

SECTION 1 – Safety Policy Statement

Safety and Health Program

It is the policy of **The Ruhlin Company** to provide a safe workplace for our employees, subcontractors, customers, and the general public and to observe all State and Federal Laws and Regulations, in addition to client-specific requirements.

The Ruhlin Company's Safety and Health Program is designed to train our employees to follow safe practices and to recognize and correct unsafe working conditions.

By employee's working collectively, The Ruhlin Company can achieve a safe work environment. Active participation and adherence to the Safety and Health Program is a condition of each employee's employment. No employee is required to work at a job that he or she knows is not safe. Therefore, we must work to make every workplace safe by detecting and correcting unsafe working conditions as well as the detection of unsafe work practices.

Our Safety and Health Program is equivalent with The Ruhlin Company's policies of providing the best quality and most productive service in our industry.

It is The Ruhlin Company's goal to avoid incidents and lost-time injuries. The Ruhlin Company is committed to sending our employees home to their families at the end of their shift free of injury. Because of the many different hazards of our industry, we must maintain constant awareness to achieve this goal.


James L. Ruhlin, Jr. PE
President & CEO

SECTION 2 – Safety and Health Program Responsibilities

Purpose

The Company's Safety and Health Program is the responsibility of each supervisor who has the right and responsibility to demand safe operations. It is the supervisor's obligation to instruct employees to work safely. Notwithstanding the responsibilities of supervisors, each level of our organization is accountable for safe performance. All aspects of this Program must receive top priority attention from all levels of personnel.

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Responsibility to Stop Work

Every employee has the responsibility and the authority to stop work **IMMEDIATELY** without fear of reprisal, when convinced a situation places themselves, their coworker(s), or the environment in danger. "Stop Work" is defined as the stopping of a specific activity that poses a danger to human health and/or the environment.

Report Unsafe Conditions

Employees shall report any activity or condition which they believe is unsafe.

Right to a Safe Workplace

Any employee who reasonably believes an activity or condition is unsafe is expected to stop or refuse work without fear of reprisal and requests that the safety concern be addressed.

If you have a "Stop Work" issue that has not been resolved through your supervisor, contact the safety department.

Duties and responsibilities of all personnel under the Company's Safety and Health Program are as follows:

Senior Managers

Senior management shall consistently be visible participants in all phases of safety and health. This can be daily or weekly involvement with management's acceptance of accountability from the top down. Employees, more often than not, will appreciate and recognize commitment more quickly if they observe senior management's commitment on the jobsite at regular intervals. This will also build confidence and trust and help senior management understand project safety and health problems more readily.

Senior manager responsibilities include the following:

1. Provides funding for the ongoing Safety and Health Program.
2. Delegates the direction and responsibilities for the administration of the Safety and Health Program.

3. Reviews safety performance with the safety director.
4. Attends and successfully complete an OSHA 30-Hour Construction Safety Course or an approved refresher course class at least every three (3) years.

Safety Director

1. Reports to the president and will act on his behalf in his absence in the field regarding safety and health matters.
2. Provides all levels of management with the services and technical advice necessary for proper administration of the Safety and Health Program.
3. Develops technical guidance and programs to identify and remove physical hazards from construction sites.
4. Formulates, recommends, and administers approved changes to the Safety and Health Program.
5. Prepares and distributes regular reports on the status of safety.
6. Advises all levels of management on matters pertaining to safety, to include establishing a "chain of command" and a network to communicate safety matters within the organization.
7. Maintains an adequate incident reporting system, personally investigating serious incidents, and taking corrective action to eliminate incident causes.
8. Coordinates with project management regarding the safety training of employees.
9. Routinely conducts physical jobsite inspections to observe any possible unsafe conditions or unsafe work practices.
10. Maintains outside professional contacts.
11. Ensures compliance with applicable federal, state, and local regulations.
12. Recommends safety-related programs and activities as incentives for the motivation of employees with regard to working safely.
13. Recommends disciplinary procedures for violators of safety rules.
14. Oversees, in conjunction with the human resources director, the Substance Abuse Policy.
15. Supports the estimator responsible for bidding a job, or assigns a member of the safety department, to conduct the Estimator Safety Checklist to determine any hazard abatements that will need to be planned for in the estimating/bidding process (see Attachments).
16. During or prior to the "Hand-Off Meeting," the safety director or appointee reviews with the superintendent the hazards present and any hazard abatements that will need to take place.
17. Conducts a Pre-Job Safety Survey with the jobsite superintendent (see Attachments).
18. Prepares all notices/posters required by OSHA, state and other appropriate agencies for posting at each construction project location in accordance with designated time regulations (Example: OSHA Form 300A).

Project Manager/Superintendent

1. Is familiar with the safety regulations related to his or her area of responsibility.
2. Directs and coordinates safety activities within his or her area of responsibility.
3. Requires all employees under his or her supervision to utilize the proper personal protective equipment and job safety devices.
4. Assures that safety equipment is available.
5. Conducts safety inspections of the work area, directs corrective action for unsafe conditions noted and informs the safety director of inspection results.
6. Assure foremen are aware of and comply with all safety requirements.
7. Reviews all incidents with foremen. Submits completed Incident Investigation Reports to the safety department and assures that corrective action is taken immediately to eliminate the cause (see Attachments).
8. Requires all subcontractors and subcontractor personnel to comply with Company safety programs and government regulations.
9. Provides information and recommendations to safety director concerning safety matters.
10. Completes either the Civil/Structural or Building/Industrial Weekly Safety Inspection form (see Attachments).
11. Attends and successfully completes an OSHA 30-Hour Construction Safety Course or an approved refresher course class at least every three (3) years.
12. Completes the Pre-Construction Safety Checklist prior to the "Hand-Off Meeting" (see Attachments)
13. Conducts a Pre-Job Safety Survey during or prior to the "Hand-Off Meeting" with a member of the safety department confirming the hazards present and hazard abatements that will need to be put into place (see Attachments).

Site Safety Specialist

1. Records all incidents that have taken place during Company operations using the Incident Investigation Report (see Attachments).
2. Processes all paperwork associated with incidents, inspections and safety department audits and forwards such documentation to the Sharon Center office.

Foreman

1. Is familiar with the safety regulations related to his or her area of responsibility.
2. Conducts daily TEAM Huddles with crew prior to the start of work (see Attachments)
3. Corrects and coordinates safety activities within his or her area of responsibility to include motivation of employees for safe work practices.

4. Assures that safety equipment and appropriate personal protective equipment are being utilized.
5. Assures that incidents and injuries are treated properly and reported promptly.
6. Investigates all incidents, obtains all pertinent data, files the Incident Investigation Report with the safety department, project manager/superintendent and initiates corrective action.
7. Ensures that no unsafe conditions exist in his or her area of responsibility and reports to the project manager/superintendent on any corrective actions needed which are beyond his or her control.
8. Attends and successfully completes an OSHA 30-Hour Construction Safety Course or an approved refresher course class at least every three (3) years.

Estimator

1. Completes the Estimator Safety Checklist while bidding a job to determine hazard abatements that will need to be planned for in the estimating/bidding process.
2. Communicates safety hazards/needs with the safety department.

Shop/Yard Equipment Manager

1. Is familiar with the safety regulations related to his or her area of responsibility.
2. Conducts safety inspections of the work area, directs corrective action for unsafe conditions noted and informs the safety director of inspection results.
3. Corrects and coordinates safety activities within his or her area of responsibility to include motivation of employees for safe work practices.
4. Assures that safety equipment and appropriate personal protective equipment are being utilized.
5. Assures that incidents and injuries are treated properly and reported promptly.
6. Investigates all incidents, obtains all pertinent data, files the Incident Investigation Report with the safety department, and initiates corrective action.
7. Ensures that no unsafe conditions exist in his or her area of responsibility and reports to the safety director on any corrective actions needed which are beyond his or her control.
8. Attends and successfully completes an OSHA 30-Hour Construction Safety Course or an approved refresher course class at least every three (3) years.

Employees

1. Shall be familiar and comply with the Company Safety and Health Program.
2. Must use the required safety equipment and appropriate personal protective equipment.
3. Notify supervisor immediately of unsafe conditions or acts.
4. Report all accidents to supervisor immediately.

5. Shall attend and successfully complete at a minimum an OSHA 10-Hour Construction Safety Course and be able to produce a Department of Labor wallet card when asked.

Subcontractors

The provisions of this safety manual are a minimum requirement and apply to subcontractors, their employees, and any lower tier contractors who are working on projects for The Ruhlin Company. All subcontractors must be familiar with and comply with The Ruhlin Company's Safety and Health Program and applicable government regulations.

All subcontractors will be subject to inspections/audits from The Ruhlin Company safety department, project managers, superintendents, foremen, insurance companies or other Ruhlin representatives. If safety violations are observed, the subcontractor will be responsible for making necessary corrections immediately. Repeat offenses may result in offending subcontractor employees, supervisors, or the subcontractor as a whole, being removed from the project.

Safety Committees

To ensure that all levels of employees are reached and represented, The Ruhlin Company has two safety committees (Core and The Ruhlin Employee Safety Committee (RESC)) that will take a proactive approach to safety-related issues.

RESC and the Core Committee meet on a monthly basis.

SECTION 3 - General Safety Program Guidelines

Purpose

These General Safety Guidelines have been established to encourage a safe and pleasant work atmosphere. Safe work environments occur only when everyone cooperates and commits to appropriate standards of behavior.

The Ruhlin Company desires a proactive approach to safety and has established the following guidelines for all employees.

Pre-Job Safety Survey

Each project must complete a Pre-Job Safety Survey (see - Attachments) well in advance of the start of every new project. All items must be discussed between the safety department, project manager and superintendent.

Toolbox Safety Meetings / Jobsite Inspections

Toolbox Safety Meetings will be held once a week. Meetings will be conducted by the superintendent or job foreman. All employees are required to attend and sign the attendance sheet. In order to be productive, these meetings require the input of all employees who are in attendance; therefore it is important to listen carefully and join in the conversation.

Likewise, weekly safety inspections are to be conducted on all active jobsites.

New-Hire Orientation

Before all new employees start work, they will be given the New-Hire Orientation by their supervisors and are required to view the New-Hire Safety Orientation Video and complete the post-test.

Substance Abuse Policy

The Ruhlin Company prohibits the manufacture, use, possession, distribution or sale of intoxicants, illegal and unauthorized drugs, narcotics, controlled substances, drug paraphernalia or other contraband while on the jobsite premises or on Company business. (Contraband is anything prohibited by law, Company policy or work rules.) Any violation of these prohibitions may result in disciplinary action up to and including termination of employment.

The complete substance abuse policy can be obtained from the Human Resources Department.

Weapons Policy

In order to provide a safe work environment, the Company prohibits the use, possession, distribution or sale of firearms, unauthorized explosives, ordnance or weapons of any kind while on the jobsite premises (including parking lots), in Company motor vehicles, as well as in privately-owned vehicles that enter upon Company premises and parking areas, at Company offices or on Company business, regardless of whether the individual is licensed to carry the weapon.

The only exception to the Company's prohibition on weapons is that an employee lawfully carrying a concealed weapon under Ohio law (either by an individual who has a valid concealed handgun license or who, under RC 2923.111, is a qualifying adult carrying a non-restricted firearm) may transport or store a firearm or ammunition in the employee's privately-owned vehicle provided that (i) each firearm and all ammunition remains inside the employee's privately-owned vehicle while the employee is physically present in the vehicle or each firearm and all ammunition is locked within the trunk, glove box, or other enclosed compartment or container within the person's privately-owned vehicle, (ii) the privately-owned vehicle is in a location where it is otherwise

permitted to be, and (iii) the employee is not using their privately-owned vehicle in the course and scope of their employment with the Company. This exception only allows an employee who commutes to and from work in a privately-owned vehicle to safely store a firearm lawfully carried under Ohio law in the privately owned-vehicle while the employee is at work. At no time may the firearm or any ammunition be outside the employee's privately-owned vehicle on Company property. Carrying a firearm in a privately-owned vehicle is prohibited if the employee is using the privately-owned vehicle in the course and scope of their employment with the Company.

Entry upon or presence at the jobsite or workplace by any employee is conditioned upon the Company's right to search the person, personal effects, vehicles, lockers, baggage and Company quarters of any employee for any of the prohibited items named above.

By entering upon or being present at a Company jobsite or workplace, one is deemed to have consented to such searches, which may include periodic and unannounced searches of any employee who is present at entering or leaving a jobsite or workplace. Any employee who refuses to submit to a search is subject to disciplinary action up to and including termination of employment.

This policy does not apply to authorized security personnel and law enforcement officers.

Further, Company employees, including contract and temporary employees, are prohibited from carrying firearms or dangerous weapons of any type outside the Company's premises while acting within the course and scope of their employment regardless of whether they are licensed to carry such weapons.

Any failure by an employee to abide by the terms of this policy may result in disciplinary action up to and including the termination of employment. Further, except as permitted by the exception stated above, carrying a weapon onto Company premises, including Company parking areas, is a violation of this policy and will be considered an act of criminal trespass, will be grounds for immediate removal from the premises and may result in prosecution.

Disciplinary Program

Safety is the responsibility of all Ruhlin employees. As a condition of your employment, employees are expected to work in a manner that will not cause injury to themselves or to those with whom they work. It is essential to the success of the Company's safety program that all employees understand that responsibility for personal safety is a job requirement. Failure to follow safety rules or safety instructions will result in disciplinary action up to and including termination of employment (See attachments).

Under the discretion of the superintendent or Company management, someone who violates any Company policy, the code of conduct or who performs an unsafe act, may be subject to immediate termination of employment.

If the incident is a minor infraction, the following programs may be utilized by the superintendent, safety department or other Company management:

1. **First Offense** - A verbal written warning is given to the employee who violates a "known safety practice" or other Company policy. A written record of the violation is sent to the safety department, the employee is advised of the disciplinary program and a letter will be sent to the employee's address. (A sample of the Safety Observation Form can be found in Attachments).
2. **Second Offense** - A written notice is given to the employee and a copy is forwarded to the safety director. The offending employee will be sent home without pay for a period of up to three (3) working days. The employee will also be advised that any safety violation or other policy violation will result in termination. A letter will be sent to the employee's address advising them of the second offense.

3. **Third Offense** - The employee is given a written notice of employment termination and is removed/escorted from the jobsite. The superintendent will forward termination documentation to the safety department.

Flagrant and/or serious safety violations may be cause for immediate termination at the Company's discretion.

A letter will be sent home after a first or second offense reminding the employee of the Company's disciplinary policy and what action will be taken if further violations occur.

Emergency Management Program

Emergency Preparedness

The Ruhlin Company's emergency action programs are contained in the Emergency Response Plan. Employees should refer to this plan, which is located on the company SharePoint site, for procedural guidelines should an emergency situation occur.

Procedure When Safety Director Is Not Available

When the safety director is not available, a member of the safety department will be the next point of contact. If no one from the safety department is available, the following procedures shall be followed:

1. For OSHA Inspections or Accident Investigations: When an OSHA compliance officer visits your jobsite, you must contact, depending upon your reporting division:
 - Jim Ruhlin Jr, President – 330-350-1470
 - Jeremy Angel, Director of Operations-216/276-7781
 - Mike Ciammaichella, General Manager Heavy Civil Division – 330-350-1728
 - George Seanor, General Manager Industrial Division – 330-419-4815
 - Ben Neal, General Manager Structural Erection Division – 330-350-2554
 - Brady Oaks, General Manager Building Division – 330-352-3005

Note: the OSHA inspection officer should be a *compliance officer*.

Ask why the compliance officer is there for an inspection. Management will provide guidance on how to proceed. Generally, the Construction Industry Service Program Safety Representative (Kent Crytzer at 216-214-2913) will assist Ruhlin on inspections or investigations. When no one else is available to assist you during the inspection, the project superintendent will accompany the OSHA inspection officer. The project superintendent will be involved in all incident investigations. Refer to the Ruhlin Company's Emergency Response Plan for guidance during serious incidents.

2. For Positive Drug Test Results: Whenever the safety director or safety administrative assistant is not available for confirmed positive drug test results, the results shall be reported to the director of human resources. The results shall then be reported to the project superintendent in order for the affected employee to be removed from the project.
3. For Personal Protective Safety Equipment: Protective safety equipment may be obtained during the safety director's absence by contacting a member of the safety department. All items removed from the safety supply trailer MUST be logged on the requisition sheet inside the trailer.

Hazard Identification (Job Hazard Analysis-JHA)

For the identification of potential hazards that could be present on a jobsite, JHA's shall be completed by each supervisor prior to performing any task, or modified through the shift as the work changes, and shall be conducted by an employee trained in hazard identification. All employees included in the crew performing work must be in attendance for this hazard identification review, and shall be trained in the hazard identification process. Safety concerns and/or questions from employees in attendance are highly encouraged during the meeting. (See Attachments)

Housekeeping

The overall appearance and neatness of the jobsite is the first impression people get of the work being performed. Good housekeeping is essential for a safe workplace, a jobsite free of trash and debris instantly removes several hazardous conditions. Proper housekeeping includes but is not limited to the following:

1. Form and scrap lumber with protruding nails, and all other debris, shall be kept cleared from work areas, passageways, and stairs, in and around buildings or other structures.
2. Protruding nails must be bent over or removed from lumber.
3. Material must not be stacked near the edge of an elevated location.
4. Wood, paper, and other debris must not be allowed to accumulate in your work area. Dumpsters are provided for waste materials.
5. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc. must be equipped with covers.
6. Spills and leaks should be cleaned up immediately and disposed of properly.
7. Dispose of flammable liquids according to labels.
8. Combustible scrap and debris must be removed at regular intervals during the course of construction.
9. Cords, hoses and/or ropes should be properly coiled when not in use to alleviate possible slips, trips or falls.
10. All compressed gas cylinders will be returned to a central storage location before the end of the workday.

Pedestrians/Security

During the Pre-Job Safety Survey, the safety department will determine the security needs/measures for the specific jobsite. In addition to the specifics determined, below are some general guidelines that will apply to all Ruhlin Company jobsites.

1. General public access to the jobsite must be restricted as much as possible.
2. Pedestrians always have the right of way.
3. NO equipment or toolboxes shall be suspended from a crane while the jobsite is inactive.
4. Tools and equipment must never be left unattended.

5. Barriers (e.g. fences, drums etc.) should be checked during the day and at the end of the shift to ensure continuity.

Office Safety

1. If objects or boxes are heavy or awkward, employees should seek assistance before lifting or moving the object (e.g. truck cart or an additional person).
2. Eliminate all tripping hazards (e.g. cords, wires, cables, loose rugs, clutter or wet and slippery floors).
3. Keep work area neat and organized.
4. Close all drawers and cabinets before leaving your work area.
5. Be familiar with the locations of all exits and emergency evacuation procedures.
6. All computer monitors should be positioned at eye level or lower.
7. Maintain proper lighting.
8. Alternate your activity to help eliminate fatigue and stress when possible.
9. Extension cords shall not be used as permanent wiring.
10. Avoid stacking items on top of file cabinets and unsecured shelves.
11. Notify the safety director of all incidents immediately.
12. All Company buildings, shops, trailers and jobsites (if enclosed) are designated as smoke-free.

Fire Protection

1. Where fire extinguishers are required due to potential fire hazards, all employees involved in such operations are to know the location(s) of the fire extinguishers, and have the proper training, both in the use of the fire extinguishers, and the hazards involved. This training shall be completed prior to initial assignment and at least annually thereafter.
2. Access to fire extinguishers will be kept clear at all times; fire extinguishers will not be removed from their designated area except for when in use.
3. All fire extinguisher tags will be visually checked and initialed by supervision monthly for damage, proper pressure, and annual certification.
4. The use of highly flammable liquids, such as gasoline, for any type of cleaning is prohibited.
5. All gasoline and diesel-powered equipment are to be shut off during refueling.
6. Any employee performing welding or burning operations where fire hazards exist, such as in buildings, will have the proper extinguisher available. He will also inspect the area where hot sparks might start a fire, prior to beginning the burning or welding, and either eliminate these hazards or contact the superintendent who will be responsible for assigning a fire watch.
7. Refer to Fire Prevention Program for additional requirements.

First Aid/CPR/AED

First aid/CPR is the immediate temporary care given to a victim of an accident or sudden illness until medical services can be obtained.

Every Ruhlin jobsite will have at a minimum one (1) employee trained in first-aid, CPR, AED.

The National Safety Council (NSC) guidelines will be followed regarding administering first-aid and CPR. First-aid treatment shall only be administered by a properly trained and authorized employee.

First Aid Kits

Properly filled first-aid kits have been placed in the trailer of every Ruhlin Company jobsite. These kits shall consist of appropriate items determined to be adequate for the job. These kits will also be inspected weekly to ensure adequate supplies of First Aid products. Emergency phone numbers and contacts are located in the trailers and are also in The Ruhlin Company Emergency Response Plan.

Route Maps for Medical Emergencies

All jobsites will have posted onsite at least one emergency route map to the nearest hospital or medical center in the event of a medical emergency. These maps will also include the emergency contact information for the specific area. Maps should be used for transport to the medical centers only when further medical care is needed.

Wash Stations

When the eyes or body of any employee may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area.

Examples of Tasks that Require Wash Stations:

- When in contact or the vicinity of concrete
- When using corrosive chemicals (When water is an approved first aid measure)
- When cleaning up hazardous material
- When working with any other corrosive materials

Bloodborne Pathogens/Exposure Control

Exposure control applies to employees with occupational exposure to blood and other potentially infectious materials. Access to a copy of the exposure control program is available by contacting the safety department. Training shall be provided at the time of initial assignment and within 1 year of previous training. Training records will be maintained for 3 years from the date of training.

Accurate records for each employee with occupational exposure will be maintained for at least the duration of employment plus 30 years.

The risk of infection with bloodborne pathogens is dependent on the likelihood of exposure to blood and other potentially infectious materials wherever that exposure occurs.

1. All bodily fluids have the potential to carry disease or viruses. These include but are not limited to blood, saliva, tissue etc. Unprotected contact shall be avoided at all times.
2. There are various methods of compliance or control against exposure to bloodborne pathogens. It is mandatory that employees utilize at least one of the following methods when there is exposure or potential exposure to blood and/or other potentially infectious materials:

- a. Universal precautions.
 - b. Engineering and work practice controls.
 - c. Personal protective equipment.
 - d. Housekeeping.
- 3. Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain body fluids are treated as if known to be infectious for HIV, HBV and other bloodborne pathogens.
- 4. Engineering Controls are guidelines that isolate or remove the bloodborne pathogens hazard from the workplace. Examples of engineering controls that the company requires employees to use include the following:
 - a. Hand-washing facilities and/or antiseptic-hand cleaners must be readily accessible to all employees.
 - b. Should sharp containers be necessary, we will utilize leakproof, color-coded and puncture-resistant containers. Contaminated needles and other contaminated sharps shall not be bent, recapped or removed. Shearing or breaking of contaminated needles is prohibited.
 - c. Eyewash stations with at least a 15-minute flow capacity will be made available to all affected employees.

Engineering controls and work practice controls shall be used in preference to other methods as good industrial hygiene practices and are compatible in adherence to traditional controls.

- 5. Work practice controls reduce the likelihood of exposure by altering the manner in which a task is performed. While work practice controls act on the source of the hazard, the protection they provide is based on management and employee behavior rather than installation of a physical device such as a protective shield.

Some examples of work practice requirements for affected employees are:

- a. Hand washing is required when gloves are removed and as soon as possible after contact with body fluids.
 - b. If exposure occurs, personal protective equipment (PPE) is to be removed before leaving the work area. It must be properly discarded by placing it in the appropriate container followed by hand washing.
- 6. Where there is a potential for exposure to bloodborne pathogens, the employees shall abide by the following:
 - a. Do not eat or drink in the area.
 - b. Do not apply cosmetics or lip balm.
 - c. Do not insert or adjust contact lenses.
- 7. When the possibility of occupational exposure is present, PPE is to be provided at no cost to the employee. PPE shall be repaired and replaced as needed to maintain its effectiveness.

Types of Personal Protective Equipment

Personal protective equipment includes but is not limited to:

Gloves
Eye protection

Gowns
Mouthpieces

Face shields
Resuscitation devices

Personal protective equipment must be selected based on the specific work and exposure conditions that will be encountered and the anticipated level of risk. All equipment shall be cleaned and decontaminated after contact with blood or other infectious materials.

8. **Waste Management** - The following procedure has been established for handling regulated waste (i.e. any bodily fluid). Regulated waste must be properly contained in closable containers constructed to contain all contents and prevent leakage of fluids during handling or transport, as well as handled and discarded to protect employees from exposure to infectious materials. Containers for regulated waste must also be labeled as "BIOHAZARD" with the biohazard symbol, and such labels must be fluorescent orange or orange-red.
9. **Hepatitis B Vaccination** - The Ruhlin Company will make available, at no cost, the Hepatitis B vaccine and vaccination series to any employee who may have had an exposure incident.

Sanitation

Sanitation on construction sites includes but is not limited to portable restroom facilities and potable drinking water.

1. Employees must use the portable restroom facility provided at the jobsite.
2. Potable water shall be provided at each jobsite.
3. Adequate washing facilities will also be provided for employees engaged in the application of paints, coating, or in other operations where contaminants may be harmful to the employees. Such facilities shall be in near proximity to the worksite and shall be so equipped as to enable employees to remove such substances.

Unsafe Acts by Employees

More accidents result from unsafe acts than from unsafe conditions. Horseplay will not be tolerated. When the safety director or job superintendent is conducting jobsite inspections, particular attention will be given to any employees who are engaged in unsafe acts.

1. Employees committing unsafe acts shall be reprimanded in a consistent and nondiscriminatory manner consistent with the disciplinary program outlined in this manual.
2. Under the discretion of the superintendent or senior management, the employment status of the employee who committed the serious unsafe act may be immediately terminated.

Demolition Program

The use of safe demolition procedures in construction is vital to the safety and health of employees in and around the operation. These procedures must include, but are not limited to:

- Following Engineered Work Plans (Section 26).
- Emergency medical and first aid information correctly in place and marked.
- Fire prevention/protection measures in place in case of a fire.
- Use of proper personal protective equipment during the course of the demolition.

Demolition Health Hazards

Possible health hazards could be prevalent during or after a pre-demo engineering inspection, and could also occur without notice during the demolition process. To protect the safety and health of employees

from these health hazards, measures of prevention/protection shall be administered. Proper personal protective equipment such as respirators, safety glasses, and skin protection membranes shall be used to protect employees from possible exposure to health hazards.

Possible health hazards projected throughout the course of demolition may include, but are not limited to:

- Lead
- Asbestos
- Silica
- Benzene

For further information on the listed health hazards, refer to the Hazard Communication Program (Section 5) of this safety manual.

Noise Hazards

During the course of demolition, noise levels exceeding the Permissible Noise Exposure Limit may be present. For prevention/protection against these noise levels, employees are to follow the Hearing Conservation Program (Section 22) of this safety manual.

Demolition Techniques

According to the nature of the project, demolition may be done by a number of different ways. Examples of these specific techniques used by The Ruhlin Company may include but are not limited to:

- Manual demolition with hand tools and other small equipment
- Concrete demolition with jack hammers or equivalent means
- Demolition by large equipment, such as track hoes or excavators with either the bucket, or the use of attachments designed for demolition practices.
- Removal of metal members with the use of cutting torches and chop saws

Tools and Equipment

All tools and equipment used in demolition must be in good working order and in compliance with the requirements stated in the Tools section (Section 13) of this safety manual, as well as with OSHA 1926.300 standard requirements. Tools shall be inspected prior to use. Broken or defective tools shall be removed from service, and shall not be used in the course of any work on-site.

Heat and Cold Related Illnesses

Why is heat a hazard?

When a person works in a hot environment, the body must get rid of excess heat to maintain a stable internal temperature. It does this mainly through circulating blood to the skin and through sweating.

When the air temperature is close to or warmer than normal body temperature, cooling of the body becomes more difficult. Blood circulated to the skin cannot lose its heat. Sweating then becomes the main way the body cools off. Sweating is only effective if the humidity level is low enough to allow for evaporation, and if the lost fluids and salts are adequately replaced.

If the body cannot get rid of excess heat, it will store it. When this happens, the body's core temperature rises and the heart rate increases. As the body continues to store heat, the person begins to lose concentration and

has difficulty focusing on a task, may become irritable or sick, and often loses the desire to drink. The next stage is most often fainting and even death if the person is not cooled down.

Excessive exposure to heat can cause a range of heat-related illnesses, from heat rash and heat cramps to heat exhaustion and heat stroke. Heat stroke can result in death and requires **immediate medical attention**.

Exposure to heat can also increase the risk of injuries because of sweaty palms, fogged-up safety glasses, dizziness, and burns from hot surfaces or steam.

Who could be affected by heat?

Workers exposed to hot indoor environments or hot and humid conditions outdoors are at risk of heat-related illness, especially those doing heavy work tasks or using bulky or non-breathable protective clothing and equipment. Some workers might be at greater risk than others if they have not built up a tolerance to hot conditions, or if they have certain health conditions. The table below shows some environmental and job-specific factors that increase the risk of heat-related illness.

Factors That Put Workers at Greater Risk	
Environmental	• High temperature and humidity • Radiant heat sources • Contact with hot objects • Direct sun exposure (with no shade) • Limited air movement (no breeze, wind or ventilation)
Job-Specific	• Physical exertion • Use of bulky or non-breathable protective clothing and equipment

Workers who are suddenly exposed to working in a hot environment face additional and generally avoidable hazards to their safety and health. New workers and those returning from time away are especially vulnerable. That's why it is important to prepare for the heat: educate workers about the dangers of heat, acclimatize workers, gradually increase the workload or allow more frequent breaks to help new workers and those returning to a job after time away build up a tolerance for hot conditions.

How can heat-related illness be prevented?

Heat-related illnesses can be prevented. Important ways to reduce heat exposure and the risk of heat-related illness include engineering controls, such as air conditioning and ventilation, that make the work environment cooler, and work practices such as work/rest cycles, drinking water often, and providing an opportunity for workers to build up a level of tolerance to working in the heat. It's important to know and look out for the symptoms of heat-related illness in yourself and others during hot weather. Plan for an emergency and know what to do — **acting quickly can save lives!**

Heat-Related Illnesses

Heatstroke, the most serious form of heat-related illness, happens when the body becomes unable to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat. Signs include confusion, loss of consciousness, and seizures. **Heat stroke is a medical emergency that may result in death!** Call 911 immediately.

Heat syncope is a fainting (syncope) episode or dizziness that usually occurs with prolonged standing or sudden rising from a sitting or lying position. Factors that may contribute to heat syncope include dehydration and lack of acclimatization.

Heat exhaustion is the body's response to loss of water and salt from heavy sweating. Signs include headache, nausea, dizziness, weakness, irritability, thirst, and heavy sweating.

Heat cramps are caused by the loss of body salts and fluid during sweating. Low salt levels in muscles cause painful cramps. Tired muscles—those used for performing the work—are usually the ones most affected by cramps. Cramps may occur during or after working hours.

Heat rash, also known as prickly heat, is skin irritation caused by sweat that does not evaporate from the skin. Heat rash is the most common problem in hot work environments.

Heat Stress

Exposure to heat can cause illness and death. The most serious heat illness is heat stroke. Other heat illnesses, such as heat exhaustion, heat cramps and heat rash, should also be avoided.

Causes of heat stress include:

- High temperature and humidity, direct sun exposure, no breeze or wind
- Low liquid intake
- Heavy physical labor
- Waterproof clothing
- No recent exposure to hot workplaces

Common symptoms of heat stress may include:

- Headache, dizziness, or fainting
- Weakness and wet skin
- Irritability or confusion
- Thirst, nausea, or vomiting

To prevent heat stress, you should:

- Provide training about the hazards leading to heat stress and how to prevent them.
- Drink plenty of fluids. Provide a lot of cool water to workers close to the work area. At least one pint of water per hour is needed. Drink often and BEFORE you are thirsty. Drink water every 15 minutes.
- Avoid beverages containing alcohol or caffeine.
- Schedule frequent rest periods with water breaks in shaded or air-conditioned areas.
- Routinely check workers who are at risk of heat stress due to protective clothing and high temperatures. Wear lightweight, light colored, loose-fitting clothes.
- Consider protective clothing that provides cooling.
- Be familiar with the signs/symptoms of heat illnesses; monitor yourself and use the buddy system.
- Block out direct sun and other heat sources.

What to do if someone is ill from working in the heat:

- Call a supervisor for help. If the supervisor is not available, call 911.
- Have someone stay with the worker until help arrives.
- Move the worker to a cooler/shaded area.
- Remove outer clothing.
- Fan and mist the worker with water; apply ice (ice bags or ice towels).
- If able to drink, provide with cool drinking water.

IF THE WORKER IS NOT ALERT or seems confused, this may be a heat stroke.
CALL 911 IMMEDIATELY and apply ice as soon as possible.

Cold Stress

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. It is vital that employees take precautions when working in cold conditions.

The Cold Stress Equation: Low Temperature + Wind Speed + Wetness = Injuries & Illness

Who could be affected by Cold?

When working in a cold environment, employees not properly clothed and protected from heat loss may suffer from cold related injuries, including frostbite and hypothermia. Workers taking certain medications, who are in poor physical condition, who have a poor diet, or who are older are at an increased risk for cold-related illnesses or injuries. Also, workers with predisposing health conditions (such as cardiovascular disease, diabetes, and hypertension) are also at greater risk.

How can cold-related illness and injuries be prevented?

Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries. Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help coworkers. Select proper clothing for cold, wet, and windy conditions; layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).

Take frequent short breaks in warm dry shelters to allow the body to warm up. Perform work during the warmest part of the day. Avoid exhaustion or fatigue because energy is needed to keep muscles warm. Use the buddy system (work in pairs).

Drink warm, sweet beverages (sugar water, sports-type drinks). Avoid drinks with caffeine or alcohol. Eat warm, high-calorie foods like hot pasta dishes.

Cold-Related Illnesses

Frostbite: Occurs when the deep layers in your skin and tissue freeze. This freezing kills the skin cells, sometimes causing major infection. Frostbite causes the skin to turn a pale, waxy-white color. The skin will also become hard and numb. Frostbite usually affects the fingers, hands, toes, feet, ears, and nose.

What to do in the event of frostbite:

- Move the person to a warm dry area. Don't leave the person alone.
- Remove any wet or tight clothing that may cut off blood flow to the affected area.
- **DO NOT** rub the affected area, because rubbing causes damage to the skin and tissue.
- Gently place the affected area in a warm (105°F) water bath and monitor the water temperature to slowly warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast causing tissue damage. Warming takes about 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. NOTE: If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

Hypothermia: Occurs when the normal body temperature (98.6°F) drops to or below 95°F. Hypothermia causes fatigue or drowsiness, dizziness, uncontrollable shivering, cool bluish skin, slurred speech, clumsy movements, and irritable, irrational or confused behavior.

Hypothermia Exposure On Land:

- **Call for emergency help** (i.e., Ambulance or Call 911).
- Move the person to a warm, dry area. Don't leave the person alone.
- Remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if they are alert. Avoid drinks with caffeine (coffee, tea, or hot chocolate) or alcohol.

- Have the person move their arms and legs to create muscle heat. If they are unable to do this, place warm bottles or hot packs in the arm pits, groin, neck, and head areas.
- **DO NOT** rub the person's body or place them in warm water bath. This may stop their heart.

Hypothermia Exposure In Water:

- **Call for emergency help** (i.e., Ambulance or Call 911). Body heat is lost up to 25 times faster in water.
- **DO NOT** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **DO NOT** attempt to swim unless a floating object or another person can be reached. Swimming or other physical activity uses the body's heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

SECTION 4 - Incident Reporting, Recording and Investigation Program

Purpose

The purpose of this section is to outline the methods The Ruhlin Company will use for incident reporting and investigation. This section is intended to provide a means to deal with workplace incidents in a standardized way; therefore, the following procedures must be followed in order for The Ruhlin Company to determine root causes and adopt methods which can prevent similar incidents from occurring in the future.

Incidents are defined as any unplanned and/or undesired events that resulted in or could have resulted in an injury or illness to employees and/or the public and/or damages to property, such as vehicles, buildings and/or equipment.

Responsibilities and Incident Reporting

Employee Responsibilities

It is mandatory for employees to immediately report incidents to their supervisor. All incidents shall be reported. Employees are responsible for preserving the scene if any incident occurs until it can be thoroughly investigated. If emergency personnel are needed (EMS, fire or police), call 9-1-1 immediately. (See the Incident Flow Chart within this section or Attachments). Employees can report all incidents in compliance with this policy without fear of retaliation.

Supervisor Responsibilities

Immediately, upon learning of an incident, it is the supervisor's responsibility to verbally report the incident to the safety director. Supervisors must report the incident even if they believe the incident is minor in nature, resulted from aggravating a previous injury or was not work-related.

The supervisor must conduct a thorough investigation of the incident by using the Incident Investigation Report (a sample of the report is located in the Attachments). This report must be completed and forwarded to The Ruhlin Safety Department within 24 hours of the incident. This investigation report includes general incident information, the type of incident, corrective actions required, witness statements, and photographs of the incident.

The following types of incidents should be reported on the Incident Investigation Report:

- First Aid Only
- Injury/Illness
- Near-miss
- Vehicle Crash/Equipment or Property Damage
- Utility Damage

Safety Director Responsibilities

If the incident resulted in inpatient hospitalization, amputation, or loss an eye of an employee, the safety director must notify OSHA within 24 hours of the incident. If the incident resulted in the death of an employee, the safety director must notify OSHA within 8 hours of the incident.

The safety director must also keep a record of all recordable incidents. The safety director will promptly record such incidents on the appropriate OSHA forms (OSHA 300 and OSHA 301) as soon as possible but no later than seven days after an incident. The safety director will also complete and post the OSHA 300A form annually.

Types of Incidents Defined (General Definitions)

First Aid Only: An employee is treated on-site and does not require professional medical attention.

Injury: Employee is treated off-site and receives professional medical attention. If the injury requires medical treatment beyond first aid, it is classified as a "recordable" injury and must be recorded under the Occupational Safety and Health Administration (OSHA) guidelines.

Illness: A sickness occurring suddenly, or any abnormal condition or disorder caused by exposure to factors associated with employment (e.g. asthma, lead poisoning, etc.)

Near-Miss: Where a potential hazard, or incident capable of causing injury and/or property damage exists but did **NOT** result in an injury and/or illness and/or property/equipment damage.

Recordable: An incident is recordable if it involves a fatality, injury, or illness that is work-related, a new case, and also involves:

- Death;
- Days away from work;
- Restricted work or transfers to another job;
- Medical treatment beyond first aid;
- Loss of consciousness;
- A significant injury or illness that is diagnosed by a physician licensed health care professional.
- Needlestick injuries and cuts from sharp objects that are contaminated with another person's blood or other potentially infectious material; or
- Certain medical removal, occupational hearing loss, and tuberculosis cases.

Vehicle Crash/Equipment or Property Damage: A collision where loss or damage is incurred to vehicles, or any other form or loss or damage to equipment or other property.

Utility Damage: Damage involving utilities and/or utility companies.

Witness Statements

Witness statements must be in the witness's own writing. If the writing is difficult to read, you can type a copy of it, but attach the original handwritten statement to the complete report.

Always use "witness stated..." when writing what the witness tells you about the incident. This tells that you are only writing what the witness tells you and not your version of what happened.

Direct and Indirect Causes

An investigation report should be as detailed as possible. It is always better to have information that is not needed than to need information that you don't have. The Incident Investigation Report should identify the why? of an incident, as well as the who?, what?, when? and where?. The report should show the direct cause, as well as indirect causes of the incident.

Supervisors should never delay filling out the Incident Investigation Report because memories get fuzzy, and workers will talk to each other, and stories could get altered. When an incident occurs, it is up to the supervisor to:

1. Take care of the injured employee
2. Secure the incident site
3. Gather information on the incident from as many sources as possible.

The supervisor and the safety director will review all completed Incident Investigation Reports to determine any changes to processes in order to prevent the reoccurrence of similar events as well as any other required actions needed (e.g. OSHA notification, Workers' Compensation claim, Job Hazard Analysis, change of work orders, additional training required, etc.).

Post-Incident Drug and Alcohol Testing

Drug and alcohol testing is required of any employee involved in an injury incident, near-miss, vehicle, or equipment/property/utility damage incident in order to evaluate the root cause of a workplace incident that harmed or could have harmed employees. The superintendent or designee **MUST** drive the employee to the testing facility.

Interpreting Drug/Alcohol Test Results

If a post-incident instant drug screening result is "negative", the employee may return to work. If a post-incident instant drug screening result is "non-negative" or "requires further testing," the employee may not return to work at this time.

All "non-negative" instant drug screening results will be sent out for further testing. A Medical-Review Officer (MRO) will review all testing samples and will issue a confirmatory test result to The Ruhlin Company. The final confirmation test result typically takes three to five working days. The employee tested may not work during this time. If the final confirmatory result reported to The Ruhlin Company is "negative", the employee may still be considered for employment, provided the position the employee was originally working is still available. If the final confirmation result reported to The Ruhlin Company is "positive", the employee is not eligible for employment by The Ruhlin Company, and the union will be notified.

If a post-incident breath alcohol test result is 0.020 gm/dl (.05%) or higher, the employee is not eligible for employment by The Ruhlin Company and the union will be notified.

Injury Incidents

When an injury requiring medical attention occurs, the supervisor shall drive and accompany the employee to the ER/occupational health clinic or arrange for emergency medical transportation. The supervisor must explain to the treating physician the duties that the injured employee has so the doctor will know what the employee can or cannot do after treatment.

NOTE: call 9-1-1 IMMEDIATELY for all serious injuries.

Employee Return to Work after Injury or Illness Incident

An employee may not return to work after an injury or illness incident until they receive signed authorization from the treating physician which allows the employee to return to work or to return to work with restrictions.

All "Return to Work" notices from a treating physician must be forwarded to the main office. The supervisor should contact the safety department if they have any questions or concerns regarding an employee's work status.

Incident Review Process

Incidents will be reviewed by project managers prior to being forwarded to the safety department. Recordable incidents will be reported using the Incident Investigation Report and must be completed within 24-hours of the incident. The safety director will ensure any necessary OSHA documentation is timely completed and/or reports are made to OSHA when necessary.

