

# ACCIDENT PREVENTION PROGRAM

**TEK**

construction, inc.



## TABLE OF CONTENTS

<b>Subject</b>	<b>Page</b>
Introduction	2
General Instructions	3
Responsibilities	4
Personal Safety Rules	5
Personal Protective Equipment Policy	6 – 7
Safety Disciplinary Policy	8
Procedure for Reporting Injury or Illness on the Job	9
Basic Rules for Accident Investigation	10
First Aid Training, Kits & Information	11
Work Crew Safety Meetings	12
Walk-around Safety Inspections	13
General Safety Rules for Construction	14
Ladders & Guardrails	15-16
Fall Protection	17-33
Scaffolding Safety Procedures for Construction	34-55
Confined Space Entry	56-66
Respiratory Protection Program	67
Lockout/Tagout Program	68
Fire Prevention	69-72
Hazard Communication Program	73
Motorized Vehicles and Equipment	74
Material Handling Safety Guidelines	75-77
Outdoor Heat Exposure	78-79
Heat Stress	80
Heat Stroke or Heat Exhaustion	80-81
Heat Stress Checklist	82
Grounding Conductor Program	83-88
Hearing Conservation	89-93
Hot Work Safety Program	94-102
Powered Industrial Trucks (Forklift)	103-114
Trench & Excavation Safety	115
Process Safety Management Compliance Program	116-119
Cranes, Rigging & Hoisting	120-131
<b>Appendices:</b>	
Employee Orientation Checklist - Safety	A
Employee's Report of Injury/Accident Form	B
Incident Investigation Report Form	C
Employee Orientation Checklist – Hazardous Substances	D
Construction Self Inspection Guide	E
Confined Space Attendant Log	F
Confined Space Pre-Job Assessment Form	G
Ground Fault Inspection Record	H
Hearing Protection / Equipment List	I
Hearing Conservation Program Follow Up Training Record	J
Updated 7/22/11	

# INTRODUCTION

The purpose of this program is to develop a high standard of safety throughout all operations of TEK Construction, Inc. and to ensure that no employee is required to work under any conditions which are hazardous or unsafe.

We believe that the individual employee has the right to gain personal satisfaction from his/her job and the prevention of occupational injury or illness is of such consequence to this belief that it will be given top priority at all times.

It is our intention here at TEK to initiate and maintain complete accident prevention and safety training programs. Every TEK employee is responsible for the safety and health of those persons in their charge, co-workers around them, and themselves. By accepting mutual responsibility to operate safely, we all contribute to the well-being of personnel.

In the event that you as an employee are involved in a job related accident, you are required to complete the "Employee's Report of an Accident" and inform the site supervisor of any injury and/or property damage that occurred. This is to be done the same day as the accident prior to leaving the jobsite.

TEK Construction's safety manager is Kip Smith. He can be contacted at 425 508-4875.

# GENERAL INSTRUCTIONS

## A. Overview

Industrial injuries create a no-win situation for everyone involved. Employees experience pain, suffering and incapacitation while the company suffers from the loss of the injured person's contributions. This document is designed to assist all personnel in assuring that such an undesirable situation will not develop in this company. It provides information and guidance for the establishment and maintenance of an injury-free work environment.

## B. Procedures

This document contains guidance for safety procedures to be followed and forms to be used. Supervisors are expected to integrate the procedures into the appropriate work activity and employees are expected to apply them on the job. The sample forms are to be used if they apply to the job concerned.

## C. Dissemination

A copy of this statement will be issued to all supervisory and management personnel. A copy of the policy statement will be posted at all jobsites. An abbreviated version will be included in the Employee handbook and a complete version is available upon request from the main office.

## D. Regulations

A copy of the following documents will be maintained on each job site:

1. Chapter 155, Construction Safety Standards from the Division of Industrial Safety and Health, Washington State Department of Labor and Industries.  
(CD format)
2. The WISHA Poster, form F416-081-909, which tells employees and employers their rights under the Washington Industrial Safety and Health Act.

# RESPONSIBILITIES

Responsibilities for safety and health include the establishment and maintenance of an effective communication system among workers, supervisors and management officials. All personnel are responsible to assure that their messages are received and understood by the intended receiver. Specific safety and health responsibilities for company personnel are as follows:

## **A. Management Officials**

Active participation in and support of safety and health programs is essential. Management officials will display their interest in safety and health matters at every opportunity. At least one manager (as designated) will participate in the safety and health committee meetings, incident investigations and inspections. Each manager will establish realistic goals for implementing instructions for meeting the goals. Goals and implementing instructions shall be within the framework established by this document. Incentives will be included as part of the instructions.

## **B. Supervisors**

The safety and health of the employees they supervise is a primary responsibility of the supervisors. To accomplish this obligation, supervisors will:

1. Assure that all safety and health rules, regulations, policies and procedures are understood and observed.
2. Require the proper care and use of all required personal protective equipment.
3. Identify and eliminate job hazards quickly through job safety analysis procedures. (See the sample Job Safety Analysis form attached to this document.)
4. Inform and train employees on the hazardous chemicals and/or procedures they MAY encounter under normal working conditions or during an emergency situation. (See the sample hazard communication program.)
5. Receive and take initial action on employee suggestions or disciplinary measures.
6. Conduct weekly safety meetings to discuss safety and health matters and work plans.
7. Conduct walk-around safety inspections at the beginning of each job, and at least weekly thereafter.
8. Train employees (new and experienced) in the safe and efficient methods of accomplishing each job or task as necessary.
9. Review injury trends and establish prevention measures.
10. Attend safety meetings and actively participate in the proceedings.
11. Participate in incident investigations and inspections.
12. Promote employee participation in the safety and health program.
13. Actively follow the progress of injured workers and display an interest in their rapid recovery and return to work.

## **C. Employees**

Observe the items of responsibility established in this document as well as job safety rules which may apply to specific task assignments.

# PERSONAL SAFETY RULES

1. Immediately report every injury, no matter how slight, to your supervisor.
2. Horseplay, fighting, gambling, possession of firearms and possession or use of alcoholic beverages are strictly forbidden.
3. Drugs, except as prescribed by a qualified physician, will not be tolerated. If you are using drugs prescribed by a qualified physician, you must notify your supervisor.
4. Running on any construction site is strictly prohibited except in extreme emergencies.
5. Wear clothing suitable for the weather and your work. Torn, loose clothing, cuffs, or sleeves, etc. are hazardous and could cause accidents.
6. Jewelry (rings, bracelets, neck chains, etc.) should not be worn.
7. Hard hats must be worn at all times.
8. ANSI approved eye protection must be carried at all times and worn when operations present potential eye injury.
9. Proper footwear must be worn on all construction sites; safety boots are highly recommended. The wearing of sport shoes, sandals, dress shoes and similar footwear is strictly prohibited.
10. Always use gloves, aprons or other protective clothing when handling rough materials, chemicals and hot or cold objects.
11. When spray painting, finish painting, burning, exposed to large quantities of dust or to other toxic hazards, always wear the correct respirator as required.
12. Safety equipment is for your protection. Use it correctly and keep it in its best working condition, immediately report any lost or damaged equipment.
13. It is the employee's responsibility to inform his supervisor of any additional protection equipment needed prior to beginning operation presenting the hazard.

# PERSONAL PROTECTIVE EQUIPMENT POLICY

## **Policy:**

This policy is designed to increase the safety and health of TEK Construction's employees, subcontractors, and visitors. TEK Construction believes that all individuals on our jobsites shall wear adequate personal protective equipment, in order to maintain this objective.

## **Procedure:**

### Hard Hats and Safety Glasses

All TEK employees and visitors must wear ANSI approved hard hats anytime they are working on or visiting a jobsite. They are also required to carry eye and/or face protection at all times and wear it when machines or operations present potential eye or face injury from physical, chemical, or radiation agents. If the safety glasses cause vision difficulties the employee is to immediately contact his project superintendent, who may authorize appropriate corrective action. If an exception is granted, it will be explained to the entire crew at the next safety meeting. TEK will provide the hard hats and non-prescription safety glasses to all TEK employees and visitors.

Subcontractor employees are required to wear hard hats at all times on the jobsite. They are also required to carry eye and/or face protection at all times and wear it when machines or operations present potential eye or face injury from physical, chemical, or radiation agents. Subcontractors have the responsibility to provide their workers with ANSI approved hard hats and safety glasses.

### Personal Flotation Devices

Any TEK employee working on, over or adjacent to water, shall be provided with, and shall wear, approved personal flotation devices. Approved flotation devices shall be approved by the United States Coast Guard as a Type I, II, III or V or their equivalent.

All subcontractors and visitors are required to wear approved personal flotation devices when exposed to the same hazards.

This requirement will be determined on each job by the Superintendent and the Safety Manager, depending on the exposure.

## Disciplinary Procedures

Usually, the following three steps shall be taken when an employee is found to not be wearing their personal protective equipment.

WARNING 1: The employee and supervisor will immediately discuss the Personal Protective Equipment Policy and the importance of wearing the equipment. The supervisor instructs the employee to wear the personal protective equipment. The supervisor reiterates the disciplinary actions that would follow if the employee is again found to not be wearing the required protective equipment.

WARNING 2: The employee is sent home for the remainder of the day without pay.

WARNING 3: The employee may be subject to termination.

If the situation warrants it, the supervisor or manager may take other actions instead of these warnings; including the termination of the employee. All warnings shall be documented in writing, copied and placed in the employees personnel file at the home office. If, after any warning, the employee chooses not to wear the personal protective equipment provided, the employee may be subject to termination.



# SAFETY DISCIPLINARY POLICY

TEK Construction, Inc. believes that a safety and health Accident Prevention Program is unenforceable without some type of disciplinary policy. Our company believes that in order to maintain a safe and healthful workplace, the employees must be cognizant and aware of all company, State, and Federal safety and health regulations as they apply to the specific job duties required. The following disciplinary policy is in effect and will be applied to all safety and health violations.

The following steps will be followed unless the seriousness of the violation would dictate going directly to Step 2 or Step 3.

1. A first time violation will be discussed orally between company supervision and the employee. This will be done as soon as possible.
2. A second time offense will be followed up in written form and a copy of this written documentation will be entered into the employee's personnel folder.
3. A third time violation will result in time off or possible termination, depending on the seriousness of the violation.

# PROCEDURES FOR AN INJURY OR ILLNESS ON THE JOB

1. Employee Accident/Injury Reporting:
  - a. Report the accident/injury immediately to your supervisor or foreman.
  - b. Fill out "Employees Report of Accident Form" - See attached form.
  - c. When you fill out your "Employee's Daily Labor Report" note the injury - See attached form.
  
2. In the case of a serious accident, the foreman will take control:
  - a. Supervise and administer first aid.
  - b. Secure site and make sure there is no chance of secondary injury.
  - c. Arrange for transportation (ambulance, company vehicle, etc.), depending on the seriousness of the injury.
  - d. Notify top management if not already present. A contact should be made with the Safety Manager at the home office (360) 380-1623.
  
3. Documentation:
  - a. **Minor injuries** (requiring doctor/outpatient care). After the medical needs of the injured person have been take care of, an investigation of the accident will be conducted by the immediate supervisor and any witnesses to determine the causes. The accident cause and finding will be discussed at the next safety meeting. The findings shall be documented on our accident form and recorded on the OSHA 300 log.
  
  - b. **Major injuries** (fatality or multiple hospitalization). Top management must see that the Department of Labor and Industries is notified as soon as possible (at least within 24 hours). Contact the Safety Manager at the home office for notification of L&I. Onsite management will then assist L&I in the investigation. The findings shall be documented on our accident form and recorded on the OSHA 300 log.
  
4. Near-Misses:
  - a. All near-misses shall be investigated to find cause and eliminate it.
  - b. Document findings on TEK accident form.
  - c. Review findings at weekly safety meeting or sooner if situation warrants.

## SAFETY MEETINGS

Safety Meetings are held weekly on every TEK jobsite. Every safety meeting will cover a specific topic. The weekly topics relate to the jobsite activities. All employees are required to attend and are encouraged to share any safety related information or safety concern they have.

# BASIC RULES FOR ACCIDENT INVESTIGATION

- The purpose of an investigation is to find the cause of an incident and prevent future occurrences, not to fix blame. An unbiased approach is necessary to obtain objective findings.
- Visit the incident scene as soon as possible – while facts are fresh and before witnesses forget important details.
- If possible, interview the injured worker at the scene of the incident and “walk” him or her through a re-enactment. Be careful not to actually repeat the act that caused the injury.
- All interviews should be conducted as privately as possible. Interview witnesses one at a time. Talk with anyone who has knowledge of the incident, even if they did not actually witness the mishap.
- Consider taking the signed statements in cases where facts are unclear or there is an element of controversy.
- Graphically document details of the incident: area, tools, and equipment. Use sketches, diagrams, and photos as needed, and take measurements when appropriate.
- Focus on causes and hazards. Develop an analysis of what happened, how it happened, and how it could have been prevented. Determine what caused the incident itself (unsafe equipment/condition, unsafe act, etc), not just the injury.
- How will you prevent such incidents in the future? Every investigation should include an action plan.
- If a third party or defective product contributed to the incident, save any evidence. It could be critical to the recovery of the claim costs.

**Use Incident Investigation Report Form – Appendix C-1 to write up accident investigation report.**

# FIRST-AID / CPR TRAINING KITS AND INFORMATION

## Purpose:

To be sure that any TEK employee that suffers an injury will receive immediate medical attention, TEK Construction, Inc. will ensure that an employee certified in first-aid / CPR is available onsite at all times.

1. To meet the above objective, the following procedures will be followed:
  - a. All supervisors or persons in charge of crews will be first-aid / CPR trained unless their duties require them to be away from the jobsite. If so, other persons who are certified in first-aid / CPR will be designated as the recognized first-aider.
  - b. Other persons, designated by management, will be trained to augment or surpass the standard requirements of first aid / CPR training.
  - c. Valid first-aid / CPR cards are recognized as ones that include both first-aid/ CPR, and have not expired.
  
2. Each jobsite will have a list containing the following information:
  - a. The location of first-aid kits on the jobsite.
  - b. The names of employees that are certified in first-aid / CPR.
  - c. The emergency procedures that should be followed in case of an emergency.

This list shall be posted at strategic locations, such as on first-aid kits, at or near telephones and on bulletin boards.

Employees shall complete the “Employee Orientation Checklist – Safety” (Appendix A-1) to review locations and procedures of safety related items.

# WORK CREW SAFETY MEETINGS

We believe that hard work and perseverance are required for the prevention of injuries and illnesses, with the crew leader being the key to a successful result.

- A. Purpose: To assist in the detection and elimination of unsafe conditions and work procedures.
  
- B. Procedures:  
The following guidelines will be followed:
  - a. These meetings are held at the beginning of each job and at least weekly thereafter, according to the various circumstances involved or when necessary to clear working procedures. No set pattern will suit all cases. It is important that the crew leader talk daily on injury prevention and immediately upon witnessing an unsafe act.
  - b. The attendance and subjects discussed will be documented and maintained on file for one year.
  - c. Copies of the minutes will be made available to the employees by posting or other means.
  
- C. Scope of Activities:  
*(certain employees, as may be designated by their supervisors, will assist)*
  - 1. Conduct in-house safety inspections with supervisor concerned.
  - 2. Investigate incidents to uncover trends.
  - 3. Review incident reports to determine means or elimination.
  - 4. Accept and evaluate employee suggestions.
  - 5. Review job procedures and recommend improvements (Job Safety Analysis Form is available in the Appendix)
  - 6. Monitor the safety program effectiveness.
  - 7. Promote and publicize safety.
  
- D. Documentation: The sample form in the Appendix D-1 is available to assist in documenting activities of crew/leader meetings. There is also a Safety Meeting Notice form that you can print out and copy to announce your next safety meeting.

# WALK-AROUND SAFETY INSPECTIONS

Walk-around safety inspections will be conducted at the beginning of each job, and at least weekly thereafter.

- The inspections will be conducted jointly by one member of management and one employee, elected by the employees, as their authorized representative.
- The inspections will be documented and the documentation will be made available for inspection by representatives of the Department of Labor and Industries.
- The records of the walk-around inspections will be maintained until the completion of the job.

**Jobsite specific safety information to be inserted here**

# GENERAL SAFETY RULES

1. Always store materials in a safe manner. Tie down or support piles, if necessary, to prevent falling, rolling or shifting.
2. Shavings, dust scraps, oil or grease should not be allowed to accumulate. Good housekeeping is every employee's responsibility.
3. Trash piles must be removed as soon as possible. Trash is a safety and fire hazard.
4. Remove or bend-over the nails in lumber that has been used or removed from a structure.
5. Immediately remove all loose material from stairs, walkways, ramps, and platforms.
6. Do not block aisles, traffic lanes, fire exits, gangways or stairs.
7. Avoid shortcuts - use ramps, stairs, walkways, ladders, etc.
8. A standard guardrail system must be erected around all floor openings, this system includes:
  - a. a top rail - 36 to 42 inches in height
  - b. an intermediate rail
  - c. a toeboard - 4 inches in height
9. Do not remove, deface or destroy any warning, danger sign or barricade, or interfere with any form of accident prevention device or practice being used by you or a co-worker.
10. Get help with heavy or bulky materials to avoid injury to yourself or damage to material.
11. Keep all tools and materials away from the edges of scaffolding, platforms, shaft openings, etc.
12. Do not use tools with split, broken or loose handles, burred or mushroomed heads. Keep cutting tools sharp and carry all tools in a container.
13. Know the correct use of hand and power tools. Always use the right tool for the job.
14. Know the location and use of fire-extinguishing equipment and the procedure for notifying your supervisor of a fire.
15. Flammable liquids shall be stored in small amounts at the jobsite and in approved safety cans.
16. Proper guards or shields must be installed on all power tools before use. Do not use any tools without guards in their proper working condition. No "homemade" handles or extensions (cheaters) will be used!
17. All electrical power tools (unless double insulated), extension cords and equipment shall be properly grounded.
18. All electrical power tools and extension cords shall be properly insulated. Damage cords shall be replaced.

# LADDERS AND GUARDRAILS

## 1. General

- Inspect before use for physical defects.
- Ladders are not to be painted, except for numbering.
- Do not use ladders for skids, braces, workbenches or any purpose other than climbing.
- When you are ascending or descending a ladder, do not carry objects that will prevent you from grasping the ladder with both hands.
- Always face the ladders when ascending or descending.
- If you must place a ladder over a doorway, barricade the door to prevent its use and post a warning sign.
- Only one person is allowed on a ladder at a time.
- Always keep both feet on the ladder rungs. Do not step laterally from a ladder onto another object.
- Do not jump from a ladder when descending.
- All joints between steps, rungs and side rails shall be tight.
- Safety feet shall be in good working order and in place.
- Rungs shall be free of grease and/or oil.

## 2. Straight or Extension Ladder

- All straight or extension ladders must be at least three feet beyond the supporting object when used as an access to an elevated work area.
- After raising the extension portion of a two or more stage ladder to the desired height, check to ensure that the safety dogs or latches are engaged.
- All extensions or straight ladders must be secured or tied off at the top.
- All ladders must be equipped with safety (non-skid) feet.
- Portable ladders shall be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is about one-quarter of the working length of the ladder.

## 3. Stepladders

- Do not place tools or materials on the steps or platform of a stepladder.
- Do not use the top two steps of a stepladder as a step or stand.
- Always level all four feet and lock spreaders in place.
- Do not use a stepladder as a straight ladder.



#### 4. Guardrails

- All guardrail systems shall have the following components - top rail, intermediate rail, toe board and posts.
- A vertical height of 36 inches to 42 inches from walking surface/floor to the top of the top rail.
- The intermediate rail should be halfway between walking surface/floor and the top rail.
- The posts spacing shall not exceed more than 8 feet.
- The top rail and post shall be made out of 2x4 stock.
- The intermediate rail shall be made of at least 1x6 stock.
- Toeboards shall be at least 4 inches high and constructed of substantial material.

# FALL PROTECTION

Falls are the leading cause of on-the-job fatalities in the construction industry. Fall Protection has been one of the top five most frequently cited violations by Washington State Safety and Health compliance inspectors over the last five years.

WAC 296-155-225 mandates that workers shall be protected from fall hazards from buildings; bridges; structures; or construction members such as trusses, beams, purlins, or plates at elevations exceeding 6 feet above ground or water surface, or the continuous floor level below.

Here at TEK we'll utilize several different methods to help minimize the fall exposure on our jobsites:

First, we try to eliminate the fall hazard. The superintendent or foreman should inspect the job regularly looking for fall hazards in any area that employees will be occupying. Any fall hazard that can be eliminated should be as soon as possible.

When eliminating the hazard can't be accomplished, there are two options that can be used to protect employees from the fall hazard - Fall Restraint and Fall Arrest. Fall Restraint is defined as restraining the employee from the fall hazard. The superintendent or foreman should inspect the job regularly looking for fall hazards in any area that employees will be occupying. Any fall hazard that can be eliminated should be as soon as possible.

When eliminating the hazard can't be accomplished, there are two options that can be used to protect employees from the fall hazard - Fall Restraint and Fall Arrest. Fall Restraint is defined as restraining the employee from the fall hazard. This can be accomplished by using a guardrail system or a warning line system and safety monitor. A Fall Arrest system stops you after you fall. Fall Arrest systems can be a full-body harness and lanyard or safety nets.

Every job where a fall hazard of six feet or more exists shall utilize the fall protection program. The TEK fall protection program covers the following eight areas.

1. All fall hazards for the jobsite shall be identified.
2. The method of fall restraint or fall arrest shall be identified.
3. Employee training on how to assemble, maintain, inspect, and disassemble the fall protection system being used.
4. The correct handling, storage and security of tools and materials.
5. The method of providing overhead protection of workers that may pass below the work area.
6. Emergency rescue procedures shall be described.
7. A copy of the plan must be onsite and available.
8. Train all employees on the fall protection procedures and keep a record of the training.

## Policy

Work activities where employees may be subject to falls and/or falling objects shall be conducted safely with associated hazards eliminated and/or controlled.

***This policy covers minimum performance standards applicable to all TEK Construction, Inc. Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.***

## Purpose

To ensure that employees are protected from the hazards associated with falls and falling objects.

## Scope

Applies to all TEK Construction, Inc. Associates work sites, i.e., TEK offices, client job sites, etc., where field construction related activities involve exposure to heights greater than or equal to six (6) feet and/or falling objects exist. In general industry (e.g. offices, shops, warehouses, etc.) exposure to heights greater than or equal to four (4) feet shall be in place of all references to the construction six (6) foot reference.

## Definitions

**Anchorage** means a secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of supporting 5,000 lbs. per employee or two times the intended impact load, whichever is greater, or for a positioning system, 3,000 lbs. without failure.

**Aerial Personnel Lifts** (reference section (8) of this manual)

**Approved** means, for the purpose of this section, authorized by the Branch Safety Officer, tested and certified by the manufacturer or any recognized national testing laboratory to possess the strength requirements specified in this section.

**Catenary Line** – see **Horizontal Lifeline**.

**Competent Person** means an individual knowledgeable (through experience and/or training) of fall protection equipment, including the manufacturer's recommendations and instructions for the proper use, inspection, and maintenance; who is capable of identifying existing and potential fall hazards; who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

**Controlled Access Zone** means an area in which certain work may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

**Deceleration Device** means a device manufactured (fall) shock-absorbing device whereby the forces of the fall are rapidly reduced to meet acceptable levels.

**Drop Line** means a vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

**Employee** means every laborer regardless of title or contractual relationship.

**Fall Arrest System (Personal)** means the use of multiple, approved safety equipment components such as body harnesses, shock absorbing lanyards, deceleration devices, droplines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged to ones body as to arrest a free fall.

**Fall Protection Work Plan** means a written planning document in which the employer identifies areas in the work area where a fall hazard of 6 feet or greater exists, whereby conventional Fall Restraint and Fall Arrest Systems cannot be utilized.

**Fall Restraint System** means an approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level.

**Fall Distance** means the actual distance from the employee's work platform (area) to the level where a fall would stop (ground level or otherwise).

**Full Body Harness** means a configuration of connection straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, positioning rings, or deceleration devices.

**Full Body Harness System** means a Class III full body harness and shock absorbing lanyard attached to an anchorage or attached to a horizontal or vertical lifeline which is properly secured to an anchorage(s) capable of withstanding the forces specified in the applicable sections.

**Hardware** means snap hooks, D-rings, buckles, carabiniers, and adjusters used to attach the components of a fall protection system together.

**Holes (floor, roof or walking surface)** means any opening in the floor greater than two inches whereby falling objects or an employee fall equal to, or greater than six foot is possible.

**Holes (wall)** – see **Wall Opening**.

**Horizontal Lifeline** means an approved rail, rope, or synthetic cable installed in a horizontal plane between two anchorages and used for attachment of a employee's lanyard or lifeline device while moving horizontally.

**Lanyard** means a flexible line of webbing, rope or cable (usually in two, four or six foot lengths) used to secure a harness to a lifeline or an anchorage point.

**Leading Edge** means the advancing edge of a floor or roof, where a fall of more than six foot is possible to the ground or to another level.

**Lifeline (vertical or horizontal)** means an approved vertical line from a fixed overhead anchorage or horizontal line between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or device is secured.

**Restraint Line** means a line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to restrict the employee from reaching a point where falling to a lower level is possible.

**Safety Line** – see **Lifeline**.

**Shock Absorbing Lanyard** means a flexible line of webbing or rope used to secure a harness to a lifeline or anchorage point that has an integral shock absorber of either a rip-stitch or retractable configuration.

**Snaphook** – means a ‘locking’ hook at the end of a lanyard or restraining/positioning line that has a double-action locking mechanism intended to eliminate unintentional unhooking from the D-ring of a body harness. Non-locking snaphooks are prohibited.

**Standard Guardrail** means a toprail at 42 inches high (plus or minus three inches), a midrail installed midway the top edge of the guardrail system and the surface.

**Static Line** – see **Lifeline**.

**Toeboard** means a barrier at the base of the guardrail system to prevent material and objects from falling off the surface. They are at least four (4) inches of nominal height with no less than one (1) inch clearance from the surface.

**Unprotected Sides and Edges** means any side or edge (except at entrances to points of access) of a floor, roof, ramp, or runway where there is no wall or guardrail system.

**Walking/Working Surface** means for the purpose of this section, any area whose dimensions are 45 inches or greater in all directions through which employees pass or conduct work, and can include scaffolding and aerial lifts regardless of surface dimensions.

**Wall Opening** means a gap in a wall where the outside bottom edge is 6 feet or more above lower levels, and the inside bottom edge (e.g. parapit wall) is less than 39 inches above the walking/working surface.

**Work Area** means that portion of a walking/working surface where work activities are being performed.

## **Requirements**

### **Training**

Fall Protection training requirements shall include:

- New employees with work responsibilities requiring the use of fall protection will be oriented to the TEK Associates Fall Protection Program (and any local addendums) as part of the ‘new employee orientation program’.
- At new worksites, i.e., TEK offices, client job sites, etc., during the pre-job meeting to describe specific fall protection requirements of the job.
- Thereafter, every foreseeably exposed employee will be trained at least annually, and include the following:

- The nature of fall hazards in the typical work area
- The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems
- The use and operation of conventional and non-conventional fall protection systems
- The role of each employee in the safety monitoring system when such a system is in use
- The limitations on the use of mechanical equipment during the performance of roof work on low-slope roofs
- The correct procedures for equipment and materials handling and storage, and the erection of overhead protection
- The correct fit, maintenance and use of (personal) fall arrest system components, as determined by the manufacturer(s)
- Rescue procedures in the event an individual falls
- All other details in this section (and local addendums)

Toolbox talks for related issues of this manual section shall be covered periodically.

Retraining shall also occur whenever deficiencies in the training program are identified, standard requirements change or are modified or new fall protection systems are introduced.

Any employee who has not received orientation or annual training (as previously outlined) shall not be allowed to work at heights identified by this section.

Training provided shall be documented and maintained in a training file at the Branch Office. Training will include dates of training, instructor's name, topics / material covered and attendee names.

**Conventional Fall Arrest and Fall Restraints Systems shall be utilized where the exposure to falls greater than 6 foot and from falling objects as is reasonably foreseen. The following systems shall be utilized:**

**Guardrail System (fall restraint and potentially from falling objects)**

Toprails and midrails of guardrail systems constructed of wood shall be at least ¼ inch diameter or thickness to prevent cuts and lacerations.

