system or equipment grounding electrode, and there shall be no direct connection between the grounding electrodes, such as buried pipe, fence or like objects.

(iii) Grounding of equipment. All non-current- carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded. However, equipment which is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus at a height exceeding 8 feet (2.44 m) above ground or grade level need not be grounded.

WIRING METHODS, COMPONENTS, AND EQUIPMENT FOR GENERAL USE.

(a) Wiring methods. The provisions of this paragraph do not apply to conductors which form an integral part of equipment such as motors, controllers, motor control centers and like equipment.

(1) General requirements.

(i) Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

(ii) Wiring in ducts. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type shall be installed in any duct used for vapor removal or in any shaft containing only such ducts.

(2) Temporary wiring.

(i) Scope. The provisions of paragraph (a)(2) of this section apply to temporary electrical power and lighting wiring methods which may be of a class less than would be required for a permanent installation. Except as specifically modified in paragraph (a)(2) of this section, all other requirements of this Chapter for permanent wiring shall apply to temporary wiring installations. Temporary wiring shall be removed immediately upon completion of construction or the purpose for which the wiring was installed.

(ii) General requirements for temporary wiring.

(A) Feeders shall originate in a distribution center. The conductors shall be run as multi-conductor cord or cable assemblies or within raceways; or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet (3.05 m) apart.

(B) Branch circuits shall originate in a power outlet or panelboard. Conductors shall be run as multi-conductor cord or cable assemblies or open conductors, or shall be run in raceways. All conductors shall be protected by overcurrent devices at their ampacity. Runs of open conductors shall be located where the conductors will not be subject to physical damage, and the conductors shall be fastened at intervals not exceeding 10 feet (3.05 m). No branch-circuit conductors shall be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment shall contain a separate equipment grounding conductor if the branch circuit is run as open conductors.

(C) Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor, and all receptacles shall be electrically connected to the grounding conductor. Receptacles for uses other than temporary lighting shall not be installed on branch circuits which supply temporary lighting. Receptacles shall not be connected to the same ungrounded conductor of multiwire circuits which supply temporary lighting.

(D) Disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(E) All lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.

(F) Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension.

(G) Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

(H) A box shall be used wherever a change is made to a raceway system or a cable system which is metal clad or metal sheathed.

(I) Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points, if protection is provided to avoid damage.

(J) Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage.

Note: The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400-4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).

(iii) Guarding. For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

(b) Cabinets, boxes, and fittings.

(1) Conductors entering boxes, cabinets, or fittings. Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers. If metal covers are used, they shall be grounded. In energized installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

(3) Pull and junction boxes for systems over 600 volts, nominal. In addition to other requirements in this section for pull and junction boxes, the following shall apply to these boxes for systems over 600 volts, nominal:

(i) Complete enclosure. Boxes shall provide a complete enclosure for the contained conductors or cables.

(ii) Covers. Boxes shall be closed by covers securely fastened in place. Underground box covers that weigh over 100 pounds (43.6 kg) meet this requirement. Covers for boxes shall be permanently marked **"HIGH VOLTAGE."** The marking shall be on the outside of the box cover and shall be readily visible and legible.

(c) Knife switches. Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be so placed that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical, a locking device shall be provided to ensure that the blades remain in the open position when so set.

(d) Switchboards and panelboards. Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to qualified persons. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures designed for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches shall be dead when open.

(e) Enclosures for damp or wet locations.

(1) Cabinets, fittings, and boxes. Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures shall be weatherproof.

(2) Switches and circuit breakers. Switches, circuit breakers, and switchboards installed in wet locations shall be enclosed in weatherproof enclosures.

(f) Conductors for general wiring. All conductors used for general wiring shall be insulated unless otherwise permitted in this Chapter. The conductor insulation shall be of a type that is suitable for the voltage, operating temperature, and location of use. Insulated conductors shall be distinguishable by appropriate color or other means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

(g) Flexible cords and cables.

(1) Use of flexible cords and cables.

(i) Permitted uses. Flexible cords and cables shall be suitable for conditions of use and location. Flexible cords and cables shall be used only for:

(A) Pendants;

(B) Wiring of fixtures;

(C) Connection of portable lamps or appliances;

(D) Elevator cables;

(E) Wiring of cranes and hoists;

(F) Connection of stationary equipment to facilitate their frequent interchange;

(G) Prevention of the transmission of noise or vibration; or

(H) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair.

(ii) Attachment plugs for cords. If used as permitted in paragraphs (g)(1)(i)(C), (g)(1) (i)(F), or (g)(1)(i)(H) of this section, the flexible cord shall be equipped with an attachment plug and shall be energized from a receptacle outlet.

(iii) Prohibited uses. Unless necessary for a use permitted in paragraph (g)(1)(i) of this section, flexible cords and cables shall not be used:

(A) As a substitute for the fixed wiring of a structure;

(B) Where run through holes in walls, ceilings, or floors;

(C) Where run through doorways, windows, or similar openings, except as permitted in paragraph (a)(2)(ii)(A) of this section;

(D) Where attached to building surfaces; or

(E) Where concealed behind building walls, ceilings, or floors.

(2) Identification, splices, and terminations.

(i) Identification. A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor shall be distinguishable from other conductors.

(ii) Marking. Type SJ, SJO, SJT, SJTO, S, SO, ST, and STO cords shall not be used unless durably marked on the surface with the type designation, size, and number of conductors.

(iii) Splices. Flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(iv) Strain relief. Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.

(v) Cords passing through holes. Flexible cords and cables shall be protected by bushings or fittings where passing through holes in covers, outlet boxes, or similar enclosures.

(h) Portable cables over 600 volts, nominal. Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2000 volts shall be shielded for the purpose of confining the voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables shall not be operated with splices unless the splices are of the permanent molded, vulcanized, or other equivalent type. Termination enclosures shall be marked with a high voltage hazard warning, and terminations shall be accessible only to authorized and qualified personnel.

(i) Fixture wires.

(1) General. Fixture wires shall be suitable for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be identified.

(2) Uses permitted. Fixture wires may be used:

(i) For installation in lighting, fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(ii) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(3) Uses not permitted. Fixture wires shall not be used as branch-circuit conductors except as permitted for Class 1 power-limited circuits.

(j) Equipment for general use.

(1) Lighting fixtures, lampholders, lamps, and receptacles.

(i) Live parts. Fixtures, lampholders, lamps, rosettes, and receptacles shall have no live parts normally exposed to employee contact. However, rosettes and cleat-type lamp holders and receptacles located at least 8 feet (2.44 m) above the floor may have exposed parts.

(ii) Support. Fixtures, lampholders, rosettes, and receptacles shall be securely supported. A fixture that weighs more than 6 pounds (2.72 kg) or exceeds 16 inches (406 mm) in any dimension shall not be supported by the screw shell of a lampholder.

(iii) Portable lamps. Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall be identified and attached to the screw shell and the identified blade of the attachment plug. In addition, portable handlamps shall comply with the following:

(A) Metal shell, paper lined lampholders shall not be used;

(B) Handlamps shall be equipped with a handle of molded composition or other insulating material;

(C) Handlamps shall be equipped with a substantial guard attached to the lampholder or handle;

(D) Metallic guards shall be grounded by the means of an equipment grounding conductor run within the power supply cord.

(iv) Lampholders. Lampholders of the screw-shell type shall be installed for use as lampholders only. Lampholders installed in wet or damp locations shall be of the weatherproof type.

(v) Fixtures. Fixtures installed in wet or damp locations shall be identified for the purpose and shall be installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

(2) Receptacles, cord connectors, and attachment plugs (caps).

(i) Configuration. Receptacles, cord connectors, and attachment plugs shall be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating. Receptacles connected to circuits having different volt-ages, frequencies, or types of current (ac or dc) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.

(ii) Damp and wet locations. A receptacle installed in a wet or damp location shall be designed for the location.

(3) Appliances.

(i) Live parts. Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, shall have no live parts normally exposed to employee contact.

(ii) Disconnecting means. A means shall be provided to disconnect each appliance.

(iii) Rating. Each appliance shall be marked with its rating in volts and amperes or volts and watts.

(4) Motors. This paragraph applies to motors, motor circuits, and controllers.

(i) In sight from. If specified that one piece of equipment shall be **"in sight from"** another piece of equipment, one shall be visible and not more than 50 feet (15.2 m) from the other.

(ii) Disconnecting means.

(A) A disconnecting means shall be located in sight from the controller location. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(B) The disconnecting means shall disconnect the motor and the controller from all ungrounded supply conductors and shall be so designed that no pole can be operated independently.

(C) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:

(1) The controller disconnecting means shall be capable of being locked in the open position.

(2) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

(D) The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.

(E) The disconnecting means shall be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(F) An individual disconnecting means shall be provided for each motor, but a single disconnecting means may be used for a group of motors under any one of the following conditions:

(1) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist;

(2) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(3) If a group of motors is in a single room in sight from the location of the disconnecting means.

(iii) Motor overload, short-circuit, and ground-fault protection. Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions do not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(iv) Protection of live parts – all voltages.

(A) Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following:

(1) By installation in a room or enclosure that is accessible only to qualified persons;

(2) By installation on a balcony, gallery, or platform, so elevated and arranged as to exclude unqualified persons; or

(3) By elevation 8 feet (2.44 m) or more above the floor.

(B) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, insulating mats or platforms shall be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

(5) Transformers.

(i) Application. The following paragraphs cover the installation of all transformers, except:

(A) Current transformers;

(B) Dry-type transformers installed as a component part of other apparatus;

(C) Transformers which are an integral part of an X-ray, high frequency, or electrostatic-coating apparatus;

(D) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits.

(ii) Operating voltage. The operating voltage of exposed live parts of transformer installations shall be indicated by warning signs or visible markings on the equipment or structure.

(iii) Transformers over 35 kV. Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35 kV shall be in a vault.

(iv) Oil-insulated transformers. If they present a fire hazard to employees, oil-insulated transformers installed indoors shall be in a vault.

(v) Fire protection. Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires which may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.

(vi) Transformer vaults. Transformer vaults shall be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches shall be so arranged that a vault door can be readily opened from the inside.

(vii) Pipes and ducts. Any pipe or duct system foreign to the vault installation shall not enter or pass through a transformer vault.

(viii) Material storage. Materials shall not be stored in transformer vaults.

(6) Capacitors.

(i) Drainage of stored charge. All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, shall be provided with an automatic means of draining the stored charge and maintaining the discharged state after the capacitor is disconnected from its source of supply.

(ii) Over 600 volts. Capacitors rated over 600 volts, nominal, shall comply with the following additional requirements:

(A) Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed caution signs to prevent switching load current.

(B) For series capacitors the proper switching shall be assured by use of at least one of the following:

(1) Mechanically sequenced isolating and bypass switches,

(2) Interlocks, or

(3) Switching procedure prominently displayed at the switching location.

SPECIFIC PURPOSE EQUIPMENT AND INSTALLATIONS.

(a) Cranes and hoists. This paragraph applies to the installation of electric equipment and wiring used in connection with cranes, monorail hoists, hoists, and all runways.

(1) Disconnecting means.

(i) Runway conductor disconnecting means. A readily accessible disconnecting means shall be provided between the runway contact conductors and the power supply.

(ii) Disconnecting means for cranes and monorail hoists. A disconnecting means, capable of being locked in the open position, shall be provided in the leads from the runway contact conductors or other power supply on any crane or monorail hoist.

(A) If this additional disconnecting means is not readily accessible from the crane or monorail hoist operating station, means shall be provided at the operating station to open the power circuit to all motors of the crane or monorail hoist.

(B) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(1) The unit is floor controlled;

(2) The unit is within view of the power supply disconnecting means; and

(3) No fixed work platform has been provided for servicing the unit.

(2) Control. A limit switch or other device shall be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(3) Clearance. The dimension of the working space in the direction of access to live parts which may require examination, adjustment, servicing, or maintenance while alive shall be a minimum of 2 feet 6 inches (762 mm). Where controls are enclosed in cabinets, the door(s) shall open at least 90 degrees or be removable, or the installation shall provide equivalent access.

(4) Grounding. All exposed metal parts of cranes, monorail hoists, hoists and accessories including pendant controls shall be metallically joined together into a continuous electrical conductor so that the entire crane or hoist will be grounded in accordance with §1926.404(f). Moving parts, other than removable accessories or attachments, having metal-to-metal bearing surfaces shall be considered to be electrically connected to each other through the bearing surfaces for grounding purposes. The trolley frame and bridge frame shall be considered as electrically grounded through the bridge and trolley wheels and its respective tracks unless conditions such as paint or other insulating materials prevent reliable metal-to-metal contact. In this case a separate bonding conductor shall be provided.

(b) Elevators, escalators, and moving walks.

(1) Disconnecting means. Elevators, escalators, and moving walks shall have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(2) Control panels. If control panels are not located in the same space as the drive machine, they shall be located in cabinets with doors or panels capable of being locked closed.

(c) Electric welders – disconnecting means.

(1) Motor-generator, AC transformer, and DC rectifier arc welders. A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.

(2) Resistance welders. A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means shall not be less than the supply conductor ampacity.

(d) X-Ray equipment.

(1) Disconnecting means.

(i) General. A disconnecting means shall be provided in the supply circuit. The disconnecting means shall be operable from a location readily accessible from the X-ray control. For equipment connected to a 120-volt branch circuit of 30 amperes or less, a grounding-type attachment plug cap and receptacle of proper rating may serve as a disconnecting means.

(ii) More than one piece of equipment. If more than one piece of equipment is operated from the same high-voltage circuit, each piece or each group of equipment as a unit shall be provided with a high-voltage switch or equivalent disconnecting means. This disconnecting means shall be constructed, enclosed, or located so as to avoid contact by employees with its live parts.

(2) Control – Radiographic and fluoroscopic types. Radiographic and fluoroscopic-type equipment shall be effectively enclosed or shall have interlocks that deenergize the equipment automatically to prevent ready access to live current-carrying parts.

HAZARDOUS (CLASSIFIED) LOCATIONS.

(a) Scope. This section sets forth requirements for electric equipment and wiring in locations which are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section or area shall be considered individually in determining its classification. These hazardous (classified) locations are assigned six designations as follows:

Class I, Division 1
Class I, Division 2
Class II, Division 1
Class II, Division 2
Class III, Division l
Class III, Division 2

For definitions of these locations see the definition section at the end of this chapter. All applicable requirements in this Chapter apply to all hazardous (classified) locations, unless modified by provisions of this section.

(b) Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be approved as intrinsically safe or approved for the hazardous (classified) location or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

(1) Intrinsically safe. Equipment and associated wiring approved as intrinsically safe is permitted in any hazardous (classified) location included in its listing or labeling.

(2) Approved for the hazardous (classified) location.

(i) General. Equipment shall be approved not only for the class of location but also for the ignitible or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: NFPA 70, the National Electrical Code, lists or defines hazardous gases, vapors, and dusts by **"Groups"** characterized by their ignitible or combustible properties.

(ii) Marking. Equipment shall not be used unless it is marked to show the class, group, and operating temperature or temperature range, based on operation in a 40º C ambient, for which it is approved. The temperature marking shall not exceed the ignition temperature of the specific gas, vapor, or dust to be encountered. However, the following provisions modify this marking requirement for specific equipment:

(A) Equipment of the non-heat-producing type (such as junction boxes, conduit, and fitting) and equipment of the heat-producing type having a maximum temperature of not more than 100º C (212º F) need not have a marked operating temperature or temperature range.

(B) Fixed lighting fixtures marked for use only in Class I, Division 2 locations need not be marked to indicate the group.

(C) Fixed general-purpose equipment in Class I locations, other than lighting fixtures, which is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(D) Fixed dust-tight equipment, other than lighting fixtures, which is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(3) Safe for the hazardous (classified) location. Equipment which is safe for the location shall be of a type and design which Joe R. Jones Construction, Inc. demonstrates will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations which will meet this requirement. The guidelines of this document address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: wiring methods, wiring connections, conductor insulation, flexible cords,

sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lightning surge protection, and grounding. Compliance with these guidelines will constitute one means, but not the only means, of compliance with this paragraph.

(c) Conduits. All conduits shall be threaded and shall be made wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper shall be utilized.

SPECIAL SYSTEMS.

(a) Systems over 600 volts, nominal. Paragraphs (a)(1) through (a)(4) of this section contain general requirements for all circuits and equipment operated at over 600 volts.

(1) Wiring methods for fixed installations.

(i) Above ground. Above-ground conductors shall be installed in rigid metal conduit, in intermediate metal conduit, in cable trays, in cablebus, in other suitable raceways, or as open runs of metal-clad cable designed for the use and purpose. However, open runs of non-metallic-sheathed cable or of bare conductors or busbars may be installed in locations which are accessible only to qualified persons. Metallic shielding components, such as tapes, wires, or braids for conductors, shall be grounded. Open runs of insulated wires and cables having a bare lead sheath or a braided outer covering shall be supported in a manner designed to prevent physical damage to the braid or sheath.

(ii) Installations emerging from the ground. Conductors emerging from the ground shall be enclosed in raceways. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, PVC schedule 80 or equivalent extending from the ground line up to a point 8 feet (2.44 m) above finished grade. Conductors entering a building shall be protected by an enclosure from the ground line to the point of entrance. Metallic enclosures shall be grounded.

(2) Interrupting and isolating devices.

(i) Circuit breakers. Circuit breakers located indoors shall consist of metal-enclosed or fire-resistant, cell-mounted units. In locations accessible only to

qualified personnel, open mounting of circuit breakers is permitted. A means of indicating the open and closed position of circuit breakers shall be provided.

(ii) Fused cutouts. Fused cutouts installed in buildings or transformer vaults shall be of a type identified for the purpose. They shall be readily accessible for fuse replacement.

(iii) Equipment isolating means. A means shall be provided to completely isolate equipment for inspection and repairs. Isolating means which are not designed to interrupt the load current of the circuit shall be either interlocked with a circuit interrupter or provided with a sign warning against opening them under load.

(3) Mobile and portable equipment.

(i) Power cable connections to mobile machines. A metallic enclosure shall be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure shall include provisions for a solid connection for the ground wire(s) terminal to ground effectively the machine frame. The method of cable termination used shall prevent any strain or pull on the cable from stressing the electrical connections. The enclosure shall have provision for locking so only authorized qualified persons may open it and shall be marked with a sign warning of the presence of energized parts.

(ii) Guarding live parts. All energized switching and control parts shall be enclosed in effectively grounded metal cabinets or enclosures. Circuit breakers and protective equipment shall have the operating means projecting through the metal cabinet or enclosure so these units can be reset without locked doors being opened. Enclosures and metal cabinets shall be locked so that only authorized qualified persons have access and shall be marked with a sign warning of the presence of energized parts. Collector ring assemblies on revolving-type machines (shovels, draglines, etc.) shall be guarded.

(4) Tunnel installations.

(i) Application. The provisions of this paragraph apply to installation and use of high-voltage power distribution and utilization equipment which is associated with tunnels and which is portable and/or mobile, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, and underground excavators.

(ii) Conductors. Conductors in tunnels shall be installed in one or more of the following:

(A) Metal conduit or other metal raceway,

(B) Type MC cable, or

(C) Other suitable multiconductor cable. Conductors shall also be so located or guarded as to protect them from physical damage. Multiconductor portable cable may supply mobile equipment. An equipment grounding conductor shall be run with circuit conductors inside the metal raceway or inside the multi-conductor cable jacket. The equipment grounding conductor may be insulated or bare.

(iii) Guarding live parts. Bare terminals of transformers, switches, motor controllers, and other equipment shall be enclosed to prevent accidental contact with energized parts. Enclosures for use in tunnels shall be drip-proof, weatherproof, or submersible as required by the environmental conditions.

(iv) Disconnecting means. A disconnecting means that simultaneously opens all ungrounded conductors shall be installed at each transformer or motor location.

(v) Grounding and bonding. All non-energized metal parts of electric equipment and metal raceways and cable sheaths shall be grounded and bonded to all metal pipes and rails at the portal and at intervals not exceeding 1000 feet (305 m) throughout the tunnel.

(b) Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits.

(1) Classification. Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are classified in accordance with their respective voltage and power limitations as summarized in paragraphs (b)(1)(i) through (b)(1)(iii) of this section.

(i) Class 1 circuits.

(A) A Class 1 power-limited circuit is supplied from a source having a rated output of not more than 30 volts and 1000 volt-amperes.

(B) A Class 1 remote control circuit or a Class 1 signaling circuit has a voltage which does not exceed 600 volts; however, the power output of the source need not be limited.

(ii) Class 2 and Class 3 circuits.

(A) Power for Class 2 and Class 3 circuits is limited either inherently (in which no overcurrent protection is required) or by a combination of a power source and overcurrent protection.

(B) The maximum circuit voltage is 150 volts AC or DC for a Class 2 inherently limited power source, and 100 volts AC or DC for a Class 3 inherently limited power source.

(C) The maximum circuit voltage is 30 volts AC and 60 volts DC for a Class 2 power source limited by overcurrent protection, and 150 volts AC or DC for a Class 3 power source limited by overcurrent protection.

(iii) Application. The maximum circuit voltages in paragraphs (b)(1)(i) and (b)(1)(ii) of this section apply to sinusoidal AC or continuous DC power sources, and where wet contact occurrence is not likely.

(2) Marking. A Class 2 or Class 3 power supply unit shall not be used unless it is durably marked where plainly visible to indicate the class of supply and its electrical rating.

(c) Communications systems.

(1) Scope. These provisions for communication systems apply to such systems as central-station- connected and non-central-station-connected telephone circuits, radio receiving and transmitting equipment, and outside wiring for fire and burglar alarm, and similar central station systems.

(2) Protective devices.

(i) Circuits exposed to power conductors. Communication circuits so located as to be exposed to accidental contact with light or power conductors operating at over 300 volts shall have each circuit so exposed provided with an approved protector.

(ii) Antenna lead-ins. Each conductor of a lead-in from an outdoor antenna shall be provided with an antenna discharge unit or other means that will drain static charges from the antenna system.

(3) Conductor location.

(i) Outside of buildings.

(A) Receiving distribution lead-in or aerial-drop cables attached to buildings and lead-in conductors to radio transmitters shall be so installed as to avoid the possibility of accidental contact with electric light or power conductors.

(B) The clearance between lead-in conductors and any lightning protection conductors shall not be less than 6 feet (1.83 m).

(ii) On poles. Where practicable, communication conductors on poles shall be located below the light or power conductors. Communications conductors shall not be attached to a crossarm that carries light or power conductors.

(iii) Inside of buildings. Indoor antennas, lead-ins, and other communication conductors attached as open conductors to the inside of buildings shall be located at least 2 inches (50.8 mm) from conductors of any light or power or Class 1 circuits unless a special and equally protective method of conductor separation is employed.

(4) Equipment location. Outdoor metal structures supporting antennas, as well as self-supporting antennas such as vertical rods or dipole structures, shall be located as far away from overhead conductors of electric light and power circuits of over 150 volts to ground as necessary to avoid the possibility of the antenna or structure falling into or making accidental contact with such circuits.

(5) Grounding.

(i) Lead-in conductors. If exposed to contact with electric light or power conductors, the metal sheath of aerial cables entering buildings shall be grounded or shall be interrupted close to the entrance to the building by an insulating joint or equivalent device. Where protective devices are used, they shall be grounded.

(ii) Antenna structures. Masts and metal structures supporting antennas shall be permanently and effectively grounded without splice or connection in the grounding conductor.

(iii) **Equipment enclosures.** Transmitters shall be enclosed in a metal frame or grill or separated from the operating space by a barrier, all metallic parts of which are effectively connected to ground. All external metal handles and controls accessible to the operating personnel shall be effectively grounded. Unpowered equipment and enclosures shall be considered grounded where connected to an attached coaxial cable with an effectively grounded metallic shield.

SAFETY-RELATED WORK PRACTICES GENERAL REQUIREMENTS.

(a) Protection of employees.

(1) Joe R. Jones Construction, Inc. shall not permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.

(2) In work areas where the exact location of underground electric power lines is unknown, employees using jack-hammers, bars, or other hand tools which may contact a line shall be provided with insulated protective gloves.

(3) Before work is begun Joe R. Jones Construction, Inc. electrical supervisor shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit.

Joe R. Jones Construction, Inc. Electrical Supervisor shall post and maintain proper warning signs where such a circuit exists. Joe R. Jones Construction, Inc. Supervisor shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

Proximity to Overhead High Voltage Lines and Equipment.

(1) General. *No Company shall require or permit any employee to enter or to perform any function in proximity to high-voltage lines, unless danger from accidental contact with said high-voltage lines has been effectively guarded against.*

(2) Clearance or Safeguards Required.

> ***(a)*** *The operation, erection, or transportation of any tools, equipment, or any part thereof capable of movement; the handling, transportation, or storage of any materials; or the moving of any building, near high-voltage lines, is prohibited, if at any time it is possible to bring such object within 10 feet of high-voltage lines.*
>
> ***(b)*** *Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been*

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

(A) *For lines rated 50 kV. or below, minimum clearance between the lines and any part of the object shall be 10 feet;*

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

(C) *For equipment in transit, on smooth surfaces, the clearance shall be a minimum of 4 feet for voltages less than 50 kV., 10 feet for voltages over 50 kV., up to and including 345 kV., and 16 feet for voltages up to and including 750 kV.*

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

(c) *Insulating links, or proximity warning devices may be used on equipment, but the use of such devices shall not alter the requirements of any other regulation of this part.*

(d) *The 10-feet requirement shall not be reduced by movement due to any strains impressed upon the structures supporting the high-voltage line and upon any equipment, fixtures, or attachments thereon.*

(3) Warning Signs Required. *Joe R. Jones Construction, Inc. Electrical Job Site Supervisor shall post and maintain in plain view of the operator on each crane, derrick, power shovel, drilling rig, hay loader, hay stacker, pile driver, or similar apparatus, any part of which is capable of vertical, lateral, or swinging motion, a durable warning sign legible at 12 feet reading*

"Unlawful to operate this equipment within
10 feet of high-voltage lines."

(4) Notification to Power Company and Responsibility for Safeguards.

(a) *When any operations are to be performed, tools or materials handled, equipment is to be moved or operated within 10 feet of any high-voltage line, the person or persons responsible for the work to be done shall promptly notify the operator of the high-voltage line of the work to be performed, and shall be responsible for the completion of the safety measures as required*

before proceeding with any work which would impair the aforesaid clearance.

(b) *This section when applied to railway systems, shall be construed as permitting operation of standard rail equipment, which is normally used in the transportation of freight and/or passengers, and the operation of relief trains, or other equipment in emergencies, at a distance of less than 10 feet from any high-voltage conductor; but shall be construed as prohibiting normal repair or construction operations at a distance of less than 10 feet from any high-voltage conductor by other than properly qualified and authorized persons or employees under the direct supervision of any authorized person who is familiar with the hazards involved, until the safety provisions of the foregoing sections have been complied with.*

(b) Passageways and open spaces.

(1) Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

(2) Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a hazard to employees.

(c) Load ratings. In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

(d) Fuses. When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.

(e) Cords and cables.

(1) Worn or frayed electric cords or cables shall not be used.

(2) Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

LOCKOUT AND TAGGING OF CIRCUITS.

(a) Controls. Controls that are to be deactivated during the course of work on energized or deenergized equipment or circuits shall be tagged.

(b) Equipment and circuits. Equipment or circuits that are deenergized shall be rendered inoperative and shall have tags attached at all points where such equipment or circuits can be energized.

(c) Tags. Tags shall be placed to identify plainly the equipment or circuits being worked on.

SAFETY-RELATED MAINTENANCE AND ENVIRONMENTAL CONSIDERATIONS- MAINTENANCE OF EQUIPMENT.

Joe R. Jones Construction, Inc. Electrical Job Site Supervisor shall ensure that all wiring components and utilization equipment in hazardous locations are maintained in a dust-tight, dust-ignition-proof, or explosion-
proof condition, as appropriate. There shall be no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition.

ENVIRONMENTAL DETERIORATION OF EQUIPMENT.

(a) Deteriorating agents.

(1) Unless identified for use in the operating environment, no conductors or equipment shall be located:

(i) In damp or wet locations;

(ii) Where exposed to gases, fumes, vapors, liquids, or other agents having a deteriorating effect on the conductors or equipment; or

(iii) Where exposed to excessive temperatures.

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

(b) Protection against corrosion. Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials appropriate for the environment in which they are to be installed.

BATTERIES AND BATTERY CHARGING.

(a) General requirements.

(1) Batteries of the unsealed type shall be located in enclosures with outside vents or in well ventilated rooms and shall be arranged so as to prevent the escape of fumes, gases, or electrolyte spray into other areas.

(2) Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.

(3) Racks and trays shall be substantial and shall be treated to make them resistant to the electrolyte.

(4) Floors shall be of acid resistant construction unless protected from acid accumulations.

(5) Face shields, aprons, and rubber gloves shall be provided for workers handling acids or batteries.

(6) Facilities for quick drenching of the eyes and body shall be provided within 25 feet (7.62 m) of battery handling areas.

(7) Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection.

(b) Charging.

(1) Battery charging installations shall be located in areas designated for that purpose.

(2) Charging apparatus shall be protected from damage by trucks.

(3) When batteries are being charged, the vent caps shall be kept in place to avoid electrolyte spray. Vent caps shall be maintained in functioning condition.

DEFINITIONS APPLICABLE TO THIS SUBDIVISION.

The definitions given in this section apply to the terms used in this chapter.

Acceptable. An installation or equipment is acceptable to the Assistant Secretary of Labor, and approved within the meaning of this chapter:

(a) If it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a qualified testing laboratory capable of determining the suitability of materials and equipment for installation and use in accordance with this standard; or

(b) With respect to an installation or equipment of a kind which no qualified testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another Federal agency, or by a State, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with those provisions; or

(c) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which Joe R. Jones Construction, Inc. Electrical Job Site Supervisor keeps and makes available for inspection to the Assistant Secretary and his authorized representatives.

Accepted. An installation is **"accepted"** if it has been inspected and found to be safe by a qualified testing laboratory.

Accessible. (As applied to wiring methods.) Capable of being removed or exposed without damaging the building structure or finish, or not permanently closed in by the structure or finish of the building. (See **"concealed"** and **"exposed."**)

Accessible. (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See **"Readily accessible."**)

Ampacity. The current in amperes a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

Appliances. Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions.

Approved. Acceptable to the authority enforcing this Chapter. The authority enforcing this Chapter is the Assistant Secretary of Labor for Occupational Safety and Health. The definition of **"acceptable"** indicates what is acceptable to the Assistant Secretary of Labor, and therefore approved within the meaning of this Chapter.

Askarel. A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of non-combustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

Attachment plug (Plug cap) (Cap). A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

Automatic. Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature, or mechanical configuration.

Bare conductor. See **"Conductor."**

Bonding. The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

Bonding jumper. A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

Branch circuit. The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

Building. A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

Cabinet. An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

Certified. Equipment is **"certified"** if it:

(a) Has been tested and found by a qualified testing laboratory to meet applicable test standards or to be safe for use in a specified manner, and

(b) Is of a kind whose production is periodically inspected by a qualified testing laboratory. Certified equipment must bear a label, tag, or other record of certification.

Circuit breaker.

(a) (600 volts nominal, or less.) A device designed to open and close a circuit by non-automatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

(b) (Over 600 volts, nominal.) A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

CLASS I LOCATIONS. Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitible mixtures. Class I locations include the following:

(a) Class I, Division 1. A Class I, Division 1 location is a location:

(1) In which ignitible concentrations of flammable gases or vapors may exist under normal operating conditions; or

(2) In which ignitible concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(3) In which breakdown or faulty operation of equipment or processes might release ignitible concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; and all other locations where ignitible concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) Class I, Division 2. A Class I, Division 2 location is a location:

(1) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

(2) In which ignitible concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

(3) That is adjacent to a Class I, Division 1 location, and to which ignitible concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or of liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions. Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

CLASS II LOCATIONS. Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

(a) Class II, Division 1. A Class II, Division 1 location is a location:

(1) In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitible mixtures; or

(2) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitible mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes, or

(3) In which combustible dusts of an electrically conductive nature may be present.

Note: Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized

sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) Class II, Division 2. A Class II, Division 2 location is a location in which:

(1) Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitible mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(2) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting there from may be ignitible by abnormal operation or failure of electrical equipment or other apparatus.

Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II Division 1 location, as described above, into which an explosive or ignitible concentration of dust may be put into suspension under abnormal operating conditions.

CLASS III LOCATIONS. Class III locations are those that are hazardous because of the presence of easily ignitible fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitible mixtures. Class III locations include the following:

(a) Class III, Division 1. A Class III, Division 1 location is a location in which easily ignitible fibers or materials producing combustible flyings are handled, manufactured, or used.

Note: Easily ignitible fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, sawdust, woodchips, and other material of similar nature.

(b) Class III, Division 2. A Class III, Division 2 location is a location in which easily ignitible fibers are stored or handled, except in process of manufacture.

Collector ring. A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

Concealed. Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. (See **"Accessible**. (As applied to wiring methods.)")

Conductor.

(a) Bare. A conductor having no covering or electrical insulation whatsoever.

(b) Covered. A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

(c) Insulated. A conductor encased within material of composition and thickness that is recognized as electrical insulation.

Controller. A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

Covered conductor. See **"Conductor."**

Cutout. (Over 600 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

Cutout box. An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. (See **"Cabinet.**")

Damp location. See **"Location."**

Dead front. Without live parts exposed to a person on the operating side of the equipment.

Device. A unit of an electrical system which is intended to carry but not utilize electric energy.

Disconnecting means. A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

Disconnecting (or Isolating) switch. (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

Dry location. See **"Location."**

Enclosed. Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

Enclosure. The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

Equipment. A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electrical installation.