Safety Flash

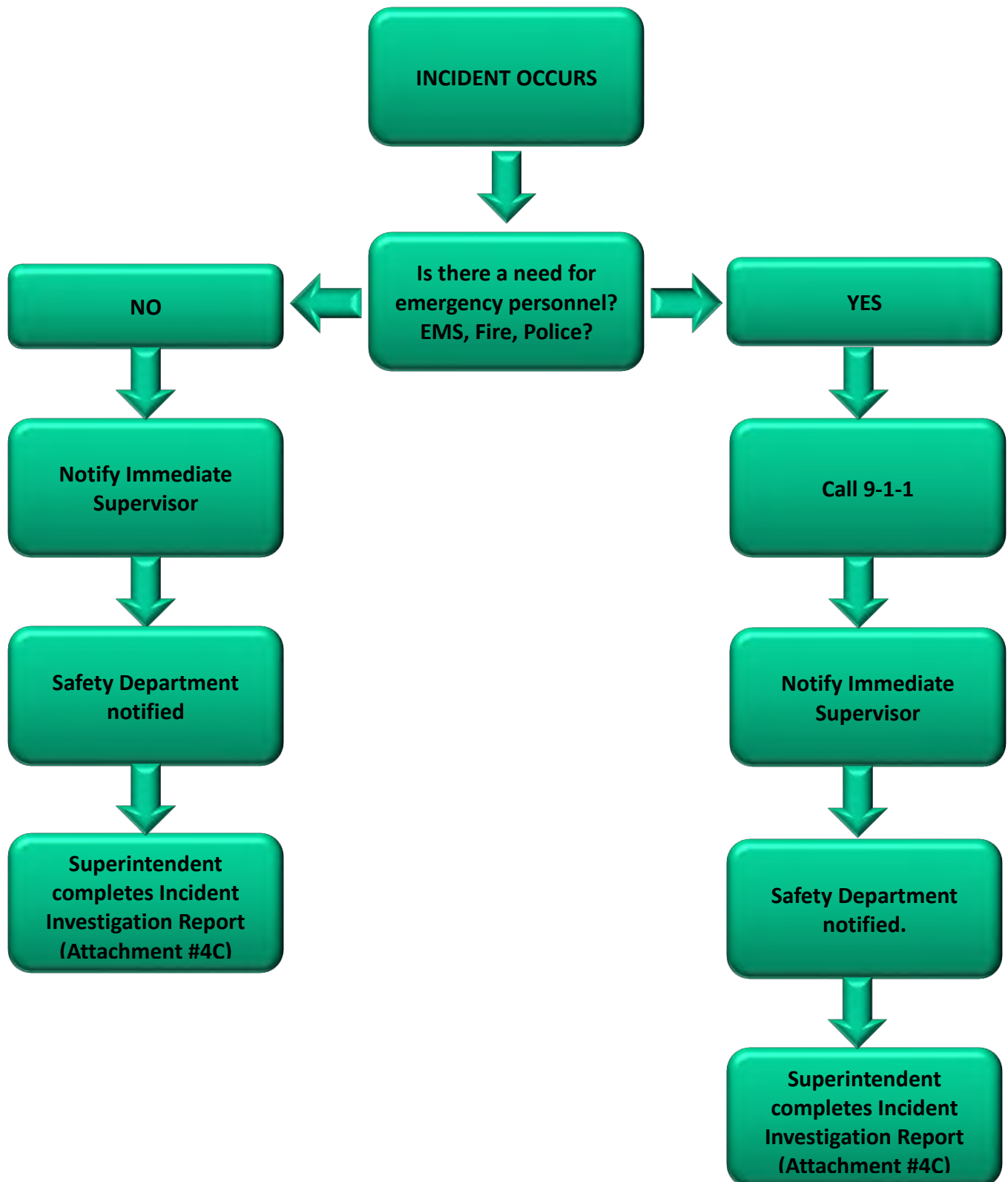
Along with the recordable Incident Investigation Report, the safety department will also be sent a "Safety Flash" within two working days of the incident. The Safety Flash will be completed by the superintendent and project manager and will be distributed company wide. Jobsites are required to post a Safety Flash on their projects for 30 days.

Recordable Review Meeting

To help management better understand the recordable incident, the superintendent is required to attend the next Core Safety Committee meeting. During the meeting, the superintendent will discuss the recordable incident including contributing factors and corrective actions taken after the incident occurred. The Core Safety Committee and the superintendent will further discuss the incident to determine if any future actions could eliminate or reduce the hazard/root cause of the incident.

Prior to the meeting, Core Safety Committee members will be sent any Safety Flashes in order to review the recordable incident(s) and prepare questions.

The superintendent is required to attend the Core Safety Committee meeting. The president is the only person who may waive this requirement. In cases where attendance was waived, the second in command on the job will replace the superintendent.

Incident Flow Chart

SAFETY FLASH.....



RECORDABLE INJURY

Click here to enter DIVISION – Project # Click here to enter project #

Click here to enter a date.

SAMPLE
Find fillable Safety Flash
forms on the Ruhlin Intranet

Click here to enter simple
injury summary

Click here to enter recordable injury explanation.

Answer Questions:

- What happened?
- Where did the injury occur?
- When did the incident occur?
- How did the incident occur?
- Steps taken to prevent similar injury from happening again, etc.

CRITICAL FACTORS:	CORRECTIVE ACTIONS:
• Click here to enter text.	• Click here to enter text.
• Click here to enter text.	• Click here to enter text.
• Click here to enter text.	• Click here to enter text.
• Click here to enter text.	• Click here to enter text.

DISCUSS THIS SAFETY FLASH WITH CREWS AND POST ON PROJECT FOR 30 DAYS

For more information contact: Enter your name here/ Enter your phone number here.

Work-Related Injury and Illness Case Management Program Purpose

This program is applicable to work-related injuries or illnesses affecting Ruhlin employees.

The purpose of this program is to ensure:

- Appropriate medical treatment is promptly provided to the injured/ill employee.
- Appropriate follow-up on cases until the injured/ill employee is fit for returning to work.
- Effective coordination and communication between supervisor and affected management personnel of the injured/ill employee, and medical providers in hospitals or occupational health clinics.
- Injuries or illnesses are classified in an accurate and consistent manner with no intention to limit the treatment to suit definitions.

Initial Treatment Facility for Work-Related Injuries/Illnesses

NOTE: For out of town/state job sites, prior to the start of your project the safety department will set up an account with an approved occupational health clinic/emergency care facility/hospital in your job area.

Employees will be referred to the following local occupational health & medical facility/hospital for treatment:

Summa Health Center at Wadsworth-Rittman
Center for Corporate Health (Occupational Medicine)
 195 Wadsworth Road, Wadsworth, Ohio 44281
 Phone: (330) 331-1510
 Hours: Monday-Friday, 7:30 AM – 5:00 PM

Emergency Room
 195 Wadsworth Road, Wadsworth, Ohio 44281
 Phone: (330) 331-1000 (main switch board number)
 Hours: 24/7

Employees wishing to use another hospital other than the above approved designated hospital will be considered on a case-by-case basis.

In cases where a work-related injury or illness occurs at another location away from the above designated hospital (e.g., injury related to a motor vehicle incident, out of town job sites, etc.) consideration should always be given to use the nearest hospital available, depending on location of incident and the severity of injury or illness.

Follow-Up Treatment for Work-Related Injuries/Illnesses

After an initial diagnosis and treatment, an occupational health clinic may transfer an injured/ill employee to another hospital or medical facility for further treatment and follow-up.

In cases where the injured/ill employee is released to go home with medical restrictions, the injured/ill employee must strictly follow the medical instructions given.

To return to work, the injured/ill employee must present a "return to work" note from the treatment hospital/clinic to the Ruhlin safety department for review prior to returning to work. Medical decisions regarding fitness for duty will be made by the medical provider only.

Interaction between Ruhlin and Medical Provider

Communication between The Ruhlin Company and the medical provider is critical, and it must be done in a professional and ethical manner. Authority and decision to treat an injured/ill employee lies with the medical provider and with the concurrence of the injured/ill employee; however, The Ruhlin Company may

consult with the medical provider to seek clarification, ensure consistent case management, and determine whether the employee can safely and effectively perform the essential functions of his or her job and to determine what restrictions or accommodations may be necessary.

Roles and Responsibilities for Work-Related Injuries/Illnesses

Employee Responsibilities:

- Notify your supervisor immediately and seek prompt medical attention following an injury or suspected work-related injury or illness.
- Provide an accurate description of the suspected work-related injury or illness to your supervisor and medical provider.
- Provide an accurate description of any concurrent medical conditions and/or treatments to the medical provider.
- Adhere to treatment prescribed, work restrictions, and communication requests of the medical provider.
- Complete the Authorization for Release of Medical Information form and the Employee's Notice of Injury form.
- Employees witnessing an accident must complete the *Statement of Witness to Incident** form.

Supervisor Responsibilities:

- Report known work-related injury/illness cases to the safety director immediately.
- Escort the injured/ill employee to the approved occupational health and medical facility or nearest hospital. All injuries/illnesses will be treated in an approved occupational health clinic unless the injury/illness is life or limb threatening.
- Conduct an *Incident Investigation Report** of work-related injury/illness and record relevant information. Forward completed reports to the safety department within 24 hours.
- Write and report to all employees any recordable injuries/illnesses via a "Safety Flash" email. The Safety Flash is discussed on all job sites during the weekly Toolbox Talk.
- Injuries require a drug and alcohol test on the injured employee and/or any other personnel directly involved in the incident. See The Ruhlin Company's Substance Abuse Policy for more information.
- Review the return-to-work status with the safety director.
- Follow-up weekly with the injured/ill employee to help monitor and manage the injury process. Contact the medical clinic as needed to manage the status and condition of the injured/ill employee.
- Support the assignment of appropriate duties to the injured/ill employee following approval for Return to Work with advice from the medical provider.
- Be prepared to discuss the injury/illness at the next CORE Safety Committee meeting.

Safety Director Responsibilities:

- If the incident resulted in inpatient hospitalization, amputation, or loss an eye of an employee, the safety director must notify OSHA within 24 hours of the incident. If the incident resulted in the death of an employee, the safety director must notify OSHA within 8 hours of the incident.
- Complete all required OSHA recordkeeping forms (OSHA 300, OSHA 301, OSHA 300A)
- Discuss all Incident Investigation Reports at the monthly CORE Safety Team meeting. During these meetings, corrective action is discussed and if necessary corrective procedures are developed and implemented.
- Notify human resources and the company controller, the corporate office must keep a record of the individual's work-related injury/illness, including sick leave, compensation, etc.
- Discuss injured/ill employee's work duties with the medical provider in order to assign appropriate duties to the injured/ill employee following approval for return to work.
- Review facts with the medical provider immediately following diagnosis and treatment for all work-related injury/illness cases that have the potential to result in any work restrictions.
- Follow-up weekly with the injured/ill employee to help monitor and manage the injury process. Contact the medical clinic as needed to manage the status and condition of the injured/ill employee.

Modified Duty Work

NOTE: Modified duty work may be available for certain job positions. Contact the safety director for additional information.

It is in everyone's best interest to keep an employee engaged in the early return to work process. The safety director will communicate the job duties of the injured employee to the medical provider and verify in writing that we have modified duty available.

All communication with the occupational health clinic/medical provider must be in writing.

*(see Attachments for all required incident reporting, recording and investigation forms, etc.

SECTION 5 - Hazard Communication Program

Purpose

This program has been developed to comply with OSHA Hazard Communication Standard (29 CFR 1910.1200) and details the steps taken by The Ruhlin Company to ensure the hazards of all chemicals utilized by the Company have been evaluated and communicated to affected employees.

Implementation of the Hazard Communication Program described herein will help to inform employees about the chemical hazards associated with their work and the protective measures which may be taken to work safely with these substances.

This program applies to all construction projects of The Ruhlin Company where construction tradesmen are directly employed by The Ruhlin Company. All, or any part of the written Hazard Communication Program, is available from the safety director to employees, their designated representatives, Assistant Secretary of Labor for Occupational Safety and Health (OSHA), and Director of National Institute for Occupational Safety & Health (NIOSH).

Hazard Classification/Determination

The Ruhlin Company does not manufacture or import chemicals; therefore, hazard classification/determination is performed by the various suppliers.

In instances where the validity of the information provided by the supplier is in question or where SDSs are not supplied, the safety director should be consulted.

Chemical Inventory Information

The list of hazardous chemicals resulting from the physical survey of The Ruhlin Company is kept current by subsequent physical surveys conducted on an annual basis.

The inventory listing applicable to each construction project may be found in the project field office trailer. The complete inventory listing for The Ruhlin Company may be found on the Ruhlin SharePoint or by going to www.SDSbinderworks.com and going to the "Sign In" tab and doing a product search or by viewing "Total SDS's Managed". The username is "ruhlin" and the password is "SDS".

Safety Data Sheets (SDS)

Copies of the SDS for all hazardous chemicals, to which employees of The Ruhlin Company may be exposed, will be maintained and updated utilizing the SDS Binderworks website. Copies are also available at each project office.

SDSs will be available to all employees for review upon request. The superintendent/project engineer will survey chemicals used at each project to determine if SDSs have been received for each chemical.

If a SDS is not received with the first shipment of a hazardous chemical, the following methods will be used to obtain an SDS:

- A letter or email requesting a SDS will be sent to the manufacturer or distributor of the hazardous chemical and a copy of the letter or email will be kept on file.
- A phone call will also be made to the manufacturer or distributor requesting an SDS.

Container Labeling

The superintendent shall verify that all containers received for use are:

- Clearly labeled with the content's information, including the name or number used for the hazardous chemical
- Clearly labeled with the appropriate hazard warnings, precautionary statements, and pictograms
- Clearly labeled with the name and address of the manufacturer

The project superintendent will ensure all secondary containers are labeled with either an extra copy of the original manufacturer's label or with labels that have the identity and the appropriate hazard warnings.

It is the policy of The Ruhlin Company that no containers will be released for use until the above data is verified.

Project supervisors are instructed to consult with The Ruhlin Company's safety director for assistance with labeling requirements.

Employee Information and Training

1. All Ruhlin employees who work with or who may be exposed to hazardous chemicals will be trained in the methods and observations that should be used to detect the presence of a hazardous chemical in their work area (e.g. visual presence, smell) and the physical and health hazards of chemicals in their work area. Employees will be made aware of the fact that specific hazardous chemical handling information is available through the SDS. Additionally, employees will learn of the protective measures they can take to protect themselves from hazardous chemicals as well as the specific procedures initiated by the Company to provide protection. These procedures include, but are not limited to:
 - a. Work practices
 - b. Personal protective equipment
 - c. Emergency procedures
 - d. How the Hazard Communication Program is implemented in the workplace
 - e. How to read and interpret labels
 - f. How to read and interpret SDS
 - g. How to obtain additional hazard information

Hazard communication training will be conducted when new hazardous chemicals are introduced and added to the "chemical inventory list". Training must be conducted before any non-routine tasks are performed that could involve exposure to hazardous chemicals.

Training will be provided through the use of audio-visual media and topics at safety meetings as needed.

The extent of information transmitted to employees during training sessions will be dictated by the degree of hazard presented by the chemicals.

Training records are maintained by the safety department and indicate the names of employees trained, dates of training and topics covered.

2. Periodically employees may be required to perform hazardous non-routine tasks. Prior to starting work on such projects, each affected employee will be given information by the superintendent about the hazardous chemicals they may encounter during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use and steps the Company is using to reduce the hazards, including ventilation, respirators, presence of another employee and emergency procedures.

Subcontractor Policy

Subcontractors and any other organizations with employees on a Ruhlin project site will be provided with all necessary information concerning the potential hazards of the substances to which their employees may be exposed, and appropriate protective measures required to minimize their exposure.

Upon request, subcontractors will be provided with a list of the hazardous chemicals and the safety data sheets for materials their employees will be exposed to in the course of their work in our area.

Subcontractors shall provide a list of the hazardous chemicals and the safety data sheets for any materials brought onsite.

Hazardous Materials Handling Program

The Ruhlin Hazardous Materials Handling Program sets forth Company rules and procedures for the handling of chemical products from purchase to disposal. These procedures are required for compliance with federal and state regulations and also the safety and efficiency necessary to control hazards of a dangerous commodity.

All administration, storage and disposal costs associated with this program are chargeable to the projects.

Purchasing Procedure

1. Chemical substances intended for use on projects must be ordered only in quantities sufficient for the project for which they have been purchased. Do not over-purchase. Unless a superintendent can demonstrate a need for an over-purchased product on a project currently in progress, such product must be returned to the supplier for credit.

Note: Unopened containers will not be accepted for transport to the yard. Any exception to this rule must be cleared through the equipment manager.

2. Copies of the product Safety Data Sheet (SDS) and invoice or shipping paper must be forwarded to the safety department.

Recognizing Shipments of Hazardous Materials

1. Drums, cylinders, or other containers which display any of the labels shown on the DOT Hazardous Materials Warnings Labels chart are considered to contain "Hazardous Materials". Any container which lists any of the characteristics identified on the labels in the chart is considered to contain "Hazardous Materials" even if the container lacks the proper hazard label.
2. If a container does not have a hazard label and you think the product might be a hazardous material (or if you are not sure), refer to the Hazardous Materials Table 172.01 49 CFR, Driver's Guide to Hazardous Materials. Coordinate with the safety department.

The table will allow you to:

- a. Determine if a material is regulated by truck transport
- b. Determine proper shipping name for shipping papers and package marking
- c. Identify the hazard class for the material
- d. Determine the proper identification number
- e. Determine if the label is correct

Column 4 of Table 172.101 will advise the type of label required on each container.

Note: A combustible liquid that does not meet the definition for any other hazard class shipped in 55-gallon drums does not require labeling or a placard.

3. All containers of hazardous material must have the proper hazard label(s) attached to the container.

Labels can be obtained by contacting the safety department.

Transporting Chemical Products

Once the nature of the contents of containers has been determined, residual products can be transported in the following manner:

1. Properly labeled and marked containers of hazardous materials in an aggregate total quantity of 1,000 lbs. or less may be transported without a vehicle hazard placard, however, a shipping paper is required.

If the aggregate total weight of hazardous materials is greater than 1,000 lbs. or 110 gallon, a hazard placard is required on the vehicle transporting the materials. Arrangements for handling hazardous chemicals in amounts greater than 1,000 lb. or 110 gallon must be made through a specialty hazardous waste hauler. Costs for such hauling will be charged to the project. Under no circumstances will The Ruhlin Company handle hazardous materials in amounts greater than 1,000 lb. or 110 gallon.

2. Ruhlin truck drivers are not authorized to transport hazardous materials to the yard.

Shipping Papers (172.200)

Every hazardous material shipment must be accompanied by a shipping paper with required entries to properly describe the material. There is no prescribed form for a shipping paper. It can be any document containing the required information.

Note: Combustible liquids do not require a shipping paper if shipped in quantities of less than 110 gallons. Non-combustible liquids do not require a shipping paper.

Basic Shipping Paper Description (172.202)

Four entries are required on all hazardous material shipping papers and the first three must be entered in the sequence listed.

1. The proper shipping name as it appears in Column 2 of 172.101.
2. The hazard class from Column 3 of 172.101.
3. The identification number assigned to the hazardous material in Column 3A.
4. The total quantity by weight, volume or as appropriate. No quantity is required for empty packaging containing only residue.

All questions should be addressed to the safety department.

Marking (172.300)

The shipper is responsible for marking each drum containing a hazardous material. The equipment manager/shop must be able to recognize and identify container markings to determine regulatory compliance and to determine container contents for proper handling.

The following markings must appear on all containers of 100 gallon capacity or less:

- Proper shipping name from Column 2 (172.101).
- Identification number preceded by UN or NA, as appropriate, from Column 3A (172.101).

- Letters "RQ" if the material is a hazardous substance and the name(s) of the ingredient(s) making a material a hazardous substance if not included in the proper shipping name.
- Liquids identified as toxic by inhalation must be marked "Inhalation Hazard" in association with proper shipping name.

The following markings must appear on all containers of over 110-gallon capacity, including portable tanks:

- Proper shipping name and ID number in letters at least 2 inches high on two opposing sides. The ID number on a portable tank must be on the placard or on a specification orange panel.
- Name of the owner.

Even when empty, all portable tanks must remain marked as required until they have been cleaned and purged or filled with a non-hazardous material.

Note: Products not identified must go through chemical analysis. The cost for such analysis will be charged to the job.

Bulk containers transporting hazardous materials are required to be placarded per the Department of Transportation (DOT) regulations in the United States. Similar rules apply in Canada and Mexico and are part of an international marking system.

Placards are a diamond-shaped hazardous material information source for emergency responders, railroad employees and others. They are approximately 10.8 inches (273 mm) by 10.8 inches (273 mm) and sit on the point at a 45-degree angle. Labels, which are just like placards for most classes of hazardous materials only smaller in size, are attached to non-bulk containers or packages of hazardous materials. Labels are approximately 4 inches (100 mm) by 4 inches (100 mm) and again are a diamond shape.



A placard provides the viewer with a variety of information through several different methods. First is the color of the placard.

- **Red** indicates flammable
- **Green** indicates nonflammable
- **Yellow** indicates oxidizer
- **Blue** indicates dangerous when wet
- **White** indicates inhalation hazard and poison
- **Black and White** indicate corrosive (acid and caustic)
- **Red and White** indicate flammable solid or spontaneously combustible depending on the color pattern on the placard
- **White and Yellow** indicate radiation or radioactive
- **Orange** indicates explosives
- **White with Black stripes** indicate miscellaneous hazardous materials
- Another Red and White placard stating "dangerous" on it

A second information indicator is the number in the bottom corner of the diamond. This number refers to the hazard classes as used internationally and by the United States DOT.

There are nine (9) classes for hazardous materials:

- Class 1** - Explosives
- Class 2** - Gases (flammable, nonflammable, inhalation hazard/poison, or oxygen)
- Class 3** - Liquids that burn (flammable and combustible liquids, based on their flashpoint)
- Class 4** - Flammable solids, spontaneously combustible or dangerous when wet materials
- Class 5** - Oxidizers and organic peroxides
- Class 6** - Poison/toxic solids and liquids, infectious materials
- Class 7** - Radioactive (three sub classes)
- Class 8** - Corrosives (acids and bases)
- Class 9** - Miscellaneous

A third indicator is the symbol in the upper corner of the diamond. A variety of symbols is used to indicate combustion, radiation, oxidizers, compressed gas, destruction of materials and skin by corrosives, an explosion or skull and cross bones to indicate poisons.

The fourth item on a placard is the four-digit United Nations (UN) number used for the hazardous material contained in the container. There are hundreds of four-digit numbers used from 1001 (acetylene) to 9279 (hydrogen, absorbed in metal hydride). The number in some cases is specific to a chemical and in other cases reflects a variety of hazardous materials (for example, 1017 is only used for chlorine, 1005 has five chemical listings, 1993 is used for eight chemical listings and 2810 is used for 36 chemical listings).

To be able to discover what other placard numbers indicate, the easiest method is to reference the "Emergency Response Guidebook" from the United States Department of Transportation.

Spill Response Program

As required under 40 CFR 112, The Ruhlin Company will follow the subsequent procedures as a countermeasure to prevent a hazardous material spill on a project. This program will be communicated to all employees on the project as part of the new employee orientation for safety.

Uncontrolled spills require a third party clean up service.

Spill Containment - Preventive Measures

- Each project must have a spill kit
- This program is covered during new-hire orientation.
- All non-petroleum products will be stored in containers with 55 gallon or less capacity when possible
- All above-ground storage fuel tanks will have 1,320 gallon or less capacity whenever possible
- All rented fuel storage tanks will be double walled for safety
- All oil and fuel storage containers will be inspected weekly for integrity
- Automatic shut-off nozzles will be used on all fuel pump hoses

Spill Response Procedures

In the event of a spill, the following general steps are to be taken:

- Determine the source and nature of the spill.
- Notify your immediate supervisor.
- **If you are unsure of the proper procedures, equipment, or general safety actions, do not attempt to remediate the spill. Never place yourself or others in danger during emergency situations.**
- Isolate the area to keep employees, machinery, and the public from entering the spill zone.
- Try to stop the spill at the source if it can be done without dangerous exposure.
- Contain the spill with absorbent material if possible.
- A spill report must be completed.

The following spill response procedures are very general in nature. They are provided to give you a starting point to address specific material that could be released onsite. If the released material is beyond Ruhlin's response capabilities, you shall contact the following emergency response agencies as well as the safety department and a member of the senior management.

The senior management team will appoint an emergency management team that will include a team leader and a Company spokesperson. The size and makeup of the team will depend on the nature of the emergency (refer to The Ruhlin Company's Emergency Response Plan).

SUNPRO: 330-966-0910 - 24 Hour 1-800-488-0910
7640 Whipple Ave., N.W.
North Canton, OH 44270

ENVIROSERVE: 216-642-1311 - Cell Number 216-337-0370
5502 Schaaf Rd.
Cleveland, OH 44131

Emergency Management Program

Refer to The Ruhlin Company's Emergency Response Plan for emergency procedures and key contacts.

Lead Program

The Company's compliance program ensures that all projects are assessed for the potential for employee occupational exposure to lead. It is our intention to provide and maintain the safest possible working conditions for all employees that may be exposed to lead. Ruhlin will provide those employees with the proper training, education and personal protective equipment necessary to eliminate the hazards of lead.

Ruhlin will implement all feasible engineering and work practice controls to reduce and maintain employee exposure to lead to or below the permissible exposure limit. All work areas which are exposed to lead will be distinguished by red barrier tape and will contain postings reading: DANGER - LEAD WORK AREA- MAY DAMAGE FERTILITY OR THE UNBORN CHILD – CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM – DO NOT EAT, DRINK, OR SMOKE IN THIS AREA.

Lead exposure increases the risk of reproductive/developmental toxicity, central nervous system effects, kidney effects, blood effects, and acute toxicity effects.

Exposure Assessment

Ruhlin will determine which employees, if any, may be exposed to lead at or above the action level of 30 $\mu\text{g}/\text{m}^3$. Until Ruhlin completes its initial exposure assessment, employees performing certain duties (including, but not limited to, using lead paint, abrasive blasting, welding, cutting, and torch burning) will be treated as if they are exposed to lead and be provided with interim employee protective measures. Affected employees will have the opportunity to observe any exposure monitoring and will be notified of any monitoring results.

Respiratory Protection

Employees must use a respirator if their exposure to lead exceeds the permissible exposure limit (PEL) of 50 $\mu\text{g}/\text{m}^3$. The safety department shall determine the appropriate level of respiratory protection prior to work. For proper respiratory protection procedures, refer to the Respiratory Protection Program (Section 7) of this safety manual.

Medical Surveillance

Medical surveillance will be available, at no cost, to employees who are exposed to lead at or above the action level of 30 µg/m³. Such medical surveillance may consist of blood sampling and analysis. Additional blood sampling and medical evaluation (including but not limited to a medical exam, medical history, blood pressure measurement, and urinalysis) may be required depending on exposure. Within five working days after the receipt of the blood sampling results, employees will be notified in writing of his or her blood lead level. Following torch-cutting, the employee will have a post-blood work performed for lead. The post test will be performed no more than seven (7) days after the work has been completed.

Any employee who has a blood lead level of over 40 ug/dl will be temporarily removed from the work zone and assigned duties outside of the work zone until the medical condition is corrected.

An employee has the right to see their medical records. Medical records must be kept for the duration of employment plus 30 years.

Protective Work Clothing

Employees will receive lead training and be issued a respirator and protective clothing. Employees are responsible for maintaining and caring for their respirator through the duration of the work, which they must be trained to do under Ruhlin's Respiratory Protection Program.

Housekeeping and Hygiene

Clean-up of floors and other surfaces where lead accumulates shall wherever possible, be cleaned by vacuuming or other methods that minimize the likelihood of lead becoming airborne. Shoveling, dry or wet sweeping, and brushing may be used only when vacuuming or other equally effective methods have been tried and found not to be effective. When vacuuming methods are selected, the vacuums shall be equipped with HEPA filters and used and emptied in a manner which minimizes the reentry of lead into the workplace.

Ruhlin will provide clean change areas and eating areas for employees whose airborne exposure to lead is above the PEL. A shower trailer will also be onsite before the first day of lead exposure. Used shower water to be tested by a lab to determine disposal method.

Ruhlin will maintain records of all monitoring and other data used in conducting employee exposure assessments, medical surveillance, and medical removals. As General Contractor, Ruhlin will advise all subcontractors on the jobsite at the location of the work area zone and the requirement to remain clear of the area when work is being performed.

Asbestos Program

The Ruhlin Company does not have certification or certified employees to abate asbestos. Ruhlin will take steps prior to commencement of work to ascertain whether asbestos is or may be present at a jobsite, including inquiring with the property or project owner and assessing the property, building, and structures to determine the presence and location of asbestos or asbestos containing material. If employees could become exposed to asbestos during the course of work (i.e. demolition work), the following procedures will be followed:

- Stop work immediately and remove employees from work area.
- DO NOT disturb or handle any suspected asbestos.
- Contact the safety director to report that suspected asbestos was found.
- A specialized asbestos contractor will be contacted to perform the abatement.
- Ruhlin employees can continue work in the area once documentation is received that the area is abated.

Silica Program

It is our intention to provide and maintain the safest possible working conditions for all employees that may be exposed to silica. Ruhlin will provide those employees with the proper training, education, and personal protective equipment necessary to eliminate the hazards of silica. Refer to the Silica Exposure Control Program (Section 27) of this Safety Manual.

This information will help employees work safely around silica, spell out workplace safety requirements and describe steps to control or prevent exposure.

All Ruhlin employees must follow this Silica Program any time they may be exposed to or work around concrete cutting, jack hammering, sand blasting or any other operation that produces air borne silica dust.

Definitions

- A. **Crystalline Silica** - The most common mineral in the earth's crust. It is a major component of sand, quartz, rock and mineral ores. Sand and granite contain large amounts of crystalline silica. Many concrete and masonry products contain crystalline silica. The following common materials also contain silica but are not limited to:

- Wallboard
- Plaster
- Tile
- Mortar
- Grout
- Gravel
- Roofing and siding

- B. **Silicosis**- A disease of the lungs caused by inhalation of fine crystalline silica dust. Silica particles stick in the lungs and scar tissue is formed. The scar tissue (fibrosis) covers lungs until you cannot breathe. Silicosis often develops after 10+ years of continuing exposure to small amounts of silica dust, but it can develop in a few weeks with high exposure.

Exposure to silica dust occurs when silica-containing material is disturbed by being ground, crushed, drilled, rubbed or cut. Sources of exposure include but are not limited to:

- Abrasive blasting using silica sand
- Abrasive blast to clean stone, concrete or brick
- Asphalt preparation
- Brick, block or slab - cutting or drilling
- Concrete drilling or mixing
- Drilling, blasting or sawing asphalt, concrete or rock
- Jack hammering
- Rock or gravel work
- Tile cutting and grouting

Symptoms of silicosis may include shortness of breath and the following may also be experienced:

- Coughing
- Fatigue
- Loss of appetite
- Chest pains
- Fever

Silicosis increases the risk of lung infections, immune system effects, kidney effects, tuberculosis and cancer. It has no cure, but it is preventable.

Permissible Exposure Limit

The silica permissible exposure limit (PEL) is 50 µg/m³.

Exposure Assessment

If silica dust is present, the safety department will have the air checked for amount and types using air sampling and personal air monitoring. Air sampling involves collecting and analyzing workplace air.

Personal air monitoring involves an employee wearing a device to collect silica dust in the employee's breathing zone during normal work activities.

If asked to wear a personal air monitor, it is important to not block, damage or remove it. The air monitor should be kept dry and immediately report any problems with it or if changes in your work routine occur.

When air monitoring is performed, affected employees will have the opportunity to observe such monitoring. The air monitoring should be repeated to make sure the airborne silica does not exceed the PEL. These measurements help the Company choose the correct exposure controls. If the amount of silica exceeds the PEL, steps should be taken to control the employee's exposure to silica dust. Engineering controls, work practices, and respiratory protection measures shall be used.

Medical Surveillance

Medical surveillance will be available, at no cost, to employees whose silica exposure requires them to wear respirators. Such medical surveillance may involve the following:

- Medical examinations
- Medical and occupational history
- Chest x-ray
- Pulmonary function test
- Tuberculosis evaluation

An employee has the right to see their medical records and will be notified, either in writing or by posting, of the results of any exposure assessment performed in accordance with this policy. Medical records must be kept for the duration of employment plus 30 years.

Engineering Controls

If sampling shows silica dust exposure levels above the PEL, Ruhlin must take steps to reduce the exposure. Engineering controls may reduce levels of silica dust. Examples of some engineering controls may include:

- Installing special ventilation
- Setting up closed system to prevent airborne dust
- Using wet grinding or water sprays
- Substituting materials that do not contain silica
- Enclose operations that generate dust

Dust control prevents silicosis by keeping silica dust out of the air. Measures should be taken to plan ahead for eliminating or controlling the dust. When possible, substitute less hazardous materials, use equipment with dust control equipment (e.g. Use a water hose to wet dust before it becomes airborne).

Control Techniques

- During dusty work use a local exhaust ventilation or containment methods.
- During rock drilling use water through the drill system or use a drill with a dust collection system.
- When sawing tile, concrete, or masonry, use saws that provide water to the blade and do not let slurry dry before cleaning it up.
- Use abrasives that contain less than 1% crystalline silica during abrasive blasting.
- Control dust when you clean by wet sweeping, using vacuums with HEPA filters, avoid dry sweeping and never use compressed air to blow dust.

Using a respirator is necessary if engineering controls cannot keep silica exposure levels low enough. The type of respirator depends on the amount of silica dust in the air. The higher the amount of silica dust, the more protection is needed.

Respiratory Protection

Respirators are chosen based on the type of work and exposure level. Abrasive blasting operations require type CE blasting respirators. For proper respiratory protection procedures, refer to the Respiratory Protection Program (Section 7) of this safety manual.

Housekeeping

Post warning signs where work generates silica dust to warn nearby workers. Employees should stay out of these areas where silica dust is present unless authorized and equipped with the proper protective equipment. Always watch for dust and ask if it contains silica. If the airborne silica levels exceed the PEL, employees must wear an approved respirator to filter out silica dust. For proper respiratory protection procedures, refer to the Respiratory Protection Program (Section 7) of this safety manual.

If silica dust is present, never smoke, eat, drink, or apply cosmetics in the work area. Employees should wash their hands and face before eating, drinking, or smoking.

Employees should wear disposable work clothing or change into clean clothes before leaving the worksite. If possible, shower before leaving work. Working safely around silica is a personal responsibility. The proper training, controls, procedures, and equipment should be provided by the Company.

The Company will make and maintain all records as required for all exposure measurements, any objective data used to evaluate exposure, and medical surveillance records.

Benzene Program

Benzene is a component of products derived from coal and petroleum and is found in fuels such as gasoline. Benzene is used in the manufacture of detergents, plastics, pesticides, and other various chemicals. It is a colorless, or light-yellow liquid at room temperature. It has a sweet odor and is highly flammable. Benzene vapor is heavier than air and may sink into low-lying areas. You may be exposed to high levels if working around an industry that uses glues, paints, furniture wax, or detergents.

Individuals exposed to Benzene have developed cancer, central nervous system effects, blood effects, aspiration, and skin, eye, and respiratory tract irritation. Long-term exposure may affect bone marrow and blood production. Short-term exposure to high levels of benzene can cause drowsiness, dizziness, unconsciousness, and death.

The safety department will designate any area in the workplace where the airborne concentration of benzene exceeds, or can reasonably be expected to exceed, the permissible exposure limits as regulation areas. All regulated areas will contain postings reading: DANGER – BENZENE - MAY CAUSE CANCER – HIGHLY FLAMMABLE LIQUID AND VAPOR – DO NOT SMOKE – WEAR RESPIRATOR PROTECTION IN THIS AREA – AUTHORIZED PERSONNEL ONLY

Permissible Exposure Limits (PEL)

If employees are working around processes that may use Benzene, proper air monitoring shall be performed. Employees exposed to Benzene must be protected from eye, skin, and respiratory contact when the following exposure limits are exceeded:

- Long Term Exposure -1 ppm per 8-hour time weighted average
- Short Term Exposure - 5 ppm per 15-minute time weighted average

Exposure Assessment

Where benzene is present, the safety department will measure employee exposure using breathing zone air samples. When air monitoring is performed, affected employees will have the opportunity to observe such monitoring. The air monitoring should be repeated to make sure the benzene exposure does not exceed the PEL. These measurements help the Company choose the correct exposure controls. If the amount of benzene exceeds the PEL, steps should be taken to control the employee's exposure to benzene. Engineering controls, work practices, and respiratory protection measures shall be used.

Respiratory Protection

Using a respirator is necessary if engineering controls cannot keep benzene exposure levels low enough. Respirators are chosen based on the type of work and exposure level. For proper respiratory protection procedures, refer to the Respiratory Protection Program (Section 7) of this safety manual.

Personal Protective Equipment

Where appropriate, personal protective clothing and equipment shall be worn to prevent eye contact and limit dermal exposure to liquid benzene. Protective clothing and equipment shall be provided by the Company at no cost to the employee and the Company shall assure its use where appropriate. Eye and face protection must meet the requirements of 29 CFR 1910.133.

Medical Surveillance

Medical surveillance will be available, at no cost, to employees who are exposed to benzene at the following levels:

- At or above the action level of .5 ppm per 8 hour time weighted average for 30 or more days per year;
- At or above the PELs for 10 or more days per year;
- Employees who have been exposed to more than 10 ppm of benzene for 30 or more days in a year prior to July 15, 2019 when employed by their current employer;

Such medical surveillance may involve the following:

- Medical examinations
- Medical and occupational history
- Blood test
- Pulmonary function test
- Tuberculosis evaluation

An employee has the right to see their medical records and will be notified, either in writing or by posting, of the results of any exposure assessment performed in accordance with this policy. Medical records must be kept for the duration of employment plus 30 years.

The Company will make and maintain all records as required for all exposure measurements and medical surveillance records.

SECTION 6 – Personal Protective Equipment (PPE) Program

Purpose

Personal Protective Equipment (PPE) is equipment worn to mitigate workplace hazards that can cause serious workplace injuries and illnesses. When engineering practices, work practices, or administrative controls are not feasible or do not provide sufficient protection, the Company will provide the required PPE at no cost to the employee.

Utilize the following Hierarchy of Controls to mitigate and/or eliminate workplace hazards:

- Elimination
- Substitution
- Engineering Controls
- Administrative Controls
- PPE



Responsibilities

The PPE Program requires the participation of management, supervisors, and all affected employees to eliminate or mitigate workplace hazards.

Senior Management

Senior management will provide financial and administrative support to supervisors and employees to ensure the PPE program is effectively communicated and implemented to achieve the purpose stated above.

Supervisors

Supervisors will:

- Ensure hazard assessments are conducted for procedures within their operations.
- Provide required PPE to affected employees based on hazard assessments.
- Ensure employees receive required training on the proper use and care of PPE.

- Ensure compliance and utilization of PPE by employees under their supervision.

Employees

Employees will:

- Attend required PPE training.
- Properly utilize required PPE.
- Provide proper care and maintenance of assigned PPE.
- Properly dispose of defective or damaged PPE.
- Notify supervisor with any concerns regarding PPE.

Safety Director

The safety director will:

- Purchase required PPE in compliance with ANSI and OSHA standards.
- Assist jobsites in determining appropriate PPE needed.
- Ensure new employees receive PPE training.
- Maintain PPE training records.

Training Requirements

All affected employees shall receive instruction on PPE requirements, proper selection, use, and care. Training shall be offered to all affected employees during new-hire orientation and upon initial work assignment.

Training will include:

- When PPE is necessary.
- What PPE is necessary.
- How to properly wear and adjust PPE.
- Limitations of PPE.
- Proper care, maintenance, useful life and disposal of PPE.

Retraining will be required whenever:

- Changes in the workplace render previous training obsolete.
- Changes in the types of PPE to be used render previous training obsolete.
- An employee's knowledge, failure to use, or improper use of PPE indicates the employee has not retained the required understanding or skill.

Training records will be retained to document and certify names of employees trained, the date(s) of training, and the subject(s) of training.

Job Hazard Assessment (JHA)

Work areas and operations will be assessed to determine if hazards are present and/or are likely to be present that require the use of PPE.

For questions regarding the selection of PPE, use the PPE Selection Guide (Attachments) or contact the safety department.

Personal Protective Equipment (PPE)

PPE will be selected and provided based on the job hazard assessment (JHA).

Helmets

Type 2 helmets are required for all jobsites.

Exceptions are as follows: while working in an office, job trailer, or enclosed shop with no overhead work/hazards, etc.

Helmet use shall be determined during the pre-job safety walk by The Ruhlin Company Safety Department and site supervision. For Building Division interior work, contact The Ruhlin Company Safety Department to determine when/if helmet use can be eliminated.

“Red-Hat Program”

New employees at the Company are required to wear red reflective stripes on their helmet for the first thirty (30) calendar days of employment. The reflective striping makes it easier for supervisors to recognize, assist, and mentor new employees.

Anytime a new employee is involved in a safety-related incident (such as: written up for a safety violation, injured, near-miss etc.), the Red-Hat Program will be extended by another thirty (30) calendar days.

Eye and Face Protection

The type of eye and face protection required is based on the type of hazard. Safety glasses are the most common form of protective eyewear, however; other types of protection such as goggles, and face shields may also be required based on the job hazard assessment (JHA).

Eye or face protection is required when employees are exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

Eye and face protection equipment shall comply with the ANSI Z87.1-1989 standard, “American National Standard Practice for Occupational and Educational Eye and Face Protection.” All eye and face protection equipment shall display the ANSI stamp or marker.

Safety Glasses

Safety glasses shall be always worn on all Company jobsites (the only exceptions are while working in an office or job trailer).

Employees who wear prescription lenses are required to wear prescription safety glasses or wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

The Company offers a Prescription Safety Eyewear Reimbursement Program (Attachments).

Safety Goggles and Face Shields

When working with hazardous chemicals, goggles with splash proof vents are required. If there is a danger of splashing, a face shield is required in addition to the goggles.

Grinding or chipping operations require double eye protection (safety glasses and face shield).

Face shields alone are not considered adequate eye protection. Complete eye protection shall be achieved by the combination of face shields with goggles and/or safety glasses with side shields.

Welding Helmets

Welding operations require welding helmets with appropriate filter lenses. Welder's helpers and observers are also required to use either welding goggles or welding helmets during welding operations. Refer to Table E-1-Filter Lens Shade Numbers for Protection Against Radiant Energy for selecting the proper filter lens.

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

Mandatory Glove Program

The purpose of the Mandatory Glove Program is to:

1. Ensure the safety and health of Company employees and subcontractors.
2. Reduce hand injuries.

The Mandatory Glove Program will apply to all employees, sub-contractors, and visitors. The only exception to this program will be if a new hazard is introduced by wearing gloves. A risk assessment must be completed to assess the possibility of an exception.