If wire rope is used for toprails, it shall be flagged at not more 6 feet intervals with high-visibility material. Steel and plastic banding are prohibited for use as toprails or midrails.

The top edge height of toprails, or (equivalent) guardrails shall be 42 inches, plus or minus 3 inches, above the walking/working level.

When employees are using ladders in distance proximity equivalent to the maximum use-length of the ladder, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the maximum use-length height of the ladder, **or see Special Control Procedures (5.4.5)** portion (for ladders) of this manual section for other options.

Screens, midrails, mesh, intermediate vertical members, or equivalent intermediate structural members shall 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 shall 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 shall extend from the top rail to the walking/working level. Intermediate members, such as balusters, when used between posts, will not be more than 19 inches apart.

The guardrail system shall be capable of withstanding a force of at least 200 pounds of force applied within 2 inches of the top edge in any outward or downward direction. When the 200 pounds is applied in a down-ward direction, the top edge of the guardrail shall 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 will be capable of withstanding a force of at least 150 pounds of force applied in any downward or outward direction at any point along the midrail or other member.

Guardrail systems shall be free of sharp edges and burrs to protect against punctures or lacerations and to prevent clothing from snagging.

The ends of top rails and midrails shall not overhang terminal posts, except where such an overhang does not constitute a projection hazard.

When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.

At uncovered holes, guardrail systems shall be set up on 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 shall be covered or provided with guardrails along unprotected sides/edges.

If guardrail systems are used around uncovered holes that are used as access points (such as ladderways), gates shall be used or the guardrail shall be offset at a 45 degree angle to prevent accidental walking into the hole. Toeboards shall be utilized around the edges not utilized as the actual access point.

If guardrails are used at unprotected sides or edges of ramps and runways, they shall be erected on each unprotected side/edge.

When guardrail systems, in combination with netting, is used to prevent materials from falling from one level to another, openings shall be small enough to prevent passage of potential falling objects.

### **Covers for Holes (fall restraint and from falling objects)**

Covers (or a guardrail system with toe boards...see Guardrail Systems within this section) shall be installed over holes equal to or greater than 2" in floors, roofs and walkways that are more than 6 feet above lower levels.

Hole covering material shall support at least two times the potential weight that will cross over it. If plywood is chosen as the cover material, it shall be of at least ¾ inch in thickness.

Hole covers shall be secured in place in such a manner as to not easily be displaced. Examples of securing methods include, but are not limited to: nailing, attached cleats, wire, etc.

Such covers shall have the word 'HOLE' or 'COVER' predominately marked on the top surface. Where covers are too small for such marking, they shall be painted or significantly marked in the color orange.

### **Restraining/Positioning System (fall restraint)**

Only full body harness systems with positioning rings are to be utilized with any restraining/positioning system.

Restraint line (rope) length shall not exceed the distance to fall exposure, and shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.

Requirements for body harness systems, snaphooks, D-rings, and other connectors used with positioning device systems shall meet the same criteria as those for fall arrest systems (5.2.4) of this section.

No makeshift fall protection equipment may be utilized.

**Body belts are prohibited.**

### **(Personal) Fall Arrest System (fall arrest)**

(Personal) Fall Arrest Systems shall do all of the following:

- Limit maximum arresting force on an employee to 1,800 pounds. Note: total body weight including tools cannot exceed 310 lbs. to stay under arresting force limit
- Be rigged so that an employee can neither free fall more than 6 feet 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 5000 lbs. (excluding horizontal lifelines which require a safety factor of at least two times the potential impact energy)
- All components of the (personal) fall arrest system (lanyards, body harness and attached hardware, and shock-absorbing devices) shall meet the design specifications of OSHA 1926.502 Subpart M

The following items/actions are prohibited for use with (personal) fall arrest systems:

- body belts
- non-locking snaphooks
- lanyards without shock absorbers
- tying back to the lanyard (once around another object) for a means of an anchorage point, unless the lanyard was designed for this purpose by the manufacturer, the object tied around can support the anticipated fall force and the object does not have sharp edges or burrs

**(Personal) fall arrest systems shall be utilized in the following manner:**

#### **Pre-Use Inspection**

All components shall be inspected prior to each use for wear damage, and other deterioration in accordance with manufacturer's requirements (see equipment inspection and maintenance procedures of this section).

#### **General Proper Body Harness Fit Guidelines (two employees are usually required to completely fit each other)**

The body harness type and size shall meet the physical needs of its user (male/female or small, medium, large, etc.).

Follow the manufacturer's guidelines on proper fit.

Shoulder, thigh, button and chest straps shall be fit snugly whereas it is slightly difficult to slide the hand underneath.

Loose straps ends shall be folded back under.

D-ring placement should be between the shoulder-blades.

Chest straps should be positioned across the mid-chest area.

#### **Sufficient Anchorage Points Utilized**

Anchorage shall be used under the supervision of a competent person, as part of a complete (personal) fall arrest system that

maintains a safety factor of at least two (i.e., capable of supporting at least twice the weight expected to be imposed upon it).

Anchorage used to attach (personal) fall arrest systems will be independent of any anchorage being used to support or suspend platforms and shall be capable of supporting at least 5,000 pounds of force per person attached.

Anchorage points can include:

- Lifelines (horizontal and vertical)
- Designed anchorage points on aerial lifts
- Eye-bolts listed for use by the manufacturer
- Specially designed anchorage tools specifically designed to meet fall force requirements, including:
  - Wrap-around lanyards as approved by the manufacturer
  - I-beam clamps designed specifically as an anchorage point

**Prohibited anchorage points** include, but are not limited to:

- Standard guardrails and railing
- Ladders/rungs
- Scaffolding, unless approved by the manufacturer for/with anchorage points
- Light fixtures, ductwork, conduit, pipe vents, wiring/duct/piping harnesses, other roof stacks, vents or fans
- C-clamps
- Piping (unless capable of meeting the criteria of an anchorage point)
- To a lanyard (around a solid object), unless the lanyard and hardware is manufactured for that purpose

### **Lifeline/Lanyard Applications**

Lanyards shall only be attached to anchorage points sufficient to meet the fall force requirements.

Shock-absorbing lanyards are required to limit the fall force to less than 1800 pounds.

**Self-retracting lanyards (retractables)** capable of withstanding the tensile load of 3,000 lbs. that limit the free fall distance to two (2) feet

or less are always recommended and **are required when the fall distance is less than nineteen and one-half (19.5) feet.**

Lanyards that do not limit free fall distance to 2 feet or less, such as ripstitch lanyards and tearing/deforming lanyards will be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

Horizontal lifelines will be designed, installed, and used under the supervision of a Competent Person, as part of a complete (personal) fall arrest system. Lifelines shall be protected against being cut or abraded. Horizontal lifelines cannot exceed sixty feet in length.

Vertical lifelines shall be utilized with leading edge work, shall reach the ground, and the method of anchorage attachment shall be of proper design (i.e. no knots).

### **Safety Net System (fall arrest and potentially from falling objects)**

When utilized, safety nets shall be installed as close as practicable under the walking/working surface on which employees are working and never more than 30 feet below such levels.

Safety nets will be inspected at least once a week for wear, damage, and other deterioration. The maximum size of each safety net mesh opening will not exceed 36 square inches nor be longer than 6 inches on any side, and the openings, measured center-to-center, of mesh ropes or webbing, will not exceed 6 inches.

Defective/unfit nets are not to be used and are to be taken from service and immediately destroyed by cutting into unuseful sizes and properly disposed.

Mesh crossings will be secured to prevent enlargement of the mesh opening. Each safety net or section will have a border rope for webbing with a minimum breaking strength of 5,000 pounds. Connections between safety net panels will be as strong as integral net components and be spaced no more than 6 inches apart.

Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net surface.	Minimum required horizontal distance of outer edge of net from edge of working surface.
Up to 5 feet	8 feet
More than 5 feet up to 10 feet	10 feet
More than 10 feet	13 feet

Safety nets shall be tested at the beginning of each workday and shall be capable of absorbing an impact force of a drop test consisting of a 400-pound bag of sand 30 inches in diameter dropped from the highest walking/working surface at which workers are exposed, but not from less than 42 inches above that level. Employees shall not be allowed in work areas controlled with safety nets until this test is complete.

If safety nets are utilized for the dual purpose of employee fall protection and the protection of other workers from fall objects, the net webbing opening shall be small enough to prevent passage of potential falling objects.

Items that have fallen into safety nets, such as materials, scrap, equipment, and tools, shall be removed as soon as possible and at least before the next work shift.

**Where conventional fall restraint and fall arrest methods cannot be utilized (or utilized safely), the following non-conventional methods can be utilized**

A written work plan shall be developed when a project or task possesses a fall exposure whereby these systems are utilized. A sample written plan format can be found in 29 CFR 1926 Subpart M Appendix E.

A Competent Person will develop and implement a written Fall Protection Work Plan including each area of the work place where the employees are assigned and where fall hazards of 6 feet or more will exist. The Risk Assessment for this project/task should be reviewed for this document.

The written Fall Protection Work Plan shall include:

- Identification of fall hazards in the work area
- Describe the non-conventional method (or in combination with conventional method) of fall protection to be provided
- Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of any fall protection system to be used
- Describe the correct procedures for the handling, storage, and securing of tools and materials
- Describe the method of providing overhead protection for workers who may be in or pass through the area below the work site
- Describe the method for prompt, safe removal of injured workers
- Describe the method for destruction of personal fall arrest system equipment subjected to the forces of any fall
- Be available at all times on the jobsite

## **Controlled Access Zone System**

Controlled access zone systems shall be set up as follows:

- Zone shall be established no closer than six (6) feet or further than twenty-five (25) feet from any leading edge
- Control line shall extend parallel along the entire length of the unprotected or leading edge
- Only trained employees are allowed in the Zone
- The Zone shall have signage marking it as a 'Controlled Access Zone'

## **Warning Line System (pitches of $\leq 4:12$ and flat surfaces only)**

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 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, will 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 will have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, shall support without breaking the load applied to the stanchions as prescribed above
- Line will 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 will be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line will 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 shall be erected not less than 6 feet from the roof edge.

The warning line system shall be used in conjunction with one of the following:

- safety monitoring system (most common); or

- (personal) fall arrest system; or
- safety net system; or
- guardrails

### **Safety Monitoring System**

A competent person will appoint the 'safety monitor' and will 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 employees and can see them
- Is close enough to work operations to communicate orally with the employees and has no other duties but the monitoring function
- Has the authority to stop work

Only employees engaged in roof/surface work and the safety monitor shall be allowed in an area where an employee is being protected by a safety monitoring system.

### **Specific Fall Hazard Procedures**

#### **Aerial Personnel Lifts**

Employees utilizing aerial personnel lifts (e.g. scissor lifts, genie lifts, cherry-pickers, boom-lifts, etc.) shall use a restraint/positioning system or (personal) fall arrest system, even though a guardrail system is in place. Refer to Aerial Personnel Lifts section (8) for specific information on operating this equipment.

Attachment points for these systems shall be capable of withstanding 5,000 pounds and shall be maintained in the floor of the lift or where designed by the manufacturer.

Rails of such lifts shall not to be used as attachment points unless designed for that purpose by the manufacturer.

#### **Excavations**

Employees who work at the edge of an excavation 6 feet or more deep will be protected from falling into the excavation by guardrail systems or covers. Refer to Excavation & Trenching section (16) for specific information.

Where walk-ways are provided to permit employees to cross over excavations, guardrails are required on the walkway if the fall would be 6 feet or more to the lower level.

### **Hoist Areas**

Each employee in a hoist area will be protected from falling 6 feet or more by guardrail, restraint/positioning or (personal) fall arrest systems. Refer to Equipment section (15) for specific information on utilizing this equipment.

If guardrail systems (or chain gate or guardrail), or portions thereof, must be removed to facilitate hoisting operations, as during the landing of materials, and a worker shall lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee shall be protected by a (personal) fall arrest system.

### **Falling Objects (additional protection from)**

Except for scaffolding and aerial lifts, no materials or equipment shall be stored within 6 feet of working edges.

When **canopies** are used as protection from falling objects, canopies shall be strong enough to prevent collapse and to prevent penetration by any objects that may fall onto them.

When **toeboards** are used as protection from falling objects, they shall be erected along the edges of the overhead walking or working surface for a distance sufficient to protect persons working below. Toeboards will be capable of withstanding a force of at least 50 pounds of force applied in any downward or outward direction at any point along the toeboard. Toeboards will be a minimum of four (4) inches tall from their top edge to the level of the walking/working surface, have no more than one (1) inch clearance between its bottom and the surface.

### **Ladders (where work height (due to leaning out) exposure is equal to, or exceeds six foot and/or the maximum ladder height is within the distance to a leading edge)**

If work is performed outside the rails of a ladder equal to, or exceeding 6' ; or if three-point contact on the ladder cannot be maintained, a (Personal) Fall Arrest Systems shall be utilized if anchorage points are available.

If anchorage points are not available or other traditional fall control systems are not feasible, a non-conventional system can be utilized (see 5.3 of this manual section).

### **Leading Edge Work**

Employees working near a leading edge 6 feet or more above lower levels shall be protected by guardrail, safety net, restraint/positioning, or (personal) fall arrest systems. If these systems are not feasible the systems under 5.3 of this manual section can be utilized.

## **Roadway/Vehicular Passage Covers**

Covers located in roadways and vehicular aisles shall be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected, and secured/marked as indicated in 5.2.2 of this manual section.

### **Roofs (work from or on)**

#### **Low-sloped (<4:12 pitch)**

Employees engaged in roof activities on low-slope roofs with unprotected sides and edges 6 feet or more above lower levels will be protected from falling by guardrail systems, safety net systems, (personal) fall arrest systems or a combination of a warning line system and guard-rail system, warning line system and safety net system, warning line system and (personal) fall arrest system, or warning line system and safety monitoring system.

#### **Steep Roofs (>4:12 pitch)**

Employees on a steep roof with unprotected sides and edges 6 feet or more above lower levels will be protected by either guardrail systems with toeboards, a safety net system, or a (personal) fall arrest systems.

### **Wall Openings**

Employee working on, at, above, or near wall openings (including those with chutes attached) shall be protected from falling by the use of either a guardrail system, a safety net system, or a (personal) fall arrest system.

## **Equipment Inspection and Maintenance Procedures**

### **Inspection, Replacement and Destruction**

All equipment hereafter noted shall be visually inspected before each use, replaced immediately if any of the defective conditions are found, tagged 'out of service' and sent back to the Branch for destruction.

### **Body Harness Inspection**

Beginning at one end, holding the body side of the harness toward you, grasp one area of the harness with your hands six to eight inches apart. Bend the strap in an inverted "U". Follow this procedure the entire length of the belt or harness. Watch for frayed edges, broken fibers, pulled stitches, cuts, burn marks or chemical damage. Special attention should be given to the attachment of buckles and D-rings to strap webbing. Inspect for frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface.

Rivets should be tight and unmovable with fingers. Body-side rivet base and outside rivet burr should be flat against the material. Bent rivets will fail under



stress. Especially note condition of D-ring rivets and D-ring metal wear pads (if applicable). Discolored, pitted, or cracked rivets indicate chemical corrosion.

The tongue or billet of bolts receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted, or broken grommets. Harnesses using punched holes without grommets should be checked for torn or elongated holes causing slippage of the tongue buckle.

### **Hardware (Buckles, D-Rings, Snaps and Thimbles)**

Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on frame. Check for distortion or sharp edges.

Inspect the friction buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.

Inspect the sliding bar buckle frame and sliding bar for cracks, distortion, or sharp edges. The sliding bar should move freely. Knurled edge will slip if worn smooth. Pay special attention to corners and ends of sliding bar.

Inspect the forged steel D-ring for cracks or other defects. Inspect the assembly of the D-ring to the body pad or D-saddle. If the D-ring can be moved vertically independent of the body pad or D-saddle, the harness should be replaced. Check D-Rings and D-Ring metal wear pad (if any) for distortion, cracks, breaks, and rough or sharp edges. The D-Ring bar should be at a 90 degree angle with the long axis of the belt and should pivot freely.

Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seal into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper.

The thimble must be unmovable in the eyes of the splice, and the splice should have no loose or cut strands. The edges must be free of sharp edges, distortion, or cracks.

### **Lanyard (shock-absorbing)**

Begin at one end and work to the opposite end. Slowly rotate the lanyard so the entire circumference is checked. Factory spliced ends require particular attention.

### **Lanyard (Webbing) Retractable**

Bend the webbing over a non-lacerating edge, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Swelling, discoloration, cracks, and charring are obvious signs of chemical or heat damage. Closely observe for any breaks in the stitching.

### **Rope**

Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken, or cut fibers. Areas weakened by extreme loads will appear as noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period. Strands should be separated and inspected since the rope may wear on the inside if grit or moisture becomes embedded.

### **Storage/Cleaning**

Storage areas shall be maintained as clean, dry and free of exposure to fumes or corrosive elements.

Cleaning methods established by the manufacturer shall be followed for all components. Generally, the following applies for body harnesses:

- Wipe off surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion
- Wipe the belt dry with a clean cloth. Hang freely to dry but away from excessive heat
- Bolts and other equipment should dry thoroughly without close exposure to heat, steam, or long periods of sunlight
- Mildly dirty cotton may be cleaned normally. For heavy dirt or grease, soak belts in a solution of one tablespoon of grease cutter to one gallon of water. **DO NOT USE A STRONGER SOLUTION.** After soaking, rinse again, then hang to dry
- Fall protection, which is not in the original package, shall be stored in a clean, dry area

### **Post-Fall or Near-Miss Incidents**

Fall incidents and near-misses shall be thoroughly investigated to determine root causes and facilitate corrective measures to prevent reoccurrences.

Employees involved in a fall equal to, or greater than 6' shall be required to receive an immediate medical evaluation.

All components of a (personal) fall arrest system involved in any fall with a fall distance of over six feet shall be immediately and completely replaced. Such equipment shall be tagged 'out of service' and sent back to the Branch for destruction.

### **References**

OSHA 29 CFR 1926 Subpart M

OSHA 29 CFR 1910 Subpart D

# SCAFFOLDING SAFETY PROCEDURES FOR CONSTRUCTION

## **Purpose**

It is this company's purpose in issuing these procedures to further ensure a safe workplace based on the following formal, written procedures for scaffold work. These procedures will be reviewed and updated as needed to comply with new OSHA regulations, new best practices in scaffolding, and as business practices demand. TEK Construction Inc. Safety Manager is the plan coordinator/manager and is responsible for its implementation. Copies of the written program may be obtained at the Safety Manager's office.

## **Application**

This general scaffold plan applies to:

- All employees who perform work while on a scaffold.
- All employees who are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds.

## **General Procedures**

The following general procedures apply to all scaffold and aerial lift operations for TEK.

### *Capacity*

Taking into account the OSHA rules we must apply and the engineering/manufacturing requirements of our scaffolds, the following rules apply.

- Each scaffold and scaffold component we use will support, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it.
- When we use non-adjustable suspension scaffolds, each suspension rope, including connecting hardware, will support, without failure, at least six times the maximum intended load applied or transmitted to that rope.
- Direct connections to roofs and floors, and counterweights used to balance adjustable suspension scaffolds, shall be capable of resisting at least 4 times the tipping moment imposed by the scaffold operating at the rated load of the hoist, or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.

- Each suspension rope, including connecting hardware, used on non-adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope.
- Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope with the scaffold operating at either the rated load of the hoist, or 2 (minimum) times the stall load of the hoist, whichever is greater.
- The stall load of any scaffold hoist shall not exceed 3 times its rated load.

Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance with that design.

## **Platform Construction**

This section documents the procedures and safety requirements we use to construct our scaffold platforms.

The following safety rules apply for this scaffold platform construction:

- Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and the guardrail supports as follows:
  - Each platform unit (e.g., scaffold plank, fabricated plank, fabricated deck, or fabricated platform) shall be installed so that the space between adjacent units and the space between the platform and the uprights is no more than 1 inch (2.5 cm) wide, except where the employer can demonstrate that a wider space is necessary (for example, to fit around uprights when side brackets are used to extend the width of the platform).
- Where the employer makes the demonstration provided for in paragraph (b)(1)(i) of this section, the platform shall be planked or decked as fully as possible and the remaining open space between the platform and the uprights shall not exceed 9 1/2 inches (24.1 cm).
- Exception to paragraph (b)(1): The requirement in paragraph (b)(1) to provide full planking or decking does not apply to platforms used solely as walkways or solely by employees performing scaffold erection or dismantling. In these situations, only the planking that the employer establishes is necessary to provide safe working conditions is required.
- Except as provided in paragraphs (b)(2)(i) and (b)(2)(ii) of this section, each scaffold platform and walkway shall be at least 18 inches (46 cm) wide.

- Each ladder jack scaffold, top plate bracket scaffold, roof bracket scaffold, and pump jack scaffold shall be at least 12 inches (30 cm) wide. There is no minimum width requirement for boatswains' chairs.
- Where scaffolds must be used in areas that the employer can demonstrate are so narrow that platforms and walkways cannot be at least 18 inches (46 cm) wide, such platforms and walkways shall be as wide as feasible, and employees on those platforms and walkways shall be protected from fall hazards by the use of guardrails and/or personal fall arrest systems.
- Except as provided in paragraphs (b)(3)(i) and (ii) of this section, the front edge of all platforms shall not be more than 14 inches (36 cm) from the face of the work, unless guardrail systems are erected along the front edge and/or personal fall arrest systems are used in accordance with paragraph (g) of this section to protect employees from falling.
- The maximum distance from the face for outrigger scaffolds shall be 3 inches (8 cm).
- The maximum distance from the face for plastering and lathing operations shall be 18 inches (46 cm).
- Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, shall extend over the centerline of its support at least 6 inches (15 cm).
- Each end of a platform 10 feet or less in length shall not extend over its support more than 12 inches (30 cm) unless the platform is designed and installed so that the cantilevered portion of the platform is able to support employees and/or materials without tipping, or has guardrails which block employee access to the cantilevered end.
- Each platform greater than 10 feet in length shall not extend over its support more than 18 inches (46 cm), unless it is designed and installed so that the cantilevered portion of the platform is able to support employees without tipping, or has guardrails which block employee access to the cantilevered end.
- On scaffolds where scaffold planks are abutted to create a long platform, each abutted end shall rest on a separate support surface. This provision does not preclude the use of common support members, such as "T" sections, to support abutting planks, or hook on platforms designed to rest on common supports.
- On scaffolds where platforms are overlapped to create a long platform, the overlap shall occur only over supports, and shall not be less than 12 inches (30 cm) unless the platforms are nailed together or otherwise restrained to prevent movement.
- At all points of a scaffold where the platform changes direction, such as turning a corner, any platform that rests on a bearer at an angle other than a right angle shall be laid first, and platforms which rest at right angles over the same bearer shall be laid second, on top of the first platform.

- Wood platforms shall not be covered with opaque finishes, except that platform edges may be covered or marked for identification. Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating may not obscure the top or bottom wood surfaces.
- Scaffold components manufactured by different manufacturers shall not be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained by the user. Scaffold components manufactured by different manufacturers shall not be modified in order to intermix them unless a competent person determines the resulting scaffold is structurally sound.
- Scaffold components made of dissimilar metals shall not be used together unless a competent person has determined that galvanic action will not reduce the strength of any component to a level below that required by paragraph (a)(1) of this section.

### *Supported Scaffolds*

- Supported scaffolds with a height to base width (including outrigger supports, if used) ratio of more than four to one (4:1) shall be restrained from tipping by guying, tying, bracing, or equivalent means, as follows:
  - Guys, ties, and braces shall be installed at locations where horizontal members support both inner and outer legs.
  - Guys, ties, and braces shall be installed according to the scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and be repeated vertically at locations of horizontal members every 20 feet (6.1 m) or less thereafter for scaffolds 3 feet (0.91 m) wide or less, and every 26 feet (7.9 m) or less thereafter for scaffolds greater than 3 feet (0.91 m) wide. The top guy, tie or brace of completed scaffolds shall be placed no further than the 4:1 height from the top. Such guys, ties and braces shall be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (9.1 m) (measured from one end [not both] towards the other).
  - Ties, guys, braces, or outriggers shall be used to prevent the tipping of supported scaffolds in all circumstances where an eccentric load, such as a cantilevered work platform, is applied or is transmitted to the scaffold.
- Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates and mud sills or other adequate firm foundation.
- Footings shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
- Unstable objects shall not be used to support scaffolds or platform units.
- Unstable objects shall not be used as working platforms.

- Front-end loaders and similar pieces of equipment shall not be used to support scaffold platforms unless they have been specifically designed by the manufacturer for such use.
- Forklifts shall not be used to support scaffold platforms unless the entire platform is attached to the fork and the forklift is not moved horizontally while the platform is occupied.
- Supported scaffold poles, legs, posts, frames, and uprights shall be plumb and braced to prevent swaying and displacement.

### *Suspension Scaffolds*

- All suspension scaffold support devices, such as outrigger beams, cornice hooks, parapet clamps, and similar devices, shall rest on surfaces capable of supporting at least 4 times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least 1.5 times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).
- Suspension scaffold outrigger beams, when used, shall be made of structural metal or equivalent strength material, and shall be restrained to prevent movement.
- The inboard ends of suspension scaffold outrigger beams shall be stabilized by bolts or other direct connections to the floor or roof deck, or they shall have their inboard ends stabilized by counterweights, except masons' multi-point adjustable suspension scaffold outrigger beams shall not be stabilized by counterweights.
- Before the scaffold is used, direct connections shall be evaluated by a competent person who shall confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed. In addition, masons' multi-point adjustable suspension scaffold connections shall be designed by an engineer experienced in such scaffold design.
- Counterweights shall be made of non-flowable material. Sand, gravel and similar materials that can be easily dislocated shall not be used as counterweights.
- Only those items specifically designed as counterweights shall be used to counterweight scaffold systems. Construction materials such as, but not limited to, masonry units and rolls of roofing felt, shall not be used as counterweights.
- Counterweights shall be secured by mechanical means to the outrigger beams to prevent accidental displacement.
- Counterweights shall not be removed from an outrigger beam until the scaffold is disassembled.
- Outrigger beams which are not stabilized by bolts or other direct connections to the floor or roof deck shall be secured by tiebacks.

- Tiebacks shall be equivalent in strength to the suspension ropes.
- Outrigger beams shall be placed perpendicular to its bearing support (usually the face of the building or structure). However, where the employer can demonstrate that it is not possible to place an outrigger beam perpendicular to the face of the building or structure because of obstructions that cannot be moved, the outrigger beam may be placed at some other angle, provided opposing angle tiebacks are used.
- Tiebacks shall be secured to a structurally sound anchorage on the building or structure. Sound anchorages include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.
- Tiebacks shall be installed perpendicular to the face of the building or structure, or opposing angle tiebacks shall be installed. Single tiebacks installed at an angle are prohibited.
- Suspension scaffold outrigger beams shall be:
  - Provided with stop bolts or shackles at both ends;
  - Securely fastened together with the flanges turned out when channel iron beams are used in place of I-beams;
  - Installed with all bearing supports perpendicular to the beam center line;
  - Set and maintained with the web in a vertical position; and
  - When an outrigger beam is used, the shackle or clevis with which the rope is attached to the outrigger beam shall be placed directly over the centerline of the stirrup.
- Suspension scaffold support devices such as cornice hooks, roof hooks, roof irons, parapet clamps, or similar devices shall be:
  - Made of steel, wrought iron, or materials of equivalent strength;
  - Supported by bearing blocks; and
  - Secured against movement by tiebacks installed at right angles to the face of the building or structure, or opposing angle tiebacks shall be installed and secured to a structurally sound point of anchorage on the building or structure. Sound points of anchorage include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.
  - Tiebacks shall be equivalent in strength to the hoisting rope.