Equipment grounding conductor. See **"Grounding conductor, equipment."**

Explosion-proof apparatus. Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

Exposed. (As applied to live parts.) Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See **"Accessible"** and **"Concealed."**)

Exposed. (As applied to wiring methods.) On or attached to the surface or behind panels designed to allow access. (See **"Accessible**. (As applied to wiring methods.)")

Exposed. (For the purposes of Communications systems.) Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

Externally operable. Capable of being operated without exposing the operator to contact with live parts.

Feeder. All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

Festoon lighting. A string of outdoor lights suspended between two points more than 15 feet (4.57 m) apart.

Fitting. An accessory such as a locknut, bushing, or other part of a wiring system that is

intended primarily to perform a mechanical rather than an electrical function.

Fuse. (Over 600 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

Ground. A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

Grounded. Connected to earth or to some conducting body that serves in place of the earth.

Grounded, effectively (Over 600 volts, nominal). Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

Grounded conductor. A system or circuit conductor that is intentionally grounded.

Grounding conductor. A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

Grounding conductor, equipment. The conductor used to connect the noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

Grounding electrode conductor. The conductor used to connect the grounding electrode to the equipment grounding conductor and/or to the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

Ground-fault circuit interrupter. A device for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some pre-determined value that is less than that required to operate the overcurrent protective device of the supply circuit.

Guarded. Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

Hoistway. Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

Identified (conductors or terminals). Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be recognized as grounded.

Identified (for the use). Recognized as suitable for the specific purpose, function, use, environment, application, etc. where described as a requirement in this standard. Suitability of equipment for a specific purpose, environment, or application is determined by a qualified testing laboratory where such identification includes labeling or listing.

Insulated conductor. See **"Conductor."**

Interrupter switch. (Over 600 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

Intrinsically safe equipment and associated wiring. Equipment and associated wiring in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable, under certain prescribed test conditions, of causing ignition of a mixture of flammable or combustible material in air in its most easily ignitible concentration.

Isolated. Not readily accessible to persons unless special means for access are used.

Isolated power system. A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

Lighting outlet. An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

Listed. Equipment or materials included in a list published by a qualified testing laboratory whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

Location.

(a) Damp location. Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements.

(b) Dry location. A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

(c) Wet location. Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other liquids, such as locations exposed to weather and unprotected.

Mobile X-ray. X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

Motor control center. An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

Outlet. A point on the wiring system at which current is taken to supply utilization equipment.

Overcurrent. Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

Overload. Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See **"Overcurrent."**)

Panelboard. A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See **"Switchboard."**)

Portable X-ray. X-ray equipment designed to be hand-carried.

Power fuse. (Over 600 volts, nominal.) See **"Fuse."**

Power outlet. An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

Premises wiring system. That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

Qualified person. One familiar with the construction and operation of the equipment and the hazards involved.

Qualified testing laboratory. A properly equipped and staffed testing laboratory which has capabilities for and which provides the following services:

(a) Experimental testing for safety of specified items of equipment and materials referred to in this standard to determine compliance with appropriate test standards or performance in a specified manner;

(b) Inspecting the run of such items of equipment and materials at factories for product evaluation to assure compliance with the test standards;

(c) Service-value determinations through field inspections to monitor the proper use of labels on products and with authority for recall of the label in the event a hazardous product is installed;

(d) Employing a controlled procedure for identifying the listed and/or labeled equipment or materials tested; and

(e) Rendering creditable reports or findings that are objective and without bias of the tests and test methods employed.

Raceway. A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this Chapter. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquid-tight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

Readily accessible. Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See **"Accessible."**)

Receptacle. A receptacle is a contact device installed at the outlet for the connection of a

single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

Receptacle outlet. An outlet where one or more receptacles are installed.

Remote-control circuit. Any electric circuit that controls any other circuit through a relay or an equivalent device.

Sealable equipment. Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

Separately derived system. A premises wiring system whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

Service. The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

Service conductors. The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

Service drop. The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

Service-entrance conductors, overhead system. The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

Service-entrance conductors, underground system. The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

Service equipment. The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

Service raceway. The raceway that encloses the service-entrance conductors.

Signaling circuit. Any electric circuit that energizes signaling equipment.

Switchboard. A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See **"Panelboard."**)

Switches.

(a) General-use switch. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

(b) General-use snap switch. A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this Chapter.

(c) Isolating switch. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

(d) Motor-circuit switch. A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

Switching devices. (Over 600 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cutouts, disconnecting (or isolating) switches, disconnecting means, and interrupter switches.

Transportable X-ray. X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle.

Utilization equipment. Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

Utilization system. A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

Ventilated. Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

Volatile flammable liquid. A flammable liquid having a flash point below 38° C (100° F) or whose temperature is above its flash point, or a Class II combustible liquid having a vapor pressure not exceeding 40 psia (276 kPa) at 38° C (100° F) whose temperature is above its flash point.

Voltage. (Of a circuit.) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

Voltage, nominal. A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

Voltage to ground. For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

Watertight. So constructed that moisture will not enter the enclosure.

Weatherproof. So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

Wet location. See **"Location."**

Fall Protection Plan

Policy:

It is the policy of Joe R. Jones Construction, Inc. to take all practical measures possible to prevent employees from being injured by falls from heights. Joe R. Jones Construction, Inc. will take all necessary steps to eliminate, prevent, and control fall hazards. Joe R. Jones Construction, Inc. will comply fully with the OSHA Fall Protection standard (CFR 1926, Subpart M, Fall Protection).

This policy will follow the OSHA standard for potential falls from heights of 4 feet and mores. First consideration will be given to the elimination of fall hazards. If a fall hazard cannot be eliminated, effective fall protection will be planned, implemented, and monitored to control the risks of injury due to falling.

All personnel exposed to potential falls from heights will be trained to minimize their exposures. Fall protection equipment will be provided and used by all employees. Managers will be responsible for implementation of a fall protection plan for each job site.

Fall Hazard Identification and Evaluation Responsibilities:

Project Supervisor on each job site will be responsible for identifying fall hazards on their job site. Project Supervisor will evaluate each situation or work procedure where employees may be exposed to a fall of 4 feet or more. Project Supervisor will be responsible for developing a plan to eliminate the exposures, if possible, or to select the appropriate fall protection systems and/or equipment.

Examples of Situations Requiring Fall Protection:

The following are examples of situations were fall protection will be required. This listing is by no means complete, and there are many other situations where a fall of 4 feet or more is possible. It should be noted that ladders and scaffolding are not included in this list. They are covered by other OSHA standards and other requirements of our safety program.

- Wall Openings

  Any employee working near a wall opening (including those with chutes attached) where the outside bottom edge of the wall opening is 4 feet or more from a lower level, or the wall opening is less than 39 inches (1.0 meter) above the walking/working surface below, will be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.

- Holes

  Personal fall arrest systems, covers, or guardrail systems shall be erected around holes (including skylights) that are more than 4 feet above lower levels.

- Leading Edges

  Each employee who is constructing a leading edge 4 feet or more above lower levels shall be protected by guardrail systems, safety net systems, or personal fall arrest systems.

- Excavations

  Each employee at the edge of an excavation 4 feet or more deep shall be protected from falling by guardrail systems, fences, barricades, or covers. Where walkways are provided to permit employees to cross over excavations, guardrails are required on the walkway if it is 4 feet or more above the excavation.

- Form-work and Reinforcing Steel

  For employees, while moving vertically and/or horizontally on the vertical face of reinforcing bar (rebar) assemblies built in place, fall protection is not required when employees are moving. OSHA considers the multiple hand holds and foot holds on rebar assemblies as providing similar protection as that provided by a fixed ladder. Consequently, no fall protection is necessary while moving point to point for heights below 24 feet. An employee will be provided with fall protection when climbing or otherwise moving at a height more than 24 feet, the same as for fixed ladders.

- Hoist Areas

  Each employee in a hoist area shall be protected from falling 4 feet or more by guardrail systems or personal fall arrest systems. If guardrail systems (chain gate or guardrail) or portions thereof must be removed to facilitate hoisting operations, as during the landing of materials, and a worker must lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee must be protected by a personal fall arrest system.

- Overhand Bricklaying and Related Work

  Each employee performing overhand bricklaying and related work 4 feet or more above lower levels shall be protected by guardrail systems, safety net systems, or personal fall arrest systems, or shall work in a controlled access zone. All employees reaching more than 10 inches (25 cm) below the level of a walking/working surface on which they are working shall be protected by a guardrail system, safety net system, or personal fall arrest system.

- Precast Concrete Erection and Residential Construction

Each employee who is 4 feet or more above lower levels while erecting precast concrete members and related operations such as grouting of precast concrete members and each employee engaged in residential construction, shall be protected by guardrail systems, safety net systems, or personal fall arrest systems.

- Ramps, Runways, and Other Walkways

  Each employee using ramps, runways, and other walkways shall be protected from falling 4 feet or more by guardrail systems.

- Low-slope Roofs

  Each employee engaged in roofing activities on low-slope roofs with unprotected sides and edges 4 feet or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest systems or a combination of a warning line system and guardrail system, warning line system and safety net system, warning line system and personal fall arrest system, or warning line system and safety monitoring system. On roofs 50 feet or less in width, the use of a safety monitoring system without a warning line system is permitted.

- Steep Roofs

  Each employee on a steep roof with unprotected sides and edges 4 feet or more above lower levels shall be protected by guardrail systems with toeboards, safety net systems, or personal fall arrest systems.

- Controlled Access Zones

  A Controlled access zone is a work area designated and clearly marked in which certain types of work (such as overhand bricklaying) may take place without the use of conventional fall protection systems—guardrail, personal arrest or safety net—to protect the employees working in the zone.

  Controlled access zones are used to keep out workers other than those authorized to enter work areas from which guardrails have been removed. Where there are no guardrails, masons are the only workers allowed in controlled access zones.

  Controlled access zones, when created to limit entrance to areas where leading edge work and other operations are taking place, must be defined by a control line or by any other means that restrict access.

  Control lines shall consist of ropes, wires, tapes or equivalent materials, and supporting stanchions, and each must be:

- Flagged or otherwise clearly marked at not more than 6-foot intervals with a high-visibility material

- Rigged and supported in such a way that the lowest point (including sag) is not less than 39 inches from the walking/working surface and the highest point is not more than 45 inches --nor more than 50 inches when overhand bricklaying operations are being performed—from the walking/working surface

- Strong enough to sustain stress of not less than 200. Control lines shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

- Control lines will be connected on each side to a guardrail system or wall.

When control lines are used, they shall be erected not less than 6 feet nor more than 25 feet from the unprotected or leading edge, except when precast concrete members are being erected. In the latter case, the control line is to be erected not less than 6 feet nor more than 60 feet or half the length of the member being erected, whichever is less, from the leading edge.

Controlled access zones when used to determine access to areas where overhand bricklaying and related work are taking place are to be defined by a control line erected not less than 10 feet nor more than 15 feet from the working edge. Additional control lines must be erected at each end to enclose the controlled access zone. Only employees engaged in overhand bricklaying or related work are permitted in the controlled access zones.

On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, controlled access zones will be enlarged as necessary to enclose all points of access, material handling areas, and storage areas.

On floors and roofs where guardrail systems are in place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

Fall Protection Systems:

When there is a potential fall of 4 feet or more, Joe R. Jones Construction, Inc. will utilize one or more of the following means of providing protection:

- Guardrail Systems

  Guardrail systems must meet the following criteria. Toprails and midrails of guardrail systems must be at least one-quarter inch nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for toprails, it must be flagged at not more 6 feet intervals with a high-visibility material. Steel and plastic banding will not be used as toprails or midrails. Manila, plastic, or synthetic rope used for toprails or midrails must be inspected as frequently as necessary to ensure strength and stability.

  The top edge height of toprails, or (equivalent) guardrails must be 42 inches plus or minus 3 inches, above the walking/working level. When workers are using stilts, the top edge height of the top rail, or equivalent member, must be increased an amount equal to the height of the stilts.

  Screens, midrails, mesh, intermediate vertical members, or equivalent intermediate structural members must be installed between the top edge of the guardrail system and the walking/working surface when there are no walls or parapet walls at least 21 inches high. When midrails are used, they must be installed at a height midway between the top edge of the guardrail system and the walking/working level. When screens and mesh are used, they must extend from the top rail to the walking/working level and along the entire opening between top rail supports. Intermediate members, such as balusters, when used between posts, shall not be more than 19 inches apart.

  Other structural members, such as additional midrails and architectural panels, shall be installed so that there are no openings in the guardrail system more than 19 inches.

  The guardrail system must be capable of withstanding a force of at least 200 pounds applied within 2 inches of the top edge in any outward or downward direction. When the 200 pound test is applied in a downward direction, the top edge of the guardrail must not deflect to a height less than 39 inches above the walking/working level.

  Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding a force of at least 150 pounds applied in any downward or outward direction at any point along the midrail or other member.

  Guardrail systems shall be surfaced to protect workers from punctures or lacerations and to prevent clothing from snagging.

  The ends of top rails and midrails must not overhang terminal posts, except where such overhang does not constitute a projection hazard.

- Guardrail Systems

When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section must be placed across the access opening between guardrail sections when hoisting operations are not taking place.

At holes, guardrail systems must be set up on all unprotected sides or edges. When holes are used for the passage of materials, the hole shall have not more than two sides with removable guardrail sections. When the hole is not in use, it must be covered or provided with guardrails along all unprotected sides or edges.

If guardrail systems are used around holes that are used as access points (such as ladderways), gates must be used or the point of access must be offset to prevent accidental walking into the hole.

If guardrails are used at unprotected sides or edges of ramps and runways, they must be erected on each unprotected side or edge.

Personal Fall Arrest Systems:

These consist of an anchorage, connectors, and a body belt or body harness and may include a deceleration device, lifeline, or suitable combinations. If a personal fall arrest system is used for fall protection, it must do the following:

- Limit maximum arresting force on an employee to 900 pounds when used with a body belt
- Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness
- Be rigged so that an employee can neither free fall more than 4feet nor contact any lower level
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet
- Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 4 feet or the free fall distance permitted by the system, whichever is less.

The use of body belts for fall arrest is prohibited and a full body harness is required.

Personal fall arrest systems must be inspected prior to each use for wear damage, and other deterioration. Defective components must be removed from service.

Positioning Device Systems:

These body belt or body harness systems are to be set up so that workers can free fall no farther than 2 feet. They shall be secured to an anchorage capable of

supporting a least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.

Safety Monitoring Systems:

When no other alternative fall protection has been implemented, Joe R. Jones Construction, Inc. shall implement a safety monitoring system. Joe R. Jones Construction, Inc. Supervisor will appoint a competent person to monitor the safety of workers and shall ensure that the safety monitor:

- Is competent in the recognition of fall hazards;
- Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices;
- Is operating on the same walking/working surfaces of the workers and can see them;
- Is close enough to work operations to communicate orally with workers and has no other duties to distract from the monitoring function.

Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-sloped roofs.

No worker, other than one engaged in roofing work (on low-sloped roofs) or one covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.

All workers in a controlled access zone shall be instructed to promptly comply with fall hazard warnings issued by safety monitors.

Safety Net Systems:

Safety nets must be installed as close as practicable under the walking/working surface on which employees are working and never more than 30 feet (9.1 meters) below such levels. Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, and other deterioration. Safety nets shall be installed with sufficient clearance underneath to prevent contact with the surface or structure below.

Items that have fallen into safety nets including—but not restricted to, materials, scrap, equipment, and tools—must be removed as soon as possible and at least before the next work shift.

Warning Line Systems:

Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

- Flagged at not more than 6-foot intervals with a high-visibility material;
- Rigged and supported so that the lowest point including sag) is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface.
- Stanchions, after being rigged with warning lines, shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge;
- The rope, wire, or chain shall have a minimum tensile strength of 500 pounds and after being attached to the stanchions, must support without breaking the load applied to the stanchions as prescribed above.
- Shall be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.

Warning lines shall be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line shall be erected not less than 6 feet from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of mechanical equipment operation.

When mechanical equipment is not being used, the warning line must be erected not less than 6 feet from the roof edge.

Covers:

Covers located in roadways and vehicular aisles must be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected. All other covers must be able to support at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time. To prevent accidental displacement resulting from wind, equipment, or workers' activities, all covers must be secured. All covers shall be color coded or bear the markings "HOLE" or "COVER."

Protection From Falling Objects:

When guardrail systems are used to prevent materials from falling from one level to another, any openings must be small enough to prevent passage of potential falling objects. No materials or equipment except masonry and mortar shall be stored within 4 feet of working edges. Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept clear of the working area by removal at regular intervals.

During roofing work, materials and equipment shall not be stored within 6 feet of a roof edge unless guardrails are erected at the edge, and materials piled, grouped, or stacked near a roof edge must be stable and self-supporting.

Training:

Employees will be trained in the following areas:

(a) The nature of fall hazards in the work area;

(b) The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems;

(c) The use and operation of controlled access zones and guardrail, personal fall arrest, safety net, warning line, and safety monitoring systems;

(d) The role of each employee in the safety monitoring system when the system is in use;

(e) The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;

(f) The correct procedures for equipment and materials handling and storage and the erection of overhead protection; and,

(g) The Employees' role in fall protection plans.

Safety Harness Inspection Report

JOBSITE	Date	Inspector's Name

Harness Make/ Model	MFG.'S SERIAL NUMBER	HARNESS WEBBING OR LEATHER	ALL STITCHING	RIVETS & EYELETS	D-RINGS, BUCKLES & TONGUE	BODY PAD (IF APPL.)	LANYARDS	SAFETY LATCH / HOOK	CERTIFICATION OR DATA TAG

0 = YES - OK

X = NO - REPLACE

Ensure Harness is COLOR-CODED with the appropriate tape marker

FORWARD TO SAFETY DIRECTOR AT _____

Roof Labor Safety

Roof construction, repair, and other maintenance operations often require manual labor at dangerous heights and on steeply pitched working surfaces. The possibility of lost footing, decreased stability, and objects falling from such heights is great; appropriate employee safeguards shall be present. When employees of Joe R. Jones Construction, Inc. are involved in such operations, the following minimum safety guidelines shall be followed to promote a safe and healthful workplace and guard against injury to others below the work area.

Training:

Each department head whose employees are required to perform duties on roofs shall insure that they receive safety training and comply with the minimum standards as specified in this document.

Catch Platforms:

A substantial catch platform shall be installed below the working area of roofs more than 20 feet from ground to eaves without a parapet, or 16 feet from ground to eaves with a slope greater than 4 inches in 12 without a parapet. The platform shall extend 2 feet in width beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline.

Safety Belts, Lifelines, and Lanyards:

Where catch platforms are not in place, employees performing duties on a roof more than 20 feet from ground to eaves without a parapet, or 16 feet from ground to eaves with a slope greater than 4 inches in 12 inches without a parapet, shall be secured by an approved safety belt attached to a lifeline.

The safety belt lanyard shall be a minimum of 1/2- inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

Lifelines shall be secured above the point of operation to an anchorage or structural member capable of supporting a minimum dead weight of 5,400 pounds. One employee acting as anchor for another does not fulfill this requirement.

Lifelines used in areas where they may be subjected to cutting or abrasion, shall be a minimum of 7/8-inch wire core manila rope. For all other lifeline applications, a minimum

of 3/4- inch manila or equivalent, with a minimum breaking strength of 5,400 pounds, shall be used.
Lifelines, safety belts, and lanyards shall be used only for employee safeguarding. Ropes used for hoisting lines and other purposes shall not be used as lifelines. Any lifeline, safety belt, or lanyard actually subjected to in-service loading, as distinguished from static testing, shall be immediately removed from employee safeguarding.

Safety Nets:

Where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or safety belts is impractical, safety nets shall be provided when workplaces are more than 20 feet above the ground, water, or other surface.

Roofing Brackets:

Roofing brackets shall be constructed to fit the pitch of the roof.
In addition to the pointed metal projections, brackets shall be secured by nailing in place. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least 3/4-inch diameter, or equivalent.

Crawling Boards or Chicken Ladders:

Crawling boards shall not be less than 10 inches wide and one inch thick, having cleats 1 x 1-1/2 inches. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside. The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

A firmly fastened lifeline of at least 3/4-inch rope shall be strung beside each crawling board for a handhold.

Crawling boards shall be secured to the roof by means of adequate ridge hoods or equivalent effective means.

Use of Hoisting Lines:

When hoisting lines are used to raise tools or materials to a roof greater than 16 feet from ground to eaves without a parapet (or with a parapet less than 30 inches in height), the employee on the roof shall be secured by an approved safety belt attached to a lifeline.

The safety belt lanyard shall be a minimum of 1/2- inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

Work Site Isolation:

Prior to the start of roof construction, repair, or maintenance, the crew chief, foreman, or person in charge of the project shall insure that the area below the work site is isolated against entry by the use of barrier tape or other means.
If means of egress are to be blocked by ladders, scaffolds, or other equipment, or to isolate below a work site, prior approval must be obtained from an Environmental Health Services Department representative.

Personal Protective Equipment:

Employees involved in roof construction, repair, or maintenance operations shall use appropriate personal protective equipment including, but not limited to, hard hats, eye protection, and leather gloves.

If Conventional Fall Protection Systems are not used, OSHA Requires the Following:

- All workers who are allowed on the roof must be proficient in the alternate methods of fall protection. Affected employees must also be trained in the specific hazards associated with work on roofs which have rake edges.
- Roof surfaces must be inspected for slipping hazards--either eliminating them or taking measures to ensure that employees avoid them.
- Workers must wear appropriate foot wear to reduce slipping potential.
- Operations must be suspended when weather conditions such as high wind, rain, snow or sleet create a hazardous condition, and must remain suspended until the condition has passed.
- Damaged portions of the roof deck must be repaired as soon as practicable. Any holes (including skylight openings) must be protected either by covers or by installing guardrails.
- Employees must be protected with a safety monitoring system or by roofing slide guards.
- Workers must not ascend or descend the roof slope within 6 feet of the rake edge, except where such a limit on movement would prevent the performance of work.
- Supplies and materials must not be stored within 6 feet of the rake edge, or three feet where tile and metal roof systems are being installed.
- The area below eaves and rakes must be kept clear of materials and other objects which could pose impalement hazards, or they must be guarded properly.

Joe R. Jones Construction, Inc. shall, when using roofing slide guards as fall protection, take additional precautions:

- On slopes of 6-in-12 or less, three rows of roofing material must be placed prior to installing slide guards. Guards must be capable of holding a worker's weight should that person slip.
- On roofs with slopes greater than 6-in-12, up to and including 8-in-12, eaves slide guards must be installed for the entire length of the eaves. Additional guards must be installed below the work area at intervals not to exceed 8 feet. While standing on the plank below, the employee must secure roof jacks with nails and add planks, then climb up to the plank and continue to install the roof. Once the roof is installed, the employee will climb down to a lower plank and remove above planking and roof jacks until all jacks and planking have been removed.
- **When a conventional method of fall protection must be provided:**
- On roofs of 8-in-12 or greater, and on roofs with slopes greater than 4-in-12 where the fall potential measured from eaves is greater than 25 feet.
- Conventional methods include safety nets, guardrails or a personal fall arrest system.

REFERENCES

29 CFR 1910.28 (T)	Crawling boards or chicken ladders
29 CFR 1926.451 (U)	Roofing brackets
29 CFR 1926.104	Safety belts, lifelines, and lanyards
29 CFR 1926.105	Safety nets
29 CFR 1910.28 (S)	Roofing brackets
29 CFR 1926.451 (U) (3)	Catch platforms

Fire Safety Plan

Purpose:

The purpose of the Fire Safety Plan is to prevent potential injuries and deaths, and to protect Joe R. Jones Construction, Inc.'s property from damage or loss due to fire. This plan includes fire prevention, building exits, fire extinguishing, emergency evacuation, and employee training.

This plan will be reviewed with all new employees when they begin their job and with all employees when the plan is changed.

Fire Prevention:

Our first line of defense against fire is to prevent it in the first place. It is the responsibility of all employees to prevent fires. All employees will be apprised of the potential fire hazards in their work area and will be trained in safe work procedures and practices. Employees are expected to follow proper procedures to prevent fires and to notify their supervisor or other management personnel if they observe any condition that could lead to the ignition of a fire or could increase the spread of a fire.

The following are some general fire prevention practices and procedures that will be followed:

- All ignition sources (i.e., open flames, cutting torches, spark producing equipment, electric motors, heating equipment, etc.) will be controlled. All contact of ignition sources with combustible and flammable materials will be avoided. All employees will keep all combustible materials at least five feet from such ignition sources and all flammable liquids at least twenty feet away.

- Extensive use of electrical extension cords should be avoided. Any damaged or frayed electrical wiring, equipment cords, extension cords, etc. will be removed from service immediately and replaced or repaired.

- Any use of flammable liquids will be done in a manner that prevents spills, and prevents the flammable liquid or its vapor or spray from coming into contact with any ignition source. All flammable liquids will be stored in proper flammable liquid storage containers and kept in the proper storage cabinets.

- Housekeeping and storage practices are critical to preventing fires. Any combustible materials will be stored in neat stacks with adequate aisle space provided to prevent the easy spread of fire and to allow for access to extinguish any fire that may start. Trash, scrap, and other unnecessary combustibles must be cleaned up immediately and placed in proper disposal containers.

- Smoking is restricted to designated areas.

Company Fire Exits:

- Each area of the building/work site has at least two means of escape and are to be used in a fire emergency. The location of exits and the path of egress (escape) will be shown on maps (and posted throughout the building as necessary).
- Fire exit doors will not be blocked or locked during business hours in order to prevent their emergency use (when employees are within the building).
- Exit routes from the work site will be clear and free of obstructions. All exits are marked with signs designating exits from the premises.

Fire Extinguishers:

- Each area of Joe R. Jones Construction, Inc. will have a full complement of the proper type of fire extinguisher for the fire hazards present. All fire extinguishers will be inspected annually by a fire protection equipment company and tagged with the date of inspection. If a fire extinguisher is used or discharged for any reason, it will be removed from service and replaced with another properly charged fire extinguisher while it is being recharged.
- Employees who are expected or anticipated to use fire extinguishers will be instructed on the hazards of fighting fires, how to properly operate the fire extinguishers available, and what procedures to follow in alerting others to the fire emergency. These employees will only attempt to extinguish small incipient fires. If a fire cannot be immediately and easily extinguished with a fire extinguisher, the employees will evacuate the building. They will not try to fight the fire! All employees who are not trained and designated to fight fires are to immediately evacuate the premises at the first sign of fire or initiation of the fire alarm and are prohibited from using an extinguisher and re-entering the premises.

Emergency Fire Evacuation:

If any employee discovers a fire or smoke, the employee will immediately pull the nearest fire alarm box. If there is time and it is safe to do so, the employee will contact a member of Management to report the fire. Management will then make an announcement over the public address system that all employees and customers are to evacuate the building. Management will then call 911 and report the fire to the fire department.

If a fire alarm sounds or a fire is otherwise announced, all employees (except those designated and trained to use fire extinguishers) are expected to immediately exit the premises by proceeding to the nearest exit in an orderly fashion. If the nearest exit is blocked by fire or smoke, the employees should proceed to an alternate exit. There should be no running, shouting, pushing, etc. A calm orderly evacuation is the safest for all concerned.

Upon exiting the building, all employees and personnel are to proceed to the designated meeting area(s) away from the building, so as not to hamper access by fire fighters, and in order to be accounted for. The designated meeting area(s) for our building is:

The front parking lot (Insert the location(s) where employees are to meet on job sites)

Supervisors and managers will account for all of their employees to ensure that no one is still in the building and unaccounted for.

Special procedures for helping physically impaired employees will be established where needed. This will be done on a case by case basis when the employee is first hired or when the physical impairment first occurs.

Employee Training:

All new employees will receive fire prevention and emergency evacuation training when they are hired. All employees will also receive refresher training and a review of this plan on an annual basis.

Joe R. Jones Construction, Inc. will hold fire drills and will include a practice evacuation of the building at least annually. These drills will be used to evaluate employee response and behavior and will help us determine where more training is needed.

Those employees who are designated and authorized to use fire extinguishers to fight small fires will receive training in the proper use of extinguishers, how to extinguish a fire, the hazards involved in fighting fires, when not to fight a fire, and when to evacuate the area.

The Safety and Health Manager administers Joe R. Jones Construction, Inc.'s fire prevention and life safety inspection programs. This includes reviewing all new building construction and renovations to ensure compliance with applicable state, local, and national fire and life safety standards.

Fire prevention measures propose to reduce the incidence of fires by eliminating opportunities for ignition of flammable materials.

Flammable and Combustible Materials:

Substitution-

> Flammable liquids sometimes may be substituted by relatively safe materials in order to reduce the risk of fires. Any substituted material should be stable and nontoxic and should either be nonflammable or have a high flashpoint.

Storage -

Flammable and combustible liquids require careful handling at all times. The proper storage of flammable liquids within a work area is very important in order to protect personnel from fire and other safety and health hazards.

1) Cabinets

Not more than 120 gallons of Class I, Class II, and Class IIIA liquids may be stored in a storage cabinet. Of this total, not more than 60 gallons may be Class I and II liquids. Not more than three such cabinets (120 gallons each) may be located in a single fire area except in an industrial area.

2) Storage Inside Buildings.

Where approved storage cabinets or rooms are not provided, inside storage will comply with the following basic conditions:

a. The storage of any flammable or combustible liquid shall not physically obstruct a means of egress from the building or area.

b. Containers of flammable or combustible liquids will remain tightly sealed except when transferred, poured or applied. Remove only that portion of liquid in the storage container required to accomplish a particular job.

c. If a flammable and combustible liquid storage building is used, it will be a one-story building devoted principally to the handling and storing of flammable or combustible liquids. The building will have 2-hour fire-rated exterior walls having no opening within 10 feet of such storage.

d. Flammable paints, oils, and varnishes in 1 or 5 gallon containers, used for building maintenance purposes, may be stored temporarily in closed containers outside approved storage cabinets or room if kept at the job site for less than 10 calendar days.

Ventilation -

Every inside storage room will be provided with a continuous mechanical exhaust ventilation system. To prevent the accumulation of vapors, the location of both the makeup and exhaust air openings will be arranged to provide, as far as practical, air movement directly to the exterior of the building and if ducts are used, they will not be used for any other purpose.

Elimination of Ignition Sources-

All nonessential ignition sources must be eliminated where flammable liquids are used or stored. The following is a list of some of the more common potential ignition sources:

• Open flames, such as cutting and welding torches, furnaces, matches, and heaters-these sources should be kept away from flammable liquids operations. Cutting or welding on flammable liquids equipment should not be performed unless the equipment has been properly emptied and purged with a neutral gas such as nitrogen.
• Chemical sources of ignition such as d.c. motors, switched, and circuit breakers-these sources should be eliminated where flammable liquids are handled or stored. Only approved explosion-proof devices should be used in these areas.
• Mechanical sparks-these sparks can be produced as a result of friction. Only nonsparking tools should be used in areas where flammable liquids are stored or handled.
• Static sparks-these sparks can be generated as a result of electron transfer between two contacting surfaces. The electrons can discharge in a small volume, raising the temperature to above the ignition temperature. Every effort should be made to eliminate the possibility of static sparks. Also proper bonding and grounding procedures must be followed when flammable liquids are transferred or transported.

Removal of Incompatibles -

Materials that can contribute to a flammable liquid fire should not be stored with flammable liquids. Examples are oxidizers and organic peroxides, which, on decomposition, can generate large amounts of oxygen.

Flammable Gases-

Generally, flammable gases pose the same type of fire hazards as flammable liquids and their vapors. Many of the safeguards for flammable liquids also apply to flammable gases, other properties such as toxicity, reactivity, and corrosivity also must be taken into account. Also, a gas that is flammable could produce toxic combustion products.

Fire Extinguishers:

A portable fire extinguisher is a “first aid” device and is very effective when used while the fire is small. The use of fire extinguisher that matches the class of fire, by a person who is well trained, can save both lives and property. Portable fire extinguishers must be installed in workplaces regardless of other fire fighting measures. The successful performance of a fire extinguisher in a fire situation largely depends on its proper selection, inspection, maintenance, and distribution.

Classification of Fires and Selection of Extinguishers-

Fires are classified into four general categories depending on the type of material or fuel involved. The type of fire determines the type of extinguisher that should be used to extinguish it.

1) Class A fires involve materials such as wood, paper, and cloth which produce glowing embers or char.

2) Class B fires involve flammable gases, liquids, and greases, including gasoline and most hydrocarbon liquids which must be vaporized for combustion to occur.

3) Class C fires involve fires in live electrical equipment or in materials near electrically powered equipment.

4) Class D fires involve combustible metals, such as magnesium, zirconium, potassium, and sodium.

Extinguishers will be selected according to the potential fire hazard, the construction and occupancy of facilities, hazard to be protected, and other factors pertinent to the situation.

Location and Marking of Extinguishers-

Extinguishers will be conspicuously located and readily accessible for immediate use in the event of fire. They will be located along normal paths of travel and egress. Wall recesses and/or flush-mounted cabinets will be used as extinguisher locations whenever possible.

Extinguishers will be clearly visible. In locations where visual obstruction cannot be completely avoided, directional arrows will be provided to indicate the location of extinguishers and the arrows will be marked with the extinguisher classification.

If extinguishers intended for different classes of fire are located together, they will be conspicuously marked to ensure that the proper class extinguisher selection is made at the time of a fire. Extinguisher classification markings will be located on the front of the shell above or below the extinguisher nameplate. Markings will be of a size and form to be legible from a distance of 3 feet.

Condition of Fire Extinguishers-

Portable extinguishers will be maintained in a fully charged and operable condition. They will be kept in their designated locations at all times when not being used. When extinguishers are removed for maintenance or testing, a fully charged and operable replacement unit will be provided.