The safety department is responsible for the implementation of the Mandatory Glove Program and will review, maintain, and update the program when necessary.

Hazard Assessment / Task Specific Glove Requirements

Employees are required to wear gloves when performing work on Company jobsites. Cut-resistant

work gloves will be assigned to all new-hires and all employees shall always have these gloves when on the jobsite.

Certain tasks require specific gloves to be worn. See the Glove Selection Guide (Attachments).

A hazard assessment will be completed before each job to identify the type of glove required for each task; this assessment will be completed during the pre-job safety survey.

The type(s) of glove(s) needed for each shift will be documented in the JHA.

Follow these general guidelines when performing a hazard assessment:

West Chester Disposable Latex Gloves (Powder and Powder Free)

Disposable latex gloves are only worn when working with solvents, paints, and/or biological substances. Disposable latex gloves protect hands from *mild* irritants. Latex gloves must also be worn when contact with any biological substance is present, such as blood or bodily fluids. Disposable gloves are prohibited for any other tasks.

West Chester Chemical-Resistant Utility Gloves

Chemical-resistant utility gloves must be worn when contact with oils, solvents, and corrosives can occur. Chemical-resistant gloves are prohibited for any other tasks.

Radians Axis Cut-Resistant Kevlar Gloves (Level A6)

Cut-resistant Kevlar gloves (level A6) must be worn when handling sharp materials, when stripping concrete forms and when working with cutting tools, scissors, metal or other sharp instruments.

Cut-Resistance Anti-Vibration Gloves

Cut-resistant anti-vibration gloves can be worn for job activities such as jack hammering.

Global Glove CR3900 Cut-Resistant Leather Work Gloves (Level A5)

Cut-resistant leather work gloves are required for general work and material handling.

Black Stallion 320 CR Cut-Resistant Welders' Gloves (Level A6)

Welders' gloves (burning gloves) must be worn during any hot work activities, such as: welding, burning, grinding or cutting with a grinder.

G-Tek PolyKor Cut-Resistant Insulated Water-Proof Winter Gloves (Level A4)

Cut-resistant insulated winter gloves shall be worn in cold environments when exposure to water exists.

Glove Purchases and Distribution

The safety department will purchase and distribute all gloves to jobsites.

Work Boots

Work boots shall be worn at all times on all Company jobsites.

General requirements for appropriate work boots are:

- 6-inch/ankle high work boot with soles and heels made of a material that will resist penetration and does not create a slipping hazard.
- Maintain work boots in good condition.
- Shoes made of canvas or other thin materials, soft soled, open toed sandals, or similar footwear are prohibited on Company jobsites.

Safety Toe Boot Incentive Reimbursement Program

The Company provides partial reimbursement to Company employees for ATSM 2413-05 approved safety toe boots.

Reimbursement Process and Qualifications

1. **Purchase approved safety toe boots.** Employees must purchase ATSM 2413-05 safety toe boots with a composite toe or steel toe.
2. **Complete the reimbursement form.** Turn the Safety Toe Boot Reimbursement Form (Attachments) and boot receipt into the safety department for direct deposit reimbursement. Reimbursement will not be granted without a receipt.
3. **To qualify for reimbursement, an employee must work a minimum of 500 hours on a Company jobsite during the current calendar year.** Upon completion of the 500-man hours, the Company will reimburse the employee up to \$125.00 towards the purchase of the ATSM 2413-05 approved boots.

Hearing Protection

Hearing protection is required to protect against noise induced hearing loss from excessive exposure to high noise levels. Sound levels at 85 decibels (8-hour work shift) or above are considered high noise levels as defined by the OSHA Hearing Conservation Standard and require the use of hearing protection. Employees in the Hearing Conservation Program shall be trained annually.

Hearing protection will be supplied at no cost to the employee. Types of hearing protection will be determined by the work environment surrounding the employee.

The Hearing Conservation Program (Section 22) defines specific requirements for hearing protection, based on the Occupational Health & Safety Standard, 1910.95.

Respiratory Protection

Respiratory protection is required when exposure to potentially hazardous air contaminants, such as vapors from chemicals or paints exceed OSHA's permissible exposure limits (PEL) and cannot be controlled by engineering methods. Disposable respirators or dust masks may be worn to protect from nuisance dusts only. Do not use dust masks for protection from chemical or paint vapors.

Employees are not allowed to wear a respirator unless authorized in accordance with the Respiratory Protection Program (Section 7).

In general, authorization requires:

- Identification of approved respirators with proper filters for the hazard(s) presented
- Initial medical evaluation
- Annual fit testing and training

Clothing

Appropriate shirts and long pants that offer protection from workplace hazards should be worn. Do not wear clothing that has loose or surplus material. Secure long hair out of the way of machinery or other snag hazards. Never wear scarves and jewelry around power equipment.

Hi-Visibility Clothing

Hi-Visibility Clothing is required for all jobsites.

Class 2 apparel is required for the following work:

- Right-of-way Work
- Site Work
- Industrial Work with heavy equipment operations

Class 3 apparel is required for all night work.

Hi-Visibility clothing shall be determined during the pre-job safety walk by The Ruhlin Company Safety Department and site supervision. For Building Division interior work, contact The Ruhlin Company Safety Department to determine when/if hi-visibility clothing can be eliminated.

Care and Maintenance of PPE

PPE shall be inspected daily before use and maintained properly. PPE equipment that is damaged or excessively worn should not be used and should be disposed of properly.

Inspect eyewear lenses for scratches and damage daily. Replace damaged eyewear immediately. Store eye protection in a clean environment.

Inspect the helmet shell daily for cracks, dents, cuts, scratches, gouges, or abnormal color or patterns. Also, inspect the helmet suspension daily for signs of wear on all parts, twisted or frayed straps, and cracks or tears on plastic clips. Replace the shell or suspension if damaged.

If a helmet sustains a hit by an object or is dropped with enough force that damage likely occurred, it should be replaced even though there may not be visible signs of damage.

Clean both the shell and suspension of the helmet on a regular basis. Use mild soap and water only, not petroleum-based cleaning agents or solvents. Cleaning prevents dirt and stains from hiding small cracks or flaws.

Employee-Owned PPE

Employee-owned PPE is not permitted on The Ruhlin Company projects unless approved by the safety department.

SECTION 7 – Respiratory Protection Program

Purpose

The Respiratory Protection Program offers requirements to prevent and reduce employee exposure to occupational air contaminants. This program applies to all Company tasks that require respiratory protection.

Respiratory Hazards

There are various types of respiratory hazards within the construction industry, such as:

- Particulates
- Gases and vapors
- Oxygen deficient atmospheres

Particulates

Particulates are air contaminants that are tiny solid or liquid particles, or pieces of matter. The following are examples of particulates:

- Silica/concrete dust
- Asbestos
- Dust
- Lead paint dust

Gases and Vapors

Gases and vapors can be fatal if inhaled. Examples include:

- Hydrogen Sulfide (H₂S)
- Carbon Monoxide (CO)
- Hexavalent Chromium (CR(VI))

Oxygen Deficient Atmospheres

Oxygen deficient atmospheres can be fatal when the oxygen content is less than 19.5%. Employees are prohibited from entering areas with an oxygen content of less than 19.5%.

General Requirements

Prior to starting work, a TEAM Huddle must be conducted to determine the respiratory hazards associated with the task. When feasible, exposure to air contaminants will be eliminated by engineering controls (e.g. general and local ventilation, enclosure or isolation, and substitution of a less hazardous process or material).

When effective engineering controls are not feasible, use of personal respiratory protective equipment shall be required to achieve a safe work environment. Respiratory protection is provided at no cost to the employee.

The Company prohibits employees from working in Immediately Dangerous to Life or Health (IDLH)

atmospheres.

Responsibilities

The following outlines responsibilities within the Respiratory Protection Program.

Safety Department

The safety department is responsible for purchasing and supplying respiratory protection. For specific questions or concerns regarding the Respiratory Protection Program, contact the safety department. The safety director oversees the respiratory protection program.

Superintendents and Foremen

Superintendents and foremen are responsible for:

- Conducting a TEAM Huddle to determine any respiratory hazards associated with the task(s).
- Verifying employees are trained in the use of respiratory protection equipment.
- Ensuring employees are utilizing the appropriate respirator for the task.
- Employees complying with the requirements of this program- including respirator inspection and maintenance.
- Following Company disciplinary procedures for any employee who does not comply with the Respiratory Protection Program.

Employees

Employees are responsible for adhering to the Respiratory Protection Program.

Employees are also responsible for:

- Correctly wearing and donning and doffing the respirator.
- Cleaning and maintaining respiratory protection equipment in an operable condition.
- Inspecting respiratory protection equipment prior to use and reporting any defects, damages, or malfunctions to supervision.
- Properly storing the respirator when not in use.

Respiratory Protection Training

Upon hire, employees receive Respiratory Protection Program training. Training consists of respiratory hazards and control measures, hazard evaluation, types of respirators and filters, medical evaluation, proper fit, donning and doffing, respirator and filter inspection, and appropriate storage and maintenance.

Thereafter; training and fit testing occur annually for employees in the Respiratory Protection Program.

Medical Evaluation and Fit Testing

Employees included in the Respiratory Protection Program shall complete an annual medical evaluation to determine medical fitness and the ability to safely wear a respirator. An annual

respirator medical evaluation questionnaire and fit test are requirements of the Company's Respiratory Protection Program. All respirator medical evaluations are confidential, and employees shall be given opportunity to discuss test results with a physician or licensed healthcare professional.

Respirator Medical Evaluation Questionnaire

The respirator medical evaluation questionnaire shall be completed by the employee and reviewed by a licensed healthcare professional who shall determine if the employee is able to perform assigned work duties while wearing a respirator. Based upon the respirator medical evaluation questionnaire, the licensed healthcare professional determines if an additional physical exam and/or pulmonary function test is necessary.

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content. The employee will be given an opportunity to discuss the questionnaire and examination results with the licensed healthcare professional.

Fit Testing

Prior to respirator use, employees in the Respiratory Protection Program, shall be properly fit tested by a licensed healthcare professional. Fit testing shall not be performed on employees with facial hair (e.g. stubble, beards, long sideburns) or any other condition which could create an interference between the face and the respirator seal.

Information for Employees Using Respirators When Not Required Under the Standard - Appendix D

Exposure Assessments shall be performed to determine if a respiratory hazard is present in the work environment. In work instances when the amount of hazardous substance does not exceed the limits set by OSHA standards, an employee may voluntarily wear a respirator by completing a respirator medical evaluation questionnaire and Appendix D (Attachment #7A).

Questions regarding the application of Appendix D should be addressed with the safety department.

Respirator Training

Employees assigned to tasks requiring respirators will be instructed by their supervisor relative to their responsibilities in the Respiratory Protection Program. Training will occur both initially and annually thereafter and whenever retraining may be necessary to ensure safe respirator use. Employees will also be instructed in the need, use, limitations, and care of their respirator.

Exposure Assessments

Exposure assessments shall be done to determine the proper respirator selection for the task. Exposure levels are determined by air samples of the workplace environment representative of the work task and work period.

Exposure assessments shall be performed prior to tasks requiring respiratory protection and

periodically thereafter as required by OSHA substance specific standards.

When exposure levels cannot be identified or reasonably identified, the atmosphere shall be considered IDLH and work will be prohibited until an exposure assessment is performed.

Respirator Selection

NIOSH-certified respirators are selected and approved for use by the safety department. Project supervision shall make sure proper respirators are available to employees assigned to specific tasks requiring respiratory protection.

Air Purifying Respirators

The Company uses positive-pressure and negative-pressure air purifying respirators. Positive-pressure respirators provide positive air pressure (e.g. PAPR); negative-pressure respirators utilize mechanical filters and chemical media (e.g. half-mask).

Negative-pressure air purifying respirators require:

- Employees to be clean shaven; facial hair (e.g. beards) can adversely affect the respirator's seal and function.
- Direct contact between the face and the edge of the respirator.

Types of Respirators

The Company uses the following types of respirators:

- N95 respirator
- Half-mask respirator
- Full-face respirator
- Powered Air Purifying Respirator (PAPR)

Contact the safety department for questions regarding which type of respirator to use.

Respirator Inspection

When in use, employees shall inspect their respirator. Project supervision will periodically spot-check employee's respirators for fit and condition. If a respirator deficiency occurs, relocate to a safe area before performing maintenance, and notify supervision.

Respirator inspection shall include:

1. Checking the tightness of connections
2. Checking the condition of various parts: face piece, head straps, valves, connecting tube, cartridges/canisters/filters, etc.
3. Checking elastomeric parts for pliability and signs of deterioration

Refer to the manufacturer's specific inspection requirements for Powered Air Purifying Respirators (PAPR).

Respirator filters shall be replaced whenever:

- Soiled/dirty
- Breathing becomes difficult
- After 40-hours of service or 30 days; whichever comes first

Donning and Doffing a Respirator

All respirators must be properly donned to appropriately protect from respiratory hazards. Never don a dirty respirator. Refer to the manufacturer's instructions on how to properly don and doff a respirator.

Respirator Storage and Maintenance

When not in use, a respirator must be properly stored to prevent damage. Respirator maintenance is required to keep a clean and efficient respirator.

Disposable respirators shall be discarded after one-time use; therefore, no cleaning or disinfecting is necessary. Non-disposable respirators shall be cleaned daily and stored appropriately.

Respirator disposal or requesting a new respirator is the responsibility of the employee.

Storage

Respirators shall be stored appropriately to protect from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, etc. Proper storage prevents facepiece and exhalation valve deformations. Contact site supervision for proper storage location(s). Reference the manufacturer's instructions for additional information regarding respirator storage.

The following cleaning and storage procedures shall be followed:

- a. Leave the hazardous area before removing filters, cartridges, headbands or disassembling any part of the respirator.
- b. Wash all respirator parts (except cartridges and elastic headbands) with alcohol-free cleaning wipes or warm soapy water. If necessary, use a hand brush to remove dirt. Do not clean respirators with solvents or bleach.
- c. Rinse completely in clean, warm water.
- d. Air dry in a clean area.
- e. Inspect all parts for deficiencies.
- f. Reassemble the respirator and insert new filters or cartridges, if needed.
- g. Place respirator in a clean plastic bag and seal it for storage.

Repairing Respirators

Respirators requiring repair shall be returned to the manufacturer.

Work Areas

Employees are required to leave work areas:

1. When dealing with a respirator defect or malfunction
2. If contaminant leaks into the respirator (e.g. smelling contaminant odors)
3. If experiencing increased breathing resistance (e.g. difficulty breathing)
4. If experiencing physical symptoms (e.g. severe discomfort, skin irritation)
6. To change filter/cartridge elements

SECTION 8 – Vehicles and Major Equipment Program

Purpose

The purpose of the Vehicles and Equipment Program is to provide general safety guidelines for employees who operate Company owned or leased vehicles and/or equipment.

Vehicle and Major Equipment Operations Policy

Drivers and operators of Company vehicles and major equipment must meet specific requirements outlined in the Company's Vehicle and Major Equipment Operations Policy. A copy of this Policy can be obtained from human resources or the safety department.

General Safe Driving Practices

Company drivers operating a motor vehicle or major equipment shall do so in a safe manner. This may include relevant driver training provided by the Company as well as applicable federal, state, and local laws governing the safe operation of motor vehicles or equipment. Company drivers observed operating a motor vehicle or major equipment in an unsafe manner are subject to disciplinary action up to and including termination of driving privileges and/or employment.

Seat Belt Usage

All Company drivers and passengers shall utilize seat belts when operating a motor vehicle or major equipment.

If a seat belt is determined to be nonfunctional or damaged, the seat belt must be repaired or replaced immediately.

Backing Vehicles

The information below is intended to help Company drivers regarding the backing of vehicles. However, this program cannot predict every possible situation, and Company drivers are responsible for making safe backing decisions.

When driving a vehicle, use the following guidelines:

1. Before leaving on a trip, obtain clear directions, jobsite accessibility information, and any other important safety-related information.
2. When safe and reasonable, Company drivers are not to put the vehicle in a situation where backing up is required.

3. When parking a Company vehicle, whenever possible, drivers shall back into the parking space or use the “pull through” method. These parking techniques allow a driver to pull out forward.
4. Company drivers must use the “GOAL” method (GET OUT AND LOOK) when safe and feasible to do so. This method allows drivers to walk an area and assess the hazards before driving.
5. Avoid U-turns that force drivers to back up in order to complete the maneuver, instead; proceed to the next safe area to turn the vehicle around.

When necessary to back a vehicle, Company drivers are required to take the following precautions:

1. If installed, ensure the back-up alarm is functioning properly (a back-up alarm is required on all commercial motor vehicles).
2. When safe and feasible to do so, use the “GOAL” method (GET OUT AND LOOK).
3. When using a spotter, Company drivers shall review hand signals before backing the vehicle.
4. While backing, lower vehicle windows, put away cell phones, and turn off the radio; listen carefully and remain 100% focused.
5. Continuously check mirrors for other vehicles, equipment, pedestrians, and obstructions.
6. Activate flashers and beacons, if equipped.
7. Sound horn before executing any backing maneuver. If more than 5 seconds elapse before backing, company drivers must sound horn again.

Major or Heavy Equipment

To control potential hazards around heavy equipment, the following safety guidelines have been established. An Operator shall not operate a piece of heavy equipment:

1. Unless properly trained and qualified.
2. Unless familiar with the operation of the particular type of heavy equipment.
3. Unless directed by job supervision.
4. Until equipment has been inspected and determined safe.
5. If unable to meet the qualifications the Company’s Vehicle and Major Equipment Operations Policy.

The following heavy equipment procedures shall be followed:

1. Before mounting heavy equipment, conduct a visual walk around inspection.
2. Check heavy equipment to determine proper functionality.
3. When heavy equipment is equipped with a rollover protection structure (ROPS), the operator is required to use a seat belt. If the seat belt is defective, immediately notify job supervision.
4. Before digging, note the location of underground utilities. Confirm that the Ohio Utilities Protection Service (OUPS) has been contacted through the i-dig website or by dialing **1(800) 362-2764** or **8-1-1** (the “Call Before You Dig” national number). Before digging in rural areas, call Ohio Oil & Gas Producers Underground Protection Service (OGPUPS) by dialing **(614) 715-2984** or **8-1-1**.
5. Only the operator is allowed on equipment. No extra riders are permitted unless the equipment is designed for passengers.
6. Adhere to load rating capabilities. Do not overload the equipment’s rated working capacity.
7. Stand clear of the pivot area when an articulated machine is running.
8. Never move a load over other employees, vehicles, or equipment.
9. Heavy equipment should not be operated within 10 feet of OSHA’s “Absolute Limit of Approach” of an energized power line without the use of a qualified signaller. A further description of operations around electrical hazards is located in Section 14 – Electrical.
10. Use extreme care when loading and unloading equipment on a transport trailer.
11. Never remove or bypass safety devices.
12. Utilize the GOAL method (Get Out and Look) prior to backing up.
13. Mount and dismount facing equipment by maintaining “3-point contact” at all times (two hands and one foot, or two feet and one hand). Use the surfaces the manufacturer designed for mounting and dismounting steps, running boards, traction strips, footholds and hand grips. Do not jump off machine!
14. The use of headphones, and similar items, are not permitted while operating heavy equipment.
15. Utilize only approved lifting devices.
16. Strobe lights and reverse alarms shall be in proper working order. Non-functioning alarms shall

be reported to job supervision immediately.

17. All equipment keys shall be kept in the Company construction trailer whenever equipment is not being used or at the end of a shift.
18. Heavy equipment platforms and steps must be kept free of mud, ice, snow, grease, and oil.
19. Before fueling, equipment engines shall be in the park position, turned off, and a fire extinguisher shall be nearby.
20. When heavy equipment is unattended, attachments shall be grounded, and keys removed.
21. Lifting employees by loader buckets or with any attachment is prohibited.
22. The heavy equipment operator is responsible for the equipment he or she is operating.
23. Abuse of equipment will not be tolerated. All equipment shall be operated within the manufacturer's recommended parameters. Unsafe operation or abuse of equipment will be subject to disciplinary actions.
24. When incidents occur, job supervision shall immediately notify the equipment manager and the safety director.
25. When equipment is being loaded, unloaded, or delivered, all non-essential employees will be kept out of the area. Do not attempt to assist the rental company.

Traffic Control

Traffic control shall be maintained whenever construction equipment enters or leaves a job site, crosses highways, streets, sidewalks, or any other area open to the public.

The Federal Highway Administration (FHA) or Department of Transportation (DOT) regulates traffic control within each state. The Manual on Uniform Traffic Control Devices (MUTCD) is intended to help protect the lives of workers and the general public.

General Traffic Control Safety Guidelines

1. All traffic control devices shall be installed and maintained in accordance with the regulations found in the MUTCD.
2. Only use proper control devices- such as: barricading, signs, and channelizing in order to guide drivers safely past hazards and through construction zones.
3. Flaggers shall comply with Part 6 of the MUTCD and be visible to approaching traffic, located in advance of a work zone, and equipped with the following:

- a. Shirt with sleeves
 - b. High visibility (ANSI class 2 or class 3) clothing with reflective stripes
 - c. Hard hat and safety glasses
 - d. Light wand for night work
 - e. Stop/slow paddle
4. Never stand, step, or put any body part into live traffic lanes.
5. When visual communication between flaggers is not possible, two-way radio contact shall be used.
6. Flaggers shall always have an “escape route” planned while flagging, never get between two vehicles or between traffic and a pinch point.
7. When dealing with motorists, be brief and polite, do not allow oneself to become distracted; always watch vehicle traffic.
8. Public access to jobsites should be limited.
9. Construction traffic inside the work zone/jobsite shall be aware of and adhere to all signs, speed limits and regulations.

SECTION 9 – Crane Operation Safety

Implementation of this standard is the responsibility of the supervisor directing activities on the facility, site, or project location.

Purpose

Planning is the key to successful and safe hoisting operations and the prevention of accidents and incidents. Proper planning includes, at a minimum:

- Development, training, and implementation of a JHA for each of the tasks to be performed during each lift.
- Using the Pre-Lift Checklist (Attachments). The Pre-Lift Checklist should not be considered as planning for the lift, but rather to assure that the lift has been properly prepared and set up. All inspections must be maintained.
- Correctly identifying when a lift is considered “critical,” as defined by this section.
- Addressing ground conditions and power line safety in the lift pre-planning.
- Using the Critical Lift Plan (Attachments) as an aid to assure that proper preparation was made for the lift.

Ground Conditions

Do not assemble or use the equipment unless ground conditions are firm, drained (except for marshes/wetlands), and graded to a sufficient extent that, in conjunction with the use of supporting materials (if necessary), the equipment manufacturer’s specifications for adequate support and degree of equipment level are met. These inspections must be maintained.

The Controlling Entity must:

- Ensure that ground preparations necessary to meet the requirements are provided.
- Inform the user of the equipment and the operator of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) that are identified in documents (such as site drawings, as-built drawings, and soil analyses) if they are available to the controlling entity.

If the assembly/disassembly (A/D) supervisor determines that ground conditions do not meet the requirements for safe lifting, the project manager (or his/her designee) must notify the controlling entity regarding the ground preparations that are needed.

Assembly/Disassembly – General Requirements

Assembly/disassembly must be supervised by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (Assembly/Disassembly Supervisor). The supervisor must be experienced in working with the make and model of equipment being assembled or disassembled and must understand applicable assembly/disassembly procedures. All manufacturer instructions and prohibitions must be followed when assembling and/or disassembling equipment.

Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person.

Crew instructions for assembly/disassembly operations must be developed by using the minimum of a JHA for each task to be performed.

Before commencing assembly/disassembly operations, the A/D Supervisor must determine that the crew members understand the following:

- Their tasks;
- The hazards associated with their tasks; and
- The hazardous position/locations that they need to avoid.

The A/D Supervisor must also address all hazards associated with the operation, including, but not limited to, seat and ground bearing conditions, blocking material, proper location of blocking, verifying assist crane loads, boom and jib pick points, center of gravity, stability upon pin removal, snagging, struck by counterweights, boom hoist brake failure, loss of backward stability, wind speed, and weather.

During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, must not be exceeded for the equipment being assembled/disassembled. The weight of each of the components must be readily available. The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment must be in accordance with the manufacturer's instructions, prohibitions, limitations, and specifications.

Protecting assembly/disassembly crew members out of operator view:

Before a crew member goes to a location that is out of view of the operator and is either in, on, under, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location. Where the operator knows that a crew member went to a location, the operator will not move any part of the equipment (or load) until the operator is informed in accordance with a pre-arranged system of communication that the crew member is in a safe position.

Pile driving:

Equipment used for pile driving must not have a jib attached during pile-driving operations.

Outriggers:

When the load to be handled and the operating radius require the use of outriggers, or at any time when outriggers are used, the following requirements must be met:

- The outriggers must be either fully extended; or, if the manufacturer's procedures permit, deployed as specified in the load chart.
- The outrigger must be set with the machine-supported level, on fully extended outriggers with all tires free of the supporting surface.
- When outrigger floats are used, they must be attached to the outriggers.
- Each outrigger must be visible to the operator or to a signal person during extension and setting.

Assembly/Disassembly – Power-Line Safety (up to 350 kilovolts [kV])

Users of this standard should also refer to ANSI 30.5-3.4.5 and OSHA 29 CFR 1926.1407.

Assembly/disassembly below power lines is prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed below, or closer than 20 feet to a power line unless the superintendent (or his/her designee) has confirmed that the utility owner/operator has de-energized and visibly grounded the power line (at the worksite).

Employees should assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. An electrocution hazard warning will be conspicuously posted in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the equipment.

Crane Inspection Procedures

Prior to using any cranes, an Initial/Annual Inspection and a Crane Load Test (Attachments) must be made on such equipment. This inspection must be made by a qualified person designated by management, or by a third-party firm qualified to perform such work.

Modified equipment:

Equipment that has modifications or additions that affect the safe operation of the equipment (such as modifications or additions involving a safety device or operator aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) or capacity must be inspected by a qualified person after such modifications/additions have been completed, prior to initial use. The inspection must meet the following requirements:

- Ensure that modifications or additions have been done in accordance with the manufacturer's approval obtained.
- Prior to initial use, and under the direction of a qualified person, load-test all cranes in which load-sustaining parts have been altered, replaced, or repaired. The replacement of wire rope is specifically excluded from this requirement; however, a functional test of the crane under a normal operating load will be made prior to putting the crane back into service.

Do not use equipment until an inspection demonstrates that the requirements of this section have been met.

Repaired/adjusted equipment:

Equipment that has had a repair or adjustment relating to safe operation (such as a repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) must be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use. The inspection must meet the following requirements:

- The qualified person will determine if the repair/adjustment meets manufacturer's equipment criteria.
- Prior to use after repair or adjustment of equipment, all cranes in which load-sustaining parts have been altered, replaced, or repaired must be load-tested by, or under the direction of, a qualified person. The replacement of wire rope is specifically excluded from this requirement; however, a functional test of the crane under a normal operating load will be made prior to putting the crane back into service.

Do not use equipment until an inspection demonstrates that the repair/adjustment meets the requirements of this section.

Post-Assembly:

Upon completion of assembly, the equipment must be inspected by a qualified person to assure that it is configured in accordance with the manufacturer's equipment criteria.

Do not use equipment until an inspection demonstrates that the equipment is configured in accordance with the applicable criteria.

Each Shift:

A competent person must begin a visual inspection prior to each shift or operation using the attached Daily Inspection Checklist (Attachments A - Attachments) to provide adequate documentation of the inspection. The inspection will consist of observation for apparent deficiencies. Disassembly is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating disassembly is needed. Determinations made in conducting the inspection will be reassessed in light of observations made during operation. All inspections must be maintained.

If any deficiency is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the equipment must be taken out of service until it has been corrected.

Monthly:

Each month the equipment is in service, it must be inspected by a qualified person using the Monthly Crane Inspection Form (see Attachments).

Equipment must not be used until an inspection demonstrates that no deficiencies are found.

Annually:

Every 12 months the equipment must be inspected by a qualified person. Annual inspections will include functional testing to determine that the equipment as configured in the inspection is functioning properly. If any deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the monthly inspections. If the qualified person determines that a deficiency is a safety hazard, the equipment must be taken out of service until it has been corrected. If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections.

Documentation:

Maintain all inspection forms on file at the job site for review by interested parties for the duration of the project.

Idle Equipment:

Equipment that has been idle for 3 months or more must be inspected by a qualified person in accordance with the requirements of the Initial and Annual Inspection Form (Attachments).

Severe Service:

If the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the equipment shall not be used until a qualified person inspects it for structural damage and determines whether the equipment can continue to be used safely. If any deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in third party crane inspection. If the qualified person determines that a deficiency is a safety hazard, the equipment must be taken out of service until it has been corrected. If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the third party inspection.

Wire Rope – Inspection

Shift Inspection:

A competent person will conduct a visual inspection of wire ropes prior to each shift. They will observe wire ropes (running and standing) that are reasonably likely to be used during the shift for apparent deficiencies, as stated in OSHA CFR 1926.1413. If a deficiency is identified, operations involving use of the wire rope in question must be prohibited until the wire rope is replaced or other appropriate corrective action has been taken.

Monthly Inspection:

Each month an inspection will be conducted in accordance with the shift inspection procedures (identified above) and shall include an inspection of any deficiencies that were identified for monitoring in the annual inspection. For additional information and forms, see the Monthly Wire Rope and Hook Inspection (Attachments). The inspection must be documented in accordance with this standard.

Documentation:

Maintain all inspection forms on file at the job site for review by interested parties for the duration of the project.

Safety Devices

The following safety devices are required on all equipment covered by this procedure, unless otherwise specified:

1. Crane-level indicator
2. Boom stops, except for derricks and hydraulic booms.
3. Jib stops (if jib is attached), except for derricks.
4. Equipment with foot-pedal brakes will have locks, except for portal cranes and floating cranes.
5. Hydraulic outrigger jacks will have an integral holding device/check valve.
6. Equipment on rails shall have rail clamps and rail stops, except for portal cranes
7. Horn

Proper Operation Required:

Operations may not begin unless the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator will safely stop operations. Do not resume operations until the device is working properly. Alternative measures are not permitted to be used.

Crane Operational Aids

(See OSHA CFR 1926.1416 for specific details of Operational Aids, which specifies which operational aids are required and the required time periods for repair.)

Do not begin operations unless the operational aids are in proper working order, except where the superintendent (or his/her designee) meets the specified temporary alternative measures. Follow more protective alternative measures specified by the tower crane manufacturer, if any.

If an operational aid stops working properly during operations, the operator will safely stop operations until the temporary alternative measures are implemented or the device is again working properly.

If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted, and is not considered a modification under this procedure.

Operator Qualifications and Certification

It is the responsibility of the superintendent directing activities of the facility or site to ensure that each operator is trained, certified/licensed, and evaluated before operating any equipment covered by this Crane Operation Safety policy. They must also ensure compliance with certification and qualification from state, local, or other licensing and certifying agencies. Note that operator's qualification or certification under this section is not required for operators of derricks, side-boom cranes, and equipment with a rated hoisting/lifting capacity of 2,000 pounds or less.

The superintendent (or his/her designee) of the operator must ensure that, prior to operating any equipment covered under this policy, the operator is either license or certified to operate the equipment or is operating the equipment during a training period.

The superintendent (or his/her designee) of the operator must verify certification and have evidence of certification on file at the project.

Operator Training:

If an operator is operating equipment during a training period, the Company will provide sufficient training to ensure that the operator-in-training develops the skills, knowledge, and ability to recognize and avert risk necessary to operate the equipment safely for assigned work. The operator-in-training will only be assigned tasks within his or her ability. The operator-in-training must be continuously monitored on site by an operator trainer while operating equipment. The operator trainer must have the knowledge, training, and experience necessary to direct the operator-in-training on the equipment in use. While monitoring the operator-in-training, the operator trainer must not perform any tasks that detract from the trainer's ability to monitor the operator-in-training. The operator's trainer and the operator-in-training must be in direct line of sight of each other (except when operating tower cranes) and must communicate verbally or by hand signals. Retraining may be required when, based on the performance of the operator or an evaluation of the operator's knowledge, there is an indication that retraining is necessary.

Operator Certification and Licensing:

If a state or local government issues operator licenses for equipment covered under this policy, the equipment operator must generally be licensed by that government entity for operation of equipment

within that entity's jurisdiction. If an operator is not required to be licensed, the operator must be certified. Such certification must come from a nationally accredited crane operator testing organization and the certification must be based on written and practical testing. The agency must also have testing procedures for re-certification. Such certifications are valid for five years.

When certification/licensure is required, it will be provided at no cost to the employee.

Evaluation:

Operators will also be evaluated by the Company to ensure that they are qualified by a demonstration of the skills and knowledge, as well as the ability to recognize and avert risk, necessary to operate the equipment safely, including those specific to the safety devices, operational aids, software, and the size and configuration of the equipment. Such evaluation will be completed by an employee who has the knowledge, training, and experience necessary to assess equipment operators.

The Company's evaluation will be documented, and such documentation will be available at the worksite while the operator is employed by the employer.

Maintenance and Repair Employees

Maintenance and repair personnel must meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed. Maintenance, inspection and repair personnel are permitted to operate the equipment only when the operation is limited to those functions necessary to perform maintenance, inspect the equipment, or verify its performance. Maintenance, inspection and repair personnel can only operate the equipment if they are under the direct supervision of an operator who meets all of the above requirements of an operator or if they are familiar with the operation, limitations, characteristics and hazards associated with the type of equipment.

Signal Person Qualifications

The superintendent (or his/her designee) of the signal person must ensure that each signal person meets the qualification requirements prior to giving any signals. This requirement will be met by using either of the following options:

- **Option 1** – Third-party-qualified evaluator: The signal person has documentation from a third-party qualified evaluator showing that the signal person meets the Qualification Requirements.
- **Option 2** – Safety Director's (or his/her designee's) qualified evaluator: The Safety Director (or his/her designee) has its qualified evaluator assess the individual and determine that the individual meets the Qualification Requirements and provides documentation of that determination. An assessment by a Safety Director's (or his/her designee's) qualified evaluator under this option is not portable.

Qualification Requirements:

Each signal person must:

- Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals.
- Be competent in the application of the type of signals used.
- Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.
- Know and understand the relevant OSHA requirements for crane and derrick signals.

The signal person must also demonstrate that he or she meets the above listed requirements through an oral or written test, and through a practical test.

The documentation for whichever option is used will be available while the signal person is employed by the company.

If subsequent actions by the signal person indicate that the individual may not meet the Qualification Requirements, the superintendent (or his/her designee) must not allow the individual to continue working as a signal person until retraining is provided and a reassessment is made in accordance with this section, which confirms that the individual meets the Qualification Requirements.

Power Line Safety (up to 350 kV) – Equipment Operations**Hazard assessments and precautions inside the work zone:**

Before beginning equipment operations, the superintendent (or his/her designee) must:

1. Identify the work zone by either:
 - Defining a work zone by demarcating boundaries (such as with flags, or a device such as a range-limit device or range-control warning device) and prohibit the operator from operating the equipment past those boundaries; or
 - Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.
2. Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, the superintendent (or his/her designee) must meet the requirements in Option 1, Option 2, or Option 3, as follows:
 - Option 1 – De-energize and ground. Confirm from the utility owner/operator that the power line has been de-energized and visibly grounded at the worksite.
 - Option 2 – 20-foot clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by

implementing the measures specified in the preventing encroachment/electrocution section below.

- Option 3 – Clearance.
 - Determine the line's voltage and the minimum approach distance permitted under the table provided in Attachments A - Attachments.
 - Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Attachments A - Attachments. If so, then the superintendent (or his/her designee) must follow the requirements in this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.

Preventing encroachment/electrocution:

Where encroachment precautions are required under Option 2 or Option 3, the following requirements must be met:

- Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution.
- If tag lines are used, they must be non-conductive.
- Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option 2 of this section) or at the minimum approach distance under the table in Appendix A (if using Option 3). If the operator is unable to see the elevated warning line, a dedicated spotter must be used.
- Implement at least one of the following measures:
 1. A proximity alarm set to give the operator sufficient warning to prevent encroachment.
 2. A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must:
 - Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include but are not limited to: a clearly visible line painted on the ground; a clearly visible line of stanchions; or a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).

- Be positioned to effectively gauge the clearance distance.
 - Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator (radio, telephone, or other electronic transmission of signals).
 - Give timely information to the operator so that the required clearance distance can be maintained.
3. A device that automatically warns the operator when to stop movement, such as a range-control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment.
 4. A device that automatically limits range of movement, set to prevent encroachment.
 5. An insulating link/device installed at a point between the end of the load line (or below) and the load.

Voltage information:

Where Option 3 of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within 2 working days of the superintendent's (or his/her designee's) request.

Operations below power lines:

No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the superintendent (or his/her designee) has confirmed that the utility owner/operator has de-energized and (at the worksite) visibly grounded the power line, with the exceptions listed below:

- For equipment with non-extendible booms: The uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line, or more than the minimum clearance distance (see Attachments) below the plane of the power line.
- For equipment with articulating or extensible booms: The uppermost part of the equipment, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line, or more than the minimum clearance distance (see Attachments) below the plane of the power line.
- The superintendent (or his/her designee) demonstrates that compliance with this section is infeasible.

The superintendent (or his/her designee) must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be de-energized and visibly grounded at the worksite.

When working near transmitter/communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter will be de-energized, or the following precautions will be taken when necessary to dissipate induced voltages:

- Provide the equipment with an electrical ground.
- Use non-conductive rigging, taglines, or an insulating link/device.

Training:

The Company will train operators and crew assigned to work with the equipment on the following:

The procedures to be followed in the event of electrical contact with a power line, including:

- Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground.
- The importance to the operator's safety of remaining inside the cab, *except* where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab.
- The safest means of evacuating from equipment that may be energized.
- The danger for the potentially energized zone around the equipment.
- The need for crew in the area to avoid approaching or touching the equipment and the load.
- Safe clearance distance from power lines.

Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be de-energized and visibly grounded at the worksite.

Power lines are presumed to be un-insulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.

The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used.

The Company will also train persons working as dedicated spotters to enable them to effectively perform their task, including training on the applicable requirements of this section.

Devices originally designed by the manufacturer for use as: a safety device, operational aid, or a means to prevent power line contact or electrocution, when used to comply with this policy, must meet the manufacturer's procedures for use and conditions of use.

Power Line Safety (Over 350 kV)

The requirements of the Power Line Safety (up to 350 kV) section of this policy outlined above apply to power lines over 350 kV, except that wherever the distance "20 feet" is specified, the distance "50 feet" will apply in its place.

Additionally, for power lines over 1000 kV, the minimum clearance distance must be established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.

Power Line Safety – While Traveling

This section establishes procedures and criteria that must be met for equipment traveling under a power line on the construction site with no load. If equipment is travelling on a construction site with a load, please refer to the above Power Line Safety sections.

The superintendent (or his/her designee) must ensure that:

1. The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this paragraph.
2. Maintain the clearances specified in attachments – Required Clearance for Normal Voltage.
3. The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that hose effects do not cause the minimum clearance distances specified in attachments – Required Clearance for Normal Voltage, to be breached.
4. Dedicated spotter: If any part of the equipment will get closer than 20 feet to the power line while traveling, the Superintendent (or his/her designee) must ensure that a dedicated spotter who is in continuous contact with the operator is used.

The dedicated spotter must:

- Be positioned to effectively gauge the clearance distance.
 - Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.
 - Give timely information to the operator so that the required clearance distance can be maintained.
5. When traveling at night, or in conditions of poor visibility, in addition to the measures specified in this section, the superintendent (or his/her designee) must ensure that:
 - The power lines are illuminated, or another means of identifying the location of the lines is used.
 - A safe path of travel is identified and used.

Equipment Modifications

Modifications or additions that affect the capacity or safe operation of the equipment are prohibited except where approved by the manufacturer in satisfaction of the requirements listed below.

Manufacturer's review and approval:

- The manufacturer approves the modifications/additions in writing.
- The load charts, procedures, instruction manuals, and instruction plates/tags/decals are modified as necessary to accord with the modification/addition.
- The original safety factor of the equipment is not reduced.

Fall Protection

Equipment manufactured after November 8, 2011 with lattice booms (except tower cranes) must be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet. The walkways must be at least 12 inches wide. The following requirements also apply:

- Originally equipped steps, handholds, ladders and guardrails/railings/grabrails must be maintained in good condition.
- Equipment manufactured after November 8, 2011 must be equipped so as to provide safe access and egress between the ground and the operator work station(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. This does not apply to tower cranes.
- Personal fall arrest system components must be used in personal fall arrest and fall restraint systems and must conform to the requirements in the Fall Protection section of this Safety Manual.
- Except for tower cranes, for non-assembly/disassembly work, the Company will provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows:
 - When moving point-to-point:
 - On non-lattice booms (whether horizontal or not horizontal).
 - On lattice booms that are not horizontal.
 - On horizontal lattice booms where the fall distance is 15 feet or more.

- While at a work station on any part of the equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.
- Except for tower cranes, for assembly/disassembly work, the Company must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.
- Personal fall arrest systems and positioning devices must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the anchorage criteria set out in the Fall Protection section (Section 10) of this Safety Manual would not be met.
- Fall restraint systems must be anchored to any part of the equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.
- A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met:
 - A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging) meets or exceeds the anchorage criteria set out in the Fall Protection section (Section 10) of this Safety Manual.
 - The equipment operator must be at the work site and informed that the equipment is being used for this purpose.
 - No load is suspended from the load line when the personal fall arrest system is anchored to the crane/derrick's hook (or other part of the load line).

In addition to these requirements, all workers must follow the requirements of Fall Protection (see "Fall Protection" section) of the Safety Manual.

Employees who may be exposed to fall hazards while on, or hoisted by, equipment covered by this policy will be trained on OSHA's fall protection requirements.

Operation

The superintendent (or his/her designee) will comply with all the manufacturer's procedures applicable to the operational functions of equipment, including its use with attachments. The superintendent (or his/her designee) should consider the use of equipment that has all the manufacturer's procedures and information available during the planning stages of the project.

1. Operational procedures:

All cranes arriving on site require pre-inspection, initial and annual inspections, load test, and verification of operator qualifications. These inspections must be maintained.

Prior to operation of crane on site, conduct pre-lift planning in accordance with the pre-lift checklist or assembly/disassembly procedures.

2. Equipment set-up:

Ensure the equipment will be uniformly level, within 1 percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable.

Equipment with outriggers must have all outriggers extended and locked. The amount of extension must be the same for all outriggers, and in accordance with the manufacturer's procedures and load charts.