- When winding drum hoists are used on a suspension scaffold, they shall contain not less than four wraps of the suspension rope at the lowest point of scaffold travel. When other types of hoists are used, the suspension ropes shall be long enough to allow the scaffold to be lowered to the level below without the rope end passing through the hoist, or the rope end shall be configured or provided with means to prevent the end from passing through the hoist.
- The use of repaired wire rope as suspension rope is prohibited.
- Wire suspension ropes shall not be joined together except through the use of eye splice thimbles connected with shackles or coverplates and bolts.
- The load end of wire suspension ropes shall be equipped with proper size thimbles and secured by eyesplicing or equivalent means.
- Ropes shall be inspected for defects by a competent person prior to each workshift and after every occurrence which could affect a rope's integrity. Ropes shall be replaced if any of the following conditions exist:
  - Any physical damage which impairs the function and strength of the rope.
  - Kinks that might impair the tracking or wrapping of rope around the drum(s) or sheave(s).
  - Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay.
  - Abrasion, corrosion, scrubbing, flattening or peening causing loss of more than one-third of the original diameter of the outside wires.
  - Heat damage caused by a torch or any damage caused by contact with electrical wires.
  - Evidence that the secondary brake has been activated during an overspeed condition and has engaged the suspension rope.
- Swaged attachments or spliced eyes on wire suspension ropes shall not be used unless they are made by the wire rope manufacturer or a qualified person.
- When wire rope clips are used on suspension scaffolds:
  - There shall be a minimum of 3 wire rope clips installed, with the clips a minimum of 6 rope diameters apart;
  - Clips shall be installed according to the manufacturer's recommendations;
  - Clips shall be retightened to the manufacturer's recommendations after the initial loading;

- Clips shall be inspected and retightened to the manufacturer's recommendations at the start of each workshift thereafter;
  - U-bolt clips shall not be used at the point of suspension for any scaffold hoist;
  - When U-bolt clips are used, the U-bolt shall be placed over the dead end of the rope, and the saddle shall be placed over the live end of the rope.
- Suspension scaffold power-operated hoists and manual hoists shall be tested by a qualified testing laboratory.
  - Gasoline-powered equipment and hoists shall not be used on suspension scaffolds.
  - Gears and brakes of power-operated hoists used on suspension scaffolds shall be enclosed.
  - In addition to the normal operating brake, suspension scaffold power-operated hoists and manually operated hoists shall have a braking device or locking pawl which engages automatically when a hoist makes either of the following uncontrolled movements: an instantaneous change in momentum or an accelerated overspeed.
  - Manually operated hoists shall require a positive crank force to descend.
  - Two-point and multi-point suspension scaffolds shall be tied or otherwise secured to prevent them from swaying, as determined to be necessary based on an evaluation by a competent person. Window cleaners' anchors shall not be used for this purpose.
  - Devices whose sole function is to provide emergency escape and rescue shall not be used as working platforms. This provision does not preclude the use of systems which are designed to function both as suspension scaffolds and emergency systems.

## **Gaining Access to Scaffolds**

We know that getting to the working platform is critical to the safety of our employees. This section outlines the mechanical requirements for gaining access to scaffold platforms such as: (1) ladders, (2) ramps and walkways, (3) stairrails, and (4) direct access from another scaffold. This section is divided into two parts. The first part is for workers gaining access to scaffold platforms to do work; the second part is access for employees erecting and dismantling scaffolds.

### *Working Employees*

- When scaffold platforms are more than 2 feet (0.6 m) above or below a point of access, portable ladders, hook-on ladders, attachable ladders, stair towers (scaffold stairways/towers), stairway-type ladders (such as ladder stands), ramps, walkways, integral prefabricated scaffold access, or direct access from another scaffold,

structure, personnel hoist, or similar surface shall be used. Crossbraces shall not be used as a means of access.

- Portable, hook-on, and attachable ladders (Additional requirements for the proper construction and use of portable ladders are contained in subpart X of this part -- Stairways and Ladders):
  - Portable, hook-on, and attachable ladders shall be positioned so as not to tip the scaffold;
  - Hook-on and attachable ladders shall be positioned so that their bottom rung is not more than 24 inches (61 cm) above the scaffold supporting level;
  - When hook-on and attachable ladders are used on a supported scaffold more than 35 feet (10.7 m) high, they shall have rest platforms at 35-foot (10.7 m) maximum vertical intervals.
  - Hook-on and attachable ladders shall be specifically designed for use with the type of scaffold used;
  - Hook-on and attachable ladders shall have a minimum rung length of 11 1/2 inches (29 cm); and
  - Hook-on and attachable ladders shall have uniformly spaced rungs with a maximum spacing between rungs of 16 3/4 inches.
  
- Stairway-type ladders shall:
  - Be positioned such that their bottom step is not more than 24 inches (61 cm) above the scaffold supporting level;
  - Be provided with rest platforms at 12 foot (3.7 m) maximum vertical intervals;
  - Have a minimum step width of 16 inches (41 cm), except that mobile scaffold stairway-type ladders shall have a minimum step width of 11 1/2 inches (30 cm); and
  - Have slip-resistant treads on all steps and landings.
  
- Stairtowers (scaffold stairway/towers) shall be positioned such that their bottom step is not more than 24 inches (61 cm.) above the scaffold supporting level.
  - A stairrail consisting of a toprail and a midrail shall be provided on each side of each scaffold stairway.

- The toprail of each stairrail system shall also be capable of serving as a handrail, unless a separate handrail is provided.
- Handrails, and toprails that serve as handrails, shall provide an adequate handhold for employees grasping them to avoid falling.
- Stairrail systems and handrails shall be surfaced to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.
- The ends of stairrail systems and handrails shall be constructed so that they do not constitute a projection hazard.
- Handrails, and toprails that are used as handrails, shall be at least 3 inches (7.6 cm) from other objects.
- Stairrails shall be not less than 28 inches (71 cm) nor more than 37 inches (94 cm) from the upper surface of the stairrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
- A landing platform at least 18 inches (45.7 cm) wide by at least 18 inches (45.7 cm) long shall be provided at each level.
- Each scaffold stairway shall be at least 18 inches (45.7 cm) wide between stairrails.
- Treads and landings shall have slip-resistant surfaces.
- Stairways shall be installed between 40 degrees and 60 degrees from the horizontal.
- Guardrails meeting the requirements of paragraph (g)(4) of this section shall be provided on the open sides and ends of each landing.
- Riser height shall be uniform, within 1/4 inch, (0.6 cm) for each flight of stairs. Greater variations in riser height are allowed for the top and bottom steps of the entire system, not for each flight of stairs.
- Tread depth shall be uniform, within 1/4 inch, for each flight of stairs.

– Ramps and walkways.

- Ramps and walkways 6 feet (1.8 m) or more above lower levels shall have guardrail systems which comply with subpart M of this part -- Fall Protection;

- No ramp or walkway shall be inclined more than a slope of one (1) vertical to three (3) horizontal (20 degrees above the horizontal).
  - If the slope of a ramp or a walkway is steeper than one (1) vertical in eight (8) horizontal, the ramp or walkway shall have cleats not more than fourteen (14) inches (35 cm) apart which are securely fastened to the planks to provide footing.
- Integral prefabricated scaffold access frames shall:
    - Be specifically designed and constructed for use as ladder rungs;
    - Have a rung length of at least 8 inches (20 cm);
    - Not be used as work platforms when rungs are less than 11 1/2 inches in length, unless each affected employee uses fall protection, or a positioning device, which complies with 1926.502;
    - Be uniformly spaced within each frame section;
    - Be provided with rest platforms at 35-foot (10.7 m) maximum vertical intervals on all supported scaffolds more than 35 feet (10.7 m) high; and
    - Have a maximum spacing between rungs of 16 3/4 inches (43 cm). Non-uniform rung spacing caused by joining end frames together is allowed, provided the resulting spacing does not exceed 16 3/4 inches (43 cm).
  - Steps and rungs of ladder and stairway type access shall line up vertically with each other between rest platforms.
  - Direct access to or from another surface shall be used only when the scaffold is not more than 14 inches (36 cm) horizontally and not more than 24 inches (61 cm) vertically from the other surface.

### *Erecting and Dismantling*

Our company shall provide safe means of access for each employee erecting or dismantling a scaffold where the provision of safe access is feasible and does not create a greater hazard. We shall have a competent person determine whether it is feasible or would pose a greater hazard to provide, and have employees use a safe means of access. This determination shall be based on site conditions and the type of scaffold being erected or dismantled.

- Hook-on or attachable ladders shall be installed as soon as scaffold erection has progressed to a point that permits safe installation and use.
- When erecting or dismantling tubular welded frame scaffolds, (end) frames, with horizontal members that are parallel, level and are not more than 22 inches apart

vertically may be used as climbing devices for access, provided they are erected in a manner that creates a usable ladder and provides good hand hold and foot space.

- Cross braces on tubular welded frame scaffolds shall not be used as a means of access or egress.

## Fall Protection Plan

Fall protection planning is critical to the safety and well being of our employees. Our fall protection plan follows the OSHA requirements that are different depending on the type of scaffold we are using. In this plan we address fall protection for our scaffold erectors and dismantlers separately.

One fact never changes. We know we must provide fall protection for any employee on a scaffold more than 10 feet above a lower level.

### *Working Employees*

This fall protection plan for our working employees is for the following type(s) of scaffold(s):

- Single- or two-point adjustable suspension scaffold-We will protect each employee on our single- or two-point adjustable suspension scaffolds by a personal fall arrest system. Our personal fall arrest systems:
  - Meet the requirements of 1926.502(d) (OSHA's Fall protection rule).
  - Are attached by lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member.

**NOTE:** Vertical lifelines shall not be used when overhead components, such as overhead protection or additional platform levels, are part of a single-point or two-point adjustable suspension scaffold.

- When vertical lifelines are used, they shall be fastened to a fixed safe point of anchorage, shall be independent of the scaffold, and shall be protected from sharp edges and abrasion. Safe points of anchorage include structural members of buildings, but do not include standpipes, vents, other piping systems, electrical conduit, outrigger beams, or counterweights.
- When horizontal lifelines are used, they shall be secured to two or more structural members of the scaffold, or they may be looped around both suspension and independent suspension lines (on scaffolds so equipped) above the hoist and brake attached to the end of the scaffold. Horizontal lifelines shall not be attached only to the suspension ropes.

- When lanyards are connected to horizontal lifelines or structural members on a single-point or two-point adjustable suspension scaffold, the scaffold shall be equipped with additional independent support lines and automatic locking devices capable of stopping the fall of the scaffold in the event one or both of the suspension ropes fail. The independent support lines shall be equal in number and strength to the suspension ropes.
    - Vertical lifelines, independent support lines, and suspension ropes shall not be attached to each other, nor shall they be attached to or use the same point of anchorage, nor shall they be attached to the same point on the scaffold or personal fall arrest system.]
- Self-contained adjustable scaffold supported by the frame structure-We will protect each employee on our self-contained, frame structure supported, adjustable scaffolds by a guardrail system. The guardrail system:
  - Has a minimum 200-pound toprail capacity.
  - Will be installed before being released for use by our employees.
  - Guardrail systems shall be installed along all open sides and ends of platforms. Guardrail systems shall be installed before the scaffold is released for use by employees other than erection/dismantling crews.
  - The top edge height of toprails or equivalent member on supported scaffolds manufactured or placed in service after January 1, 2000 shall be installed between 38 inches (0.97 m) and 45 inches (1.2 m) above the platform surface. The top edge height on supported scaffolds manufactured and placed in service before January 1, 2000, and on all suspended scaffolds where both a guardrail and a personal fall arrest system are required shall be between 36 inches (0.9 m) and 45 inches (1.2 m). When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of paragraph (g)(4).
  - When midrails, screens, mesh, intermediate vertical members, solid panels, or equivalent structural members are used, they shall be installed between the top edge of the guardrail system and the scaffold platform.
  - When midrails are used, they shall be installed at a height approximately midway between the top edge of the guardrail system and the platform surface.
  - When screens and mesh are used, they shall extend from the top edge of the guardrail system to the scaffold platform, and along the entire opening between the supports.

- When intermediate members (such as balusters or additional rails) are used, they shall not be more than 19 inches (48 cm) apart.
- Each toprail or equivalent member of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along its top edge of at least 100 pounds (445 n) for guardrail systems installed on single-point adjustable suspension scaffolds or two-point adjustable suspension scaffolds, and at least 200 pounds (890 n) for guardrail systems installed on all other scaffolds.
- When the loads specified in paragraph (g)(4)(vii) of this section are applied in a downward direction, the top edge shall not drop below the height above the platform surface that is prescribed in paragraph (g)(4)(ii) of this section.
- Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along the midrail or other member of at least 75 pounds (333 n) for guardrail systems with a minimum 100 pound toprail capacity, and at least 150 pounds (666 n) for guardrail systems with a minimum 200 pound toprail capacity.
- Suspension scaffold hoists and non-walk-through stirrups may be used as end guardrails, if the space between the hoist or stirrup and the side guardrail or structure does not allow passage of an employee to the end of the scaffold.
- Guardrails shall be surfaced to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
- The ends of all rails shall not overhang the terminal posts except when such overhang does not constitute a projection hazard to employees.
- Steel or plastic banding shall not be used as a toprail or midrail.
- Manila or plastic (or other synthetic) rope being used for toprails or midrails shall be inspected by a competent person as frequently as necessary to ensure that it continues to meet the strength requirements of paragraph (g) of this section.
- Crossbracing is acceptable in place of a midrail when the crossing point of two braces is between 20 inches (0.5 m) and 30 inches (0.8 m) above the work platform or as a toprail when the crossing point of two braces is between 38 inches (0.97 m) and 48 inches (1.3 m) above the work platform.



The end points at each upright shall be no more than 48 inches (1.3 m) apart.]

## Falling Object Protection

All employees must wear hardhats when working on, assembling, or dismantling scaffolds. This is our primary protection from falling objects. Additionally, we will:

- Install all guardrail systems with openings small enough to prevent passage of potential falling objects.
- Prevent tools, materials, or equipment that inadvertently fell from our scaffolds from striking employees by barricading the area below the scaffold.
- In addition to wearing hardhats each employee on a scaffold shall be provided with additional protection from falling hand tools, debris, and other small objects through the installation of toeboards, screens, or guardrail systems, or through the erection of debris nets, catch platforms, or canopy structures that contain or deflect the falling objects.
- When the falling objects are too large, heavy or massive to be contained or deflected by any of the above-listed measures, the Company will place such potential falling objects away from the edge of the surface from which they could fall and shall secure those materials as necessary to prevent their falling.
- Where there is a danger of tools, materials, or equipment falling from a scaffold and striking employees below, the following provisions apply:
  - The area below the scaffold to which objects can fall shall be barricaded, and employees shall not be permitted to enter the hazard area; or
  - A toeboard shall be erected along the edge of platforms more than 10 feet (3.1 m) above lower levels for a distance sufficient to protect employees below, except on float (ship) scaffolds where an edging of 3/4 x 1 1/2 inch (2 x 4 cm) wood or equivalent may be used in lieu of toeboards;
  - Where tools, materials, or equipment are piled to a height higher than the top edge of the toeboard, paneling or screening extending from the toeboard or platform to the top of the guardrail shall be erected for a distance sufficient to protect employees below; or
  - A guardrail system shall be installed with openings small enough to prevent passage of potential falling objects; or
  - A canopy structure, debris net, or catch platform strong enough to withstand the impact forces of the potential falling objects shall be erected over the employees below.
  - Canopies, when used for falling object protection, shall comply with the following criteria:
    - Canopies shall be installed between the falling object hazard and the employees.

- When canopies are used on suspension scaffolds for falling object protection, the scaffold shall be equipped with additional independent support lines equal in number to the number of points supported, and equivalent in strength to the strength of the suspension ropes.
- Independent support lines and suspension ropes shall not be attached to the same points of anchorage.
- Where used, toeboards shall be:
  - Capable of withstanding, without failure, a force of at least 50 pounds (222 n) applied in any downward or horizontal direction at any point along the toeboard (toeboards built in accordance with Appendix A to this subpart will be deemed to meet this requirement); and
  - At least three and one-half inches (9 cm) high from the top edge of the toeboard to the level of the walking/working surface. Toeboards shall be securely fastened in place at the outermost edge of the platform and have not more than 1/4 inch (0.7 cm) clearance above the walking/working surface. Toeboards shall be solid or with openings not over one inch (2.5 cm) in the greatest dimension

## Using Scaffolds

Site preparation, scaffold erection, fall protection, and gaining access to the working platform are only some of the requirements for scaffold work. While this all takes concentration and safe work practices, the most dangerous time can be when employees are concentrating on their work and not particularly aware of the hazards of working from scaffolds. It is critical that employees who use scaffolds be trained, among other things, in the recognition of the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. Our competent person will inspect all scaffolds and scaffold components for visible defects before each work shift, and after any occurrence that could affect a scaffold's structural integrity. However, in addition to that, all users of scaffolds in this company will know and understand the following safety rules:

- Scaffolds and scaffold components will never be loaded in excess of their maximum intended loads or rated capacities.
- Debris must not be allowed to accumulate on platforms.
- The use of shore or lean-to scaffolds is prohibited.
- Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift, and after any occurrence which could affect a scaffold's structural integrity.
- Any part of a scaffold damaged or weakened such that its strength is less than that required by paragraph (a) of this section shall be immediately tagged out, repaired or replaced,

braced to meet those provisions, or removed from service until repaired. An example of tag used in tagging out scaffolding equipment is provided at the back of this program.

- Scaffolds shall not be moved horizontally while employees are on them, unless they have been designed by a registered professional engineer specifically for such movement or, for mobile scaffolds, where the provisions of §1926.452(w) are followed.
- The clearance between scaffolds and power lines shall be as follows: Scaffolds shall not be erected, used, dismantled, altered, or moved such that they or any conductive material handled on them might come closer to exposed and energized power lines than (see table in 1926.451(f)(6)).

Exception to paragraph (f)(6): Scaffolds and materials may be closer to power lines than specified above where such clearance is necessary for performance of work, and only after the utility company, or electrical system operator, has been notified of the need to work closer and the utility company, or electrical system operator, has deenergized the lines, relocated the lines, or installed protective coverings to prevent accidental contact with the lines.

- Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.
- Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.
- Where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or equivalent measures to control the loads shall be used.
- Suspension ropes supporting adjustable suspension scaffolds shall be of a diameter large enough to provide sufficient surface area for the functioning of brake and hoist mechanisms.
- Suspension ropes shall be shielded from heat-producing processes. When acids or other corrosive substances are used on a scaffold, the ropes shall be shielded, treated to protect against the corrosive substances, or shall be of a material that will not be damaged by the substance being used.
- Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for employees to be on the scaffold and those employees are protected by a personal fall arrest system or wind screens. Wind screens shall not be used unless the scaffold is secured against the anticipated wind forces imposed.
- Debris shall not be allowed to accumulate on platforms.
- Makeshift devices, such as but not limited to boxes and barrels, shall not be used on top of scaffold platforms to increase the working level height of employees.

- Ladders shall not be used on scaffolds to increase the working level height of employees, except on large area scaffolds where employers have satisfied the following criteria:
  - When the ladder is placed against a structure which is not a part of the scaffold, the scaffold shall be secured against the sideways thrust exerted by the ladder;
  - The platform units shall be secured to the scaffold to prevent their movement;
  - The ladder legs shall be on the same platform or other means shall be provided to stabilize the ladder against unequal platform deflection, and
  - The ladder legs shall be secured to prevent them from slipping or being pushed off the platform.
- Platforms shall not deflect more than 1/60 of the span when loaded.
- To reduce the possibility of welding current arcing through the suspension wire rope when performing welding from suspended scaffolds, the following precautions shall be taken, as applicable:
  - An insulated thimble shall be used to attach each suspension wire rope to its hanging support (such as cornice hook or outrigger). Excess suspension wire rope and any additional independent lines from grounding shall be insulated;
  - The suspension wire rope shall be covered with insulating material extending at least 4 feet (1.2 m) above the hoist. If there is a tail line below the hoist, it shall be insulated to prevent contact with the platform. The portion of the tail line that hangs free below the scaffold shall be guided or retained, or both, so that it does not become grounded;
  - Each hoist shall be covered with insulated protective covers;
  - In addition to a work lead attachment required by the welding process, a grounding conductor shall be connected from the scaffold to the structure. The size of this conductor shall be at least the size of the welding process work lead, and this conductor shall not be in series with the welding process or the work piece;
  - If the scaffold grounding lead is disconnected at any time, the welding machine shall be shut off; and
  - An active welding rod or uninsulated welding lead shall not be allowed to contact the scaffold or its suspension system.]

## **Prohibited Practices**

The following practices will never be tolerated in this company:

- Scaffold components manufactured by different manufacturers will never be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained.
- Unstable objects will never be used to support scaffolds or platform units. Footings must be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
- Crossbraces will never be used as a means of access.
- The use of shore or lean-to scaffolds is prohibited.

## **Aerial Lifts**

Anytime aerial lifts, including: (1) extensible boom platforms, (2) aerial ladders, (3) articulating boom platforms, (4) vertical towers, or (5) a combination of any such devices, are used to elevate employees to job-sites above ground, the following safety rules will apply:

- No aerial lift this company owns or uses will be 'field modified' for uses other than those intended by the manufacturer unless:
  - the manufacturer certifies the modification in writing, or
  - any other equivalent entity, such as a nationally recognized testing lab, certifies the aerial lift modification conforms to all applicable provisions of ANSI A92.2-1969, and the OSHA rules at 1926.453. The lift must be at least as safe as the equipment was before modification.

### *Ladder Trucks and Tower Trucks*

- Aerial ladders must be secured in the lower traveling position by the locking device on top of the truck cab, and the manually operated device at the base of the ladder before the truck is moved for highway travel.

### *Extensible and articulating boom platforms*

- We will test lift controls each day prior to use to determine they are in safe working condition.
- Only authorized employees can operate an aerial lift.
- A body belt must be worn and a lanyard attached to the boom or basket when working from an aerial lift.

[\* No aerial lift this company owns or uses will be "field modified" for uses other than those intended by the manufacturer unless: (1) the manufacturer certifies the modification in writing, or (2) any other equivalent entity, such as a nationally recognized testing lab, certifies the aerial lift modification conforms to all applicable provisions of ANSI A92.2-1969, and the OSHA rules at 1926.453. The lift must be at least as safe as the equipment was before modification.

### *Ladder trucks and tower trucks*

- Aerial ladders must be secured in the lower traveling position by the locking device on top of the truck cab, and the manually operated device at the base of the ladder before the truck is moved for highway travel.

### *Extensible and articulating boom platforms*

- We will test lift controls each day prior to use to determine they are in safe working condition.
- Only authorized employees can operate an aerial lift.
- A body belt must be worn and a lanyard attached to the boom or basket when working from an aerial lift.

## **Duties of Competent and Qualified Persons**

When working with scaffolds in this company there are some tasks that must be done by our competent or a qualified person. By definition they are:

*Competent person*-One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

*Qualified person*-One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

The following tasks will only be done by the person we have deemed competent or qualified to perform them:

### *Competent Person(s):*

- We will not intermix scaffold components manufactured by different manufacturers unless the components fit together without force and the scaffold's structural integrity is maintained. Scaffold components manufactured by different manufacturers will not

be modified in order to intermix them unless our competent person determines the resulting scaffold is structurally sound.

- Before a suspension scaffold is used, direct connections must be evaluated by our competent person who will confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed.
- Prior to each work shift and after every occurrence that could affect a rope's integrity, suspension scaffold ropes will be inspected by our competent person. Ropes will be replaced if any of the conditions outlined in 1926.451(d)(10) exist.
- Scaffolds will be erected, moved, dismantled, or altered only under the supervision and direction of a competent person.

### *Qualified Person(s):*

- Scaffolds must be designed by a qualified person and shall be constructed and loaded in accordance with that design.
- Swaged attachments or spliced eyes on wire suspension ropes of suspension scaffolds will not be used unless they are made by the wire rope manufacturer or a qualified person.
- We will have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards.

**NOTE:** *Only qualified and competent personnel are allowed to modify scaffolding systems. Non-qualified personnel may create more hazards. If modifications are attempted by non-qualified personnel they will be subject to disciplinary action up to and including termination of employment.*

## **Training**

Recognizing the need for training for employees who: (1) perform work while on scaffolds, (2) are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds, and (3) have lost the requisite proficiency, training is one of the highest priority of this program.

### *Employees Who Use Scaffolds*

Our employees who perform work on scaffolds will be trained by a qualified person to recognize the hazards associated with the type of scaffold being

used and to understand the procedures to control or minimize those hazards. The training will include the following areas as applicable:

- The nature of and the correct procedures for dealing with electrical hazards.
- The nature of and the correct procedures for erecting, maintaining, and disassembling the fall protection and falling object protection systems used.
- The proper use of the scaffold, and the proper handling of materials on the scaffold.
- The maximum intended load and the load-carrying capacities of the scaffolds used.
- Tagging out of scaffolds.
- Any other pertinent requirements of the OSHA rules.

### *Employees Who Erect, Disassemble, Move, Operate, Repair, Maintain, or Inspect Scaffolds*

Our employees who erect, disassemble, move, operate, repair, maintain, or inspect scaffolds will be trained by our competent person to recognize the hazards associated with the work being done. The training will include the following topics as applicable:

- The nature of scaffold hazards.
- The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question.
- The design criteria, maximum intended load-carrying capacity, and intended use of the scaffold.
- Tagging out of scaffolds.
- Any other pertinent requirements of this subpart.

### *Employees Who Need Retraining*

- When we have reason to believe that one of our employees lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, we will retrain the employee so that the requisite proficiency is regained. Retraining will be done in at least the following situations:
  - Where changes at the worksite present a hazard about which the employee has not been previously trained.



- Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained.
- Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.



Example of tags used to tagout scaffolding equipment.  
**DANGER. EQUIPMENT TAGGED OUT. MY LIFE IS ON THE LINE.**

## CONFINED SPACE ENTRY

Confined spaces present a serious safety and health risk to any employee working in them. The state defines a confined space in two ways: a confined space and a permit required confined space.

1. A confined space is a space:
  - a. large enough that an employee can enter and perform the assigned task.
  - b. that has limited or restricted means for entry or egress.
  - c. that is not designed for continuous employee occupancy.
2. A permit required confined space is a space that has one of the following:
  - a. contains, or has the potential to contain, a hazardous atmosphere.
  - b. contains a material that has the potential for engulfing an entrant
  - c. 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-section; or
  - d. contains any other recognized serious safety or health hazard.

Before entering a confined space you should understand if there are any potential hazards in the space, if your work will create any hazards, and what safety equipment you will need to use.

### Policy

Systems shall be utilized to ensure the safety of employees who are required to enter confined spaces. Only those TEK Construction, Inc. employees who have received specifically required training and certification on confined space entry shall be allowed to enter and/or attend a confined space. This program will be reviewed annually by the Corporate Director of Health and Safety, and revised as necessary.

***This policy covers minimum performance standards applicable to all TEK employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.***

## **Purpose**

To set forth procedures for the safe entry to confined spaces.

## **Scope**

Applies to all TEK work sites, i.e., TEK offices, client job sites, etc., involving confined space entry.

## **Definitions**

**Attendant** means an individual stationed outside permitted confined spaces that monitors the authorized entrants and who performs all attendants' assigned duties.

**Authorized Entrant** means an individual who is authorized to enter a confined space.

**Blanking or blinding** means an 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.

**Confined space** means a space that is large enough and so configured that an individual can enter and perform assigned work; 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 occupancy. A permit required confined space has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- 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- section
- Contains any other recognized serious safety or health hazard

**Confined Space Permit** means a written or printed document that allows persons to enter into a permitted confined space.

**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.

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

**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.

**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.

**Entry supervisor** means the person responsible for determining if acceptable entry conditions are present at a permitted confined space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section. An entry supervisor may also be acting as an attendant.

**Hazardous atmosphere** means an atmosphere that may expose persons to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness.

**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.

**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.

**Permit system** means a written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

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

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

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

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

**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.

**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.

## **Requirements**

### **General**

Employees shall be informed of identified permit required confined spaces for the work site as they are identified.

Only authorized personnel may be permitted to enter a permit required confined space.

The Confined Space Pre-Job Assessment Form (Appendix 10-1) must be completed (in addition to the Site Safety Plan requirements) for each potential confined space identified where entry is planned. Refer to **Definitions 4.0** - Confined Space.

Danger signs or other equivalent means shall be used to warn of existing confined spaces that are accessible by employees and others. The wording shall be "DANGER-PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or other equivalent language.

Required safety equipment shall be at the confined space work area, in working order, and instruments calibrated.