Mounting and Distribution of Extinguishers-

Extinguishers will be installed on hangers, brackets, in cabinets, or on shelves. Extinguishers having a gross weight not exceeding 40 pounds will be so installed that the top of the extinguisher is not more than 3-1/2 feet above the floor.

Extinguishers mounted in cabinets or wall recesses or set on shelves will be placed so that the extinguisher operating instructions face outward. The location of such extinguishers will be made conspicuous by marking the cabinet or wall recess in a contrasting color which will distinguish it from the normal décor.

Extinguishers must be distributed in such a way that the amount of time needed to travel to their location and back to the fire does not allow the fire to get out of control. OSHA requires that the travel distance for Class A and Class D extinguishers not exceed 75 feet. The maximum travel distance for Class B extinguishers is 50 feet because flammable liquid fires can get out of control faster that Class A fires. There is no maximum travel distance specified for Class C extinguishers, but they must be distributed on the basis of appropriate patterns for Class A and B hazards.

Inspection and Maintenance of Extinguishers

Once an extinguisher is selected, purchased, and installed, it is the responsibility of the Safety and Health Manager to oversee the inspection, maintenance, and testing of fire extinguishers to ensure that they are in proper working condition and have not been tampered with or physically damaged.

Fire Safety Inspections and Housekeeping:

First line Supervisors and the Safety and Health Manager are responsible for conducting work site surveys at least annually. These surveys should include observations of work site safety and housekeeping issues and should specifically address proper storage of chemicals and supplies, unobstructed access to fire extinguishers, and emergency evacuation routes. Also, they should determine if an emergency evacuation plan is present in work areas and that personnel are familiar with the plan.

Emergency Egress:

Every exit will be clearly visible, or the route to it conspicuously identified in such a manner that every occupant of the building will readily know the direction of escape from any point. At no time will exits be blocked.

Any doorway or passageway which is not an exit or access to an exit but which may be mistaken for an exit, will be identified by a sign reading "Not An Exit" or a sign indicating it actual use (i.e., "Storeroom"). Exits and accesses to exits will be marked by a readily visible sign. Each exit sign (other than internally illuminated signs) will be illuminated by a reliable light source providing not less than 5 foot-candles on the illuminated surface.

Facilities Design Review:

Facilities will be designed in a manner consistent with health and safety regulations and standards of good design. Company Management, together with Safety and Health Manager, will ensure that there is appropriate health and safety review of facility concepts, designs, and plans. A formal design review process is currently in place for all new construction efforts.

Occupant Emergency Plan for Persons with Disabilities:

The first line supervisor is assigned the responsibility to assist Persons with Disabilities under their supervision. An alternate assistant will be chosen by the supervisor. The role of the two assistants is to report to their assigned person, and to either assist in evacuation or assure that the Persons with Disabilities is removed from danger.

- Supervisors, alternates, and the person with a disability will be trained by the Safety and Health Manager on available escape routes and methods.
- A list of persons with disabilities is kept in the Office of Health and Safety. This list is updated by the Safety and Health Manager and the Office of Personnel Management.
- Visitors who have disabilities will be assisted in a manner similar to that of Company employees. The Host of the person with disabilities will assist in their evacuation.

Emergencies Involving Fire:

Fire Alarms-

In the event of a fire emergency, a fire alarm will sound for the building.

Evacuation Routes and Plans-

Each facility shall have an emergency evacuation plan. All emergency exits shall conform to NFPA standards.

Should evacuation be necessary, go to the nearest exit or stairway and proceed to an area of refuge outside the building. Most stairways are fire resistant and present barriers to smoke if the doors are kept closed.

Do not use elevators. Should the fire involve the control panel of the elevator or the electrical system of the building, power in the building may be cut and you could be trapped between floors. Also, the elevator shaft can become a flue, lending itself to the passage and accumulation of hot gases and smoke generated by the fire.

Emergency Coordinators-

Emergency Coordinators will be responsible for verifying personnel have evacuated from their assigned areas.

Fire Emergency Procedures-

If you discover a fire:

1. Activate the nearest fire alarm.

2. Notify the fire department by dialing 911. Give your location, the nature of the fire, and your name.

3. Notify the Manager on duty and other occupants.

4. Notify the Safety and Health Manager.

Fight the fire ONLY if:

1.The fire department has been notified of the fire, AND

2.The fire is small and confined to its area of origin, AND

3.You have a way out and can fight the fire with your back to the exit, AND

4.You have the proper extinguisher, in good working order, AND know how to use it.

5. If your are not sure of your ability or the fire extinguisher's capacity to contain the fire, leave the area.

If you hear a fire alarm:

1. Evacuate the area. Close windows, turn off gas jets, and close doors as you leave.

2. Leave the building and move away from exits and out of the way of emergency operations.

3. Assemble in a designated area.

4. Report to the Manager/monitor so he/she can determine that all personnel have evacuated your area.

5. Remain outside until competent authority (Physical Security, Safety and Health Manager, or your supervisor) states that it is safe to re-enter.

Evacuation Routes

1. Learn at least two escape routes, and emergency exits from your area.
2. Never use an elevator as part of your escape route.
3. Learn to activate a fire alarm.
4. Learn to recognize alarm sounds.
5. Take an active part in fire evacuation drills.

Flammable Liquids

Purpose

Proper Storage and use of flammable liquids can significantly reduce the possibility of accidental fires and injury to employees. To minimize risk to life and properly, the requirements of NFPA 30 & 321 and OSHA Standard 1910.106 have been implemented. MSDS for flammable liquids are kept in the War Room at the main office and job supt. will determine the location on job sites.

Responsibilities

Management

- Provide proper storage for flammable liquids
- Ensure proper training is provided to employees who work with flammable liquids
- Ensure containers are properly labeled

Supervisors

- Provide adequate training in the use and storage of flammable liquids
- Monitor for proper use and storage
- Keep only the minimum amount required on hand
- Ensure MSDS are current for all flammable liquids

Employees

- Follow all storage and use requirements
- Report deficiencies in storage and use to supervisors
- Immediately report spills to supervisors

Hazard Control

Administrative Controls

- Designated storage areas
- Limiting amount of flammable liquids in use and storage
- Employee Training

- Limited & controlled access to bulk storage areas
- Posted Danger, Warning and Hazard Signs

Engineering Controls

- Properly designed flammable storage areas
- Ventilated Storage areas
- Grounding Straps on Drums and dispensing points

Definitions

Flammable Liquid - a liquid with a flashpoint below 100^0F

Class IA - flashpoint below 73^0F and boiling point below 100^0F

Class IB - flashpoint below 73^0F and boiling point above 100^0F

Class IC - flash at or above 73^0F and below 100^0F

Combustible Liquids - a liquid having a flash point at or above 100^0 F.

Class II Combustibles - Flashpoint above 100^0F and below 140^0F

Class III Combustibles - Flashpoint at or above 140^0F

Subclass IIIA - flashpoint at or above 140^0F and below 200^0F

Subclass IIIB - flashpoint at or above 200^0F

Substitution

Relatively safe materials sometimes may substitute flammable liquids in order to reduce the risk of fires. Any substituted material should be stable and nontoxic and should either be nonflammable or have a high flashpoint.

Storage & Usage of Flammable Liquids

Flammable and combustible liquids require careful handling at all times. The proper storage of flammable liquids within a work area is very important in order to protect personnel from fire and other safety and health hazards.

- Storage of Flammable liquids shall be in NFPA approved flammable storage lockers or in low value structures at least 50 feet from any other structure. Do not store other combustible materials near flammable storage areas or lockers
- Bulk drums of flammable liquids must be grounded and bonded to containers during dispensing

- Portable containers of gasoline or diesel are not to exceed 5 gallons
- When not in use flammable liquids shall be kept in covered containers.
- Safety cans used for dispensing flammable or combustible liquids shall be kept at a point of use.
- Appropriate fire extinguishers are to be mounted within 75 feet of outside areas containing flammable liquids, and within 10 feet of any inside storage area for such materials.
- Storage rooms for flammable and combustible liquids must have explosion-proof light fixtures
- Bulk storage of gasoline or diesel is kept in above ground tanks. Tank areas are diked to contain accidental spills. Tanks shall be labeled IAW NFPA guidelines. All tank areas shall be designated no smoking - no hot work - no open flame areas.
- No flames – hot work or smoking is be permitted in flammable or combustible liquid storage areas.
- The maximum amount of flammable liquids that may stored in a building are

  20 gallons of Class IA liquids in containers

  100 gallons of Class IB, IC, II, or III liquids in containers table tank.
- Flammable liquid transfer areas are to be separated from other operations by distance or by construction having proper fire resistance.
- Class I liquids may be used only where there are no open flames or other sources of ignition within the possible path of vapor travel.
- Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or portable tanks within a building only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container or portable tanks by gravity through an approved self-closing valve. Transferring by means of air pressure on the container or portable tanks shall be prohibited.
- Maintenance and operating practices shall be in accordance with established procedures which will tend to control leakage and prevent the accidental escape of flammable or combustible liquids. Spills shall be cleaned up promptly.
- Combustible waste material and residues in a building or unit operating area shall be kept to a minimum, stored in covered metal receptacles and disposed of daily.
- Rooms in which flammable or combustible liquids are stored or handled by pumps shall have exit facilities arranged to prevent occupants from being trapped in the event of fire.

- Inside areas in which Class I liquids are stored or handled shall be heated only by means not constituting a source of ignition, such as steam, hot water or forces central systems located away from the area.

Cabinets

Not more than 120 gallons of Class I, Class II, and Class IIIA liquids may be stored in a storage cabinet. Of this total, not more than 60 gallons may be Class I and II liquids. Not more than three such cabinets (120 gallons each) may be located in a single fire area except in an industrial area.

Containers

The capacity of flammable and combustible liquid containers will be in accordance with the below table.

Maximum allowable capacity of containers and portable tanks

Flammable Liquids			**Combustible Liquids**		
Container	**1A**	**1B**	**1C**	**II**	**III**
Glass or approved plastic1	1 pt[2]	1 qt[2]	1 gal	1 gal	1 gal
Metal (Other than DOT drums)	1 gal	5 gal	5 gal	5 gal	5 gal
Safety Cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal drums (DOT specifications)	60 gal	60 gal	60 gal	60 gal	60 gal
Approved portable tanks	660 gal	660 gal	660 gal	660 gal	660 gal
(1) Nearest metric size is also acceptable for the glass and plastic (2) One gallon or nearest metric equivalent size may be used if metal and labeled with their contents.					

Storage Inside Buildings

Where approved storage cabinets or rooms are not provided, inside storage will comply with the following basic conditions:

The storage of any flammable or combustible liquid shall not physically obstruct a means of egress from the building or area.

Containers of flammable or combustible liquids will remain tightly sealed except when transferred, poured or applied. Remove only that portion of liquid in the storage container required to accomplish a particular job.

If a flammable and combustible liquid storage building is used, it will be a one-story building devoted principally to the handling and storing of flammable or combustible liquids. The building will have 2-hour fire-rated exterior walls having no opening within 10 feet of such storage.

Flammable paints, oils, and varnishes in 1 or 5 gallon containers, used for building maintenance purposes, may be stored temporarily in closed containers outside approved storage cabinets or room if kept at the job site for less than 10 calendar days.

Ventilation

Every inside storage room will be provided with a continuous mechanical exhaust ventilation system. To prevent the accumulation of vapors, the location of both the makeup and exhaust air openings will be arranged to provide, as far as practical, air movement directly to the exterior of the building and if ducts are used, they will not be used for any other purpose.

Designated Flammable Storage Areas are:

1. In the main office - Shop area near back door - 2 shelves

2. On job sites the flammable storage area will be designated by the job supt.

3. In all other instances the S&H manager, PM and/or job supt. will consult with the property owner.

Chemical Segregation & Incompatibilities Guidelines

Class of Chemical	**Examples**	Recommended Storage Method	Incompatible Materials	Possible Reaction If Mixed
Corrosive Acids	Mineral Acids – Chromic Acid Hydrogen Chloride Hydrochloric Acid Nitric Acid Perchloric Acid Phosphoric Acid Sulfuric Acid	Separate cabinet or storage area away from potential water sources, i.e. under sink	Flammable Liquids Flammable Solids Bases Oxidizers Poisons	Heat Gas Generation Violent Reaction
Chapter 3 Corrosive Bases/ Chapter 4 Caustics	Ammonium Hydroxide Sodium Hydroxide Sodium Bicarbonate	Separate cabinet or storage area away from potential water sources, i.e. under sink	Flammable Liquids Flammable Solids Acids Oxidizers Poisons	Heat Gas Generation Violent Reaction
Explosives	Ammonium Nitrate Nitro Urea Picric Acid Trinitroaniline Trinitrobenzene Trinitrobenzoic Acid Trinitrotoluene Urea Nitrate	Secure location away from other chemicals	Flammable Liquids Oxidizers Poisons Acids Bases	Explosion Hazard
Flammable Liquids	Acetone Benzene Diethyl Ether Methanol Ethanol Toluene Glacial Acetic Acid	Grounded flammable storage cabinet of flammable storage refrigerator	Acids Bases Oxidizers Poisons	Fire Hazard Heat Violent Reaction
Flammable Solids	Phosphorus Magnesium	Separate dry cool area	Acids Bases Oxidizers Poisons	Fire Hazard Heat Violent Reaction
Oxidizers	Sodium Hypochlorite Benzoyl Peroxide Potassium Permanganate Potassium Chlorate Potassium Dichromate	Spill tray that is separate from flammable and combustible materials	Reducing Agents Flammables Combustibles Corrosives	Fire Hazard Toxic Gas Generation

Poisons	Peroxides Perchlorates Chlorates Nitrates Cyanides Cadmium Mercury Osmium Acrylamide DMSO	Vented, cool, dry area in unbreakable chemically resistant secondary containers	Flammable Liquids Acids Bases Oxidizers Corrosives	Generation of Toxic & Flammable Gas Violent Reaction
Water Reactive Chemicals	Sodium Metal Potassium Metal Lithium Metal Lithium Aluminum Hydride	Dry, cool location away from potential spray from fire sprinklers and other water sources, i.e. under sink	Aqueous Solutions Oxidizers	Heat Violent Reaction
Flammable Compressed Gases	Methane Acetylene Propane Hydrogen	Cool, dry area away from oxidizing gases while securely attached to wall or bench	Oxidizing & Toxic Compressed Gases Oxidizing Solids	Fire Hazard Explosion Hazard
Oxidizing Compressed Gases	Oxygen Chlorine Bromine	Cool, dry area away from flammable gases while securely attached to wall or bench	Flammable Gases	Fire Hazard Explosion Hazard
Poisonous Compressed Gases	Carbon Monoxide Hydrogen Sulfide	Cool, dry area away from flammable gases or liquids while securely attached to wall or bench	Flammable Gases Oxidizing Gases	Release of Toxic Gas Violent Reaction

Partial Incompatibility Listing

Compound/Class	Avoid Storage Near or Contact With:
Acids	
Acetic Acid	Chromic acid, nitric acid, hydroxyl compounds, ethylene, glycogen, perchloric acid, peroxides, permanganate
Hydrofluoric Acid	---Ammonia (aqueous or anhydrous) Nitric Acid (conc.) Acetic acid, aniline, chromic acid, acetone, alcohol, or other flammable liquids, hydrocyanic acid, hydrogen sulfide, or other flammable gases, nitratable substances: copper, brass or any heavy metals (or will generate nitrogen dioxide/nitrous fumes) or organic products such as wood and paper
Sulfuric Acid	Light metals (lithium, sodium, potassium), chlorates, perchlorates, permanganates
Bases	
Ammonia	Mercury, chlorine, bromine, iodine, hydrofluoric acid, calcium hypochlorite
Calcium oxide	Water
Alkaline metals	Sodium, potassium, magnesium, calcium, aluminum, carbon dioxide, carbon tetrachloride or other chlorinated hydrocarbons, halogens, water
Bromine	Ammonia, acetylene, butadiene, methane, propane, butane (or other petroleum gases), hydrogen, sodium carbide, turpentine, benzene, finely divided metals
Carbon, activated	Calcium hypochlorite, oxidizing agents
Chlorine	Ammonia, acetylene, butadiene, methane, propane, butane, or other petroleum gases, hydrogen, sodium carbide, turpentine, benzene, finely divided metals
Copper	Acetylene, hydrogen peroxide, nitric acid
Fluorine	Isolate from everything
Iodine	Acetylene, ammonia (aqueous or anhydrous), hydrogen
Mercury	Acetylene, ammonia, fulminic acid (produced in nitric acid ethanol mixtures)
Oxygen	Oils, grease, hydrogen, other flammable gases, liquids, or solids
Phosphorous (white)	Air, oxygen, caustic alkalis as reducing agents (or will generate phosphine)
Potassium	Carbon tetrachloride, carbon dioxide, water
Silver	Acetylene, oxalic acid, tartaric acid, fulminic acid (produced in nitric acid-ethanol mixtures), and ammonium compounds
Organics	
Acetone	Concentrated nitric acid and sulfuric acid mixtures
Acetylene	Fluorine, chlorine, bromine, copper, silver, mercury
Aniline	Nitric acid, hydrogen peroxide
Flammable Liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
Hydrocarbons	Fluoride, chlorine, bromine, chromic acid, sodium peroxide (propane, butane, etc.)
Nitroparaffins	Inorganic bases, amines
Oxalic Acid	Silver, mercury
Oxidizers	
Chlorates	Ammonia salts, acids, metal powders, sulfur, finely divided organics, or combustible materials
Chromic Acid (trioxide)	Acetic acid, naphthalene, camphor, glycerol, turpentine, alcohol or flammable liquids
Ammonium Nitrate	Acids, metal powders, flammable liquids, chlorates, nitrates, sulfur, finely divided organic or combustible materials
Chlorine Dioxide	Ammonia, methane, phosphine, hydrogen sulfide,
Cumene Hydroperoxide	Organic or inorganic acids

Hydrogen Peroxide	Copper, chromium, iron, most other metals or salts, alcohols, acetone, or other flammable liquids, aniline, nitromethane, or other organic or combustible materials
Hypochlorites	Acids (will generate chlorine or hypochlorous acid
Nitrates	Sulfuric acid (will generate nitrogen dioxide)
Perchloric Acid	Acetic acid, bismuth and its alloys, alcohol, paper, wood, grease, oils
Peroxides (Organics)	Organic or inorganic acids; also avoid friction and store cold
Potassium Chlorate	Acids, especially sulfuric acid
Potassium Permanganate	Glycerol, ethylene glycol, benzaldehyde, sulfuric acid
Sodium Peroxide	Any oxidizable substance such as methanol, ethanol, glycerol, ethylene glycol, glacial acetic acid, acetic anhydride, benzaldehyde, furfural, methyl acetate, ethyl acetate, carbon disulfide
Alkaline metals	Sodium, potassium, magnesium, calcium, aluminum, carbon dioxide, carbon tetrachloride or other chlorinated hydrocarbons, halogens, water
Calcium oxide	Water
Cyanides	Acids (will generate hydrogen cyanide)
Phosphorous (white)	Air, oxygen, caustic alkalis as reducing agents (will generate phosphine)
Potassium	Carbon tetrachloride, carbon dioxide, water
Sodium	Carbon tetrachloride, carbon dioxide, water
Sodium Peroxide	Any oxidizable substance such as methanol, ethanol, glycerol, ethylene glycol, glacial acetic acid, acetic anhydride, benzaldehyde, furfural, methyl acetate, ethyl acetate, carbon disulfide
Sulfides	Acids (will generate hydrogen sulfide)

Reducing Agents

Hydrazine	Hydrogen peroxide, nitric acid, other oxidants
Nitrites	Acids (will generate nitrous fumes)
Sodium Nitrite	Ammonium nitrate and other ammonium salts

Toxics/Poisons

Arsenicals	Reducing agents (will generate arsine)
Azides	Acids (will generate hydrogen azide)
Cyanides	Acids (will generate hydrogen cyanide)
Hydrocyanic Acid	Nitric Acid, alkalis
Hydrogen Sulfide	Fuming nitric acid, oxidizing gases
Selenides	Reducing agents (will generate hydrogen selenide)
Sulfides	Acids (will generate hydrogen sulfide)
Tellurides	Reducing agents (will generate hydrogen telluride)

Truck and Vehicle Driver Qualifications:

Purpose:

To establish the policy and procedures that will insure all Company truck and vehicle drivers are qualified to operate Company trucks and vehicles safely. Any employee that is authorized to operate a Company truck or vehicle must meet all requirements of the Federal Highway Administration and State Government Regulations. Employees that are assigned to operate any kind of vehicle that has a gross combination weight rating of 26,000 or more pounds are required to have a current, valid Commercial Driver's License (CDL), issued by the state.

Qualifications:

The following lists the MINIMUM qualifications which must be met (and maintained) by any employee assigned to drive a Company truck or vehicle:

1. Applicants must be at least 21 years of age.

2. Applicants must be able to read, speak and write fluently in English.

3. Applicants must understand highway traffic signs and signals

4. Applicants must be able to respond to official inquiries and to make written entries on reports and records

5. Is physically qualified to operate a motor vehicle and has no movement limitations concerning their arms, legs, foot, head, waist, back, hands or fingers.

6. Has no established medical history that would interfere with their ability to operate a motor vehicle to include:

    a) Myocardial infarction, coronary difficulty, or any heart condition
    b) Diabetes
    c) Respiratory dysfunction
    d) High Blood Pressure
    e) Epilepsy
    f) Mental, nervous, or other functional or psychiatric disorder
    g) Arthritis, neuromuscular, or vascular disease

Forklift and Motorized Industrial Trucks

Policy:

All Company employees required to operate a powered industrial truck and/or forklift must be trained to operate the equipment. Motorized industrial trucks and forklifts are a vital and necessary tool that enable Joe R. Jones Construction, Inc. to conduct its business efficiently and safely.

Powered industrial trucks are defined as forklifts, platform lift trucks, power sweepers, motorized pallet jacks and all other motorized vehicles used on Joe R. Jones Construction, Inc.'s premises. Joe R. Jones Construction, Inc. will insure that all industrial trucks are inspected daily for safety and mechanical operability. Any industrial truck found to be defective or unsafe will not be used until the defect or unsafe condition is repaired/remedied.

Employee Certification:

Employees must meet the following requirements before they are "certified" to operate a powered industrial truck:

- 18 Years of age
- Is physically qualified to operate the industrial truck and has no movement limitations concerning their arms, legs, foot, head, waist, back, hands or fingers.
- Has an established medical history that would not interfere with their ability to operate the industrial truck to include:
    a) Epilepsy
    b) Mental, nervous, or other functional or psychiatric disorder
    c) Arthritis, neuromuscular, or vascular disease
    - Does not use drugs that fall into the following categories: opiate, hallucinogenic, depressant, or stimulants.
- Has a valid drivers license
- Perform a minimum of 2 hours "On-the-Job Training" in operating an industrial truck.

The Supervisor will provide on-the-job training about how to physically operate the powered industrial truck and additional supervised training as necessary.

The Supervisor will discuss with and instruct the employee so that the employee can gain an understanding of the following key elements:

- Basic operation of the industrial truck to include its major components, principals of loading, load capacity, operating “nuances”, etc.

- Maintenance and inspection of the industrial truck

- Starting and operating the truck- parking, turning, load traveling, stacking, backing up, etc.

- Refueling procedures

- Personal Protective Equipment- seat belt, safety shoes, hard hat, gloves, etc.

On-the-Job Coach

Provides on-the-job (hands on training) of 10 hours about how to physically operate the powered industrial truck. This training will be divided into specific areas listed below:

- Pre-Operation and Inspection of Powered Industrial Trucks
- Proper start-up and mastery of controls
- Maneuvering Skills
- Safety procedures
- Re-fueling or re-charging
- Actually operating the truck in working situations

Once the employee completes the minimum training time, shown consistent safe operating skills, and has demonstrated the ability to handle the equipment, the On-the-Job coach certifies the employee according to the Truck Operator Performance Test.

DAILY CHECKLISTS FOR POWERED INDUSTRIAL TRUCKS

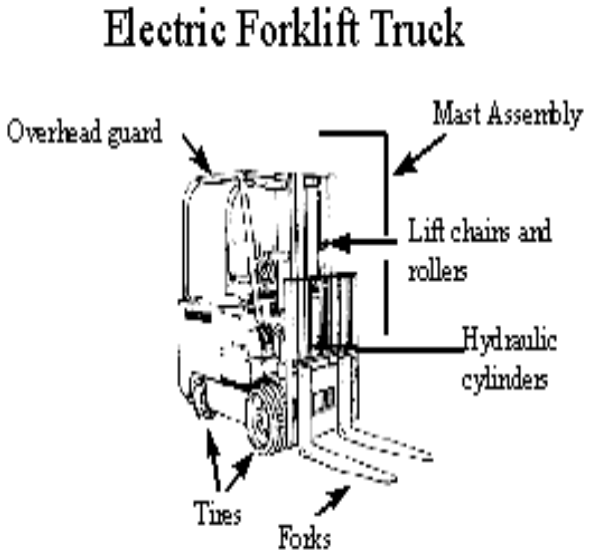
DAILY INSPECTION CHECKLIST
Electric Forklift Truck

KEY OFF Procedures

- The vehicle inspection
  - Overhead guard
  - Hydraulic cylinders
  - Mast assembly
  - Lift chains and rollers
  - Forks
  - Tires
- Examine the battery
- Check the hydraulic fluid level

KEY ON Procedures

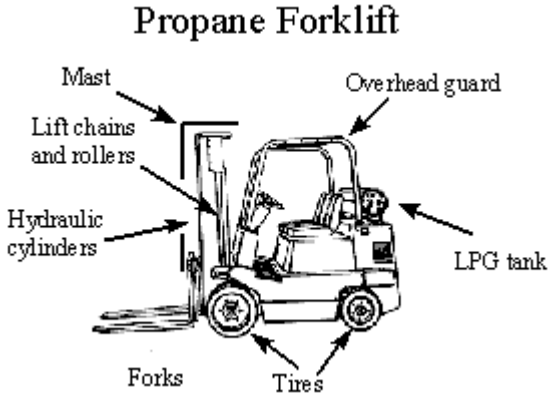
- Check the gauges
  - Hour meter
  - Battery discharge indicator
- Test the standard equipment
  - Steering
  - Brakes
  - Front, tail, and brake lights
  - Horn
- Safety seat (if equipped)
- Check the operation of load-handling attachments



DAILY INSPECTION CHECKLIST
Propane Forklift Truck

KEY OFF Procedures

- The vehicle inspection
  - Overhead guard
  - Hydraulic cylinders
  - Mast assembly
  - Lift chains and rollers
  - Forks
  - Tires
  - LPG tank and locator pin
  - LPG tank hose
  - Gas gauge

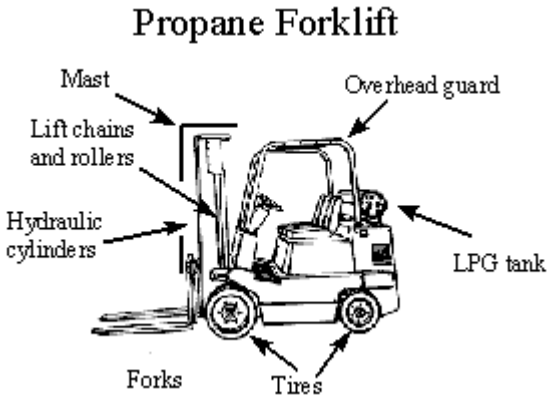


DAILY INSPECTION CHECKLIST
Propane Forklift Truck (continued)

KEY OFF Procedures (continued)
- Check the engine oil level
- Examine the battery
- Check the hydraulic fluid level
- Check the engine coolant level

KEY ON Procedures
- Test the front, tail, and brake lights

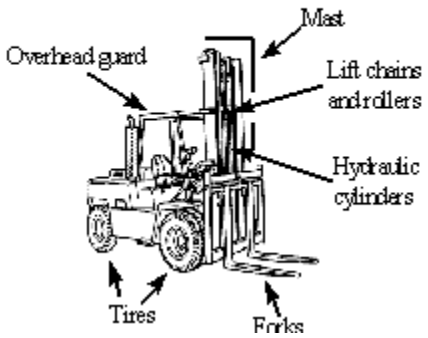
ENGINE RUNNING Procedures
- Check the gauges
  - Oil pressure indicator lamp
  - Ammeter indicator lamp
  - Hour meter
  - Water temperature gauge
- Test the standard equipment
  - Steering
  - Brakes
  - Horn
- Safety seat (if equipped)
  - Check the operation of the load-handling attachments
- Check the transmission fluid level



DAILY INSPECTION CHECKLIST
Yard Forklift Truck

KEY OFF Procedures

The vehicle inspection
- Overhead guard
- Hydraulic cylinders
- Mast assembly
- Lift chains and rollers
- Forks
- Tires
- LPG tank and locator pin
- LPG tank hose
- Gas gauge



KEY OFF Procedures (continued)

- Check the engine oil level
- Examine the battery
- Inspect the hydraulic fluid level
- Check the engine coolant level

KEY ON Procedures

Test the standard equipment

- Front, tail, and brake lights
- Fuel gauge (if diesel)
- Windshield wiper
- Heater

ENGINE RUNNING Procedures

Check the gauges

- Oil pressure indicator lamp
- Ammeter indicator lamp
- Ammeter
- Hour Meter
- Water Temperature Gauge

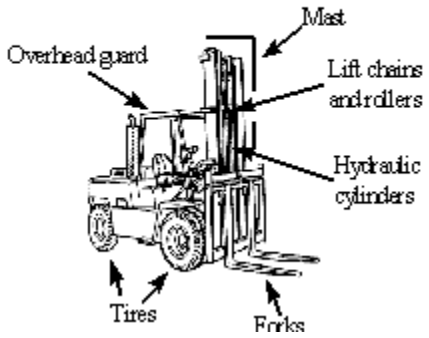
Test the standard equipment

- Steering
- Brakes
- Horn
- Safety seat (if equipped)

Check the operation of load-handling attachments

Check the transmission fluid level

Yard Forklift



GENERIC CHECKLIST FOR POWERED INDUSTRIAL TRUCKS

Overhead Guard - Are there broken welds, missing bolts, or damaged areas?

Hydraulic Cylinders - Is there leakage or damage on the lift, tilt, and attachment functions of the cylinders?

Mast Assembly - Are there broken welds, cracked or bent areas, and worn or missing stops?

Lift Chains and rollers - Is there wear or damage or kinks, signs of rust, or any sign that lubrication is required?

Is there squeaking?

Forks - Are they cracked or bent, worn, or mismatched?

Is there excessive oil or water on the forks?

Tires - What do the tires look like?

Are there large cuts that go around the circumference of the tire?
Are there large pieces of rubber missing or separated from the rim?
Are there missing lugs?
Is there bond separation that may cause slippage?

- **Battery Check** - Are the cell caps and terminal covers in place? Are the cables missing insulation?
- **Hydraulic Fluid** - Check level?
- **Gauges** - Are they all properly working?
- **Steering** - Is there excessive free play? If power steering, is the pump working?

Brakes - If pedal goes all the way to the floor when you apply the service brake, that is the first indicator that the brakes are bad. Brakes should work in reverse, also.

Does the parking brake work? The truck should not be capable of movement when the parking brake is engaged.

Lights - If equipped with lights, are they working properly?

Horn - Does the horn work?

Safety seat - if the truck is equipped with a safety seat is it working?

Load Handling Attachments - Is there hesitation when hoisting or lowering the forks, when using the forward or backward tilt, or the lateral travel on the side shift?

- **Is there excessive oil on the cylinders?**

Propane Tank - Is the tank guard bracket properly positioned and locked down?

- **Propane Hose** - Is it damaged? It should not be frayed, pinched, kinked, or bound in any way. Is the connector threaded on squarely and tightly?

Propane Odor - If you detect the presence of propane gas odor, turn off the tank valve and report the problem.

Engine Oil - Check levels.

Engine Coolant - Visually check the level. Note: Never remove the radiator cap to check the coolant level when the engine is running or while the engine is hot. Stand to the side and turn your face away. Always use a glove or rag to protect your hand.

Transmission Fluid - Check levels?

Windshield Wipers - Do they work properly?

Seat Belts - Do they work?

Safety Door - (found on stand up rider models) Is it in place?

Safety Switch - (found on stand up riding tow tractors) Is it working?

Hand guards - (found on stand up riding tow tractors, walking pallet trucks, walking transtackers) Are they in place?

Tow Hook - Does it engage and release smoothly?
Does the safety catch work properly?
Control Lever - Does the lever operate properly?

Safety Interlock - (found on order pickers) If the gate is open, does the vehicle run?

Gripper Jaws - (found on order pickers) Do the jaws open and close quickly and smoothly?

Work Platform - (found on order pickers) Does the platform raise and lower smoothly?

Housekeeping & Material Storage

Purpose:

Attention to general cleanliness, storage and housekeeping can prevent numerous accidents. This chapter covers items not discussed in other areas and is not intended to cover all specific housekeeping requirements. Good housekeeping efforts are a part of Joe R. Jones Construction, Inc. fire prevention and accident prevention program.

Management and Employee Responsibility:

All Employees share the responsibility for maintaining good housekeeping practice and following the established housekeeping procedures. The Manager, Supervisors, Safety Coordinator and Safety Committee will be responsible to monitor housekeeping as part of their facility safety inspection procedures, note any hazards or areas of non-compliance, initiate clean-up procedures and provide follow-up. Management has the additional responsibility to provide disciplinary action when necessary to reinforce compliance with this program.

Smoking Policy:

Smoking is not permitted inside buildings and/or within 50 feet of material storage. This includes all offices, rest rooms, locker rooms, production floor, storage areas, coolers, etc. Smoking is permitted outside in designated areas and in the Smoking Section of authorized break areas before work, after work and during breaks. To prevent fires and keep the grounds neat and orderly, all cigarette/cigar ashes and butts are to be disposed in the provided butt cans or ash-trays only.