Procedures related to the capacity of the equipment must be developed and signed by a registered professional engineer familiar with the equipment.

3. Accessibility of procedures:

The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be readily available in the cab at all times for use by the operator. Where rated capacities are available in the cab only in electronic form: in the event of a failure that makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities are available.

4. The operator must not engage in any practice that diverts his/her attention while actually engaged in operating the crane, such as the use of cell phones (other than when used for signal communications) or other attention-diverting activities.

5. Leaving the equipment unattended:

The operator must not leave the controls while the load is suspended, except where the following are met:

- The operator remains adjacent to the equipment and is not engaged in any other duties.
- The load is to be held suspended for a period of time exceeding normal lifting operations.
- The competent person determines that it is safe to do so, and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger functions.
- Barricades or caution lines (and notices) are erected to prevent all workers from entering the fall zone. Do not permit workers in the fall zone.

6. Tag-Out:

Where the superintendent (or his/her designee) has taken the equipment out of service, a tag must be placed in the cab stating that the equipment is out of service and is not to be used.

Where the superintendent (or his/her designee) has taken a function(s) out of service, a tag must be placed in a conspicuous position stating that the function is out of service and is not to be used.

Response to “Do Not Operate” tag-out signs:

If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator must not activate the switch or start the equipment until the sign has been removed by a management person authorized to remove it. An inspection of the entire area must be completed, and all attempts must be made to locate the person who applied the tag or lock prior to any actions. These inspections must be maintained. If the person who applied the tag or lock cannot be located, the following steps must be adhered to. Management must determine that:

- a. No one is servicing, working on or otherwise in a dangerous position on the machine.
 - b. The equipment has been repaired and is working properly.
7. Before starting the engine, the operator must verify that all controls are in the proper starting position and that all personnel are in the clear.
 8. When a local storm warning has been issued, the competent person will determine whether it is necessary to implement manufacturer’s recommendations for securing the equipment.
 9. The operator must be familiar with the equipment and its proper operation. If adjustments or repairs are necessary, the operator must promptly inform the person designated by the Superintendent to receive such information; and, where there are successive shifts, inform the next operator. The Superintendent or the Company must also notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.
 10. Safety devices and operational aids must not be used as a substitute for the exercise of professional judgment by the operator.
 11. If the competent person determines that there is a slack rope condition requiring re-spooling of the rope, it will be verified (before starting to lift) that the rope is seated on the drum and in the sheaves as the slack is removed.
 12. The competent person will adjust the equipment and/or operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.
 13. Compliance with rated capacity:

- Do not operate the equipment in excess of its rated capacity.
- The operator will verify that the load is within the rated capacity of the equipment by at least one of the following methods:

- a. The weight of the load will be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per-foot weight), or by other equally reliable means.

In addition, when requested by the operator, this information will be provided to the operator prior to the lift; or

- b. The operator will begin hoisting the load to determine—using a load-weighing device—load-moment indicator, rated-capacity indicator, or rated-capacity limiter, if it exceeds 75 percent of the maximum rated capacity at the longest radius that will be used during the lift operation. If it does, the operator will not proceed with the lift until management verifies the weight of the load.

14. The boom or other parts of the equipment must not contact any obstruction.
15. Do not use the equipment to drag or pull loads sideways.
16. On wheel-mounted equipment, do not lift loads over the front area, except as permitted by the manufacturer.
17. The operator will test the brakes each time a load that is 90 percent or more of the maximum line pull is handled by lifting the load a few inches and applying the brakes. In duty cycle and repetitive lifts where each lift is 90 percent or more of the maximum line pull, this requirement applies to the first lift, but not to successive lifts.
18. Do not lower the load or the boom below the point where less than two full wraps of rope remain on their respective drums.
19. Traveling with a load:
 - Traveling with a load is prohibited if the practice is prohibited by the manufacturer.
 - Where traveling with a load, the superintendent (or his/her designee) will ensure that:
 - a. A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety.
 - b. The determinations of the competent person required in this section are implemented.

- c. For equipment with tires, maintain tire pressure specified by the manufacturer.
20. Rotational speed of the equipment must be such that the load does not swing out beyond the radius at which it can be controlled.
 21. A tag or restraint line must be used if necessary to prevent rotation of the load that would be hazardous.
 22. Adjust the brakes in accordance with the manufacturer's procedures to prevent unintended movement.
 23. The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.
 24. A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it, until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.
 25. Counterweight/ballast: With the exception of tower cranes:
 - Equipment must not be operated without the counterweight or ballast in place as specified by the manufacturer.
 - The maximum counterweight or ballast specified by the manufacturer for the equipment must not be exceeded.
 26. Authority to Stop Operation:

Whenever there is a safety concern, the operator or any other workers associated with the operation have the authority to stop, and refuse to handle loads until a qualified person has determined that safety has been assured.
 27. An accessible fire extinguisher must be on the equipment.

Swing Radius Hazards

The requirements in this section apply where there are accessible areas in which the equipment's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of:

- Striking and injuring a worker; or
- Pinching/crushing a worker against another part of the equipment or another object.

Preventing Workers from Entering Hazard Areas:

To prevent workers from entering these hazard areas, the superintendent (or his/her designee) must:

- Instruct workers assigned to work on or near the equipment (authorized personnel) in how to recognize struck-by and pinch/crush hazards areas posed by the rotating superstructure.
- Erect and maintain control lines, warning lines, railings, or similar barriers to mark the boundaries of the hazard areas. Exception: where it is neither feasible to erect such barriers on the ground nor on the equipment, the hazards areas must be clearly marked by a combination of warning signs and high-visibility markings on the equipment that identify the hazard areas. In addition, the superintendent (or his/her designee) must train the workers to understand what these markings signify.

Protecting Workers in the Hazard Area:

Before a worker goes to a location in the hazard area that is out of view of the operator, the worker (or someone instructed by the worker) must ensure that the operator is informed that he/she is going to that location.

Where the operator knows that a worker went to a location covered by this section, the operator will not rotate the superstructure until the operator:

- It's informed in accordance with a pre-arranged system of communication that the worker is in a safe position.

Multiple Equipment Coordination:

Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations. If there is no controlling entity, the superintendent (or his/her designee) must institute such a system.

Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation must be planned. The plan must be developed by a qualified person, designed to meet all OSHA requirements for cranes and derricks, and incorporate engineering expertise when necessary. The lift director must review the plan in a meeting with all workers who will be involved with the operation. The multiple-crane/derrick lift must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (lift director).

Keeping Clear of the Load:

Where available, hoisting routes that minimize the exposure of workers to hoisted loads will be used, to the extent consistent with public safety.

Although the operator is not moving a suspended load, no worker will be within the fall zone, except for workers:

- Engaged in hooking, unhooking, or guiding a load;
- Engaged in the initial attachment of the load to a component or structure; or
- Operating a concrete hopper or concrete bucket.

Hooking, Unhooking, or Guiding the Load:

When workers are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, the following criteria must be met:

- a. Rig the materials being hoisted to prevent unintentional displacement.
- b. Use hooks with self-closing latches or their equivalent. Exception: “J” hooks are permitted to be used for setting wooden trusses.
- c. Ensure the materials are rigged by a qualified rigger.

Receiving a load:

Only workers needed to receive a load will be permitted to be within the fall zone when a load is being landed.

Signals – General Requirements

A signal person must be provided in each of the following situations:

- When the point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator.
- When the equipment is traveling, the view in the direction of travel is obstructed.
- When due to site-specific safety concerns, either the operator or the person handling the load determines that it is necessary.

Types of Signals:

Signals to operators must be by hand, voice or audible.

Hand Signals:

When using hand signals, the Standard Method must be used.

Other Signals:

Signals other than hand, voice, or audible signals may be used where the superintendent (or his/her designee) demonstrates that:

- a. The new signals provide communication at least equally effective as voice, audible, or standard method hand signals; or
- b. The new signals comply with a national consensus standard that provides at least equally effective communication as voice, audible, or Standard Method hand signals.

Determining Signals to be Used:

The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), must be appropriate for the site conditions.

Transmitting and Interrupted Signals:

During operations requiring signals, the ability to transmit signals between the operator and signal person must be maintained. If that ability is interrupted at any time, the operator will safely stop operations requiring signals until it is reestablished, and a proper signal is given and understood.

Communicating a Safety Problem:

If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop operations. Operations may not resume until the operator and signal person agree that the problem has been resolved.

Emergency Stop Signal:

Only one person gives signals to a crane/derrick at a time, unless anyone who becomes aware of a safety problem must alert the operator or signal person by giving the stop or emergency stop signal. Note that this procedure requires the operator to obey a stop or emergency stop signal.

Operator's Direction Perspective:

All directions given to the operator by the signal person must be given from the operator's direction perspective.

Communication with multiple cranes/derricks:

Where a signal person(s) is in communication with more than one crane/derrick, a system for identifying the crane/derrick each signal is for must be used, as follows:

- a. For each signal, prior to giving the function/direction, the signal person will identify the crane/derrick the signal is for; or
- b. An equally effective method of identifying which crane/derrick the signal is for must be used.

Signals – Radio, Telephone, or other Electronic Transmission

The superintendent (or his/her designee) must test the device(s) used to transmit signals on site before beginning operations to ensure that the signal transmission is clear and reliable.

Signal transmission must be through a dedicated channel. Exceptions:

- Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations.
- Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with the movement of other equipment or trains on the same or adjacent tracks.
-

The operator's reception of signals must be by a hands-free system.

Signals – Voice

Prior to beginning operations, the operator, signal person, and lift supervisor (if there is one), will contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is substituted; there is confusion about the voice signals; or a voice signal is to be changed.

Each voice signal must contain the following three elements, given in the following order:

1. Function (such as hoist, boom, etc.)
2. Direction (distance and/or speed)
3. The 'stop' command

The operator, signal person, and lift supervisor (if there is one), must be able to effectively communicate in the language used.

Signals – Hand Signal Chart

Hand signal charts must either be posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.

Training

The superintendent (or his/her designee) must provide training as follows:

1. Overhead power lines:

Train workers as specified in the "Electrical" section of this Safety Manual.

2. Signal persons:

Train workers who will be assigned to work as signal persons who do not meet the requirements of a signal person addressed in the "Signal Person Qualifications" section of this policy.

3. Operators:

Train operators-in-training and operators on the safe operation of the equipment the operator will be using. Train operators in the following practices:

- On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load off the boom) to determine if the boom hoist brake needs to be adjusted. On other types of equipment, the same practice is applicable, except that typically there is no means of adjusting the brake; if the brake does not hold, a repair is necessary.
- Where available, the manufacturer's emergency procedures for halting unintended equipment movement.

4. Competent persons and qualified persons:

Train competent persons and qualified persons regarding the requirements of ASME B30 standards and on their respective roles under this policy.

5. Crush/pinch points:

Instruct workers who work with the equipment to keep clear of holes, and crush/pinch points and the hazards addressed in this procedure (work area control).

6. Lock-out /Tag-out:

Train operators and other workers authorized to start/energize equipment or operate equipment controls (such as maintenance and repair workers) in the tag-out measures in this procedure.

7. Training administration:

- a. The superintendent (or his/her designee) must ensure that workers required to be trained under this procedure are evaluated to confirm that they understand the information provided in the training.
- b. The superintendent (or his/her) must provide refresher training in relevant topics when, based on the conduct of the worker or an evaluation of the worker's knowledge, there is an indication that retraining is necessary.

Critical Lifts

Critical lift identifies loads classified as requiring a formal, written plan. A critical lift is defined as a non-routine crane lift requiring detailed planning, and additional or unusual safety precautions.

Critical lifts include:

- lifts made when the load is greater than 75 percent of the rated capacity of the crane in the configuration that the lift will be made;
- lifts that require the load to be lifted, swung, or placed out of the operators view;
- lifts made with more than one crane;
- lifts involving non-routine or technically difficult rigging arrangements;
- lifts of long lead time permanent materials;
- lifts that involve lifting loads over structures or equipment;
- lifts taking place in a confined or limited access areas;
- hoisting personnel with a crane or derrick;
- or any lift that the lift supervisor thinks should be considered critical.

The following items should be documented/included with critical lift plans:

1. Copy of the completed Critical Lift Plan Form (see Attachments) (note: this same form may also be used for non-critical lifts).
2. Sketch of elevation view of the crane and load.
3. Sketch of plan view of crane and load indicating associated radius and distances, or setup and load.

4. Copy of the crane load chart.
5. Copy of the crane range diagram.
6. Copy of the crane outline dimensions.
7. Rigging diagram indicating minimum size of slings and shackles.
8. Calculation indicating adequacy of rigging.

Critical Lift Plan Requirements:

A Critical Lift Plan consists of as many drawings, specifications, and procedures as necessary to accurately assess all important load factors and site factors relating to a Critical Lift. These items are included as a guide, but should not be interpreted as being all-inclusive in the analysis and preparation of a Critical or Pre-Engineered Lift. Sound engineering and planning is still the responsibility of the superintendent associated with the lift.

The following is the minimum level of information required for completing an adequate critical lift plan:

- a. Crane manufacturer(s), model(s), and counterweight(s), if variable.
- b. Boom length(s) and lifting radius.
- c. Maximum load elevation during lifting procedure.
- d. Any jibs or special lifting devices required.
- e. Minimum number of parts of crane hoist line required for lifting the load.
- f. All required slings, shackles, and other rigging components identified by capacity, size, length, and location.
- g. Calculated center of gravity of load.

Plan View Drawing of the crane, load, and nearby structures that could cause interference. This drawing must be made to scale and should note:

- a. Route that transport will take to position the load for lifting.
- b. Initial lifting position of the load, including radius. Lifting radius must be accurately determined.
- c. Final placement position of the load, including radius. Lifting radius must be accurately determined.
- d. Location of the crane(s), including tail swing limits.

- e. Route that crane(s) will take if walking with the load, as well as associated matting requirements.
- f. Any utilities located within the work zone. Underground facilities—piping, ducts, etc.—must be accurately located.
- g. Space may be needed to assemble crane.
- h. Planning must include load transportation considerations, such as how to get the load close enough to the crane. This may be a function of the type of crane being used, because some cranes perform better in certain sectors (quadrants) of operation than others.

Lift Analysis, including:

- a. Tabulation of the gross load weight, including the weight of all blocks and rigging tackle.
- b. Rigging attachment points and special rigging requirements.
- c. Gross rated capacity of the crane in the configuration specified.
- d. Calculation of the percentage of the crane's rated capacity at which the lift will be made.
- e. Crane-imposed soil loads must be determined. Soil analysis may be needed to verify crane-imposed loads can be safely supported.
- f. Allowable weather conditions for the lift, and the effect of wind loading.
- g. Sequence of work, including lift-off, steady-state conditions, and set-down of load (including positions where there is a shift in the location of the center of gravity, for the pick points).
- h. Completed Critical Lift Plan (see Attachments A - Attachments).
- i. Copy of crane range diagram.
- j. Copy of crane load chart.
- k. Copy of crane outline dimensions.

All potential complicating issues for any lift must be addressed in the lift plan; however, for a relatively simple operation, the above items can provide sufficient information, and may even be organized onto one drawing.

Personnel Hoisting

Hoisting personnel is considered to be a Critical Lift. All of the criteria for a Critical Lift must be observed and in place prior to any personnel hoisting.

Procedures:

- Personnel are only allowed to ride in a personnel platform supported by the crane load line attachment or boom-mounted platform when used in accordance with the requirements of ASME B30.23 and the crane manufacturer's instructions. The crane may not be used for other purposes while handling personnel.

The requirements of this section are supplemental to the other requirements in this standard, and apply when one or more workers are hoisted.

The use of equipment to hoist workers is prohibited except where the superintendent (or his/her designee) demonstrates that the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions.

Use of personnel platform:

When using equipment to hoist workers, the workers must be in a personnel platform that meets the requirements of this section.

Exceptions:

A personnel platform is not required for hoisting workers:

- Into and out of drill shafts that are up to and including 8 feet in diameter (see this section for requirements for hoisting these workers).
- In pile driving operations (see this section for requirements for hoisting these workers).
- Solely for transfer to or from a marine worksite in a marine hoisted-personnel transfer device (see this section for requirements for hoisting these workers).
- In storage tank (steel or concrete), shaft, and chimney operations (see this section for requirements for hoisting these workers).

Equipment set-up:

The equipment must be uniformly level, within 1 percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable.

Equipment with outriggers must have them all extended and locked. The amount of extension must be the same for all outriggers and in accordance with the manufacturer's procedures and load charts.

Equipment criteria:

- a. Capacity – Use of suspended personnel platforms. The total load (with the platform loaded, including the hook, load line, and rigging) will not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.
- b. Capacity – Use of boom-attached personnel platforms. The total weight of the loaded personnel platform will not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.

- c. Capacity – Hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform, the total load (including the hook, load line, rigging and any other equipment that imposes a load) will not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.
- d. When the occupied personnel platform is in a stationary working position, the load and boom hoist brakes, swing brakes, and operator-actuated secondary braking and locking features (such as pawls or dogs) or automatic secondary brakes must be engaged.
- e. Devices:
 - *Variable-Angle Boom:* Equipment (except for derricks) with a variable-angle boom must be equipped with:
 - 1. A boom angle indicator, readily visible to the operator.
 - 2. A boom hoist limiting device.
 - *Articulating Cranes:* Articulating cranes must be equipped with a properly functioning automatic overload protection device.
 - *Luffing Jib:* Equipment with a luffing jib must be equipped with:
 - 1. A jib angle indicator, readily visible to the operator.
 - 2. A jib hoist limiting device.
 - *Telescoping Booms:* Equipment with telescoping booms must be equipped with a device to indicate the boom's extended length clearly to the operator, or have measuring marks on the boom.
 - *Anti-two-block:* A device that automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component) must be used. The device(s) must prevent such damage/failure at all points where two-blocking could occur.
 - *Controlled Load Lowering:* The load line hoist drum must have a system, other than the load line hoist brake, that regulates the lowering rate of speed of the hoist mechanism. This system or device must be used when hoisting personnel. Free-fall of the load line hoist is prohibited. The use of equipment in which the boom hoist mechanism can free-fall is prohibited.
 - *Proper Operation Required:* Personnel hoisting operations will not begin unless the devices listed in this section are in proper working order. If a device stops working properly during such operations, the operator must safely stop operation. Personnel hoisting operations must not resume until the device is again working properly. Alternative measures are not permitted.
- f. Direct attachment of a personnel platform to a luffing jib is prohibited.

Personnel platform criteria:

- a. The personnel platform and attachment/suspension system must be designed for hoisting personnel by a qualified person familiar with structural design.
- b. The system used to connect the personnel platform to the equipment must allow the platform to remain within 10 degrees of level, regardless of boom angle.
- c. The suspension system must be designed to minimize tipping of the platform due to movement of workers occupying the platform.
- d. The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load.
- e. All welding of the personnel platform and its components must be performed by a certified welder familiar with the weld grades, types, and material specified in the platform design.
- f. Equip the personnel platform with a guardrail system that meets the requirements of the Fall Protection procedures, and is enclosed at least from the toe-board to mid-rail with either solid construction material, or expanded metal having openings no greater than ½ inch (1.27 centimeters). Points to which personal fall arrest systems are attached must meet the anchorage requirements in the Fall Protection procedures.
- g. Install a grab rail inside the entire perimeter of the personnel platform except for access gates/doors.
- h. If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) will:
 - Not swing outward.
 - Be equipped with a device that prevents accidental opening.
- i. Ensure headroom is sufficient to allow workers to stand upright in the platform.
- j. In addition to the use of hard hats, protect workers by overhead protection on the personnel platform when workers are exposed to falling objects. The platform overhead protection must not obscure the view of the operator or platform occupants (such as wire mesh that has up to ½ inch openings), unless full protection is necessary.
- k. All edges exposed to worker contact must be smooth enough to prevent injury.
- l. Conspicuously post the weight of the platform and its rated capacity on the platform with a plate or other permanent marking.

Personnel platform loading:

Do not load the personnel platform in excess of its rated capacity.

Personnel platforms will be used only for workers, their tools, and the materials necessary to do their work. Platforms must not be used to hoist materials or tools when not hoisting personnel.

Exception: materials and tools to be used during the lift, if secured and distributed, may be in the platform for trial lifts.

Materials and tools must be:

- Secured to prevent displacement.
- Evenly distributed within the confines of the platform while it is suspended.

The number of workers occupying the personnel platform will not exceed the maximum number the platform was designed to hold, or the number required to perform the work, whichever is less.

Attachment and rigging:

- a. Dedicated rigging: Do not use the rigging used for hoisting personnel for any other hoisting activities such as materials or equipment.
- b. Hooks and other detachable devices used in the connection between the hoist line and the personnel platform (including hooks on overhaul ball assemblies, lower load blocks, bridle legs, or other attachment assemblies or components) must be:
 - Of a type that can be closed and locked, eliminating the throat opening.
 - Closed and locked when attached.

Shackles used in place of hooks must be of the alloy anchor type, with either:

- A bolt, nut, and retaining pin designed for the shackle, in place; or
- Of the screw type, with the screw pin secured from accidental removal.

Where other detachable devices are used, they must be of the type that can be closed and locked to the same extent as the devices addressed in this section. Such devices must be closed and locked when attached.

- c. Rope bridle: When a rope bridle is used to suspend the personnel platform, each bridle leg must be connected to a master link or shackle (see this section) in a manner that ensures that the load is evenly divided among the bridle legs.
- d. Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) and hooks must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation-resistant rope is used, the slings must be capable of supporting, without failure, at least ten times the maximum intended load.
- e. Fabricate eyes in wire rope slings with thimbles.
- f. Use bridles and associated rigging for suspending the personnel platform only for the platform and the necessary workers, their tools, and materials necessary to do their work, and do not use for any other purpose when not hoisting personnel.

Trial lift and inspection:

Make a trial lift with the unoccupied personnel platform loaded at least to the anticipated lift weight from ground level, or any other location where workers will enter the platform, to each location at which the platform is to be hoisted and positioned. Where there is more than one location to be reached from a single set-up position, perform either individual trail lifts for each location, or a single trail lift for all locations.

Perform the trial lift immediately prior to each shift in which personnel will be hoisted. In addition, repeat the trial lift prior to hoisting workers in each of the following circumstances:

- The equipment is moved and set up in a new location or returned to a previously used location.
- The lift route is changed, unless the competent person determines that the new route presents no new factors affecting safety.

The competent person must determine that:

- Safety devices and operational aids required by this section are activated and functioning properly. Other safety devices and operational aids must meet the requirements of this procedure.
- Nothing interferes with the equipment or the personnel platform in the course of the trial lift.
- The lift will not exceed 50 percent of the equipment's rated capacity at any time during the lift.
- The load radius to be used during the lift has been accurately determined.

Immediately after the trial lift, the competent person must:

- Conduct a visual inspection of the equipment, base support or ground, and personnel platform to determine whether the trial lift has exposed any adverse defect or produced any adverse effect.
- Confirm that, upon the completion of the trail lift process, the test weight has been removed.

Immediately prior to each lift:

- Hoist the platform with the personnel and materials/tools onboard a few inches and have it inspected by a competent person to ensure that it is secure and properly balanced.
- The following conditions must be determined to exist by a competent person before the lift of personnel proceeds:
 - a. Hoist ropes are free of deficiencies in accordance with this procedure.
 - b. Multiple part lines are not twisted around each other.
 - c. The primary attachment is centered over the platform.
 - d. If the load rope is slack, the hoisting system must be inspected to ensure that all ropes are properly seated on drums and in sheaves.

Any condition found during the trial lift and subsequent inspection(s) that fails to meet a requirement of this procedure or otherwise creates a safety hazard must be corrected before hoisting personnel.

Proof testing:

At each jobsite, prior to hoisting workers on the personnel platform, and after any repair or modification, the platform and rigging must be proof-tested to 125 percent of the platform's rated capacity. The proof test may be done concurrently with the trial lift.

The platform must be lowered by controlled load lowering; braked; and held in a suspended position for a minimum of 5 minutes with the test load evenly distributed on the platform.

After proof testing, a competent person must inspect the platform and rigging to determine if the test has been passed. If any deficiencies are found that pose a safety hazard, the platform and rigging cannot be used to hoist personnel unless the deficiencies are corrected; the test is repeated; and a competent person determines that the test has been passed.

Do not conduct personnel hoisting until the competent person determines that the platform and rigging have successfully passed the proof test.

Work practices:

Perform the hoisting of the personnel platform in a slow, controlled, cautious manner, with no sudden movements of the equipment or the platform.

Platform occupants must:

- Keep all parts of the body inside the platform during raising, lowering, and horizontal movement. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person.
- Not stand, sit on, or work from the top or intermediate rail or toe board, or use any other means/device to raise their working height.
- Not pull the platform out of plumb in relation to the hoisting equipment.

Before workers exit or enter a hoisted personnel platform that is not landed, the platform must be secured to the structure where the work is to be performed, unless securing to the structure would create a greater hazard.

If the platform is tied to the structure, the operator must not move the platform until the operator receives confirmation that it is freely suspended.

Use tag lines when necessary to control the platform.

Platforms without controls:

Where the platform is not equipped with controls, the equipment operator must remain at the equipment controls at all times on site and in view of the equipment while the platform is occupied.

Platforms with controls:

Where the platform is equipped with controls, the following must be met at all times while the platform is occupied:

- The occupant using the controls in the platform must be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation.
- The equipment operator must be at the equipment controls, must be on site and in view of the equipment.
- The platform operating manual must be in the platform or on the equipment.

Environmental conditions:

- Wind. When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person must determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation will not begin (or, if already in progress, will be terminated).
- Other weather and environmental conditions. A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operations will not begin (or, if already in progress, will be terminated).

Workers being hoisted must remain in direct communication with the signal person (where used), or the operator.

Fall protection:

- Except over water, workers occupying the personnel platform must be provided and use a personal fall arrest system. The system must be attached to a structural member within the personnel platform.
- The fall arrest system, including the attachment point (anchorage) used must meet the requirements of Fall Protection.

Other load lines:

- Do not make lifts on any other of the equipment's load lines while personnel are being hoisted, except in pile driving operations.
- Factory-produced boom-mounted personnel platforms that incorporate a winch as original equipment: Loads are permitted to be hoisted by such a winch while workers occupy the personnel platform only where the load on the winch line does not exceed 500 pounds, and does not exceed the rated capacity of the winch and platform.

Hoisting of employees while the equipment is traveling is prohibited.

Pre-lift meeting:

A pre-lift meeting will be:

- a. Held to review the applicable requirements of this policy and the procedures that will be followed.
- b. Attended by the equipment operator, signal person (if used for the lift), workers to be hoisted, and the person responsible for the task to be performed.

- c. Held prior to the trial lift at each new work location, and repeated for any workers newly assigned to the operation.

Hoisting personnel near power lines:

Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited.

Hoisting personnel in drill shafts:

When hoisting workers into and out of drill shafts that are up to and including 8 feet in diameter, the following requirements must be met:

- The worker must be in either a personnel platform or on a boatswain's chair.
- If using a personnel platform, the Personnel Hoisting requirements of this policy apply.

Hoisting personnel for pile-driving operations:

When hoisting a worker in pile-driving operations, the following requirements must be met:

- a. The worker must be in a personnel platform or boatswain's chair.
- b. For lattice-boom cranes and telescopic boom cranes, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking and use a spotter who is in direct communication with the operator to inform the operator when this point is reached.
- c. If using a personnel platform, the Personnel Hoisting requirements of this policy apply.
- d. If using a boatswain's chair:
 - "Platform" is used in these paragraphs; the term "boatswain's chair" applies in their place.
 - Worker must be hoisted in a slow, controlled descent and ascent.
 - The worker must use personal fall protection equipment, including a full body harness, independently attached to the lower load block or overhaul ball.
 - The fall protection equipment must meet the applicable Fall Protection requirements as specified in this policy as well as the fall protection section of this safety manual.

Floating Cranes/Derricks and Land Cranes/Derricks on Barges

This section contains supplemental requirements for floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels, or other means of flotation (vessel/flotation device).

The requirements of this section do not apply when using jacked barges when the jacks are deployed to the river/lake/sea-bed, and the barge is fully supported by the jacks.

Work area control:

The superintendent (or his/her designee) must either:

- a. Erect and maintain control lines, warning lines, railings, or similar barriers to mark the boundaries of the hazard areas; or
- b. The hazard areas must be clearly marked by a combination of warning signs and high-visibility markings on the equipment that identify the hazard areas. In addition, the superintendent (or his/her designee) must train the workers to understand what these markings signify.

Keep clear of the load.

In addition to the safety devices listed in the Safety Devices section of this procedure, the following safety devices are required:

- a. Barge, pontoon, vessel, or other means of flotation list and trim device will be located in the cab; or, where there is no cab, at the operator's station.
- b. Horn.
- c. Positive equipment house lock.
- d. Wind speed and direction indicator. A competent person will determine if wind is a factor that needs to be considered; if so, a wind speed and direction indicator will be used.

Operational aids:

- a. An anti-two-block device is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft.
- b. Load weighing and similar devices) does not apply to dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, and pile driving work.

Accessibility of procedures applicable to equipment operation:

If the crane/derrick has a cab, the procedures applicable to the operation of the equipment must be readily available in the cab. If the crane/derrick does not have a cab:

- a. Rated capacities (load charts) must be posted at the operator's station. If the operator's station is moveable (such as with pendant-controlled equipment), the load charts must be posted on the equipment.
- b. Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, must be readily available on board.

Inspections:

In addition to meeting the requirements of this procedure for inspecting the crane/derrick, the superintendent (or his/her designee) must ensure that the barge, pontoons, vessel, or other means of flotation used to support a floating crane/derrick or land crane/derrick is inspected as follows:

- a. *Shift.* For each shift inspection means used to secure/attach the equipment to the vessel/flotation device must be inspected for wear, corrosion, loose or missing fasteners, defective welds, and, where applicable, insufficient tension.

- b. *Monthly.* For each monthly inspection, inspect the vessel/flotation device used as follows:
- The means used to secure/attach the equipment to the vessel/flotation device must be inspected for wear, corrosion, loose or missing fasteners, defective welds, and, where applicable, insufficient tension.
 - The vessel/flotation device is not taking on water.
 - Deck load is properly secured.
 - Chain lockers, storage, fuel compartments and battening of hatches for serviceability as a water-tight appliance.
 - Firefighting and lifesaving equipment in place and functional.
- c. The shift and monthly inspections must be conducted by a competent person. If any deficiency is identified, an immediate determination will be made by a qualified person as to whether the deficiency constitutes a hazard. If the deficiency is determined to constitute a hazard, the vessel/flotation device must be removed from service until it has been corrected.
- d. *Annual:* The external portion of the barge, pontoons, vessel, or other means of flotation used must be inspected annually by a qualified person who has expertise with respect to vessels/flotation devices. The inspection must include the following items:
- The items identified in the above referenced shift and annual inspections.
 - Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions for significant corrosion, wear, deterioration, and deformation.
 - External evidence of leaks and structural damage.
 - Four-corner draft readings.
 - Firefighting equipment for serviceability.

Rescue skiffs, lifelines, work vests, life preservers and ring buoys must be inspected for proper condition.

If any deficiency is identified, an immediate determination will be made by the qualified person as to whether the deficiency constitutes a hazard; or, although not yet a hazard, needs to be monitored in the monthly inspections. If the deficiency is determined to constitute a hazard, the vessel/flotation device must be removed from service until it has been corrected.

If the qualified person determines that, although not currently a hazard, the deficiency needs to be monitored, the superintendent (or his/her designee) must ensure that the deficiency is checked in the monthly inspections.

- e. *Quadrennial:* Internal vessel/flotation devices must be inspected every four years. For this inspection, a marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices must survey the internal portion of the barge, pontoons, vessel, or other means of flotation.

If the surveyor identifies a deficiency, the surveyor must make an immediate determination as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate. If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.

- f. Documentation:* The monthly and annual inspections required in this section must be documented in accordance with this procedure. The quadrennial inspection required in this section must be documented in accordance with this procedure, except that the documentation for that inspection will be retained for a minimum of 4 years.

Working with a diver:

The following additional requirements apply when working with a diver in the water:

- a. If a crane/derrick is used to get a diver into and out of the water, it cannot be used for any other purpose until the diver is back on board. When used for more than one diver, it cannot be used for any other purpose until all divers are back on board.
- b. The operator must remain at the controls of the crane/derrick at all times.
- c. In addition to the signals requirements in this procedure; either:
 - A clear line of sight must be maintained between the operator and tender, or
 - The signals between the operator and tender must be transmitted electronically.
- d. The means used to secure the crane/derrick to the vessel/flotation device cannot allow any amount of shifting in any direction.

The superintendent (or his/her designee) must ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and in-transit load for the barge, pontoons, vessel, or other means of flotation are not exceeded or violated.

The requirements for maximum allowable list and maximum allowable trim as specified below must be met.

Rated Capacity	Maximum Allowable List	Maximum Allowable Trim
Equipment designed for marine use by permanent attachment (other than derricks):		
25 tons or less	5 degrees	5 degrees
Over 25 tons	7 degrees	7 degrees
Derricks designed for marine use by permanent attachment:		
Any rated capacity	10 degrees	10 degrees

If the equipment is superintendent (or his/her designee)-made, it cannot be used unless the superintendent (or his/her designee) has documents demonstrating that the load charts and applicable parameters for use meet the requirements of this section. Such documents must be signed by a registered professional engineer who is a qualified person with respect to the design of this type of equipment (including the means of flotation).

The barge, pontoons, vessel, or other means of flotation used must:

- Be structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derricks' maximum-rated capacity with all anticipated deck loads and ballasted compartments.
- Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free-surface effect.
- Have access to void compartments to allow for inspection and pumping.

Land cranes/derricks:

For land cranes/derricks used on barges, pontoons, vessels, or other means of flotation:

- a. The rated capacity of the equipment (load charts) applicable for use on land must be reduced to:
 - Account for increased loading from list, trim, wave action, and wind.
 - Be applicable to a specified location(s) on the specific barge, pontoons, vessel, or other means of flotation that will be used, under the expected environmental conditions.
 - Ensure that the conditions required in this section are met.
- b. The rated capacity modification required above must be done by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity, and the stability of vessels/flotation devices.
- c. List and trim.
 - The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel, or other means of flotation cannot exceed the amount necessary to ensure that the conditions in this section are met. In addition, the maximum allowable list and the maximum allowable trim cannot exceed the least of the following: 5 degrees, the amount specified by the crane/derrick manufacturer; or, where an amount is not so specified, the amount specified by the qualified person.
 - The maximum allowable list and the maximum allowable trim for the land-crane derrick cannot exceed the amount specified by the crane/derrick manufacturer; or, where an amount is not so specified, the amount specified by the qualified person.

d. The following conditions must be met:

- All deck surfaces of the barge, pontoons, vessel, or other means of flotation used must be above water.
- The entire bottom area of the barge, pontoons, vessel, or other means of flotation used must be submerged.

e. Physical attachment, corraling, rails system, and centerline cable system. The superintendent (or his/her designee) must meet the requirements in Option 1, Option 2, Option 3, or Option 4, as follows. Whichever option is used, the requirements of this section must also be met.

Option 1 – Physical attachment. The crane/derrick must be physically attached to the barge, pontoons, vessel, or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel flotation device (this type of system allows the crane/derrick to lift up slightly from the surface of the vessel/means of flotation), bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment.

Option 2 – Corraling. The crane/derrick must be prevented from shifting by installing barricade restraints (a corraling system). Corraling systems must not allow any amount of shifting in any direction by the equipment.

Option 3 – Rails. The crane/derrick must be prevented from shifting by being mounted on a rail system. Rail clamps and rail stops are required unless the system is designed to prevent movement during operation by other means.

Option 4 – Centerline cable system. The crane/derrick must be prevented from shifting by being mounted to a wire rope system. The wire rope system must meet the following requirements:

- The wire rope and attachments must be of sufficient size/strength to support the side load of crane/derrick.
- The wire rope must be physically attached to the vessel/flotation device.
- The wire rope must be attached to the crane/derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage, which will allow the crew to secure the crane/derrick from movement during operation, and to move the crane/derrick longitudinally along the vessel/flotation device for repositioning.
- A method will be employed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments.
- The crane/derrick must be secured from movement during operation.

The systems/means used to comply with Option 1, Option 2, Option 3, or Option 4 will be designed by a marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/derrick design.

Exception: For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement to use Option 1, Option 2, Option 3, or Option 4 of this section does not apply where the superintendent (or his/her designee) demonstrates implementation of a plan and procedures that meet the following requirements:

- A marine engineer or registered professional engineer familiar with floating crane/derrick design develops and signs a written plan for the use of the mobile auxiliary crane.
 - The plan must be designed so that the applicable requirements of this section will be met despite the position, travel, operation, and lack of physical attachment (or corraling, use of rails, or cable system) of the mobile auxiliary crane.
 - The plan must specify the areas of the deck where the mobile auxiliary crane is permitted to be positioned, travel, and operate, and the parameters/limitations of such movement and operation.
 - The deck must be marked to identify the permitted areas for positioning, travel, and operation.
 - The plans must all specify the dynamic/environmental conditions that must be present for use of the plan.
 - If the dynamic/environmental conditions in this section are exceeded, the mobile auxiliary crane must be physically attached or corralled in accordance with Option 1, Option 2, Option 3, or Option 4 (see this section).
- f. The barge, pontoons, vessel, or other means of flotation used must:
- Be structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments.
 - Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect.
 - Have access to void compartments to allow for inspection and pumping.

Dedicated Pile Drivers

The provisions of this standard apply to dedicated pile drivers, except as specified in this section. Information provided elsewhere in this standard on anti-two-block devices does not apply.

Operator Qualification and Certification applies, except that the qualification or certification will be for operation of either dedicated pile drivers, or equipment that is the most similar to dedicated pile drivers.

Boom-Truck Procedures

Prior to the manipulation of any controls, operators are to ensure that all personnel are clear of all moving parts. Workers working with boom truck operators must review the boom-truck hazard check list to heighten awareness while working on and around the boom truck. Access has been improved on boom trucks; these are the ONLY approved access and egress on/off the bed of the truck.

The operator must be in control of ALL operations associated with this equipment. The operator will ensure the following items have been performed and reviewed and signed by all parties working with boom truck PRIOR TO THE START OF OPERATIONS. The completed form (see Attachments) will be returned to the safety department at the end of each shift.

Boom free fall is prohibited in the following circumstances:

- An employee is in the fall zone of the boom or load.
- An employee is being hoisted.
- The load or boom is directly over a power line, or over any part of the area extending the Appendix Table A clearance distance to each side of the power line; or any part of the area extending the Table A clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load.
- The load is over a shaft, except where there are no employees in the shaft.
- The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load.
- Lifting operations are taking place in a refinery or tank farm.

In order prevent boom free fall, the boom hoist must have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:

Friction drums must have:

- A friction clutch and, in addition, a braking device, to allow for controlled boom lowering.
- A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device).

- Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure.
- Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this subpart.
- Hydraulic boom cylinders must have an integrally mounted holding device.

Hydraulic telescoping booms must have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.

Load lowering is required and free fall of the load line hoist is prohibited when:

- An employee is directly under the load.
- An employee is being hoisted.
- The load is directly over a power line, or over any part of the area extending the Appendix Table A clearance distance to each side of the power line; or any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line is within the radius of vertical travel of the load.
- The load is over a shaft.
- The load is over a cofferdam, except where there are no employees in the fall zone of the load.

Section 10 - Fall Protection Program

Fall Protection Standards

The Ruhlin Company's Fall Protection Program is to be followed on all Ruhlin projects for Ruhlin employees and for all subcontractors working on Ruhlin-controlled projects, both when Ruhlin is the General Contractor and when Ruhlin is the Construction Manager.

All Ruhlin projects shall adopt a 100% fall protection policy. Enforcement of employee compliance will be monitored, and the Ruhlin Disciplinary Program will be administered by Ruhlin project supervisory personnel.

Personal protective equipment such as full-body harnesses, lanyards, rope grabs, positioning devices and horizontal lifeline kits are to be ordered through the Ruhlin Safety Department only.

Purpose

It is **REQUIRED** by Ruhlin to utilize "100% positive protection and full-body harness while working from an **unprotected elevation of six (6) feet or more from the ground/floor**".

The purpose of the Fall Protection Program is:

- To become aware of the hazards associated with falls.
- To be able to select the proper fall protection equipment depending on the project or task hazards.
- To be able to properly use, maintain, store and inspect fall protection equipment.
- To comply with applicable OSHA and Ruhlin requirements.

Responsibilities

The following section describes the responsibilities for all site personnel.

Supervisor is responsible for:

- Knowing the principles of:

Fall hazard recognition, fall hazard analysis and fall hazard protection as needed for Ruhlin site activities.

- Providing personnel with proper fall arrest equipment and ensuring personnel receive training in the use of the equipment.
- Ensuring that all appropriate fall protection equipment is worn in those situations when and where it is required.

Site Personnel are responsible for:

- Adhering to the requirements of this program.
- Immediately reporting hazards or unsafe work practices associated with elevated work to the SUPERVISOR.

Contractors are responsible for:

- Adhering to OSHA and Ruhlin requirements regarding fall protection.

- Immediately reporting hazards or unsafe work practices associated with elevated work to their supervisor.
- Providing their own fall protection equipment which meets all state and federal requirements.
- Providing fall protection training to their employees.
- Contractors must instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to the work environment to control or eliminate any hazards or other exposure to illness or injury.

Personal Fall Protection Requirements

In general, employees on a walking/working surface 6 feet (1.8 m) or more above lower levels must be protected from falling by a guardrail system, safety net system, or personal fall arrest system. In the below specified circumstances, the following requirements apply:

- Unprotected Sides and Edges: Each employee on a walking/working surface with an unprotected side or edge that is 6 feet (1.8m) or more above a lower level must be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.
- Leading Edges: Each employee who is constructing a leading edge 6 feet (1.8 m) or more above lower levels must be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems. The same protection must also be provided for anyone who is on a walking/working surface 6 feet (1.8 m) or more above a lower level where leading edges are under construction, but who is not engaged in the leading-edge work.
 - Exception: When the employer can demonstrate that it is not feasible or creates a greater hazard to use these systems for unprotected sides and edges and leading edges, the employer shall develop and implement a fall protection plan.
- Hoist Areas: Each employee in a hoist area must be protected from falling 6 feet (1.8 m) or more to lower levels by guardrail systems or personal fall arrest systems. If the guardrail systems or portions thereof are removed to facilitate the hoisting operation and the employee must lean through the opening or out over the edge of the access opening that person must be protected from falling by a personal fall arrest system.
- Holes: Each employee on walking/working surfaces must be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes. Employees must also be protected from tripping in or stepping into or through holes (including skylights) by covers and from objects falling through holes (including skylights) by covers.
- Dangerous Equipment: Each employee 72 inches (6 feet or 1.8m) or more above dangerous equipment must be protected from fall hazards by guardrail systems, personal fall protection systems or safety nets. Employees who are less than 6 feet (1.8 m) above dangerous equipment must be protected from falling into or onto the dangerous equipment by guardrail systems or by equipment guards.
- Formwork and Reinforcing Steel: Each employee on the face of formwork or reinforcing steel must be protected from falling 6 feet (1.8 m) or more to lower levels by personal fall arrest systems, safety net systems, or positioning device systems.
- Ramps, Runways, And Other Walkways: Each employee on ramps, runways, and other walkways must be protected from falling 6 feet (1.8 m) or more to lower levels by guardrail systems.