### **Initial Evaluation of Confined Spaces**

Confined spaces shall be considered as permit required confined spaces until a competent person conducts an initial evaluation of the work site to identify permit required confined spaces. This evaluation shall be recorded on the Confined Space Pre-Job Assessment Form (Appendix 10-1). Confined spaces shall be classified as follows:

- Non Hazardous
- Hazardous due to work task
- Hazardous due to internal condition

If the work site contains permit required confined spaces, danger signs stating "DANGER - CONFINED SPACE - ENTER BY PERMIT ONLY" or equivalent shall be posted to inform employees of the existence and location of the spaces. Bilingual signs shall be posted as necessary.

### **Reclassification or Canceling of Permit Required Spaces**

Permit required confined spaces shall be reclassified as non-permit spaces under the following circumstances:

- The space has no actual or potential atmospheric hazards and if hazards within the space are eliminated without entry into the space
- If testing and inspection during entry demonstrates that the hazards within the space have been eliminated and remain eliminated
- If the permit required confined space is to be reclassified as a non permit space, the basis for determining that hazards have been eliminated shall be documented on Appendix 10-2.
- If a hazard returns, personnel shall evacuate the space and the space shall be reevaluated
- If new hazards are identified that are not part of the original permit, personnel shall immediately evacuate the space and the confined space shall be re-evaluated
- Cancelled permits shall be kept on file for a period of at least 12 months and reviewed to determine problems encountered.

### **Confined Space Entry Form**

The responsible supervisor shall ensure that a Confined Space Entry Form (reference Appendix 10-3) is completed prior to the entry of any permit required confined space. Completion of this form involves the following activities:

- Assessing hazards
- Atmospheric testing
- Identification of qualified entrants
- Identification of attendant(s).
- Identification of entry supervisor
- Establishment of Rescue method and Rescue Service
- De-energizing systems
- Cleaning of confined spaces
- Types of equipment required
- Hazards that may be generated through work activities
- Communication methods
- Entrants are qualified

Confined Space Permits are valid for the work period or work shift and become void and shall be reissued when:

- There is an unplanned interruption in the work process
- The surrounding conditions change that introduce a new hazard
- Personnel leave the space to perform other work
- The work space is left unattended

- The work period (normal time a person or crew is scheduled to work during that day) ends
- When new crew assumes the work assignments of the existing work crew

Permits are not void during any single work period when crewmembers are added to the existing crew or when crewmembers are replaced on a planned rotational basis and the provisions of the permit are met including training and instructions.

Permits become void when the scope of work exceeds the definition of work defined on the permit, and when work is required to be completed that is not covered by the permit.

Confined Space Permits shall be posted at the confined space work area until the work is completed. At the conclusion of work, the permit shall be returned to the issuer (i.e. Entry Supervisor, client, etc.).

Completed confined space permits shall be kept for a minimum of 12 months and until a review of the confined space permit program is completed.

### **Atmospheric Testing**

Atmospheric conditions of a confined space shall be tested with calibrated equipment prior to entry of personnel and as identified by the Initial Evaluation of Confined Spaces (5.2 of this section). Atmospheric testing shall be completed as indicated below and recorded on the Entry Permit:

- Oxygen content shall be tested. The acceptable range is 19.5 to 23.5 percent
- Test for combustible gas and vapors. Acceptable range is 0 to 10 percent of the Lower Flammable Limit (or Lower Explosive Limit). Record readings on the Entry Permit
- Check for toxic gases and airborne combustibles (i.e. dusts) as identified by the initial determination of confined spaces (5.2 of this section). Safe operating levels can be determined from the Permissible Exposure Level (PEL) as listed in OSHA 29 CFR 1910.1000, applicable Material Safety Data Sheets (MSDSs) or as provided by the client
- Entrants and/or attendants may request additional monitoring at any time

See testing equipment requirements under the Industrial Hygiene section (23) of this manual.

### **Pre Entry (occurring prior to entry)**

Only those persons receiving specifically required training and certification on confined space entry shall be allowed to enter and/or attend a confined space. This training shall be documented at orientation (see Orientation Checklists - Appendix 7-5) and at the required pre-job meeting (see Confined Space Pre-Job Assessment Form – Appendix

10-1) defining the specific requirements of the confined space being entered. Annual refresher training shall be conducted for all applicable TEK personnel to include emergency rescue drills.

Persons who enter confined space, Attendant(s), and Entry Supervisor shall receive the following minimum instructions concerning the confined space:

- How to recognize symptoms of the specific potential hazards of the confined space
- The consequences of exposure to potential hazards
- When to evacuate the confined space
- Adhering to instruction of the Attendant
- Evacuating when alarms sound
- How communications will be maintained
- What to do if an exposure occurs or there is a release of a substance
- Shutting off tools during an emergency

Sources of energy or contaminants shall be controlled, such as:

- Electrical energy
- Pressurized systems such as pipelines and vessels are isolated through double blocking, blinding, bleeding, and depressurization
- Extreme heat and extreme cold conditions

Pre-entry atmospheric testing shall be completed (5.5 of this section).

The method of ventilating the confined space shall be established (5.7 of this section).

The approved tools shall be identified and staged at or near the entry point of the confined space. Tools, electrical tools and lighting systems shall be approved for use in confined spaces as identified by the Initial Evaluation of confined spaces (5.2 of this section).

Depending upon the Pre-Job Assessment (see Appendix 10-1), lighting and electrical equipment may be either low voltage (50V or less), or conventional 120V portable lamps and tools if powered by approved ground-fault circuit interrupter devices and the work is not an electrically hazardous location. Pneumatic equipment may be used instead of electrical equipment.

Required rescue procedures and rescue equipment that shall be staged at the confined space (refer to section 5.9).

The safe methods to enter, exit, and escape for personnel (including rescue personnel during retrieval) working in a permit-required confined space shall be developed during the job planning phase, specified on, and included, as needed, on the entry permit.

Personnel have been issued required personal protective equipment (PPE).

Persons who enter confined spaces shall be logged using the Confined Space Pre-Job Assessment Form (Appendix 10-1).

### **Ventilation of Confined Spaces**

Powered ventilation shall occur before entry into permit-required confined space and continue until after the employees have left the space. Layout of ventilation equipment will be made in such a manner that the air is being sent throughout the entire confined space. Forced air ventilation shall come from a clean source and may not increase hazards.

Air hoses with diffusers may not be used to provide forced ventilation.

Air sampling shall be conducted prior to personnel entry to assure the safety of the space and periodic air sampling shall be continued thereafter in the space when forced ventilation is used.

Forced ventilation may be used to:

- To remove contaminants created by work activities such as welding
- As a method of maintaining controlling the ambient temperature of a confined space when the rise in temperature is caused by atmospheric conditions.

Ventilation shall occur only by forcing air into a confined space. If it is necessary to exhaust hazardous gases, such as those produced when welding, the air being forced into the confined space shall be increased by at least the amount that is being exhausted out of the space.

### **Performance of Work**

The confined space attendant shall remain at the entry point of the confined space while personnel are inside any permit required confined space.

The confined space attendant shall ensure that only authorized personnel enter the confined space.

Confined space attendants shall not perform any other work activities except that they may also serve as the attending supervisor.



Confined space attendants shall only monitor a single confined space, unless entry points to subsequent confined space(s) are immediately adjacent and are under the direct control of the attendant.

If an emergency or other unplanned event takes place during the course of work the Confined Space Work Permit is void.

The Attendant and Entry Supervisor have the authority to discontinue work activities at any time.

Compressed gas cylinders other than a self-contained breathing apparatus should not be taken into a confined space.

The hoses of gas cutting and welding tools shall be inspected for leaks prior to taking them into any confined space.

Scaffolds constructed inside confined spaces shall conform to the provisions of the Scaffold policy section (28) of this manual.

Persons who enter confined spaces shall comply with the provisions of this standard and the confined space permit. This includes:

- Supervisors
- Inspectors
- Surveyors
- Observers
- Scaffold Builders
- Engineers
- Vendors
- Contractors, subcontractors, and other employers

Sources of ignition (e.g., flame, arc, or spark) shall not be permitted in any confined space until tests have ensured that the percentage of combustible/flammable gas or vapor is not more than zero (0) % of the Lower Explosive Limit (LEL).

## **Emergencies**

### **Emergency Notification**

It is the responsibility of the Entry Supervisor and/or the Entry Attendant to immediately notify the senior TEK employee on the worksite of a potential emergency by radio or cell phone. The senior TEK employee will assess the situation and contact emergency response personnel if applicable.

Only those individuals trained and certified in confined space entry procedures on the worksite may assist in emergency rescue operations.

### **First Aid / Medical Services**

Refer to the requirements in First Aid section (20) for specific worksite requirements.

### **Rescue / Retrieval Systems**

To facilitate emergency rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a confined space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

The entry supervisor, prior to the initial entry of personnel into a confined space, shall ensure the rescue equipment and retrieval system is functioning properly.

Retrieval systems shall meet the following requirements to the greatest extent possible.

- Each authorized entrant shall use a full body harness with a retrieval lifeline attached at the center of the entrant's back near shoulder level, or above the entrant's head or safety coveralls with built-in harness, with a retrieval lifeline attached at the near shoulder level of the entrant's back, or above the entrant's head
- Wristlets may be used in lieu of the full body harness if the entry supervisor can demonstrate that the use of a full body harness is not feasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative
- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the confined space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type confined spaces more than 5 feet deep
- The safety harness shall be of the type that permits easy rescue of personnel from the confined space during emergency conditions and may be either the harness type that suspends a person in an upright position or the wrist type rescue harness. (A hoisting device or other effective means for lifting personnel from confined spaces is preferred)
- Lifelines shall have a minimum breaking strength of 5,400 pounds

### **Completion of Work**

When the work is completed in a confined space the following, as a minimum shall be completed:

- Tools, equipment and materials shall be removed

- The space shall be inspected to ensure no personnel are inadvertently left in the confined space according to the Energy Control section (14) of this manual
- The area surrounding the confined space shall be clean of materials, equipment, scraps, and debris
- The supervisor responsible for the confined space work shall inspect the work location to ensure cleanup of materials, tools, and other items is complete
- (Lockout) locks are removed only when work is completed

## **References**

OSHA 29 CFR 1910.146

# RESPIRATORY PROTECTION PROGRAM

## **Policy:**

The requirement to wear respirators arises occasionally on our jobsites. The respiratory program is designed to help protect you from any harmful conditions. These may include: exposure to any harmful air contaminant, an oxygen-deficient atmosphere, or in an emergency-rescue situation.

Before an employee can wear a respirator, the following steps must be taken:

1. You must be medically cleared to wear a respirator.
2. You must be correctly fit-tested (sized) for a respirator.
3. Must be clean shaven. You can have a mustache, but it must not interfere with the seal of the respirator.
4. You must understand the need and effectiveness of the respirator.

# LOCKOUT/TAGOUT PROGRAM

The lockout / tagout procedure is designed to ensure that employees are 100% protected prior to performing any service or maintenance activities where unexpected energization, start-up or release of stored energy could result in an injury.

Energy can be stored in many ways including, but not limited to, electrical, hydraulic, pneumatic, magnetic, steam, springs, counterweights, etc. Each type of energy stored must be isolated in such ways as to ensure that de-energizing or stopping the energy source renders the equipment or device completely safe to service and/or maintain.

Lockout / Tagout procedures are intended to be applied during servicing and/or maintenance of machines and equipment. Normal production operations are not covered under this policy unless:

An employee is required to remove or by-pass a guard or other safety device.

**-OR-**

An employees is required to place their body into an area where an associated danger zone exists during the machine's operating cycle.

In addition, the standard doesn't apply to:

Work on cord and plug connected electrical equipment which can be de-energized, and unexpected energization prevented by unplugging the equipment from the energy source, and the plug remains under the sole exclusive control of the employee performing the service or maintenance.

As an employee, it is important that you understand and recognize the locks and tags that are on the jobsite. Only the person that applies the lockout / tagout should remove it. If lockout / tagout is being used at your jobsite, your supervisor or foreman will review the site specific program with all employees.

# FIRE PREVENTION

The potential for fire is always a possibility on any construction site. It is very important that all TEK employees take an active role in the prevention of fires. By understanding and observing the following rules the chance of a fire can be greatly reduced.

1. Internal combustion engine powered equipment shall be so located that exhausts are well away from combustible materials.
2. Smoking shall be prohibited at or in the vicinity of operations which constitute fire hazard, and shall be conspicuously posted: **“No Smoking or Open Flame.”**
3. Workers shall not take open lights or open flames near or in an open sewer manhole, gas main, conduit or other similar place until the absence of explosive or harmful gases has been assured. Open lights or flames shall not be carried into areas and enclosures where flammable vapors or exposed low flash point solvents exits. Only approved and suitable protected lights shall be used.
4. Combustible materials shall be piled with regards to the stability of the piles but in no case higher than 20 feet.
5. Access to all available firefighting equipment shall be maintained at all times.
6. Fire extinguishers shall be provided in all TEK trucks, heavy equipment and job shacks.
7. All firefighting equipment shall be periodically inspected by a competent person and maintained in operating condition. Defective equipment shall be immediately replaced. Anytime a fire extinguisher is used it must be taken out of service and recharged.

## FIRE PREVENTION

### PURPOSE:

Fire Prevention/Protection Policy is intended to provide compliance with all related OSHA regulation and standard safe work practice. The purpose of the policy is to prevent fires and to provide guidelines for action in the event that a fire does occur.

Fire prevention program combines the following policies:

- HazCom Training Policy
- PPE Policy
- Electrical Safety Policy
- Emergency Action Plan

These policies encompass methods used for incidence avoidance, incident response and specialized training required in the event of a fire.

Issues addressed in the above policies include, but are not limited to:

- Evacuation Procedure
- Extinguisher Training
- Basic Process Safety Training (if applicable)
- Hot Work Safety Training (if applicable)
- Confined Space Entry Safety Training (if applicable)
- Emergency Life Support Training
- Respiratory Protective Devices Training (if applicable)
- Assured Grounding Programs

### POLICY:

Employees shall be informed of the proper actions to take in the event of a fire. This includes, but is not limited to; notification and evacuation procedures. It is STRESSED that at no time does the task of fighting fire supersede an employee's primary duties of:

- Ensuring their own personal safety and the safety of others.
- Reporting the incident to the proper authority and ensuring personnel accountability for yourself and all subordinates at the jobsite, in accordance with company and client policy.

#### PROCEDURE:

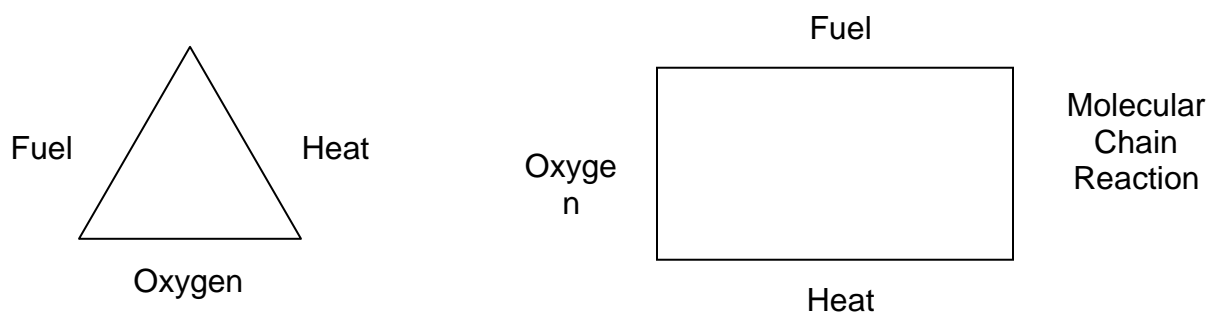
- All employees are responsible for good housekeeping practices to enhance fire prevention methods. Supervisors will be held accountable for the housekeeping of their job sites.
- If applicable, welding machine mufflers will be equipped with an approved spark arresting muffler.
- Only approved containers will be used during fueling operations. These shall be of the self-closing type.
- Flammable material shall be kept under control. It shall be stored in compliance with applicable OSHA and client regulations. The quantity of flammable/combustible material shall be kept to a minimum on the job site.
- Welding, cutting and grinding sparks shall be contained.
- Hot work areas shall be kept wetted down, and a fire extinguisher and hose maintained on each jobsite.
- Oily rags shall be immediately disposed of in designated hazardous waste containers.
- No hot work is to be performed without a Hot Work Permit.
- All vehicle entry into process areas requires a permit or permission from the operator.
- Use bonding straps to discharge and prevent static charges during transfer of flammable liquids from one container to another.
- Report all spills or suspicious odors immediately.
- Fire extinguishers are to be kept in areas easily accessible to employees. Only approved fire extinguishers are to be used. They must have an inspection tag attached. Extinguishers are to be maintained in a fully charged, ready to operate state. Extinguishers are to be inspected before each use and documented annually. Training is provided to all employees who use or may use fire extinguishers.
- **NEVER** put yourself or others a risk while attempting to extinguish an incipient fire.
- **DO NOT USE** any fire hoses larger than 1-3/4", unless fully trained as an industrial firefighter.
- **NEVER** attempt to extinguish a pressurized-fuel fed fire.
- **DO NOT** direct a fire nozzle with a straight stream at any type of LPG fire. This action could extinguish the fire, producing an LPG vapor cloud capable of detonation.
- **DO NOT USE** fire monitors as the force can damage small equipment and certain high chrome alloy equipment cannot have water applied as cracking could occur.
- **DO NOT APPLY** water to any acid or caustic release as it can cause a violent reaction. Additionally, low concentration acids or caustics become extremely corrosive, causing an increasing leak condition.

## IN THE EVENT OF A FIRE:

- Remain calm
- Only extinguish a fire when it is clearly within your abilities and the equipment available
- Know the location of the nearest alarm and how to activate the emergency system
- Know the evacuation routes and collection points
- If the fire cannot be extinguished, leave the area immediately and report to your evacuation area
- Await further instructions from the Incident Commander, or designated responsible personnel

## BASIC FIRE SCIENCE:

- The combination of fuel, heat, oxygen equals the well-know fire triangle. To understand fire better, a fourth factor is added, a molecular chain reaction. This is due to the fact that fire results from a series of reactions in which complicated molecules “crack” into easily oxidized fragments. Disruption of this chain, along with the removal of fuel, heat or oxygen, is recognized as a method of fire extinguishment through the use of dry chemical extinguishers.



- **Heat Energy** - Can be produced by building up molecules (composition) or breaking apart (decomposition) by heat or a solution when materials are dissolved in a liquid, or by combustion.
- **Heat Transfer** - A law of physics states that heat tends to flow up from a hot substance or place to a cold substance or place. This is through conduction (transfer of heat through a medium such as metals) or through convection (transfer of heat with a medium-usually circulatory).
- **Fuels** - Those substances that will burn when heat is applied. The most common fuels are not pure elements such as carbon, but compounds and mixtures such as paper and wood.
- **Oxygen** - Makes up a major portion of the oceans and earth’s crust and one-fifth of our atmosphere. Atmospheric oxygen is the major source of oxygen that supports combustion. Oxygen itself does not burn, however, without it, combustion is impossible. Normal burning is the combination of fuels with oxygen under the influence of heat.
- **Combustion** - A rapid oxidation or chemical combination accompanied by heat.
- **Oxidation** - The ability of materials to produce oxygen during a chemical reaction.
- **Spontaneous Combustion** - When oxidation is allowed to occur, enough oxygen is available, heat is produced, molecules become more energetic and combine with oxygen at an increasing rate, temperatures rise and visible heat (flames) are produced.

## CLASSES OF FIRES:

- Class A - **Ordinary combustibles (wood/paper/textiles)**

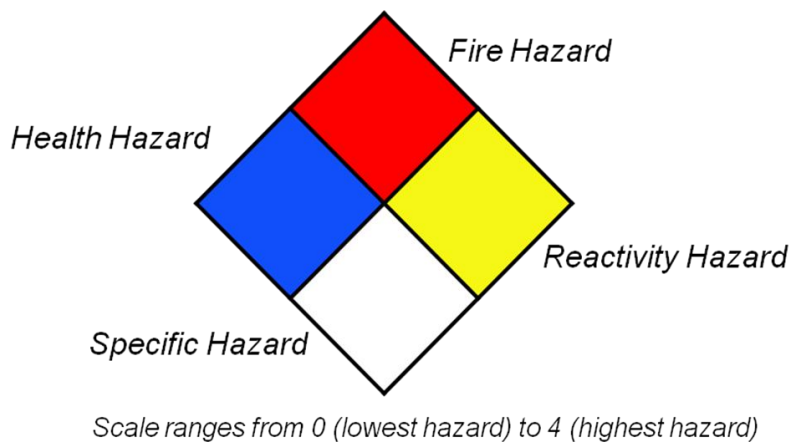



- Class B - **Flammable liquids (gasoline/oils/grease)**
- Class C - **Live electric (wiring/generators/motors)**
- Class D - **Combustible metals (finely divided form/chips, turnings)**

**TYPES OF FIRE EXTINGUISHERS:**

- **Water** - extinguisher for ordinary combustible fires
- **Dry Chemical or CO2** - extinguisher for electrical equipment fires and for flammable liquid fires
- **Multipurpose Dry Chemical** - extinguisher for ordinary combustible fires, liquid fires, and electrical equipment fires
- **Foam** - extinguishing agent for hydrocarbon fires

**NFPA Diamond:**



<b>Fire Hazard (Red)</b>	<b>Health Hazard (Blue)</b>	<b>Reactivity (Yellow)</b>	<b>Specific Hazards (White)</b>
Flash Points	4 Deadly	4 may detonate	Oxidizer = OX
4 below 73 <sup>o</sup> F	3 Extreme Danger	3 shock and heat, may detonate	Acid = ACID
3 below 100 <sup>o</sup> F	2 Hazardous	2 violent chemical change	Corrosive = COR
2 from 100 - 200 <sup>o</sup> F	1 Slight Hazard	1 unstable if heated	Use no water = <del>W</del>
1 above 200 <sup>o</sup> F	0 Normal Material	0 stable	Radioactive = 
0 will not burn			

# HAZARDOUS COMMUNICATION PROGRAM

TEK Construction, Inc. trains and educates all employees concerning the hazards associated with the chemicals used on our jobsites. Before you begin working with any hazardous chemicals on our jobsites, your supervisor shall review our hazardous communication program with you. This training shall include:

1. Our company policy and program.
2. How we label secondary containers.
3. Material Safety Data Sheets:
  - a. What they are and what information they contain.
  - b. Where they are located at the jobsite.
  - c. How to interpret them.
4. What types of protective equipment needs to be used with the chemicals.

# MOTORIZED VEHICLES AND EQUIPMENT

1. Do not ride on motorized vehicles or equipment unless a proper seat is provided for each rider.
2. Always be seated when riding authorized vehicles.
3. Do not operate any motorized vehicle or equipment unless you are specifically authorized to do so by your supervisor.
4. Seat belts must be worn by all drivers and passengers in TEK vehicles.
5. Obey all speed limits and other traffic regulations.
6. Always be aware of pedestrians and give them the right-of-way.
7. Always inspect your vehicle or equipment daily.
8. Never mount or dismount any vehicle or equipment while they are still in motion.
9. Do not dismount any vehicle without first shutting down the engine, setting the parking brake and securing the load.
10. Do not allow other persons to ride the hook or block, dump box, forks, bucket or shovel of any equipment.
11. Each operator must be knowledgeable of all hand signals and obey them.
12. Each operator is responsible for the stability and security of the load.

# GENERAL MATERIALS HANDLING SAFETY

## General material storage safety:

- Make sure that all materials stored in tiers are stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse.
- Post conspicuously the maximum safe load limits of floors within buildings and structures, in pounds per square foot, in all storage areas, except for floor or slab on grade. Do not exceed the maximum safe loads.
- Keep aisles and passageways clear to provide for the free and safe movement of material handling equipment or employees. Keep these areas in good repair.
- Do not store materials on scaffolds or runways in excess of supplies needed for immediate operations.
- Use ramps, blocking, or grading when a difference in road or working levels exists to ensure the safe movement of vehicles between the two levels.
- Do not place materials stored inside buildings under construction within 6 feet of any hoistway or inside floor openings, or within 10 feet of an exterior wall which does not extend above the top of the material stored.
  - (i) Anchor and brace temporary floors used in steel erection, concrete forms, and shoring and other “in-process equipment” that are to be left overnight or for longer periods of time to prevent their displacement in any direction. While in “interim storage,” this equipment is subject to the provisions in WAC 296-155-325(2)(i) (see previous bullet point: Do not place materials stored inside buildings under construction within 6 feet of any hoistway or inside floor openings, or within 10 feet of an exterior wall which does not extend above the top of the material stored.)
- When working on stored materials in silos, hoppers, tanks, and similar storage areas, use personal fall arrest equipment meeting the requirements of Chapter 296-155 Part C-1.
- Segregate non-compatible materials in storage.
- Stack bagged materials by stepping back the layers and cross-keying the bags at least every ten bags high.
  - (i) Carefully handle cement and lime delivered in paper bags to prevent the bags from bursting.
  - (ii) Do not pile cement and lime bags more than ten bags high except when stored in bins or enclosures built for the purpose of storage.
  - (iii) When bags are removed from the pile, keep the length of the pile at an even height and maintain the necessary step backs every five bags.

- (iv) When handling cement and lime bags, wear eye protection preventing any contact with the substance (such as goggles or other sealed eye protection) and wear long sleeve shirts with close fitting collar and cuffs.
- (v) Do not wear clothing that has become hard and stiff with cement.
- (vi) Make sure to report any susceptibility of skin to cement and lime burns.
- (vii) Make sure that a hand cream or Vaseline and eyewash is provided and kept ready for use to prevent burns.
- (viii) Store lime in a dry place to prevent a premature slacking action that may cause fire.
- Do not stack bricks more than 7 feet high. When a loose brick stack reaches a height of 4 feet, taper it back 2 inches for every foot of height above the 4-foot level.
  - (i) Never stack bricks, for storage purposes, on scaffolds or runways.
  - (ii) Always stack blocks; do not throw in a loose pile.
- When stacking masonry blocks higher than 6 feet, taper back the stack one-half block per tier above the 6-foot level.
  - (i) When stacking inside a building, distribute the piles to prevent overloading the floor.
  - (ii) Do not drop or throw blocks from an elevation or deliver blocks through chutes.
- Do not stack lumber more than 20 feet high; if handling lumber manually, do not stack more than 16 feet high.
  - (i) Remove all nails from used lumber before stacking.
  - (ii) Stack lumber on level and solidly supported sills, and such that the stack is stable and self-supporting.
  - (iii) Stack stored lumber on timber sills to keep it off the ground. Sills must be placed level on solid supports.
  - (iv) Place cross strips in the stacks when they are stacked more than 4 feet high.
- If not racked, stack and block structural steel, poles, pipe, bar stock, and other cylindrical materials as to prevent spreading or tilting.
  - (i) Wear heavy gloves when handling reinforcing steel.
  - (ii) When bending reinforcing steel on the job, use a strong bench set up on even dry ground or a floor to work on.
  - (iii) Carefully pile structural steel to prevent danger of members rolling off or the pile toppling over.
  - (iv) Keep structural steel in low piles, giving consideration to the sequence of use of its members.

- (v) Stack corrugated and flat iron in flat piles, with the piles not more than 4 feet high; place spacing strips between each bundle.
- Frequently inspect stock piles of sand, gravel, and crushed stone to prevent their becoming unsafe by continued adding to or withdrawing from the stock.
  - (i) Do not remove frozen material in a manner that would produce an overhang.

#### General Rigging Equipment Safety:

- Inspect rigging equipment for material handling prior to use on each shift and as necessary during its use to ensure that it is safe. Remove defective rigging equipment from service.
- Never load rigging equipment in excess of its recommended safe working load.
- Remove rigging equipment when not in use from the immediate work area so as not to present a hazard to employees.
- Mark special rigging accessories (i.e., spreader bars, grabs, hooks, clamps, etc.) or other lifting accessories with the rated capacity. Proof test all components to 125% of the rated load prior to the first use. Maintain permanent records on the job site for all special rigging accessories.