Department and Area Housekeeping Procedures:

Office areas are to be kept neat and orderly. The following general rules apply to prevent injuries and maintain a professional appearance.

1. All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet of either side) of material storage (temporary and permanent) at all times.
2. Storage areas will be maintained orderly at all times. When supplies are received, the supplies will be stored properly.
3. Spills will be cleaned-up immediately and wastes disposed of properly.

4. All waste receptacles will be lined with a plastic trash bag to avoid direct contact while handling. Custodial Employees will use rubber gloves and compaction bar when handling wastes.
5. Keep file and desk drawers closed when not attended to avoid injuries. Open only one drawer at a time to prevent tipping of file cabinets.
6. At the end of the business day, turn off all office equipment (area heaters, lamps, coffee-maker, PCs, etc.) and lights to save energy and prevent fires. All space heaters shall be un-plugged at the end of the day to assure they have been turned-off.

Production areas will be kept neat and orderly, during operations and as follows:

1. All aisles, emergency exits, fire extinguishers, eye wash stations, etc., will be kept clear (a minimum of three feet in front of and to either side) of product storage, material storage, fork trucks and pallet jacks at all times.

2. Spills will be cleaned up immediately.

3. All process leaks will be reported to supervision and maintenance for immediate repair and clean-up.

4. Utility Employees will be responsible to keep aisles and work floors clear of excessive debris and waste materials during shift operation, between breaks and at shift change when necessary or directed by supervision; however, all Employees are responsible to communicate slippery floors to supervision for immediate clean-up.

5. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Rest rooms, locker rooms and break room are provided as a convenience for all Employees.

The following rules will apply:

1. Employees are expected to clean-up after themselves as a common courtesy to fellow Employees.

2. Flammable materials (fire works, explosives, gasoline, etc.) may not stored in lockers or brought on company property.

3. Personal food item will not be stored in lockers or break room overnight.

4. All waste receptacles will be lined with a plastic trash bag to avoid direct contact while handling and Custodial Employees will use rubber gloves and compaction bar when handling wastes.

5. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Maintenance Areas:

1. All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet of either side) of material storage (temporary and permanent) at all times.

2. Storage Areas will be maintained orderly at all times:

a. Pipe stock stored horizontally on racks and sorted by size

b. Metal stock stored horizontally on racks and sorted by size

c. Sheet metal stock stored vertically in racks and sorted by type

d. All fittings, etc., stored in bins on shelves and sorted by type and use

e. All flammables stored in OSHA-approved Fire Cabinets and self-closing cans where necessary

3. Spills will be cleaned-up immediately by the person responsible and wastes disposed properly.

4. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Grounds:

The grounds surrounding Joe R. Jones Construction, Inc. are an extension of the work place. Grounds that are kept neat and orderly show pride by Joe R. Jones Construction, Inc. for employees, customers and neighbors to enjoy.

The following general rules will apply:

1. All trash will be discarded only in the waste containers provided.

2. Park only in the designated assigned area.

3. The Maintenance Department will be responsible for grounds keeping (mowing, trimming, etc.) as needed. Maintenance will also establish procedures for ice/snow removal, when necessary, prior to operations each day.

Material Storage :

Proper storage procedures are required for dry, raw materials, finished product flammables and compressed gases storage to prevent fires, keep exits and aisles clear and avoid injuries and illnesses. General rules for material storage are as follows:

Materials and Finished Products Storage

1. Materials may not be stored any closer than 18 inches to walls or sprinkler heads. A minimum of 3 feet side clearance will be maintained around doorways and emergency exits. Passageways and aisle will be properly marked and a minimum of

six feet in width. Materials, fork lifts, pallet jacks, etc., may not be stored in aisles or passageways.

2. Aisles and passageways will be kept clear of debris. All spills of materials will be immediately cleaned-up by the person responsible.

3. All platforms and racks will have maximum load capacity displayed. The weight of stored material will not exceed the rated load capacity.

Flammable Storage

1. All flammables will be stored in OSHA-approved flammable storage cabinets or stored outside

2. Fuels, solvents and other flammables (not stored in original shipping containers) will be stored in OSHA-approved self-closing containers with flame arresters. Flammables may not be stored in open containers (open parts baths, etc.).

3. Flammable storage areas will be kept dry and well ventilated. No storage of combustible materials, open flames or exposed electrical components are permitted in the flammable storage area.

4. Flammable or combustible materials may not be stored in electrical rooms. Electrical rooms must be kept clean and dry at all times.

Compressed Gas Storage Safety

1. Gas Cylinder Shipment Receiving
2. Inspect bottle for defects & proper marking/labels
3. Ensure stamped date on bottle has not expired
4. Inspect valve assembly and adapter thread area
5. Ensure MSDS is on file or with shipment
6. Follow MSDS requirements for storage
7. Gas Cylinder Storage
8. Cylinder cap securely in place when not in use.
9. Marked with contents and if empty/full.
10. Stored up-right and secured to a stationary structure in an shaded and well ventilated area.
11. Cylinders not stored within 50 feet of exposed electrical components or combustible materials.
12. Cylinders are protected from accidental rupture.
13. Chemically reactive gases not stored within 50 feet of each other.

14. Gas Cylinder Movement
15. Must be secured to a cart or cylinder trolley
16. Cap securely fastened
17. Gas Cylinder Usage
18. Inspect valve adapter threads.
19. Inspect all fasteners, hoses & regulators prior to hooking up to cylinder.
20. Use only for approved purposes.
21. Use in up-right position.
22. Fasten cylinder to structure or cart.
23. Regulators must be of same rated pressure as cylinder
24. Keep cylinder valve shut when not in use; don't depend on regulators

Ladder Safety

Purpose:

Ladders present unique opportunities for unsafe acts and unsafe conditions. Employees who use ladders must be trained in proper selection, inspection, use and storage. Improper use of ladders has cause a large percentage of accidents in the workplace are of accidents. Use caution on ladders. OSHA reference: (29 CFR 1910.25, 1910.26, and 1910.27).

Hazards:

Falls are the primary hazard associated with the use of ladders. Falls result from a number of unsafe acts and conditions such as:

1) Ladders being set on unstable surfaces.
2) Personnel reaching too far out to the sides.
3) Personnel standing too high to maintain balance.
4) Personnel using defective ladders (e.g., broken rails, rungs, missing hardware).

These hazards are minimized if workers adhere to proper ladder safety practices and if supervisors ensure equipment is used, inspected, and maintained in good condition. Tasks which require frequent use of ladders and involve significant climbing effort must be accomplished by workers capable of the physical exertion required under these conditions.

Procurement:

Portable ladders procured for Joe R. Jones Construction, Inc. shall meet the design and construction specification of OSHA 29 CFR 1910.25 for wood ladders and 29 CFR 1910.26 for metal ladders. Portable ladders constructed of reinforced plastic shall meet the specifications of ANSI A14.5-1974.

Requirements: The following requirements apply to all ladders as indicated, including job-made ladders.

(1) Ladders shall be capable of supporting the following loads without failure:

(i) Each self-supporting portable ladder: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction.

(ii) Each portable ladder that is not self-supporting: At least four times the maximum intended load, except that each extra-heavy- duty type 1A metal or plastic ladders shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by

applying or transmitting the requisite load to the ladder in a downward vertical direction when the ladder is placed at an angle of 75½ degrees from the horizontal.

(iii) Each fixed ladder: At least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments (the number and position of additional concentrated loads of 250 pounds (114 kg) each, determined from anticipated usage of the ladder, shall also be included), plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices. Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds (114 kg) applied in the middle of the step or rung.

(2) Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.

(3)

(i) Rungs, cleats, and steps of portable ladders (except as provided below) and fixed adders (including individual rung/step ladders) shall be spaced not less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, as measured between center lines of the rungs, cleats and steps.

(ii) Rungs, cleats, and steps of step stools shall be not less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, as measured between center lines of the rungs, cleats, and steps.

(iii) Rungs, cleats, and steps of the base section of extension trestle ladders shall be not less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, as measured between center lines of the rungs, cleats, and steps. The rung spacing on the extension section of the extension trestle ladder shall be not less than 6 inches (15 cm) nor more than 12 inches (31 cm), as measured between center lines of the rungs, cleats and steps.

(4)

(i) The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches (41 cm).

(ii) The minimum clear distance between side rails for all portable ladders shall be 11½ inches (29 cm).

(5) The rungs of individual-rung/step ladders shall be shaped such that employees' feet cannot slide off the end of the rungs.

(6)

(i) The rungs and steps of fixed metal ladders manufactured after March 15, 1991, shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

(ii) The rungs and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or other-wise treated to minimize slipping.

(7) Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.

(8) A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.
(9) When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.
(10) Except when portable ladders are used to gain access to fixed ladders (such as those on utility towers, billboards, and other structures where the bottom of the fixed ladder is elevated to limit access), when two or more separate ladders are used to reach an elevated work area, the ladders shall be offset with a platform or landing between the ladders.
(11) Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
(12) Wood ladders shall not be coated with any opaque covering, except for identification or warning labels which may be placed on one face only of a side rail.
(13) The minimum perpendicular clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches (18 cm), except in the case of an elevator pit ladder, for which a minimum perpendicular clearance of 4½ inches (11 cm) is required.
(14) The minimum perpendicular clearance between the center line of fixed ladder rungs, cleats, and steps, and any obstruction on the climbing side of the ladder shall be 30 inches (76 cm), except as provided in paragraph (a)(15) of this section.
(15) When unavoidable obstructions are encountered, the minimum perpendicular clearance between the centerline of fixed ladder rungs, cleats, and steps, and the obstruction on the climbing side of the ladder may be reduced to 24 inches (61 cm), provided that a deflection device is installed to guide employees around the obstruction.
(16) Through fixed ladders at their point of access/egress shall have a step-across distance of not less than 7 inches (18 cm) nor more than 12 inches (30 cm) as measured from the centerline of the steps or rungs to the nearest edge of the landing area. If the normal step-across distance exceeds 12 inches (30 cm), a landing platform shall be provided to reduce the distance to the specified limit.
(17) Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches (38 cm) on each side of the centerline of the ladder.
(18) Fixed ladders shall be provided with cages, wells, ladder safety devices, or self-retracting lifelines where the length of climb is less than 24 feet (7.3 m) but the top of the ladder is at a distance greater than 24 feet (7.3 m) above lower levels.
(19) Where the total length of a climb equals or exceeds 24 feet (7.3 m), fixed ladders shall be equipped with one of the following:

(i) Ladder safety devices; or
(ii) Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet (45.7 m); or

(iii) A cage or well, and multiple ladder sections, each ladder section not to exceed 50 feet (15.2 m) in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet (15.2 m).

(20) Cages for fixed ladders shall conform to all of the following:

(i) Horizontal bands shall be fastened to the side rails of rail ladders, or directly to the structure, building, or equipment for individual- rung ladders;

(ii) Vertical bars shall be on the inside of the horizontal bands and shall be fastened to them;

(iii) Cages shall extend not less than 27 inches (68 cm), or more than 30 inches (76 cm) from the centerline of the step or rung (excluding the flare at the bottom of the cage), and shall not be less than 27 inches (68 cm) in width;

(iv) The inside of the cage shall be clear of projections;

(v) Horizontal bands shall be spaced not more than 4 feet (1.2 m) on center vertically;

(vi) Vertical bars shall be spaced at intervals not more than 9½ inches (24 cm) on center horizontally;

(vii) The bottom of the cage shall be at a level not less than 7 feet (2.1 m) nor more cage shall be flared not less than 4 inches (10 cm) all around within the distance between the bottom horizontal band and the next higher band;

(viii) The top of the cage shall be a minimum of 42 inches (1.1 m) above the top of the platform, or the point of access at the top of the ladder, with provision for access to the platform or other point of access.

(21) Wells for fixed ladders shall conform to all of the following:

(i) They shall completely encircle the ladder;

(ii) They shall be free of projections;

(iii) Their inside face on the climbing side of the ladder shall extend not less than 27 inches (68 cm) nor more than 30 inches (76 cm) from the centerline of the step or rung;

(iv) The inside clear width shall be at least 30 inches (76 cm);

(v) The bottom of the wall on the access side shall start at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder.

(22) Ladder safety devices, and related support systems, for fixed ladders shall conform to all of the following:

(i) They shall be capable of withstanding without failure a drop test consisting of an 18-inch (41 cm) drop of a 500-pound (226 kg) weight;

(ii) They shall permit the employee using the device to ascend or descend without continually having to hold, push or pull any part of the device, leaving both hands free for climbing;

(iii) They shall be activated within 2 feet (.61 m) after a fall occurs, and limit the descending velocity of an employee to 7 feet/sec. (2.1 m/sec.) or less;

(iv) The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9 inches (23 cm) in length.

(23) The mounting of ladder safety devices for fixed ladders shall conform to the following:

(i) Mountings for rigid carriers shall be attached at each of the carrier, with intermediate mountings, as necessary, spaced along the entire length of the carrier, to provide the strength necessary to stop employees' falls.

(ii) Mountings for flexible carriers shall be attached at each end of the carrier. When the system is exposed to wind, cable guides for flexible carriers shall be installed at a minimum spacing of 25 feet (7.6 m) and maximum spacing of 40 feet (12.2 m) along the entire length of the carrier, to prevent wind damage to the system.

(iii) The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.

(24) The side rails of through or side-step fixed ladders shall extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For a parapet ladder, the access level shall be the roof if the parapet is cut to permit passage through the parapet; if the parapet is continuous, the access level shall be the top of the parapet.

(25) For through-fixed-ladder extensions, the steps or rungs shall be omitted from the extension and the extension of the side rails shall be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where ladder safety devices are provided, the maximum clearance between side rails of the extensions shall not exceed 36 inches (91 cm).

(26) For side-step fixed ladders, the side rails and the steps or rungs shall be continuous in the extension.

(27) Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches (1.1 m) above an access level or landing platform either by the continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.

Use of Ladders:

The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated. The correct procedures for using ladders are as follows

(1) When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection

under a load would, by itself, cause the ladder to slip off its support.
(2) Ladders shall be maintained free of oil, grease, and other slipping hazards.
(3) Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.
(4) Ladders shall be used only for the purpose for which they were designed.
(5)

(i) Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).
(ii) Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.
(iii) Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.

(6) Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
(7) Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.
(8) Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
(9) The area around the top and bottom of ladders shall be kept clear.
(10) The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.
(11) Ladders shall not be moved, shifted, or extended while occupied.
(12) Ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized electrical equipment.
(13) The top or top step of a stepladder shall not be used as a step.
(14) Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
(15) Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.
(16) Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with "Do Not Use" or similar language, and shall be withdrawn from service until repaired.

(17) Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired.

The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:

(i) Immediately tagged with "Do Not Use" or similar language.
(ii) Marked in a manner that readily identifies it as defective;
(iii) Or blocked (such as with a plywood attachment that spans several rungs).

(18) Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
(19) Single-rail ladders shall not be used.
(20) When ascending or descending a ladder, the user shall face the ladder
(21) Employees will always maintain at least three points of contact with the ladder at all times.
(22) An employee shall not carry any object or load that could cause the employee to lose balance and fall.

Care of Ladders:

a) Handle ladders with care. Do not drop, jar or misuse them.
b) Ladders shall be stored in a manner that will provide easy access for inspection and will permit safe withdrawal for use. They shall not be stored in a manner that presents a tripping hazard not where they can fall on someone. They should be stored in a manner that will prevent sagging.
c) Lubricate metal bearings of locks, wheels, pulleys, etc., as required to keep them working.
d) Replace frayed or badly worn rope.
e) Keep safety feet and other parts in good condition to ensure they work.
f) Maintain ladders in good usable condition. Inspect ladders prior to use.
g) Ladders with defects which cannot be immediately repaired, shall be removed from service for repair or destruction, and shall be tagged with a danger tag. Do not attempt to straighten or use a bent ladder made of reinforced plastic.
h) Rungs or steps on metal ladders that are not corrugated, knurled, or dimpled will have skid-resistant materials applied.

Landscape and Grounds Maintenance

Policy:

Landscape and Grounds Maintenance involves the use of various sizes and types of lawnmowers, grass/weed cutting tools, edgers, hedge clippers and other hand tools. The most significant dangers are being struck by the blade or a foreign object thrown by the high speed blades and noise-inducted hearing loss.

Procedures:

1. Personal Protective Equipment and Safeguards

   Workers shall wear face shields or safety goggles or glasses with side shields, safety-toe boots, and hearing protection during the operation of all lawn mowers. Gloves may be worn when using walk-behind mowers. Bump caps should be worn when using a riding or towed mower around tall brush and low handing tree limbs. All mower discharge chutes shall be guarded with shields or approved grass catchers to deflect or stop foreign objects during operation.

2. Operating Practices Applicable to Push, Self-Propelled, and Riding Mowers

   a. Operators shall be trained and qualified to operate the different type(s) of mowers available. Manufacturer's instructions and operating procedures shall be followed.

   b. Prior to mowing, operators shall clear the area to be mowed of all people and inspect for foreign objects, raised sprinkler heads, holes, soft ground, and obstructions.

   c. Mowers shall not be left running unattended. For riding mowers, the engine shall be shut off and all drives disengaged prior to getting off the mower. No riders are permitted on riding lawn mowers. The engine on push and self-propelled mowers shall be turned off while moving to another job location or while passing over curbs, loose gravel, or other similar obstructions. Power to attachments shall be disengaged on riding or towed mowers while passing over similar obstructions and when travelling over unobstructed areas and roads on the way to the next job site or return to the shop.

   d. Mower blades cutting height should normally be set as near to 2 inches as possible. Blades shall never be set lower than 1 ½ inches.

e. When mowing hills and slopes, operators shall know the special precautions to follow. Slopes, hills, or banks exceeding a 30 degree angle shall be mowed with a push or self-propelled walk-behind mower in a horizontal (across) direction.

f. Electric hedge clippers shall be inspected, cleaned, oiled, and sharpened as required when in use. A grounded power cord shall be used if the tools is not double insulated. The cord shall be inspected before use and daily for condition. The cord shall be kept away from the cutting surface and out from under the feet of the operator. The cutting teeth of the clipper shall not be pointed toward the body of the operator. The unit shall be shut off and unplugged while moving from job to job. Gloves shall be worn when operating hedge clippers. No electric power tool shall be operated in rain, sprinklers, or any kind of precipitation.

b) General Rules for Maintaining Lawn Care Equipment

a. Always refuel with engines off and allow the engine to cool first. Do not permit smoking in the area. Refuel mowers prior to use versus refueling prior to storing inside a building. Complete refueling outside, at least 10 feet away from the building or any open flame.

b. Use boards or ramps to load and unload mowers from vehicles ensuring the engine is off and the spark plug wire is disconnected. Always shut off the fuel supply line when parking mowers inside or outside at the end of the day. As storage space permits, leave 1 to 3 feet separation space between parked gasoline-operated riding mowers.

c. Clean mowers or perform other maintenance on mowers only after turning engine off and disconnecting the spark plug wire.

d. Use manufacturer's guidelines for operation and use of mowers.

3. Tractor Operations

a. Roll-over protective structures (ROPS) are required on tractors used for landscape maintenance. Seat belts shall be installed on all ROPS-equipped tractors and used whenever the vehicle is in motion.

b. When pulling a load, operators shall hitch only to the draw bar. The draw bar hitch shall be kept at least 13 inches, but less than 17 inches, off the ground.

c. When moving a front load, the load shall be kept low to the ground and the rear wheels as level as possible.

d. Operators shall avoid holes and obstacles; both on the ground and overhead. Speed shall be reduced with heavy loads when vision is limited or when operating on rough terrain.

e. When stuck, operators shall try carefully to back out. Increasing engine speed or fastening a post to the rear wheels greatly increases the chances of tipping over backward; therefore, these methods shall not be used. Operators shall get help if needed.

f. Grass shall not be mowed with a tractor on slopes greater than a 4-inch rise or drop per foot of travel. Lower gears shall be used when going down hill and the wheels shall be allowed to control the tractor speed.

g. The engine shall be shut off before the operator dismounts from the tractor or makes adjustments to either the tractor or towed equipment.

h. Riders shall not be allowed on tractors, on the draw bar, or on towed equipment, except where the equipment is specifically designed to allow riders or passengers.

i. Fenders are guards for the worker's protection. Fenders shall be kept in place at all times.

j. Tractors shall only be left on an incline after the engine has been turned off, gear shift has been placed in park position (or the lowest gear if standard transmission), and the wheels have been braked and blocked. Where possible, tractors shall be parked on level ground.

k. The power take-off guard shall always be in place.

l. Hearing protection and safety-toe shoes shall be worn by the operator, when required. The Safety and Health Manager should be consulted to determine the need for respiratory protection.

4. Flower Bed and Shrub Maintenance

a. Workers shall wear clothing and gloves that will protect their hands and arms from thorns and leaves which may cut or puncture the skin. Dust masks may be

required to prevent reactions to fine dust or pollen. Personnel shall not work on flower or shrub beds within 24 hours after application of herbicides.

b. Shovels, hoes, and cultivators shall be kept sharp, used in moist soil, and placed where stepping on the cutting surface will not cause the handle to strike a person.

5. Fertilizer Storage and Handling

a. Fertilizer can become a very combustible material and, at temperatures in excess of 130 degrees F, it may explode. When fertilizers become wet and start to decompose, they give off a gas that will burn. Some fertilizers give off a very toxic gas when burning. No more than 2,500 tons of fertilizer shall be stored in a building unless that building is equipped with an automatic sprinkler system.

b. When spreading fertilizer, pellets shall not be directed toward other personnel. If personnel enter the area, the spreader shall be turned off. Fertilizer spreaders shall be cleaned and lubed daily. Safety glasses and gloves shall be worn during fertilizing spreading operations.

6. Herbicides

The use of herbicides for weed control poses a significant potential safety and health hazard. Herbicides shall be applied per manufacturer's instructions and used only by certified personnel. Due to the absorption properties of herbicides, coveralls shall be worn during application, in addition to safety goggles and appropriate respiratory protection, as required.

Machinery & Machine Guarding Safety

Policy:

All mechanical motion is potentially hazardous. Motion hazards, such as rotating devices, cutting or shearing blades, in-running nip points, reciprocating parts, linear moving belts and pulleys, meshing gears, and uncontrolled movement of failing parts, are examples of motion and peculiar to any one machine or job operation. Personnel working within areas where they are exposed to machinery or equipment hazards must be aware of the potential for accidents. Machine operators and others are exposed to moving parts and can get clothing or body parts caught in the machinery.

Personnel Training:

Personnel will be trained to:

1. Safely operate each machine they will be required to use

2. To recognize potential accident producing situations, and

3. To know what to do when hazards are discovered.

Only personnel who have been thoroughly trained, or those who are undergoing supervised on-the-job training on the equipment, will be permitted to operate machinery.

Personal Protective Equipment:

Eye protection or face shields will be worn by all personnel within areas where machines are operated.

Loose fitting clothing, neckties, rings, bracelets, or other apparel that may become entangled in moving machinery will not be worn by machine operators or their helpers.

Hair nets or caps will be worn to keep long hair away from moving machinery.

Gloves will not be worn where there is a chance of them being caught in machinery.

Ear plugs or muffs will be used when required for worker protection.

The Safety and Health Manager should be contacted to assist Supervisors in determining personnel protective equipment needs.

Environmental:

Machines designed for fixed locations will normally be securely fastened to the floor or other suitable foundation to eliminate all movement or "walking." Machines equipped with rubber feet, non-skid foot pads, or similar vibration dampening materials will be installed according to the manufacturer's recommendations.

Machines that have the potential of tipping or falling over will be firmly secured.

Machines that develop fine dust and fumes will be equipped with effective exhaust hoods, connected to an effective exhaust system. An interlocking device should be installed to link the machine's power supply and the exhaust system to prevent the operation of machines without the exhaust system operating.

Machines will never be left unattended with the power on unless the worker is operating more than one machine in a battery of machines. In this latter instance, the clear zone will be appropriately marked to include all machines in the group.

No attempt will be made to clean any part of a machine until the moving parts have come to a complete stop. Chips will not be removed from machinery by hand. Hand brushes should be used but compressed air may be used when reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

Brushes, swabs, lubricating rolls, and automatic or manual pressure guns will be used by operators to lubricate material, punches, or dies. This equipment will be used so that operators are not required to reach into the point of operation or other hazardous area.

Housekeeping:

Floors will be kept in good repair and free of chips, dust, metal scraps, and other slipping and tripping hazards.

Waste containers will be emptied daily or more often, if necessary, to prevent excessive waste accumulations.

All materials, including usable scrap, will be stored so that they will not present a hazard.

Drip pans will be used whenever equipment must be oiled. Machinery will not be in motion when being lubricated unless lubrication is automatic or a long gravity flow spout is used, enabling the oiler to remain in the clear while performing this task.

Material Handling:

Trucks used for scrap disposal will not be overloaded, and scrap will not extend beyond the ends or sides of trucks.

When materials are of a weight or size which makes manual lifting hazardous, mechanical handling equipment will be used.

Maintenance and Repair:

When maintenance or repair is needed, machines will be completely shut down and the control switch/switches locked and tagged in the "OFF" position.

Cutting tools will be kept sharp and forming tools well dressed and free from accumulations of chips, dust, and other foreign matter. Where two or more cutting tools are used in one cutting head, they will be properly adjusted and balanced.

Damaged cutting tools will be removed from service and will not be used until repaired.

Machine Usage:

Machines will be used only for work within the rated capacity specified by the machine manufacturer.

Machines will be maintained so that while running at full or idle speed, with the largest cutting tool attached, they are free of excessive vibration.

Machines will be completely stopped before attempting to clear jammed work or debris.

No saw blade, cutter head, or tool collar will be placed or mounted on a machine arbor, unless it has been accurately sized and shaped to fit the arbor.

Electrical Safeguards:

The motor "START" button will be protected against accidental/inadvertent operation. "START" buttons will not be wedged for continuous operation.

The wiring and grounding of machinery will be in accordance with the National Electric Code.

Each machine will have a positive electrical disconnect or isolation switch which can be locked out.

Electrically driven machines will be equipped with under-voltage protective systems to preclude automatic restart after either a power failure or other under-voltage condition.

Machine Controls:

Foot pedal mechanisms will be located and guarded so that they cannot be activated by falling objects or other accidental means. A pad with a non-slip contact area will be firmly attached to the pedal.

Controls will be available to the workers at their operating positions so that they do not reach over moving parts of the equipment. Control functions will be identified by printed words and color coding. Controls will not be wedged for continuous operation.

Power controls must have a way of locking out electrical power. Disconnecting or isolating switches will be mounted on a visible side of, or near, the machine and will be used to lock out power to the machine during repairs or adjustments. When the power is locked out, the isolating switch will be tagged.

Machine Guards

Purpose

The Machine Guard Program is designed to protect Employees from hazards of moving machinery. All hazardous areas of a machine shall be guarded to prevent accidental "caught in" situations. References: General Requirements for all Machines (29 CFR 1910.212), Woodworking Machinery (29 CFR 1910.213), Abrasive Wheels (29 CFR 1910.215), Power Presses (29 CFR 1910.217), Power Transmission (29 CFR 1910.219).

Many accidents are caused by machinery that is improperly guarded or not guarded at all. Important factor that must be kept in mind relative to machinery guarding is that no mechanical motion that threatens a worker's safety should be left without a safeguard.

The following areas of machinery will be provided with barriers and/or enclosures that will effectively prevent personnel from coming in contact with moving components:

a) Point of operation exposures such as blades, knives and cutting heads.
b) Power transmission exposures such as belts, pulleys, shaft, gears, etc.
c) Top, bottom and backside exposures, such as the underside of table saws and the wheels on band saws.
d) When a point-of-operation guard cannot be used because of unusual shapes or cuts, jigs or fixtures which will provide equal safety for the operator will be used.
e) Upon completion of an unusual operation, the guard will be immediately replaced.

Whenever a guard is removed for other than an operational requirement, the machine will be shut down and the control switch/switches locked and tagged in the "OFF" position.

Guards will be affixed to the machine. Where possible, the guards will be of the hinged type to enhance maintenance or adjustments.

Responsibilities

Management

Ensure all machinery is properly guarded

Provide training to employees on machine guard rules

Ensure new purchased equipment meets the machine guard requirements prior to use

Supervisors

Train assigned employees on the specific machine guard rules in their areas

Monitor and inspect to ensure machine guards remain in place and functional

Immediately correct machine guard deficiencies

Employees

Do not remove machine guards unless equipment if locked and tagged

Replace machine guards properly

Report machine guard problems to supervisors immediately

Do not operate equipment unless guards are in place and functional

Only trained and authorized employees may remove machine guards

Definition of Terms

1. Guards: Barriers that prevent Employees from contact with moving portions or parts of exposed machinery or equipment which could cause physical harm to the Employees.

2. Enclosures: Mounted physical barriers which prevent access to moving parts of machinery or equipment.

3. Point-of-Operation: The area on a machine or item of equipment, where work is being done and material is positioned for processing or change by the machine.

4. Power Transmission: Any mechanical parts which transmit energy and motion from a power source to the point-of-operation. Example: Gear and chain drives, cams, shafts, belt and pulley drives and rods. NOTE: Components which are (7) feet or less from the floor or working platform shall be guarded.

5. Nip Points: In-Running Machine or equipment parts, which rotate towards each other, or where one part rotates toward a stationery object.

6. Shear points: The reciprocal (back and forth) movement of a mechanical part past a fixed point on a machine.

7. Rotating Motions an exposed mechanism are dangerous unless guarded. Even a smooth, slowly rotating shaft or coupling can grasp clothing or hair upon contact with the skin and force an arm or hand into a dangerous position. Affixed or hinged guard enclosure protects against this exposure.

8. Reciprocating: Reciprocating motions are produced by the back and fourth movements of certain machine or equipment parts. This motion is hazardous, when exposed, offering pinch or shear points to an Employee. A fixed enclosure such as a barrier guard is an effective method against this exposure.

9. Transverse Motions: Transverse motions are hazardous due to straight line action and in-running nip points. Pinch and shear points also are created with exposed machinery and equipment parts operating between a fixed or other moving object. A fixed or hinged guard enclosure provides protection against this exposure.

10. Cutting Actions: Cutting action results when rotating, reciprocating, or transverse motion is imparted to a tool so that material being removed is in the form of chips. Exposed points of operation must be guarded to protect the operator from contact with cutting hazards, being caught between the operating parts and from flying particles and sparks.

11. Shearing Action: The danger of this type of action lies at the point of operation where materials are actually inserted, maintained and withdrawn. Guarding is accomplished through fixed barriers, interlocks, remote control placement (2 hand controls), feeding or ejection.

Machine Guarding Requirements

1. Guards shall be affixed to the machine where possible and secured.

2. A guard shall not offer an accident hazard in itself.

3. The point-of-operation of machines whose operation exposes an Employee to injury shall be guarded.

4. Revolving drums, barrels and containers shall be guarded by an enclosure which is interlocked with the drive mechanism.

5. When periphery of fan blades are less than 7 feet above the floor or working level the blades shall be guarded with a guard having openings no larger than 1/2 inch.

6. Machines designed for a fixed location shall be securely anchored to prevent walking or moving. For example; Drill Presses, Bench Grinders, etc.

General Requirements for Machine Guards

1. Guards must prevent hands, arms or any part of an Employees body from making contact with hazardous moving parts. A good safeguarding system eliminates the possibility of the operator or other Employees from placing parts of their bodies near hazardous moving parts.

2. Employees should not be able to easily remove or tamper with guards. Guards and safety devices should be made of durable material that will withstand the conditions of normal use and must be firmly secured to the machine.

3. Guard should ensure that no objects can fall into moving parts. An example would be a small tool which is dropped into a cycling machine could easily become a projectile that could and injure others.

4. Guard edges should be rolled or bolted in such a way to eliminate sharp or jagged edges.

5. Guard should not create interference which would hamper Employees from performing their assigned tasks quickly and comfortably.

6. Lubrication points and feeds should be placed outside the guarded area to eliminate the need for guard removal.

Training

All Employees shall be provided training in the hazards of machines and the importance of proper machine guards. Machine safety and Machine guarding rules will be thoroughly explained as part of the new hire orientation program and annually as refresher safety training.

Motor Vehicle Operation

Policy:

Vehicles are to be operated in a safe manner consistent with local, state and federal laws. All accidents must be reported promptly according to procedures outlined below. The use of vehicles is limited to necessary Company business.

Personnel permitted to drive vehicles (e.g. Company automobiles, delivery vehicles, trucks, forklifts, tractors, loaders, back hoes, bobcats, mowers, etc.) must demonstrate the knowledge and ability to operate the equipment safely to the satisfaction of a qualified examiner.

Responsibilities:

a. Driver's Supervisor

1. Ensures that employees under his/her supervision who drive vehicles possess a valid state driver's license.

2. Ensures that vehicles are used only for official Company business and carries only Company employees who are authorized passengers.

3. Ensures all operators of powered industrial trucks are properly trained in the operation of the vehicles.

4. Ensures all vehicle drivers have the necessary medical examinations to ensure that the driver is physically qualified to operate the equipment.

5. Regularly inspects vehicles and vehicle systems.

b. Employee

1. Carries the required, valid state driver's license

2. Inspects daily the vehicle before it is used. Items to be checked should include the forks, batteries, wheels, cables, lights, horns, back-up alarm, mirrors, steering, brakes, tires and controls.

3. Reports any defects or malfunctions to the supervisor immediately. Does not use a malfunctioning vehicle if the defect impairs the safe operation or use of the vehicle.