- Excavations: Each employee at the edge of an excavation 6 feet (1.8 m) or more in depth must be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier. Each employee at the edge of a well, pit, shaft, and similar excavation 6 feet (1.8 m) or more in depth must be protected from falling by guardrail systems, fences, barricades, or covers.
- Overhandd Bricklaying: Each employee performing overhand bricklaying and related work 6 feet (1.8 m) or more above lower levels, must be protected from falling by guardrail systems, safety net systems, and personal fall arrest systems. Each employee reaching more than 10 inches (25 cm) below the level of the walking/working surface on which they are working, must be protected from falling by a guardrail system, safety net system, or personal fall arrest system.
- Roofing (Low-Slope Roofs): Each employee engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet (1.8 m) or more above lower levels must be protected from falling by guardrail systems, safety net systems, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system. On roofs 50-feet (15.25 m) or less in width, the use of a safety monitoring system alone [i.e. without the warning line system] is permitted.
 - Steep Roofs: Each employee on a steep roof with unprotected sides and edges 6 feet (1.8 m) or more above lower levels must be protected from falling by guardrail systems with toe boards, safety net systems, or personal fall arrest systems.
- Precast Concrete: Each employee engaged in the erection of precast concrete members (including, but not limited to the erection of wall panels, columns, beams, and floor and roof “tees”) and related operations such as grouting of precast concrete members, who is 6 feet (1.8 m) or more above lower levels must be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems, unless another provision in this policy provides for an alternative fall protection measure.
 - Exception: When the employer can demonstrate that it is not feasible or creates a greater hazard to use these systems for precast concrete operations, the employer shall develop and implement a fall protection plan.
- Residential Construction: Each employee engaged in residential construction activities 6 feet (1.8 m) or more above lower levels shall be protected by guardrail systems, safety net system, or personal fall arrest system unless another provision of this policy provides for an alternative fall protection measure.
 - Exception: When the employer can demonstrate that it is not feasible or creates a greater hazard to use these systems for residential construction, the employer shall develop and implement a fall protection plan.
- Wall Openings: Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet (1.8 m) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0 m) above the walking/working surface, must be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.

Falling Objects

Employees must wear a hard hat when they are exposed to falling objects. The following protective measures will also be used:

- Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels;
- Erect a canopy structure and keep potential falling objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced; or
- Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced.

Fall Protection Plan

When conventional fall protection is infeasible when employees are performing leading edge work, precast concrete erection work, or residential construction work, a qualified person will develop and maintain a site-specific fall protection plan. The plan will be available at the job site and implementation of the plan will be supervised by a competent person.

The fall protection plan will identify each location where conventional fall protection methods cannot be used and these locations shall be classified as controlled access zones, which will be defined by a control line or by other means that restricts the area. When control lines are used, they shall be erected not less than 6 feet or no more than 25 feet from the unprotected area and shall extend along the entire length of the unprotected edge and shall be approximately parallel to the unprotected edge. The plan identifies each employee who is designated to work in controlled access zones and no other employees may enter the controlled access zones.

Where no other alternative methods have been implemented, a safety monitoring system will be implemented. A competent person will be assigned to recognize fall hazards, warn employees if they are unaware of a fall hazard or are acting in an unsafe manner, be on the same working surface and in visual sight, stay close enough for verbal communication, and not have any other assignments that would take the monitor's attention from the monitoring function.

In the event an employee falls or some other related, serious incident occurs, i.e., a near-miss, an investigation will be conducted to determine the circumstances of the fall or other incident to determine if the fall protection plans need to be changed and the Company will implement those changes to prevent similar types of falls or incidents.

Personal Fall Arrest Systems

Personal fall arrest systems when stopping a fall shall:

- Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness.
- Be rigged such 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 a person travels to 3.5 feet.
- Have sufficient strength to withstand twice the potential impact energy of an employee free-falling a distance of 6 feet or the free-fall distance permitted by the system, whichever is less.
- The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level or above the wearer's head.
- If after a fall a person cannot readily climb or maneuver to safety, a provision for prompt rescue must be made.

Personal Fall Restraint Systems

Personal Fall Restraint Systems shall:

- Utilize body harnesses.
- Anchorage points used for fall restraint shall be capable of supporting four times the intended load.
- Restraint protection shall be rigged to allow the movement of personnel only as far as the sides of the working level/area.
- Site Specific plans must be developed by a qualified person.
- All fall protection equipment must meet the requirements of applicable ANSI, ASTM, or OSHA requirements.

Positioning Device Systems

Positioning Device Systems shall:

- Be inspected prior to each use for wear, damage and other deterioration, and defective components removed from service.
- Be rigged such that a person cannot free fall more than 2 feet.
- Use locking snap hooks.
- Utilize anchorage points that are capable of supporting two times the intended load or 3,000 pounds, whichever is greater.

Fall Arrest Systems Are Divided into Three Component Groups

1. Anchorage Point - This point must be capable of supporting 5,000 pounds per person.
2. Connecting Devices - This device can be a rope or a web lanyard, rope grab or retractable lifeline.
3. Body Wear - The full body harness is the only appropriate equipment to be worn in the event of a free fall.

Anchorage Selection

One of the most important aspects of personal fall protection systems is fully planning the system before it is put into use. In some cases, anchorages must be installed immediately prior to use.

- A registered professional engineer with experience in designing fall protection systems or another qualified person with appropriate education and experience must design the anchor point to be installed.
- In other cases, there will be a need to devise an anchor point from existing structures which must conform to the strength requirements specified by OSHA.

Connecting Devices

A connector is defined as a device used to couple (connect) components of a personal fall arrest system and positioning device system together. It includes the following:

- The connector may be an independent component (such as a carabiner) or an integral component (such as a buckle or D-ring sewn into a body belt) of the system.
- Connectors shall be drop forged, pressed, or formed steel or made of equivalent materials.
- Connectors shall have a corrosion-resistant finish and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.
- D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds.
- D-rings and snap hooks shall be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- Snap hooks shall be a locking type of snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member.
- Unless the snap hook is a locking type and designed for the following connections, snap hooks shall not be engaged:
 - Directly to webbing, rope, or wire rope.
 - To each other.
 - To a D-ring to which another snap hook or other connector is attached.
 - To a horizontal lifeline.
 - To any object which is incompatibly shaped or dimensioned in relation to the snap hook such that unintentional disengagement could occur by the connected object being able to depress the snap hook keeper and release itself.
- On suspended scaffolds or similar work platforms with horizontal lifelines, which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.

Deceleration Devices

A deceleration device is any mechanism that dissipates, or limits energy imposed on a person during fall arrest. Examples include:

- Rope grabs.
- Rip stitch lanyards.
- Special woven lanyards.
- Automatic self-retracting lifelines.

Lanyards

A lanyard is defined as a flexible rope, strap or webbing that connects a harness to a deceleration device, lifeline, or anchor.

- Lanyards that tie-off one person must have a minimum breaking strength of 5,000 pounds.
- Lanyards that automatically limit free-fall distance to 2 feet or less must have components capable of sustaining a minimum static tensile load of 3,000 pounds with the lanyard in the fully extended position.
- Non-retractable lanyards shall be approved by the safety department prior to use.

Lifelines

The following information details the various types of lifelines and requirements for lifelines:

- A lifeline is a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage..
- A lifeline that hangs vertically and is connected to one anchor is a vertical lifeline.
- A lifeline that stretches horizontally between two anchors is a horizontal lifeline.
- All lifelines must be protected against cuts or abrasions.
- Lifelines shall be secured above the point of operation to an anchorage or structural member capable of supporting a minimum dead weight of 5,400 pounds.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,400 pounds.
- When vertical lifelines are used, each employee shall be attached to a separate lifeline.
- Self-retracting lifelines and lanyards which automatically limit free-fall distance to 2 feet or less shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

Self-retracting lifelines and lanyards which do not limit free-fall distance to 2 feet or less, rip stitch lanyards, and tearing and deforming lanyards shall 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.

Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body harnesses shall be made from synthetic fibers.

Leading edge retractables shall be used during a leading edge application.

Body Harnesses

Body harnesses are straps that an individual wears to distribute fall-arresting forces over the thighs, waist, chest, shoulders, and pelvis. It attaches to other components of a personal fall-arrest system.

The maximum arresting force permitted for a body harness is 1,800 pounds.

The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level or above the wearer's head.

Harnesses and components shall be used only for personal protection (as part of a personal fall-arrest system or positioning device system) and not to hoist materials.

Guardrails

- The top edge of guardrails must be between 39 inches and 45 inches above the walking/working level.
- Guardrails must be capable of withstanding a force of at least 200 pounds applied within 2 inches of the top edge in any outward or downward direction. With 200 pounds of downward force, the top edge of the guardrail must not deflect to less than 39 inches above the walking/working level.
- Guardrail must be surfaced in a way that will prevent punctures, lacerations, and clothing snags.
- When a guardrail is used in hoist areas, a chain, gate or removable guardrail section must be placed across the access opening between guardrail sections when hoisting operations are not taking place.
- When guardrails are used at holes, they must be erected on all unprotected sides or edges.
- When guardrails are used to protect holes which are used for passage of materials, not more than two sides can be protected by removable guardrail.
- When guardrail systems are used around holes which are used as points of access (such as ladderways), they shall be provided with a gate, or be so offset that a person cannot walk directly into the hole.
- Guardrail systems used on ramps and runways shall be erected along each unprotected side or edge.
- Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists except as specified in this policy.

These guardrail guidelines do not apply to equipment covered by Section 9 (Crane Operations).

Protection from Falling Objects

- Toe boards, when used as falling object protection, must be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.
- Toe boards must be capable of withstanding, without failure, a force of at least 50 pounds (222 N) applied in any downward or outward direction at any point along the toeboard.
- Toe boards must be a minimum of 3 ½ inches (9 cm) in vertical height from their top edge to the level of the walking/working surface. They cannot have not more than ¼ inch (0.6 cm) clearance above the walking/working surface. They must be solid or have openings not over 1 inch (2.5 cm) in greatest dimension.
- Where tools, equipment, or materials are piled higher than the top edge of a toeboard, paneling or screening must be erected from the walking/working surface or toeboard to the top of a guardrail system's top rail or midrail, for a distance sufficient to protect employees below.
- Guardrail systems, when used as falling object protection, must have all openings small enough to prevent passage of potential falling objects.

Scaffolding

Using scaffolds is an essential part of our business, while a properly installed and utilized scaffold makes our job easier; scaffolds inherently have dangers that following the guidelines below will help reduce. Refer to Section 23 of this Safety Manual for more information on scaffolds. If you have any questions, call the safety department before proceeding.

1. All scaffolding will be placed on a firm, level surface as chosen by the qualified person/erector supervisor. Blocks, bricks or other unstable objects must not be used for scaffold footing.
2. Scaffolds and scaffolding components must be capable of supporting without failure its own weight and at least four (4) times the maximum intended load.
3. Scaffolding platforms must be provided with standard guard railing. This railing consists of:
 - a. Uprights every 8 feet.
 - b. Top rails 38-45 inches above the work surface (if manufactured before January 1, 2000, then 36-45 inches).
 - c. When mid-rails are used, they shall be installed at a height approximately midway between the top edge of the guardrail system and the platform surface.
 - d. Railing must be adequate and substantially built, able to withstand 200 pounds of force applied outward and downward.
4. Use ladders to gain access, **NOT** scaffolding frames.
5. Only "scaffold grade" planks will be used. **DO NOT** paint scaffold planks.
6. No more than a 1-inch gap between planks is authorized; all working levels of the scaffold will be fully planked and the front edge will be within 14 inches of the working surface.
7. Scaffold planks will extend a minimum of 6 inches and a maximum of 12 inches over outside supports.
8. Scaffolds will be secured to the building if over 20 feet in height and at intervals as required by OSHA
9. Scaffolding erectors will ensure scaffolding remains plumb and level.
10. A minimum 10 feet clearance must be maintained from overhead power lines.
11. Scaffolds must be erected and dismantled by qualified personnel.

Horizontal Lifeline and Guidelines

Always wear a full-body harness with a decelerating lanyard. The lanyard's small hook always goes on the harness while the large pelican hook always goes on the lifeline. As you walk the bridge girders, slide your lanyard through the open top of the upright post and pull your hook through to eliminate the need to disconnect at every post.

If there are any questions during installation or dismantling, contact the Safety Department for further guidance. When the bridge deck is completed, carefully return the pieces to the container for transportation to the next job or return to the Yard.

By taking care of the system you are ensuring the next individual will have a lifeline system that can be used and depended upon. One day **YOU** could be that next person; therefore, it is crucial to take care of this equipment.

Equipment Selection

The kind of personal fall arrest system selected should match the particular work situation, and any possible free-fall distance should be kept to a minimum.

Consideration should be given to the particular work environment.

- For example, the presence of sand, moisture, oil, grease etc. and its effect on the system, should be evaluated.
- Hot or cold environments may also have an adverse effect on the system.

Wire rope should not be used where an electrical hazard is anticipated.

As required by OSHA standards, the site must have the means available to promptly rescue a person should a fall occur, since the suspended person may not be able to reach a work level independently.

Where lanyards, connectors and lifelines are subject to damage by work operations such as welding, burning, chemical cleaning and sandblasting, the component should be protected or other securing systems should be used.

The site should fully evaluate the work conditions and environment (including seasonal weather changes) before selecting the appropriate personal fall protection system. Once in use, the system's effectiveness should be monitored. In some cases, a program for cleaning and maintenance of the system may be necessary.

Component Compatibility Considerations

All components of the personal fall arrest system are to be certified by the manufacturer as meeting OSHA specifications.

Ideally, a personal fall arrest system, connectors, lifelines, deceleration devices, and body harnesses are to be interchanged since some components wear out before others. It should be noted that not all components are interchangeable. For instance, a lanyard should not be connected between a harness and a deceleration device of the self-retracting type since this can result in additional free-fall for which the system was not designed.

Any substitution or change to a personal fall arrest system should be fully evaluated or tested by a competent or qualified person for anchorages to determine that it meets OSHA standards before the modified system is put into use.

Equipment Inspection

Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration and defective components shall be removed from service. Any component with any of the following conditions must be withdrawn from service immediately and should be tagged or marked as unusable or destroyed:

- Any significant defect, such as cuts, tears, abrasions, mold or undue stretching; alterations or additions which might affect its efficiency.
- Damage due to deterioration.
- Contact with fire, acids or other corrosives.
- Distorted hooks or faulty hook springs.

- Tongues unfitted to the shoulder of buckles.
- Loose or damaged mountings.
- Non-functioning parts.
- Wearing or internal deterioration in the ropes.
- Equipment that has gone through a fall.

A fall protection system is like a chain with each link being a part of the system. Individually, none of these components will provide protection from a fall. Used properly with each other, they form a Personal Fall Arrest System that becomes a critically important part of the "total fall protection system".

Training

The Ruhlin Company employees, contractors and subcontractors must be trained regarding fall hazards and fall protection by a competent person prior to any work where fall protection is required. This training will enable each employee to recognize the hazards of falling and shall train each employee in the procedures of this program to minimize these hazards. Periodic training must be conducted covering the program, use and inspection of equipment for those people who will frequently be working in risk areas. Retraining will be conducted when there are deficiencies in training, work place changes and/or fall protection systems or equipment changes that render previous training obsolete. All training shall be documented.

This training is to include:

- Nature of the fall hazards in the work area.
- Hazards related to ladders and stairways.
- Use and operation of personal fall protection to be used.
- Selection criteria.
- Use and limitations.
- Correct procedures for erecting, maintaining, disassembling and inspecting the systems.
- Alternative protection systems and procedures, if used.

Written certification records of training indicating who was trained, when training was conducted and dates of training, along with the signature of the person providing the training and the date employer determined training was deemed adequate.

SECTION 11 – Hot Work Program

Purpose

This program has been developed to prevent fires resulting from temporary operations that produce heat, sparks, hot slag, or have open flames. This includes, but is not limited to brazing, cutting, grinding, soldering, thawing pipes, torch applied roofing, and welding.

This program applies to Ruhlin employees and subcontractors who perform or supervise hot work activities in existing structures, new construction, and new construction attached to existing structures that is under occupancy, areas with an abundance of combustible material, and/or as deemed necessary due to any hazard or risk identified during the work process.

This program does not apply to areas that are specifically designed and equipped for such operations. (i.e. designated welding areas)

Responsibilities

1. Superintendents:

- a. Ensure that all employees and subcontractors are following hot work procedures.
- b. Ensure that a Hot Work Permit is issued prior to the start of work.
- c. Ensure that all cutting and welding equipment is in good repair.
- d. Ensure that employees are properly trained in the hot work program and in the operation of the equipment used in the hot work process.
- e. Update work permits as needed.

2. Hot Work Operator:

- a. Obtain a Hot Work Permit prior to starting work.
- b. Ensure that all cutting and welding equipment is in good repair. Remove defective equipment from service.
- c. Protect nearby personnel and the general public against heat and sparks when working in occupied buildings.
- d. Follow and adhere to the hot work procedures.

3. Fire Watch Designee:

- a. Ensure proper firefighting equipment is readily available.

- b. Inspect hot work area before any hot work is conducted.
- c. Ensure that safe conditions are maintained during hot work operations.
- d. Extinguish incipient stage fires only.
- e. Contact local authorities if the fire passes the incipient stage fire.
- f. Stay on watch at least 30 minutes after hot work has been completed.

General Hot Work Procedures and Requirements

1. Hot work should not be performed if the work can be avoided or can be performed in a safer manner. When practical, objects to be welded, cut, or heated must be moved to a designated area. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.
2. If hot work must be performed, a Hot Work Permit must be obtained before the hot work begins.
3. All instructions must be followed and all checklists filled out on the Hot Work Permit prior to performing any hot work.
4. A Hot Work Permit will be completed and posted at the hot work site after it has been signed by the superintendent. The permit is not valid beyond one work shift and is valid only for the date and time specified on the permit. A copy of the permit must remain at the hot work location until the hot work is completed. Upon completion of the hot work the permit must be forwarded to the safety department.
5. A fire watch is **REQUIRED** whenever hot work is done in an area where one or more of the following conditions exists:
 - A. Any combustible materials located within 35 feet of the point of operation;
 - B. Wall or floor openings within 35 feet with expose combustibles in adjacent areas including confined spaces.
 - C. Combustibles that could be ignited by conduction or radiation through metal partitions, walls, ceilings, or roofs.
6. Maintain a Fire Watch Designee at the scene for at least 30 minutes after the hot work has stopped.
7. All personnel (employees, subcontractors, building occupants, etc.) must be suitably protected against hazards generated by the work, (i.e. heat, sparks, fumes, welding rays, etc.). This may include but is not limited to, the use of personal protective equipment, shields, screens, or local exhaust ventilation.

8. Conveyor systems that might carry sparks to distant combustibles shall be shut down.
9. Exhaust systems that might carry sparks to distant combustibles shall be shielded.
10. Hot Work Operators are not to use equipment in need of repair or that malfunction during operations. Any equipment defects or other safety hazards are to be reported to the supervisors and all work shall cease until defects, equipment repairs, and/or hazards are corrected.
11. After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers.

Prohibited Conditions

A Hot Work Permit will not be issued if any of the following conditions exist:

1. Appropriate firefighting equipment such as portable fire extinguishers, class 2 standpipe, or small hose systems are not readily available.
2. Combustible or flammable materials are within 35 feet and cannot be moved or protected.
3. The presence of an explosive atmosphere (i.e. mixtures of flammable gases, vapors, liquids, or dusts).
4. Floor and wall openings cannot be covered including ductwork.
5. Cutting or welding on pipes or other metals can conduct enough heat to ignite nearby combustible materials.
6. Any condition that could result in undue hazards by performing the work.

Use and Storage of Compressed Gas Cylinders

These guidelines must be followed in order to prevent an unsafe condition or incident:

1. Compressed gas cylinders shall have legible Globally Harmonized System (GHS) labels.
2. Under no condition shall acetylene be generated, piped or utilized at a pressure in excess of 15 pounds per square inch gauge pressure.
3. Storage -
 - a. Cylinders shall be stored in an upright position and secured.
 - b. Valve protection caps shall remain on cylinders while in storage or transit.

- c. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible material (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire resistance rating of at least one-half hour. Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields shall be provided.
 - d. Cylinder storage area shall be a minimum of 20 feet from any buildings, job trailers or combustible materials.
 - e. Storage of propane cylinders inside of job trailers is prohibited.
 - f. Cylinders shall be returned to the designated storage area when not in use or empty.
- 4. Welders and cutters shall close valves on oxygen and acetylene cylinders and bleed-off hose pressure at the end of each work shift to prevent malfunction of the regulators.
 - 5. When cylinders are hoisted, they shall be secured with an approved hoisting attachment. Cylinders **shall not** be hoisted by means of choker slings. When cylinders are transported by powered vehicles, they shall be secured in a vertical position.
 - 6. Storage locations shall be provided with at least one appropriately rated fire extinguisher.

Welding and Cutting

Before Beginning Welding Operations

- 1. Clear the floor of paper, wood shavings, and other combustible materials for a space of 35 feet. Move other combustible materials at least 35 feet from the work area or cover them with fire resistant shields. Combustible floors shall be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock.
- 2. Cover the cracks and openings in floors to prevent sparks from falling through to lower floors. If it is not possible, check lower floors to ensure there are no combustibles which could be exposed to sparks.
- 3. Whenever possible, move welding operations to a safe location free of combustibles.
- 4. Cover wooden floors with a fire-resistant material.
- 5. Cover nearby combustible walls and partitions with fire resistant shields. If the walls are made of metal, remove the combustible material from the other side. If combustible materials cannot be removed, a fire watch is required.

6. Shut down ventilation and close ducts if there is a chance sparks could be transmitted to other areas.
7. Maintain a fire watch during hot work and for 30 minutes after the work is completed.
8. Fire Watch Designee shall be trained in the proper use of fire extinguishing equipment and how to sound fire alarms.
9. Portable welding equipment shall be equipped with a fire extinguisher.
10. Before a regulator to a cylinder valve is connected, the valve shall be opened slightly and closed immediately. (This action is generally termed “cracking” and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition. The cylinder valve should always be opened slowly to prevent damage to the regulator.

Welding Equipment

1. Check both the weld lead and the work lead for damaged insulation and exposed wires.
2. Check the electrode holders for loose or exposed connections. Do not splice weld lead within 10 feet of the holder.
3. Never coil the electrode cable around your body.
4. Check the composition of fluxes, rods and coatings before, during, and after welding operations.
5. Ground both the frame of the welding equipment and the metal being welded. Do not attach ground wires to pipes carrying gas or flammable liquids, or to metal conduits. Ground as close to the machine as possible.
6. Do not weld on wet floors; remove water from the work area or insulate the work environment.
7. Do not allow metal parts in contact with the electrode to touch your skin or wet clothing. Wear dry work gloves.
8. Do not cool electrode holders by putting them in water.
9. Disconnect the welding equipment when changing electrodes in gas tungsten arc electrode holders.

Personal Protective Equipment

Personal protective equipment for welders is required to protect the operator's eyes from radiation and to protect the operator from hot weld slag.

Helmets or hand shields shall be used during all arc welding or arc cutting operations. Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. All operators and attendants of resistance welding or resistance brazing equipment shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes, as required.

Sunglasses or colored glass will not provide sufficient protection against radiation. Specially designed helmets equipped with filter plates to protect against ultraviolet, infrared and visible radiation must be worn when arc welding. Refer to the table below when choosing the correct filter plate shades:

WELDING OPERATION-Table E1	SHADE NUMBER
Shielded metal-arc welding 1/16", 3/32", 1/8", 5/32" diameter electrodes.....	10
Gas-shielded arc welding (nonferrous) 1/16", 3/32", 1/8", 5/32" diameter electrodes.....	11
Gas-shielded arc welding (ferrous) 1/16", 3/32", 1/8", 5/32" diameter electrodes.....	12
Shielded metal-arc welding 3/16", 7/32", 1/4" diameter electrodes.....	12
5/16", 3/8" diameter electrodes.....	14
Atomic hydrogen welding.....	10-14
Carbon-arc welding.....	14
Soldering.....	2
Torch brazing.....	3 or 4
Light cutting, up to 1".....	3 or 4
Medium cutting, 1" to 6".....	4 or 5
Heavy cutting, over 6".....	5 or 6
Gas welding (light), up to 1/8".....	4 or 5
Gas welding (medium), 1/8" to 1/2".....	5 or 6
Gas welding (heavy), over 1/2".....	6 or 8

When performing hot work activities, employees shall wear flame-resistant clothing. The safety department shall be consulted for specific PPE needs for hot work operations.

Cutting

1. Know the correct procedure for setting up cutting operations, turning on the torch, and completing the cut before attempting to use the torch-cutting machine. If you have questions on proper set-up, contact site supervision.
2. Inspect the torch body, gauges, and hoses for damage or defects before making any cuts. Immediately report any compressed gas leaks.

3. Keep oil and grease away from all oxygen valve connections, hoses, and gauges.
4. Make sure all hose and torch body connections are tight and not cross threaded. Remember that gas hose connections have left-handed threads. Never interchange oxygen hoses with a gas hoses.
5. When setting up for a cut, visually check for congestion, combustibles, and other conditions that could impair the safety of the operation.
6. Wear proper protective equipment when working on torch cutting operations. Properly tinted safety glasses with side shields (Refer to table E-1 above), safety shoes, gloves and clothing as required. Do not wear clothing with synthetic materials that can burn rapidly when exposed to sparks.
7. Be alert for leaks when opening natural gas valves. If a strong odor of gas is present, shut the system off and investigate the problem.
8. When lighting the torch, open the torch fuel gas valve one-half turn, reduce the fuel pressure to get rid of black smoke, and open the torch oxygen valve to get the proper flame. If the torch backfires, try relighting. If there is another flashback, stop use immediately and contact site supervision.
9. During cutting, keep hands and arms, and fuel hoses out of the scrap fall area. Be alert for sparks during the operation.
10. When torch-cutting lead painted steel, stainless steel, or galvanized materials, wear a properly fitted respirator containing the appropriate cartridges. For more information, see the Respiratory Protection Program (Section 7).
11. Make sure that a fire extinguisher is readily available during cutting operations. The fire extinguisher should be located in close proximity and easily accessible.
12. After making the cut, turn off torch valves and fuel/oxygen supply. Mark all hot materials with the word "HOT" when other employees are working close to this operation.
13. Always be on the alert for pinch points caused from materials being placed onto the torch table by manual or mechanical means. Never place your fingers into an area that could result in a crush injury.
14. Torch bodies and tips must be kept clean if they are going to do the right job. Make sure that the tip and the torch body are in good condition. Do not use cigarettes, matches or cigarette lighters when lighting torches. The best method is to use the spark lighter.
15. When burning in an elevated man-lift, always have a spotter below. Make sure all hoses in the basket are protected from damages due to hot slag.

Hexavalent Chromium

Hexavalent Chromium is a toxic form of the element chromium. Hexavalent Chromium compounds are man-made and widely used in many different industries, such as:

- Chromates added as anti-corrosive agents to paints, primers and other surface coatings
- Chrome plating by depositing chromium metal onto an item's surface using a solution of chromic acid
- Fume from welding stainless steel or nonferrous chromium alloys

The Company will conduct air monitoring if there is a suspected risk of exposure to Hexavalent Chromium to any employee that is welding or cutting.

The Company will take the following steps to protect employees from health hazards caused by Hexavalent Chromium:

- Limit eight-hour time-weighted average hexavalent chromium exposure in the workplace to 5 micrograms or less per cubic meter of air.
- Perform periodic monitoring at least every 6 months if initial monitoring shows employee exposure at or above the action level (2.5 micrograms per cubic meter of air calculated as an 8-hour time-weighted average).
- Provide appropriate personal protective clothing and equipment when there is likely to be a hazard present from skin or eye contact.
- Implement good personal hygiene and housekeeping practices to prevent hexavalent chromium exposure.
- Prohibit employee rotation as a method to achieve compliance with the exposure limit (PEL).
- Provide respiratory protection as specified in the standard.
- Medical examinations will be made available to employees exposed to Hexavalent Chromium:
 - Within 30 days of initial assignment
 - Annually
 - Emergency situations
 - Employees who experience signs or symptoms
 - Employees at or above the action level for 30 or more days a year
 - Termination of employment.

OSHA Hexavalent Chromium	
PEL (Permissible Exposure Limit)	AL (Action Level)
5.0 µg/m ³ - TWA	2.5 µg/m ³ - TWA

If exposure limits are above the OSHA posted TWA/TLV, engineering controls and/or PPE will be required.

A site-specific plan will be developed for work that exposes employees to Hexavalent Chromium.

For additional information see the OSHA Hexavalent Chromium Standard (29 CFR 1926.1126).

Cadmium

Cadmium and its compounds are highly toxic and exposure to this metal is known to cause cancer. Cadmium targets the body's cardiovascular, renal, gastrointestinal, neurological, reproductive, and respiratory systems. Cadmium is used extensively in electroplating and is found in some industrial plants. Operations involving removal of Cadmium paints by scraping or blasting may pose a significant hazard.

Employees must wear Personal Protective Equipment (PPE) when exposure to Cadmium is over the Permissible Exposure Limit (PEL). Employee exposure to Cadmium should not exceed five micrograms per cubic meter of air ($5 \mu\text{g}/\text{m}^3$). Proper air monitoring should be performed if Cadmium is suspected in a work area or on a work surface.

OSHA Cadmium	
PEL (Permissible Exposure Limit)	AL (Action Level)
$5.0 \mu\text{g}/\text{m}^3$ - TWA	$2.5 \mu\text{g}/\text{m}^3$ - TWA

Personal Protective Equipment

Employees working in areas where exposure to cadmium is expected to exceed the PEL, or where skin and/or eye irritation can result from cadmium exposure, will be provided (at no cost) with respiratory protection and other protective work clothing. Equipment to prevent contamination of both the employee and the employee's clothing will also be provided.

Examples of appropriate personal protective equipment include: coveralls, gloves, head coverings, boots, face shields, and goggles. The Company will provide and maintain the necessary personal protective equipment to employees at no cost. And when necessary, the Company will also provide changing rooms, hand washing facilities, and showers.

A site-specific plan will be developed for work that exposes employees to Cadmium.

For additional information see the OSHA Cadmium Standard (29 CFR 1926.1127).

SECTION 12 - Confined Space

Introduction

A **confined space** is a space whose configuration and/or contents may present special dangers not found in normal work areas. Confined spaces may be poorly ventilated and, as a result, contain insufficient oxygen or hazardous levels of toxic gases. Working in a tight space can prevent a worker from keeping a safe distance from mechanical and electrical hazards in the space. Fumes from a flammable liquid that is used in a poorly ventilated area can reach explosive levels. Such hazards endanger both the workers in the confined space and others who become exposed to the hazards when they attempt to rescue injured workers. In a number of cases, rescue workers have themselves died or been injured because they did not have the training and equipment necessary to conduct the rescue safely.

Because confined spaces are potentially dangerous, The Ruhlin Company must evaluate all confined spaces in which our employees work to determine whether hazards exist or whether the work to be done in the space can create hazards. If a confined space contains an actual or potential hazard that can cause death, injury or acute illness, incapacitation, entrapment, or otherwise interfere with a worker's ability to leave the space in an emergency, it is a **permit-required confined space**, or **permit space**.

The Ruhlin Company must take certain precautions whenever workers enter a permit space. These include:

1. specifying the precautions to be taken to protect the workers in the space;
2. training the workers who are covered by the standard to give them the knowledge to protect themselves and others; and
3. planning how to rescue injured workers promptly and safely.

Purpose

This policy is intended to help comply with the Confined Spaces standard. It addresses the most common compliance issues that The Ruhlin Company will face and provides sufficient detail to serve as a useful compliance guide. It does not, however, describe all provisions of the standard or alter the compliance responsibilities set forth in the standard, which is published at 29 CFR 1926.1200-1213.

Please contact The Ruhlin Safety Department with any questions concerning the Confined Spaces standard.

Confined Spaces and Permit Spaces

The distinction between *confined spaces* and *permit spaces* is crucial to understanding what the standard requires. Briefly, a *permit space* is a confined space containing a serious hazard or hazards. Employees must evaluate all *confined spaces* to determine whether they are *permit spaces* but must take steps to protect workers only if a space is classified as a *permit space*.

What is a "confined space?"

A **confined space** is a space that:

1. Is large enough and so arranged that an employee can bodily enter it;
2. Has limited or restricted means for entry and exit; and
3. Is not designed for continuous employee occupancy.

A space is **large enough to enter** if a person's whole body would fit both:

- Inside the space, and through the opening

OSHA defines "entry" as occurring as soon as any part of the entrant's body breaks the plane of an opening into the confined space. For example:

- The air within a five-gallon pail is hazardous, that pail is not a confined space because your body would not fit inside.
- If you weld rebar across the opening on six-inch centers, this behavior is not entry, and the task can be done by one person without a permit.

A space has a **limited or restricted means of exit** if a person could not readily escape from the space in an emergency. Any of the following factors indicate that a work space has a limited or restricted means of exit:

- The need to use a ladder or movable stairs, or stairs that are narrow or twisted;
- A door that is difficult to open or a doorway that is too small to exit while walking upright;
- Obstructions such as pipes, conduits, ducts, or materials that a worker would need to crawl over or under or squeeze around;
- The need to travel a long distance to a point of safety.

A space is **not designed for continuous employee occupancy** if it is not designed with features such as ventilation, lighting, and sufficient room to work and move about that are needed if people are to occupy it continuously.

Confined spaces that may be found on construction sites include, but are not limited to:

- Manholes (such as sewer, storm drain, electrical, communication, or other utility)
- Sewers
- Storm drains
- Water mains
- Lift stations
- Tanks (such as fuel, chemical, water or other liquid, solid or gas)
- Pits (such as elevator, escalator pump, valve or other equipment)
- Concrete pier columns
- Heating, ventilation, and air-conditioning (HVAC) ducts
- Precast concrete and other pre-formed manhole units
- Drilled shafts
- Enclosed beams
- Digesters
- Forms
- Air preheaters
- Turbines
- Crawl spaces
- Attics
- Basements (before steps are installed)

What is a "permit space?"

A **permit-required confined space (permit space)** is a confined space that:

1. Contains or has the potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant;
3. Has an internal configuration 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
4. Contains any other recognized serious safety or health hazard such as exposed wiring or anything that interferes with an employee's ability to exit without assistance.

As mentioned above, steps must be taken to protect workers only when working in a permit space. In addition, effective steps must be taken to prevent entry from unauthorized personnel entering the space.

Other Confined Spaces

What is an "alternate confined space?"

An **alternate confined space** is a confined space that:

1. The only hazard is a potential or actual hazardous atmosphere which can be controlled solely through continuous forced air ventilation.

NOTE: If an initial entry of the space is necessary to obtain the data required above, the entry must be made under *Permit Required Confined Space* conditions and then the space may be reclassified after information is obtained.

What is a "non-permit confined space?"

A **non-permit confined space** is a confined space that does not meet the requirements for a permit-required confined space. Non-permit confined spaces do not contain any recognized serious potential dangers or hazards. However, if a hazard is introduced into a non-permit space, the space will likely have to be reclassified as a *permit required confined space*.

Three Categories of Confined Spaces

Confined Spaces	Protective Action
<i>Permit-Required Confined Spaces</i>	Follow the written permit required confined space program, or permit space program. The permit required confined space program specifies, among other things, how the employer will: 1) regulate worker entry into permit spaces; and 2) control permit space hazards. All employers must inform their workers about the locations and dangers of each permit space and take additional steps to ensure that workers do not enter permit spaces if they are not authorized to do so.
<i>Non-Permit Confined Spaces</i>	Spaces that contain only physical (non-atmospheric) hazards. If the physical hazards are eliminated or isolated so that they no longer present a hazard, the space may be reclassified as a non-permit space, with no further precautions required. However, if a hazard is introduced into a non-permit confined space, the space will likely have to be reclassified as a permit- required confined space.
<i>Alternate Confined Spaces</i>	Spaces containing an atmospheric hazard that can be controlled by continuous forced air ventilation. As long as the atmospheric hazard is controlled by continuous forced air ventilation and any physical hazards are eliminated or isolated, the alternate confined space program may be followed instead of the permit-required confined space program, although the space is still classified as a permit space.

Work Covered by the Standard

The Confined Spaces standard applies to construction work performed in confined spaces, except for certain construction activities that are subject to confined space provisions in other OSHA construction standards. The activities excluded from this standard are:

- Diving - regulated by 29 CFR Part 1926 subpart Y.
- Excavations - regulated by 29 CFR Part 1926 subpart P.
- Underground Construction, Caissons, Cofferdams and Compressed Air - regulated by 29 CFR Part 1926 subpart S.

Note, however, that employers engaged in these activities must comply with this standard if their workers are exposed to confined space hazards that are not addressed by the standards listed above.

For example, the Excavation standard (subpart P) protects workers in a trench (a type of confined space) against the hazards associated with the trench itself. However, the Excavation standard would not protect workers *inside* a sewer line that is installed in an open trench from confined space hazards associated with the sewer line. The employer must comply with the excavation standard to protect workers in the trench and with the Confined Spaces standard to protect workers in the sewer line.

Employers engaged in the following activities in confined spaces must also comply with other applicable OSHA standards, such as:

- Process Safety Management: 29 CFR 1926.64.
- Hazardous Waste Operations: 29 CFR 1926.65.
- Welding and Cutting: 29 CFR 1926 Subpart J.

Classification of a Confined Space

All employers engaged in construction work must:

1. Identify any confined spaces in which their workers will be working, and
2. Determine the classification of the confined space (see Classification of a Confined Space Report in attachments)

Employer Responsibilities

When employees work in permit required confined spaces (PRCS), they must be protected against the hazards within those spaces. To ensure such protection, 29 CFR 1926.1200-1213 standard imposes duties on "entry employers," "host employers," and "controlling contractors."

If an employer knows that a confined space is present at its worksite, it must inform and train its employees of the locations and dangers of the confined spaces. The employer must post confined space warning signs on all confined spaces. In addition, where an employer's workers have no work to do in the space, that employer must ensure that its workers stay out.

Permit Space Entry Communication and Coordination

An **entry employer** is an employer who decides that an employee it directs will enter a permit space. There may be more than one entry employer if the employees of multiple employers must enter the space. Each entry employer is responsible for complying with all provisions in the confined spaces standard except those specifically imposed on the controlling contractor and host employer. The entry employer must obtain all of the controlling contractor's information regarding permit space hazards and entry operations and inform the controlling contractor of the permit space program that the entry employer will follow, including any hazards likely to be confronted or created in each permit space. After entry, the entry employer must inform the controlling contractor in a timely manner of the permit space program followed and of any hazards confronted or created in the permit space during entry operations.

A **controlling contractor** is the employer with overall responsibility for construction at the worksite. The controlling contractor is responsible for coordinating entry operations when there is more than one entry employer and when other activities on the site could foreseeably result in a hazard in the confined space. In addition, controlling contractors must obtain the host employer's information about the permit space hazards and previous entry operations and provide such information, and any additional information the controlling contractor has, to each entity entering a permit space. After entry, the controlling contractor must debrief each entity that entered a permit space regarding the permit space program followed and any hazards confronted or created in the permit space during entry operations. The controlling contractor must apprise the host employer of the information exchanged with the entry entities.

A **host employer** is the employer that owns or manages the property where the construction work is taking place. Where the host employer has information about confined space hazards on the site, it must share that information with the controlling contractor, who is then responsible for sharing it with the other employers on the site. The host employer must share the location of each known permit space, the hazards or potential hazards in each space or the reason it is a permit space, and any precautions that the host employer or any previous controlling contractor or entry employer implemented for the protection of employees in the permit space.