#### Disposal of waste materials:

- Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, use an enclosed chute of wood or equivalent material.
- When debris is dropped without the use of chutes, make sure that the area onto which the material is dropped is completely enclosed with barricades at least 42 inches high and 20 feet back from the projected edge of the opening above. Post at each level warning signs of the hazard of falling materials. Do not remove debris in this lower area until debris handling ceases above.
- Remove all scrap lumber, waste material, and rubbish from the immediate work area as the work progresses.
- Make sure to comply with local fire regulations if disposing of waste material or debris by burning.
- Keep all solvent waste, oily rags, and flammable liquids in fire-resistant covered containers until removed from the work site.

# OUTDOOR HEAT EXPOSURE

**Purpose:** The purpose of this addendum is to ensure compliance with the Outdoor Heat Exposure rule, WAC 296-62-095, for employees who are exposed to temperatures at or above Table 1 of the regulation. Employees with only incidental exposure as defined in the rule are not covered.

**Scope:** The following requirements are only in effect during the months of May through September each year for the following job categories or positions having outdoor heat exposure:

***Laborer  
Carpenter***

**Training:** Each year prior to the month of May, all employees working in the categories listed above will be provided training on signs and symptoms of outdoor heat exposure and on the company policies to prevent heat-related illness. Additional training will be scheduled for a make-up class as needed. When new employees are hired during the summer months, training will be provided prior to the new employee working in the outdoor environment.

**Employee Training Content:** Training on the following topics will be provided to all employees who may be exposed to outdoor heat at or above the temperatures listed in WAC 296-62-09510(2) Table 1:

- (a) The environmental factors that contribute to the risk of heat-related illness;
- (b) General awareness of personal factors that may increase susceptibility to heat-related illness including, but not limited to, an individual's age, degree of acclimatization, medical conditions, drinking water consumption, alcohol use, caffeine use, nicotine use, and use of medications that affect the body's responses to heat. This information is for the employee's personal use;
- (c) The importance of removing heat-retaining personal protective equipment such as non-breathable chemical resistant clothing during all breaks;
- (d) The importance of frequent consumption of small quantities of drinking water or other acceptable beverages;
- (e) The importance of acclimatization;
- (f) The different types of heat-related illness, the common signs and symptoms of heat-related illness; and
- (g) The importance of immediately reporting signs or symptoms of heat-related illness in either themselves or in co-workers to the person in charge and the procedures the employee must follow including appropriate emergency response procedures.

**Supervisor Training Content:** Prior to supervising employees working in outdoor environments with heat exposure at or above the temperature levels listed in WAC 296-62-09510(2) Table 1, supervisors will be given training on the following topics:

- (a) The information required to be provided to employees listed in subsection (1) of this section;
- (b) The procedures the supervisor must follow to implement the applicable provisions of WAC 296-62-095 through 296-62-09560;
- (c) The procedures the supervisor must follow if an employee exhibits signs or symptoms consistent with possible heat-related illness, including appropriate emergency response procedures; and

(d) Procedures for moving or transporting an employee(s) to a place where the employee(s) can be reached by an emergency medical service provider, if necessary.

**Drinking Water:** On days when the temperature is at or above those listed in Table 1 of the regulation, employees will be provided a sufficient quantity of drinking water which is readily accessible at their work location. The water quantity will be sufficient to allow each employee to drink at least a quart or more of water each hour.

[**Note:** Drinking water packaged as a consumer product and electrolyte-replenishing beverages such as sports drinks that do not contain caffeine are acceptable.]

As the temperature increases through the day, additional water will be made available or replaced. It is the responsibility of this employer to ensure that the supply of available drinking water does not run out.

**Responding to Signs and Symptoms.** Time is critical when people are experiencing heat stress/heat stroke. The quicker any employee experiencing symptoms can be removed from the heat and cooled down, the better the chances are for a full recovery. On days when the temperatures will be at or above those listed in Table 1 of the regulation, the company will:

Never leave an employee who is experiencing heat-related problems by themselves; if they do not respond quickly to cooling attempts, immediately call emergency medical services. If a co-worker is experiencing difficulty, do not hesitate to bring it to the attention of the supervisor or lead worker.



## Heat Stress - How do you prevent heat illness?

- Supply adequate water and encourage workers who work in hot weather to drink regularly, even when not thirsty. A small amount of water every 15 minutes is recommended rather than a large amount after hours of sweating.
- Learn the signs and symptoms of heat-related illness.
- Inform workers they should avoid alcohol or drinks with caffeine before or during work in hot weather.
- Try to do the heaviest work during the cooler parts of the day.
- Adjusting to work in heat takes time. Allow workers to acclimatize. Start slower and work up to your normal pace.
- Wear lightweight, loose-fitting, light-colored, breathable (e.g. cotton) clothing and a hat.
- Allow workers to take regular breaks from the sun. Loosen or remove clothing that restricts cooling.
- Watch workers for symptoms of heat-related illness. This is especially important for non-acclimatized workers, those returning from vacations and for all workers during heat-wave events.
- If exertion causes someone's heart to pound or makes them gasp for breath, become lightheaded, confused, weak or faint, they should STOP all activity and get into a cool area or at least into the shade, and rest.

The two major heat-related illnesses are heat exhaustion and heat stroke. Heat exhaustion, if untreated, may progress to deadly heat stroke. **Heat stroke is very dangerous and frequently fatal.** If workers show symptoms, *always take this seriously* and have them take a break and cool down before returning to work. *Stay with them.* If symptoms worsen or the worker does not recover within about 15 minutes, call 911 and have them transported and medically evaluated. *Do not delay transport.*

### Heat Stroke or Heat Exhaustion? How do you tell the difference?

The telling difference is mental confusion or disorientation in ALL heat stroke victims

You can ask these 3 questions: What is your name? What day is this? Where are we?

If a worker can't answer these questions, assume it is heat stroke.

## What are the symptoms of heat exhaustion and heat stroke?

Heat Exhaustion	Heat Stroke
<ul style="list-style-type: none"> <li>• Heavy sweating</li> <li>• Exhaustion, weakness</li> <li>• Fainting / Lightheadedness</li> <li>• Paleness</li> <li>• Headache</li> <li>• Clumsiness, dizziness</li> <li>• Nausea or vomiting</li> <li>• Irritability</li> </ul>	<ul style="list-style-type: none"> <li>• Sweating may or may not be present</li> <li>• Red or flushed, hot dry skin</li> <li>• Any symptom of heat exhaustion but more severe</li> <li>• Confusion / Bizarre behavior</li> <li>• Convulsions before or during cooling</li> <li>• Collapse</li> <li>• Panting/rapid breathing</li> <li>• Rapid, weak pulse</li> <li>• Note: May resemble a heart attack</li> </ul>

## What to do if someone is suffering from heat exhaustion or heat stroke?

Heat Exhaustion	Heat Stroke (medical emergency)
<ul style="list-style-type: none"> <li>• Move the worker to a cool, shaded area to rest; <b>do not leave them alone.</b></li> <li>• Loosen and remove heavy clothing that restricts evaporative cooling.</li> <li>• Give cool water to drink, about a cup every 15 minutes.</li> <li>• Fan the worker, spray with cool water, or apply a wet cloth to their skin to increase evaporative cooling.</li> <li>• Recovery should be rapid. Call 911 if they do not feel better in a few minutes.</li> <li>• Do not further expose the worker to heat that day. Have them rest and continue to drink cool water or electrolyte drinks.</li> </ul>	<ul style="list-style-type: none"> <li>• Get medical help immediately, call 911 and transport as soon as possible.</li> <li>• Move the worker to a cool, shaded area and remove clothing that restricts cooling.</li> <li>• Seconds count – Cool the worker rapidly using whatever methods you can. For example, immerse the worker in a tub of cool water; place the worker in a cool shower; spray the worker with cool water from a garden hose; sponge the worker with cool water; or, if the humidity is low, wrap the worker in a cool, wet sheet and fan them vigorously. Continue cooling until medical help arrives.</li> <li>• If emergency medical personnel are delayed, call the hospital emergency room for further instruction.</li> <li>• Do not give the worker water to drink until instructed by medical personnel.</li> </ul>

## Heat Stress Check List

- Does the worksite have temperature extremes (above 85 degrees in higher humidity, above 90-95 degrees in lower humidity) that may cause heat stress?
- Do employees do heavy labor or wear heavy protective clothing? (increases heat stress conditions)
- Do employees have access to adequate drinking water at all times?
- Are employees allowed work breaks during prolonged heavy labor?
- Do workers have access to shade during breaks?
- Have employees been trained on the symptoms of heat-related illness (heat exhaustion and heat stroke) ?
- Are employees trained on first aid measures for heat-related illness?

# GROUNDING CONDUCTOR PROGRAM

## PURPOSE:

The purpose of this policy is to specify procedures and guidelines to eliminate all injuries resulting from possible malfunctions, improper grounding and/or defective electrical tools.

## GROUND FAULT PROTECTION

TEK Construction, Inc. will use ground fault circuit interrupters or assured equipment grounding conductor program to protect employees on the job site. These requirements are in addition to any other requirements for equipment grounding conductors.

**Ground-fault circuit interrupters (GFCI)** - All 120 volt, single phase, 15 and 20 ampere Receptacle outlets on the job site, which are not 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 5kw, where the circuit conductors of the generator frame and all other grounded surfaces, need not be protected with ground fault circuit interrupters.

**Assured equipment grounding conductor program** - TEK has established the following assured equipment grounding conductor program on the job site covering all cord sets, receptacles which are not part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program will comply with the following minimum requirements:

(A) A written description of the program, including the specific procedures adopted by the employer, shall be available at the job site for inspection and copying by Assistant Secretary and any affected employee.

(B) The manager and/or designated employee have been designate to implement the program as defined by OSHA 1926.304(f).

(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. Damaged or defective items shall be tagged "DO NOT USE" and removed from service until repaired and tested.

(D) The following tests shall be performed on all cord sets, receptacles which are not part of the permanent wiring of the building or structure, and cord and plug connected 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 test 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 cause damage (for example, when the cord set has been 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) TEK will not make available or permit the use by employees on any equipment which has not met the above requirements.

(G) Tests performed as required will 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 late date it was tested or the interval for which it was tested. The equipment will be identified with a nonconducting tag or other means of identification. This record shall be kept by means of logs, color coding, (example – colored plastic tapewriter tape) or other effective means and shall be maintained until replace by a more current record. The record shall be made available on the job site for inspection by the Assistant Secretary and any affected employee.

(H) TEK will use a different color plastic tape for each quarterly inspection. Red 1<sup>st</sup> Quarter, Blue 2<sup>nd</sup> Quarter, Green 3<sup>rd</sup> Quarter, and Yellow 4<sup>th</sup> Quarter. A plastic tape writer will be used to identify each cord set by a number (SP01, 02, 03 etc.). A written record will be maintained on all cords sets and news sets as they are added. A Volt/OHM meter will be used to test continuity of each set.

# **SAFETY ALERT**

## **ASSURED ELECTRICAL EQUIPMENT GROUNDING CONDUCTOR PROGRAM**

**INSPECT - TEST - COLOR CODE**

ALL ELECTRICAL TOOLS, EXTENSION CORDS, AND EQUIPMENT

**FIRST QUARTER**

**JANUARY 1 – MARCH 31**

**COLOR CODE IS**

**RED**

ENSURE ALL ELECTRIC APPARATUS HAVE BEEN SATISFACTORILY TESTED AND COLOR CODED PRIOR TO USE.

# **SAFETY ALERT**

## **ASSURED ELECTRICAL EQUIPMENT GROUNDING CONDUCTOR PROGRAM**

**INSPECT - TEST - COLOR CODE**

ALL ELECTRICAL TOOLS, EXTENSION CORDS, AND EQUIPMENT

**SECOND QUARTER**

**APRIL 1 – JUNE 30**

**COLOR CODE IS**

**BLUE**

ENSURE ALL ELECTRIC APPARATUS HAVE BEEN SATISFACTORILY TESTED AND COLOR CODED PRIOR TO USE.

# **SAFETY ALERT**

## **ASSURED ELECTRICAL EQUIPMENT GROUNDING CONDUCTOR PROGRAM**

**INSPECT - TEST - COLOR CODE**

ALL ELECTRICAL TOOLS, EXTENSION CORDS, AND EQUIPMENT

**THIRD QUARTER**

**JULY 1 – SEPTEMBER 30**

**COLOR CODE IS**

**GREEN**

ENSURE ALL ELECTRIC APPARATUS HAVE BEEN SATISFACTORILY TESTED AND COLOR CODED PRIOR TO USE.



# **SAFETY ALERT**

## **ASSURED ELECTRICAL EQUIPMENT GROUNDING CONDUCTOR PROGRAM**

**INSPECT - TEST - COLOR CODE**

ALL ELECTRICAL TOOLS, EXTENSION CORDS, AND EQUIPMENT

**FOURTH QUARTER**

**OCTOBER 1 – DECEMBER 31**

**COLOR CODE IS**

**YELLOW**

ENSURE ALL ELECTRIC APPARATUS HAVE BEEN SATISFACTORILY TESTED AND COLOR CODED PRIOR TO USE.

# HEARING CONSERVATION

## **PURPOSE:**

TEK Construction Inc. has established a Hearing conservation Program to protect worker from the hazards of noise on the job. OSHA regulations require that each employer implement a hearing conservation program when workers are exposed to noise levels exceeding 85 dB. It is not hard to exceed this level of noise on many of the jobs sites. Typically, noise levels exceeding 85 dB are experienced when working with any type of pneumatic chipper or hammer, metal saw, and grinders. See attachment I for list of some common noise levels.

## **RESPONSIBILITY:**

The Manager of Operations is responsible for the developing a written Hearing Conservation Procedure and overseeing the training of all employees in the company. The Manager of Operations is also responsible for the monitoring and administering this procedure.

## **INTRODUCTION:**

The OSHA Standard on Occupational Noise Exposure, 29 CFR 1910.95, established the permissible limit of noise as 85 dB(A) (decibels), expressed as an eight-hour (8-hours), time-weighted average, (TWA). This standard allows short-term unprotected noise exposure up to a maximum of 115dB (A), peak sound.

The noise standard requires the identification by personnel monitoring of employees who may be exposed above the 85 db (A), 8-hour, TWA. Hearing protection is also required for specific activities or using certain types of equipment.

## **PROCEDURES:**

TEK Construction has taken a conservative approach to this noise hazard by establishing this program. The following elements establish the program:

- a. An Audiometric Testing Program when required
- b. An Employee Education and Training Program
- c. Monitoring and Analysis of Workplace Noise Levels
- d. Providing Suitable Engineering Controls when appropriate
- e. Providing Hearing Protectors when required
- f. Maintain required records for the above.

## **AUDIOMETRIC TESTING**

Each new employee whose work exposes them to noise levels above the "OSHA action level" will receive an Audiometric test as part of a pre-screening physical examination to establish a baseline audiogram against which subsequent audiograms can be compared as required by the OSHA Standard.

Annually, all employees who are exposed to noise levels exceeding the 85 dB standard will be given a follow-up Audiometric examination to monitor for any significant changes in their hearing ability.

Employees will be formally notified if there is any change in their hearing as the result of the testing. The Standard has defined this shift as a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 200, 3000 and 4000 hz in either ear. In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F: "Calculation and Application of Age Correction to Audiograms."

When audiometric testing is required, each affected employee must not be exposed to any workplace noise for at least 14 hours prior to his/her test. This requirement may be met by wearing hearing protectors which will reduce the employee's exposure to a sound level of 80 db (A) or below.

Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometer does not need to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.

An audiologist, otolaryngologist or physician will review problem audiograms and shall determine whether there is a need for further evaluation. The company will provide to the person performing this evaluation the following information:

- a. A copy of the 29 CFR 1910.95 Hearing Conservation.
- b. The baseline audiogram and most recent audiogram of the employee to be evaluated.
- c. Measurement of background sound pressure in the audiometric test room as required in 29 CFR 1910.95 Appendix D.
- d. Records of audiometric calibrations as required by 20 CFR 1910.95 Appendix E.

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined by OSHA, the employee will be informed of this fact, in writing, by the company within 21 days of determination.

Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the company will ensure that the following steps are taken when a standard threshold shift occurs:

- a. An employee not using hearing protectors will be fitted with hearing protectors, trained in their use and care, and required to use them; and
- b. An employee already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

- c. Refer the employee for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the company suspect that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
- d. Inform the employee of the need for an otological examination if a medical pathology of the ear which is unrelated to the use of hearing protector is suspected.

If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour TWA average of 90 decibels indicates that a standard threshold shift is not persistent the company:

- a. Will inform the employee of the new audiometric interpretations: and
- b. May stop the required use of hearing protectors for that employee.

See Attachment II

## **EMPLOYEE EDUCATION AND TRAINING**

TEK employees must be trained on the use of personal hearing protection equipment. Also each employee must know how to clean and maintain the hearing protection equipment. The training will cover the following:

- a. Training will be for all employees who are exposed to noise at or above the 8-hour TWA of 85 dB.
- b. The training will be repeated annually for each employee included in the hearing conservation program.
- c. The effects of noise on hearing
- d. The purpose of hearing protectors, the advantages, disadvantages, and the attenuation of various types and instruction on selection, fitting, use and care
- e. The purpose of audiometric testing, and an explanation of the test procedures.
- f. Access to information and training materials.

## **MONITORING AND ANALYSIS OF WORKPLACE NOISE LEVELS**

TEK Construction will, periodically or as necessary, conduct noise level surveys of the workplace. The results of these surveys will be made available to employees upon request.

Any job area or company location found to be in excess of the allowable designated noise levels that cannot be brought into compliance with the noise standard will be designated as an area where hearing protectors are to be worn. When signs are posted employees must wear hearing protection. The signs may read as follows:

**NOTICE  
EAR PROTECTION  
REQUIRED  
IN THIS AREA**

## **PROVIDE SUITABLE ENGINEERING CONTROLS**

Where appropriate, TEK will provide engineering controls to reduce noise exposure. Due to the complexity of most job sites, it is difficult if possible to institute effective engineering controls for

most noise exposures. Should this be the case, then employees will be required to wear suitable hearing protection.

## **PROVIDE HEARING PROTECTORS WHERE REQUIRED**

TEK will provide and required employees with hearing protectors if his/her 8 hour TWA is above the 85dB (A) TEK will also make hearing protectors available to all employees exposed to a TWA above 85dB (A) at no cost to the employee. Any employee who may have a significant threshold shift of hearing level will be required to wear hearing protection if they are exposed to noise TWA of 85dB. TEK will provide workers with a choice of at least one type of ear plug and one type of ear muff (ear muff can not be used when anything prevent the seal of the ear muff, such as safety glasses) On some job site there will be a choice of two different ear plugs. TEK will make a concerted effort to fine the right protector for each employee, one that offers the right attenuation, is accepted on the terms of comfort, and is used by the employee.

## **RESPONSIBILITIES**

### **A CLIENT WILL:**

- a. Determine all sources of noise at or above 85dD.
- b. Determine if personnel have 8-hour TWA exposures at or above fifty-percent (50%) of the OSHA allowable.
- c. Review noise exposures annually for all job classifications with TWA
- d. Exposure at or above fifty-percent (50%)
- e. Ensure that audiograms are made annually for personnel whose TWA exposures are at or above fifty-percent (50%) of the OSHA allowable.

### **JOB SITE SUPERVISION WILL:**

- a. Will require hearing protection in all area with noise levels at or above the 85dB(A) and for all task which generate such noise level (i.e., grinding, hammering).  
Ear plug shall be required in an area and/or on tasks with the sound levels exceeding 105dB.
- b. To alert employees to possible hazardous noise exposures, Signs shall be posted in work areas in which the sound levels may exceed 85dB. These signs will be posted by the client.
- c. Evaluate the need for engineering and/or administrative controls to reduce the noise levels below the 85 dB and, where feasible, develop a plan to reduce all personnel exposures to less than fifty-percent (50%) of the OSHA allowable.
- d. Make hearing protection available and enforce its use by all employees with TWA exposures at or above the fifty-percent (50%) of the OSHA allowable and/or by those who must enter or work in areas where the noise level is 85dB or above.

## **REMEMBER**

The client determines if a unit or work area is classified as a high noise area. After the determination is made, SYLVAN PIPING of NJ, INC. employees will be instructed to wear the appropriate hearing protection.

## **RECORDKEEPING**

All record-keeping for this program will be maintained in the office. Records will include:

- a. Audiometric tests
- b. Noise surveys
- c. Employee training
- d. Engineering controls implemented
- e. Record of purchase of hearing protector

**WORK REQUIRING HEARING PROTECTORS**

There are many jobs or types of work that generally produce noise levels that intermittently or for short durations exceed the permissible TWA. It is the policy of \_\_\_\_\_ to require all workers who are engaged in these jobs to wear hearing protectors. The attached list is some of those jobs. See Attachment \_\_\_\_\_

**HEARING PROTECTORS**

Employees may choose the type of hearing protection that best suits their particular assignment and personal preference for among those listed below. Each employee required to wear hearing protection is responsible for carrying hearing protection on his/her person. Hearing protection is furnished at no cost to employees.

**EAR PLUGS** – Most ear plugs, when worn properly, have a noise reduction rating (NRR) on the package. Most ear plugs have NRR of about 30.

**EAR MUFFS** – Adjustable muffs can be worn in three positions:

POSITION	NRR
1. Over the head	24 (this depends on the NRR of the Ear Muff)
2. Under the chin	20
3. Behind the head	20

**COMPUTING THE HEARING PROTECTION LEVEL**

To compute the actual hearing protection level under the protector, subtract 7dB(A) from the Noise Reduction Rating (NRR), divide the number by 2, and subtract the remainder from the measured noise level dB (A).

For example:  $NRR\ of\ 29 - 7 = 22\ dB(A)$   
 $22\ Db(A) \div 2 = 11\ dB(A)$   
 Noise level of 95 dB(A) – 11 = 84 dB(A)  
 Therefore, this device offers a protection level of 11 dB(A).

# HOT WORK SAFETY PROGRAM

## **PURPOSE:**

The purpose of this policy is to establish cutting and welding safety procedures and to ensure that all cutting and welding operations are performed in the safest manner possible, and in compliance with applicable regulations.

## **POLICY:**

All cutting and welding operations shall be performed in compliance with OSHA standards and all other applicable state, local and client regulations, policies, procedures and standard safe work practices. Welding is restricted to areas or situations where adequate fire prevention, welder protection and passerby protection can be assured.

## **PROCEDURES:**

This safety standard is intended as a guide to safe practices in welding, burning, brazing and related operations. The precautions and protective measures outlined are recommended minimum requirements. Welders should exercise judgment in applying these precautionary measures in such matters as length of work periods, poor ventilation, unusual work locations, and specialized operations. Additional protective measures may be required in certain instances.

## **TRAINING:**

- Fire Watch Training – At a minimum the fire watch will be trained to the following standards: A “Fire Watch” is a person specifically trained and assigned to warn others of hazards associated with flammable materials, and when capable to prevent incipient stage fires.
  - Ensure proper “Hot Work” permit is on site
  - Ensure permit is signed by all appropriate personnel
  - Ensure adequate means of access and egress are provided to the work site
  - Read and understand all permit provisions, and maintain the conditions of the permit at all times
  - Wear an identification vest (made of flame retardant material)
  - Maintain appropriate sewer drain coverage (if applicable)
  - Maintain a charged fire hose to the end nozzle, and/or a charged dry chemical fire extinguisher with current inspection tags
  - Maintain spark containment by using approved fire blankets
  - Prevent the taking of samples, venting, or opening of piping or equipment in the immediate area of the hot work
  - Must be able to communicate in English so that you can inform others in the event of emergency conditions
  - Determine the exact location of firefighting equipment in the immediate area
  - Ensure proper barricading and warning signs are used
  - Continuously monitor the work area during and for 30 minutes after hot work has finished to ensure no smoldering embers or slag exist
  - During actual hot work, keep area wet when possible

- Continuously monitor the work area and surrounding area for any unsafe conditions, or potentially hazardous conditions
  - In the event of a hazardous condition, emergency, or changing environment, the fire watch will stop all work until it is safe to resume
  - Never leave the work site unless the work has stopped, or until you are relieved by another employee with equal or greater training and knowledge
  - Ensure surrounding conditions are inspected and precautions are taken with consideration given to wind direction
  - Ensure equipment such as welding machines, hoses, tools, etc., are located so as not to impede access or egress, or access to firefighting equipment
  - In the event of a fire - Remain calm
  - Only extinguish a fire when it is clearly within your abilities and the equipment available
  - Know the location of the nearest alarm and how to activate the emergency system
  - Know the evacuation routes and collection points
  - If the fire cannot be extinguished, leave the area immediately and report to your evacuation area
  - Await further instructions from the Incident Commander, or designated responsible personnel
- Only trained and qualified personnel may operate or maintain welding, cutting or brazing equipment Welders/Cutters will be trained per this policy and will possess the appropriate certifications for their work scope.
  - Craft who perform any of the functions covered by this policy will be required to complete training including:
    - A test or other method to determine competency
    - All training records shall be documented and kept on file with Human Resources

**General Rules**

**Initial Assessment – Fire is a primary focus and the assessment for fire protection guide should be used:**

A dedicated fire watch is required for all hot work. If the object to be cut, burned or brazed cannot be moved and if all fire hazards cannot be removed, then guards shall be used to confine the heat sparks and slag and to protect the immovable fire hazards. If these steps cannot be taken to prevent fire, then the hot work will be stopped until a safer alternative is available to perform the work safely.

Supervisor/qualified personnel will inspect the area prior to work beginning, and authorize the work. The competent person will be trained to perform his/her job functions and to identify substandard conditions/acts. The competent person shall ensure all oxygen-fuel gas supply equipment is suitable, safe to use, and in good working condition for the hot work.

Inspections and certification records will be kept for recordkeeping.

If	And	Then
The object to be welded, cut or heated can be moved	A fire-resistant, safe workspace is available	Welding, cutting or heating shall be done in that space.
The object to be welded, cut or heated cannot be moved	All fire hazards can be moved to a safe distance	Welding, cutting or heating can be done once fire hazards are taken to a safe place.



The object to be welded, cut or heated cannot be moved	All the fire hazards cannot be removed	Guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.
--	--	--

1. Before doing any welding or burning, outside of an area approved for routine hot work, be certain the necessary Hot Work Permit has been issued. All hot work will be approved by the client and the site supervisor. The crew responsible for the equipment will ensure all is suitable and in good working order. All equipment is inspected prior to beginning work and all crew members using the equipment will be familiar with "American Welding Society Standard A6-1-1966". Any equipment that is not ready for service or needs repair shall be red-tagged and repaired by qualified personnel.
2. Whenever it is necessary for hoses, lines or cords to cross walkways or work areas, they must be strung overhead or protected by planks laid on both sides of the hose. All hoses, cord and leads and other welding equipment must be maintained in a safe and serviceable condition, with no fraying or exposed copper permitted. They should be deployed in a manner that does not create tripping hazards.
3. Contain all sparks with fire blanketing.
4. Before each use, hose must be inspected for leaks, burns, worn places, loose connections, or other defects which may render the hose unfit for service. Hose burned by a flash back must be discarded.
5. Welding machine ground connections must be made on or as close as possible to the object being worked upon to assure a good ground and prevent damage to valves, pump bearings, etc.
6. Welding machine grounds shall not be made to handrails, stairs, or to projections from steel power or lighting towers, or on any active oil, gas, steam, air, or chemical line.
7. Temporary power lines to portable arc welding machines should be carried overhead whenever practical, or laid on the floor or ground suitably protected so that they cannot be damaged or interfere with safe passage.
8. Necessary precautions must be taken to protect against electrical shocks when working in wet or damp places.
9. In electric welding, all parts of the body should be covered to prevent skin burns from ultra-violet rays or molten metal. The feet and ankles are particularly vulnerable to burns, and care should be taken to see that they are properly protected.
10. Do not use ear cotton when welding. Sparks or slag may ignite the cotton.
11. Welding rod shall not be stored in its original container once the container has been opened. When an original container is opened, the rod shall be immediately transferred to either a rod oven or an approved container, such as the plastic "rod guard" container. The original container shall then be crushed and properly disposed of.
12. Full spark containment is required and any exposed equipment or small bore piping must be protected from damage. A trained fire watch must be present at all times hot work is in progress.
13. Two sets of Flash Back arrestors must be installed on oxyacetylene system; one set installed at regulators and one set at torch handle (unless torch is equipped with arrestors).
14. Welders must wear Z-87 Safety Glasses with side shields under their welder's hoods.
15. Grinders are required to have OSHA approved guards in place at all times. Exceptions must be approved by the Safety Department.