4. Operates equipment safely and in accordance to operating instructions.

5. Wears appropriate protective equipment at all times.

c. Safety and Health Manager

1. Maintains with the Supervisor, records of employee qualification tests.

2. Assists, when necessary, in selection and designation of jobs which require powered industrial trucks.

3. Periodically and routinely inspects vehicles and vehicle operations.

4. Coordinates with the supervisor, training programs for use and operation of the vehicles.

General Requirement:

a. The operator is required to:

1. Point to and explain the following controls: lift, tilt, forward and reverse gears.

2. Perform all driving and loading/unloading maneuvers deemed necessary by the examining official.

b. Upon satisfactory completion of the test procedures, permission will be granted by the examiner. The permission shall be valid as long as health requirements and safe operating techniques are met.

Operating Rules and Practices:

a. Safeguard pedestrians at all times. Do not drive a truck up to anyone standing in front of a stationary or fixed object (e.g., a bench or parked vehicle).

b. Do not allow anyone to stand or pass under the elevated portion of any truck or lift.

c. Unauthorized personnel shall not be permitted to ride on or operate powered industrial trucks.

d. Never allow anyone to ride the forks, while the vehicle is in motion, or to lift them to a higher level except with a personnel platform.

e. Do not put arms or legs between the uprights of the mast or outside the running lines of the truck.

f. When leaving a powered industrial truck unattended, lift platform shall be fully lowered, controls shall be neutralized, power shut off, brakes set, key or connector plug removed. Block wheels if truck is parked on an incline.

g. When you park the machine, lower the forks so they are flat on the ground.

h. Maintain a safe distance from edge or ramps or platforms.

i. Be sure of sufficient head room under overhead installations, lights, pipes, sprinkler systems, etc.

j. Use an overhead guard as protection against falling objects.

k. Use a load backrest extension whenever necessary to minimize the possibility of the load or part of it falling rearward.

l. Report to supervisor all accidents involving personnel, building structures, and equipment.

m. Obey all safety signs and markers.

n. Never exceed trucks' rated capacity.

o. Never travel with load above five feet.

p. Avoid sudden stops and starts when loaded.

q. Do not use fork extensions.

Use of Powered Mowers, Tractors, etc.

a. Operation is limited to qualified operators approved for use of specific equipment. Equipment may also be used by supervised individuals who are training for certification.

a. Equipment operators must wear approved safety shoes, and, as appropriate, eye and hearing protection.

Motor Vehicle Accident:

a. In cases of accident:

1. Stop immediately.

2. Take steps to prevent another accident at the scene.

3. Call a doctor or ambulance, if necessary.

4. Notify police.

5. DO NOT sign any paper or make any statement as to who was at fault (except to your supervisor or to a Federal Government investigator).

6. Obtain the name and address of each witness.

7. Provide your name, address, place of employment, name of your supervisor, and upon request, show your operator's permit.

8. Make notes of the following:

a. Registration information for other vehicle(s) (owner's name, tag number and state, serial number, and vehicle description).

b. Information on other driver (name, address, operator's permit number, and expiration date).

c. Name and address of each person involved and extent of injury, if any.

d. Name and address of company insuring other vehicle(s).

e. General information such as location, time, measurements, weather, damage, etc.

9. As soon as possible, notify your supervisor and, if driving an interagency motor pool vehicle, the manager of the pool which issued the vehicle.

10. If the vehicle is unsafe to operate, have it towed to the nearest garage or service station.

11. If you are injured, notify the Safety and Health Manager.

12. Submit all reports and data to your supervisor within one working day.

13. If you are injured have the police notify your supervisor who will assume your responsibilities for reporting the accident.

100 Hour Maintenance Inspection:

The following items must be checked on a 100 hour maintenance inspection schedule by a qualified mechanic.

A. Steering and horn – check free play – ease of handling horn operation.
B. Brakes – check brake power.
C. Tires – remove all foreign matter from tires.
D. Hoist cylinder – check for leaks and wear – clean off.
E. Tilt cylinder – check for leaks and wear – clean off.
F. Hydraulic oil – check dipstick – add oil, if necessary.
G. Forks – check for cracked or bent forks.
H. Battery – check water level.
I. Acceleration control – check speed – time delay- general operation.
J. Wires and terminals – check and tighten.
K. Lubricate – as specified on lubrication chart.

L. Hoist motor – check brush wear.
M. Drive motor – check brush wear.
N. Controller – check contact tips – switches.

Office Safety

Policy:

All work performed in Company offices and administrative areas will be conducted using safe work practices. Office and administrative areas will be maintained free of recognized hazard

Purpose:

The office is like any other work environment in that it may present potential health and safety hazards. Most of these, however, may be minimized or eliminated by designing jobs and workplaces properly, and by taking into account differences among tasks and individuals.

Inadequate environmental conditions, such as noise, temperature, and humidity, may cause temporary discomforts. Environmental pollutants such as chemical vapors released from new carpeting and furniture may also induce discomforts.

Responsibility:

a. Office Supervisor

1.The ultimate responsibility for office safety rests with the office supervisor. All work hazards must be anticipated and appropriate safeguards utilized.

2. Ensures all employees are properly trained and instructed in safe office practices and aware of all hazards associated with their work.

b. Employees

1. Follows Joe R. Jones Construction, Inc.'s health and safety policies and instructions of the responsible Office Supervisor and the Safety and Health Manager.

2. Brings to the attention of the Office Supervisor and/or Safety and Health Manager potential hazardous situations.

c. Safety and Health Manager

1. Assists Office Supervisors in correcting hazardous situations and designating safe working practices.

1. Periodically inspects all office facilities to ensure compliance with existing Company policy.

Procedure:

Joe R. Jones Construction, Inc. will ensure all employees work in an environment that is comfortable to work in. With this in mind, the following topics will be addressed and policies relating to each will be conducted:

- Noise
- Electrical Safety
- Housekeeping
- Waste Disposal
- Video Monitors and Computer Typing
- Lighting
- Indoor Air Quality

Noise:

A. Effects of Noise

Noise can be defined very simply as unwanted sound. Whether a sound is classified as noise or not depends mostly on personal preferences. For noise levels in offices, the most common effects are interference with speech communication, annoyance, and distraction from mental activities. Noise in the office can interfere with communications. For example, it may be difficult to talk on the telephone when other people are talking nearby. Speech is likely to interfere with communications especially if the speakers have similar voices.

The annoying effect of noise can decrease performance or increase errors in some task situations. If the task requires a great deal of mental concentration, noise can be detrimental to performance. Also, there is some indication that unexpected or unpredictable noise can have more of an effect than continuous or periodic noise. The annoyance caused by noise also depends on the individual.

Noise can also be distracting. A sudden noise can interrupt activity temporarily, such as when someone drops a heavy object.

B. Reducing Noise

Many unexpected noises cannot be controlled, as when someone accidentally drops something. For many of the annoying sounds in the office environment, the following measures are useful for reducing the level of noise or its effects:

•Select the quietest equipment if possible. When there is a choice between two or more products, sound levels should be included as a consideration for purchase and use.

• Provide proper maintenance of equipment, such as lubrication and tightening of loose parts that can cause noise.

• Locate loud equipment in areas where its effects are less detrimental. For example, place impact printers away from areas where people must use the phone.

• Use barrier walls or dividers to isolate noise sources. Use of buffers or acoustically-treated materials can absorb noise that might otherwise travel further. Rubber pads to insulate vibrating equipment can also help to reduce noise.

• Enclose equipment, such as printers, with acoustical covers or housings.

• Schedule noisy tasks at times when it will have less of an effect on the other tasks in the office.

Electrical Safety:

Electric cords should be examined on a routine basis for fraying and exposed wiring. Attention should be paid to connections behind furniture, since files and bookcases may be pushed tightly against electric outlets, severely bending the cord at the plug.

A. Use of Extension Cords

•Extension cords shall only be used in situations where fixed wiring is not feasible.

•Extension cords shall be kept in good repair, free from defects in their insulation. They will not be kinked, knotted, abraded, or cut.

•Extension cords shall be placed so they do not present a tripping or slipping hazard.

•Extension cords shall not be placed through doorways having doors that can be closed, and thereby damage the cord.

•All extension cords shall be of the grounding type (three conductor).

Housekeeping:

Good housekeeping is an important element of accident prevention in offices.

Poor housekeeping may lead to fires, injuries to personnel, or unhealthful working conditions. Mishaps caused by dropping heavy cartons and other related office equipment and supplies could also be a source of serious injuries to personnel.

Passageways in offices should be free and clear of obstructions. Proper layout, spacing, and arrangement of equipment, furniture, and machinery are essential.

All aisles within the office should be clearly defined and kept free of obstructions.

Chairs, files, bookcases and desks must be replaced or repaired if they become damaged. Damaged chairs can be especially hazardous. Filing cabinet drawers should always be kept closed when not in use. Heavy files should be placed in the bottom file drawers.

Materials stored within supply rooms must be neatly stacked and readily reached by adequate aisles. Care should be taken to stack materials so they will not topple over. Under no circumstances will materials be stacked within 18 inches of ceiling fire sprinkler heads.

Materials will not be stored so that they project into aisles or passageways in a manner that could cause persons to trip or could hinder emergency evacuation.

Waste Disposal:

Office personnel should carefully handle and properly dispose of hazardous materials, such as broken glass. A waste receptacle containing broken glass or other hazardous material should be labeled to warn maintenance personnel of the potential hazard.

Video Monitors and Computer Typing:

Complaints concerning musculo-skeletal problems are frequently heard from computer operators. Most common are complaints relating to the neck, shoulders, and back. Others concern the arms and hands and occasionally the legs.

Certain common characteristics of computer typing jobs have been identified and associated with increased risk of musculo-skeletal problems. These include:

- Design of the workstation.
- Nature of the task.
- Repetitiveness of the job.
- Degree of postural constraint.
- Work pace.
- Work/rest schedules.
- Personal attributes of individual workers.

The key to comfort is in maintaining the body in a relaxed, natural position. The ideal work position is to have the arms hanging relaxed from the shoulders. If a keyboard is used, arms should be bent at right angles at the elbow, with the hands held in a straight line with forearms and elbows close to the body. The head should be in line with the body and slightly forward.

A. Display Screen

When work is conducted at a computer, the top of the display screen should be at, or just slightly below, eye level. This allows the eyes to view the screen at a comfortable level, without having to tilt the head or move the back muscles.

Control glare at the source whenever possible; place VDTs so that they are parallel to direct sources of light such as windows and overhead lights, and use window treatments if necessary. When glare sources cannot be removed, seek appropriate screen treatments such as glare filters. Keep the screen clean.

B. Chairs

The chair is usually the most important piece of furniture that affects user comfort in the office. The chair should be adjusted for comfort, making sure the back is supported and that the seat pan is at a height so that the thighs are horizontal and feet are flat on the floor. An ergonomically sound chair requires four degrees of freedom - seat pan tilt, backrest angle, seat height, and backrest height. Operators can then vary the chair adjustments according to the task. In general, chairs with the most easily adjustable dimension permit the most flexibility to support people's preferred sitting postures.

Armrests on chairs are recommended for most office work except where they interfere with the task. Resting arms on armrests is a very effective way to reduce arm discomforts. Armrests should be sufficiently short and low to allow workers to get close enough to their work surfaces, especially for tasks that require fixed arm postures above the work surface.

C. Working height

The work surface height should fit the task. The principle is to place the surface height where the work may be performed in such a manner as to keep arms low and close to the body in relation to the task. If the working height is too high, the shoulders or the upper arms have to be lifted to compensate, which may lead to painful symptoms and cramps at the level of the neck and shoulders. If, on the other hand, the working height is too low, the back must be excessively bowed, which may cause backache. Generally, work should be done at about elbow height, whether sitting or standing. Adjustable work stations should be provided so that individuals may change the stations to meet their needs. A workstation without an adjustable keyboard height and without an adjustable height and distance of the screen is not suitable for continuous work.

D. Work/Rest Schedules

One solution for stress and fatigue is to design the computer operator's work so that tasks requiring concentrated work at the terminal are alternated with non-computer based tasks throughout the workday. Also, a short break (5-10 minutes) should be taken at least once each hour when involved in continuous work at the computer.

E. Other

Additional measures that will aid in reducing discomfort while working with computer typing include:

- Change position often, standing up or stretching whenever the employee begins to feel tired.
- Using a soft touch on the keyboard and keeping the shoulders, hands, and fingers relaxed.
- Using a document holder, positioned at about the same plane and distance as the display screen.
- Resting the eyes by occasionally looking off into the distance.

Lighting:

Different tasks require different levels of lighting. Areas in which intricate work is performed, for example, require greater illumination than warehouses. Lighting needs vary form time to time and person to person as well. One approach is to use adjustable task lighting that can provide needed illumination without increasing general lighting.

Task lamps are very effective to supplement the general office light levels for those who require or prefer additional light. Some task lamps permit several light levels. Since the individual controls task lamps, they can accommodate personal preferences.

Indoor Air Quality:

Indoor air quality (IAQ) is an increasingly important issue in the work environment. The study of indoor air quality and pollutant levels within office environments is a complex problem. The complexity of studying and measuring the quality of office environments arises from various factors including:

- Office building floor plans are frequently changing to accommodate increasingly more employees and reorganization.
- Office buildings frequently undergo building renovations such as installation of new carpet, modular office partitions and free-standing offices, and painting.
- Many of the health symptoms appearing are vague and common both to the office and home environment.
- In general, very little data on pollutant levels within office environments is available.
- Guidelines or standards for permissible personal exposure limits to pollutants within office buildings are very limited.

Many times, odors are associated with chemical contaminants from inside or outside the office space, or from the building fabric. This is particularly noticeable following building renovation or installation of new carpeting.
Out-gassing from such things as paints, adhesives, sealants, office furniture, carpeting, and vinyl wall coverings is the source of a variety of irritant compounds. In most cases, these chemical contaminants can be measured at levels above ambient (normal background) but far below any existing occupational evaluation criteria.

In order to determine if relationships between the adverse human health symptoms and the indoor air quality exist, Joe R. Jones Construction, Inc. will conduct an indoor air quality survey. In many situations, the cause of the inadequate indoor air quality can be recognized and certain mitigation measures can be implemented.

To request an indoor air quality investigation, contact the Safety and Health Manager.

Miscellaneous Safe Work Practices:

a. Guard the sharp edges of furniture to prevent personal injury. Keep desk "pull-out" writing surfaces closed when not in use.

b. Practice good housekeeping. Keep floors free of items that might cause tripping. Keep waste cans out of the way; do not overfill them.

c. Prevent slipping accident by cleaning up spills immediately.

d. Report all defects such as loose tiles, broken steps, railings and doors immediately to the Office Supervisor.

e. Do not participate in horseplay.

f. Keep razor blades, tacks, and other sharp objects in closed containers.

g. Use the proper tool for the job at hand (e.g. a staple remover to remove staples).

h. Do not overload electrical outlets. Do not plug a multiple outlet strip-- an extension cord with multiple electrical receptacles--into a second multiple outlet strip.

i. Report immediately, any damaged electrical cords, broken switches, loose connections, or bare wires to the Office Supervisor.

j. Unplug any office machine that smokes, sparks, or delivers an electrical shock. Have it inspected by the appropriate repair personnel.

k. Our Company is a smoke free environment and smoking is prohibited inside all Company buildings.

Miscellaneous Safe Work Practices:

l. Avoid overloading the top drawers of filing cabinets to avoid the possible tipping of the cabinet when the drawers are opened. Open one drawer of the file cabinet at a time to prevent tipping. File cabinets should be placed where their use will not interfere with office traffic patterns.

m. Keep file and desk drawers closed when not in use to help prevent tripping accidents.

n. Be sure to use proper lifting techniques. Make arrangements with personnel skilled in moving to shift furniture and other heavy objects.

o. Do not lean too far back in chairs. This may result in over-balancing and a fall.

p. Use only safety step stools or ladders for climbing. Don't stand on swivel chairs or use them as step stools.

q. Be careful with flammable liquids. Only the quantity needed for use should be in the work place. They should be kept and used in a ventilated area, away from excessive heat or ignition sources.

r. Book cases or file cabinets taller than 72 inches must be secured or anchored. Keep book case doors closed when not in use.

s. Power switches must be off, or the cord unplugged, when electrical equipment, such as a typewriter, is being cleaned or serviced.

t. Office doors shall be free of obstructions at all times to permit egress in case of an emergency.

u. Jewelry, long hair, and clothing must be kept clear of the moving parts of all office machines.

v. If it is necessary to run a cable or electrical cord across the floor, a cable cover must be used to protect the wiring and prevent tripping.

w. Do not cover air vents or obstruct air flow from registers. Do not place furniture, equipment, or materials in locations that will interfere with air movement around thermostats.

x. Report any observed pest control problems to the Office Supervisor. Never attempt to apply any pest control chemical yourself.

Painting Operations

Policy:

Painting and paint removal present hazards requiring effective controls. Hazards include exposure to toxic materials and flammable or explosive mists, particulates, and vapors.

Inhalation of mists and vapors from nearly all paints, solvents, thinners, cleaning chemicals, strippers, and epoxies can be injurious depending upon the agent's toxic characteristics and the amount and method of exposure. Further, many can physically injure the skin and eyes, or be absorbed through the skin.

Potential physical and health hazards can be effectively controlled by appropriate work procedures, controls, facility design, protective clothing, and equipment.

Procedures:

Pressure Equipment-

> Pressure equipment used in painting operations is hazardous because of the compressed air component; therefore, the Supervisor shall assure that spray painting equipment is in serviceable condition.
>
> On all air-type spraying equipment a pressure regulator valve shall be installed in the air line between the compressor and painting equipment. A pressure relief valve and a pressure gauge shall be installed between the pressure regulator and pressurized paint containers and/or spray guns. Pressure relief valves shall be set to open at pressures not more than 10 pounds above the required working pressure.

Other Equipment-

> Painter's ladders, scaffolds, and other equipment shall be inspected prior to use to be certain they are in safe condition.

Paint Mixing-

> Paint mixing shall be done in designated, adequately ventilated rooms constructed of fire-resistant materials. All sources of ignition shall be prohibited in mixing areas. All electrical fixtures or equipment in or within 20 feet of designated paint preparation areas shall meet the requirements of the National Electrical Code (NFPA #70) for Class I Division 2 locations.

Housekeeping-

Good housekeeping is essential to safe operations in paint shops. Paint rooms, booths, etc., shall be kept clean with equipment stored in a proper and orderly manner. All solvent or paint soiled rags shall be placed in approved self-closing metal containers plainly marked to indicate the contents. At the end of each day, these containers shall be emptied or removed to an approved location for pickup and disposal.

Health-

Personnel Exposures-

There is a wide application of organic solvents in painting. All organic solvents have some effect on the central nervous system and the skin. The principal modes of personnel exposure are inhalation of vapors and skin contact and absorption. Personnel engaged in painting operations should review Material Safety Data Sheets (MSDS) in order to acquaint themselves with the properties and hazards of the solvents that are used. Skin contact with solvents may cause dermatitis, ranging in severity from a simple irritation to actual damage to the skin.

Protective Equipment-

Personnel engaged in painting and paint removal shall wear protective clothing, respiratory devices if required, and appropriate face, eye, and hand protection. Eye or face protection is required during scraping or paint preparation (abrasive techniques). Clothing shall be changed, as needed, to minimize body contamination.

Respiratory Protection-

The Safety and Health Manager should be consulted for specific advice on respiratory protection required for specific painting activities.

. Personal Hygiene-

The hands and face shall be kept clean, clothes shall be changed when contaminated and hands and soiled objects shall be kept out of the mouth.

No food or drink shall be brought into, or consumed, in paint shops. Personnel shall wash their hands prior to smoking or consuming food.

Air and Water Pollution-

Pollution Prevention-

Painting and paint removal operations can cause air and water pollution problems which can impact the local community. Liquid, solid, and gaseous waste products from painting and paint removal operations shall be disposed of in accordance with federal and state air, water, and solid waste pollution control laws and as specified by the Safety and Health Manager.

. Spills-

All spills of flammable or combustible liquids shall be cleaned up promptly. With major spills, remove ignition sources, evacuate, and ventilate the area, and provide appropriate protective equipment to cleanup personnel. These liquids shall not be allowed to enter a confined space, such as a sewer, because of the possibility of an explosion.

Fire Prevention and Protection -

Fire Prevention -

Painting operations of particular concern are those having a fire potential; i.e., paint removal, solvent wipe and paint application by means of spray apparatus. Certain paints, lacquers, varnishes, shellacs, solvents, and thinners are very flammable. These, for the purpose of control, are classified as being flammable. Solvent materials selected to do the residual clean up, after the initial removal, shall have a flash point of 140 degrees F or above.

Spray Painting -

Spray painting presents varying degrees of fire hazards, depending on the materials used. Material having a flash point below 140 degrees will be handled very carefully, and precautions are in order even for those having a flash point higher than this.

Sprinklers -

Fire suppression sprinklers installed in spray finishing areas shall conform to NFPA 13, provisions for extra hazardous occupancy. Dry chemical, carbon dioxide, or halogenated extinguisher systems may be installed where automatic sprinkler protection is not available.

Extinguishers -

Portable fire extinguishers shall be installed near all paint spraying areas. The Safety and Health Manager shall determine the type of extinguisher that is appropriate.

Ventilation Systems-

Ventilation-

Ventilation and exhaust systems shall be in accordance with the standard for Blower and Exhaust Systems for Vapor Removal, NFPA 91. Mechanical ventilation shall be in operation while spraying operations are being conducted and for a sufficient time thereafter to assure vapors are completely exhausted. Adequate conditioned make-up air must be provided.

Fan Unit

The fan-rotating element and its casing shall be non-sparking. Ample clearances shall be provided to prevent friction-caused fire hazards. Fan blades shall be mounted on a shaft rigid enough to maintain alignment when the fan is operating under full load.

Exhaust Ducts

Exhaust ducts shall be protected against mechanical damage, properly supported, and will normally have a separation of at least 18 inches from combustible materials. Ducts shall be periodically inspected for accumulation of paint deposits and shall be cleaned as needed.

Exhaust

Air exhaust from spray operations shall be directed so that it will not contaminate make-up air being introduced into the spraying area or other ventilation intakes. Unless the spray booth exhaust duct terminal is from a water-wash spray booth, the terminal discharge point shall be at least 6 feet from any combustible exterior wall or roof.

Motors

Electric motors driving exhaust fans shall not be placed inside booths or ducts. Drive belts shall not enter the duct or booth unless the belt and pulley within the duct or booth are enclosed or guarded.

Storage and Handling

Storage

The quantity of paints, lacquers, thinners, solvents and other flammable and combustible liquids kept near spraying operations shall be the minimum required for operations but shall not exceed 1 day's supply.

Bulk storage of these liquids shall be in a separate building detached from other buildings or in rooms specifically designed and constructed to meet flammable storage room requirements.

No storage of open containers of solvents is permitted. Open containers may only be used for cleaning of painting materials after which the solvent shall be transferred back to a closed container for retention or disposal.

Supplies of flammable and combustible liquids shall be stored in approved fire-resistant safety containers equipped with flash screens and self-closing lids.

Operations involving water base latex paints are exempt from the above requirements.

Containers

Original closed containers, approved portable tanks, and approved safety cans shall be used for bringing flammable or combustible liquids into spray finishing rooms. Open or glass containers shall not be used.

Liquid Transfer

The withdrawal of liquids from containers and the filling of containers, including portable mixing tanks, shall be done only in a mixing room or in a spraying area when the ventilating system is in operation. Precautions shall be taken to protect against liquid spillage.

Grounding

Whenever flammable or combustible liquids are transferred from one container to another, both containers shall be effectively bonded and grounded. This practice prevents electrical discharge from the accumulation of static charge because of the transfer process.

Electrical

Electrical Wiring

Electrical wiring and equipment shall conform to the provisions of the National Electrical Code (NFPA 70). Electrical wiring located in spray areas must be rigid metal conduit, Type MI cable, or in metal boxes or fitting containing no taps, splices or terminal connections. There are alternative electrical wiring in options when the location is adjacent to (rather than inside) a spray area (NFPA 33).

Electrical Equipment

Electrical equipment outside of, but within 20 feet horizontally and 10 feet vertically, of any spraying area and not separated from it by partitions extending at least to the boundary of the Division 2 location shall be of non-spark producing design. This equipment shall also conform to the provisions of NFPA 70, for Class I or Class I, Division 2 locations as applicable. If spraying operations are confined to an enclosed spray booth or room, the space adjacent to the booth or room shall be considered non-hazardous except for the space within three feet in all directions from any opening in the booth or room.

Grounding

All metal parts of spray booths and exhaust ducts conveying flammable or combustible liquids or aerated combustible solids shall be electrically grounded.

Airless Paint Spraying

Never point an airless spray gun at any part of the body. Paint can be hypodermically injected into the body by the high operating pressures.

Do not disconnect the gun from the fluid hose or the hose from the pump until the pressure has been released from the hose. This is accomplished by first closing off

the main line air pressure to the pump and then bleeding off the pressure in the fluid hose by triggering the gun before disconnecting it.

When handling the gun but not actually spraying (such as while changing parts or work position), hold the gun by the grip and remove the fingers from the trigger. This will prevent the gun from being activated if the operator should inadvertently tighten his hold due to sipping or stumbling. Guns should be equipped with trigger guards and a safety lock. The lock should be in the non-operating position except when the gun is actually in use.

Check all hose connections and fittings to make sure they are tight and not leaking. The fluid hose must be designed to withstand the high pressure to which it is subjected. The hose, gun, and pressure vessel should be equipped with special fittings that are not interchangeable with low pressure fittings.

Check the fluid hose to be sure that there are no weak or worn spots. Make certain the hose does not contact moving parts of machinery, lie over or around sharp edges and corners, or come near objects that would damage it. Check for deterioration caused by exposure to chemicals or ordinary wear and tear. High-pressure leaks from the hose or connections can also cause hypodermic injection.

Never pass the finger over the gun orifice to clean it, as this will result in hypodermic injection of paint into the finger. Consult the manufacturer's operating manual for cleaning procedures.

The object being sprayed as well as the spray gun, should be grounded to prevent static electricity from being created. Periodic continuity checks should be performed to ensure the hose ground wire is intact.

The operator shall wear eye protection and gloves to guard against accidental contact with the spray. Respiratory protective equipment shall be worn if exhaust ventilation is not available. The Office of Health and Safety shall be contacted to determine appropriate protective equipment needed for the operation.

Paint Spray Booths

Extinguishers

Provide portable fire extinguishers adequate to handle the most flammable of the coating materials being used. The Safety and Health Manager shall be consulted for appropriate extinguishers needed.

Floor Covering

It is desirable that the floor of paint spray booths be covered with a non-combustible mat, removable for cleaning or disposal.

Hoses and Couplings

Pressure hoses and couplings shall be regularly inspected for condition and shall be replaced as needed. When positive displacement pumps are used, a relief valve shall be installed in the discharge line to prevent overpressure.

Portable Paint Spray Equipment

Description

Such equipment consists of an air compressor, paint spray gun and hose. The paint reservoir on most portable spray guns holds one quart of fluid or less. When a considerable amount of paint is to be applied, a 2 ½ or 5 gallon pressure tank is usually employed.

Compressor

The air compressor shall be equipped with an ASME rated air tank, a visible pressure gauge on the tank, a pressure reducer with its own gauge, a guard fully enclosing the drive belt and pulleys, and a pressure limiting switch to shut down the compressor when the system's working pressure has been reached. The equipment should be securely mounted on a wheeled carriage for portability. For interior painting only electric motor-driven equipment shall be used.

Overpressure Protection

When separate paint pressure tanks are used, they shall be equipped with a gauge and a relief valve to prevent overpressure. Hoses shall be rated for the maximum working pressure of the system.

Maintenance

A preventive maintenance program shall be implemented to cover periodic inspection and testing of all components.

Storage of compressors, hoses, paint pressure tanks and spray guns shall be in areas designated and approved by the supervisor in conjunction with the Office of Health and Safety.

Aerosol Spray Paint Cans

The same general safety and health precautions apply to spray painting from pressurized cans as to spray painting by other means. The following specific items are noted:

Storage

Pressurized cans of spray paint are to be considered flammable materials and stored in appropriate locations.

Office desks are not to be used for the storage of pressurized cans of spray paint.

Office store rooms are not to be used for the storage of pressurized cans of spray paint unless the storage area has been designated safe for the storage of flammable materials by the Office of Health and Safety.

Disposal

Disposal of malfunctioning paint spray cans still containing paint under pressure shall be in accordance with the Office of Health and Safety hazardous waste disposal procedures.

Office waste cans shall not be used for the disposal of cans of spray paint nor for the disposal of wiping rags and other waste material.

Disposal of wiping rags and other waste materials shall be in self-closing metal containers labeled to indicate the contents.

Protective Equipment

The same general rules governing the use of personal protective equipment apply to painting with pressurized cans.

Procedures For the Identification, Safe Removal, and Disposal of Lead-Based Paints:

Due to the potential exposure of personnel to lead released during abatement of lead-based paint, proposed EPA regulatory authority over lead abatement activities in federal buildings, and existing regulatory mandates governing the disposal of hazardous wastes, the following procedures shall be adopted in order to reduce the possibility of human exposure and contamination of the environment.

1) Identification of Lead-Based Paints

Lead-based paints may have been used in the past in Company buildings. The presence of lead on existing painted surfaces shall be determined by sequential use of the following methods:

First, knowledge by painters, maintenance personnel, or contractors of a specific paint that has been applied where the manufacturer's Material Safety Data Sheet documents there is greater than 1% lead in the paint.

Second, all "red or rust-colored", and gray primer coats are assumed to contain lead.

Third, presence of lead as determined by "lead swabs" or any other direct reading procedure or instrument.

Fourth, analysis by a contracted analytical laboratory by the AIHA Environmental Lead Laboratory Accreditation Program.

2) Training of Personnel

The Federal EPA is proposing the establishment of specific disciplines and training for lead-based paint activities. The disciplines to be established are: Inspector Technicians, Inspector/Risk Assessors, Workers, and Supervisors. Additionally, numerous OSHA requirements govern the activities associated with lead exposure.

To that end, prior to involvement in lead removal activities, successful completion of the following training must be documented:

OSHA hazard communication training specific to lead and any hazardous materials used during the paint removal process.

Respiratory protection training and fit testing.

Maintenance supervisors responsible for causing the removal of lead-based paints should attend an accredited lead abatement course for supervisors.

Hazardous waste training pursuant to 40 CFR 265.16 and 262.34.

Work Practices-

Interior building surfaces-

All work areas where paint removal or scraping is to be conducted must be sealed off from other work areas. This step includes placing barrier tape across all access areas to the work site and taping 6-mil plastic over all vents, doorways, windows, and other openings into the work site.

Personnel shall be instructed not to grind or sand painted areas known to contain lead. Hand scraping is permitted.

The work area shall be cleaned periodically during the day by using a combination of a HEPA-filtered vacuum and wiping down the area using damp cloths.

Exterior building surfaces

When removing lead-containing paint from the exterior of Company buildings, the following occupational health/ environmental guidelines shall be followed:

Special precautions shall be taken when working near air intakes, doors, and windows. Air intakes shall be protected by construction of a wood frame and plastic sheeting barrier and shall be of such a size to ensure that air is pulled from uncontaminated areas. Door and windows shall remain closed and shall be sealed with duct tape and/or plastic sheeting.

Physical barriers shall be set up around the work area to prevent pedestrian traffic through the work site.

When removing lead-containing paint from the exterior of Company buildings, the following occupational health/ environmental guidelines shall be followed:

Loose and flaking paint should be removed by manually scraping the surfaces of the building. Sanding or grinding will not be permitted.

A drop cloth shall be placed directly and completely under the work area. Paint chips shall be collected periodically throughout the day and at the end of the work day and shall be placed in a container with a tight fitting lid or sealed in a plastic bag (6-mil).

Abrasive blasting units-

Removal of paints containing lead or other heavy metals must be conducted in a sealed abrasive blasting unit equipped with a high efficiency particulate air (HEPA) filter.

The abrasive blasting media should be used to its fullest extent prior to disposal.

Institute the protective measures listed below when cleaning out an abrasive blasting unit.

General Practices-

Personnel shall remove contaminated clothing prior to leaving the work site for breaks, lunch, and at the end of the work day.

All surfaces shall be maintained as free as practicable of accumulation of lead-based paint debris.

All waste materials, including used disposable clothing, respirator cartridges, plastic, etc. shall be placed in a plastic bag or other container as appropriate and sealed.

All tools and equipment used on the project shall be wet-wiped prior to removal from the work site.

After the waste containers are sealed, the outside of the container shall be wiped off for any residual dust that may be present prior to being taken off-site for disposal.

Protective Measures

All personnel shall wear respiratory protection (half-mask, dual cartridge with HEPA filters, as a minimum) and full-body disposable clothing. Personnel shall have a current (<6 months) medical clearance to wear a respirator and have been fit-tested with their respirator.

Personnel shall also be provided and instructed to wear face shield or vented goggles, gloves, head coverings, and disposable shoe coverlets.

Personnel are not permitted to eat, drink, or smoke in or near the work area.

Personnel shall be instructed to wash their face and hands before eating, drinking or smoking and before leaving the work area for breaks or lunch.

All personnel involved in lead-based paint removal shall shower at the end of the shift before going home to prevent contamination of their vehicle and exposure of family members and others to lead-containing dust.

The Safety and Health Manager requires that paint removal personnel participate in the personal air monitoring program in order to determine their potential exposures to lead dust. The results of this monitoring will also be used to determine if personnel need to be enrolled in a medical surveillance program for lead. Contact must be made with Safety and Health Manager prior to the start of the project to coordinate the sampling effort.

Host Contractors are responsible for meeting OSHA personnel air monitoring, personal protective equipment, and medical surveillance requirements for lead exposures (29 CFR 1910.1025, or 29 CFR 1926.62, as appropriate).