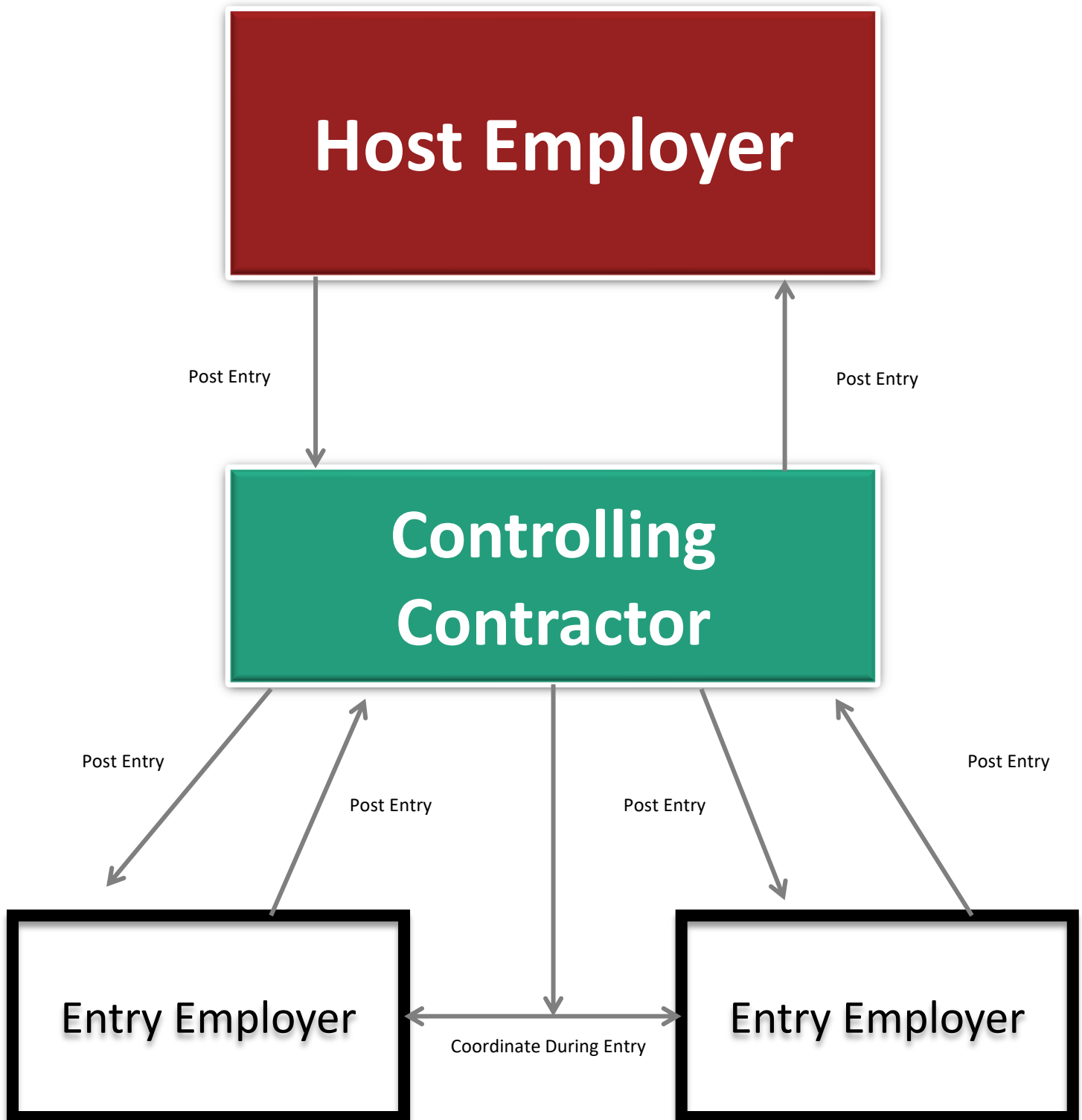
In no case will there be more than one host employer. If the owner of the property on which the construction activity occurs has contracted with another employer to manage the property and provided any relevant information it has about confined spaces on the property to the managing entity, the managing entity is the host employer. Absent such a contract and exchange of information, the owner of the property is the host employer. If the controlling contractor owns or manages the property, it is both the controlling contractor and the host employer.

The following table summarizes the responsibilities of the various categories of employer.

Duties of Employers under the Confined Spaces Standard

Category of Employer:	Employer Responsibilities
Host Employers	Share information it has about confined space hazards with the controlling contractor.
Controlling Contractors	- Share information it has about confined space hazards with entry employers and other employers whose activities may create hazards in the confined space. - Coordinate entry operations when there is more than one entry employer. - Coordinate operations when confined space entry occurs during other activities at the site that might create a hazard in the space.
Entry Employers	- Protect workers against confined space hazards by complying with the standard. - Inform controlling contractor of the program followed and hazards encountered in permit required confined spaces.
All Employers	- Identify all confined spaces in which their workers may work and determine whether any are permit spaces. If its workers are supposed to enter permit spaces, the employer is an "entry employer." - Employers who are not "entry employers" must make sure their workers stay out of any confined spaces present on the site, unless the workers are authorized for entry.

Confined Space Entry Communication and Coordination



Identification

Employers must take the following steps to protect workers against confined space hazards.

Prior to start of work each employer must ensure that a **competent person** identifies all confined spaces in which its employees may work.

A **competent person** is "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 the authority to take prompt corrective measures to eliminate them."

The various contractors on a site may use a single individual to perform the duties required of a competent person.

If confined spaces are present, each employer must have the competent person determine whether the confined spaces are "permit spaces" (PRCS).

A PRCS has one or more of the following characteristics:

1. contains or has the potential to contain a hazardous atmosphere;
2. contains a material that has the potential for engulfing an entrant;
3. has an internal configuration 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
4. contains any other recognized serious safety or health hazard.

If the workplace contains a PRCS, the entry employer must protect its workers against the hazards in the confined space.

The protection that is required depends on the type and severity of the hazards present in the confined space.

The **entry employer** must train workers who work in a confined space.

The entry employer must identify:

1. the worker(s) authorized to enter the space;
2. an attendant who must remain outside the space and monitor the workers within; and
3. an entry supervisor with overall responsibility for seeing that the program is followed. (The duties of these workers are discussed later).

All workers covered by the confined space program, including entrants, attendants, entry supervisors, and rescue workers, must be trained to have the knowledge and skills needed to recognize confined space hazards and protect themselves and their co-workers against PRCS hazards.

The entry employer must plan to rescue entrants who cannot exit the space under their own power.

The entry employer must ensure that a worker who becomes sick or injured in a confined space can be rescued in a safe and timely manner. Its PRCS program must specify whether the employer plans to use its own workers, a rescue team of another on-site employer, or an outside rescue service if the need for a rescue arises.

Identifying Permit Required Confined Spaces (PRCS)

Identification of PRCS is critical because it determines whether precautions are required before employees enter the space. Failure to take those precautions can result in death or serious injury to workers.

Each employer engaged in construction work must ensure that a **competent person** identifies all confined spaces in which its workers may work on its worksite and evaluates each confined space to determine whether it is a PRCS.

The competent person must answer the following four questions to determine whether a confined space is a PRCS. If the answer to one or more of the questions is "yes," the space is a PRCS.

Does the space contain or have the potential to contain a hazardous atmosphere?

Most deaths and injuries in confined spaces result from atmospheric hazards. Such hazards include insufficient oxygen and toxic or flammable chemicals. The competent person must evaluate, including testing as necessary, whether the following hazards are or may be present, before workers enter the space:

- Oxygen deficiency (concentration less than 19.5 percent) or excess (concentration above 23.5 percent).
- Concentration of any flammable gas, vapors, or mists in excess of 10 percent of its lower explosive limit.
- Airborne combustible dust at a concentration equal to or greater than its lower explosive limit.
- Atmospheric concentration of any substance that can cause death, incapacitation, impairment of ability to self-rescue, injury or acute illness.

In evaluating atmospheric hazards, the competent person must consider:

1. the hazards present in the space before any workers enter; and
2. whether the work that will be performed can introduce toxic, flammable, or combustible air contaminants or lead to an excess or deficiency of oxygen.

To perform the second part of this evaluation, the competent person must be familiar with the work to be done in the space and the potential for that work to introduce atmospheric hazards. For example, a confined space that is safe when entered can become deadly if inert gas welding inside the space leads to the inert gas displacing oxygen in the worker's breathing zone.

The competent person must also evaluate chemicals for which no PEL is set by OSHA. For example, if a product's label or the product manufacturer's safety data sheet warns that a product is harmful if inhaled and should not be used without adequate ventilation, the competent person must evaluate whether use of that product in a confined space requires the space to be classified as a permit space.

Does the space contain a material with the potential to engulf an entrant?

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, crushing, or the substance suffocates the individual. The competent person must consider whether any liquid or flowable solid (such as sand) could enter the space. Any pipe or manhole in an operating water or sewer system in which a worker works is a confined space that could potentially engulf an entrant and must be treated as a permit space.

Does the space have an internal configuration such that an entrant could be trapped by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section?

An area of a confined space with a small cross section can develop a hazardous atmosphere if ventilation is inadequate. In addition, a space of this configuration could prevent an injured worker from escaping the space and add to the difficulty of rescuing the worker.

Does the space contain any other recognized serious safety or health hazard(s) that pose an immediate danger to a worker's life or health or would impair the worker's ability to escape from the space in the event of injury?

Hazards that the competent person should consider include fire and explosion hazards, the presence of mechanical, electrical, hydraulic and pneumatic energy, temperature extremes, radiation, noise, corrosive chemicals, and biological hazards (such as venomous animals or insects).

If a workplace contains a confined space or PRCS, the employer must inform workers in the vicinity of the location of the danger posed by each space. This can be done by posting warning signs at each possible point of entry, or by other equally effective means.

In addition to posting warning signs, an employer who learns about a permit space must also notify its employees' authorized representative and the controlling contractor of the location and danger of the space. The controlling contractor must then notify other employers on the site, whose activities could create a hazard in the permit space, of the presence and location of such spaces and the hazards associated with them before workers enter the space.



An employer whose workers will not be authorized to enter a permit space must take steps in addition to posting the warnings above, to prevent workers from entering the space. An employer might accomplish this by providing effective training on, and enforcement of, a work rule against entry.

If an employer's workers will enter a permit space, the employer must follow the written permit space program, and entry is only permitted under the terms of the program. That employer, who is an "entry employer" under the standard, must keep any unauthorized persons from entering the permit space, and remove any unauthorized persons who do enter the space.

Permit-Required Confined Space Program

The PRCS program must establish a system for preparing, using, and canceling *entry permits*, which are written or printed documents that allow and control entry into PRCS.

A PRCS program must:

- Implement measures to prevent unauthorized entry;
- Identify and evaluate permit space hazards before allowing employee entry;
- Provide for the atmospheric conditions in the permit space to be tested before entry operations and for the space to be monitored during entry;
- Require appropriate testing for the following atmospheric hazards in this sequence: oxygen, combustible gases or vapors, and toxic gases or vapors;
- Establish and implement the means, procedures and practices to eliminate or control hazards necessary for safe permit space entry operations;
- Identify employee job duties;
- Provide and maintain, at no cost to the employee, personal protective equipment and any other equipment necessary for safe entry, and require employees to use the equipment properly;
- Ensure that at least one attendant is stationed outside the PRCS during entry operations;
- Implement the procedures that any attendant who is required to monitor multiple spaces will follow during an emergency in one or more of those spaces;
- Coordinate entry operations (in consultation with the controlling contractor) when employees of more than one employer are working in the PRCS; and
- Establish procedures for summoning rescue and emergency services and preventing unauthorized personnel from attempting rescue.
- Develop and implement a system for the preparation, issuance, use, and cancellation of entry permits as required by this standard, including the safe termination of entry operations under both planned and emergency conditions.
- Develop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed.

The employer must review the program and correct any deficiencies whenever it learns that the program may not be protecting employees adequately. Circumstances requiring such review include an injury or near-miss during entry, unauthorized entry, detection of a new hazard or a condition prohibited by the permit, or an employee complaint about the program's effectiveness. In addition, the employer must annually review the program using the cancelled permits, and revise the program as necessary to ensure that employees are protected.

With the exceptions discussed earlier, the PRCS program must provide that entry is only permitted pursuant to a written **entry permit**. Before entry begins, the entry supervisor identified on the permit must sign the entry permit to authorize entry.

The entry permit must include:

- Name of the permit space to be entered, authorized entrant(s), current attendants, and current entry supervisors;
- Purpose of entry;
- Date and authorized duration of entry;
- Means of detecting an increase in atmospheric hazard levels;
- Name and signature of supervisor who authorizes entry;
- Known hazards in the space;
- Measures to be taken to isolate permit spaces and to eliminate or control space hazards;
- Acceptable entry conditions;
- Test results, date and time of test(s), and tester's initials or signature;
- Name and telephone numbers of rescue and emergency services and means to be used to contact them;
- Communication procedures and equipment to maintain contact during entry;
- Special equipment and procedures, including personal protective equipment and alarm systems;
- Any other information needed to ensure employee safety; and
- Additional permits, such as for hot work, which have been issued authorizing work in the permit space.

The permit must be posted at the entrance to the space or be otherwise made available to authorized entrants and their authorized representatives at the time of entry. Attachment #12E contains a Confined Space Entry Permit that includes the information required by the standard. The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit.

Canceling Entry Permits

The employer must make sure that the entry supervisor cancels entry permits when an assignment is completed or when new conditions exist. Once a permit is cancelled, entry under it is no longer permitted. New conditions must be noted on the canceled permit and used in revising the permit space program. The employer must keep all canceled entry permits for at least one year.

Suspending Entry Permits

An entry supervisor may suspend an entry permit instead of cancelling it if a temporary condition has occurred in or near the space that, once corrected, is not expected to reoccur. The permit may be reinstated and entry may occur under the permit if the entry supervisor has determined that the conditions in the space match the allowable conditions listed on the permit.

Reclassifying a Permit Required Space as a Non-Permit Confined Space

A PRCS that contains only physical hazards may be reclassified as a non-permit space if:

1. The permit space poses no actual or potential atmospheric hazards and if all of the physical hazards are eliminated or isolated without entering the space; or
2. The hazards are eliminated or isolated by entering the space using permit space procedures.

Physical hazards include all hazards that are not atmospheric hazards, including:

- explosives (other than explosive atmospheres)
- mechanical
- electrical
- hydraulic and pneumatic energy
- radiation
- temperature extremes
- engulfment
- noise
- inwardly converging surfaces
- chemicals that can cause death or serious physical harm through skin or eye contact (rather than through inhalation).

Example: A confined space contains electrical machinery that presents mechanical and/or electric shock hazards. If the hazards presented by the machinery are eliminated by de-energizing and locking out the machinery at an electrical panel outside the space, the space can be reclassified as a non-permit space as long as the equipment remains de-energized and locked out.

If it is necessary to enter the space to de-energize and lock out the machinery, the entry must be conducted pursuant to a full permit program. However, once the machinery is de-energized and locked out, the space may then be reclassified as a non-permit space.

Whenever a PRCS is reclassified as a non-permit space, the entry employer must document the basis for determining that all hazards in the PRCS have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification must be made available to each worker entering the space or to that worker's authorized representative.

If any hazards arise within a reclassified non-permit space, each worker in the space must exit the space. The entry employer must then reevaluate the space and determine how to proceed. If the new hazards are physical hazards that can be eliminated or isolated, the employer can reclassify the space as a non-permit space after that has been accomplished. If the new hazard is an atmospheric hazard that can be made safe for entry by continuous forced air ventilation, the employer can proceed in accordance with the Alternate Entry Procedures. In all other situations, further entry can only be made pursuant to a full permit space program.

Alternate Entry Procedures for Certain Permit Spaces

Unlike a space that contains only physical hazards, a space containing an atmospheric hazard cannot be reclassified as a non-permit space. However, if the atmospheric hazard in a PRCS can be controlled by forced air ventilation, less stringent procedures may be used instead of PRCS procedures when workers enter the space.

The alternate procedures may be used if the employer can show that:

- All physical hazards are eliminated or isolated;
- The only hazard is an actual or potential hazardous atmosphere that can be and is made safe for entry using continuous forced air ventilation; and
- In the event the ventilation system stops working, entrants can exit the space safely.

An employer who uses the alternate procedures must document the reasons, and the supporting data, for concluding that these criteria are met. The documentation must be made available to each worker who enters the space or to that worker's authorized representative.

The **alternate procedures** are as follows:

Entry and Exit:

- Any conditions making it unsafe to remove an entrance cover must be eliminated before the cover is removed.

- When entrance covers are removed, the opening must be immediately guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.
- Before a worker enters the space, the internal atmosphere must be tested, with calibrated direct-reading instruments, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order. The testing must demonstrate that the atmosphere in the space is not hazardous. Any worker who enters the space, or that worker's authorized representative, must be provided an opportunity to observe the pre-entry testing.
- The employer must verify that the space is safe for entry and that the pre-entry measures discussed above have been taken, through a written certification that contains the date, the location of the space, and the signature of the person providing the certification. The certification must be made before entry and must be made available to each worker entering the space or to that worker's authorized representative.
- The employer must provide workers with a safe method of entering and exiting the space. Any hoisting system that is used must either:
 1. be designed and manufactured for personnel hoisting; or
 2. be approved for personnel hoisting by a registered professional engineer prior to use.

Ventilation Requirements:

- Continuous forced air ventilation must be used. (Exhaust ventilation is not an acceptable substitute for forced air ventilation.)
- If the forced air ventilation stops for any reason, the entrant(s) must immediately leave the space.
- The forced air ventilation must be directed to ventilate the immediate areas where each entrant is or will be located within the space and must continue until all employees have left the space.
- The air supply for the forced air ventilation must be from a clean source and must not increase the hazards in the space.

During Entry

The atmosphere within the space must be monitored to ensure that the forced air ventilation is preventing the accumulation of a hazardous atmosphere. Monitoring must be conducted continuously unless the entry employer can demonstrate that equipment for continuous monitoring is not commercially available or that periodic monitoring is sufficient to ensure that the atmosphere remains nonhazardous.

Employers must provide any worker who enters the space, or that worker's authorized representative, with an opportunity to observe the required testing.

If a hazard is detected during entry:

1. Employers must make sure each worker leaves the space immediately;
2. The space must be evaluated to determine how the hazard developed; and
3. The employer must implement measures to protect workers from the hazard before any subsequent entry takes place.

The following table compares the requirements for spaces where permits are required and for spaces where alternate procedures are permitted.

Comparison of Requirements for Permit Required Spaces and Alternate Procedure Spaces

Precautions Required	Permit-Required Space	Alternate Procedures Space
Written Permit Space Program Meeting Requirements of Sections 1926.1204-1206	YES	NO
Worker Training Meeting Section 1926.1207	YES	YES
Duties of Authorized Attendants (Section 1926.1208), Attendants (Section 1926.1209), and Entry Supervisors (Section 1926.1210)	YES	Possibly
Rescue and Emergency Services (Section 1926.1211)	YES	NO
Information exchange between controlling contractor and entry employer(s) (Section 1926.1203(h))	YES	YES
Permit Space Warning Signs and Entry Restrictions (Sections 1926.1203(b) and (c))	YES	YES

Entry into Reclassified Non-Permit Spaces

Based on the evaluation and the actions listed on the Alternate Entry/Reclassification Form, to eliminate, isolate, or control atmospheric, engulfment, physical or any other type of hazard, the entry into the identified space will be conducted as non-permit space entry.

Non-Permit confined spaces may be entered provided the following conditions are met:

- If the confined space poses no actual or potential atmospheric hazard and if all hazards within the space are eliminated or isolated without entry into the space.
- The entry employer must eliminate or isolate the hazards without entering the space, unless it can demonstrate it is infeasible.
- Entry employer must document the basis for determining that all hazards in a confined space have been eliminated or isolated, through certification that contains date, location of space, and the signature of the person making the determination. (Alternate Entry/Reclassification Form – See Attachments)
- If hazards arise within the space that has been classified as a non-permit each employee must exit the space.

Entrants, Attendants, and Entry Supervisors

Three categories of workers have specific duties whenever work is performed in a PRCS: authorized entrants; attendants, and entry supervisors. The entry employer is responsible for ensuring that these workers carry out those duties.

- An **authorized entrant** is a worker who is authorized by the entry supervisor to enter a permit space.

- An **attendant** is an individual stationed outside one or more permit spaces that monitors conditions within the space(s) and prevents unauthorized entry.
- An **entry supervisor** is a qualified person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry. An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this standard for each role he or she fills. The duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

Authorized entrants must:

- Know space hazards, including information on the modes of exposure such as inhalation or skin contact, and symptoms of the exposure;
- Use appropriate personal protective equipment properly;
- Stay in communication with attendants as necessary to enable the attendants to monitor the entrant's status and alert the entrant to evacuate when necessary;
- Exit from the permit space as soon as possible when:
 1. Ordered by the attendant or entry supervisor;
 2. He or she recognizes the warning signs or symptoms of exposure;
 3. A prohibited condition exists; or
 4. An automatic alarm is activated.
- Alert the attendant when a prohibited condition exists or when warning signs or symptoms of exposure exist.

The **attendant** must:

- Remain outside the PRCS during entry operations unless relieved by another authorized attendant;
- Perform non-entry rescues when specified by the employer's rescue procedure;
- Know existing and potential hazards, including information on the mode of exposure, and signs or symptoms, and consequences, and possible behavioral effects of exposure;
- Maintain communication with and keep an accurate account of those workers entering the permit space;
- Assess conditions inside and outside the space and order evacuation of the PRCS when:
 1. A prohibited condition exists;
 2. A worker shows behavioral effects of hazard exposure;
 3. A situation exists outside the confined space that could endanger entrants; or
 4. The attendant cannot effectively and safely perform required duties.
- Summon rescue and other services during an emergency;
- Ensure that unauthorized people stay away from PRCS or exit immediately if they have entered the PRCS;
- Inform authorized entrants and the entry supervisor if any unauthorized person enters the PRCS; and
- Perform no other duties that interfere with the attendant's primary duties.

Entry supervisors must:

- Know space hazards including information on the mode of exposure, signs or symptoms and consequences;
- Verify that specified entry conditions are satisfied, including permits, tests, procedures and equipment before allowing entry;
- Terminate entry and cancel or suspend permits when entry operations are completed or if a condition that is not allowed under the permit arises;
- Verify that rescue services are available and that the means for summoning them are operable;
- Take appropriate measures to remove unauthorized entrants; and
- Ensure that entry operations remain consistent with the entry permit and that acceptable entry conditions are maintained.

Training Requirements

Before any employee works in a confined space, the entry employer must train authorized entrants, attendants, entry supervisors, and other employees with duties under the standard (such as persons who test and monitor the atmosphere in a confined space) to understand the hazards in the permit space and the methods used to protect against those hazards.

If a worker is not authorized to perform entry rescues, the training must include the dangers of attempting such rescues. All training must be provided at no cost to workers. After the training, the employer must ensure that the workers have the understanding, knowledge and skills necessary to safely perform their assigned duties.

The required training must be provided:

- In both a language and vocabulary that the worker can understand;
- Before the worker is first assigned duties under this standard and before there is a change in the worker's assigned duties;
- Whenever there is a change in PRCS entry operations that presents a new hazard about which the worker has not previously been trained;
- Whenever the worker's actions show inadequacies in the worker's knowledge or use of entry procedures.

As discussed below, rescue personnel must also be trained to perform their duties.

The Ruhlin Company must keep a record showing that the required worker training has been completed. The record must contain the worker's name, the trainer's signature or initials and the dates of the training. The Ruhlin Company must make the record available for inspection by workers and their authorized representatives and maintain the training records for the period of employment.

Rescue and Emergency Services

Effective emergency planning is vital to ensure that any entrant who becomes sick or is injured in a PRCS can be evacuated quickly and safely. The entry employer's PRCS program must therefore include procedures for entrants to be rescued in a timely manner by qualified personnel.

Role of the attendant: Whenever an entrant is in a PRCS, there must be an attendant outside the space who must maintain communication with all entrants and keep track of their condition. If one or more entrants suffers an injury or illness and is unable to exit the space without help, the attendant must initiate a rescue.

Non-entry rescue: It is preferable if the entrant(s) can be rescued without others entering the space to avoid having additional personnel exposed to the hazard that caused the injury or illness. Therefore, Ruhlin's rescue procedures must provide for non-entry rescue using retrieval equipment unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant, such as when obstructions can snag the retrieval line or the line can become entangled with air lines or electric cords. The attendant must be prepared to perform non-entry rescues when required by the company's rescue procedures.

When the rescue procedures provide for non-entry rescue, each entrant must wear a chest or full body harness, with a retrieval line attached at the D-ring in the center of the back or another point which positions the entrant so that he or she is small enough to be pulled out of the space. The other end of the retrieval line must be attached to a mechanical device or a fixed point outside the permit space. A mechanical device must be available to retrieve someone from vertical type spaces more than five feet deep. (NOTE: A mechanical device must also be used for retrieval in Non-Permit Confined Spaces and Alternate Spaces.)

Wristlets or anklets may be used instead of a chest or full body harness only if the employer can demonstrate that use of a chest or full body harness is infeasible or would create a greater hazard and that the use of wristlets or anklets is the safest and most effective alternative.

When non-entry rescue is selected, the entry employer must also confirm, before entry begins, that emergency assistance would be available if the non-entry rescue fails. Emergency assistance is typically provided by a local fire department or similar service.

Entry rescue: Non-entry rescue might not be feasible. If so, the only way to rescue the entrant is for others to enter the PRCS.

For entry rescue, the company may plan to use an on-site rescue team (consisting of its own or another contractor's employees) or an off-site team, such as a local fire department or other rescue service. In either case, the employer must make sure that the rescue service is able to respond in time to enable the injured worker to receive needed medical attention in light of the hazards present in the PRCS by contacting the rescue service prior to entry and informing them of the nature of the space and the hazards involved. In some cases, this may require a standby rescue team, such as when the entrant is working in an atmosphere that is immediately dangerous to life or health and is wearing an airline respirator or a self-contained breathing apparatus.

Whenever entry rescue takes place, an attendant must be stationed outside the PRCS so that additional help can be summoned if needed. If the original attendant is to enter the space as part of the rescue team, a new attendant must be in position before the first attendant enters the space.

Rescue and emergency services: The employer of the members of the designated rescue team (whether entry or non-entry) must ensure that the team members have received the training required for authorized entrants and have also been trained to perform their assigned rescue duties. That employer must provide the rescue team members with personal protective and rescue equipment, including respirators, and must train them on how to use it. All rescuers must be trained in first aid and CPR. At a minimum, one rescue team member must be currently certified in first aid and CPR.

Employers must ensure that the team practices or performs rescue exercises at least yearly and that rescue services are provided access to PRCS so they can practice rescue operations. Rescuers also must be informed of the hazards of the permit space before they enter the space. The rescue service must agree to notify the employer in the event the service becomes unavailable, and the employer must provide the service with access to the permit space so the service can develop an appropriate rescue plan and practice rescue as necessary.

If the entry employer designates an off-site rescue service, it must determine that the service has the ability and equipment to carry out a rescue in the particular permit space or type of PRCS in which the entrant is working. It must contact the rescue service and make sure that it will be able to respond in a timely manner whenever an entrant is in the PRCS.

Definitions

Alternate Confined Space - A confined space that the only hazard is a potential or actual hazardous atmosphere which can be controlled solely through continuous forced air ventilation.

Attendant - An individual stationed outside one or more permit spaces that monitors conditions within the space(s) and prevents unauthorized entry.

Authorized Entrant - A worker who is authorized by the entry supervisor to enter a permit space.

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 the authority to take prompt corrective measures to eliminate them.

Confined Space - A space that is large enough and so arranged that an employee can bodily enter it; has limited or restricted means for entry and exit; and is not designed for continuous employee occupancy.

Controlling Contractor - The employer with overall responsibility for construction at the worksite. The controlling contractor is responsible for coordinating entry operations when there is more than one entry employer and when other activities on the site could foreseeably result in a hazard in the permit space. In addition, controlling contractors must provide any information they have about any permit space hazards and precautions previously used in the space.

Engulfment - 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, crushing, or the substance suffocates the individual

Entry Employer - An employer who decides that an employee it directs will enter a permit space. There may be more than one entry employer if the employees of multiple employers must enter the space. Each entry employer is responsible for complying with all provisions in the Confined Spaces standard except those specifically imposed on the controlling contractor and host employer.

Entry Permits - Written or printed documents that allow and control entry into permit spaces.

Entry Supervisor - A qualified person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry. An entry supervisor also may serve as an attendant or as an authorized entrant; as long as that person is trained and equipped for each role he or she fills. The duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

Host Employer - The employer that owns or manages the property where the construction work is taking place. Where the host employer has information about permit space hazards on the site, it must share that information with the controlling contractor, who is then responsible for sharing it with the other employers on the site.

Non-Permit Confined Space - A confined space that meets the definition of a confined space but does not meet the requirements for a permit-required confined space.. However, if a hazard is introduced into a non-permit space, the space will likely have to be reclassified as a *permit required confined space / permit space*.

Permit-Required Confined Space or Permit Space (PRCS) - A confined space that contains or has the 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; or contains any other recognized

serious safety or health hazard such as exposed wiring or anything that interferes with an employee's ability to exit without assistance.

SECTION 13 – Hand and Power Tool Program

Purpose

The Hand and Power Tool Program has been developed to provide protection to employees using hand and power tools. The number of different types of tools used throughout the Company prohibits listing descriptions and safety procedures for each type of tool.

Most hand and power tool accidents are caused by improper handling and poor maintenance. Potential hazards are mitigated by following the guidelines listed in this program which apply to the safe use, storage, and maintenance of tools.

General Requirements

The following guidelines apply to the use of hand and power tools:

- Inspect all tools before using. **DO NOT USE defective tools.**
- Defective or unsafe tools shall be tagged "**Out of Service**" and removed from the jobsite until repairs are complete. Take any damaged tool to job supervision.
- Tools must be used in accordance with the manufacturer's instructions, if you have questions contact your supervisor or the safety department.
- Always use the proper tool for the job.
- Jewelry (facial or body), loose fitting clothing, and long hair are hazards around power tools; appropriate precautions must be taken to avoid injury.
- Appropriate personal protective equipment must be worn when using hand and power tools.
- Employees shall be familiar with the proper use, maintenance, and storage of hand and power tools before use.
- Employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall be provided with the PPE necessary to protect them from the hazard. Refer to the "**Personal Protective Equipment**" section of this safety manual.

Hand Tools

The following guidelines apply to the use of hand tools:

- Do not use hand tools with mushroomed heads or split or broken handles.
- Never strike hardened faces of hand tools together (e.g., striking hammer with a hammer).
- Keep cutting edges on hand tools sharp.
- Do not use a piece of pipe (or other cheater) to try to increase the leverage of a hand tool.
- Do not place your body in the line of fire when using hand tools. Do not pull on hand tools; always push tools away from the body.

Power Tools

The following guidelines apply to the use of power tools:

- Electric-powered hand tools should be plugged into a circuit that is positively grounded or is protected by a ground fault circuit interrupter (GFCI).
- Disconnect and bleed off tools and machines from their power source before making adjustment or attachment changes.
- Do not yank cords or hoses to disconnect.
- Air-powered tools must have safety clips, retainers, and whip checks on all connections.
- All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 p.s.i. pressure at the tool shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.
- Do not remove, tie back, or deactivate safety guards and/or devices on tools. When power operated tools are designed to accommodate guards, they must be equipped with such guards when in use.
- Before mounting abrasive wheels, inspect for cracks, chips, or other defects. After mounting abrasive wheels, be sure they are properly tightened. All employees using abrasive wheels shall be protected by eye protection equipment in accordance with the "Personal Protective Equipment" section of this safety manual, except when adequate eye protection is afforded by eye shields which are permanently attached to the bench or floor stand.
- Use the proper blade for the tool and the material being cut.
- For gasoline powered tools, use approved and labeled gasoline storage cans.
- Gasoline powered tools shall not be refueled while the engine is running or hot.
- Grinder wheels shall be inspected for cracks and defective grinder wheels should be removed from service. Wheels should be ring tested prior to placement and sufficiently tightened onto grinder.
- Ensure the blade or grinding wheel is appropriate for the tool or material for which it is being used.
- Never carry a tool by the cord or hose.
- Compressed air should not be used to clean clothing.
- Compressed air above 30 PSI shall not be used for housekeeping.
- Only trained, certified employees are permitted to use powder actuated tools.
- Know the lifting capacity of jacks and hooks before using them. The manufacturer's rated capacity shall be legibly marked on all jacks and shall not be exceeded.

Maintenance

The following guidelines apply to the maintenance of hand and power tools.

- Maintenance shall only be performed by a qualified shop mechanics or authorized dealers/vendors.
- All hand and power tools shall be kept free from rust, defective parts, corrosion, etc.

Storage

The following guidelines apply to the proper storage of hand and power tools.

- Store tools in appropriate containers or boxes to prevent damage.
- Tools should not be left unattended when not in use. At the end of each shift, tools should be placed into proper storage.

SECTION 14 - Electrical

Overhead Electrical and Utility Hazards During Equipment Operations

No part of any equipment, load line, or load should get closer than OSHA's Table A. There is an area surrounding every live power line that we refer to as OSHA's Table A. It is strictly forbidden to move any crane boom, load line, load, or any piece of equipment into this area unless the line has been de-energized. **There are no exceptions.**

Power Line Safety – During Operation

TABLE A—MINIMUM CLEARANCE DISTANCES

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)	The Ruhlin Company Spotter Requirements (feet)
Up to 50	10	20
over 50 to 200	15	25
over 200 to 350	20	30
over 350 to 500	25	35
over 500 to 750	35	45
over 750 to 1,000	45	55
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

The time to address potential power line problems is during pre-job planning. The pre-construction site survey will be conducted by the superintendent and a member of the Safety Department in accordance with the following procedures. Power line problems must be addressed prior to the equipment's operation near overhead utility hazards. Refer to the Crane Operation Safety (Section 9) of this Safety Manual for additional information on requirements and procedures to be used when operating equipment near power lines.

Procedure

1. Contact all utilities and hold a pre-construction on-site safety inspection.
2. Notify the electric utility company when a crane or any equipment will be used near overhead utilities and power lines.
3. Treat all wires as energized until a utility company representative certifies that lines are de-energized and grounded.
4. Erect and maintain an elevated warning line, barricade, or line of signs, in view of the equipment operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line.
5. Whenever powered equipment will be working **within 20 feet of** a power line or distances identified above, use a designated spotter who is in continuous contact with the operator. The designated spotter will have no other duties until the equipment moves further away from the energized power line. The

designated spotter must be equipped with a visual aid to assist in identifying the minimum clearance distance, be positioned to effectively gauge the clearance distance, use equipment that enables him or her to communicate directly with the operator where necessary, and give timely information to the operator so that the required distance can be maintained. Any unqualified employee must maintain at least a 10-foot clear distance from any energized power line.

6. Erect barricades forming a perimeter at least 10 feet away from the equipment to prevent unauthorized personnel from entering the work area.
7. When setting or removing concrete barrier wall beneath power lines, ensure that the hazard signs are erected on the lifting point of the barriers.
8. Review and execute with appropriate job personnel the "Overhead Power Line Hazard Review" form for each Equipment or Job Operation that has the potential of coming **within 20 feet of** a power line or distances identified in Table A.

Working Around Underground Utilities

Pre-Job Planning

If the scope of your project includes any excavation work, you must contact the Ohio Utilities Protection Service (OUPS) 48 hours before you dig at **1-800-362-2764**, or the National 8-1-1 hotline. Drawings and site markings may not include all existing underground utilities, do not assume that it is clear. Verify with OUPS before commencing digging operations, **IT'S THE LAW.**

When digging close to marked utility lines, pay close attention to the tolerance zone. This zone is the width of the underground facility plus 18 inches on each side of the utility. Any excavation within the tolerance zone must be performed with hand tools in a careful and prudent manner until the marked facility is exposed.

Important points to remember:

- All facilities are not at specific and constant depths.
- Treat all cables as energized until advised otherwise by the utility representative.
- Do not assume that utilities are not present in remote locations.
- Treat all excavation work as new even if you have worked in the same area before.
- While you are focused on the digging operation, remember that overhead power lines may be in the area.

In the event of a utility strike, **DO NOT** attempt any inspection, repair or manipulation of the underground facility you may have damaged. The utility company will handle the repairs after you notify them. If there is an emergency, such as a ruptured gas line, contact the local Fire and Police Departments and then the Safety Department.

Work On Exposed Energized Parts

When working near exposed energized parts, all "qualified employees" must adhere to the approach distances given in table S5, shown below:

Voltage range (phase to phase) I Minimum approach distance **Table S5**

300V and less	Avoid Contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm).

Employees may not enter spaces containing exposed energized parts unless illumination is provided that enables the employees to work safely.

When working in confined or enclosed workspaces where electrical hazards may exist, protective shields, barriers, or insulating material shall be used to protect employees from the electrical hazards.

Electrical

1. The Company will ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees
2. Listed, labeled, or certified equipment must be installed and used in accordance with instructions included in the listing, labeling, or certification.
3. Electric equipment shall be firmly secured to the surface on which it is mounted. Wooden plugs driven into holes in masonry, concrete, plaster, or similar materials shall not be used.
4. Electrical equipment which depends upon the natural circulation of air and convection principles for cooling of exposed surfaces must be installed so that room air flow over such surfaces is not prevented by walls or by adjacent installed equipment.
5. Electrical equipment will not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment and unless other markings are provided giving voltage, current, wattage, or other ratings as necessary.
6. Sufficient access and working space must be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment. The working space cannot be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, must be guarded.
7. Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are only to be accessible to qualified persons only. The entrances to all buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.
8. Employees are not permitted to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by deenergizing the circuit and grounding it or by guarding it effectively by insulation or other means.
9. Before work is begun the Company will ascertain whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. Proper warning signs will be

posted where such a circuit exists and the Company will advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

10. Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a hazard to employees.
11. Worn or frayed electric cords or cables shall not be used.
12. Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.
13. All wiring components and utilization equipment in hazardous locations must be maintained in a dust-tight, dust-ignition-proof, or explosion-proof condition, as appropriate. There shall be no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition.
14. No conductors or equipment may be located in damp/wet locations; where exposed to gases, fumes, vapors, liquids, or other agents having a deteriorating effect on the conductors or equipment; or where exposed to excessive temperatures.
15. Use only double insulated tools or tools that are properly grounded.
16. Grounding pins must not be bent or cut from equipment plugs.
17. Temporary electrical circuits must have Ground Fault Circuit Interrupter (GFCI) protection.
18. Any equipment found to be defective shall be taken out of service and tagged "do not use".
19. Employees who face a risk of electric shock but who are not qualified persons shall be trained & familiar with electrically related safety practices for each respective job assignment.
20. Electrical repairs must be made by qualified persons; all repairs must meet the manufacture's specifications for conductivity and insulation.
21. Only heavy-duty extension cords are authorized on Ruhlin jobsites.
22. Do not run extension cords through doorways, floor openings etc. Not only will this cause a trip hazard but it could damage the cord.
23. Avoid running extension cords through puddles or areas that could flood.
24. Temporary panels must be secured and all openings closed.
25. Electrical panels will have a closable, secure cover and will be closed at all times.
26. Only trained and authorized employees will work inside of an electrical panel.
27. Always use the correct lockout and tagout procedures when working with hazardous energy.
28. Portable ladders shall have non-conductive side rails.
29. Conductive items, such as jewelry or clothing shall not be worn unless they are rendered nonconductive by covering, wrapping or other insulating means.
30. Electrical work shall be performed in accordance with NFPA 70E

SECTION 15 - Trenching and Excavations

Trenching and Excavating

An "excavation" is any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal. A "trench" is a narrow excavation made below the surface of the ground, and the depth generally exceeds the width. Both trenches and excavations possess numerous hazards. The following are guidelines to reduce and/or eliminate these hazards while conducting trenching and excavation work:

- A competent person shall be assigned to each jobsite and will have specific knowledge and/or training on trenching and excavations, the ability to recognize hazards, and authority to take corrective action to eliminate any hazards that may exist.
- Daily inspections of excavations, adjacent areas and protective systems shall be made by the competent person using the "Excavation Checklist" and "Daily Trenching Log" (see Attachments). The completed checklist and logs will be kept onsite, and a copy must be forwarded to the Safety Department by the end of the work week. If the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees will be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- A competent person shall complete the "Soils Analysis Checklist" (see Attachments) for all excavations and when existing conditions change on the jobsite.
- All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.
- All utilities must be located before digging begins. Confirm OUPS was called (1-800-362-2764 or 8-1-1) 48 hours before you dig. While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.
- Any overhead lines and power lines that are in the area should be marked or the proper signage posted, and precautions taken to prevent contact.
- Keep all personnel well away from any piece of equipment whenever it is being used within 20 feet of power lines. Further description of procedures for working around power lines is in the "Electrical" section, "Overhead Electrical & Utility Hazards during Equipment Operations" of this safety manual.
- Trenches shall be shored, shielded, or sloped to meet the Federal OSHA Trenching and Excavation Standards communicated by the competent person.
- If sloping or benching is used as a protection system, the slope/bench must comply with all applicable OSHA regulations. *Specifications noted in "Sloping and Benching" section below.*
- Trenches deeper than 20 feet must have a protection system designed and stamped/certified by a registered Professional Engineer.
- Under no circumstances will employees be authorized to enter an unprotected trench or excavation.
- Trench boxes or shields and shoring systems shall not be modified and can only be used as designed by the manufacturer's tabulated data, and such tabulated data must be present on each trench box or shield before placing it in service.

- Excavation of material to a level no greater than 2 feet below the bottom of the members of a support system will be permitted but only if the system is designed to resist the forces calculated for the full depth of the trench.
- Where oxygen deficiency (atmospheres containing less than 19.5% oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter. When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.
- Should a potential hazardous atmosphere exist, proper precautions shall be taken including the following (refer to the "Confined Space" Section of this manual):
 - a. Respiratory protection or ventilation;
 - b. Availability of Emergency rescue equipment; and
 - c. Safety harness and line.
- When using shoring or trench shields, employees must work within the protection of the system.
- Employees shall not be in the trench box during any movement of the trench box.
- An approved means of access and egress will be installed in all trenches and excavations greater than 4 feet in depth (i.e. a structural ramp or ladder).
- Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails shall be provided where walkways are 6 feet or more above lower levels. Guardrails must comply with 1926.502(b) (Top-rail at 42 in $\pm$ 3in and Mid-rail at 21 in, capable of withstanding a force of at least 200 pounds applied within 2 in of the top edge, in any outward or downward direction, at any point along the top edge).
- If structural ramps are used, they will be approved by a competent person and meet all applicable OSHA standards.
- A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.
- Do not jump into or over the trench.
- Do not use exposed utility lines, cables or conduits as a step, platform or handrail.
- Keep materials, to include the spoil pile and equipment, at least 2 feet back from edge of excavation.
- When mobile equipment is operated next to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system must be utilized such as barricades, hand or mechanical signals, or stop logs.
- Employees shall not work under suspended loads or in a trench while equipment or material is being lowered into place (i.e. sewer pipe, plate tamper etc.). Employees must stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

- Employees shall not work where water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation and the competent person has determined the trench is safe.
- Employees in a trench must be protected from vehicular traffic by a barricade or other proper means of protection. Employees exposed to public vehicular traffic will also be provided with, and must wear, warning vests or other suitable garments marked with or made of reflective or high-visibility material.
- If the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning must be provided to ensure the stability of such structures for the protection of employees.
- All excavations left open overnight must be properly barricaded.
- Employees will not work around the edge of a trench unless fall protection is provided (see the "Fall Protection" section of this safety manual for further guidance).
- Except in stable rock, excavations below the level of the base footing of any foundation or retaining wall are not permitted unless the wall is provided with a support system such as underpinning to ensure the safety of employees and the stability of the structure.
- Trenches and excavations will be backfilled immediately upon removal of the protection system. Before temporary removal of protective support systems begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system. Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.
- Safe access and egress from a trench shall not exceed a lateral distance of 25 feet from an employee at any given time.
- Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function. Manufactured materials and equipment used for protective systems must be used and maintained in a manner that is consistent with the recommendations of the manufacturer. When material or equipment that is used for protective systems is damaged, a competent person must examine it and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment must be removed from service and be evaluated and approved by a registered professional engineer before being returned to service.
- 24-hour benching and sloping rules shall be approved by the safety department.

Soil Analysis

Due to the wide range of soil conditions, we come across on the jobsite, we utilize OSHA's soil classification system to safely classify these soils according to particle cohesiveness.