16. Only pipe stands that are designed to prevent pinch points at the center tube locking washer, and a stop at the base of the center tube to prevent crushing type injuries shall be used.
17. All welding rigs must be in safe operating condition and be properly identified.
18. Welding rigs must have emergency brake set and transmission in park or low gear when parked. If there is any slope the wheels must be chocked. When exiting a welding rig, welders must wear all required PPE.
19. The work area must be kept clean and materials including used weld rod removed when job is complete.
20. All welding rigs shall have a fire extinguisher.
21. Approved spark arrestors are required on all welding machines.
22. Always inspect grinders before each use. Grinders must have ground fault circuit interrupters (GFCI's)
23. Welding hoods must be equipped with the proper shaded lens for protection against radiant energy. (according to chart)
24. Make sure all sewers, drains, pits, pipe trenches, confined spaces; enclosed spaces have been tested for flammable vapors and/or hydrocarbons. Cover all openings per client policy.

**Filter Lens Shade Numbers for Protection against Radiant Energy**

Shade Number	Welding Operation
10	Shielded metal arc welding 1/16, 3/32, 1/8, 5/32-in. diameter electrodes
11	Gas-shielded arc welding (nonferrous) 1/16, 3/32, 1/8, 5/32-in. diameter electrodes
12	Gas-shielded arc welding (ferrous) 1/16, 3/32, 1/8, 5/32-in. diameter electrodes
12	Shielded metal-arc welding 3/16, 7/32, 1/4-in. diameter electrodes
14	Shielded metal-arc welding 5/16, 3/8-in. diameter electrodes.
10 to 14	Atomic hydrogen welding
14	Carbon arc Welding
2	Soldering
3 or 4	Torch Brazing
3 or 4	Light cutting, up to 1 in.
4 or 5	Medium cutting, 1 in. to 6 in.
5 or 6	Heavy cutting, over 6 in.
4 or 5	Gas welding (light), up to 1/8-in.
5 or 6	Gas welding (medium), 1/8-in. to 1/2-in.
6 or 8	Gas welding (heavy), over 1/2-in.

**Gas Cylinders**

1. Compressed gas cylinders are to be shut-off at the bottle when not in use or unattended for short periods of time. At the end of the shift the bottles are to be shut off and gauges and hoses detached and properly stored and protective caps installed.
2. Compressed gas cylinders shall have gauges removed and be capped prior to transportation. Cylinders shall only be transported or stored in the up position.
3. Use approved storage racks or dollies to store compressed gas cylinders. Chain or #9 wire may also be used. Never use rope for this purpose.
4. On welding rigs compressed gas cylinders shall be securely stored in vertical racks.

5. Oxygen and acetylene cylinders must be stored at a distance of 20 feet apart or be separated by a fire wall that is 5 feet or higher and has a fire rating of 60 minutes or more. These cylinders must be kept at least 20 feet away from combustibles or separated by a fire wall.
6. Do not use a choker or chokers to haul cylinders.
7. Keep cylinders away from work so sparks, slag, or flame cannot reach them. If cylinders cannot be isolated, fire resistant shields must be provided for them.
8. Cylinders shall always have the gauges removed and cylinder caps installed prior to being moved.
9. Acetylene shall never be exposed to unalloyed copper except in a torch.
10. Compressed gas cylinders shall be equipped with connections that conform to ANSI B57.1-1965.
11. Cylinders shall be marked to identify contents.
12. No more than 15 psi of acetylene shall be used at any time.
13. Bottles shall be slightly opened then closed just prior to attachment of the regulator.
14. Torches shall be lighted by friction lighters, not matches or other hot work.
15. Welders must insure that lines have been adequately purged prior to working on them.
16. Equipment shall be inspected for leaks daily. Unserviceable/non-approved equipment may not be used.
17. All welders shall possess current certifications.
18. Hot work area shall be kept damp at all times.
19. Unattended/unused welding machines shall be turned off.
20. Fire Watches shall remain on site for 1/2 hour after job.
21. MOST IMPORTANTLY: NO HOT WORK PERMIT = NO WELDING.

## **Ventilation**

The following are ventilation requirements for welding.

1. Ensure that adequate ventilation is provided for employees working with welding and cutting equipment. Confined space work will have a plan to address securing of cylinders, lifelines, and warning systems that will be utilized by the safety attendant (Fire Watch/Confined Space Attendant).
2. Ensure that contaminated air exhausted from a working space is discharged into the open air or otherwise clear of the source or intake air.
3. Do not use oxygen for ventilation, comfort cooling, blowing dust from clothing, or for cleaning a work area.
4. Ensure that all necessary precautions are taken to prevent the accumulation of gases when cutting torches are used.
5. Do not take compressed gas cylinders into confined areas.
6. Ventilation equipment consists of air siphons (air movers), and/or exhaust blower (copus air mover).
7. When using blowers or siphons to exhaust fumes, exhaust inlet must be kept as close as possible to the work. Air siphons use large amounts of compressed air. The following safety procedures shall be followed:

- Keep connecting air hoses as short as possible.
- Do not attempt to operate more than one siphon off a single air hose or outlet.
- If used to exhaust a vessel, be sure to seal the bell of the inlet side around the manhole or vessel opening.
- A daily inspection of the safety screens' condition should be accomplished on the blowers. Repair or replace if broken. The use of a blower hinge is also recommended.

### Planning Hot Work Welding

In planning or carrying out hot work, certain factors should be considered besides the obviously important hot work permit, gas test and hazard analysis. Those factors include, but are not limited to:

1. The base metal and its health effects. The MSDS on the metal is available and will address this issue.
2. The welding or burning process to be used and its special health problems, if any.
3. The location of the work: Is the work to be done in the open or in a confined space?
4. Ventilation required: Is special ventilation equipment needed?
5. Position of the work: Is the work overhead or below? Can it be positioned to allow fumes to be carried away without entering the welder's breathing zone?
6. Presence of other employees near the job: Is eye protection needed against ultraviolet radiation? Are other workers in the path of the welding fumes?
7. Cleanliness of the metal surface: Are harmful or flammable materials present beneath patches or in seams?
8. Respiratory protection: Are fume respirators adequate, or are air-supplied respirators needed? Protection must be appropriate to the circumstances and must meet the minimum requirement of the permit, but also may be upgraded.
9. Ensure adequate first aid supplies are available before beginning work. All injuries will be reported immediately.

### Welding and Burning Safe Practices

The following information is the recommended minimum precautionary measure to be followed in performing the types of hot work listed in Table 13-1. If, in the opinion of the supervisor, additional protection is required for a particular welding or burning job, such added protective measures should be used.

Open Area includes most outside work, the mechanical shop (except vessels or partitioned areas inside the building) and well-ventilated large rooms, buildings or tanks. Confined Spaces include work areas such as inside small tanks, drums, towers, or other vessels, whether indoors or out, as well as small rooms, deep excavations, and manholes.

**Table 13-1 - Welding and Burning Stick Electrode Welding**

Electrode	Basic Elements	Byproducts	Precautions
AWS E-6010	Iron		A
AWS E-6011	Iron		A
AWS E-6012	Iron		A
AWS E-6013	Iron		A
AWS E-6020	Iron		A
E-316 Stainless 18-12	Chromium, Nickel, Iron	Chromium, Nickel	B
E-310 Stainless 25-20	Chromium, Nickel, Iron	Chromium, Nickel	B

e-308 Stainless 18-8	Chromium, Nickel, Iron	Chromium, Nickel	B
E-610 12% Cr	Chromium, Iron	Chromium	B
E-502 5% Cr	Chromium, Iron		A
E-605 9% Cr	Chromium, Iron	Chromium	B
E-7018 Low Hydrogen	Iron	Fluorides	C
E-8018 B-2 (1-1/4% Cr)	Chromium, Iron		A
E-9018 B-3 (2-1/4% Cr)	Chromium, Iron		A
E-8108 C-2 (3-1/2% Ni)	Nickel, Iron		
Stoody 6	65% Cobalt, 45% Tungsten, 28% Chromium Cobalt	Chromium	B
Eutectic 680	High Chromium, Nickel	Chromium, Nickel	B
Inco-A	68% Nickel	Nickel	B
Inconel 182	65% Nickel	Nickel	B
Monel 190	60% Nickel, 23% Copper	Nickel, Copper	B
Ni-Rod 55	60% Nickel	Nickel	B
Carpenter 20	36% Nickel, 20% Chromium		B

**Precautions:**

A. No special precautions are needed in open or well-ventilated areas. Work in poorly ventilated areas will require respiratory protection. Work in confined spaces may require fume filter-type respirators or supplied air. Adhere to or upgrade permit requirements. Consult the Welding Supervisor.

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces will require high efficiency particulate respirators.

C. Fumes and gases generated:

1. Use exhaust blowers or air siphons to remove gases and fumes from breathing zone in open areas.
2. Work in confined spaces will require air-supplied respirator.

D. Intense arc. Large amounts of metal fumes and gases generated:

1. Provide adequate ventilation of work. Use fume exhausters to remove fumes and gases from breathing zone in open areas. Do not direct exhaust air toward other employees. Use fume filter-type respirators in open areas.
2. In confined areas, adequate ventilation must be provided and air-supplied respirator must be worn.

E. Use only in metalizing hood. If necessary to metalize in other locations, use air-supplied respirator and protect other workers in the vicinity. Do not use any lead alloys in open shop area.

**Table 13-1  
Tungsten Arc Welding, Gas Shielded (Heliarc)\* (TIG)**

Rod	Basic Elements	Harmful Byproducts	Precautions
Evedur 1010	05.6% Copper Silicon	Copper, Ozone	C
Oxweld 372 Copper	98% Copper	Copper, Ozone	C
AWS ER 4043	Aluminum, Silicon	Ozone	C
AWS ER 5356	Magnesium, Aluminum	Ozone	C
Oxweld 28	18% Chromium, 8% Nickel, Iron	Chromium, Nickel Ozone	C
Steel	Steel	Ozone	C
1-1/4% Chromium	Chromium, Iron	Ozone	C
2-1/4% Chromium	Chromium, Iron	Ozone	C

\*High levels of ultraviolet light produced. Avoid eye flash with side shield goggles. Avoid skin burns with proper clothing.

C. Fumes and gases generated:

1. Use exhaust blowers or air siphons to remove gases and fumes from breathing zone in open areas.
2. Work in poorly ventilated areas will require respiratory protection.

3. Work in confined spaces will require air-supplied respirator.

### Short Arc Consumable Electrode Gas Shield\* (MIG)

Wire	Basic Elements	Harmful Byproducts	Precautions*
18-8 Stainless	18% Chromium, 8 % Nickel, Steel	Chromium, Nickel, Ozone	B
25-20 Stainless	25% Chromium, 20% Nickel, Steel	Chromium, Nickel, Ozone	B
Oxweld 63	98% Copper	Copper, Ozone	B
Airco 110	98% Copper	Copper, Ozone	B
Oxweld 62	91.5% Copper, Aluminum	Copper, Ozone	B
Type 316 Stainless	18% Chromium, 13% Nickel, Steel	Copper, Nickel, Ozone	B
Aluminum	Aluminum	Ozone	B
Hastelloy B	Nickel, Molybdenum	Nickel, Ozone	B
Inconel 62	Chromium, Nickel	Nickel, Ozone	B
Oxweld 65	Iron		B

\*High levels of ultraviolet light produced. Avoid eye flash with side shield goggles. Avoid skin burns with proper clothing.

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces or poorly ventilated areas will require high efficiency particulate respirators.

### Acetylene Welding and Brazing

Wire	Basic Elements	Harmful Byproducts	Precautions
Hastelloy D	Silicon, 90% Nickel	Nickel	A
Oxweld 5M	Copper, Zinc, Tin	Copper, Zinc	B
1 Oxweld	Steel		A
Aluminum	Aluminum		A
Everdur 1010	Copper, Silicon	Copper	A
Arcosil J	56% Silver, 22% Copper 17% zinc, 5% Tin	Copper, Zinc	B
Oxweld 28	18% Chromium, 8% Nickel, Steel	Chromium, Nickel	B
18-8 Stainless	18% Chromium, 8% Nickel, Steel	Chromium, Nickel	B
Easy-Flo	45% Silver, 15% Copper 25% Cadmium, 16% Zinc	Copper, Cadmium Zinc	B
Sil-Fos	15% silver, 80% Copper 5% Phosphorus	Copper	B
Oxweld 372	98% Copper	Copper	B
Colmonoy 6	65% Cobalt, 28% Chromium	Cobalt, Chromium	B
Chromium	Tungsten		
Stoodite	Iron, 30% Chromium	Chromium	B
Borod	Tungsten Carbide, Iron		

A. No special precautions are needed in open or well-ventilated areas. Work in confined spaces or poorly ventilated areas may require fume filter-type respirators. Consult the mechanical welding and metals supervisor.

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces will require high efficiency particulate respirators.

### Silver Soldering and Soldering

Rod, Wire	Basic Elements	Harmful Byproducts	Precautions*
1801 Super	Silver, Copper, Cadmium, Zinc	Copper, Cadmium, Zinc	B

1602	Silver, Copper, Tin	Copper	B
18 FC	Copper, Tin Zinc	Copper, Zinc	B
16 FC	Silver Copper, Nickel	Copper, Nickel	B
15 Phoson	Silver Copper Phosphorous	Copper	B
11 Allstate	Copper, Zinc, Nickel	Copper, Zinc, Nickel	B

**B. Moderate amounts of fumes generated:**

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces will require high efficiency particulate respirators.

**Air Arc Cutting and Gouging (Carbon Rod)\***

Material Worker	Basic Elements	Harmful Byproducts	Precautions*
Steel	Iron	Iron Oxides	D
Cast Iron	Iron	Iron Oxides	D
Monel	Copper, Nickel	Copper, Nickel	D
Stainless Steels	Chromium Nickel, Iron	Chromium, Nickel	D
Chrome Steels	Chromium, Iron	Chromium	D
Brass	Copper, Zinc	Copper, Zinc	D
Copper	Copper	Copper	D
Aluminum	Aluminum	Nickel Oxides	D
High Nickel	Nickel	Nickel Oxides	D

\*Air gouging produces much higher metal fume levels than ordinary cutting or welding. Hearing protection needed for high noise levels.

**D. Intense arc. Large amounts of metal fumes and gases generated:**

1. Provide adequate ventilation of work. Use **fume** exhausters to remove fumes and gases from breathing zone in open areas. Do not direct exhaust air toward other employees. Use fume filter-type respirators in open areas.
2. In confined areas, adequate ventilation must be provided.
3. Use IH monitoring or representative sampling results to determine level of respiratory protection. If no monitoring or sampling results are available, supplied air must be used until analytical information is available to safely downgrade the level of protection.

**Plasma Arc Cutting**

Metals Cut	Basic Elements	Harmful Byproducts	Precautions*
Steel	Iron	Iron Oxides	D
Cast Iron	Iron	Iron Oxides	D
Monel	Copper, Nickel	Copper Nickel	D
Stainless Steel	Chromium, Nickel Steel	Chromium, Nickel	D
Chrome Steel	Copper, Steel	Chromium	D
Brass	Copper, Zinc	Copper, Zinc	D
Aluminum	Aluminum	Aluminum Oxides	D
Everdur	Silicon, Copper	Copper	D
Copper	Copper	Copper	D

\*High levels of ultraviolet light produced. Avoid eye flash with proper eye protection. Avoid skin burns with proper clothing. High noise levels produced. Hearing protection required.

**D. Intense arc. Large amounts of metal fumes and gases generated:**

1. Provide adequate ventilation of work. Use fume exhausters to remove fumes and gases from breathing zone in open areas. Do not direct exhaust air toward other employees. Use fume filter-type respirators in open areas.
2. Adequate ventilation must be provided in confined areas.
3. Use IH monitoring or representative sampling results to determine level of respiratory protection. If no monitoring or sampling results are available, supplied air must be used until analytical information is available to safely downgrade the level of protection.

# POWERED INDUSTRIAL TRUCKS

One of the most common sights in an industrial setting is the powered industrial truck. Whether it is a tow motor, order picker, motorized pallet jack, or forklift, it is the most versatile material handling equipment. Forklifts are wonderful tools for moving and stocking material. These trucks can be powered by propane gas, electric power, or diesel fuel.

Because these trucks most often operate in areas where other people are working, there is a potential for accidents involving both the forklift operator and pedestrians. OSHA has developed extensive regulations, detailing operator training requirements, forklift inspection needs, safe driving rules, and battery charging and changing requirements. The regulations even spell out what type of vehicle must be used in certain types of work areas. If you have an area with flammable gases or combustible dusts, it makes a difference how the forklift is powered.

There are a number of interpretive documents developed by OSHA on this subject. Check the following:

- (1) STD 1-11.4, which covers battery charging stations for fork lifts.
- (2) STD 1-11.3, which covers opening or closing railroad freight cars with a fork lift.
- (3) STD 1-11.1, which covers safety requirements of industrial trucks in a hazardous location.
- (4) STD 1-11.7, which allows the use of a mechanical means to secure trucks or trailers to a loading dock.

Almost one million forklift vehicles are in use in the industries covered by the OSHA standards. Industries with the largest number of forklifts include:

- Wholesale trade-non-durable goods (SIC 51): 127,000 vehicles;
- Food and kindred products (SIC 20): 82,000 vehicles;
- Construction: 46,000 vehicles; and
- Maritime: 3,240 vehicles.

## Affected workers

This standard covers workers who operate powered industrial trucks. This includes operators using these vehicles in the general industry, construction, and maritime sectors (including shipyards, marine terminals, and longshoring operations). The population-at-risk in forklift accidents consists primarily of the operators of these trucks.

Operators of forklift trucks include workers employed as designated truck operators as well as those who might operate the trucks as part of another job. These alternate users include shipping and receiving clerks, order pickers, maintenance personnel, and general temporary workers. Non-driving workers such as warehouse personnel, material handlers, laborers, and



pedestrians who work on or are present in the vicinity of forklift trucks are also injured and killed in these accidents.

## Background

In 1971, OSHA adopted the powered industrial truck standard from the American National Standards Institute (ANSI) B56.1-1969 consensus standard for the safe operation of powered industrial trucks. The standard defines a powered industrial truck as a mobile, power-driven vehicle used to carry, push, pull, lift, stack, or tier material. Vehicles included are commonly referred to as:

- High lift trucks, counterbalanced trucks, cantilever trucks, rider trucks, forklift trucks;
- High lift platform trucks;
- Low lift trucks, low lift platform trucks;
- Motorized hand trucks, pallet trucks;
- Narrow aisle rider trucks, straddle trucks;
- Reach rider trucks;
- Single side loader rider trucks;
- High lift order picker rider trucks;
- Motorized hand/rider trucks; and
- Counterbalanced front/side loader lift trucks.

Vehicles used for earth moving or over-the-road haulage are excluded from the scope of the consensus standard, and consequently from coverage by the OSHA standard.

## Vehicle type vs. group

Each prospective operator must be trained on the type of forklift vehicle that he/she will be operating. The use of a single characteristic to describe a truck, such as "high lift" truck, doesn't fully describe a single type of truck. Rather, "high lift" defines a group of different trucks that have that same characteristic.

A given truck can only be accurately described by referring to all of its characteristics. For example, the common type of truck used in a warehouse is a high lift, counterbalanced, sit-down rider truck.

## Characteristics

Powered industrial trucks are classified by their manufacturers according to individual characteristics. There are seven classes of powered industrial trucks:

## Class/Vehicle

1. Electric motor, sit-down rider, counter-balanced trucks (solid and pneumatic tires)
2. Electric motor narrow aisle trucks (solid tires)
3. Electric motor hand trucks or hand/rider trucks (solid tires)
4. Internal combustion engine trucks (solid tires)
5. Internal combustion engine trucks (pneumatic tires)
6. Electric and internal combustion engine tractors (solid and pneumatic tires)
7. Rough terrain forklift trucks (pneumatic tires)

Each of the different types of powered industrial trucks has its own unique characteristics and some inherent hazards. To be most effective, training must address the unique characteristics of the type of vehicle(s) the employee is being trained to operate.

Different trucks are designed and manufactured to operate in different work environments. Some powered industrial trucks are used for moving material in a particular type of workplace. High lift trucks can be used to raise loads 30 or 40 feet above the ground, deposit the material on a rack, mezzanine, roof under construction, scaffold, or another elevated location, and subsequently retrieve and lower the material. Other vehicles are used to raise a palletized load just a few inches above the floor and move that load to another location in a warehouse or other indoor workplace.

Powered industrial trucks can be equipped with, or can be modified to accept, attachments that permit the truck to move odd-shaped material or carry out tasks that may not have been envisioned when the truck was designed and manufactured. Many of these attachments are added to or installed on the vehicle by the dealer or the employer. For example, there are powered industrial truck attachments for grasping barrels or drums of material. Some of these attachments not only grasp a barrel or drum but allow the vehicle operator to rotate the barrel or drum to empty it or lay it on its side.

When a forklift truck is used with specialized attachments, or when it is used for hazardous operations (such as when the truck is used to lift people), operator training must include instruction on the safe conduct of those operations so that the operator knows and understands the restrictions or limitations imposed on vehicle operation in these situations.

## Vehicle hazards

Forklifts are used in almost all industries. They are used to move, raise, lower, or remove large objects or a number of smaller objects on pallets or in boxes, crates, or other containers. Because forklift movement is controlled by the operator and is not restricted by the frame of the machine or other impediments, virtually unrestricted movement about the workplace is possible.

## Unstable loads

The hazards commonly associated with powered industrial trucks vary for different vehicle types, makes, and models. Each type of truck presents different operating hazards. A sit-down, counterbalanced high-lift rider truck is more likely than a motorized hand truck to be involved in a falling load accident, because the sit-down rider trucks can lift loads much higher, making them prone to tip over if the load is too heavy or imbalanced.

## Tip overs

The method or means to prevent an accident and to protect employees from injury varies for different types of trucks. Operators of sit-down rider trucks are often injured in tip over accidents when they attempt to jump clear of the vehicle as it tips over. Because the operator's natural tendency is to jump downward, he or she lands on the floor or ground and is then crushed by the vehicle's overhead guard. Therefore, operators of sit-down trucks need to be trained to remain in the operator's position in a tipover accident and to lean away from the direction of fall to minimize the potential for injury.

On the other hand, when a stand-up rider truck tips over, the truck operator can exit the vehicle by simply stepping backward, perpendicular to the direction of the vehicle's fall, to avoid being crushed. In this situation, the operator usually should attempt to jump clear of the vehicle, and should be trained accordingly.

## Speed

Driving a forklift at excessive speed can result in loss of control, causing the vehicle to skid, tip over, or fall off a loading dock or other elevated walking or working surface. This condition can be made more dangerous because the load being carried sometimes partially obscures the operator's vision.

A vehicle that is out of control or being operated by a driver whose view in the direction of travel is restricted can strike an employee, run into a column or other part of the building, or strike stored material, causing the material to topple and injure employees in the area.

## Stability

Other characteristics of a powered industrial truck that affect safe truck operation are: the truck's tendency to become unstable; its ability to carry loads high off the ground; and its characteristic mode of steering, i.e., with the rear wheels while being powered by the front wheels.

Moving loads upward, downward, forward, and backward causes a shift of the center of gravity and can adversely affect the vehicle's stability. When a load is raised or moved away from the vehicle, the vehicle's longitudinal stability is decreased. When the load is lowered or moved closer to the vehicle, its longitudinal stability is increased.

Each powered industrial truck has distinct characteristics that make its operation different from the operation of other trucks. Therefore, operators must know how these differences affect safe truck operation.

## Vehicle Maintenance

Maintaining the forklift properly is just as important as driving safely. Although a regular maintenance schedule should be set up for lift trucks, you should always run down a safety checklist at the start of your shift. This check is not only visual, but it includes checking fluid levels, hydraulics, wheels and tires, brakes and any potential mechanical problems with the vehicle.

(1) BRAKES. The most important of your inspections, brakes are the single most common cause of lift truck accidents due to mechanical failure. Push the brake pedal in. It should have free travel before meeting resistance. Then, depress the pedal again and hold it for ten seconds. The pedal must hold solid and not be spongy or drift under pressure.

(2) STEERING. Steering is a vital maintenance concern. With the engine running, check if the steering wheel turns correctly both ways to its stops. The wheel should not feel loose and the pump should not squeal before reaching the stops.

The following checklist should be strictly adhered to before operating the vehicle:

- Check the fork pins and stops to make sure that they are in place.
- Check all cowling and body parts.
- Check the wheels and tires for excessive wear.
- Look for any broken or loosened parts.
- Check the fuel level, crankcase oil level, radiator water level. Check the engine air cleaner, the fan belt, the hydraulic fluid level and the battery water level.
- Check the hour meter and record it. This is important for maintenance scheduling.
- With the engine running, check operation of the hour meter, headlights, taillights and warning lights.
- Check the oil pressure gauge, the water temperature, ammeter, and sound the horn. Note if the clutch is working properly, check incapability, the hydraulic controls and any other controls on the lift system.

These checks are not excessive. For safety's sake and for your own wellbeing, you need to know if your vehicle is safe to operate. Anything not up to par must be reported to your supervisor at once.

## Work and workplace hazards

The workplaces where these trucks are being used also present a variety of different hazards. The safety of industrial truck operations can be decreased by workplace conditions such as rough, uneven, or sloped surfaces; unusual loads; hazardous areas; narrow aisles, blind spots, or intersections; and pedestrian traffic or employees working close to the path of travel.

Finally, there are hazardous work practices that relate to all trucks, including driving at excessive speed, poor loading, and carrying unauthorized passengers. In addition, poor truck maintenance can contribute to accidents.

Accidents have occurred because of unsafe truck operation, such as employees who have fallen from trucks while using them to change light bulbs on overhead fixtures or riding on the forks to manually retrieve items from high racks. Operators have attempted to drive with an obstructed view in the direction of travel and run into another employee. Improper truck maintenance has caused deaths from over exposure to carbon monoxide, loss of brakes, or rupture of hydraulic lines.

### Forklift operator training

Training provides a person with the necessary specialized instruction and practice to become proficient at a particular task. It is the means by which an employer ensures that employees have the knowledge and skills they need to do their jobs correctly and safely.

The alternative to formal training is learning by trial and error, an approach that results in an inadequate knowledge base and relies on mistakes (which often involve accidents, injuries, and near-miss incidents) for learning to occur. Reliance on this approach creates a greater chance of injuries and fatalities.

After employees have received initial training, acquired the basic knowledge, and perfected their operating skills, the employer may rely on refresher training to:

- Reinforce or improve the employee's knowledge of the basic training material;
- Impart new information;
- Teach material in a new manner; or
- Maintain an acceptable level of awareness of workplace conditions, operating hazards, and truck- related characteristics.

### Training methods

There are several approaches to assembling the necessary materials and methods for an effective training program. One approach is to make use of existing literature and model programs already developed. Another approach is to look at problems that occur during ongoing operations and identify what an operator must know to avoid or otherwise minimize the potential for an accident due to those problems.

A third approach to developing a training program is to analyze the accidents that have occurred and develop a training program that will minimize the potential for a recurrence of the conditions that caused the accident. A problem with this third method of program development is that it is reactive rather than proactive, i.e., tends to emphasize the problems that have caused an accident (the training is in reaction to an accident). By contrast, proactive training teaches

employees to prevent accidents rather than waiting for accidents to occur before recognizing the need for the training and determining what the scope and content of the training should be.

The training requirements in the final rule mandate training in specific topics unless a particular topic is not relevant to the types of vehicles or the employer's workplace. They require the training to address topics specific to the employer's workplace and to cover information learned from accidents or near-misses that have occurred in the employer's workplace.

### Formal and informal training

Training comes in many forms. It may be as simple and informal as a supervisor discussing the correct way to operate a vehicle, correcting an error in the way an employee is doing a job, or showing an employee how to perform a particular task properly.

Alternatively, training may consist of detailed, structured instruction using formal training methods (e.g., lectures, formal demonstrations, practical exercises, examinations, etc.). Formal training is usually used to provide trainees with a large amount of information. OSHA believes that a combination of training methods is most effective in training powered industrial truck operators.