Hazardous Waste Disposal

The Safety and Health Manager shall be contacted prior to the initiation of a lead-based paint removal project. The Safety and Health Manager will dispose of hazardous wastes generated by in-house maintenance personnel only. Contractors are responsible for disposing of all waste materials that they generate in the course of their work/contract obligations. Specific wastes generated during lead-based paint removal can include, but is not limited to:

•Paint chips/dusts •Solvents used to remove paints •Media using in abrasive blasting units

Other Wastes

Materials known to have been painted with a lead-based paint such as scrap metal (old filing cabinets, HVAC ducts, etc.) should be turned in for recycling. Contact the Safety and Health Manager if there are any questions on disposal of other materials.

Plumbing Operations and Safety

Policy:

Plumbing operations normally includes the installation, preventive maintenance, and repair of water supply systems, sewage and water disposal systems, natural liquefied petroleum gas (LPG) or other gas supply systems (to include gas appliances), and oxygen supply systems. These systems and the maintenance of them contribute to the total well-being of the Company and facilities.

Hazards encountered during plumbing operations include, but are not limited to, entry into an oxygen deficient atmosphere (confined space), fire or explosion (by introducing an ignition or flame source into a hazardous environment), and falls. Cave-in of an excavated area, burns from heat producing equipment, strains and sprains of the back (or other muscle group), and cuts and/or bruises, are also potential dangers.

Working in confined spaces, handling heavy and awkward materials, being subjected to numerous obstructions in limited working space, and health related hazards are conducive to producing accidents. Plumbing maintenance workers need to be knowledgeable of these potential hazards and conditions and take reasonable actions to prevent incidents before they occur.

Personal Protective Equipment:

Personal protective equipment worn during plumbing maintenance operations normally consists of eye and/or face protection, work or chemical resistant gloves, and safety-toe shoes. A bump cap or hard hat may be required under conditions that could result in head injuries (e.g., work in manholes and in close spaces with low overhead pipe or other obstructions).

Eye or face protection is required while working plumbing connections, with chemicals, or where an eye hazard could exist while using tools or machines, and while working on pressure systems.

Procedures:

Hot Operations- (“Open Flame” permits may be required for these operations. Seek guidance from the Safety and Health Manager or Supervisor prior to “Hot Operations”)

1) Torches and Furnaces

    a) Only essential fire prevention items pertaining to the operation of blow-torches and plumber’s furnaces are included. Work and storage areas for this equipment shall be well ventilated.

b) No one shall be permitted to use a torch or furnace until the user is trained on its use and is familiar with the operating instructions.

c) Where flammable or explosive vapors or dust may be present, torches and furnaces shall not be used until the atmosphere has been vented and the sources of such vapors or dust removed.

d) Gasoline blowtorches and furnaces shall not be used in small, unventilated spaces since they could cause explosions. Acetylene gas shall never be brought in contact with metal powders such as copper or silver as the combination may produce flashes which can ignite explosive atmospheres.

e) Combustible materials in locations where torches or furnaces are to be used shall be protected or kept far enough away to prevent their being subjected to sparks or dangerous temperatures. Appropriate fire extinguishers shall be available.

2) Soldering and Brazing

a) Soldering and brazing is the joining of metal parts by melting a fusible alloy. When solders used have a melting point above 800 degrees F, the procedure is called brazing.

Improper equipment and/or unsafe practices may cause lead poisoning, irritation from fluxes, burns, electric shock, or fires. The concentration of toxic fumes and irritants at the breathing level of the operation shall be checked. Where required because of toxic fumes, a respirator or adequate ventilation shall be provided. Lead-tin, zinc, silver, cadmium, and antimony-tin solders can pose moderate to serious health hazards.

Soldering, particularly with lead-tin, in a confined space where ventilation is not adequate to remove toxic fumes may require the use of a self-contained breathing device. The Safety and Health Manager shall be consulted for evaluation of potential health hazards and recommendations on respiratory protection during welding, soldering, and brazing operations.

b) Electric soldering irons shall be grounded unless of double insulation construction. All soldering irons shall be placed in suitable non-combustible receptacles when not in use.

c) Appropriate safety eyewear shall be worn during all soldering and brazing operations.

Open Storm Drains Procedures:

Plumbing personnel are not likely to come in contact with the hazards associated with sewer systems while working on open storm drains. However, there are certain hazards associated with that type of drainage system. Some of these hazards and their associated incidents are:

a. Manhole covers

Manhole covers are heavy and closely fitted to the manhole opening. Never attempt to lift a cover without using proper pry bar tools, special lifting tools, and additional help where needed. Ensure fingers and toes do not remain under manhole covers when putting them down.

b. Hazards

Insects, animals, and snakes have been known to nest or den in storm drains. Hazards encountered are:

Stings from wasps, spiders, and ants that could lead to toxic shock.

Bites from animals that could lead to rabies.

Bites from poisonous snakes that could be fatal or cause gangrene.

Requirements:

Prior to working in storm drains, inspect and clear the drains of dangerous insects, animals, or snakes. Seek assistance from an exterminator or County Animal Control Department when necessary.

Wear proper protective clothing, hard hats, boots, and gloves while working in storm drains.

Gas Systems:

Maintenance of gas systems includes natural gas, LPG, and oxygen. Shop personnel shall be familiar with the properties of the gases in the systems they maintain. Until proved otherwise, all escaping gases shall be considered flammable. Prior to entering an area where a gas leak is suspected, the area shall be properly vented and purged of existing gas. Personnel entering the area shall be suited with proper protective clothing and self-contained breathing devices.

For oxygen deficient atmospheres, air supply systems with a special emergency escape air supply are required and shall be used. Tools used to repair leaks in or perform maintenance on gas lines shall be spark-free and protective clothing shall be static-free. When working on oxygen dispensing lines, workers shall not use tools and equipment that are coated with lubricating substances or grease.

Tunnels, Pits, and Sumps:

Where shop personnel are required to work in utility tunnels, pits, and sumps, the atmospheric conditions shall be checked for explosive atmosphere or oxygen deficiency before allowing them to enter. Personnel shall be suited with proper protective clothing and respiratory protective devices, when required, while performing maintenance to underground utilities.

All tunnels, pits, or sumps known to be contaminated shall be tagged or identified for the information of work crews. Workers shall be assigned in pairs for work performed on underground utilities and all known contaminated tunnels, pits, and sumps shall be ventilated while work is in progress.

When a manhole or vault is open, at least one member of the crew shall be stationed at the surface. This person shall not, under normal circumstances, leave for any purpose.

NOTE: UNDER NO CIRCUMSTANCES SHALL A PERSON ENTER A SUBSURFACE STRUCTURE FOR ANY REASON WITHOUT A SECOND PERSON TO ACT AS A GUARD AND TO OBTAIN ASSISTANCE IN THE EVENT OF AN EMERGENCY.

In areas where removal of a victim would be difficult, an approved lifeline, equipped with a wrist harness, shall be worn by the person entering the area to facilitate rapid removal in case of an emergency.

Compressed Air:

Plumbing workers should be trained and authorized to inspect, maintain, or install compressed air systems. Before opening a compressed air line, workers shall ensure the line has been completely drained of existing air to prevent a sudden release of air which will cause the line to whip. The reverse is also true; when personnel have installed a new compressed air system, all parts of the system shall be secured together before air is put into the system. Workers shall wear eye and face protective equipment while working on compressed air systems.

Refrigeration and Air Conditioning Maintenance

Policy:

Refrigeration and air conditioning maintenance personnel, as with many other mechanical contractor activities, perform duties in many different locations and environments. Not only must these workers be aware of the hazards of the tasks they are performing, but also tasks being performed around them. Potential hazards include hazardous noise, electrical hazards, exposure to refrigerants, lifting hazards, and compressed gases and cylinders.

Potential physical and health hazards can be effectively controlled by proper work procedures and controls, and by using the required personal protective equipment.

Procedures:

Equipment rooms where air conditioning equipment is installed shall be kept free and clear of all trash and clutter which could present tripping or fire hazards. Refrigerant piping shall be properly insulted, both to improve operating efficiency and to prevent injury to workers who may accidentally come in contact with it. Equipment rooms are not normally designed for, nor intended for, storage of materials.

All belts, pulleys, and rotating shafts shall be guarded to prevent accidental contact. Large valve handle stems which can present a bump or trip hazard shall be marked (color coded) for easy recognition.

Electrical parts of the equipment and controls shall have all covers and plates in place.

Wiring shall be properly secured to the equipment or structure.

Storage and Handling:

Storage and handling of cylinders of compressed gas refrigerants can be a source of injury to workers.

> Workers shall ensure that containers are legibly marked with the type of gas contained and stored with minimum intermingling of types of refrigerant.
>
> Cylinders shall be stored separately from flammable gases and oxygen.

Where caps have been provided for valve protection, they shall be kept in place at all times until the cylinder is actually in use. Valves shall be kept closed at all times except when the cylinder is in use.

Cylinders shall not be used as rollers or supports. Their only use is to contain the gas.

Non-refillable containers, such as Department of Transportation (DOT) –2P, DOT 2Q, and DOT 39 containers, shall not be refilled with any material after use of the original contents. They shall be disposed of in accordance with the container manufacturer's or filler's instructions.

Cylinders shall not be dragged, slid, dropped, or allowed to strike each other or solid objects violently. Whenever possible, a suitable hand truck or roll platform shall be used.

Containers shall never be lifted by the valve. Cylinders shall not be suspended by chains, ropes, or slings unless the manufacturer has provided appropriate attachment points.

Storage areas shall be legibly marked with the names of the gases being stored. Full cylinders and empty cylinders shall be segregated and the full ones arranged so the oldest stock can be removed first with a minimum of handling. The storage area shall be kept as dry as possible and away from exposure to salt or other corrosive chemicals or materials. Cylinders shall be secured by a metal securing device or rack specifically designed to prevent damage.

The rules above apply to all refrigeration and air conditioning maintenance work centers that use and store compressed gases.

Fluorocarbons:

The fluorocarbons are relatively inert, in general are non-flammable, and are low in toxicity. Shipped as liquefied compressed gases under their own vapor pressures, they are colorless as liquids and gases under their own vapor pressures; they are colorless as liquids and freeze to white solids. The fluorocarbons are odorless in concentrations of less than 20 percent by volume in air but some have a faint and ethereal odor in higher concentrations.

The fluorocarbons are unusually stable for organic compounds. Resistance toward thermal decomposition, in general, is high but varies with each product. When decomposition does occur, toxic products are very irritating and usually give adequate warning of their

presence in very low concentrations in air. Hot work should never be performed on charged systems.

Large Liquid Leaks:

Large liquid leaks in fluorocarbon systems may be detected visually. As the material escapes, moisture in the air surrounding the leak condenses and then freezes around the leak due to the refrigerating effect of the vaporizing fluorocarbons. The frost thus formed is readily apparent. Smaller leaks may be located with the use of:

A solution of liquid detergent in water applied directly to the area being tested. The formation of bubbles indicates a leak.

Electronic leak detectors, capable of sensitivities far greater than the other methods – often in terms of fractions of an ounce of fluorocarbon per year. When the probe of the instrument is placed near a leak, positive identification of the leak is indicated by a flashing light, meter deflection, or by audible means.

NOTE: The vapors of these fluorocarbons are all much heavier than air and in the absence of good ventilation will tend to collect in low areas, thus possibly displacing available air. The vapors will undergo decomposition when drawn through a flame or if in contact with very hot surfaces. The products of decomposition include hydrogen fluoride and hydrogen chloride and, perhaps, small quantities of carbonyl compounds such as phosgene. The halogen acids are both toxic and intensely irritating to the nose and throat. The irritating action of these decomposition products is readily noticeable before hazardous levels are reached. If such a situation develops, the affected areas should be vacated, the heat source and leak eliminated, and the area well ventilated before resuming work.

Respiratory Protection Program

Policy:

All employees will be protected from exposure to airborne radioactive, chemical, or biological contamination by installing, implementing, or instituting feasible engineering or administrative controls. If these controls do not prove feasible, or while they are being installed/instituted, appropriate respiratory protection will be provided. For some experiments, respiratory protection may be provided as an additional safeguard against exposure.

It is Joe R. Jones Construction, Inc.'s policy to provide employees with a safe and healthful working environment. This is accomplished by utilizing facilities and equipment that have all feasible safeguards incorporated into their design. When effective engineering controls are not feasible, or when they are being initiated, protection shall be used to ensure personnel protection.

This program does not apply to contractors as they are responsible for providing their own respiratory protection programs and respiratory protective equipment.

Definitions:

a. Respirator – A device provided to protect the wearer from inhalation of harmful or nuisance atmospheres. Respirators may function by air purifying and/or air supplying techniques.

b. Air Purifying Respirator – A respirator that filters and/or absorbs contaminants from the ambient air being inhaled by the wearer.

c. Supplied Air Respirator – A respirator in which clean air is supplied to the face-piece from an auxiliary source away from the wearer.

d. Self-Contained Breathing Apparatus – A respirator in which the air supply is carried by the wearer.

e. Atmospheric Contamination – The term applies equally to gases such as nitrogen, carbon monoxide, and carbon dioxide; the vapors of volatile substances such as benzene and carbon tetrachloride; toxic dusts and fumes; radioactive materials; and so forth.

f. Respirator Fit Test – A test used to determine a proper match or fit between the face-piece of the respirator and face of the wearer.

Responsibilities:

a. Supervisor

Supervisors will ensure each employee under his or her supervision using a respirator has received appropriate training in its use and an annual medical evaluation. Supervisors will ensure the availability of appropriate respirators and accessories, provide adequate storage facilities, and encourage proper respirator equipment maintenance. Supervisors must be aware of tasks requiring the use of respiratory protection, and ensure all employees engaged in such work use the appropriate respirators at all times. The Supervisors are responsible for the following:

1. Ensures that all employees who wear respiratory protective devices are thoroughly trained in their use.
2. Provides employees with the respiratory protection appropriate for the operation, and ensures the use of such devices.
3. Identifies potentially hazardous conditions and immediately notifies the Safety and Health Manager for corrective action.

Supervisors shall contact the Safety and Health Manager prior to non-routine work which may expose workers to hazardous substances or oxygen deficient atmospheres. Examples of work which may require the use of respirators includes, but are not limited to:

- Asbestos abatement activities
- Abrasive blasting
- Cutting or melting lead or stripping lead-based paints from surfaces
- Welding or burning
- Painting, especially with epoxy or organic solvent coatings
- Using solvents, thinners, or degreasers
- Any work which generates large amounts of dust
- Working in a confined space
- Using formaldehyde to decontaminate a space
- Bio-aerosols

b. Employee

1. Uses respiratory protective equipment as instructed and required under hazardous agent protocols.

2. Stores respirator properly to prevent damage and inspects prior to each use.

3. Reports any malfunction of respiratory protective equipment to the immediate supervisor.

c. Others

Personnel, such as employees, inspectors, and visitors, who must enter an area where the use of respiratory protective equipment is required, even when their stay time in the area may be 15 minutes or less, shall be provided with and use appropriate equipment, including instructions regarding use and limitations. Personnel shall be fit tested and medically qualified to wear the respirator being issued prior to entry to the site.

Contractors are required to develop and implement a respiratory protection program for their employees who must enter into or work in areas where exposure to hazardous materials can not be controlled or avoided. This program must meet OSHA regulations and include issuance of respirators, medical evaluations, fit testing and training.

d. Safety and Health Manager

1. Develops and implements all aspects of the respiratory protection program.

2. Develops training programs and standard operating procedures to fulfill the requirements of existing OSHA regulations and amendments.
3. Purchases, selects, inspects, maintains, cleans, stores, and fit tests respiratory protective equipment.

4. Periodically inspects and replaces all respiratory protective devices stored for emergency use.

Procedures:

a. Selection – Respirators shall be selected on the basis of the potential hazards to which the worker is exposed. The following factors shall be ascertained by the Health and Safety Branch to ensure that the device selected for the employee will provide satisfactory protection when used properly:

1. Chemical, physical, and toxicological properties of the contaminant(s).

2. Review of actual and potential hazards to assess extent of injurious effects produced under all conditions of potential exposure.

3. Evaluation of the duties to be performed by the wearer as they relate to restriction of movement and duration of potential exposure.

4. An understanding of the principles, design, scope of use, limitations, advantages, and disadvantages of the available respirators. Respiratory equipment selected will be approved by Joe R. Jones Construction, Inc. or will otherwise be in accordance with existing OSHA regulations.

b. Medical Evaluations – It is the responsibility of the Health and Safety Branch to review the health status of all employees who may be required to wear respiratory equipment. In the event of prolonged respirator use, the wearer should have a medical examination to determine if he/she is medically able to wear respiratory protective equipment without aggravating a pre-existing medical condition

Medical considerations include, but are not limited to the following:

- History of asthma or emphysema
- Difficulty in breathing
- Previously documented lung problems
- High blood pressure
- Artery diseases
- Documented heart problems
- Missing or arthritic fingers
- Facial scars
- Claustrophobia
- Poor eyesight

c. Fitting – Each individual required to use a respirator of any type will be fitted by the Safety and Health Manager prior to using any such device. The fit test will include a demonstration of proper donning, wearing, and field fit testing techniques, an extensive leak test using a solution of isoamyl acetate as the test vapor and a quantitative fit test using a respirator fit tester. Any individual with a beard or other facial hair that may prevent a proper face piece-to-face seal will not be fit tested until the hair has been removed. A separate Respirator Fitting and Training Record shall be maintained for each participating individual.

Respirator Fit testing

A fit test shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with any air-purifying respirator. Both quantitative and qualitative fit tests will be performed. Personnel must successfully pass the fit test before being issued an air-purifying respirator.

No Company employee is permitted to wear a negative-pressure respirator in a work situation until he or she has demonstrated that an acceptable fit can be obtained. Respirator fitting is conducted initially upon assignment to a task requiring use of a respirator. Refitting is conducted annually thereafter upon successful completion of the respirator training.

Fit testing will be conducted by the Safety and Health Manager and the test results will be the determining factor in selecting the type, model, and size of negative-pressure respirator for use by each individual respirator wearer.

Fit Checking-

Each time a respirator is donned, the user will perform positive and negative pressure fit checks. These checks are not a substitute for fit testing. Respirator users must be properly trained in the performance of these checks and understand their limitations.

A. Negative Pressure Check

Applicability/Limitations: This test cannot be carried out on all respirators; however, it can be used on face-pieces of air purifying respirators equipped with tight-fitting respirator inlet covers and on atmosphere supplying respirators equipped with breathing tubes which can be squeezed or blocked at the inlet to prevent the passage of air.

Procedure: Close off the inlet opening of the respirator's canister(s), cartridge(s), or filter(s) with the palm of the hand, or squeeze the breathing air tube or block its inlet so that it will not allow the passage of air. Inhale gently and hold for at least 10 seconds. If the face-piece collapses slightly and no inward leakage of air into the face-piece is detected, it can be reasonably assumed that the respirator has been properly positioned and the exhalation valve and face-piece are not leaking.

B. Positive Pressure Check

Applicability/Limitations: This test cannot be carried out on all respirators; however, respirators equipped with exhalation valves can be tested.

Procedure: Close off the exhalation valve or the breathing tube with the palm of the hand. Exhale gently. If the respirator has been properly positioned, a slight positive pressure will build up inside the face-piece without detection of any outward air leak between the sealing surface of the face-piece and the face.

Qualitative Fit Testing

Federal regulations (29 CFR 1910.1001) require qualitative fit tests of respirators and describe step-by-step procedures. This test checks the subject's response to a chemical introduced outside the respirator face-piece. This response is either voluntary or involuntary depending on the chemical used. Several methods may be used. The two most common are the irritant smoke test, and the odorous vapor test.

b. Irritant Smoke

The irritant smoke test is an involuntary response test. Air purifying respirators must be equipped with a high efficiency particulate air (HEPA) filter for this test. An irritant smoke, usually either stannic chloride or titanium tetrachloride, is directed from a smoke tube toward the respirator. If the test subject does not respond to the irritant smoke, a satisfactory fit is assumed to be achieved. Any response to the smoke indicates an unsatisfactory fit.

The irritant smoke is an irritant to the eyes, skin, and mucous membranes. It should not be introduced directly onto the skin. The test subject must keep his or her eyes closed during the testing if a full face-piece mask is not used.

b. Odorous Vapor

The odorous vapor test is a voluntary response test. It relies on the subject's ability to detect an odorous chemical while wearing the respirator. Air purifying respirators must be equipped with an organic cartridge or canister for this test. Isoamyl acetate (banana oil) is the usual test. An isoamyl acetate-saturated gauze pad is placed near the face-piece-to-face seal of the respirator of the test subject's skin. If the test subject is unable to smell the chemical, than a satisfactory fit is assumed to be achieved. If the subject smells the chemical, the fit is unsatisfactory.

If the subject cannot smell the chemical, the respirator will be momentarily pulled away from the subject's face. If the subject is then able to smell the chemical, a satisfactory fit is assumed. If the subject cannot smell the chemical with the respirator pulled away from the face, this test is inappropriate for this subject, and a different test will be used.

This test is limited by the wide variation of odor thresholds among individuals and the possibility of olfactory fatigue. Since it is a voluntary response test it depends upon an honest response.

Quantitative Fit Testing

Quantitative fit testing, using the Port-a-count Plus fit test system, is generally performed on both full-face and half-face negative pressure respirators. Fit factors are determined by comparing the particle concentration outside the respirator with the concentration inside the respirator face-piece. An acceptable fit is achieved when the respirator wearer successfully completes a series of six programmed exercises (normal breathing, deep breathing, moving head up and down, moving head side to side, reading, and normal breathing) with a fit factor of 100 or more.

Special Problems

A. Facial Hair

No attempt is made to fit a respirator on an employee who has facial hair which comes between the sealing periphery of the face-piece and the face, or if facial hair interferes with normal functioning of the exhalation valve of the respirator.

B. Glasses and Eye/Face Protective Devices

Proper fitting of a respiratory protective device face-piece for individuals wearing corrective eyeglasses or goggles, may not be established if temple bars or straps extend through the sealing edge of the face-piece. If eyeglasses, goggles, face shield or welding helmet must be worn with a respirator, they must be worn so as not to adversely affect the seal of the face-piece. If a full face-piece respirator is used, special prescription glasses inserts are available if needed.

d. Training – Appropriate training and instructions in the proper use of each type of respirator shall be provided by the Safety and Health Manager. Respirator users and their supervisors will receive training on the contents of this Respiratory Protection Program and their responsibilities under it. They will be trained on the proper selection and use, as well as the limitations of the respirator. Training also covers how to ensure a proper fit before use and how to determine when a respirator is no longer providing the protection intended.

The Safety and Health Manager provides training of respirator wearers in the use, maintenance, capabilities, and limitations of respirators is initially upon assignment of personnel to tasks requiring the use of respirators. Retraining is given annually thereafter and only upon successful completion of the medical evaluation.

The training program will include the following:

Respirator training will be properly documented (Appendix A) and will include the type and model of respirator for which the individual has been trained and fit-tested.

This training will include, but not be limited to:

1. Nature and degree of respiratory hazard
2. Respirator selection, based on the hazard and respirator capabilities and limitations
3. Donning procedures and fit tests including hand's-on practice to ensure an effective face piece to face seal
4. Actual handling of the respirator and wearing it for a period in a test atmosphere.
5. A discussion of respirators construction, operating principles and limitations.
6. Care of the respirator, e.g., need for cleaning, maintenance, storage, and/or replacement
7. Instruction on the nature of the hazard, including information on its physical properties, possible concentrations, modes of physiological action and means of detection.
8. Use and limitations of respirator
9. Discussions of maintenance and inspection procedures.

e. Inspection – For sanitary and health reasons, clean respirators shall be used by one individual only and shall be returned to the Safety and health Manager for cleaning, maintenance, and repairs. Cleaning and disinfecting of reusable components of a respirator unit will be performed by utilizing recognized procedures corresponding to the exposure atmosphere. Disposable respirators will be discarded properly after use by the individual. Inspection frequency for all unused devices shall be monthly. Units receiving routine use shall be inspected by the employee before and after each use. The inspection shall include the following checks when applicable.

1. Tightness of connections
2. Condition of face-piece, headbands, exhalation and inhalation valves, connecting tube, and canister
3. Pressure in cylinders (do not use if less than 1500 psi)
4. Deterioration of all rubber parts
5. Regulator mechanism
6. Lens of face-pieces

7. Warning alarm (self-contained units)
8. Seal on cartridge package

f. Location and Storage of Respirators – Location and storage of all respiratory devices shall be controlled by the Safety and Health Manager. When the need for respiratory equipment is anticipated, approval by the Safety and Health Manager should be obtained in advance.

After inspection, cleaning and any necessary minor repairs, store respirators to protect against sunlight, heat, extreme cold, excessive moisture, damaging chemicals or other contaminants. Respirators placed at stations and work areas for emergency use shall be stored in compartments built for that purpose, shall be quickly accessible at all times and will be clearly marked. Routinely used respirators, such as half-mask or full-face air-purifying respirators, shall be placed in sealable plastic bags. Respirators may be stored in such places as lockers or tool boxes only if they are first placed in carrying cases or cartons. Respirators shall be packed or stored so that the face-piece and exhalation valves will rest in a normal position and not be crushed. Emergency use respirators shall be stored in a sturdy compartment that is quickly accessible and clearly marked.

g. Self-Contained Breathing Apparatus – Emergency respirators in carrying cases shall be located in areas designated by the Safety and Health Manager. These respirators are provided for emergency situations only and for use by authorized personnel. Any conditions requiring the use of these devices shall be reported to Safety and Health Manager.

h. Special Requirements for Confined Spaces – In areas immediately hazardous to life or health, self-contained breathing apparatus, air line respirators or hose masks with blowers shall be used. For emergency rescue, a standby person with suitable self-contained breathing apparatus shall be at the nearest fresh air base. Communications (visual, voice or signal line) shall be maintained between all individuals present.

Persons using air line respirators and hose masks with blowers shall be equipped with safety harnesses and safety lines for lifting or removing them from hazardous atmospheres, or other equivalent provisions for rescue from hazardous atmospheres shall be used. More details concerning respiratory protection for confined space entry can be found in Joe R. Jones Construction, Inc.’s Confined Space Program.

Types of Respirators-

A. Air-Purifying Respirator

These respirators remove air contaminants by filtering, absorbing, adsorbing, or chemical reaction with the contaminants as they pass through the respirator canister or cartridge. This respirator is to be used only where adequate oxygen (19.5 to 23.5 percent by volume) is available. Air-purifying respirators can be classified as follows:

1. Particulate removing respirators, which filter out dusts, fibers, fumes and mists. These respirators may be single-use disposable respirators or respirators with replaceable filters.

NOTE: Surgical masks do not provide protection against air contaminants. They are never to be used in place of an air-purifying respirator. They are for medical use only.

2. Gas- and vapor-removing respirators, which remove specific individual contaminants or a combination of contaminants by absorption, adsorption or by chemical reaction. Gas masks and chemical-cartridge respirators are examples of gas- and vapor-removing respirators.

3. Combination particulate/gas- and vapor-removing respirators, which combine the respirator characteristics of both kinds of air-purifying respirators.

B. Supplied-Air Respirators

These respirators provide breathing air independent of the environment. Such respirators are to be used when the contaminant has insufficient odor, taste or irritating warning properties, or when the contaminant is of such high concentration or toxicity that an air-purifying respirator is inadequate. Supplied- air respirators, also called air-line respirators, are classified as follows:

1. Demand

This respirator supplies air to the user on demand (inhalation) which creates a negative pressure within the face-piece. Leakage into the face-piece may occur if there is a poor seal between the respirator and the user’s face.

2. Pressure-Demand

This respirator maintains a continuous positive pressure within the face-piece, thus preventing leakage into the face-piece.

3. Continuous Flow

This respirator maintains a continuous flow of air through the face-piece and prevents leakage into the face-piece.

C. Self-Contained Breathing Apparatus (SCBA)

This type of respirator allows the user complete independence from a fixed source of air and offers the greatest degree of protection but is also the most complex. Training and practice in its use and maintenance is essential. This type of device will be used in emergency situations only.

Identification of Respirator Cartridges and Gas Mask Canisters

Respirator cartridges and canisters are designed to protect against individual or a combination of potentially hazardous atmospheric contaminants, and are specifically labeled and color coded to indicate the type and nature of protection they provide.

An approved label on the respirator will also specify the maximum concentration of contaminant(s) for which the cartridge or canister is approved. For example, a label may read:

"DO NOT WEAR IN ATMOSPHERES IMMEDIATELY DANGEROUS TO LIFE. MUST BE USED IN AREAS CONTAINING AT LEAST 20 PERCENT OXYGEN. DO NOT WEAR IN ATMOSPHERES CONTAINING MORE THAN ONE-TENTH PERCENT ORGANIC VAPORS BY VOLUME. REFER TO COMPLETE LABEL ON RESPIRATOR OR CARTRIDGE CONTAINER FOR ASSEMBLY, MAINTENANCE, AND USE."

Warning Signs of Respirator Failure

A. Particulate Air-Purifying

When breathing difficulty is encountered with a filter respirator (due to partial clogging with increased resistance), the filter(s) must be replaced. Disposable filter respirators must be discarded.

B. Gas or Vapor Air-Purifying

If, when using a gas or vapor respirator (chemical cartridge or canister), any of the warning properties (e.g., odor, taste, eye irritation, or respiratory irritation) occur, promptly leave the area and check the following:

- Proper face seal
- Damaged or missing respirator parts
- Saturated or inappropriate cartridge or canister

If no discrepancies are observed, replace the cartridge or canister. If any of the warning properties appear again, the concentration of the contaminants may have exceeded the cartridge or canister design specification. When this occurs an airline respirator or SCBA is required.

C. Service Life of Air-Purifying Respirator Canisters and Cartridges

The canisters or cartridges of air-purifying respirators are intended to be used until filter resistance precludes further use, or the chemical sorbent is expended as signified by a specific warning property, e.g., odor, taste, etc. New canisters, cartridges or filters shall always be provided when a respirator is reissued. When in doubt about the previous use of the respirator, obtain a replacement canister or cartridge.

D. Supplied Air Respirator

When using an airlines respirator, leave the area immediately when the compressor failure alarm is activated or if an air pressure drop is sensed. When using an SCBA leave the area as soon as the air pressure alarm is activated.

Maintenance and Issuance of Respirators:

Maintenance

The maintenance of respiratory protective devices involves a thorough visual inspection for cleanliness and defects (i.e., cracking rubber, deterioration of straps, defective exhalation and inhalation valves, broken or cracked lenses, etc.). Worn or deteriorated parts will be replaced prior to reissue. No respirator with a known defect is reissued for use. No attempt is made to replace components, make adjustments or make repairs on any respirator beyond those recommended by the manufacturer. Under no circumstances will parts be substituted as such substitutions will invalidate the approval of the respirator. Any repair to reducing or admission valves, regulators, or alarms will be conducted by either the manufacturer or a qualified trained technician.

Cleaning of Respirators

All respirators in routine use shall be cleaned and sanitized on a periodic basis. Respirators used non-routinely shall be cleaned and sanitized after each use and filters and cartridges replaced. Routinely used respirators are maintained individually by the respirator wearer. Replacement cartridges and filters are obtained by contacting the Safety and Health Manager.

Cleaning and disinfection of respirators must be done frequently to ensure that skin-penetrating and dermatitis-causing contaminants are removed from the respirator surface. Respirators maintained for emergency use or those used by more than one person must be cleaned after each use by the user.

The following procedure is recommended for cleaning and disinfecting respirators:

1. Remove and discard all used filters, cartridges, or canisters.
2. Wash face-piece and breathing tube in a cleaner-disinfectant solution. A hand brush may be used to remove dirt. Solvents which can affect rubber and other parts shall not be used.
3. Rinse completely in clean, warm water.
4. Air dry in a clean area in such a way as to prevent distortion.
5. Clean other respirator parts as recommended by the manufacturer.
6. Inspect valves, head-straps, and other parts to ensure proper working condition.
7. Reassemble respirator and replace any defective parts.
8. Place in a clean, dry plastic bag or other suitable container for storage after each cleaning and disinfection.

Issuance of Respirators

Respiratory protective equipment shall not be ordered, purchased, or issued to personnel unless the respirator wearer has received respirator training and a fit test. New employees, who require respiratory protective equipment, must be placed into the respirator program before being issued equipment.

APPENDIX A

RESPIRATOR TRAINING CERTIFICATION (site specific)

I hereby certify that I have been trained in the proper use and limitations of the respirator issued to me. The training included the following:

1. Instruction on putting on, fitting, testing and wearing the respirator.

2. Instruction on inspection, cleaning, and maintaining the respirator.

3. Explanation of dangers related to misuse.

4. Instructions on emergency situations.

I further certify that I understand the use, care, and inspection of the respirator and have tested and worn the unit.

Date: _____

Signed:_____ EMP# _____

Respirator Type Issued: _____

Training Coordinator: _____

APPENDIX B – FIT TEST WORKSHEETS

QUALITATIVE RESPIRATOR FIT TEST

Name: _____ EMP# _____

Clean Shaven? __Yes __No

Spectacle Kit? ___Yes ___No

Manufacturer/Model _____ Size: ___S ___M ___L

Irritant Smoke ___Pass ___Fail

Isoamyl Acetate ___Pass ___Fail

Manufacturer/Model_____ Size: ___S___M___L

Irritant Smoke ___Pass ___Fail

Isoamyl Acetate ___Pass ___Fail

Examiner _____

Date_____

Employee _____

Date _____

APPENDIX B – FIT TEST WORKSHEETS

QUANTITATIVE RESPIRATOR FIT TEST REPORT

LAST NAME _____

FIRST NAME_____

ID NUMBER_____

NEXT TEST DUE_____

OPERATOR NAME_____

RESPIRATOR MODEL_____

•SIZE_____ •MANUFACTURER_____

•APPROVAL NUMBER_____

NOTES_____

TEST DATE_____

TEST TIME_____

TEST DATA

Fit Factor Pass Level: 100

Ex. Ambient
(Part/cc) Mask
(Part/cc) Fit Factor Pass/Fail NB
DB
SS
UD
R
NB
OVERALL FIT FACTOR = _____

Operator _____ Date _____

Subject_____ Date _____

Safety and Health Signs and Tags

Policy and Purpose:

All devices, structures and areas where hazardous materials are used, or where hazards or possible hazards may exist will be identified with appropriate hazard warnings.