The Four Soil Classifications

Stable Rock: Natural solid mineral matter that can be excavated with vertical walls and remain intact while exposed

Type A: Cohesive soils with an unconfined compressive strength of 1.5 ton/ft² or 144 kPa or greater. This may include clay, silty clay, clay loam, and in some cases silty clay loam and sandy clay loam. Soil is not considered to be Type A if:

- It is fissured.
- The soil is subjected to vibration.
- The soil has been previously disturbed.
- The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
- The material is subject to other factors that would require it to be classified as a less stable material.

Type B: Cohesive soils with an unconfined compressive strength greater than 0.5 ton/ft² but no greater than 1.5 ton/ft² or any of the following:

- Granular cohesionless soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
- Previously disturbed soils except those which would otherwise be classified as Type C soil.
- Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration;
- Dry rock that is not stable; or
- Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

Type C: Cohesive soil with an unconfined compressive strength of 0.5 ton/ft² or less or any of the following:

- Granular soils including gravel, sand, and loamy sand;
- Submerged soil or soil from which water is freely seeping;
- Submerged rock that is not stable; or
- Material in a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or steeper

Acceptable Field Soil Analysis Tests

Either of the following manual field tests may be utilized by a competent person to classify the soil type:

Test 1: Thumb Penetration Test

Take a sample of undisturbed soil, at least 2 inches in diameter, and place it in one hand. With the free hand, place your thumb on top of the soil sample and apply force:

- Type A soils - Your thumb will only dent the sample, however only with great effort, may be penetrated.
- Type C soils - Your thumb will easily penetrate the sample a few inches with little effort.

Test 2: Plasticity Test

Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.

A visual test should also be utilized.

Sloping, Benching, and Shielding (Methods)

Employees are not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

Sloping and Benching (For depths up to 20ft)

The following figures are approved protection systems for excavation:

Table Of Maximum Allowable Slopes

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V)(1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP(3)
STABLE ROCK	VERTICAL (90°)
TYPE A (2)	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1 1/2:1 (34°)

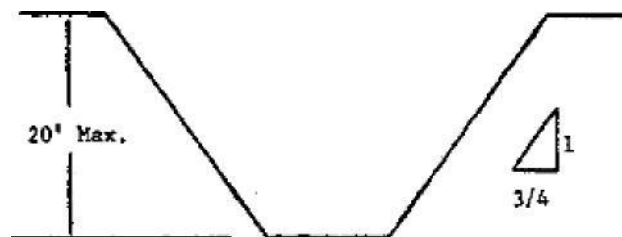
Footnote (1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

Footnote (2) A short-term maximum allowable slope of 1/2 H:1V (63°) is allowed in excavation in Type A soil that are 12 feet or less in depth. Short Term maximum allowable slopes for excavations greater than 12 feet in depth shall be 3/4 H:1V (53°).

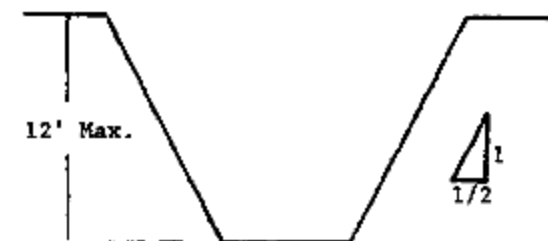
Footnote (3) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Configurations of sloping and benching systems shall be in accordance with the following figures:

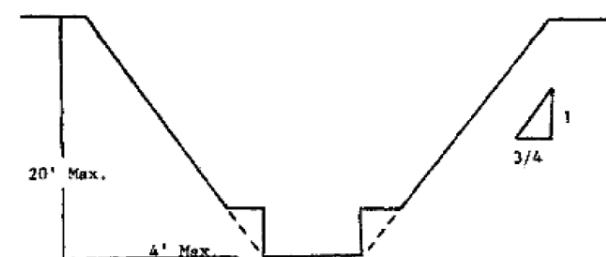
Excavations Made In Type A Soil



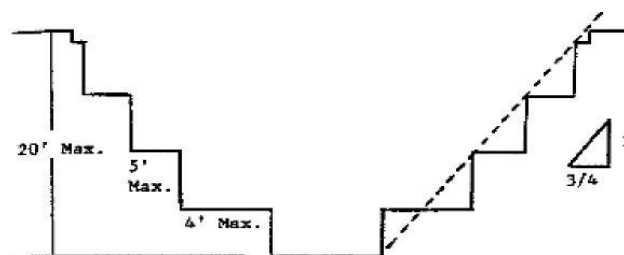
Simple Slope: All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4 :1.



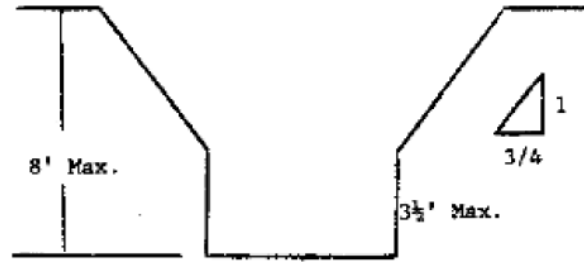
Simple Slope
(Duration less than 24 hrs.)



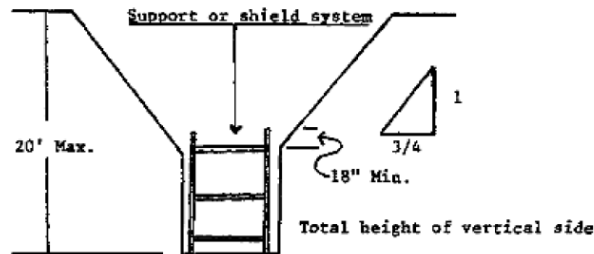
Simple Bench: All benched excavations 20 feet or less in depth shall have a maximum allowable slope of $\frac{3}{4}$ to 1 and maximum bench dimensions as displayed here and below for multiple bench.



Multiple Bench

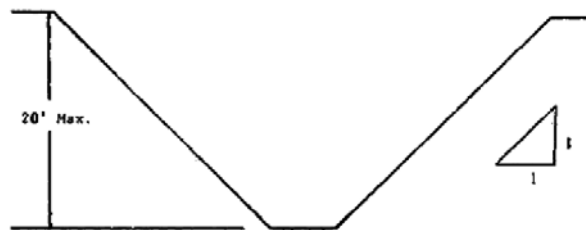


Unsupported Vertically Sided Lower Portion: All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 ½ feet.

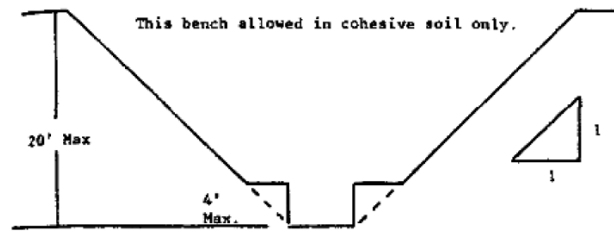


Supported or Shielded Vertically Sided Lower Portion: All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾ :1. The support or shield system must extend at least 18 inches above the top of the vertical side.

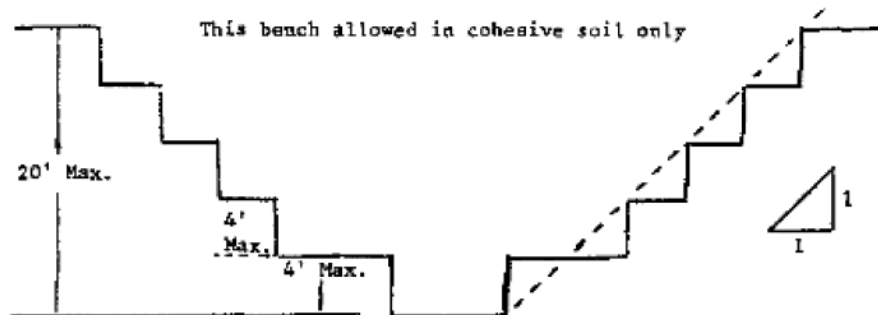
Excavations Made In Type B Soil



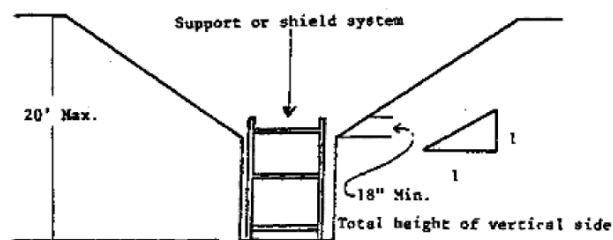
Simple Slope: All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.



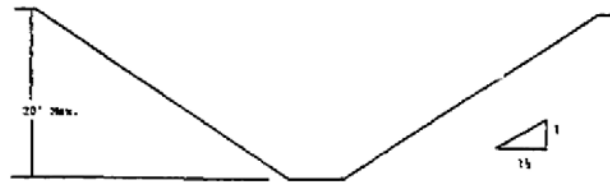
Simple Bench: All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as displayed here and below for multiple bench.



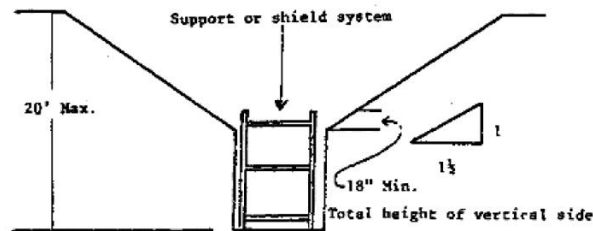
Multiple Bench



Vertically Sided Lower Portion: All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

Excavations Made In Type C Soil

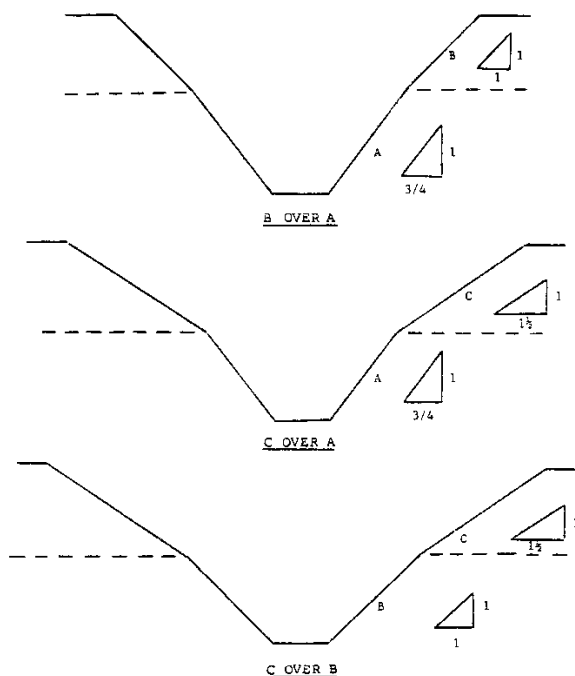
Simple Slope: All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 $\frac{1}{2}$:1.



Vertically Sided Lower Portion: All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1 $\frac{1}{2}$:1.

Excavations Made In Layered Soils

All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth here:



When excavating in layered soils where the stronger material is beneath the weaker material, slope all soils according to soil type as mentioned in the Table of Maximum Allowable Slopes.

When excavating in layered soils where the weaker material is beneath the stronger material, slope all soils according to the weakest soil type as mentioned in the Table of Maximum Allowable Slopes.

SECTION 16 – Equipment Shop Program

Purpose

The purpose the Equipment Shop Program is to establish safety requirements for safe work practices in the shop.

General Shop Safety

Maintenance servicing and equipment repair pose several serious hazards. Safety guidelines for general shop operations are as follows:

- Field/shop mechanics shall abide by all applicable warnings stated in service manuals.
- All loads must be blocked, or appropriate safety locks and pins must be utilized (truck beds, blades, buckets, booms etc.).
- Equipment shall be shut down before lubrication or service work is started, unless otherwise stated by the manufacturer.
- When handling heavy and awkward parts, mechanical aids (hoists, hand trucks, etc.) shall be used.
- Do not weld or cut near flammable materials.
- On articulated machines, lock bars shall be in place before service work begins.
- Use cardboard or wood to check for hydraulic leaks. Do not use your fingers.
- Eye protection shall be worn on the shop floor during working hours. Proper eye and face protection shall be worn when grinding, chipping or sand blasting. Appropriate eye protection shall be worn for burning or welding, when handling chemicals or other liquid substances and during all power tool use.
- Compressed gas cylinders shall be secured and capped when not in use.
- Compressed gas cylinders shall be stored at least 20 feet apart from one another when not in use.
- Acetylene pressure must not exceed 15 psi
- When tires are removed from wheel assembly, tire racks shall be used to inflate tires.

- Do not bypass or remove safety devices on tools or equipment unless approved by shop foreman for maintenance.
- Use only approved lifting devices.
- The condition of lifts shall be inspected prior to use. Leaks shall be repaired, and oil levels maintained on hydraulic lifts.
- Good housekeeping shall be implemented in all areas of the Shop.
- The location of fire extinguishers shall be identified and access to fire extinguishers shall not be blocked.
- Use the appropriate tool for the job. Tools shall be maintained in good condition. Remove defective tools from service and properly tag.
- Oil and coolant levels shall be checked before starting any equipment.
- Proper ventilation shall be maintained when equipment is running indoors.
- Shop employees shall not attempt to aid delivery companies or rental facilities with the loading or unloading of equipment, unless the loading or unloading can be accomplished with a forklift.
- Immediately notify the equipment manager of all incidents.
- Materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.
- The weight of stored materials on floors within buildings and structures must not exceed maximum safe load limits. Maximum safe load limits of floors within buildings and structures, will be conspicuously posted, in pounds per square foot, in all storage areas, except when the storage area is on a floor or slab on grade. Posting is not required for storage areas in all single-family residential structures and wood-framed multi-family residential structures.
- Material stored inside buildings under construction must not be placed within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the material stored.
- Bagged materials must be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high.
- Used lumber must have all nails withdrawn before stacking. Lumber must be stacked on level and solidly supported sills.

Lock-Out/Tag-Out (LOTO) Procedures

Purpose & Scope

These LOTO Procedures cover the servicing and maintenance of machines and equipment in which the unexpected energizing or startup of the machines, equipment, or the release of potential (stored) energy such as electrical, steam, hydraulic, tension, and/or gravitational, could cause injury to an employee. These LOTO Procedures establish minimum performance requirements for the control of hazardous energy as required by 29 CFR 1910.147 and 29 CFR 1926.417.

Periodic inspections of the LOTO Procedures are conducted and documented at least annually to ensure processes and requirements are being followed.

Equipment in the Shop is capable of being locked-out, tag-out procedures shall not be used unless authorized by the safety department.

Enforcement

Any employee who fails to follow these procedures will face disciplinary action in accordance with the disciplinary program outlined in this safety manual.

Lock-Out Rules

1. Locks, plug lock outs, and lock-out tags shall be provided by the Company.
2. Lock-out devices shall be singularly identified. They shall be the only devices used for controlling energy and shall not be used for any other purposes.
3. Lock-out devices shall indicate the identity of the employee applying the devices.
4. All machines/equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Lock out will also apply when working on or near exposed de-energized electrical circuits/parts.
5. No employee shall attempt to operate any switch, valve or other energy-isolating device that is locked out.
6. Each isolating device shall only be removed by the employee who applied the device.

Lock-Out Procedures/Techniques

1. Preparation for shut down:
 - a. In preparation for lock-out, an initial survey must be made to locate and identify all energy isolating devices to be certain which breaker or plug

lock-out to apply to the machine. More than one energy source may be involved.

- b. Before an authorized or affected employee turns off a machine or piece of equipment, the authorized employee must have knowledge of the type and magnitude of the energy to be controlled, the hazards of the energy to be controlled, and the method or means to control the energy.

2. Machine or Equipment Shutdown

- a. All affected employees shall be notified that a lock-out system will be utilized and the reason for it, and an estimated duration before the controls are applied.
- b. If the machine or equipment is operating, shut it down by normal stopping procedures (depress “Stop” button, open toggle switch etc.).

3. Machine or Equipment Isolation

Physically locate and operate the switch or other energy isolating devices so the equipment is isolated from its energy sources and apply adequate hardware.

4. Lock-Out Device Application

- a. Authorized employees shall lock-out the energy isolating devices with assigned individual locks; if more than one employee will be performing maintenance on the piece of equipment, each employee will place his or her own lock on the equipment.
- b. Lock-out devices shall be applied so they will hold the energy isolating devices in a “Neutral”, “safe”, or “Off” position.

5. Stored Energy

All stored energy or residual energy in springs or other systems shall be blocked or dissipated. If there is a possibility of re-accumulation of stored energy, verification of isolation must be continued until service or maintenance is completed.

6. Verification of Isolation

Prior to starting work on machines or equipment that has been locked-out and after ensuring that no personnel are exposed, the authorized employee(s) shall operate the start-up switch/button to verify the equipment will not operate.

Ensure all normal operating controls are tested to confirm the equipment will not operate. Return the controls to the “Neutral” or “Off” position after the test.

The machine is now locked-out. Service or maintenance may now occur.

Removal of Lock-out Devices

1. After service and/or maintenance are completed and before the lock-out devices are removed and energy restored, the sequence of activities in these procedures shall be completed by the authorized employee(s).
 - a. Inspect the work area to ensure the machine or equipment is intact and clear the machine or equipment of nonessential items such as tools and materials.
 - b. Remove employees from the machine or equipment.
 - c. Inform all employees present the machine or equipment will be restarting.
 - d. Remove the lock-out device. The lockout device must be removed by the employee who applied the device.
 - e. Energize and proceed with positioning or testing.
2. If the authorized employee(s) who applied the lock is not available, the supervisor shall take the above steps.

Additional Requirements

1. In the preceding steps, if more than one employee is required to lock out machines/equipment, the following procedures shall be implemented to provide protection to all employees:
 - a. A primary authorized employee will be designated and responsible for the number of people working under the protection of the group lock-out device. The primary authorized employee will ascertain the exposure status of the individual member participating in the group lock-out to ensure continuity of protection for each individual. In addition, this primary authorized employee will be responsible for notifying affected employees before and after lock-out procedures are performed.
 - b. Each authorized employee will place his or her own personal lock-out device on the energy isolating device(s).
 - c. When an energy-isolating device cannot accept multiple locks, a multiple lock-out system must be used. Specific group lock-out procedures are outlined in the procedures.
 - d. If maintenance cannot be completed in a single shift:

- 1) If a second shift will be performing maintenance, the following steps shall be followed:
 - a) The authorized employee(s) will remove their locks in the presence of the new authorized employee(s) without attempting to restart the machine or equipment.
 - b) The “new” authorized employee(s) will follow the entire lock-out procedure as outlined above including testing the equipment for start-up.
- 2) If no further maintenance will be performed until the authorized employee(s) returns the next day, the following steps will be followed:
 - a) The authorized employee(s) will leave the machine or equipment locked-out and give their key(s) to the equipment manager.
 - b) The equipment manager will lock all keys in a secure area to which only he has access.
 - c) The key(s) will be in the possession of the authorized employee before the machine or equipment is tested the next day to ensure it will not start and maintenance can begin.
2. Cord and Plug Connected Equipment – If service or maintenance is performed on cord- and plug-connected equipment; the following procedures shall be performed to protect employees:
 - a. Unplug equipment from the electrical socket.
 - b. Place a lockable cover over the plug and a lock on the plug cover during machine/equipment service or maintenance.
3. Outside Contractors – If outside contractors perform service or maintenance that requires lock-out, a shop employee shall isolate the equipment according to this procedure.
4. Training

All training must be documented, signed and certified.

 - a. Authorized employees shall receive training covering the following:

- 1) Recognition of hazardous energy sources.
- 2) Types and magnitude of hazardous energy in the workplace.
- 3) Methods, devices, and procedures used to lock-out, verify lock-out and otherwise control hazardous energy on all pieces and types of equipment (including cord- and plug-connected equipment).
- 4) Procedures for removing locks and returning a machine or piece of equipment to operation.
- 5) Transfer of lock-out responsibilities.
 - Group lock-out procedures.
- b. Affected and all other employees shall receive training, so these employees are able to:
 - 1) Recognize when energy control procedures are being implemented.
 - 2) Understand the purpose of the procedures and importance of not attempting to start-up or use the machine/equipment that has been locked out.
5. Retraining – Authorized and affected employees shall receive training in the proper application of lock-out procedures whenever there is a change in:
 - a. Job assignments that expose an authorized employee to new hazards or lock-out procedures.
 - b. Machines, equipment or processes that present a new hazard or require modified lock-out procedures.
 - c. Energy control procedures for a piece or type of equipment.
 - d. When it becomes known that an employee incorrectly performs lock-out procedures.

Retraining will re-establish employee proficiency in lock-out and ensure that employees are knowledgeable of new or revised procedures. This training shall also be documented, signed, and certified.
6. Periodic Inspections

- a. An inspection of the energy control procedures will be conducted at least annually, and it must be documented by a certification containing the following: the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.
- b. Energy control procedures for each machine or type of machine must be inspected.
- c. The inspection shall include a review of lock-out responsibilities with each employee authorized to lock-out the machine/equipment.
- d. The employee who performs the inspection must be authorized to perform the lock-out procedures being inspected. The inspector cannot, however, review their own use of lock-out procedures.
- e. Any deviations or inadequacies identified shall be immediately addressed and corrected.

SECTION 17 - Process Safety Management (PSM)

Purpose

The primary purpose of the PSM Standard is to prevent or minimize the unwanted release of hazardous chemicals, especially into locations that would expose personnel to serious hazards.

Policy

It is The Ruhlin Company's intent to comply with all applicable regulations and to provide a workforce that is trained to safely perform their jobs with a full knowledge of the hazards and safe work practices associated with refining/chemical plant or other PSM regulated industry work. PSM regulated industry work includes any process which involves large quantities of a hazardous chemical, flammable gas, or flammable liquid. Such processes include any activity involving a highly hazardous chemical including any use, storage, manufacturing, handling, or the on-site movement of such chemicals, or combination of these activities. The client will be the entity ultimately responsible for PSM requirements and Ruhlin will serve as the contractor's employer.

In accordance with the law, employees will receive initial and refresher training in the following:

- An overview of the client process and operating procedures for the process that employees will be working with or near, including the hazards of the chemicals used in the process. This will include a complete review of the company HazCom Program and all SDS that are provided for each unit where the employees will be working;
- Specific safety and health hazards.
- Procedures and safe work practices applicable to the employee's job tasks, including personal protective equipment, permits (confined space, hot work and general safe permits), job hazard analysis and auditing.
- Incident investigations are required for all incidents. When an incident occurs, an investigation will be immediately implemented, but not longer than 24 hours after the incident. Causal analysis and corrective actions will be documented and tracked for closure. Those records will be kept for a minimum of 5 years.
- The site-specific Emergency Action Plan.

Employees shall comply with established procedures and safe work practices, be on the alert for changing conditions and quickly report any accidental release or potential release of hazardous chemicals to a supervisor.

The client or the company will promptly investigate every incident that results in, or could have resulted in, a dangerous release of a hazardous chemical. An investigation report will be prepared at the conclusion of the investigation.

All employees will attend client's process overview and any site-specific training during the refinery/chemical plant/facility orientation, including the process overview and Emergency Action Plan.

Process Safety Management of Acutely Hazardous Materials

These regulations contain requirements for **preventing or minimizing the consequences of catastrophic releases** of toxic, reactive, flammable or explosive chemicals. These regulations are intended to eliminate to a substantial degree, the risks to which employees are exposed in petroleum refineries and chemical plants.

The client shall complete a compilation of **written process safety information (PSI)** before conducting any process hazard analysis. This safety information should include information pertaining to the hazards of the highly hazardous chemicals used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

The client shall perform an initial **process hazard analysis (PHA)**. The process hazard analysis should address the hazards of the process, the identification of any previous incident which had a likely potential for catastrophic consequences in the workplace, engineering and administrative controls applicable to the hazards and their interrelationships such as appropriate application of detection methodologies to provide early warning of releases, consequences of failure of engineering and administrative controls, facility siting, human factors, and a qualitative evaluation of a range of the possible safety and health effects of failure of controls on employees in the workplace.

The client shall develop and implement **written operating procedures** that provide clear instructions for safely carrying out activities involved in each process. These procedures should cover the following:

A. Steps for Each Operating Phase:

1. Start-up
2. Normal operation
3. Temporary operations
4. Emergency operations, including emergency shutdowns
5. Normal shutdown
6. Start-up following a turnaround, or after an emergency shutdown

B. Operating Limits:

1. Consequences of deviation
2. Steps required to correct and/or avoid deviation
3. Safety systems and their functions

C. Safety and Health Considerations:

1. Properties and hazards of the chemicals used in the process
2. Precautions necessary to prevent exposure, including PPE
3. Control measures to be taken if physical contact or airborne exposure occurs
4. Safety procedures for opening process equipment (such as pipeline breaking)
5. Verification of raw materials and control of hazardous chemical inventory levels
6. Any special or unique hazards

Note: If Hot Work is to be performed, as with any hot work, a "Hot Work" permit shall be obtained from the client before any work commences (refer to the company hot work/welding policy if applicable).

A copy of the operating procedures shall be readily accessible to employees who work in or near the process area or to any other person who works in or near the process area.

The operating procedures shall be reviewed as often as necessary to assure that they reflect safe operating practices, including changes that result from changes in process chemicals, technology and equipment and changes to facilities.

The client shall develop and implement safe work practices to provide for the control of hazards during operations such as opening process equipment or piping and control over entrance into a facility by maintenance, contractor, laboratory or other support personnel. These safe work practices shall apply to employees and contractor employees. The contract employer (Ruhlin or Subcontractor) shall advise the client of any unique hazards presented by the contract employer's work, or of any hazards found during the contract employer's work. The client will be notified in writing of whether or not the hazard was created due to the contract employer's work or if the hazard was discovered as a result of the client's processes. A description of the hazard will be provided.

Training

1. **Initial training.** Each employee (contract employee) presently involved in operating or maintaining a process, and each employee before working in a newly assigned process, shall be trained in an overview of the process and in the operating procedures. The training shall include emphasis on the specific safety and health hazards, emergency operations, and procedures and safe practices applicable to the employee's job tasks. All training shall be documented.
2. **Refresher and supplemental training.** At least every three years, and more often, if necessary, refresher and supplemental training shall be provided to each maintenance or operating employee and other workers necessary to ensure safe operation of the facility. The employer in consultation with employees involved in the operation or maintenance of a process shall determine the appropriate frequency of refresher training.
3. **Training certification.** The employer shall ensure that each employee involved in the operation or maintenance of a process has received and successfully completed training. The employer, after the initial or refresher training shall prepare a certification record which contains the identity of the employee, the date of training, and the signatures of the persons administering the training.
4. **Testing procedures** shall be established by each employer to ensure competency in job skill levels and safe and healthy work practices.

Contractor

1. The client shall inform contractors (including Ruhlin and its subcontractors) performing work on, or near, a process of the known potential fire, explosion or toxic release hazards related to the contractor's work and the process and require that contractors have trained their employees to a level adequate to safely perform their jobs. The employer shall also inform contractors of any applicable safety rules of the facility and assure them that the contractors have so informed their employees.
2. The client shall explain to contractors the provisions of the emergency action plan.
3. Contractors shall be assured that each of their employees has received training to safely perform their job and that the contract employees shall comply with all applicable work practices and safety rules of the facility. This training shall then be documented. The name, date of training and the means used verify the employee understood the training shall also be documented. Contractors must also assure that each contract employee is instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the emergency action plan.

Trade Secrets

The Ruhlin Company's employees will respect and maintain the confidentiality of all "Trade Secret" information received and/or gathered from the client. Any and all proprietary information obtained including but not limited to the following is governed by this policy:

- Development of the process hazard analysis
- Development of operating procedures
- Involvement in incident investigations
- Involvement in emergency response or emergency planning
- Involvement in compliance auditing

Management of Change (MOC)

The client will typically handle all MOC situations, but we need to be aware of the program and be mindful that if we get involved with any changes, the necessary steps will need to take place. The Ruhlin Company 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 Ruhlin 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 Ruhlin Company or the client will update Process Safety Information (PSI), Process Hazard Analysis (PHA) and Operating Procedures as applicable.

Mechanical Integrity

The client will establish written procedures to maintain the on-going integrity of process equipment. Process equipment includes pressure vessels and storage tanks, piping systems (including piping components such as valves), relief and vent systems and devices, emergency shutdown systems, controls (including monitoring devices and sensors, alarms, and interlocks) and pumps. Employees involved in maintenance of process equipment will be trained in an overview of the process and its hazards and in the procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner. Process equipment will be inspected and tested.

SECTION 18 - Railroad Safety

Purpose

To protect roadway workers (as defined by 49 C.F.R. § 214.7) from being struck by moving locomotives, cars, and roadway maintenance machines; and to prevent accidents and casualties caused by collisions between roadway maintenance machines and moving locomotives, cars and/or other maintenance machines.

Rules

1. Never foul a track (< 6 feet) unless necessary in the performance of duty. In other words, do not walk or stand in the fouling space to conduct work unless you are absolutely certain that on-track safety has been established. Always obtain permission when fouling the track from a designated railroad official.
2. An on-track safety job briefing must be conducted before fouling the track, and you should understand all aspects of your on-track safety to ensure that you are adequately protected. You must acknowledge that you understand the briefing and the on-track safety must be appropriate for the work that you are performing.
3. Remind the person providing you with the on-track safety job briefing that you must be notified of any changes in the on-track safety procedures that may occur throughout the day.
4. You must know the identity of the worker who is in charge of the on-track safety procedures.
5. It is critical to know the type of on-track safety for the track(s) you are to foul.
6. The specific working limits must be clearly defined. Otherwise, train approach warning must be provided and, when clearing the track, the designated place of safety must be known. It is imperative that you are clear of the track before any train approaches your work area.
7. Proper PPE must be worn when working around tracks; this includes hard hats, safety glasses, high-visibility vests, and metatarsal guards.
8. Employees shall only cross tracks at designated crossing areas unless the work activity involves working on the track. If for some reason an employee is not able to cross at the designated crossing and has to cross the tracks, the following procedures should be followed:
 - Do NOT cross the track(s) within 10 feet of a parked rail car.
 - Do NOT cross between uncoupled cars.
 - Stop, Look, and Listen prior to crossing tracks.
 - Never step on rail because they may be slippery.
 - Never attempt to crawl under, between, or walk in front of moving rail cars.
 - Expect the movement of trains, engines, cars, or other moveable equipment at any time, on any track, in either direction.
9. If you are a lone worker using individual train detection:
 - The on-track safety statement must be completed.

- You have the right to use an alternative form of on-track safety other than individual train detection.
 - You cannot be working where there is noise (e.g., environmental, power tools, machines, etc.) or other impairments interfering with your ability to detect approaching trains.
 - You must have the ability to clear a protected area.
 - Never place your body in a pinch-point situation.
10. The required on-track safety training and/or qualification must be completed before you perform your duties. This training shall be documented, and employees will be given a quiz at the end of the training to provide verification of understanding. Written certification of such training shall be maintained by the Site Safety Specialist. This certification will include employee name, trainer signature/initials, and dates of training. Certification will be made available to employees and their authorized representatives.
- Retraining will occur prior to a change in assigned duties or if a new hazard has been created or special deviations have occurred. Any deficiencies found in either the procedure, permits or actual practice shall be addressed and affected employees shall be retrained as necessary.
11. The required on-track safety training and/or qualification must be completed before you perform your duties.
12. If required, railroad communication (e.g., radio) must be available.
13. Stop, look, and listen before crossing any track, regardless of the on-track safety status of the track(s). Expect the movement of trains, engines, cars or other moveable equipment at any time, on any track, in either direction.

If roadway maintenance machines are used, such use shall comply with the requirements of Crane Operation Safety (Section 9) of this Safety Manual, with exceptions as stated in 29 CFR 1926.1442. "Roadway maintenance machine" means a device powered by any means of energy other than hand power which is being used on or near railroad track for maintenance, repair, construction or inspection of track, bridges, roadway, signal, communications, or electric traction systems. Roadway maintenance machines may have road or rail wheels or may be stationary.

SECTION 19 - Hydrogen Sulfide

General

Hydrogen sulfide, commonly referred to as H_2S , is a colorless, flammable, toxic, and poisonous gas. In low concentrations, H_2S smells similar to rotten eggs. In higher concentrations, H_2S paralyzes the sense of smell, so odor cannot be used as a warning for high concentrations.

H_2S is an irritant of the eyes and respiratory tract at low concentrations. At higher levels, it causes respiratory system paralysis and is rapidly fatal.

H_2S is a natural component of crude oil processing. It occurs in "sour" crude oil and its products such as untreated process streams, sour water systems, sour gas systems, flare gases, slop oils, process sewers, sanitary sewers, grated or process trenches, distillate off-gases, and residual oils. In a refinery, it may be encountered in vessels, tanks, pipelines, flare lines, and sewers. It is also common in sewers, biological digesters, and agricultural operations.

Scope

This procedure applies in its entirety to all Ruhlin Company operations and projects involving refinery operations or maintenance, unless client-specific requirements require stricter controls. Employees must be aware of site-specific contingency/emergency plans. The purpose of this procedure is to ensure that hydrogen sulfide is handled safely and consistently throughout the operation and describes protective measures to prevent and minimize personal exposure to H_2S . It establishes guidelines for detection of H_2S , defines methods for respiratory protection, and specifies first aid, work practices, and training.

Responding to a Sour Gas Leak or a Sour Gas Release

Response to a sour gas odor or sour gas leak will depend largely on the situation and the H_2S content of the leaking stream. The following are steps for responding to noticeable or recognized H_2S leaks or odors.

1. Supervisors must be immediately notified of any H_2S odor or a recognized leak or release, or a person who may have been overcome by H_2S exposure. Supervisors should contact the Site Safety Specialist to report any potential release and initiate emergency action in accordance with the site plan if directed.
2. A hot zone will be established to prevent non-essential personnel from entering an area impacted by the leak or release. Initially, the hot zone should be identified to all on-site supervisors by radio or cell phone communications, but barricade tape and warning signs will be used to direct personnel out of the leak area. A hot zone may include but is not limited to the following: pump alley, roadways surrounding an operation unit, a confined or restricted access area, a scaffold or walkway, the upper levels of a building or structure, an elevated work platform.
3. In establishing a hot zone, it is critical to check the wind direction indicators. The gas is slightly heavier than air so it may accumulate in low spots or dead spots if there is no wind to move it. Try to work upwind or at least crosswind of the odor or leak to minimize the impact of wind direction changes. The H_2S concentration must be < 10 ppm at the perimeter of the hot zone. A portable four-gas or five-gas analyzer or personal H_2S monitor can be used to establish a hot zone perimeter.

***** WARNING *****

When investigating for a noticeable or recognized leak, DO NOT enter a confined space without completing a confined space entry permit. DO NOT climb any scaffold or other temporary structures without access to a supplied air breathing system, adequate fall protection, and a back-up person.

Hazard Evaluation and Air Monitoring

Prior to commencing any work in an H₂S work atmosphere, the hazards of the H₂S hazard must be assessed considering site operations and gas concentrations. Attachment #19C provides guidance for Hazard Condition Rating for oil field operations as recommended by the API. This guidance can be used in oil field and well operations as well as other operations as appropriate. Air monitoring is critical to establish hazard conditions and the following information is provided regarding air monitoring procedures and methods.

Characteristics of H₂S

H₂S has a characteristic rotten egg odor, which can be detected at well below one part per million (ppm). H₂S is a flammable gas in concentrations of 4.3 to 45.5% and has a low ignition temperature. Because H₂S is slightly heavier than air, it can accumulate in low lying spaces, trenches, sewer lines, dead legs, and confined spaces. Low concentrations of H₂S can dull the sense of smell and impair reasoning abilities. It is a severe health hazard.

Odor is not a reliable indicator of H₂S concentration since it can deaden the sense of smell over time or in high concentrations.

Possible Health Effects

Possible health effects from H₂S depend on the duration and intensity of exposure. Some typical effects are:

<u>ppm H₂S</u>	<u>Possible Effect</u>
.00011-0.00033	Typical background concentrations
0.01-1.5	Odor threshold (when rotten egg smell is first noticeable to some). Odor becomes more offensive at 3-5 ppm. Above 30 ppm, odor described as sweet or sickeningly sweet.
2-5	Prolonged exposure may cause nausea, tearing of the eyes, headaches or loss of sleep. Airway problems (bronchial constriction) in some asthma patients.
20	Possible fatigue, loss of appetite, headache, irritability, poor memory, dizziness.
50-100	Slight conjunctivitis ("gas eye") and respiratory tract irritation after 1 hour. May cause digestive upset and loss of appetite.
100	Coughing, eye irritation, loss of smell after 2-15 minutes (olfactory fatigue). Altered breathing, drowsiness after 15-30 minutes. Throat irritation after 1 hour. Gradual increase in severity of symptoms over several hours. Death may occur after 48 hours.
100-150	Loss of smell (olfactory fatigue or paralysis).

200-300	Marked conjunctivitis and respiratory tract irritation after 1 hour. Pulmonary edema may occur from prolonged exposure.
500-700	Staggering, collapse in 5 minutes. Serious damage to the eyes in 30 minutes. Death after 30-60 minutes.
700-1000	Rapid unconsciousness, "knockdown" or immediate collapse within 1 to 2 breaths, breathing stops, death within minutes.
1000-2000	Nearly instant death

H₂S Exposure Limits, IDLH, LEL Values

OSHA and NIOSH have established the following H₂S exposure limits for: PEL - permissible exposure limit; STEL - short term exposure limit; LEL - lower explosive limit; UEL - upper explosive limit; IDLH immediately dangerous to life and health. ACGIH has recommended guidelines such as TLVs for H₂S exposures.

ACGIH TLV-TWA = 1 ppm H₂S - Full Shift (8-hour TWA) Exposure.

ACGIH TLV-STEL = 5 ppm H₂S - 15 Minute Exposure.

NIOSH IDLH = 100 ppm H₂S

EXPLOSIVE RANGE (LEL-UEL) = 4.3% - 46%

OSHA ACCEPTABLE CEILING = 20 ppm H₂S - Exception for 10-min exposure*

*Note a once per shift peak exposure up to 50 ppm for up to 10 minutes is allowed.

OSHA PEL (Construction) = 10 ppm

H₂S Monitors - Personal and Area Instruments

The monitoring instruments described herein are used specifically to monitor H₂S in the atmosphere. The information below summarizes the general use of these instruments. Check with project specific procedures for use of monitors.

Personal H₂S Monitors

Personal monitors are small, battery-operated units that are worn on an employee's clothing near the breathing zone used for detection of H₂S. They continuously monitor airborne H₂S concentrations. H₂S monitors must have pre-set alarm levels with audible and visual alarms. The battery and chemical sensor may have a specific life span (1-3-year).

In addition, H₂S monitors may have optional accessory alarms (i.e., vibration alarm or ear jacks) for use in high noise areas. H₂S personal monitors do not have to include digital display reading in ppm H₂S but must have audio and visual alarms.

H₂S monitoring devices such as film badges with colorimetric paper, gas detector tubes, monitoring devices without audible and visual alarms are NOT APPROVED for use as personal H₂S monitors but may be used for

supplemental area monitoring purposes. Where there is a potential for H₂S accumulation, a personal H₂S monitor shall be worn. This may include task such as personnel collecting samples or the breaking, entering, or draining of equipment, vessels, pumps, tanks, pipelines, water draws, compressors, control valves, pressure relief valves, sulfide absorbers, sour water strippers, etc.

Work areas should designate areas where there is potential for H₂S accumulation by using area plot plans, or identify areas requiring personal H₂S monitors by posting signs.

Projects should maintain an adequate supply of personal H₂S monitors for personnel in their area. Personal H₂S monitors should be worn near the breathing zone on the outermost layer of clothing (i.e., collar or front pocket of parka, overalls, shirt, or coat).

Work groups (i.e., Operators/Crafts/Contractors) may share a personal H₂S monitor among 2-3 personnel with Safety Manager approval. The monitor must remain with the work group for the duration of the work task. All workers must remain with the work group.

Operators/Crafts/Contractors performing job tasks in SCBA or breathing air carts do not have to wear the monitor. Standby personnel for these job tasks must wear a personal monitor.

Personal H₂S monitor maintenance and calibration procedures must be done according to the manufacturer's instructions. Maintenance and calibration can include operational checks, zero adjustment, and calibration with the recommended span gas. All calibrations will be performed according to manufacturer recommendations and documented in project logs.

Operators/Crafts/Contractors must be instructed on use of the personal H₂S monitor. This should include instrument limitations (i.e., effects of a sudden H₂S release, wind shifts, low battery indicator, visual and audible alarms, chemical interferences, etc.).

If an H₂S alarm is activated, the employee must assume that H₂S is present. Operators/Crafts/Contractors must know to evacuate areas at the first indication of H₂S such as odor or activation of a personal H₂S monitor alarm at 10 ppm H₂S. Before work continues, an evaluation must be conducted by operations or safety personnel.

If exposure levels are determined to be above the maximum peak of 50 ppm H₂S, Operators/Crafts/Contractors must avoid further exposure to H₂S for the remainder of the shift. Administrative controls or supplied air respirators are required to avoid further exposure during the remainder of the shift.

Operators/Crafts/Contractors shall not be permitted to enter areas where H₂S is present without proper personal protective equipment unless it has been determined that the concentration is less than 10 ppm H₂S in the breathing zone. A breathing zone is an imaginary globe of two-foot radius surrounding the head.

Visitors and non-routine personnel are not required to wear personal H₂S monitors inside offices, control rooms, lunch rooms, enclosed vehicles, parking areas immediately adjacent to office-type environments and vehicle boarding areas immediately adjacent to entrance gates.

They may share a monitor in work groups (per Step 4 above) in refinery areas requiring the use of personal H₂S monitors. All visitors must be briefed regarding their actions in the event of an emergency.

When H₂S may be present as a health hazard during an emergency situation, emergency response team members must wear a personal H₂S monitor or have H₂S monitoring performed by a team member.

When SCBA or supplied-air system is required for a flange opening due to harmful or toxic gases being involved, special precautions must be followed for the protection of personnel and the environment. After a flange has been closed and all bolts have been tightened, the craftsman must remain at the job in their respirator while the flange is monitored for leakage. For H₂S monitoring, an approved personal monitor may be used by the craftsman to check for leakage.