Proper employee training must take into account different operating conditions including the type and size of the load, the type and condition of the surface on which the vehicle is being operated, and other factors that can adversely affect vehicle operation. Operator training must emphasize two points regarding potential accidents:

1. The employee must not engage in activities that will increase the potential for an accident to occur; and
2. The employee must take appropriate action to minimize the potential for injury to himself/herself or to other employees if an accident occurs.

### OSHA's required training for forklift operators

In December 1998, OSHA issued a rule with specific training requirements that prospective operators of powered industrial trucks be trained in before they are allowed to operate the vehicles independently. The training must consist of instruction (both classroom-type and practical training) in proper vehicle operation, the hazards of operating the vehicle in the workplace, and the requirements of the OSHA standard for powered industrial trucks.

### Training program elements

Operator training must include the following three elements:

- Formal instruction such as: Lecture, discussion, interactive computer learning, video tape, or written material;
- Practical training: Demonstrations performed by the trainer and practical exercises performed by the trainee; and

- Evaluation of the operator's performance in the workplace.

### Basis of training

Amount and type of operator training must be based on the:

- Operator's prior knowledge and skill;
- Type of powered industrial truck that the operator will drive in the workplace;
- Hazards present in the workplace; and
- Operator's demonstrated ability to operate a powered industrial truck safely.

### Trainer qualifications

All training and evaluation required by this standard must be conducted by persons with the knowledge, training, or experience to train operators. An employer may have the necessary prerequisites to qualify as a trainer and evaluator, or he or she may assign the responsibility for training and evaluation to one or more employees or an outside trainer and evaluator having those prerequisites.

OSHA considers this a "performance-oriented" approach to the qualifications of trainers and evaluators. Trainers and evaluators with different backgrounds can achieve the level of ability necessary to teach and evaluate trainees.

### Training program content

Powered industrial truck operators need to be trained using a combination of classroom and practical training. Some elements are better taught using one or the other type of training, and often both methods of training are needed. To ensure that the training contains the appropriate information for the operator, a list of subjects that must be mastered is included in the rule.

All of the topics must be covered in operator training unless the employer can demonstrate that one or more of these topics is not necessary for safe operation in a particular workplace. In such cases, the employer must be able to demonstrate that a particular topic on the list is not relevant to the training program because that element does not apply to the type of vehicle(s) in use, or because the workplace condition addressed by the element does not exist.

It is the employer's responsibility to ensure that operators successfully complete all needed training and that the appropriate subjects are taught, including those that are pertinent to the type(s) of truck the operator will be allowed to operate and the work environment in which the vehicle(s) will be operated.

### Refresher training

Refresher training is required when any of the following conditions occur:

- If the operator is involved in an accident or a near-miss incident;

- If the operator has been observed driving the vehicle in an unsafe manner;
- When the operator is assigned to a different type of truck;
- If it has been determined during an evaluation that the operator needs additional training; or
- When there are changes in the workplace that may affect safe operation of the truck. This could include a different type of paving, reconfiguration of storage racks, new construction leading to narrower aisles, or restricted visibility.

The type and amount of training needed in the refresher training depend on several factors, including: the different characteristics of the new type of truck or terrain; the practice or practices that the evaluation indicated needed improvement; the nature of the unsafe act; and the potential for an accident to occur.

The refresher training also includes an evaluation of the operator's performance in the workplace. This is necessary to determine the effectiveness of the training and ensure that the operator can effectively utilize all the training to drive safely in the workplace.

#### Duplicative training

To eliminate unnecessary or duplicative training both for newly hired operators and those already on the payroll, the rule allows employers to forego those portions of the required training that operators have previously received.

If an operator is already trained in certain aspects of powered industrial truck operation, knows the necessary information, has been evaluated, and has proven to be competent to perform the duties of an operator, there is no reason to repeat that operator's training. If an operator already knows how to operate a powered industrial truck safely and can demonstrate that ability, there is no need to further train that operator. Some training on the site-specific factors of the new operator's workplace is always likely to be necessary.

An employer need not provide further training to any operator (whether currently on the payroll or a new hire) in any training topic in which the operator has previously received training, if the operator, after evaluation, is found to be competent to perform the operator's duties safely.

The operator would need additional training in any element(s) for which the evaluation indicates the need for further training, and for any new type of equipment or changes in workplace conditions.

In evaluating the applicability and adequacy of an operator's prior training, the employer may wish to consider these factors: the type of equipment the operator has operated; how much experience the operator has had on that equipment; how recently this experience was gained; and the type of environment in which the operator worked. The employer may, but is not required to, use written documentation of the earlier training to determine whether an operator has been properly trained.

#### Periodic evaluations



An evaluation of operator performance must be conducted once every three years.

The operator's competency may be evaluated by the employer or another person with the knowledge, skills, and experience to perform evaluations. The employer can determine from this information whether the experience is recent and thorough enough, and whether the operator has demonstrated sufficient competence in operating the powered industrial truck to forego any or some of the initial training.

These evaluations need not take excessive time, or interrupt the production process. In most cases, the person conducting the evaluation would do two things: first, observe the powered industrial truck operator during normal operations to determine if the operator is performing safely, and second, ask pertinent questions to ensure that the operator has the knowledge or experience needed to operate a truck safely.

In some cases, because of the danger or complexity of the operation, the extent of the change in conditions, or the operator's need for additional skills, the evaluation will need to be lengthier and more detailed.

Evaluations of each operator's performance are required:

- As part of the initial and refresher training; and at least once every three years.

#### Duplicative training

An employee who has received training and been found by an evaluation to be competent to perform the duties of an operator safely does not have to be retrained at specified intervals. However, all new operators must have their performance evaluated.

#### Certification

Employers must certify that the required training and evaluation has been conducted and that the employee is competent to perform the duties of an operator safely by keeping a record with:

- the name of the trainee,
- the dates of the training, and
- the name of the person performing the training or evaluation.

As the final rule does not require the trainer's signature, employers are able to keep their training records on the computer.

#### Appendix

A non-mandatory appendix is included in the final rule to provide guidance to employers and employees on understanding the basic principles of truck stability. The information contained in this appendix is not intended to provide an exhaustive explanation; rather, it is intended to

introduce basic concepts that the employer may use in developing and implementing a training program.

### Safe Forklift Driving Rules

- Keep to the right, the same as highway driving with an automobile.
- Obey speed limits. Remember that a fork lift is not a street rod, but is a slow moving vehicle, designed that way for safety.
- Keep three vehicle lengths away from other vehicles - it's a space cushion around the vehicle.
- Slow down at all intersections, and always sound the horn at blind ones.
- The pedestrian always has the right of way.
- No horse play is allowed. It's basic common sense.
- No riders are allowed on any forklift vehicle.
- Always keep arms and legs inside the vehicle.
- Face the direction of travel, keep your mind on what you are doing, and never travel forward with the load blocking your view.
- Know the position of your forks at all times.
- Be aware of overhead clearances, such as pipes, sprinklers, door beams, and know the load limits of elevators.
- Be alert for oil and grease spots, which could result in an accident.
- Cross railroad tracks at an angle, never a right angle.
- Wear protective equipment when required, such as safety glasses, ear protection and restraining belts.
- Be careful of changing light conditions, such as coming in from bright daylight into dimly lit areas, and vice-versa.
- No towing or pushing is allowed with a forklift.
- Beware of edges on loading docks.
- Stop completely before raising or lowering a load.
- Make sure forks are all the way into a pallet, and tilt the mast back to stabilize the load before moving.

- When moving, always have the unloaded forks no more than six inches high. Never travel with a load raised high.
- Make sure the load is balanced and secure on the forks.
- Do not attempt to move loads with broken pallets, loads beyond the capacity of the fork lift or loads that are unbalanced.

# TRENCH AND EXCAVATION SAFETY

(excavations four (4) feet or more below grade)

1. A certified “Competent Person” is required to make decisions about safety and entry procedures.
2. Do NOT enter excavations over four (4) feet deep unless shoring or shielding are in place.
3. The walls and faces of all excavations in which employees are exposed to danger from moving ground shall be guarded by a shoring system, sloping off the ground or some other equivalent means.
4. No person shall be permitted to work under suspended loads.
5. Walkways or bridges with standard railings shall be provided when employees or equipment are required to cross over excavation.
6. Access and egress means (ladders, ramps) must be available in all trenches.

For other rules and regulations regarding trenching and excavation see Part N, Chapter 155, Washington State Department of Labor and Industries, Division of Industrial Safety and Health Construction Safety Standards.

# PROCESS SAFETY MANAGEMENT COMPLIANCE PROGRAM

TEK Construction, Inc. has processes within our operations which involve highly hazardous chemicals. In order to protect our employees and the environment TEK has developed this Process Safety Management Compliance Program.

In recent years, a number of catastrophic accidents in the chemical industry have drawn attention to the safety of processes involving highly hazardous chemicals. OSHA determined that employees have been and continue to be exposed in their workplaces to the hazards of releases of highly hazardous chemicals which may be toxic, reactive, flammable, or explosive.

The requirements of the PSM standard are intended to eliminate or mitigate the consequences of such releases. The standard emphasizes the application of management controls when addressing the risks associated with handling or working near hazardous chemicals.

## **Administration**

TEK Safety Manager is responsible for ensuring that this program is fully implemented and updated to ensure its effectiveness. The company's Process Safety Management Program is located in the Safety Manager's office.

## **References**

- 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals; Final Rule; February 24, 1992, Federal Register Vol. 57, No. 36, pp. 6356-6417.
- OSHA Instruction CPL 2.45B, June 15, 1989, the Field Operations Manual (FOM).
- OSHA Instruction STP 2.22A, CH-2, January 29, 1990, State Plan Policies and Procedures Manual.
- OSHA Instruction CPL 2.94, July 22, 1991, OSHA Response to Significant Events of Potentially Catastrophic Consequence.
- OSHA Instruction ADM 1-1.12B, December 29, 1989, Integrated Management Information System (IMIS) Forms Manual.

## **Responsibilities**

### *Company Management*

### **Contractors**

In regard to contractors, TEK Construction will do the following:

- Obtain and evaluate information regarding the contract Company's safety performance and programs.
- Inform all contractors of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process.
- Inform all contractors of the applicable provisions of the emergency action plan.
- Develop and implement safe work practices to control the entrance, presence and exit of contract personnel.
- Evaluate the performance of contract Companies in fulfilling their obligations.
- Maintain a contract employee injury and illness log related to the contractor's work in process areas.

### **Management of Change (MOC)**

TEK Construction will establish and implement written procedures to manage changes (except for "replacements in kind") to process chemicals, technology, equipment, and procedures; and, changes to facilities that affect a covered process.

Prior to the change, address the following considerations:

- The technical basis for the proposed change;
- Impact of change on safety and health;
- Modifications to operating procedures;
- Necessary time period for the change; and,
- Authorization requirements for the proposed change.

The Company will train affected employees and contract employees in the change prior to start-up of the process or affected part of the process.

The Company will up-date PSI, PHA and Operating Procedures.

## **Incident Investigation**

TEK will investigate each incident that resulted in, or could reasonably have resulted in a catastrophic release of highly hazardous chemical in the workplace. An incident investigation will be initiated as promptly as possible, but not later than 48 hours following the incident.

Establish an incident investigation team which consists of at least one person knowledgeable in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with appropriate knowledge and experience to thoroughly investigate and analyze the incident

An incident report will be prepared at the conclusion of the investigation that includes at a minimum:

- Date of incident
- Date investigation began
- Description of the incident
- Factors that contributed to the incident
- Recommendations resulting from the investigation

### *Corrective Actions*

The company will establish a system to promptly address and resolve the incident report findings and recommendations. Resolutions and corrective actions will be documented

### *Report Review*

The report will be reviewed with all affected personnel whose job tasks are relevant to the incident findings including contract employees where applicable. Incident investigation reports will be retained for five years

## **Emergency Planning & Response**

TEK Construction will establish and implement an emergency action plan for the entire plant in accordance with the provisions of 29 CFR 1910.38(a), and 29 CFR 1910.120(a), (p) and (q). In addition, the emergency action plan will include procedures for handling small releases.

## **Training**

### *General*

Training is an essential part of the PSM Program. It provides a means of conveying information and ensuring comprehension of information.

## Contractors

### *General*

Contractors under the Process Safety Management program are those who are involved in the installation or maintenance of (**PROCESS COVERED IN THIS PROGRAM**) equipment and systems at this Company. All contractors, covered in this PSM Program will be provided necessary information concerning the (**PROCESS COVERED IN THIS PROGRAM**) process, equipment and procedures.



# CRANES, RIGGING AND HOISTING

1. TEK CRANE AND BOIOM TRUCK OPERATORS MUST HAVE COMPLETED CERTIFIED TRAINING AND HAVE A CURRENT CERTIFICATION.
2. All crane lifts require a lift plan.
3. Operators, Supervisor and Riggers must be familiar with their duties and responsibilities; below.
4. Crane operators are required to conduct Daily Inspection of the Crane and Boom Truck (Attachment A). Always follow the manufacturer's recommendations for setting up and operating equipment, selection of tip size, and gas cylinder-operating pressures.
5. Dispatch will ensure Cranes and Boom Trucks receive a Periodic Inspection by a certified operator prior to assigning the equipment to a project (Attachment B)
6. Dispatch and Field Supervisors will ensure only trained and competent operators are allowed to operate.
7. Dispatch is responsible for crane and boom truck maintenance and inspection program, crane certificate and operator training.

## CRANE OPERATOR RESPONSIBILITIES

The operator is responsible for the safety of the crane operation as soon as the load is lifted clear of the ground. Because of this responsibility, whenever there is reasonable cause to believe that the lift might be dangerous or unsafe, the operator may refuse to make the lift until the concern has been reported to the supervisor, any hazards rectified and safe conditions assured.

Because of the skill required to safely operate a crane and the responsibility it involves, every operator should recognize in themselves when their physical and mental condition is such that they can no longer operate safely. Of particular importance to consider are, physical dexterity, eye sight (with or without eye glass), and hearing (with or without hearing aid). Operators must be capable of reacting rapidly and correctly to unforeseen potential hazards. They must be intimately familiar with and have thorough understanding of the statements on the crane Rating Plate. They must be aware of and capable of interpreting all safety regulations for cranes, and must comply with the instructions in the machine handbook. They must know the load (weight, center of gravity) and lift (distance of set, overhead obstructions, stability of wind conditions, crane pad, and other external variables).

The operator is responsible for:

1. Knowing the machine well. They must understand its functions and limitations as well as its particular operations characteristics.
2. Must be totally familiar with the information contained in the crane's operating manual.

3. Must be totally familiar with the crane's load chart, the correct meaning of all notes and warnings and be able to calculate or determine the crane's actual net capacity for every possible configuration of the machine.
4. Inspecting and maintaining the crane regularly as prescribed by the crane manual.
5. Informing our company of any problems, needed maintenance or necessary repairs to the machine. This must also be done in writing, in the machine's log book.
6. Recording in the log book the details of all inspections, maintenance and work done on the crane while in the field.
7. Being aware of any site conditions that could affect the crane operations and in particular the presence of power lines.
8. Checking that the site is adequately prepared for the crane. To include access, pad stability and swing clearance.
9. Reviewing the planned operation and requirements with our site supervision.
10. Finding out the load and rigging weight and determining where the load is to be placed. The operator must know the weight of the load.
11. Determining number of parts of hoist line required to make a lift.
12. Checking the load chart to ensure that the crane has sufficient net capacity for every lift.
13. Selecting from the load range diagram the best boom, jib and crane configuration to suite the load, site and lift conditions.
14. Assembling, setting up and rigging the crane properly.
15. Following the manufacturer's operating instructions in accordance with the load chart.
16. Considering all factors that might reduce crane capacity and adjusting the load weight accordingly.
17. Knowing basic load rigging procedures and ensuring that they are applied.
18. Ensuring the signal person understands proper signals and sequences and maintaining communication with signal person.
19. Ensuring the support personnel are in a safe place during operation and all non-essential personnel are clear of the lift zone.
20. Operating in a smooth, controlled and safe manner.
21. Moving and setting up the crane properly and safely.
22. Shutting down and securing the machine properly when leaving it unattended. Ensuring the boom is lowered and cable grounded during lightning storms.
23. Ensuring weather conditions are appropriate for the lift to include avoiding high winds and lightning storms.

## **CRANE AND RIGGING SAFETY – SITE SUPERVISION**

NOTE: Our site supervision has overall responsibility for the lift and will plan all phases of the operation, which includes, complete co-operation with the crane operator who has the final say regarding the safety of the operation.

Site Supervisors are also generally responsible for:

1. Supervising all work involving the crane.
2. Determining the correct load weight and radius and informing the operator.
3. Ensuring that the rigging crew is experienced and competent. They must be capable of establishing weight; judging distances, heights and clearances; selecting tackle and lifting gear suitable for the loads; and rigging the load safely and securely.
4. Supervising the rigging crew.
5. Ensuring that the load is properly rigged.
6. Ensuring that the signal people are competent and capable of directing the crane and load to ensure the safety and efficiency of the operation. Knowledge of the international hand signals is mandatory.
7. Designating signal people and identifying them to the operator.
8. Ensuring the safety of the rigging crew and all other personnel affected by the rigging operation.
9. Keeping the public and all non-essential personnel clear of the crane during operation.
10. Controlling the movements of all personnel, including support personnel, within the area affected by the lift.
11. Ensuring that all required safety precautions are taken when the lift is in the vicinity of power lines.
12. Ensuring that all personnel involved in the operation understand their jobs, responsibilities and safety related aspects.

#### PRIOR TO LIFTING- CRANE OPERATORS AND COMPANY SUPERVISION

1. Never use or allow the use of any crane not in good mechanical condition. No one who has reasonable cause to believe that any crane or part of the machinery or structure is unsafe because of its condition or suitability should use or operate it until the defect has been reported to the supervisor and safe conditions have been assured and all hazards rectified. **Whenever there is any doubt as to safety, no operator should operate, nor should he be requested to operate, a crane until safety has been assured.**
2. Before starting operations inspect, test and maintain the crane in accordance with the recommendations in this policy and the manufacturer's handbook. Replace all parts and components showing excessive wear, damage or other defects that might affect safe operation of the crane.
  - ✓ Check all wire ropes and rigging components in accordance with the Rigging Manual.
  - ✓ Keep the machine clean and in good working order. Oil, grease or mud on floors can cause serious falls, and dirty in working parts will cause excessive wear and consequent possible failure. **Note:** Lower the load to the ground before attempting any repairs or adjustments.

- ✓ Check that all protective guards and panels are secure before operating.
  - ✓ Check the fuel, oil, radiator and battery levels.
  - ✓ Check all hydraulic hoses and fittings for chafing, bulging, leaks, cracks; or other damage.
  - ✓ Visually inspect all gear cases for leakage or damage. If leakage is evident, fill the case to the proper level before operating.
  - ✓ Check all controls for correctness and ease of operation.
  - ✓ Check tire pressures and wheel studs. Tire wear can be greatly reduced and stability of the machine increased by matching tires carefully for size and degree of wear. Maintain proper inflation at all times. This is particularly important when working without outriggers.
  - ✓ Check brake air pressure.
  - ✓ Check low air pressure warning devices.
  - ✓ Check foot brake operation.
  - ✓ Check headlights, clearance lights, turn signals, parking lights, tail and stop lights, windshield wipers, horn, etc.
  - ✓ Check all instrument panel gauges.
  - ✓ Visually inspect the entire machine for loose or missing bolts, or cotter pins, cracked welds, frayed or damaged ropes, dented or damaged boom chords or lattice sections. Repair or replace any damaged or missing components before operating the machine.
  - ✓ Visually inspect all clutch and brake linings for evidence of wear, or grease and oil on the linings. Adjust brakes and clutches immediately when any indication of slipping is noted. Serious injury to ground personnel or damage to property and equipment could result if adjustments are neglected.
  - ✓ Keep fingers, feet and clothing away from gears and ropes, unless the machine is shut down and everyone knows what you are doing. Never place hands on lines when climbing to the top of the cab. A sudden movement may pull them into the sheaves. Be especially careful to keep hands clear of moving cables.
  - ✓ Provide lubrication or maintenance of the machine, in accordance with the manufacturer's manual knowledge of protective maintenance may allow the operator to spot a malfunction in the machine before an accident occurs.
3. The operator should remain alert to possible malfunctioning of the machine while operating. If the machine does malfunction, shut it down until the problem is found and corrected. During operation the operator should:
- ✓ Remain alert to any unusual noises, loss of power, or bad response to control of the engine.
  - ✓ Watch for any gauges showing incorrect readings. If any appear to be wrong shut the machine down and determine the cause.
  - ✓ Check the master clutch for slipping or jumping out of engagement.
  - ✓ Make sure all controls work freely and easily with no sticking or binding.

- ✓ Listen for any unusual noises from the hydraulic system or the gear train.
  - ✓ Watch for oil leaks. If any develop, correct them before continued operation.
  - ✓ Test the winch brakes when a load is first lifted, and when the load is only a few inches above its starting position, to assure the ability of the brakes to hold the load while it is aloft.
  - ✓ The operation of any machine not in good condition in any respect may be hazardous and can result in unnecessary wear or breakage, or may result in immediate or eventual accident.
  - ✓ If the crane is being operated by more than one operator be sure to notify the next operator of any defects when changing shifts.
4. Never use or allow the use of any crane when weather conditions are such that hazards to personnel, property or the public are created. This includes that the size and shape of the loads being lifted must be carefully examined to determine if a safety hazard exists when they are to be lifted during conditions of high wind speeds.
- It is advisable to avoid handling loads presenting large wind catching surfaces which could result in loss of control of the load and crane even though the weight of the load is within the normal capacity of the crane.
5. If the visibility of the operator is impaired by dust, darkness, snow, fog or rain, strict supervision of the crane operation must be exercised, and if necessary, the crane should be withdrawn from service.
6. In low temperatures, generally below freezing, extreme caution must be exercised to ensure that no part of the crane's structure is shock loaded or impacted as brittle fracture of the steel can result.
7. Never operate or allow anyone to operate any crane until that person is thoroughly familiar with the machine, its operation and proper care.
8. When refueling the machine ensure that:
- ✓ The engine is stopped and the carrier and cab heaters are off
  - ✓ The fuel is stored in containers that meet the requirements of the local fire laws.
  - ✓ There are no flames, or spark producers nearby.
  - ✓ No one is smoking
  - ✓ No smoking signs are posted in all fueling or fuel storage areas.
  - ✓ There is a fire extinguisher nearby and that however is refueling the machine knows how to use it.
  - ✓ Ground straps are in place to prevent static sparks from igniting the fuel vapors.
9. Before putting the crane into operation check that it has not moved and that it remains level. Ensure also that all guards, controls, clutches, brakes, gears and other components are properly set and that putting the equipment into operation will not endanger property, the public, or personnel.

10. If there is a warning sign or tag out on the switch or engine starting controls, do not start the engine until the warning sign has been removed by the person who placed it there.
11. Before starting the engine make sure that all personnel are well clear of the machine.
12. When starting the engine it may be necessary at times to reduce the starter load by disengaging the clutch before starting. After starting the engine this way, throttle down to idle speed before engaging the clutch. This reduces the shock load on the pump shaft.
13. Let the engine warm up for a few minutes to give the oil in the pumps a chance to circulate. Do not operate the machine under load until the hydraulic oil has warmed to the minimum operating temperature specific in the manufacturer's manual. Operate the winches, boom hoist cylinders, boom extension cylinders, and swing mechanism to circulate the oil. Failure to warm the hydraulic system prior to operation may result in pump failure or erratic operation due to cold viscous oil. It is extremely important to engage boom cylinders slowly in cold weather, since severe shock loading could occur if cold oil in the cylinders is not displaced gently.
14. When the carrier engine is idled for long periods during crane operation ensure that the idle speed is sufficient to show a positive reading of the ammeter indicating that the generator or alternator is charging the battery at a satisfactory rate.
15. Keep the crane engine at or near maximum governed speed during normal operation, especially when lifting a load. This gives maximum fuel economy, operating efficiency, safety and power.
16. Before shutting down a heavily worked engine, let it run without any load at part throttle for sufficient time to cool off.
17. The engine should not be operated in an excavation unless provision is made to ensure that exhaust gases or fumes will not accumulate in the excavation, or in a building or other structure that is enclosed, unless there is an adequate supply of air for combustion and adequate ventilation.
18. If an overheated condition necessitates an engine shutdown, use extreme care when checking the radiator. If possible, wait for it to cool. Use a heavy cloth and gloves to protect yourself while slowly loosening the cap. Wait until the sound and fluid flow stops. Then remove the cap.
19. Know the location and use of all emergency shutdowns.
20. Never back up the machine without first making certain that no one will be endangered. When clear vision of the area behind the crane is impossible, use a signal person. Sound the horn before moving the machine and intermittently during travel, especially when approaching personnel.
21. Never work alone – use the buddy system.
22. Never get on or off a machine when it is in motion and always use both hands when climbing onto or around the machine. Never jump down from the machine – step down.
23. Wear all necessary protective clothing such as hard hats, safety glasses, safety shoes and gloves when working on or around the machines.
24. Never attempt to adjust, repair or lubricate moving machinery. Always lower the load to the ground, lock or support the boom and stop the engines.

25. With the exception of those involved in the operation of the crane, no one should be permitted to get on, leave or ride on the equipment when it is in motion or in operation.
26. The operator must never allow his attention to be diverted from the operation of the crane. When possible he should practice operating all controls to get the feel of the equipment particularly if this is not the machine he usually operates.
27. Always use the shortest boom possible.
28. Know the exact location of utility lines, pipelines, sewers, and other underground obstructions, and avoid them with room to spare. Mark locations clearly to prevent having to make estimations.
29. Ensure that, whenever possible, the machine is operated in its most stable position and in the area of highest capacity. In general this means that most of the lifting should be done in the rear quadrant.
30. Never, unless otherwise specified by the manufacturer, lift or swing over the front of the machine.
31. Position the crane as close to the load as possible and in such a way as to minimize the swing.
32. Be sure there is adequate clearance for tail swing of the revolving frame, especially when people or vehicles may enter the area. The crane should be positioned so that no part of the superstructure comes within 2 feet of any obstruction in which a worker could be trapped and crushed. If this is not possible then entry to the obstructed area must be prevented by barriers or fences.
33. Regardless of the size or weight of the load to be lifted use the crane's outriggers. Extend the beams fully to elevate the wheels off the ground.
34. The revolving portion of the superstructure of the crane must be dead level before making the lift.
35. When organizing to make a lift ensure that no one is within the radius of rotation of any part of the crane or load unless he is authorized by the person in charge of the work to be in that area, ensure that no one is ever directly beneath the load.
36. Ensure that the swing lock is disengaged before starting to operate.
37. If the machine is equipped with a manually operated boom hoist drum pawl then it must be engaged at all times except when lowering the boom. If the machine is equipped with automatically engaged boom hoist drum pawls, the operation of the pawls should be checked at regular intervals.
38. Engage the boom hoist lever lock (where provided) whenever the boom hoist is not in use.
39. Before performing any type of crane work, be sure that the machine is secured against travel. If necessary block the crane to prevent movement. Remove blocking before attempting to travel.
40. When operating a truck crane, be sure the carrier transmission is placed in neutral. Otherwise the rocking or tilting motion can be transmitted to the locked transmission and may cause severe damage.
41. If lifts have to be made on rubber, be sure the transmission shift lever is positioned in neutral, the air brakes are applied and wheel chocks are used to block the wheels. Check the air brake pressure frequently.

42. Watch out for the carrier cab on truck mounted units when swinging the boom. Keep the boom high enough to swing well clear of the cab.
43. Make a dry run, especially in areas which are really tight. Go through all the motions without a load, anticipating what actions you will take to make a safe lift, and a smooth operation.
44. One of the most important precautions is to determine the weight of all loads before rigging them or attempting to lift them, making ample allowances for unknown factors and determining the available capacity of the equipment being used. In cases where the assessment of load weight is difficult, safe load indicators or weighing devices should be utilized.
45. In figuring the total weight of the lift, be sure to include the block, hook, and any slings or other rigging devices between the boom peak and the load. When making near capacity lifts, calculate the entire load carefully and check it against the rated lifting capacity of the crane.
46. Before making any lift that exceeds 75% of the rated capacity of the crane in addition to the normal procedures the load radius will be measured to avoid any possibility of error and to ensure a safe lift.
47. Before the machine is put into operation, the operator must know the capacity under all conditions and configurations. Load chart capacities are based on almost ideal conditions seldom achieved under actual working conditions, and as such it is extremely important to not only know how to determine the capacity from the chart but also to recognize the factors which can reduce the capacity below what the chart says. The rated capacities of mobile cranes are based on both strength and stability. It is extremely important to know the difference for in one case one of the structural components of the crane will break and in the other case the crane will tip over.