Signs and tags are not intended as substitutes for preferred abatement methods such as engineering controls, substitution, isolation, or safe work practices. Rather, they are additional safety guidance and increase the employee's awareness of potentially hazardous situations.

Tags are temporary means of warning all concerned of hazardous conditions, defective equipment, etc. **Tags are not to be considered as a complete warning method**, but should only be used until a positive means can be employed to eliminate the hazard; for example, a "Do Not Start" tag is affixed to a machine and is used only until the machine can be locked out, de-energized, or inactivated.

The Safety and Health Manager maintains a supply of a variety of safety signs and tags for use by Company personnel.

Responsibilities:

Supervisor-

Posts appropriate warning signs for materials of a hazardous nature (poisonous, toxic, flammable, carcinogenic, biological hazard, radioactive, etc.) or hazardous conditions (high voltage, slippery when wet, welding arcs, etc.).

Employee-

1. Conducts themselves in the manner (safe procedures, protective equipment, clothing, etc.) as called for by the hazard warning signs and training.

2. Assists the supervisor in recognition of any potentially hazardous condition that may need identification by hazard warning signs.

Safety and Health Manager-

1. Periodically surveys all operations to ensure proper identification of hazardous areas or conditions by use of warning signs and immediately notifies supervisor of any lack of, or improper markings.

2. Assists the supervisor in defining proper identification, and acceptable location of signs in compliance with existing OSHA, Nuclear Regulatory Commission (NRC), Environmental Protection Agency (EPA), or other regulations.

3. Provides fabricated hazard warning signs.

4. Maintains a supply of all frequently used hazard warning signs.

Sign Policy:

a. Common sense is required in the use of Hazard Warning Signs so their effectiveness is not lost by over use. Hazard Warning Signs are not to be abused for personal reasons such as to keep people out of an area or to discourage use of laboratory materials, equipment, etc.

b. Any temporary posting of a hazard should be replaced as soon as possible by an acceptable permanent sign or removed when the hazard no longer exists.

c. Safety colors and specifications for accident prevention signs and tags shall be in accordance with applicable federal and state regulations.

d. The following key colors will be used in the signs, paint, tape, etc. for warning personnel of hazardous conditions and identifying emergency equipment.

1. Red – basic color for fire protection equipment and apparatus, danger, and emergency stop devices.

2. Orange – designates dangerous parts of machines or energized equipment which may cut, crush, shock, or otherwise injure.

3. Yellow – designates caution and is used for marking physical hazards. Solid yellow, yellow and black stripes or checkers should be used interchangeably to attract the most attention in the area in question.

4. Green – used as a safety designation and for marking the location of first aid equipment.

5. Blue – also designates caution, but limited to warning against the starting, use of, or movement of equipment under repair or being worked on.

6.Black, Purple or magenta on yellow – designates radiation hazards.

7. Black on white – designates traffic and housekeeping markings.

Danger Signs- "Danger" signs shall be used where an immediate hazard exists and specific precautions are required to protect personnel or property. The sign shall be of red, black, and white colors.

"**Danger**" tag shall be placed on a damaged ladder or other damaged equipment, and immediate arrangements made for the ladder/equipment to be taken out of service and sent to be repaired.

Caution Signs- "Caution" signs shall be used to warn of a potential hazard or to caution against unsafe practices, and to prescribe the precaution that will be taken to protect personnel and property from mishap probability. The sign shall be of yellow and black colors.

Radiation Signs- "Radiation" signs shall be used to warn of radiation hazards and of special precautions that will be taken. "Radiation" signs shall use the conventional radiation warning colors of magenta on a yellow background. Radiation warning signs are strictly regulated.

Exit Signs- "Exit" signs shall be utilized to clearly identify the means of egress from a building or facility. Where the exit is not apparent, signs shall have an arrow indicating the direction of the exit.

Biological Hazard Warning Signs- "Biological Hazard" warning signs shall be used to signify the actual or potential presence of a biological hazard and to identify equipment, containers, rooms, experimental animals, etc., which contain or are contaminated with viable hazardous agents. The symbol on these signs shall be the standard fluorescent orange or orange-red color.

Safety Instruction– Shall be used where there is a need for general instructions and suggestions relative to safety measures.

No smoking, eating or drinking signs– Will be placed in all designated areas where there are flammable, toxic, carcinogenic, mutagenic, teratogenic, or radioactive materials stored or used.

Special signs or tags – Will be used as needed (e.g. labels for chemical carcinogens).

No Smoking Signs – Our Company is a smoke free environment and smoking is prohibited inside all Company owned buildings. No Smoking Signs are required in all areas (i.e., loading docks) designated by fire regulations or as areas where smoking is not allowed.

Posting of Signs and Tags-

Any Company employee who becomes aware of an unsafe condition will immediately advise the work area Supervisor of that condition. The Supervisor will determine whether a tag or sign is needed and, if so, that the appropriate sign or tag is posted or attached as required. They will coordinate the placement of tags, with the Safety and Health manager. If the responsible Supervisor is not available, the employee will contact the Safety and Health Manager and request assistance.

The Supervisor will evaluate the situation and initiate appropriate corrective action. The Supervisor, in coordination with the Safety and Health Manager, is responsible for removing the sign or tag only after the unsafe condition has been corrected.

Method of Posting

a. Signs that are to be used permanently will be installed only by Joe R. Jones Construction, Inc. Authorized Personnel.
b. Signs that are to be used in laboratory areas on a temporary basis (less than one month) will be posted with masking tape on a glass surface door or, if more appropriate, on refrigerators, freezers, etc.
c. Signs will not be posted with tacks, pins, and various adhesive materials that will damage the doors, walls, or building when the signs are removed. In areas where suitable surfaces for attaching the signs are not available, stands will be provided by Management.
d. Unauthorized signs in hallways and conference rooms are subject to immediate removal.
e. Laboratory entrance warning placards to alert personnel of specific hazards within laboratories will be affixed to the doors of laboratories. These placards will identify the presence of carcinogenic agents, biohazards, radioactive materials, reproductive toxins, flammable solvents, corrosive materials, reactive chemicals, toxic chemicals, toxic gases, and emergency contacts.

Scaffold Safety Program

Policy:

It is the policy of Joe R. Jones Construction, Inc. to take all practical measures possible to prevent employees from being injured by falls from scaffolds. Joe R. Jones Construction, Inc. will take all necessary steps to eliminate, prevent, and control fall hazards. Joe R. Jones Construction, Inc. will comply fully with the OSHA Fall Protection standard (CFR 1926, Subpart M, Fall Protection).

Workers may die or be injured if scaffold equipment and fall protection systems are defective or misused.

A "Scaffold" means one or more working platforms suspended by ropes or other means from an overhead structure. Recent investigations by OSHA suggest that fatal falls occur as a result of defective scaffold equipment, improper installation or operation, improper training of workers, or a failure to use appropriate personal fall protection equipment.

Safety regulations of the Occupational Safety and Health Administration (OSHA) establish specific requirements for suspension scaffolds and their operation, including the use of fall protection systems. Our Company will ensure that all supervisors and worker(s) involved in work from suspension scaffolds will comply with these regulations.

Background:

Falls are a leading cause of traumatic occupational death. The U.S. Department of Labor indicates that falls accounted for 8% of all occupational fatalities from trauma. Personal fall protection equipment was used in several of these incidents, but it was used improperly in each case. In several incidents, workers fell out of their improperly fastened safety belt or in the other incidents; excessively long lanyards broke or separated after victims fell 30 feet.

Responsibilities:

1. Supervisors of all employees that are required to work from scaffolds will ensure the following procedures are taken:
2. Comply with the current and proposed OSHA regulations for working with scaffolds.
3. Assure that design and construction of scaffolds conform to OSHA requirements.
4. Shield scaffold suspension ropes and body belt or harness system (lifelines) from hot or corrosive processes, and protect them from sharp edges or abrasion.
5. Inspect all scaffolds, scaffold components, and personal fall protection equipment before each use.

6. Provide personal fall protection equipment and make sure that it is used by all workers on suspension scaffolds.
7. Use structurally sound portions of buildings or other structures to anchor drop-lines for body belt or harness systems and tiebacks for suspension scaffold support devices. Drop-lines and tiebacks should be secured to separate anchor points on structural members.
8. Provide proper training for all workers who use any type of suspension scaffold or fall protection equipment.
9. Follow scaffold manufacturers' guidance regarding the assembly, rigging, and use of scaffolds.

Employees shall;

1. Inspect all scaffolds, scaffold components, and personal fall protection equipment before each use. Defective components must be removed from service and replaced.
2. Shield scaffold suspension ropes and body belt or harness system lifelines from hot or corrosive processes, and protect them from sharp edges or abrasion.
3. Wear a body harness which may include a deceleration device, lifeline, or suitable combinations. The body harness shall be rigged so that an employee can neither free fall more than 4feet nor contact any lower level and bring an employee to a complete stop and limit the maximum deceleration distance an employee travels to 3.5 feet The use of body belts for fall arrest is prohibited

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General Scaffold Requirements:

1. Supervisors and employees will insure that the following operating procedures are observed:
2. Scaffolds must be substantially constructed to carry the loads imposed upon them and to provide a safe work platform. All scaffolds more than 4’ high must have approved guardrails on all ends exposed ends and sides.
3. Guardrails, mid-rails, and toe boards must be installed on all open sides of scaffolds 4’ high or more in height.
4. Only approved scaffolds will be used. Barrels, boxes, rebar. Or other make-shift substitutes for scaffolds will not be used.
5. Scaffold planks must be cleated together, and must extend over the end supports at least 6 inches, but not more than 12 inches.

6. All scaffold planks must be visually inspected before each use. Damaged scaffold planks must be destroyed immediately.

7. All scaffold planks must be at least two planks wide: No employee may work from a single plank.

8. Adequate mud sills or other rigid footing, capable of withstanding the maximum intended load, must be provided.

9. Scaffolds must be tied to the building or structure at intervals which do not exceed 30 feet horizontally and 26 feet vertically.

10. Do not overload scaffolds. Materials should be brought up as needed. Scaffolds must not be loaded in excess of one-fourth of their rated capability.

11. Where persons are required to work or pass under scaffolds, a screen of 18 guage, ½ inch wire mesh is required between the toe and guard rail.

12. Overhead protection is required if employees working on scaffolds are exposed to overhead hazards. Such protection must be a 2" thick plank or equivalent.

13. Diagonal bracing must be used on all support components.

14. Mid-rails 1" x 6" or equivalent must be present on all sides.

15. Ladders will be used as a means of entry onto and exit off of the scaffold.

Rolling Scaffolds- General Requirements:

1. The height of the rolling scaffold must not exceed four times the minimum base dimension.
2. The work platform must be planked tight for the full width of the scaffold. Cleat the underside of the planks to prevent their movement.
3. Caster breaks must be locked when the scaffold is not in motion.
4. Get help when moving rolling scaffolds. Make certain that the route is clear. Watch for holes and overhead obstructions.
5. No one shall be permitted to ride on rolling scaffolds.

Two Point Suspended Scaffolds (Swinging Stages) General Requirements:

1. Each employee working from a two point suspended scaffold must be tied off to an independent safety line.

2. Suspended scaffolds must be not less than 20 inches nor more than 36 inches wide.

3. Wire ropes used to suspend such scaffolds must be able to withstand a load that is six times the load it is intended to support.

4. Non–conductive insulating material must be placed over suspension cables of each scaffold for protection when the chance of contact with an electric arc exists.

Design and Construction of Scaffolds:

The design and construction of scaffolds must conform with OSHA requirements concerning type of equipment, rated capacities, construction methods, and use. Each scaffold and scaffold component must be capable of supporting its own weight plus at least four times the maximum intended load without failure. Each suspension rope must be capable of supporting at least six times the maximum intended load.

Shielding of Ropes

Suspension ropes and drop-lines for body belt or harness systems should be shielded from:

- Heat-producing processes such as welding,
- Acids or other corrosive substances, and
- Sharp edges or abrasions.

Such ropes should be made from material that is not adversely affected by heat or by acids or other corrosives.

Inspection

Supervisors and Employees will inspect all scaffolds and scaffold components for visible defects before use on each work shift. Scaffolds will be erected, moved, dismantled, or altered only under the supervision of a competent person.

All components of personal fall protection equipment (including body belts or harnesses, lanyards, drop-lines, trolley lines, and points of anchorage) should be inspected by Supervisors and Employees before use. Any visibly damaged or worn equipment should be removed from service immediately.

Use of Fall Protection Equipment

Joe R. Jones Construction, Inc. will provide appropriate fall protection systems and ensure their use by all workers on suspension scaffolds. Generally, these workers will be protected by a Type I guardrail system [see note 2 below] or a combination of body belt or harness system with a Type II guardrail system [see note 3 below].

However, when single-point and two-point adjustable suspension scaffolds are used, workers must be protected by both a body belt or harness system and a Type I or Type II guardrail system. Also, when boatswain chairs, catenary scaffolds, and float scaffolds are used, workers must be protected only by a harness system.

Use of Structural Members as Anchor Points:

Structurally sound portions of buildings or other structures must be used to anchor drop-lines for body belt or harness systems and tiebacks for suspension scaffold support devices. Drop-lines and tiebacks should be secured to separate anchor points of structural members. Owners, architects, and engineers planning renovation or designing new facilities should incorporate strategically located anchor points on structural members of buildings for future exterior maintenance and repair work.

Proper Training of Workers

Joe R. Jones Construction, Inc. will provide workers with proper training, including the manufacturers' recommendations for installing and operating suspended scaffold systems and for using personal fall protection equipment. Untrained personnel should never be permitted to work from any type of suspension scaffold.

NOTES

1. Fall protection systems consist of harness systems (personal fall arrest systems) used independently or in combination with guardrail systems.

2. Type I guardrail systems are those capable of providing adequate fall protection without the use of body belts.

3. Type II guardrail systems are those that delineate the scaffold edge, restrain movement, provide handholds, and prevent mis-stepping. Type II systems must be supplemented by body belt or harness systems to provide adequate fall protection

Temporary Contract Worker Safety

Policy:

All firms contracted by Joe R. Jones Construction, Inc., because they are employers, are required by the Williams-Steiger Occupational Safety and Health Act of 1970 to provide safe and healthy employment to their employees.

Joe R. Jones Construction, Inc. as an employer is also responsible for providing a safe and healthful work environment for its employees. Contract work, especially in occupied buildings, may present situations or conditions that may adversely impact on the safety and health of our Company employees.

Responsibilities:

All Company personnel responsible for managing contracts will ensure that:

1. Each contractor is provided with warnings of hazards and information about our Company programs for abating these hazards;

2. Each contractor is informed of our Company's safety, health, and environmental requirements; and

3. The work is conducted in a safe and responsible manner in compliance with applicable regulations and our Company's requirements.

Our Company's Contracting Officer will ensure that the contract language requires the contractor to:

1. Meet all applicable federal, state, and local environmental, health, and safety regulations and our Company's requirements;

2. Provide their employees with the necessary training, medical exams, and safety equipment;

3. Submit written comprehensive safety and health plan for the specific contract undertaken;

4. Comply with all applicable federal, state, and local regulations and our Company's requirements, with violation being grounds for default of the contract.

Our Project Contracting Officer will:

1. Communicate the contractual, statutory, and other environmental, health and safety requirements to the contractor prior to the start of the contract;

2. Ensure that such requirements are addressed in the Request for Solicitation and/or contract paperwork; and

3. Ensure that such requirements are observed.

4. Upon receipt of a report of a noncompliance or any condition which poses a serious or imminent danger to health or safety, issue a request for immediate corrective action from the contractor.

Our Project Compliance Officer will, prior to the start of the contract, inform the contractor of the requirement to observe all environmental, health, and safety provisions specified in the contract, provided by statutes/regulations or otherwise required.

Our Project Compliance Officer and his/her representative will:

1. Ensure our Safety and Health Manager is represented at all pre-construction meetings held with contractors.

2. Provide our Safety and Health Manager and our Security Officer with a tentative construction schedule for contractors on-site and immediate written notification of changes.

3. Notify our Company’s Management of the contractor work schedule, location, and special precautions or concerns prior to the start of the project.

4. Monitor the contractor's work performance and determine if contractor is complying with the contract health and safety plan and pertinent environmental, health, and safety regulations. Any questions regarding compliance with specific regulations should be referred to our Safety and Health Manager.
5. Ensure that all required permits are completed by the contractor and provided for review and signature of an authorized person and by our Safety and Health Manager

6. Notify our Safety and Health Manager immediately of construction accidents and provide our Safety and Health Manager with a copy of the contractor's accident reports.

7. Notify our Safety and Health Manager immediately of an OSHA complaint and/or inspection of contractor's job site.

Our Safety and Health Manager will conduct a pre-solicitation project review of the contract to ensure that all appropriate health and safety regulations and requirements and pertinent work site hazard information have been incorporated, where necessary. Our Safety and Health Manager will document review of the plan and will note any areas of special concerns.

The Safety and Health Manager will review and monitor the contractor's adherence to its written health and safety plan and all applicable environmental, health, and safety requirements.

The contractor is responsible for meeting all contractual agreements and for providing a safe and healthy workplace for its employees.

The contractor will:

1. Provide for frequent and regular safety inspections of the work sites, materials, and equipment by competent employees.

2. Notify our Project Compliance Officer of construction accidents in a timely manner.

3. Notify our Project Compliance Officer of any non-formal OSHA complaint notifications and/or OSHA inspection(s) of the job site.

The contractor Health and Safety Plan:

The contractor must develop and implement a comprehensive health and safety plan for his or her employees that cover all aspects of onsite construction operations and activities associated with the contract. This plan must comply with all applicable health and safety regulations and any project-specific requirements that our Company has specified. The contractor must provide our Contracting Officer with a copy of this plan with their bid package.

Acceptance of the contractor's health and safety plan only signifies that the plan generally conforms to the requirements of the contract. It does not relieve the contractor of the responsibility for providing employees with a safe and healthful work environment. This concept must be communicated to the contractor by our Contracting Officer and also incorporated into the contract document.

Pre-Construction Meeting:

Representatives of the contractor shall meet with our Contracting Officer, Project Compliance Officer, and Safety and Health Manager. The purpose of the meeting will be to discuss our safety requirements and for the implementation of all health and safety provisions pertinent to the work under contract.

Our Safety and Health Manager will review the contractor's site specific safety and health plan with the contractor as well as review all required material safety data sheets (MSDS) submitted for proposed products to be used by the contractor.

Our Company is required by OSHA standards (most notably 29 CFR 1910.1200, Hazard Communication Standard) to provide information to contractors on the hazards present at the work site. This information will be made available to the contractor in the project specifications (pre-bid) as well as at the pre-construction meeting.

Our Safety and Health Manager will, during the pre-construction meeting, provide the contractor with copies of our Company's written procedures such as lockout/tagout, confined space entry and permit process, and other safety and health requirements that apply.

Fire Prevention and Protection:

The contractor shall prepare and carry out an effective fire protection and prevention plan, including provisions for the fire protection and suppression equipment set forth in this section. This plan shall be made part of the comprehensive safety and health plan submitted by the contractor with their bid package.

Housekeeping:

Good housekeeping, with provision for the prompt removal and disposal of accumulations of combustible scrap and debris, shall be maintained in all areas of the job site. Self-closing metal containers shall be used for disposal of waste saturated with flammable liquids.

Codes and Regulations:

The contractor shall comply with the requirements published in the current revisions of the National Electrical Code, National Electrical Safety Code, the National Fire Protection Association standards, and all other applicable Municipal Codes and Regulations.

Smoking:

Smoking or other sources of ignition shall not be permitted in areas where flammable or explosive materials are stored or are present. All such areas shall be conspicuously posted: NO SMOKING OR OPEN FLAMES. There is a no smoking policy in effect within all Company facilities.

Fires:

Fires and open flame devices shall not be left unattended unless protected with automatic temperature control and cutoff devices.

Cleaning and Degreasing:

Gasoline and liquids with a flash point below 100 degrees Fahrenheit shall not be used for cleaning and degreasing.

Building Exits:

All buildings, shops, and plant facilities in which employees are required to work shall have at least two well-marked and lighted exits. The two exits shall be arranged to minimize the possibility of both exits being rendered inaccessible by one fire or emergency condition.

Fire Extinguishers:

Distinctly marked fire extinguishers rated 2A40B:C or greater shall be suitably placed as follows:

1. One for each 3,000 square feet of building area or major fraction thereof. Travel distance from any point of protected area to nearest extinguisher shall not exceed 100 feet.
2. One or more on each floor of buildings with at least one located adjacent to each stairway.
3. At least one located outside but not more than 10 feet from the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.
3. At least one located not less than 25 feet, nor more than 75 feet from any outside flammable or combustible liquid storage area.
4. At least one within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas is being used.

Noncompliance with Safety and Health Requirements:

If during the course of the contract, our Safety and Health Manager notes any situations of non-compliance with the contractor's safety and health plan or with our Company’s safety and health requirements, our Safety and Health Manager will bring them to the attention of our Project Compliance Officer and our Contracting Officer verbally (and will

immediately follow-up in writing). Failure to correct the violation or continued violations shall be grounds for termination of the contract.

If after notifying the Project Compliance Officer and Contracting Officer in writing of deficiencies in any health, safety, or environmental requirements, and if our Safety and Health Manager finds continued violations of those requirements, or find actions that pose an imminent danger, an immediate order to stop work will be issued. Should this occur, our Safety and Health Manager will bring the matter to the immediate attention of the Project Compliance Officer and Contracting Officer. Such violations may result in the default of the contract.

Our Safety and Health Manager will document all violations brought to the attention of the contractor, Project Compliance Officer and Contracting Officer

Safety Training:

The contractor must ensure that their employees have completed appropriate health and safety training when required by statute/regulation and our Company's requirements and provide documentation of such training when required by the contract.

Medical Clearance:

The contractor must ensure that their employees have appropriate medical clearance when required either by governmental regulations or by our Company's requirements. Copies of medical clearance for contractor personnel are required to be presented as specified by the contract.

The Project Compliance Officer and our Safety and Health Manager shall, in conjunction with our Company's requirements, determine if additional medical requirements (i.e., Blood serum samples, immunizations) are required for contractor personnel prior to the start of work.

Incident Reporting:

Our Safety and Health Manager will participate with contractors in the investigations of incidents resulting in injury/illness and/or damage or loss of government property and also near misses.

Safety and Personal Protective Equipment:

Unless otherwise specified, the contractor is responsible for providing all necessary safety and personal protective equipment needed by their employees. This equipment must meet

appropriate OSHA and ANSI approval requirements and be in good working order.

The contractor shall ensure that their employees have received appropriate training on the use and maintenance of safety and personal protective equipment prior to its use. Failure to correctly use appropriate safety equipment is a violation of the contract and may result in default of the contract.

Documentation:

The contractor must provide our Company with documentation of all required training, medical exams, permits, material safety data sheets (MSDS), etc., for his or her employees or operations at the pre-construction meeting.

Welding and Metal Fabrication

Policy:

Welding, cutting and brazing operations present a series of hazardous situations with potential exposure to burns, eye damage, electrical shock, crushed toes and fingers, and the inhalation of vapors and fumes. Many welding, cutting and brazing accidents result from:

- Inadequately trained personnel.
- Poor housekeeping practices.
- Poor shop layout.
- Inadequate lighting and ventilation.
- Improper storage and movement of compressed gas cylinders.
- Exposure of oxygen cylinders and fittings to oil or grease creating a fire or explosive hazard.
- Pointing welding or cutting torches at a concrete surface causing spattering and flying fragments of concrete.
- Electric shock when motors, generators and other electric welding equipment are not grounded.
- Inhalation of toxic fumes or vapors from welding metals or alloys.

Fires, explosions, and injuries can occur resulting from:

- The proximity of combustible solids, liquids, or dusts.
- The presence or development of possible explosive mixtures of flammable gases and air.
- The presence or nature of an oxygen-enriched atmosphere in locations where hot work is performed.

Cutters and welders, and other exposed personnel, are also susceptible to eye injury from infrared light and ultraviolet radiation.

Procedures:

The following provides minimum guidance on procedures and operating precautions:

Provide ventilation in shops or rooms where work is to be performed but avoid strong drafts directed at the welding work.

Do not place work to be welded or heated on a concrete floor. Concrete, when heated, may splatter and fly, exposing the welder to possible burns (and also throwing hot particles a considerable distance creating a potential fire hazard).

Provide appropriate protection for welders and helpers when working on elevated surfaces. Welding areas shall be kept neat, clean, and free from tripping hazards.

Provide approved personal protective equipment for welders who must enter confined spaces, manholes or other space restricted areas. Also, provide a means to ensure their quick removal in case of an emergency.

Do not perform cutting and welding operations in sprinklered buildings when the sprinkler system is inoperable; in explosive atmospheres or where explosive atmospheres may develop; or, within 50 feet of storage of large quantities of exposed, readily ignitible materials.

Before lighting the torch for the first time each day, allow enough of each gas to flow through its respective hose to purge any flammable gas mixture.

Purge hoses in open spaces and away from ignition sources. Light the torch with a friction lighter or stationary pilot flame keeping a safe distance between he torch and the welder's hands. Point the torch away from persons or combustible materials when lighting. Do not attempt to light a torch from hot metal.

When working in a confined space, the fuel gas and oxygen supply shall be located outside the confined space. The torch and hose should be removed from confined spaces when not in use.

Fuel gas and oxygen torch valves shall be closed and the fuel gas and oxygen supply to the torch shall be shut off during lunch or break periods, when not in use for extended periods, and when unattended.

Welding torch hoses must be protected from damage by contact with hot metal, open flames, corrosive agents or sharp edges. Pressure on hoses will be released at the end of each workday. Hoses must be visually inspected for damage at the beginning of each shift. Hose showing leaks, cuts, burns, worn spots or other evidence of deterioration must be repaired or replaced prior to use. Replacement hoses or fittings must be approved for use with acetylene equipment.

Shielding shall be provided to protect personnel from heat, sparks, slag, light, and radiation.

A fire watch will be maintained for at least 30 minutes after completion of cutting or welding operations to detect and extinguish possible smoldering fires.

Personal Protective Equipment:

Key portions of OSHA Standard 1910.252 covering protective equipment are included here. Personnel engaged in or exposed to welding, cutting, or brazing activities will be provided and use personal protective equipment to include eye and face protection, head protection when in a hard hat area, foot protection, and body, arm, and hand protection.

a. Eye Protection

b. Helmets shall be used during all arc welding or arc cutting operations. Goggles should also be worn during arc welding or cutting operations to provide protection from injurious rays from adjacent work, and from flying objects. The goggles may have either clear or colored glass, depending upon the amount of exposure to adjacent welding operations. Helpers or attendants shall be provided with proper eye protection. Helmets shall be arranged to protect the face, neck, and ears from direct radiant energy from the arc.

d. Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. Spectacles with side shields and suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection. Goggles shall be ventilated to prevent fogging of the lenses as much as practicable.

e. All operators and attendants of resistance welding or resistance brazing equipment shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes, as required.

e. Eye protection in the form of suitable goggles shall be provided where needed for brazing operations.

Protective Clothing:

a. All welders should wear flame-resistant gauntlet gloves and shirts with sleeves of sufficient length and construction to protect the arms from heat, UV radiation, and sparks.

b. All welders should wear fire-resistant aprons, coveralls, and leggings.

c. Clothing should be kept reasonably free of oil or grease. Front pockets and upturned sleeves or cuffs should be prohibited, and sleeves and collars should be kept buttoned to prevent hot metal slag or sparks from contacting the skin.

Respiratory Protection:

The Safety and Health Manager shall be consulted to determine appropriate levels of respiratory protection to be worn by personnel performing welding operations.

Fire Prevention and Protection:

1. The welding operation environment shall be free of flammable liquids and vapors. Combustible materials within a radius of 35 feet of the operation will be protected from activity residue (flame, heat, sparks, slag, etc.).

2. Fire watcher procedures shall be implemented whenever welding activities are conducted within 35 feet of combustible materials, regardless of protection provided. A qualified individual proficient in the operation of available fire extinguishing equipment and knowledgeable of fire reporting procedures shall observe welding or cutting activities. His or her duty is to detect and prevent the spread of fire produced by welding or cutting activities.

3. Whenever there are cracks or other floor openings within 35 feet of the welding or cutting that cannot be closed or covered, precautions shall be taken to remove or otherwise protect combustible materials on the floor below that may be exposed to sparks. The same precautions shall be observed with regard to cracks or openings in walls, open doorways, and open or broken windows.

4. Fire extinguishing equipment shall be maintained, ready for use, while welding or cutting operations are being performed. Equipment may consist of pails of water, buckets of sand, hose, or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

5. Where sprinkler protection exists, it shall be in full service while welding or cutting work is being performed. If welding or cutting is to be done within three feet of automatic sprinkler heads, noncombustible sheet material or damp cloth guards will be used to temporarily shield the individual heads.

Welding and Cutting Tanks, Cylinders, or Containers:

The procedures described below apply only to tanks too small to be entered. Compressed gas cylinders are excluded as are pipelines. Cutting and welding on containers that have held flammable liquids or gases shall be under the direct supervision of knowledgeable personnel.

Inspection-

BEFORE any tank, cylinder, or other container is cut, welded or other hot work is performed, the item shall be purged or made inert. New containers shall also be made inert as they may contain a flammable preservative which could form explosive vapors when heated. Welders shall also ensure that there are no substances such as grease, tars, or acids which, when subjected to heat, might produce explosive or toxic vapors. Any pipe lines or connections to the drums, cylinders, tanks, or other containers shall be disconnected or blanked.

Purging and Inerting-

Purging with Water

Where the liquid or gas previously contained is known to be readily displaced or easily soluble in water, it can be removed by completely filling the container with water and then draining. When hot work is performed on containers filled with water, extreme care shall be used to eliminate any vapor accumulation by proper venting or positioning of the container during the filling operation.

Purging with Air

Hazardous vapors may be displaced from inside containers by purging with air. A safe atmosphere shall be maintained by continuous ventilation.

Inerting with Gas

Inert gas may be used to displace flammable gas from the container. Adequate ventilation shall be maintained during the operation to ensure gas concentrations remain below hazardous levels.

Examples of inert gases are carbon dioxide and nitrogen.

Venting-

All hollow spaces, cavities, or containers shall be vented to permit the escape of air or gases before and during preheating, cutting, or welding.

Arc Welding:

Arc welding equipment shall conform to the design and installation criteria of OSHA 29 CFR 1910.252, “Welding, Cutting, and Brazing.” The frame or case of the welding machine (except engine-driven machines) shall be grounded under the conditions and according to the methods prescribed in OSHA Standard 1910, Subpart S, “Electrical”, and 1910.252.

Before starting operations, all connections to the arc welding machine shall be checked. The work lead shall be firmly attached to the work; contact surfaces of the magnetic work clamps shall be free of metal splatter particles. Coiled welding cable shall be spread out before use to avoid serious overheating and damage to insulation. Work and electrode lead cables shall be inspected for damage and wear before use. Cables with damaged insulation or exposed conductors shall be replaced. Electrode cables shall be joined and insulated in accordance with approved methods.

Grounding of the welding machine from shall be checked. Special attention shall be given to the ground connections of portable machines.

Electrode holders, when not in use, shall be placed where they cannot make electrical contact with persons, conducting objects, fuel, or compressed gas cylinders.

When it is necessary to splice cables to extend their length, only certified electricians shall make the splices. Cables with splices within 10 feet of the electrode holder shall not be used. The welder shall not coil or loop welding electrode cables around parts of their body.

Welders shall not place welding cable and other equipment where it will obstruct passageways, ladders, and stairways.

Machines which have become wet shall be thoroughly dried and tested before being used.

When welders are working close to one another on one structure where they may touch the exposed parts of more than one electrode holder simultaneously, the machines shall be connected to minimize shock hazard as follows:

All direct current (DC) machines shall be connected with the same polarity.

All alternating current (AC) machines shall be connected to the same phase of the supply circuit and with the same instantaneous polarity.

Resistance Welding:

Thermal Protection

Every pair of ignition tubes used in resistance welding equipment shall be equipped with a thermal protection switch. When used in a series-connected water line, a single switch shall be adequate if related to the downstream tube.

Control Safeguards

Controls, such as push buttons, foot switches, retraction, and dual-schedule switches on portable guns, etc., shall be arranged or guarded to prevent inadvertent activation.

Guarding Welding Machines

Multi-gun welding machines shall be effectively guarded at the point of operation. Devices such as an electronic eye, latches, blocks, barriers, or two-hand controls shall be installed. All chains, gears, operating bus linkage, and belts shall be protected by adequate guards.

Electrical Hazards:

All external weld-initiating control circuits shall operate on low voltage, not over 120 bolts for stationary equipment and not over 36 volts for portable equipment. All electrical equipment shall be suitably interlocked and insulated to prevent access by unauthorized persons to live portions of the equipment. Only non-ferrous welding clamps should be used to prevent magnetic induction during actuation of the equipment.

Welding in Confined Spaces Procedures-

Confined space means a relatively small or restricted space such as a tank, boiler, pressure vessel, mixing vat, sump, or pit. Ventilation is a prerequisite to work in confined spaces. All welding and cutting operations carried on in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials, possible oxygen deficiency, or explosive atmosphere.