## **CRANE AND RIGGING SAFETY – RIGGER RESPONSIBILITIES**

1. Major rigging operations must be planned and supervised by competent personnel typically the Crane Operator, to ensure that the best methods and most suitable equipment and tackle are employed.
2. Care of Rigging Equipment: Our Riggers must ensure that:
  - ✓ Proper rigging equipment is available.
  - ✓ Correct load ratings are available for the material and equipment used for rigging.
  - ✓ Rigging material and equipment are maintained in proper working condition.
3. The supervisor of the rigging operation will be responsible for:
  - ✓ Proper rigging of the load.
  - ✓ Supervision of the rigging crew.
  - ✓ Ensuring that the rigging materials and equipment have the necessary capacity for the job and are in safe condition.
  - ✓ Ensuring correct assembly of rigging material or equipment as required during the operation, such as the correct installation of lifting bolts.
  - ✓ Safety of the rigging crew and other personnel as they are affected by the rigging operation.



## PROCEDURES AND PRECAUTIONS

The single most important rigging precaution is to determine the weight of all loads before attempting to lift them, making ample allowances for unknown factors, and determining the available capacity of the equipment being used. In cases where the assessment of load weight is difficult, safe load indicators or weighing devices should be utilized.

It is equally important to rig the load so that it is stable. Unless the center of gravity of the load is below the hook, the load will shift. The safety of personnel involved in rigging and hoisting operations largely depends upon care and common sense. Practice these safe practices:

- ✓ Know the safe working load of the equipment and tackle being used. Never exceed this limit.
- ✓ Determine the load weight before rigging it.
- ✓ Examine all hardware, equipment, tackle and slings before using it and destroy defective components. Never allow discarded equipment to be used by someone not aware of the hazards or defects.
- ✓ Never carry out any rigging or hoisting operation when weather conditions are such that hazards to personnel, property or the public are created. The size and shape of the loads being lifted must be carefully examined to determine if a safety hazard exists during high wind speeds. Avoid handling loads presenting large wind catching surfaces which could result in loss of control of the load during times of high or gusty winds, even though the weight of the load is within the normal capacity of the equipment. Wind loading can be critical on the manner in which the load is landed and the safety of the men handling it. When winds reach 25-30 mph consider limiting operations.
- ✓ If the visibility of the riggers or hoist crew is impaired by dust, darkness, snow, fog or rain, strict supervision of the operation must be exercised and, if necessary, it should be suspended.
- ✓ Whenever the temperature is below freezing, extreme caution must be exercised to ensure that no part of the hoist or crane structure or tackle is shock loaded or impacted as brittle fracture of the steel can result.
- ✓ The most repeated killer of riggers and those persons handling loads is electrocution caused by the contact of the boom, load line or load of a crane with electric power lines. When working with or around cranes that are within a boom's length of any power line ensure that a competent signalman is stationed at all times within view of the operator to warn them when any part of the machine or its load is approaching the minimum safe distance (10-20 feet depending on the line voltage) from the power line. Caution must also be exercised when working near overhead lines having long spans as they tend to swing laterally due to the wind and accidental contact could occur. Federal and state requirements must be reviewed and regulations closely followed prior to making lifts near power lines.
- ✓ The safe working loads of all hoisting and rigging equipment, hardware and tackle are based on almost ideal conditions seldom achieved under actual working conditions, and as such it is important to recognize the factors which can reduce the capacity of the equipment.

- ✓ The safe working loads of hoisting equipment apply only to freely-suspended loads on plumb hoist lines. If the hoist line is not plumb at all times when handling loads then additional side loads will hazard the stability of the equipment and introduce stresses for which it has not been designed. In circumstances such as this, structural failures can result without any warning.
- ✓ Rapid swinging of suspended loads also subjects the equipment to additional stresses which can cause collapse. The force of the swinging action causes the load to drift away from the machine increasing the radius and side loading the equipment. The load must always be kept directly below the boom point or upper load block.
- ✓ The safe working loads also apply only to equipment in good condition, having undamaged and unkinked structural members. If any equipment becomes damaged in service it should be taken out of service until the necessary repairs have been provided.
- ✓ The maximum safe working loads of most rigging and hoisting equipment are determined from static loads the safety factor is applied to account for dynamic motions of the load and equipment. In order to ensure that the safe working load is not exceeded during operation, allowances should be made for wind loading and dynamic forces set up by the normal operational movements of the machine and load. It is essential to avoid sudden snatching, swinging and stopping of suspended loads since rapid acceleration and deceleration will greatly increase the stresses in the equipment and tackle.
- ✓ The rated loads of most hoisting equipment do not generally account for the weight of hook blocks, hooks, slings, equalizer beams, material handling equipment and other elements of lifting tackle. Their combined weight must be subtracted from the load capacity of the equipment to determine the maximum allowable load to be lifted.

The life and safety of slings and their contribution to the security of hoisting operations can be greatly increased by taking care in the application. To provide maximum operating efficiency and safety, all slings and fittings should be given thorough inspections prior to each use for signs of wear and abrasion, broken wires, worn or cracked fittings, loose seizings and splices, kinking, crushing, flattening, and corrosion. Special care should be taken in inspecting the areas around thimbles and fittings. Remove damaged or defective slings from service.

- ✓ Never use kinked or damaged slings or hoist ropes.
- ✓ Sharp bends, pinching and crushing must be avoided. Loops and thimbles should be used at all times. Corner pads or softeners that prevent the sling from being sharply bent or cut can consist of large diameter split pipe sections, corner saddles, padding or blocking and should be utilized.
- ✓ Never allow wire rope to lie on the ground for any length of time or on damp or wet surfaces, rusty steel or near corrosive substances. Store slings by hanging.
- ✓ Avoid dragging grope slings from beneath loads or allowing them to be run over.
- ✓ Keep all wire rope away from flame cutting and electric welding operations. Welding end attachments shall not be used.
- ✓ Avoid contact with solvents and chemicals.
- ✓ Knotted and kinked slings are permanently damaged and should not be used. Slings shall not be shortened with knots.

- ✓ Never use discarded hoist rope as sling material.
- ✓ Never wrap a wire rope completely around a hook. The sharp radius will damage the sling.
- ✓ Avoid bending the eye section of wire rope slings around corners. The bend will weaken the splice or swaging. There must be no bending near any attached fitting.
- ✓ Ensure that the sling angle is always greater than 45 degrees. To make sure that the angle is adequate once a load is rigged, check that the horizontal distance between the attachment points on the load is less than the length of the shortest sling leg. If this is the case then the angle is greater than 60 degrees.
- ✓ Do not assume that the multi-legged bridle sling will safely lift a load equal to the safe load on one leg multiplied by the number of legs. There is no way of knowing that each leg is carrying its share of the load. With slings having more than two legs and a rigid load, it is possible for two of the legs to take practically the full load while the others only balance it. Due consideration with regard to this has been given in computing the safe working load tables for three and four legged bridle slings which are only given the same safe load as a two legged sling. When lifting rigid objects with slings having three or four legs, any two of the slings must be capable of supporting the total load. In other words, after considering the angle between the legs, the slings should be considered as having only two legs when estimating the size required. Where the object is flexible and able to bend to adjust itself to the sling legs, each leg can be assumed to take its own share of the load.
- ✓ When using multi-legged slings to lift loads in which one end is much heavier than the other the tension in the most heavily loaded leg is much more important than the total weight. The sling must be selected to suit the most heavily loaded leg rather than the total weight.
- ✓ When using choker hitches, do not force the eye down toward the load once tension is applied. Rope damage is the invariable result.
- ✓ Whenever two or more rope eyes must be placed over a hook, install a shackle on the hook with the shackle pin resting in the hook and hook the rope eyes to the shackle. This will prevent the spread of the sling legs from opening up the hook and also prevent the eyes from damaging each other when under load.

The following procedures and precautions should be observed whenever loads are to be handled:

- ✓ All loads must be properly rigged to prevent the dislodgement of any part. Suspended loads should be securely slung and properly balanced before they are set in motion.
- ✓ The load must be kept under control at all times. Where necessary, when personnel may be endangered by the rotation, one or more guide ropes or tag lines should be used to prevent the rotation or uncontrolled motion.
- ✓ Loads must be safely landed and properly blocked before being unhooked and unslung.
- ✓ Lifting beams should be plainly marked with their weight and designed working loads and should only be used for the purpose for which they were designed.
- ✓ The hoist rope must never be wrapped around the load. The load should be attached to the hook by slings or other rigging devices that are adequate for the load being lifted.
- ✓ Multiple part lines must not be twisted around each other.

- ✓ The load line should be brought over the center of gravity of load before the lift is started.
- ✓ If there has been a slack rope condition, determine that the rope is properly seated on the crane drum and in the sheaves.
- ✓ Materials and equipment being hoisted must be loaded and secured to prevent any movement which could create a hazard in transit.
- ✓ Keep hands away from pinch point as the slack in lines and rigging is being taken up.
- ✓ Wear gloves when handling wire rope.
- ✓ Make sure that all personnel stand clear while loads are being lifted, suspended, and lowered or while the slings are being drawn from beneath the load. The hooks may catch under the load and suddenly fly free.
- ✓ Before making a lift, check to see that the sling is properly attached to the load.
- ✓ Avoid impact loading caused by sudden jerking when lifting or lowering. Lift the sling gradually until the slack is eliminated.
- ✓ Never ride on a load that is being lifted.
- ✓ Never allow the load to be carried over the heads of any personnel or the public.
- ✓ Never work under a suspended load unless the load has been adequately supported from the floor and all conditions have been checked.



# APPENDICES

# TEK CONSTRUCTION, INC.

## Employee Orientation Checklist – Safety

Employee Name \_\_\_\_\_

Project Name/Number \_\_\_\_\_

Position/Title \_\_\_\_\_

This checklist is a guideline for conducting employee safety orientations for employees new to TEK Construction. Once completed and signed by both supervisor and employee, it serves as documentation that orientation has taken place.

Place a check on each line to indicate that the subject has been covered.

- \_\_\_ 1. Explain the company safety program, including:
  - a. Accident investigation and reporting
  - b. Safety meetings
  
- \_\_\_ 2. First-Aid Supplies, Equipment and Trained Personnel
  - a. Location of Kits/Facilities
  - b. Trained Employees Onsite
  - c. Bloodborne Pathogens
  
- \_\_\_ 3. Personal Protective Equipment Policy
  - a. Types of equipment required
  - b. How to properly wear equipment
  
- \_\_\_ 4. Job Specific Hazards and Training
  - a. Personal Work Rules
  - b. General Safety Rules
  - c. Ladders and Guardrails
  - d. Fall Protection
  - e. Confined Spaces
  - f. Respiratory Protection
  - g. Lockout/Tagout
  - h. Fire Prevention
  - i. Hazardous Chemicals
  
- \_\_\_ 5. Vehicle and Equipment Safety
  - a. Individuals are responsible for the equipment they operate.
  - b. Only trained operators are allowed to operate equipment.

**\*Note to Employee:** Do not sign unless all items are covered and all questions are answered.

The signature below documents that the appropriate elements have been discussed to the satisfaction of both parties, and that both the supervisor and employee accept responsibility for maintaining a safe and healthful work environment.

Date \_\_\_\_\_ Supervisor's Signature \_\_\_\_\_

Date \_\_\_\_\_ Employee's Signature \_\_\_\_\_

# EMPLOYEE'S REPORT OF INJURY/ACCIDENT

Injured Worker's Name: \_\_\_\_\_ Social Security Number: \_\_\_\_\_ Job Title: \_\_\_\_\_ Date of Hire: \_\_\_\_\_  
\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

Date of Injury: \_\_\_\_\_ Time: \_\_\_\_\_ Report by: \_\_\_\_\_ Witnessed: \_\_\_\_\_

Job Site: \_\_\_\_\_ Work Area \_\_\_\_\_ Was employee performing regular job?  
YES \_\_\_\_\_ NO \_\_\_\_\_

INCIDENT INFORMATION: Provide as much detail as possible:

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Did employee go to Doctor? YES \_\_\_\_\_ NO \_\_\_\_\_ Doctor's Name \_\_\_\_\_ L&I Claim # \_\_\_\_\_  
Phone # Address \_\_\_\_\_

## INJURY INFORMATION

Use the following code to locate the injury on body part

L = Left  
R = Right  
U = Upper  
LO = Lower

Fingers: \_\_\_\_\_ Head \_\_\_\_\_ Leg \_\_\_\_\_ Neck \_\_\_\_\_  
\_\_\_\_\_ Thumb \_\_\_\_\_ Face \_\_\_\_\_ Thigh \_\_\_\_\_ Shoulder \_\_\_\_\_ Back \_\_\_\_\_  
\_\_\_\_\_ Index \_\_\_\_\_ Eye \_\_\_\_\_ Knee \_\_\_\_\_ Arm \_\_\_\_\_ Groin \_\_\_\_\_  
\_\_\_\_\_ Middle \_\_\_\_\_ Ear \_\_\_\_\_ Calf \_\_\_\_\_ Elbow \_\_\_\_\_ Buttocks \_\_\_\_\_  
\_\_\_\_\_ Ring \_\_\_\_\_ Nose \_\_\_\_\_ Feet \_\_\_\_\_ Wrist \_\_\_\_\_ Chest \_\_\_\_\_  
\_\_\_\_\_ Pinky \_\_\_\_\_ Mouth \_\_\_\_\_ Toe \_\_\_\_\_ Hand \_\_\_\_\_ Abdomen \_\_\_\_\_

## ACTIVITY INFORMATION

\_\_\_\_ Lifting \_\_\_\_\_ Walking \_\_\_\_\_ Reaching \_\_\_\_\_  
\_\_\_\_ Twisting \_\_\_\_\_ Climbing \_\_\_\_\_ Jumping \_\_\_\_\_  
\_\_\_\_ Running \_\_\_\_\_ Pushing \_\_\_\_\_ Kneeling \_\_\_\_\_  
\_\_\_\_ Carrying \_\_\_\_\_ Pulling \_\_\_\_\_ Squatting \_\_\_\_\_  
\_\_\_\_ Falling \_\_\_\_\_ Bending \_\_\_\_\_

Handling what? \_\_\_\_\_  
\_\_\_\_\_

Dimensions? \_\_\_\_\_ Weight? \_\_\_\_\_

## HAZARD INFORMATION

Unsafe:

\_\_\_\_ Equipment Use  
\_\_\_\_ Equipment Handling  
\_\_\_\_ Equipment Placement  
\_\_\_\_ Behavior  
\_\_\_\_ Work Habits  
\_\_\_\_ Work Speed  
\_\_\_\_ Clothing  
\_\_\_\_ Body Positioning

Lack of:

\_\_\_\_ Training  
\_\_\_\_ Supervision  
\_\_\_\_ Attention to Task  
\_\_\_\_ Safety Rules  
\_\_\_\_ Safety Devices/Guards  
\_\_\_\_ Protective Gear  
\_\_\_\_ Equipment Maintenance  
\_\_\_\_ Facility Maintenance

Failure to:

\_\_\_\_ Follow Rules  
\_\_\_\_ Get Help  
\_\_\_\_ Secure/Warn  
\_\_\_\_ Lock/Tag  
\_\_\_\_ Use Personal Protection  
\_\_\_\_ Use Safety Devices/Guards

Corrective Action:

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Supervisor's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

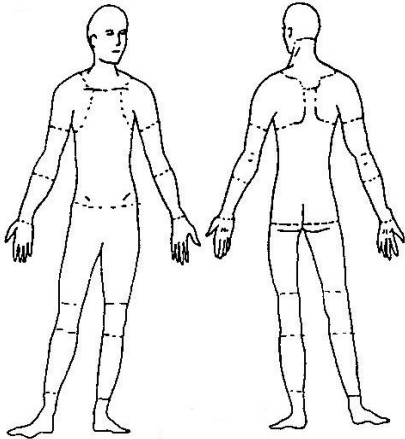
Employee's Signature: \_\_\_\_\_ Date: \_\_\_\_\_



# Incident Investigation Report Form

**Instructions:** Complete this form as soon as possible after an incident that results in serious injury or illness.  
 (Optional: Use to investigate a minor injury or near miss that *could have resulted in a serious injury or illness.*)

This is a report of a: <input type="checkbox"/> Death <input type="checkbox"/> Lost Time <input type="checkbox"/> Dr. Visit Only <input type="checkbox"/> First Aid Only <input type="checkbox"/> Near Miss	
Date of incident:	This report is made by: <input type="checkbox"/> Employee <input type="checkbox"/> Supervisor <input type="checkbox"/> Team <input type="checkbox"/> Final Report

Step 1: Injured employee (complete this part for each injured employee)		
Name:	Sex: <input type="checkbox"/> Male <input type="checkbox"/> Female	Age:
Department:	Job title at time of incident:	
Part of body affected: (shade all that apply)  	Nature of injury: (most serious one) <input type="checkbox"/> Abrasion, scrapes <input type="checkbox"/> Amputation <input type="checkbox"/> Broken bone <input type="checkbox"/> Bruise <input type="checkbox"/> Burn (heat) <input type="checkbox"/> Burn (chemical) <input type="checkbox"/> Concussion (to the head) <input type="checkbox"/> Crushing Injury <input type="checkbox"/> Cut, laceration, puncture <input type="checkbox"/> Hernia <input type="checkbox"/> Illness <input type="checkbox"/> Sprain, strain <input type="checkbox"/> Damage to a body system: <input type="checkbox"/> Other _____	This employee works: <input type="checkbox"/> Regular full time <input type="checkbox"/> Regular part time <input type="checkbox"/> Seasonal <input type="checkbox"/> Temporary  Months with this employer  Months doing this job:   (e.g.: nervous, respiratory, or circulatory systems)

Step 2: Describe the incident	
Exact location of the incident:	Exact time:
What part of employee's workday? <input type="checkbox"/> Entering or leaving work <input type="checkbox"/> Doing normal work activities <input type="checkbox"/> During meal period <input type="checkbox"/> During break <input type="checkbox"/> Working overtime <input type="checkbox"/> Other	
Names of witnesses (if any):	

Number of attachments:	Written witness statements:	Photographs:	Maps / drawings:
What personal protective equipment was being used (if any)?			
Describe, step-by-step the events that led up to the injury. Include names of any machines, parts, objects, tools, materials and other important details.			
Description continued on attached sheets: <input type="checkbox"/>			

<b>Step 3: Why did the incident happen?</b>	
Unsafe workplace conditions: (Check all that apply) <ul style="list-style-type: none"> <li><input type="checkbox"/> Inadequate guard</li> <li><input type="checkbox"/> Unguarded hazard</li> <li><input type="checkbox"/> Safety device is defective</li> <li><input type="checkbox"/> Tool or equipment defective</li> <li><input type="checkbox"/> Workstation layout is hazardous</li> <li><input type="checkbox"/> Unsafe lighting</li> <li><input type="checkbox"/> Unsafe ventilation</li> <li><input type="checkbox"/> Lack of needed personal protective equipment</li> <li><input type="checkbox"/> Lack of appropriate equipment / tools</li> <li><input type="checkbox"/> Unsafe clothing</li> <li><input type="checkbox"/> No training or insufficient training</li> <li><input type="checkbox"/> Other: _____</li> </ul>	Unsafe acts by people: (Check all that apply) <ul style="list-style-type: none"> <li><input type="checkbox"/> Operating without permission</li> <li><input type="checkbox"/> Operating at unsafe speed</li> <li><input type="checkbox"/> Servicing equipment that has power to it</li> <li><input type="checkbox"/> Making a safety device inoperative</li> <li><input type="checkbox"/> Using defective equipment</li> <li><input type="checkbox"/> Using equipment in an unapproved way</li> <li><input type="checkbox"/> Unsafe lifting by hand</li> <li><input type="checkbox"/> Taking an unsafe position or posture</li> <li><input type="checkbox"/> Distraction, teasing, horseplay</li> <li><input type="checkbox"/> Failure to wear personal protective equipment</li> <li><input type="checkbox"/> Failure to use the available equipment / tools</li> <li><input type="checkbox"/> Other: _____</li> </ul>
Why did the unsafe conditions exist?	
Why did the unsafe acts occur?	
Is there a reward (such as “the job can be done more quickly”, or “the product is less likely to be damaged”) that may have encouraged the unsafe conditions or acts? <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span> If yes, describe:	
Were the unsafe acts or conditions reported prior to the incident? <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Have there been similar incidents or near misses prior to this one? <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span>	

**Step 4: How can future incidents be prevented?**

**What changes do you suggest to prevent this injury/near miss from happening again?**

- Stop this activity       Guard the hazard       Train the employee(s)       Train the supervisor(s)
- Redesign task steps       Redesign work station       Write a new policy/rule       Enforce existing policy
- Routinely inspect for the hazard       Personal Protective Equipment       Other: \_\_\_\_\_

What should be (or has been) done to carry out the suggestion(s) checked above?

Description continued on attached sheets:

**Step 5: Who completed and reviewed this form? (Please Print)**

Written by:	Title:
Department:	Date:
Names of investigation team members:	
Reviewed by:	Title:
	Date:

# Employee Orientation Checklist - Hazardous Substances

Employee Name \_\_\_\_\_

Project Name/Number \_\_\_\_\_ Title \_\_\_\_\_

Trainer \_\_\_\_\_ Date Hired \_\_\_\_\_

This checklist is to inform employees of TEK Construction's Hazard Communication Program. Place a check on each line to indicate the subject has been covered.

The supervisor has reviewed the following Hazard Communication Program information with the employee:

- \_\_\_ 1. The purpose of the hazard communication standard is to require chemical manufacturers or importers to assess the hazards of chemicals they produce or import. All employers must provide information to their employees about the hazardous chemicals to which they may be exposed. Employees must be informed about the hazard communication program, labels and other forms of warning, material safety data sheets, and they must have training on the hazardous substances they may encounter.
- \_\_\_ 2. The supervisor has reviewed the hazardous chemical list with the employee.
- \_\_\_ 3. The employer has shown the employee the:
  - a. location of hazardous chemicals within the employee's work site.
  - b. location of the written Hazard Communication Program.
  - c. location of the material safety data sheets for all hazardous chemicals in the employee's assigned work area.
  - d. location of the list of persons trained and authorized to handle the hazardous chemicals.

The signatures below document that appropriate elements have been discussed to the satisfaction of both parties and that both the supervisor and employee accept responsibility for maintaining a safe and healthful work environment.

Date \_\_\_\_\_ Supervisor's signature \_\_\_\_\_

Date \_\_\_\_\_ Employee's Signature \_\_\_\_\_

# CONSTRUCTION SELF INSPECTION GUIDE

- Power lines:** Minimum 10' clearance / insulate – de-energize, under 50 kw; over 50 kw – refer to Chapter 155
- Trench/excavation:** Any trench four feet or more must be sloped, shored or braced
- Guardrails:** Any opening four feet or more above ground level must be guarded
- Standard guardrail:** Top rail = 39" to 45" above working surface. Midrail = halfway between top rail and floor. Toeboard = 4".
- Scaffold:** Fully planked
- Scaffold:** Fall protection provided if fall hazards over 10 feet exist
- Stairs:** Four or more risers must have handrails
- Fall protection:** Any exposure to fall hazards of 10' or greater must be eliminated by the use of safety harness/belt, lanyard or lifeline, horizontal lines, or cantenary lines. Positive fall restraint/protection must be utilized at all times. Two lanyards may be necessary at the beam/upright traverse points. No exposure at any time is allowed.
- Fall protection work plan:** Job specific, in writing; available on-site for all fall hazards above 10'.
- Open belts and pulleys, chains and sprockets, points of operation** must be guarded to prevent accidental contact. Air compressors and electric motor pulleys are the most common hazards.
- Radial saws:** Cutting head must return easily to start position when released; blade must not extend past the edge of the worktable; off/on switch should be at front of operator's position.
- Table saws:** Upper hood guard; anti-kickback, push stick, belt and pulley guarded
- Circular saws:** Blade guard instantly returns to covering position
- Never wedge or pin a guard.**
- Chain saw:** Ballistic nylon leg protection; eye, ear, face protection; hard hat
- Angle grinders:** 180-degree guard required
- Ladders:** Extended 36" above landing and secured to prevent displacement
- Articulating boomlift:** Safety harness and lanyard at all times
- Floor holes/openings:** Covered and secured; be sure no tripping hazards in the area.
- Extension cords/electric power tools:** Marked/covered by Assured Grounding Program
- Clothing:** Minimum of short sleeve shirts, long pants, and substantial footwear; no recreational shoes
- Hard hats:** readily accessible at all times; worn when overhead hazard exists
- Oxygen/acetylene storage areas:** Cylinders chained and separated
- Personal protective equipment:** Head, eye, ear, respiratory, and leg protection – high visibility vests when required
- Housekeeping:** Workers are responsible for their own area of exposure
- First aid/fire extinguishers:** Available and readily accessible
- First aid trained personnel:** Minimum of one person on-site at all times with first aid CPR training.
- Accident Prevention Program:** In written format
- Crew Leader Meetings:** At beginning of each job and at least weekly thereafter. Documented
- Chemical hazard communication program**



# CONFINED SPACE PRE-JOB ASSESSMENT FORM

Supervisor \_\_\_\_\_ Client \_\_\_\_\_ Date: \_\_\_\_\_  
 Project \_\_\_\_\_ Project No. \_\_\_\_\_ Safety Contact \_\_\_\_\_  
 Scope and Description of Work: \_\_\_\_\_

<b>Potential Hazards Identified</b> – be specific Use Additional Paper if necessary	<b>Physical Control Methods</b> – Air Gap, Blinding, Double Blocks, Bleed & Flush, Lockout, Ventilation, Purging, Disconnect, etc	What are the <b>consequences</b> if people or the environment is exposed to hazard? – Attach MSDS and other documents	Permissible Exposure Limits <b>PEL</b>	Type <b>PPE</b> Required – Clothing, SCBA, Respiratory, etc.

What method will be used to physically clean the confined space of hazardous liquids, gases, and other toxic substances?  
 \_\_\_\_\_

What safety equipment is required?  
 \_\_\_\_\_

What hazards will be generated by the work to be done? For example: painting, welding, grinding, material removal spills?  
 \_\_\_\_\_

How will emergency rescue be performed and who will be responsible for rescue operations?  
 \_\_\_\_\_

What type of rescue system will be used?  
 \_\_\_\_\_

Who will perform the work? Are they Trained? Are they qualified to do the work?

Name	CS Trained?	Other Training needed	Assignment

Name of Client's "Authorizing Agent" who has knowledge of contents and hazards and will declare space safe for entry: \_\_\_\_\_

General Comments: \_\_\_\_\_

**Confined Space Classification** (circle): Non-hazardous / Hazardous Due To Work Task / Hazardous Due To Internal Condition

# GROUND FAULT PROTECTION INSPECTION RECORD

Equipment ID No.	Test performed	DATE
DJC01	CONDUCTIVE	3/01/2005
DJC02	CONDUCTIVE	3/01/2005
DJC03	CONDUCTIVE	3/01/2005
DJC04	VISUAL FOR CORRECT CONNECTION	3/01/2005
DJC04	REMOVED FROM SERVICE	3.01/2005

EXAMPLE





## HEARING PROTECTION / EQUIPMENT LIST

The following list represents some work activities and equipment which will require the use of hearing protection:

<b>ACTIVITIES AND/OR EQUIPMENT TYPICALLY RESULTING IN HIGH NOISE LEVEL</b>	<b>ESTIMATED AVERAGE NOISE LEVEL dB(A)</b>
1. Air Arc Gouging	115
2. Air compressor	95
3. Chain saw	107
4. Electric Disc Grinder	100
5. Forklift inside a trailer	98
6. Heavy equipment working	100
7. Impact tools	108
8. Pneumatic chipping hammer	110
9. Abrasive blasting	100
10. Welding machines	95