This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. All air replacing *that* which is withdrawn shall be clear and breathable. Oxygen shall never be used as makeup air.

In such circumstances where it is impossible to provide such ventilation, respirators or hose masks approved for this purpose by NIOSH/MSHA shall be used. In areas immediately hazardous to life, hose masks with blowers or self-contained breathing apparatus shall be used.

Where welding operations are carried on in a confined space and where welders and helpers are provided with hose masks, hose masks with blowers, or self-contained breathing apparatus, a worker shall be stationed on the outside of the confined space to ensure the safety of those working within.

When welding or cutting is being performed in any confined space, the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

Where a welder must enter a confined space through a manhole or other small opening, a means shall be provided for quick removal of the worker in case of emergency. When safety belts and lifelines are used for this purpose, they shall be attached to the welder's body in a way that ensures his or her body cannot be jammed in a small exit opening. A wrist harness assembly shall be used. An attendant with a preplanned rescue procedure shall be stationed outside to observe the welder at all times and shall be capable of putting rescue operations into effect.

When arc welding is to be stopped for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so accidental contact cannot occur. The machine shall be disconnected from the power source.

When gas welding or cutting, the torch valves shall be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch or overnight. Where practicable, the torch and hose shall also be removed from the confined space.

All confined spaces shall be monitored for oxygen content, combustible vapors, and toxic material prior to entry and periodically throughout the operation. Periodic testing shall depend on the type of space being entered. The Safety and Health Manager shall be consulted for guidance.

Portable Gas Units Procedures-

Portable gas welding, cutting, and brazing equipment must be of a type approved for the use intended.
Cylinders of compressed gas must have pressure reducing regulators installed.

Cylinders in use or in a transport must be stored in an upright position and secured to prevent them from falling.

Pressure hoses shall be secured to prevent whipping.

Oxygen cylinders and fittings shall be kept free of grease and oil at all times.

Cylinders shall be kept away from external sources of heat at all times.

Cylinders shall not be dropped of handled roughly. Cylinders or welding sets in excess of 40 pounds total weight shall be transported to and from work sites by push cart or motorized vehicle.

Portable Electric Unit Procedures-

Circuits shall be de-energized before testing, checking or transporting.

Motor-generator sets and other electrical welding equipment shall be grounded prior to use.

Rotary and polarity switches shall not be operated while the equipment is under an electrical load.

Arc welding equipment shall be inspected periodically and inspected prior to use following relocation. Power cables and electrode holders shall be inspected prior to every use.

Sheet Metal:

1.Machines shall be guarded in accordance with manufacturer's requirements.

2.Supervisors shall ensure sharp metal is stored in an area that will not pose a hazard to machine operators or personnel walking through designated aisles.

3. Work gloves shall always be worn when working with metal and metal scraps.

4. Hearing protection shall be worn when working in designated hazardous noise areas with noise sources operating or when using hand tools labeled hazardous noise producers.

Workplace Violence Policy

PREVENTING ACTS OF AGGRESSION, THREATENING BEHAVIOR, AND VIOLENCE IN THE WORKPLACE

Background:

An average of 20 workers are murdered each week in the United States. The majority of these murders are robbery-related crimes. In addition, an estimated 1 million workers are assaulted annually in U.S. workplaces. Most of these assaults occur in service settings such as hospitals, nursing homes, and social service agencies. Factors that place workers at risk for violence in the workplace include interacting with the public, exchanging money, delivering services or goods, working late at night or during early morning hours, working alone, guarding valuables or property, and dealing with violent people or volatile situations.

Joe R. Jones Construction, Inc. recognizes workplace violence as a serious occupational problem. In a June 1996 report, the National Institute for Occupational Safety and Health (NIOSH) published data that revealed homicide has become the second leading overall cause of occupational injury and death, exceeded only by motor-vehicle-related deaths. This report also identified homicide as the leading cause of occupational injury and death for female workers. The Northwestern National Life notes the seriousness of workplace violence in their 1993 report, which states that of every four full-time workers, one is harassed, threatened, or attacked on the job each year. Many incidents can be avoided by employees who are able to recognize early warning signs of potential violence, know when and how to report concerns, and know how to implement the steps to defuse situations before they become violent.

Purpose and Scope:

The purpose of this policy is to provide a safe workplace free from aggressive, threatening, or violent acts through the development and implementation of an effective program that provides a safe workplace. The provisions of this Policy apply to all work sites owned or controlled by Joe R. Jones Construction, Inc. and at which work is performed for Joe R. Jones Construction, Inc.

Policy:

It is the policy of Joe R. Jones Construction, Inc. to provide a safe workplace for its employees. To this end, all elements of Joe R. Jones Construction, Inc. are expected to implement a program to prevent and respond to violence in the workplace.

For purposes of this policy, violence is defined as the deliberate and wrongful violation, damage, or abuse of other persons, self, or property and includes threats of violence. Acts of violence and threats thereof include, but may not be limited to:

- verbal (such as threats, harassment, abuse, and intimidation),
- non-verbal (such as gestures and intimidation),
- physical (such as hitting, pushing, shoving, kicking, touching, and assault), and
- other (such as arson, sabotage, vandalism, and stalking).

It is important that all threats be taken seriously. The threat should not be ignored in the hope that it will resolve itself or out of fear of triggering an outburst from the person who has lodged the threat. If someone poses a danger to himself or others, appropriate authorities should be notified and action should be taken.

It is Company Policy to notify the police if any employee is threatened by anyone.
In developing this program, all sites shall consider the following:

1) A site-specific workplace violence policy and plan that includes written objectives and requirements for all organizational elements and incorporates the overall company policy in identifying and addressing threatening workplace behavior.

2) A review and approval of each plan by the cognizant manager. Specific protocols to be considered in the approval of such plans include:

a) Establishment of crisis assessment and response teams to include all interested stakeholders;

b) Maintenance of information on incidents of violence for review and analysis;

c) Establishment of a procedure for employees to confidentially report threatening situations and other relevant information to management

3) An awareness program for workplace violence prevention which should include:

a) Initial awareness and response orientation and instruction for management and supervisors;

b) Initial awareness orientation and information for workers, including new employee orientation as necessary;

c) Refresher awareness training on an as needed basis for all employees.

4) Written communication from each site to the responsible office of all incidents of violence and subsequent outcomes as the incidents occur.

5) Written communication from each organizational element to human resources of all incidents of violence involving employees and subsequent outcomes.

6) A written quarterly report from each site of all workplace violence incidents and outcomes submitted to the responsible office with a copy of this report forwarded to the occupational health department.

The cognizant manager should include information on workplace violence incidents and outcomes involving the workforce in this submittal.

Responsibilities:

The Safety and Health Manager will provide specific guidance for implementation of this program.

Supervisors will develop implementation plans incorporating the program requirements for prevention of, and response to, workplace violence of this program for employees

Implementation:

All departmental elements will modify their responsibilities, organizations, management processes, and missions as needed to ensure implementation of this policy.

POSSIBLE RISK FACTORS AND PREVENTIVE MEASURES

Risk Factors

Researchers have suggested a number of factors that may increase the risk of violence, injury and homicide in the workplace. The following are examples of these factors:

- Exchange of money with the public
- Working alone or in small numbers
- Working late night or early morning hours
- Working in high-crime areas
- Guarding valuable property or possessions
- Working in community settings (e.g., taxicab drivers and police)

Preventive Measures

Immediate preventive measures are needed to reduce the large number of occupational violence and homicides each year. The preventive measures presented here may provide some protection to workers until research studies can be conducted to evaluate their effectiveness.

A number of environmental and behavioral measures have been proposed for reducing occupational violence and homicides in high-risk establishments and occupations. These measures include the following:

- Make high-risk areas visible to more people.
- Install good external lighting.
- Use drop safes to minimize cash on hand.
- Carry small amounts of cash.
- Post signs stating that limited cash is on hand.
- Install silent alarms.
- Install surveillance cameras.
- Increase the number of staff on duty.
- Provide training in conflict resolution and nonviolent response.
- Avoid resistance during a robbery.
- Provide bullet-proof barriers or enclosures.
- Have police check on workers routinely.
- Close establishments during high-risk hours (late at night and early in the morning).

Conclusions:

Occupational violence and homicide is a serious public health problem, but many employers and workers may be unaware of the risk. No current OSHA regulations apply specifically to occupational violence or homicide, but a great need exists for worker protection from intentional injury in the workplace.
High-risk workplaces include taxicab establishments, liquor stores, gas stations, detective/protective services, justice/public order establishments, grocery stores, jewelry stores, hotels/motels, and eating/drinking places. High-risk occupations are taxicab drivers/chauffeurs, law enforcement officers (police officers/sheriffs), hotel clerks, gas station workers, security guards, stock handlers/baggers, store owners/managers, and bartenders. Employers in these high-risk establishments and occupations need to be aware of the risk for homicide and take steps to ensure a safe workplace.

RECOMMENDATIONS

NIOSH recommends that the following steps be taken to prevent occupational injuries and homicides. Joe R. Jones Construction, Inc. will take these steps:

- Evaluate the factors or situations in the workplace that may place workers at risk, and
- Carefully consider intervention efforts that might minimize/remove risk.

Tool Box Talks/Work Group Safety Meetings

Purpose:

The purpose of Tool Box Talks/Work Group Safety Meetings is to provide a method for the dissemination of information to all employees regarding safety and health issues.

Regular Tool Box Talks/Work Group Safety Meetings demonstrate Joe R. Jones Construction, Inc.'s concern for the lives and well being of its employees. Tool Box Talks/Work Group Safety Meetings help build a cooperative climate by providing employees with the opportunity to contribute ideas, and to make suggestions that may improve quality, productivity, morale, and safety.

Safety education is required of all employees *at all levels* within the organization. Joe R. Jones Construction, Inc. will have a formalized safety training program to prevent accidents and to train employees to do their job safely. Scheduled, Tool Box Talks/Work Group Safety Meetings will be conducted every Monday morning at 8:00 am and at times deemed necessary by the Safety and Health Manager or supervisory personnel

Responsibilities:

Joe R. Jones Construction, Inc. President will provide the direction and motivation to ensure that all managers conduct regular Tool Box Talks/Work Group Safety Meetings.

Managers and Supervisory Personnel that conduct safety discussions will maintain a log of what was discussed and who attended the meeting. This information shall be turned over to the Safety and Health Manager on a weekly basis.

The Safety and Health Manager shall be a resource for safety and health discussion topics, and shall keep all documentation of all training at a central location.

Employees are required to attend all Tool Box Talks/Work Group Safety Meetings. In the event an employee misses a Tool Box Talk/Work Group Safety Meeting, the employee shall be given individual instruction by their supervisor concerning what was discussed/covered. The supervisor shall document this "training session" and will provide the Safety and Health Manager with this documentation.

A collection of materials is available on the Joe R. Jones Construction, Inc. web site.

Procedure:

The Tool Box Talk/Work Group Safety Meeting is a method used by this Company to develop the employees' safety awareness.

Conducting Tool Box Talks/Work Group Safety Meetings

For greatest effectiveness, cover subjects that most interest the employees. These topics might include accidents, inspection results, the safety program, or a work procedure.

These weekly meetings should last no longer than 15-30 minutes. Ideally, the meeting would include time for active participation by employees; at the least, there should be a question and answer session.

Schedule meetings at the beginning of new operations to ensure that all of the employees are familiar with safe job procedures and the requirements of the upcoming work. These meetings save a lot of time in the long run.

Tool Box Talks/Work Group Safety Meetings may be either motivational or instructional. The motivational meeting creates awareness and aims at worker self protection. The instructional meeting covers a particular job task or procedure.

The supervisor is the key management communicator for work groups, because he or she is most familiar with the individual workers and their work requirements.

The Control Of Hazardous Energy (Lockout/Tagout)

NOTE: The Control of Hazardous Energy (Lockout/Tagout) was adopted by Joe R. Jones Construction, Inc. on August, 2003- and was effective on September, 2003.

(a) Scope, application and purpose

(1) Scope

(i) This standard covers the servicing and maintenance of machines and equipment in which the unexpected energization or start up of the machines or equipment, or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

(ii) This standard **does not cover** the following:

(A) Installations under the exclusive control of electric utilities for the purpose of power generation, transmission and distribution, including related equipment for communication or metering; and

B) Exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations. and

(C) Oil and gas well drilling and servicing.

(2) Application.

(i) This standard applies to the control of energy during servicing and/or maintenance of machines and equipment.

(ii) Normal production operations are not covered by this standard. Servicing and/or maintenance which takes place during normal production operations is covered by this standard only if:

(A) An employee is required to remove or bypass a guard or other safety device; or

(B) An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

Note: Exception to paragraph (a)(2)(ii): Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection

(iii) This standard **does not apply** to the following.

(A) Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

(B) Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that the Company demonstrates that

(1) continuity of service is essential;
(2) shutdown of the system is impractical; and
(3) documented procedures are followed, and
(4) special equipment is used which will provide proven effective protection for employees.

(3) Purpose.

(i) This section requires Joe R. Jones Construction, Inc. to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start-up or release of stored energy in order to prevent injury to employees.

(ii) When other standards in this part require the use of lockout or tagout, they shall be used and supplemented by the procedural and training requirements of this section.

(b) Definitions applicable to this section.

Affected employee. An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under

lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized employee. A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of being locked out. An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized. Connected to an energy source or containing residual or stored energy.

Energy isolating device. A mechanical device that physically prevents the transmission or release or energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy source. Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot tap. A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout. The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device. A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Normal production operations. The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance. Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting up. Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout. The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout device. A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

(c) General.

(1) Energy control program. Joe R. Jones Construction, Inc. shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and rendered inoperative.

(2) Lockout/tagout.

(i) If an energy isolating device is not capable of being locked out, the Company's energy control program under paragraph (c)(1) of this section shall utilize a tagout system.

(ii) If an energy isolating device is capable of being locked out, Joe R. Jones Construction, Inc.'s energy control program under paragraph (c)(1) of this section shall utilize lockout, unless Joe R. Jones Construction, Inc. can demonstrate that the utilization of a tagout system will provide full employee protection as set forth in paragraph (c)(3) of this section.

(iii) Whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machines or equipment shall be designed to accept a lockout device.

(3) Full employee protection.

(i) When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached, and Joe R. Jones Construction, Inc. shall demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

(ii) In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, Joe R. Jones Construction, Inc. shall demonstrate full compliance with all tagout-related provisions of this standard together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include the implementation of additional safety measures such as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

(4) Energy control procedure.

(i) Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.

Note: Exception: Joe R. Jones Construction, Inc. need not document the required procedure for a particular machine or equipment, when all of the following elements exist:

(1) The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees;

(2) The machine or equipment has a single energy source which can be readily identified and isolated;

(3) The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;

(4) The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;

(5) A single lockout device will achieve a locked-out condition;

(6) The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;

(7) The servicing or maintenance does not create hazards for other employees; and

(8) Joe R. Jones Construction, Inc., in utilizing this exception, has had no accidents involving the unexpected activation or re-energizing of the machine or equipment during servicing or maintenance.

(ii) The procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

(A) A specific statement of the intended use of the procedure;

(B) Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;

(C) Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and

(D) Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

(5) Protective materials and hardware.

The following Joe R. Jones Construction, Inc.-initiated rule relates to **29 CFR 1910.147(c)(5)**: ***437-002-0154 Unique Locks.*** *In addition to and not in lieu of the definition contained in 1910.147(b) for "lockout device," each person's lock shall have either a key or combination which is* ***unique*** *to that device.*

(i) Locks, tags, chains, wedges, key blocks, adapter pins, self- locking fasteners, or other hardware shall be provided by Joe R. Jones Construction, Inc. for isolating, securing or blocking of machines or equipment from energy sources. **(ii)** Lockout devices and tagout devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

(A) Durable.

(1) Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
(2) Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.
(3) Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

(B) Standardized. Lockout and tagout devices shall be standardized within the facility in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized.

(C) Substantial.

(1) **Lockout devices.** Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

(2) **Tagout devices.** Tagout devices, including and their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

(D) Identifiable. Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

(iii) Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following:

Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate.

(6) Periodic inspection.

(i) Joe R. Jones Construction, Inc. shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed.

(A) The periodic inspection shall be performed by an authorized employee other than the one(s) utilizing the energy control procedure being inspected.

(B) The periodic inspection shall be conducted to correct any deviations or inadequacies identified.

(C) Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

(D) Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy

control procedure being inspected, and the elements set forth in paragraph (c)(7)(ii) of this section.

(ii) Joe R. Jones Construction, Inc. shall certify that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

(7) Training and communication.

(i) Joe R. Jones Construction, Inc. shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:

(A) Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

(B) Each affected employee shall be instructed in the purpose and use of the energy control procedure.

(C) All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

(ii) When tagout systems are used, employees shall also be trained in the following limitations of tags:

(A) Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

(B) When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

(C) Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.

(D) Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

(E) Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

(F) Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

(iii) Employee retraining.

(A) Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

(B) Additional retraining shall also be conducted whenever a periodic inspection under paragraph (c)(6) of this section reveals, or whenever Joe R. Jones Construction, Inc. has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

(D) The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

(iv) The Company shall certify that employee training has been accomplished and is being kept up-to-date. The certification shall contain each employee's name and dates of training.

(8) Energy isolation. Lockout or tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.

(9) Notification of employees. Affected employees shall be notified by Joe R. Jones Construction, Inc. Supervisor or authorized employee of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

(d) Application of control. The established procedures for the application of energy control (the lockout or tagout procedures) shall cover the following elements and actions and shall be done in the following sequence:

(1) Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type

and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

(2) Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

(3) Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

(4) Lockout or tagout device application.

(i) Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

(ii) Lockout devices, where used, shall be affixed in a manner to that will hold the energy isolating devices in a "safe" or "off" position

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(iii) Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

(A) Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.

(B) Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

(5) Stored energy.

(i) Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

(ii) If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation shall be continued until the

servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

(6) Verification of isolation. Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and de-energization of the machine or equipment have been accomplished.

(e) Release from lockout or tagout. Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following

:**(1) The machine or equipment.** The work area shall be inspected to ensure that non-essential items have been removed and to ensure that machine or equipment components are operationally intact.

(2) Employees.

(i) The work area shall be checked to ensure that all employees have been safely positioned or removed.

(ii) After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.

(3) Lockout or tagout devices removal. Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device.

Exception to paragraph (e)(3): When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of Joe R. Jones Construction, Inc. Supervisor, provided that specific procedures and training for such removal have been developed, documented and incorporated into the Joe R. Jones Construction, Inc.'s energy control program. Joe R. Jones Construction, Inc. shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:

(i) Verification by Joe R. Jones Construction, Inc. Supervisor that the authorized employee who applied the device is not at the facility;

(ii) Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and

(iii) Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.

(f) Additional requirements.

(1) Testing or positioning of machines, equipment or components thereof. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions shall be followed:

(i) Clear the machine or equipment of tools and materials in accordance with paragraph (e)(1) of this section;

(ii) Remove employees from the machine or equipment area in accordance with paragraph (e)(2) of this section;

(iii) Remove the lockout or tagout devices as specified in paragraph (e)(3) of this section;

(iv) Energize and proceed with testing or positioning;

(v) Deenergize all systems and reapply energy control measures in accordance with paragraph (d) of this section to continue the servicing and/or maintenance.

(2) Outside personnel (contractors, etc.).

(i) Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the on-site Company and the outside Company shall inform each other of their respective lockout or tagout procedures.

(ii) The on-site Company shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside Company's energy control program.

(3) Shift or personnel changes. Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

TYPICAL MINIMAL LOCKOUT PROCEDURE

Note: The following Appendix A to §1910.147 serves as a non-mandatory guideline to assist Joe R. Jones Construction, Inc. and employees in complying with the requirements of this section, as well as to provide other helpful information. Nothing in the Appendix adds to or detracts from any of the requirements of this section.

APPENDIX A – TYPICAL MINIMAL LOCKOUT PROCEDURE GENERAL

The following simple lockout procedure is provided to assist Joe R. Jones Construction, Inc. in developing its procedures so they meet the requirements of this standard. When the energy isolating devices are not lockable, tagout may be used, provided Joe R. Jones Construction, Inc. complies with the provisions of the standard which require additional training and more rigorous periodic inspections.

When tagout is used and the energy isolating devices are lockable, the Company must provide full employee protection (see paragraph (c)(3)) and additional training and more rigorous periodic inspections are required. For more complex systems, more comprehensive procedures may need to be developed, documented and utilized.

LOCKOUT PROCEDURE

Purpose

This procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing is done on machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

Compliance with this program

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance shall not attempt to start, energize or use that machine or equipment.

ANY VIOLATION OF THIS PROCEDURE CAN AND WILL BE SUBJECTED TO DISCIPLINARY ACTIONS AND CAN INCLUDE IMMEDIATE TERMINATION!

SEQUENCE OF LOCKOUT

(1) Notify Joe R. Jones Construction, Inc. Supervisor the need of Tagout/Lockout.

(2) The Joe R. Jones Construction, Inc. Supervisor will assess the equipment to be locked and/or tagged out.

(3) Joe R. Jones Construction, Inc. Supervisor to prepare the Lockout/Tagout and notify/coordinate with the proper authorities of the Lockout/Tagout.

(4) Joe R. Jones Construction, Inc. Supervisor will Lockout/Tagout the requested Equipment and test to ensure the equipment is safe for service to be performed.

(5) Before proceeding Joe R. Jones Construction, Inc. employee that will be performing service to equipment will verify that equipment is out of service and ready to be worked on.

(6) The Joe R. Jones Construction, Inc. Employee to install any additional locks or tags on the out of service equipment to satisfy his own personal safety.

(7) The Joe R. Jones Construction, Inc. Employee and Supervisor will discuss any special requirements or needs.

Caution: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

(8) The Joe R. Jones Construction, Inc. Employee will start work on required equipment only after: he/she has verified proper equipment to be worked on, equipment is locked/tagged out satisfactorily all safety precautions have been taken.

Note: If equipment is to be locked/tagged out more than one shift prior to The start of every shift the lockout/tag out must be re-verified.

RESTORING EQUIPMENT TO SERVICE- When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

(1) The Joe R. Jones Construction, Inc. employee to inform Supervisor that the required work is completed on locked out/tagged out equipment.

(2) The Joe R. Jones Construction, Inc. employee to remove all of his/her tags and or locks or any other installed safety or blocking devices.

(3) The Joe R. Jones Construction, Inc. Supervisor to verify that all required work is complete and all safety or blocking devices are removed. Ensure that the equipment is ready to return to normal service.

(4) The Joe R. Jones Construction, Inc. Supervisor to notify/coordinate with the proper authorities to return the equipment to service. .

Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.

(5) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

EMPLOYEE POSTING
JOB SITE FIRST AID PRECAUTIONS-BLOOD AND BODILY FLUIDS

PERSONAL PROTECTIVE EQUIPMENT

1) RUBBER GLOVES ARE TO BE USED WHEN THERE IS ANY POTENTIAL FOR DIRECT CONTACT WITH BLOOD OR ANY POTENTIALLY INFECTIOUS BODY FLUIDS. GLOVES SHOULD BE DISCARDED IF THEY HAVE VISIBLE DEFECTS OR IF THEY ARE SOILED.

2) MOUTH PIECES AND RESUSCITATION BAGS ARE TO BE USED FOR ALL RESUSCITATION PROCEDURES.

3) EYE PROTECTION OR FACE SHIELDS SHOULD BE USED IF THERE IS ANY POTENTIAL FOR SPLASHING OR SPRAYING OF BLOOD OR FLUIDS.

HYGIENE

1) IF CONTAMINATED WITH BLOOD OR OTHER BODILY FLUIDS, HANDS AND OTHER SKIN SURFACES SHOULD BE WASHED IMMEDIATELY WITH SOAP AND WATER OR ANTISEPTIC HAND CLEANER IF WATER IS NOT AVAILABLE.

2) HANDS SHOULD BE WASHED IMMEDIATELY AFTER RUBBER GLOVES ARE REMOVED.

3) ANY PERSONAL PROTECTIVE DEVICES USED, EXCEPT FOR DISPOSABLE KITS, MAY BE CLEANED AND REUSED IF THE MANUFACTURER PERMITS. IF NOT, THEY SHOULD BE DISPOSED OF IN THE PROPER MANNER. MANUFACTURERS CLEANING PROCEDURES SHOULD BE STRICTLY ADHERED TO.

RESUSCITATION

1) RESUSCITATION SHOULD ONLY BE DONE USING MOUTHPIECES AND/OR RESUSCITATION BAGS. MOUTH-TO-MOUTH PROCEDURES ARE NOT ALLOWED.

WASTE

1) ALL MATERIALS SUCH AS GLOVES, BANDAGES, ETC. THAT ARE SOAKED WITH BLOOD OR OTHER POTENTIALLY HAZARDOUS BODILY FLUIDS SHOULD BE PLACED IN BIOHAZARD BAGS FOR DISPOSAL.

EMPLOYEE POSTING

JOB SITE FIRST AID PRECAUTIONS-BLOOD AND BODILY FLUIDS

FIRST AID KITS

JOB SITE FIRST AID KITS SHOULD BE PROVIDED WITH THESE ITEMS IN ADDITION TO THEIR REGULAR SUPPLIES:

1) **RUBBER GLOVES (AT LEAST ONE DOZEN PAIR)**

2) **SAFETY GLASSES WITH SIDE SHIELDS OR A FACE SHIELD.**

3) **RESUSCITATION MOUTHPIECES.**

4) **ANTISEPTIC HAND CLEANER AND CLEAN PAPER TOWELS OR SELF-CONTAINED TOWELETTES.**

5) **BIOHAZARD DISPOSAL BAGS.**

JOE R. JONES CONSTRUCTION, INC.

Blood-Borne Pathogen and Infectious Waste Program (site specific)

Hazardous Exposure Incident Report Form

Employee:	Employee Number:
Location of Job Site:	
Date Exposure Occurred:	Date Reported:
What was the material to which you were exposed?	Where did the material touch you?
How did exposure occur?	To whom did you report exposure?
Did you notify your Supervisor or Project Manager or Safety Coordinator?	
Comments:	
Your Signature:	Date:
Report Accepted By:	Date:
Referred to:	Date:
Additional Information:	

Incident Reporting System and Investigation Procedure

Introduction:

Joe R. Jones Construction, Inc. Incident Reporting System is designed to:

1. Track and analyze employee injuries and illnesses, property and vehicle damage, as well as serious events or near misses which might have resulted in personal injury, illness, or property and vehicle damage
2. Initiate the worker's compensation process, if necessary
3. Meet regulatory reporting requirements

All incidents (accidents resulting in injury or causing illness to Company employees) and events (near-miss accidents) shall be reported in order to:

- Establish a written record of factors which cause injuries and illnesses and occurrences (near-misses) which might have resulted in injury or illness but did not, as well as property and vehicle damage.
- Maintain a capability to promptly investigate incidents and events in order to initiate and support corrective and/or preventive action.
- Provide statistical information for use in analyzing all phases of incidents and events involving Company personnel.
- Provide the means for complying with the reporting requirements for occupational injuries and illnesses outlined in Section 19 of the Occupational Safety and Health Act of 1970.

Applicability and Scope:

The Incident Reporting System requirements apply to all incidences involving Company personnel arising out of or in the course of employment which results in (or might have resulted in) personal injury, illness, and/or property and vehicle damage.

Incidents (Occupational Injuries and Illnesses)

Injuries and illnesses that require reporting include those injuries and illnesses occurring on the job which result in any of the following: lost work time, restrictions in performing job duties, requirement for first aid or outside medical attention, permanent physical bodily damages, or death. Examples of "reportable injuries and illnesses include, but are not limited to, heat exhaustion from working in hot environments, strained back muscles from moving equipment, acid burns on fingers, etc.

Other incidents requiring reporting include those incidents occurring on the job which result in any of the following: injury or illness, damage to a Government vehicle, fire/explosion, property damage of more than $100, or chemical releases requiring evacuation of at least that immediate spill area. Examples of reportable incidents include denting the fender of a Government vehicle, spilling 1 liter of sulfuric acid on the floor, and release of pressurized air through a leaking valve into a room.

Examples of "non-reportable" injuries and illnesses include small paper cuts, common colds, and small bruises not resulting in work restrictions or requiring first aid or medical attention. Examples of other non-reportable incidents include, but are not limited to, dropping and breaking an empty glass sample bottle, knocking over 10 milliliters of sulfuric acid in a graduated cylinder under a fume hood and knocking a chair or table over.

Events (Near Misses)

Other incidents which, strictly by chance, do not result in actual or observable injury, illness, death, or property damage are required to be reported. The information obtained from such reporting can be extremely useful in identifying and mitigating problems before they result in actual personal or property damage.

Examples of near miss incidences required to be reported include the falling of a compressed gas cylinder, overexposures to chemical, biological, or physical agents (not resulting in an immediately observable manifestation of illness or injury), and slipping and falling on a wet surface without injury.

Responsibilities

All Company personnel have a responsibility to report all occupational injuries and illnesses, and other incidents or events under Joe R. Jones Construction, Inc. Incident Reporting System.

Office of Health and Safety

Safety and Health Coordinator has the overall responsibility for implementing the Incident Reporting System, including review of incident/event reports, recommendation of corrective and/or preventive actions, and maintaining record keeping required by federal regulations.

Supervision

Supervisors are primarily responsible for ensuring that Joe R. Jones Construction, Inc. Incident Report and appropriate workers compensation forms are completed and distributed as indicated on the forms in a timely manner.

Company Personnel

All Company employees must be familiar with the procedures for reporting occupational injuries and illnesses and hazardous conditions or situations in which employees may be potentially exposed. All Company personnel have the responsibility to initiate the incident reporting sequence by informing their supervisors immediately of an actual or potential injury or illness as soon as possible after an incident has occurred.

Incident Reporting Procedures and Practices

This section describes the specific procedures that shall be followed by Company personnel in order to effectively report occupational injuries and illnesses and other incidents or events.

Incidents (Injuries and Illnesses)

Serious injury or illness posing a life-threatening situation shall be reported immediately to the local emergency response medical services (Call 911).

Injuries and illnesses shall be reported by the injured employee to his or her supervisor in person or by phone as soon after any life-threatening situation has been addressed. If the injured employee is unable to report immediately, then the incident should be reported as soon as possible.

Upon notification of an occupational injury or illness, the supervisor should notify the Safety and Health Coordinator, who will then prepare the necessary record keeping forms.

Events

Incidents not involving injury or illness, but resulting in property damage, must also be reported to the Safety and Health Coordinator within 48 hours of the incident. In cases of a fire or explosion that cannot be controlled by one person, vehicular accident resulting in injury or more than $500 worth of damage, or a chemical release requiring a building evacuation, the involved party must immediately report the incident to the emergency response services in the area (911 – police, fire, etc.)

All near miss incidences are also required to be reported on the Incident Report Form within 48 hours of occurrence. In place of indicating the result of the incident (i.e., actual personal or property damage), the reporting person shall indicate the avoided injury or damage.

Events, hazardous working conditions or situations, and incidents involving contractor personnel must be reported to Safety and Health Safety and Health Coordinator immediately.

Recordkeeping

The Safety and Health Safety and Health Coordinator will maintain the required OSHA 200 Log and Summary of (recordable) Occupational Injuries and Illnesses and the OSHA 101 Supplementary Record of Occupational Injuries and Illnesses for each calendar year.

The required portion of the OSHA 200 Log and Summary of Occupational Injuries and Illnesses will be posted annually during the entire month of February throughout Company facilities for the previous calendar year.

Each individual field station must also maintain their own OSHA 200 Log and OSHA 101 outlined above must be followed. OHS should be contacted [(404) 639-3146] for more specific information regarding this matter.

Incident Investigations

The Safety and Health Safety and Health Coordinator will review each reported incident and event to:

1. Determine if further investigation is required and then perform the investigation
2. Make recommendations for corrective and/or preventative actions necessary to reduce or eliminate hazardous conditions and monitor the status of the abatement actions.

Company Health and Safety Manual

Each new employee shall be given copies of sections of the Company Health and Safety Manual (that pertain to employee safety) upon starting employment with Joe R. Jones Construction, Inc. These copies of the manual describes health and safety programs at Company and is available to the employee as a reference dealing with health and safety issues.

Training

To ensure that Company personnel are cognizant of Joe R. Jones Construction, Inc. Incident Reporting System requirements and are aware of their own and other's responsibilities, a series of informational and instructional training opportunities exist.

Personnel new to Joe R. Jones Construction, Inc. are required to attend New Employee Orientation training which will inform them on Company organizational structure, resources, and procedures. This orientation will ensure that new personnel are aware of the existence of this Manual and of its contents, and who the responsible persons in their organizations are.

Review and Audit

The effectiveness of a program can only be accomplished if the program is implemented. Therefore, periodic reviews and audits shall be conducted to confirm that all employees have obtained a copy of this Manual and are familiar with the incident reporting requirements. Furthermore, review and auditing many include an inspection of report submissions and filing systems.

Implementation

Implementation of Joe R. Jones Construction, Inc. Incident Reporting System will be effected through a combination of mechanisms. The general theme of these means is focused on program education, understanding, and awareness which includes:

- Distribution of Joe R. Jones Construction, Inc. Health and Safety Manual
- Training for supervisors
- Program review and audit

Bibliography

The National Institute of Environmental Health Sciences (NIEHS)

The Center for Disease Control, US Government

National Institute of Occupational Safety and Health (NIOSH)

Occupational Safety and Health Administration (OSHA)

Texas Occupational Safety and Health

US Department of Agriculture

Office of Health and Safety, Centers for Disease Control and Prevention,
1600 Clifton Road N.E., Mail Stop F05 Atlanta, Georgia 30333, USA

University of California, Berkeley, California