Area H₂S Monitors

Area H₂S monitors, fixed or portable, may be used to monitor H₂S levels continuously around new construction projects or designated process equipment. Note, however, that area H₂S monitors are not a substitute for personal H₂S monitors. Area monitors may be used for additional monitoring over and above what is provided by personal H₂S monitors. Area H₂S monitors have specific manufacturer calibration and maintenance requirements that are different from personal H₂S monitors. Area H₂S monitors must have audible and visual alarms. Colorimetric and indicator type devices are only used to supplement area monitoring instruments and should not be considered accurate measurement devices.

Fixed, area H₂S monitors must have visual and audible alarms to warn of a H₂S release. These monitors are typically equipped to send a signal to a process area control room that alerts operators to the H₂S release.

Portable, area H₂S monitors should be posted within a 0-50' radius of a working group and must have audible and visual alarms. Alarms must activate when H₂S concentrations reach OSHA PELs.

Portable Four Gas or Five Gas Analyzers

Portable four gas or five gas analyzers with CO, H₂S, SO₂, LEL, and O₂ sensors must be maintained and calibrated according to the manufacturer's instructions and department procedures. Employees using the instrument must be trained and familiar with its proper use.

For detection of H₂S levels above the detectable limits of the four gas or five gas portable analyzers, use the high range H₂S colorimetric detector tubes. These devices are subject to error and should be used as qualitative indicators of high range concentrations.

Colorimetric Detector Tubes

Detector tubes must be used according to the manufacturer's instructions (i.e., number of strokes, possible chemical interferences, etc.). Do not use detector tubes that have expired. Check the expiration date on each box before using.

The following colorimetric detector tubes for H₂S are commercially available:

- Low Range 2.5-60 ppm
- Medium Range 2.5-500 ppm
- High Range 100-1600 ppm
- Very High Range 250-20,000 ppm {0.025% - 20% H₂S}
- Extremely High Range 10,000-400,000 ppm {1% - 40% H₂S}

Training Requirements

Personnel working in departments with H₂S-containing streams or tanks must be trained annually on Hazard Awareness and Supplied Air Respirator Training. These programs address the following topics:

- The health hazards of H₂S.
- Dangers of exposure to high concentrations of H₂S - even for short periods.

- The unreliability of smell as a means of detecting H₂S.
- The characteristics of H₂S including flammability.
- Proper use of personal protective equipment including respirator requirements and limitations for protection against H₂S vapors.
- Emergency rescue procedures and appropriate notifications.

Engineering Controls for H₂S Exposures

In the event monitoring reveals H₂S exposure levels are unacceptable for personnel, H₂S concentrations must be controlled by using engineering controls. After engineering controls are implemented, additional exposure monitoring shall be conducted to determine the effectiveness of the controls at reducing H₂S concentrations. Engineering control options may include, but are not limited to, the following:

Isolating or enclosing a process or work operation to reduce personal H₂S exposures.

Design considerations such as installation of valves, double block and bleed setups, and flanging can be arranged to reduce exposures.

Installation of local exhaust systems, or general dilution fans at the generating and dispersing points of H₂S. They must provide sufficient ventilation to keep the H₂S concentration below the OSHA PELs. The local exhaust systems or fans must be explosion proof, and electrically classified for use in an operating area.

Purge the equipment with nitrogen to reduce the H₂S concentration. Ensure the discharge point of the nitrogen purge does not cause an oxygen deficient atmosphere for workers in the area.

In buildings where H₂S may be present, such as instrumentation shelters, laboratories, or control houses, a fixed area H₂S monitor system shall be utilized to activate audible and visual alarms to indicate the presence of H₂S before employees shall be allowed to enter the building.

In buildings where H₂S may be present, two or more means of exit shall be provided from each separate room or building. No portions of such a room or building shall be farther than 75 feet from the nearest exit. Additional exits may be required, depending upon the number of persons in the building.

Exit doors shall open in the direction of exit travel and shall be provided with panic hardware. Exits shall have a visible sign. Where signs are not readily visible, an exit directional sign must be used.

Personal Protective Equipment(PPE)Controls for H₂S Exposures

In the event additional control beyond engineering controls are needed, PPE controls must be used to prevent or reduce H₂S personnel exposures. PPE will be used as an interim measure to mitigate personal exposure. See Appendix A - Attachment #19A.

Remember - PPE does not reduce or eliminate the H₂S hazard. Since H₂S is primarily an inhalation hazard, selection of the proper supplied air respirator is very important.

PPE controls should include, but are not limited to, the following list:

- Identify H₂S concentrations in a line or vessel by instrumentation, sample analysis, or engineering calculations before beginning any work. Once the H₂S concentration has been determined, the proper respirators can be selected depending on the job task and duration.

- For protection against H₂S levels ranging from 10 - 100,000 ppm, trained personnel may use a supplied airline respirator with an egress bottle.
- For protection against H₂S levels ranging from 10 - 100,000 ppm, trained personnel may use a self-contained breathing apparatus (SCBA).
- Emergency SCBAs located in operating areas should be used for emergency use only. They should not be used for routine maintenance jobs.
- Consideration should be given to the LEL% of H₂S as well as the toxicity of H₂S. High LEL atmospheres would mandate the use of bunker gear for enhanced flash fire protection.

All Ruhlin company employees required to wear respiratory protection must be medically qualified and fit tested per the Ruhlin Company Respirator Protection Program. Only personnel trained in emergency response procedures may participate in site emergency response actions.

First Aid Procedures

First aid procedures for a person overcome by H₂S require prompt removal of the person from the hazardous areas. This should only be attempted with the use of adequate respiratory protection for the rescue personnel. Immediate fresh air is critical for respiratory exposures and humidified 100% oxygen should be administered if available. Immediate notification of assigned emergency or medical support is necessary. Eye exposure to H₂S requires removal of contact lenses and eye irrigation for 15 minutes with sterile or saline eye wash solution followed by prompt medical attention. H₂S is not considered a skin hazard but skin contamination can be washed with mild soap and water.

SECTION 20 – Mobilized Elevated Work Platform

Purpose

This program has been developed to reduce the risk of physical injury or property damage in areas where Mobilized Elevated Work Platforms (MEWPs) are in operation.

Scope

This program applies to the operation of all MEWPs operated by Ruhlin employees, subcontractors, vendors, and visitors. Please see attachment 20-C – Examples of MEWPs for specific examples.

Responsibilities

Safety Department

- Must implement and administer the MEWP safety policies found in this section of the Ruhlin Safety Manual.
- Review the MEWP program periodically for compliance and effectiveness.
- Verify that all employees who operate, occupy, and/or supervise MEWPs are properly trained.
- Maintain written records of operator training on a MEWP and the name of the trainer.
- Maintain written records of all inspections performed by the MEWP owner, including the date any problems found, the date when fixed, and the name of the person performing the repairs.
- Maintain written records of the name and purchaser of each MEWP.
- Make recommendations for revisions if necessary.
- Establish expected operating conditions for MEWPs.
- Provide orientation and initial training as requested by Ruhlin departments.
- Provide the general safety training requirements for the MEWP program.
- Monitor the effectiveness of the program by receipt of copies of inspection checklists.
- Evaluate designated areas for MEWP use.
- Define appropriate eyewash facilities for battery changing/charging areas.
- Observe the operation of MEWPs and report unsafe practices to the appropriate supervisor.

Project Management/Superintendents

- Provide appropriate funding and scheduling time for MEWP Training.
- Ensure adequate training for operators, occupants, and supervisors.
- Identify and correct unsafe MEWP operations
- Develop a rescue plan for the site and ensure adequate resources are available for the rescue.
- Ensure rented MEWPs are properly maintained and annually inspected.

Supervisors

- Coordinate employee training, and certify that all operators receive training including, but not limited to, the items listed in this document.
- Ensure that only trained and qualified individuals use MEWPs.
- Verify employee compliance with the principles and practices outlined in the safety manual.
- Provide specific operational training for each MEWP.
- Observe the operation of MEWPs, and correct unsafe practices.
- Trained in supervising MEWP operations.
- Request familiarization training from rental companies.
- Conduct a risk assessment JHA prior to operating a MEWP and update accordingly.
- Conduct training for lift attachments.
- Ensure rented MEWPs are properly maintained and annually inspected.

Operators

- Read the MEWP safety program.
- Complete the Daily Pre-Use Inspection Checklist before operating any MEWP.
- At least annually review the procedures outlined in this document.
- Observe the operation of the MEWP and report unsafe practices to your supervisor.
- Properly select the correct MEWP for the scope of work to be performed.
- Participate in the risk assessment (JHA).
- Understand the site-specific rescue plan.
- Ensure rented MEWPs are properly maintained and annually inspected.

Occupants

- Trained in occupying a MEWP.
- Participate in the risk assessment.
- Understand the site-specific rescue plan.
- Know how to operate the emergency controls only.
- Report all hazards and unsafe MEWP operations to the MEWP operator and supervisor.

MEWP Procedures

MEWP Site Mobilization

- Prior to a MEWP mobilizing to site, supervisors shall select the proper lift for the job based off the following:
 - How high do the employees need to go?
 - Where do your hands need to be?
 - How close can you get the lift to the work?
 - Is the work performed inside or outside?
 - Will the lift be exposed to wind?

- Is additional ventilation needed?
- Could a buildup of carbon monoxide occur in the work area? (Are air monitors and additional ventilation required? Are lifts that do not produce CO available?)
- What type of energy source is needed for lift? (Electric, Gas/LP, Diesel)
- What is the path from the drop off area to the work area?
- What type of work will be performed?
- How many workers are needed on the lift?
- Supervisors shall ensure the MEWP has an annual inspection and ensure it has received the proper maintenance upon arriving onsite.
- MEWP supervisors shall ensure the offload area is safe for MEWP mobilization.
- MEWP shall pass a pre-use inspection prior to accepting the lift from the rental company.
- Supervisors shall request familiarization training from the rental company upon arriving.

Pre-Use Inspection

- Prior to the operation of any MEWP the Pre-Use Inspection Checklist found in attachment 20-A must be completed. This applies at the beginning of every work period, and whenever a new equipment operator takes control of the MEWP.
- When an operator leaves the work area, the employee shall inspect the MEWP again for any defects.
- The MEWP shall be inspected for the following items for defects
 - Hydraulic fluid leaks,
 - Defective brakes,
 - Steering,
 - Lights,
 - Horn,
 - Fire extinguisher,
 - Back-up alarm.
 - Attach
 - Adequate Fuel
 - Batteries
 - Platform structural
 - Accordance with the owner's manual

General Safe Work Practices

- Operators shall not wear any loose clothing or any accessory that can catch in moving parts.
- Before machine is started, the operator must walk completely around the machine to ensure everyone and everything is clear of the machine.

- Articulating boom and extendable boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.
- Modifications and additions that may affect the capacity or safe operation of a MEWP are strictly prohibited without the manufacturer's written approval. Capacity, operation, and maintenance instruction markings will be changed as necessary if the manufacturer approves a modification.
- The insulated portion (if applicable) of a MEWP shall not be altered in any manner that might reduce its insulating value.
- Any signs, plates, or decals which are missing or illegible must be replaced.
- If the MEWP becomes disabled, a "out of service" tag or equivalent shall be attached to the controls inside the platform in a conspicuous location.
- MEWP devices with noted, reported deficiencies shall not be operated until repairs are made and equipment is authorized for use.
- Operators must report all accidents, regardless of fault and severity, to their supervisor.

Safe Work Practices Before Operation

- Consideration shall be given to the amount of wind. Follow the manufacturer's instruction regarding operation in windy conditions. As a general rule, MEWPs shall not be operated in winds exceeding 25mph although this can vary depending on the model of equipment.
 - At 20mph wind speeds or anticipated gusts, lifts will be lowered to a maximum height of 20 feet.
 - At 25mph wind speeds or anticipated gusts, lifts will be grounded.
 - If at any time, employees feel unsafe in lifts, they may make the decision to ground the lifts and cease work. No questions asked.
 - The Ruhlin Company has a wind gauge which measures wind speeds. Contact the Safety Department to obtain and use the wind gauge.
 - Some work activities may require the lifts to be shutdown with lower wind speeds such as siding, plywood, sheeting, etc.

- Guardrails must be installed, and access gates or openings must be closed before raising the platform.
- Boom and platform load limits specified by the manufacturer shall not be exceeded.
- Before moving an MEWP for travel, the boom(s) shall be inspected to see that it is properly cradled, and outriggers are in stowed position (if equipped).
- Consideration shall be given to the protection of bystanders via barricading, overhead protection, and/or having another employee keep bystanders at a safe distance or by other means.
- MEWPs shall not be operated from trucks, scaffolds, or similar equipment.
- Prior to operating a lift, a risk assessment shall be performed by the MEWP supervisors with assistance of the occupants and operators of the lifts. The risk assessment will include but not limited to the following:
 - Ground Stability
 - Underground Utilities
 - Overhead Hazards
 - Electrical Hazards
 - Fall Hazards
 - Fallen object hazards
 - Caught in or between hazards
 - Struck by Hazards
 - Marine Hazards
 - Hazardous gases
 - Vehicle traffic
 - Simultaneous Operations
 - Improper equipment
 - Correct MEWP for the Job
 - Wind

Safe Work Practices During Operation

- Once an employee accesses the lift, the employee shall immediately tie-off to the manufacturer tie-off point prior to starting the equipment.
- Attention shall be given towards the direction of travel, clearances above, below and on all sides.
- All MEWPs will have a working back-up alarm and/or use a spotter when backing.
- Load limits of the equipment shall not be exceeded.
- An approved personal fall arrest system shall be worn when in an MEWP.
- An approved fall arrest system shall be attached to the manufactured approved tie-off point.

- Employees must stand firmly on the floor and shall not sit or climb on the guardrails of the MEWP.
- Planks, ladders, or other devices shall not be used on the work platform.
- A MEWP shall not be moved when the boom is elevated in a working position with employees in the basket.
- MEWP shall not be placed against another object to steady the elevated platform.
- MEWP shall not be used as a crane or other lifting device.
- MEWP devices shall not be operated on grades, side slopes or ramps that exceed the manufacturer's recommendations.
- MEWPs shall only be operated on surfaces capable of supporting their weight.
- The brakes shall be set and outriggers, when used, shall be positioned on pads or a solid surface.
- Speed of MEWP devices shall be limited according to the conditions of the ground surface, congestion, visibility, slope, location of personnel and other factors that may cause hazards to other nearby personnel.
- Stunt driving and horseplay shall not be permitted.
- Booms and elevated platform devices shall not be positioned to jack the wheels off the ground.
- The area surrounding the elevated platform shall be cleared of personnel and equipment prior to lowering the elevated platform. All alarms must be in good condition.
- A minimum distance of 20 feet must be kept in between any part of the equipment, conductive tools, or materials when working near energized, unprotected electrical lines for electrical equipment up to 50KV.
- All equipment must be secured on the inside of the MEWP.
- Operators are to call for assistance if the platform or any part of the machine becomes entangled.

Safe Work Practices After Operation

- Safe shutdown shall be achieved by utilizing a suitable parking area, placing the platform in the stowed position, placing controls in neutral, idling engine for gradual cooling, turning off electrical power, and taking the necessary steps to prevent unauthorized use.
- MEWPs shall be shut off prior to fueling. Fueling must be completed in well ventilated areas free of flames, sparks or other hazards which may cause fires or explosions.

Changing and Charging Batteries

- Battery charging installations must be in areas designated for that purpose.
- Facilities must provide for: flushing and neutralizing spilled electrolyte, fire protection, protection of charging apparatus from damage by trucks, adequate ventilation for dispersal of fumes from gassing batteries.
- Precautions must be taken to prevent open flames, sparks, or electric arcs in battery charging areas.
- Employees charging and changing batteries shall be authorized to do the work, trained in the proper handling, and required to wear protective clothing, including face shields, long sleeves, rubber boots, aprons, and gloves.

Maintenance

- Any MEWP not in safe operating condition must be removed from service. Authorized personnel must make all repairs.
- Repairs to the fuel and ignition systems of MEWPs that involve fire hazards must be conducted only in locations designated for such repairs.
- MEWPs in need of repairs to the electrical system must have the battery disconnected before such repairs.
- Only use replacement parts that are currently recommended by the manufacturer.

MEWP Rescue Plan

Each project shall have a site-specific rescue plan for MEWP and working at height operations. The plan shall be developed by the site superintendent and project management team with the

assistance of the safety department. Project management and superintendents can use the form 20-D to develop the rescue plan or similar format.

The rescue plan will consist of the following components:

- Project Information
- Scope of Work
- Training and Equipment Required for rescue plan
- Rescue Options
- Contacting of proper Authorities

Rescue Options-Every rescue situation is different and needs to be evaluated accordingly. Prior to sending an employee up in the lift, the supervisor must make a determination if the employee is fit for duty. This step is taken to ensure no employee will be put into a dangerous condition on the job.

The following are the rescue methods on The Ruhlin Company projects we can use to rescue someone from a MEWP.

Self-rescue consists of the employee that needs rescued from an elevated MEWP, rescues themselves by pulling themselves back onto the MEWP. This method is preferred since we do not have to expose other employees or rescuers to the hazards.

Ground Control Rescue uses the ground control device on the MEWP to safely lower to the ground. This is a very effective technique but can be challenging if the employee's MEWP is inside of structures. Take precautions and ensure the victim isn't exposed to pinch points and other crushing hazards. This plan shall carefully be thought out with someone to spot the employee down to the ground. The keys for the lifts shall be placed inside of the key ignition and are not to be removed when working from heights.

Another MEWP Rescue can help employees descend to the ground but can expose employees and rescue members to working at height hazards. This method shall be carefully thought out and ensure the other lift does not exceed the occupancy limit with the rescuers and victims. The rescue MEWP shall be readily available for the workers working at heights. The rescue MEWP shall follow all requirements of this section. The pre-use inspection of the rescue MEWP shall be done prior to working at heights.

Man-Basket Rescue shall be used as a last option method to rescue an employee. The man basket rescue shall be done in accordance with section 23-Scaffolding and Suspended Platforms.

Suspension Trauma Straps shall be used as an aid to another rescue option. Employees shall be trained on the proper use of the suspension trauma straps.

Additional Rescue Options: Project management and superintendents need to identify any other rescue options that are applicable to the site.

Training Requirements

Operator training

Employees who are authorized to operate MEWPs must receive training prior to engaging in their duties, and at least every five (5) years thereafter. The training is to ensure that the MEWP safety program is understood. The supervisor will also ensure that authorized MEWP operators have acquired the necessary practical skills for safe operation.

Retraining is required for MEWP operators for the following reasons:

- Every 5 years.
- When a MEWP operator demonstrates the ability to operate the MEWP in an unsafe manner.
- Involved in an incident.
- Violates the Ruhlin company safety manual.
- New attachments introduced to the work environment.
- New equipment introduced to the work environment.

The Ruhlin Company will perform operational training with each employee to determine if operators have the knowledge, training, and skills necessary to use the MEWP. Operational training will consist of a combination of general safety instruction, practical/operational training (demonstrations performed by the trainer, and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace. All operational training must be conducted under close supervision. All functional training shall be performed in an area that is safe for the trainee.

Initial Training

- Receive instruction on the intended purpose and function of each control.
- Prior to operating any MEWP, the trainee will read and understand the manufacturer's operating instruction(s) and MEWP procedures, or receive training by a qualified person on the contents of the manufacturer's operating instruction(s) and users safety rules.
- Be informed of the MEWP operating limitations and restrictions as defined by the manufacturer.
- Understand by reading or having a qualified person explain all decals, warnings, and instructions displayed on the MEWP.
- During operational training, trainees may operate an MEWP only under the direct supervision of authorized trainers, and where such operation does not endanger the trainee or other employees.

- All training and evaluation must be completed before an operator is permitted to use an MEWP without continual and close supervision.

Supervisor Training

- Supervisor training will consist of the follow items:
 - Proper Selection of the correct MEWP for the scope of work.
 - Applicable Rules, Regulations, and standards.
 - Hazards associated with the MEWP operations.
 - Mitigation controls for MEWPs.
 - Manufacturers operating and maintenance manuals.
 - MEWP Rescue Plan.

Occupant Training

- **Occupant training will consist of the following items:**
 - The requirement to use fall protection and the location of fall protection anchors.
 - Factors including how their actions could affect stability.
 - Safe use of any MEWP accessories that they are assigned to use.
 - Any site-specific work procedures the occupants must follow related to the operation of the MEWP.
 - Hazards related to the task at hand
 - Mitigation and elimination of the hazards.
 - Manufacturer's warnings and instructions.
 - Operation of the emergency descent device.

Training Records

The Safety Department must maintain a record of all operators, supervisors, and occupants.

- Subject of training.
- Date of training.
- Name of individual trained.
- Name of supervisor or safety person providing the training.
- Training records shall be maintained by the Safety Department for a minimum of 3 years.

SECTION 21 - Mobile Equipment

Introduction

The Ruhlin Company recognizes the hazards associated with the operation of mobile equipment. This policy has been developed to establish guidelines to eliminate injuries or fatalities related to this type of equipment.

Scope

This policy applies to all free moving mobile equipment that may be propelled by gasoline, propane, diesel or electricity. Only competent personnel may operate mobile equipment. An individual's competency must be demonstrated by successful completion of the training and evaluation process specified in this policy. This policy establishes requirements to work in or around all types of mobile equipment. Ruhlin employees are required to comply with the procedures outlined in this document.

Definitions

Competent Person - Person who by possession of a recognized degree in an applicable field or a certificate of professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.

Free Moving Mobile Equipment - Operator controlled mobile equipment not constrained by Fixed Rails and can include Industrial Fork Trucks, Aerial Lifts, Buggies, Sweepers and Backhoes.

Mobile Equipment - Free moving equipment propelled/powered by gasoline, propane, natural gas, diesel or electricity used to haul, transport, excavate, move, maneuver, or hoist materials, equipment, products or personnel.

Pre-use Inspection - Required inspection of a piece of mobile equipment at the beginning of each shift before the mobile equipment is put in service. (See Attachments)

Responsibilities

Project Managers will:

- Ensure that this policy and all rules in the equipment training procedure are followed.
- Ensure a Competent Person is available for mobile equipment training.
- Provide a resource for training the operators of mobile equipment to ensure that all equipment is safely operated.

Superintendents will:

- Enforce this policy and all rules in the equipment training procedures.
- Identify and provide the appropriate training for the Competent Person to conduct mobile equipment training.
- Ensure that operators of mobile equipment are trained, evaluated, observed and given skills needed to operate the equipment safely.
- Document random observations and on the spot corrections or refresher training.

- Enforce these safety procedures and rules as related to mobile equipment; such as, but not limited to, seatbelt use.

Employees will:

- Follow this policy and other safety rules pertaining to the pre-shift inspection of, operation and routine maintenance of mobile equipment.
- Perform pre-use inspections prior to start of work for respective equipment.
- Report any pre-use inspection deficiencies with equipment to their immediate supervisor for maintenance or further action prior to operation of the equipment.
- Obey traffic signs and signals and audible or visual warning devices.

Competent Person (Equipment Trainer) will:

- Train and evaluate equipment operators in classroom, hands-on training process and refreshers.
- Be knowledgeable and experienced in the particular equipment operation and how-to train employees.
- Document evaluations and training.

The Safety Department/Safety Director/Site Safety Specialists will:

- Provide assistance for compliance with the policy to requesting individual departments/employees.

General Operating Requirements

- The location shall determine the vehicle speed limit and post the information.
- All incidents involving mobile equipment shall be formally investigated following The Ruhlin Company's Accident Investigation guidelines.
- Equipment operators are responsible for keeping the equipment under control at all times.
- All equipment operators must obey traffic signs and signals, and audible or visual warning devices.
- Alteration or modification of equipment is not permitted without prior written consent of the manufacturer and the Project Manager.
- When parking equipment, the operator must not block fire aisles, access to stairs, stretcher storage, fire equipment, or other emergency response areas or equipment. When parking equipment, the parking brake must also be set. When parking on inclines, the wheels must be chocked.
- Stunt driving and horseplay are strictly forbidden.
- Operators must use the equipment in the manner it was designed and intended to be used.
- All equipment rated capacities shall not be exceeded.

- Mobile equipment shall not be loaded beyond established manufacturer's load limits. All loads must be correctly and safely secured for transportation.
- Equipment operators shall perform a pre-use inspection on all equipment using the appropriate form (see attachments).
- Any deficiencies found in the pre-use inspections shall be reported and the equipment taken out of service until repairs are made and the equipment is safe to operate.
- The right of way must be yielded to emergency vehicles.
- Riders are not permitted on mobile equipment except when equipment is approved to accommodate passengers.
- Operators must keep both hands free such as not eating, reading and drinking while operating.
- Proper PPE must be used while operating mobile equipment (i.e .seatbelts, hearing protection, hard hat, gloves, and eye protection, unless operating within an enclosed cab).
- When fueling mobile equipment, the engine must be shut off, ensure the fuel is the proper type of fuel, nozzles shall be equipped with an automatic shut-off to prevent overfill, and fuel tanks should not be "topped off." Whenever practical, mobile equipment shall be transported to the designated fueling area for refueling. Smoking is prohibited while refueling any mobile equipment.
- Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.
- When operating equipment near power lines refer to section 14 for the electrical safety program to identify safe distance requirements for powerlines and energized equipment.
- Tools and material must be secured to prevent movement when transported in the same compartment with employees.
- Seatbelts are required.

Free Moving Equipment or Vehicles

- If governors are in use and are set to a specific speed, they must not be removed or altered in any way.
- Equipment operators must maintain a safe following distance from other equipment or vehicles (three vehicle lengths or three seconds).
- For intersections with obstructed views, the equipment operator is responsible to slow down, sound the horn and use fixed convex mirrors, where provided to check for cross-traffic.
- Equipment operators must stay within the floor markings and out of the pedestrian lanes.
- Operators must attach the seatbelt before starting the equipment. When the equipment is in use, seatbelts must be always worn.

- Load backrest extension will not increase the maximum weight, which can be handled and provides overhead protection for operators and helps prevent parts of the load from falling on employees.
- Excess counterweighting is forbidden.
- Unstable or unsafely arranged loads shall not be picked up and restacked, banded, taped, or shrink-wrapped.
- Transfer loads from broken pallets or containers to sound ones before picking them up and promptly remove these same pallets or containers to void their future use.
- The proper attachments must be used for the respective equipment.
- Be aware of bystanders and pedestrians that may be in the target zone of an unstable load.
- Level the top of the forks and do not lift with only one fork.
- Lift from the broadest side of the load and set the forks at the greatest width the pallet allows.
- Fork extensions shall be used for deep loads and can cause a pallet behind the load being lifted to move or fall over.
- Heavy equipment must be wedged; a spotter used; and controls not run from the floor unless made for that type of operation.
- Off-center loads must be strapped if it could become unstable; operate slower; and use controls such as raise and tilt smoothly.
- Center of gravity of the load must be as close to the mast as possible. The stability is greater as the center of gravity of the load is brought closer to the front axle.
- Tilt the mast gently backward to stabilize the load when the load is elevated.
- Loads become less stable when the load is raised, turning, on slopes, tilting the load, and on rough or uneven surfaces.
- Traveling surfaces must be able to support the weight of the equipment and the load.
- Railroad tracks and similar edges shall be crossed at a 45-degree angle, where possible.
- There must be adequate overhead clearance maintained such as from lights, sprinklers and pipes.
- Employees are responsible to report and help correct leaning stacks.
- Equipment operators must maintain a safe distances from edges such as elevated ramps, platforms and docks.
- Transporting an individual in a lift platform is forbidden.
- Equipment operators must not pass forks or attachments over anyone, nor shall anyone pass under them whether the equipment is loaded or empty.

- Equipment operators shall not pass other vehicles moving in the same direction at intersections, blind spots or other dangerous locations.
- Equipment operators shall check that wheels are blocked; brakes are set; and use dock locks before loading a trailer.
- Dock boards or bridge plates must be substantial to hold the equipment and the load secured; and equipment operators must travel slowly on them.
- Condition of the floorboards must be satisfactory and enough overhead clearance prior to boarding a trailer.
- Equipment operators need to look back over both shoulders before changing direction or moving in reverse.
- Equipment operators shall travel with the load as close to the floor as possible (one or two inches at the heel of the forks and four to six inches at the tips, with the load resting against the mast).
- Equipment operators must follow rules for refueling.
- When traveling loaded on ramps greater than 10%, equipment operators shall always have the load upgrade.
- When traveling unloaded on ramps, forks shall be down ramp and mast tilted back.
- When leaving free moving equipment or industrial trucks unattended (greater than 25 feet away is abandoned), the operator shall place the forks on the floor; put the truck in neutral; set the brakes; shut-off the truck; and block the wheels if on a ramp.
- Equipment operators shall keep their bodies within the dimensions of the truck and not between the mast uprights.
- When parking near railroad tracks, equipment operators must park no closer than 25 feet from the center of the railroad tracks.
- Equipment operators shall travel with the load trailing if it obstructs their view.
- Equipment operators must avoid running over loose materials, uneven or soft surfaces and slippery areas including oils slicks. The equipment operator must report and help correct these situations.
- Equipment operators shall slow down for the conditions including wet or slippery floors and weather factors.
- Equipment operators shall avoid running on ice and snow, where possible.
- All free moving mobile equipment shall have back-up alarms.
- Back-up alarms and lighting must be inspected during the pre-use inspections and any deficiencies corrected.
- Flatbed truck operators shall avoid steering wheels all the way in either direction.
- The load must clear the floor for a flatbed truck before engaging the reverse speed.

- Flatbed truck operators shall pre-examine loads to ensure they do not overload the truck.
- Flatbed truck operators shall not use the reverse direction power for braking.
- Flatbed truck operators shall allow sufficient clearance for lowering loads into storage spaces.

Equipment Operator Training and Evaluation

General Training Requirements:

1. A formal training program that consists of a combination of classroom instruction with competency testing and practical training. (See attachments
2. Training shall include safety rules, operating procedures, equipment controls and safety work instructions such as, but not limited to, job safety analyses and standard operating procedures.
3. A competent person who has the requisite mobile equipment knowledge, training and experience to conduct the training and evaluations.
4. The competent person will evaluate each prospective operator while performing the safe operation of the equipment.
5. All operators shall exhibit satisfactory operating skills and pass a supervised written exam.
6. Employees who operate equipment shall be certified / re-certified on the specific equipment they operate. The documentation shall be training and evaluation records with the name of the operator, the date of training and the competent person performing the training. These records shall be retained for review.

Safe Operation Topics for Training:

1. All operating instructions, warnings and precautions for the type of trucks the operator will be authorized to operate.
2. Differences between the industrial vehicle and an automobile.
3. Equipment controls and instrumentation location, what they do and how they work.
4. Engine or motor operation.
5. Steering and maneuvering.
6. Visibility (including restrictions due to loading).
7. Fork and attachment adaptation, operation and use limitation.
8. Vehicle capacity.
9. Vehicle stability.
10. Vehicle inspection and maintenance the equipment operator will be required to perform.
11. Any other operating instruction, warning or precaution listed in the operator's manual for the type of vehicle that the employee is being trained to operate.

12. Workplace related topics and operating procedures (i.e., weather, docks, etc.).
13. Surface conditions where the vehicle will be operated.
14. Composition of probable loads and load stability.
15. Load manipulation, stacking, un-stacking.
16. Pedestrian traffic areas where vehicles will be operated.
17. Narrow aisles and other restricted places of operation where vehicles will be operated.
18. Hazardous (classified) locations where vehicles will be operated.
19. Ramps and other sloped surfaces that could affect the stability of the vehicle.
20. Other unique or potentially hazardous environmental conditions that exists or may exist in the workplace.
21. Closed environments and other areas where insufficient ventilation could cause a build-up of carbon monoxide or diesel exhaust.
22. Operating limitations.
23. Refueling and charging/recharging batteries.

Evaluation and Refresher Training:

A periodic evaluation and periodic formal documented refresher training based on the evaluation shall be conducted for equipment operators.

A competent person(s) must conduct and document an evaluation of the performance of the operator of mobile equipment at least initially and triennially thereafter.

Documented corrective training shall be required when conditions in the workplace change or the equipment operator demonstrates the following:

1. Observed operating in an unsafe manner;
2. Involved in an incident;
3. Evaluated not operating the equipment safely;
4. Assigned to drive a different piece of equipment; or
5. Conditions in the workplace have changed and could affect the safe operation of the equipment.

Mobile Equipment Safety Requirements:**Forklift:**

- Only certified, competent, trained personnel are permitted to operate the forklift. To receive your certification, you must go through the required training program, provided by a qualified instructor.

- Training programs must include formal instruction, practical training, and operator evaluation in the workplace.
 - Formal instruction includes lecture, discussion, interactive computer learning, videos, and written materials. Topics covered will include but are not limited to load capacity, instructions, distances, refueling, ramps, visibility, and stability.
 - Practical training involves instructor demonstrations and trainee exercises.
 - Operator evaluation includes a critique of all operational requirements.
- Operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.
- Mandatory refresher training shall be provided when unsafe operations are observed, after an accident, operation of a different type of vehicle, changes in conditions, etc.
- Operators are required to be re-evaluated every three (3) years.
- The operator shall perform pre-use inspections daily, and at the beginning of each shift. (The form shall be readily available for review.)
- Defective equipment must be locked out until repairs are complete.
- A preventative maintenance program shall be utilized and documented.
- Seatbelts shall be always required the forklift is being operated.
- Make sure there is a clear path before moving loads.
- Always move at a safe speed, and do not exceed posted speed limits.
- Always face the direction of travel.
- When necessary to travel in reverse, or there is obstruction to vision, have another person guiding.
- Always sound horn when coming around blind corners, at intersections or traveling in reverse.
- In picking up a load, be sure forks are set squarely and as far as possible under the load. Never raise or lower loads while traveling. Whether loaded or empty forks shall be carried as low as possible.
- Never swing or suspend loads over people. No one is permitted to walk or stand under raised material handling equipment.
- On inclines, forklifts must be driven with the load on the upgrade side of the driver.
- Check to make sure loads are firmly fastened and positioned to prevent tipping or slipping.
- Avoid any action that might dump a load.
- Moveable or replaceable forks must be firmly in place by use of a proper securing pin.

- Never use improvised attachments. Use only those approved by the manufacturer and be certain all attachments are properly secured.
- Only the operator is permitted to ride the forklift.
- The forklift may not be left unattended unless the load is lowered, controls are in neutral, brakes are set and the lift is turned off.
- When the forklift is parked on an incline the wheels shall be chocked.
- When trucks are unloaded, the wheels of the truck must be chocked and only approved, properly stabilized dock boards may be used.
- Detached semi-trailers must be properly jacked before being unloaded.
- The forklift driver will check the soundness of the dock plate and truck floor before driving the forklift onto either.
- They must also check trailer chocks and supports.
- The forklift shall be used only for the purpose for which it is designed. Raising personnel on the forks, for example, must be prohibited.
- The rated capacity must be clearly posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.
- All industrial trucks must meet comply with the American National Standards Institute B56.1–1969, Safety Standards for Powered Industrial Trucks. All high lift rider industrial trucks shall be equipped with overhead guards.
- If a truck is equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks for lifting personnel, the following additional precautions shall be taken for the protection of personnel being elevated.
 - Use of a safety platform firmly secured to the lifting carriage and/or forks.
 - Means shall be provided whereby personnel on the platform can shut off power to the truck.
 - Such protection from falling objects as indicated necessary by the operating conditions shall be provided.

Maintenance:

- The location shall follow the manufacturer's recommendations in their equipment preventative maintenance program.
- Only designated maintenance personnel shall be authorized to perform service on equipment.
- Maintenance shall conduct a pre-release inspection on equipment prior to return to service. Inspections should be reviewed periodically and retained for six (6) months.

SECTION 22 - Hearing Conservation Program

Introduction

Prolonged exposure to noise over the years can cause permanent damage to the inner ear that cannot be repaired medically or surgically.

This operating procedure provides the steps required to ensure that The Ruhlin Company Hearing Conservation Program is successfully and consistently implemented.

This procedure is designed to protect employees who perform work in areas where noise levels may exceed 85 decibels (dBA) over an 8-hour time-weighted average in the completion of their job duties.

Hearing Conservation Program

The Hearing Conservation Program shall be activated whenever the 8 Hour time-weighted average sound levels exceed 85 Dba (the "action level").

The Ruhlin Company Hearing Conservation Program shall consist of:

1. Adequate monitoring.
2. Employee training.
3. Audiometric examinations (testing to be conducted by a qualified licensed and certified provider).
4. Periodic re-examination of the program.
5. Recordkeeping.
6. Hearing protection, including fitting and training.

If employees are exposed over 90 dBA averaged over an 8-hour period, the following aspects of the Hearing Conservation Program also apply:

- The Ruhlin Safety Department shall assess whether noise exposures can be reduced below 90 dBA time-weighted average using engineering or administrative controls.
- Hearing protection is mandatory if noise levels can't be reduced below 90 dBA.

The Safety Department is responsible for overseeing, administering, and reviewing the Program.

Program requirements shall be made available to affected employees at no cost to the employee.

Whenever it is reasonable to suspect that an employee could be exposed to noise levels more than the acceptable limits, employees shall be notified, and a monitoring sample shall be taken to determine the exact amount of exposure. If it is shown that the limits are exceeded, attempts shall be made to acoustically reduce the noise levels to acceptable limits. If that is not possible the area will be posted as a high noise area and hearing protection will be required. All affected employees will be fitted with and trained in noise attenuating personal protective equipment and be required to wear it. Employees shall be informed of noise levels of which test results shall be posted and made available for review.

Employees required to wear hearing protective equipment shall be trained in the various types available, how to use the equipment, why the equipment is needed and how to fit it at no cost to the employee. The use of hearing protection shall be re-evaluated and/or refitted and if necessary, a medical evaluation may be required.

Within 6 months of an employee's first exposure at or above the action level, a valid baseline audiogram shall be established against which future audiograms can be compared. Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protection may be used to meet the requirement.

If a threshold shift has occurred, use of hearing protection shall be re-evaluated and/or refitted and if necessary, a medical evaluation may be required.

At least annually after obtaining the baseline audiogram, a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 dBA shall be obtained. Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred. If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift, the employee shall be informed of this fact in writing, within 21 days of the determination.

The training shall be repeated annually for each affected employee. Training shall be updated consistent to changes in personal protective equipment and work processes. Copies of the noise exposure procedures shall be readily available to the affected employees and shall be posted along with the other required OSHA postings. Program records shall be available to authorized representatives. Accurate records of all employee exposure measurements shall be maintained as required and in accordance with OSHA guidelines.

SECTION 23 - Scaffolding and Suspended Platforms

Purpose

The purpose of this safety policy and procedure is to provide guidelines for the safe use of scaffolds. It includes training provisions and guidelines for scaffold erection and use.

Policy

Scaffolds shall be erected, moved, dismantled, or altered (modified) only under the supervision of a competent person and will have guardrails and toe boards installed. When scaffolding hazards exist that cannot be eliminated, then engineering practices, administrative practices, safe work practices, Personal Protective Equipment (PPE), and proper training regarding scaffolding will be implemented. These measures will be implemented to minimize those hazards and to ensure the safety of employees and the public.

Responsibilities

It is the responsibility of each project manager, supervisor, and employee to ensure implementation of The Ruhlin Company's safety policy and procedure on scaffolding. It is also the responsibility of each employee to report immediately any unsafe act or condition to his or her supervisor.

Project Managers

Project Managers will ensure adequate funds are available and budgeted for the purchase of scaffolds in their areas. They will also identify the employees affected by this safety policy and procedure. Project Managers will obtain and coordinate the required training for the affected employees. Project Managers will also ensure compliance with this safety policy and procedure through their safety auditing processes.

Supervisors

Supervisors will not allow any employee who has not received the required training to perform any of the tasks or activities related to scaffold erection and/or dismantling. Supervisors will communicate appropriate needs to project managers and/or supervisors. Supervisors will ensure that employees are provided with PPE as necessary for their job. Supervisors will ensure that a competent person is in charge of scaffold erection according to the manufacturer's specifications.

Competent Person

The competent person will oversee the scaffold selection, erection, use, movement, alteration, dismantling, maintenance, and inspection, and ensure guardrails and toe boards are installed. The competent person will be knowledgeable about proper selection, care, and use of the fall protection equipment. Additionally, the competent person shall assess hazards.

Employees

Employees shall comply with all applicable guidelines contained in this safety policy and procedure. Employees will report damaged scaffolds, accessories, and missing or lost components. Employees will assist with safety inspections as requested.

Safety Department

The Safety Department will provide prompt assistance to project managers, supervisors, or others as necessary on any matter concerning this safety policy and procedure. The Safety Department will assist in developing or securing required training and will also ensure that all newly purchased scaffolds comply with current safety

regulations. Safety Specialists will provide consultative and audit assistance to ensure effective implementation of this safety policy and procedure.

Training

Employees who perform work while on a scaffold will receive instruction on the types of scaffolds which they are to use. The training will be provided 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. Training should focus on proper erection, handling, use, inspection, and care of the scaffolds. Training must also include the installation of fall protection, guardrails, fall hazards, the proper use and care of fall arrest equipment, electrical hazards, and load limits. Employees who are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold will also be trained on the nature of scaffold hazards, design criteria, and the correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question.

This training should be done upon initial job assignment. Retraining shall be done when job conditions change. Periodic refresher training shall be done at the discretion of the supervisor.

Company designated "competent person(s)" will receive additional training regarding the selection of scaffolds, recognition of site conditions, recognition of scaffold hazards, protection of exposed personnel and public, repair and replacement options, and requirements of standards.

Safe Scaffold Erection and Use

Safe scaffold erection and use is important in minimizing and controlling the hazards associated with their use. Scaffold work practices and rules should be based on:

- Sound design
- Selecting the right scaffold for the job
- Assigning personnel
- Fall protection
- Guidelines for proper erection
- Guidelines for use
- Guidelines for alteration and dismantling
- Inspections
- Maintenance and storage

Types of Scaffolds

There are many different types of scaffolds used by the company. The three major categories are:

- Self-supporting scaffolds
- Suspension scaffolds
- Special use scaffolds

Self-supporting scaffolds are one or more working platforms supported from below by outriggers, brackets, poles, legs, uprights, posts, frames, or similar supports. The types of self-supporting scaffolds include:

- Fabricated Frame
- Tube and Coupler
- Mobile
- Pole

Suspension scaffolds are one or more working platforms suspended by ropes or other means from an overhead structure(s). The types of suspension scaffolds include:

- Single-Point Adjustable (Boatswain's Chairs)
- Two-Point Adjustable (Swing Stage)
- Multiple-Point Adjustable
- Multi-Lend Category
- Float (Ship)
- Interior Hung
- Needle Beam

Special use scaffolds and assemblies are capable of supporting their own weight and at least 4 times the maximum intended load. The types of special use scaffolds include:

- Form and Carpenter Bracket
- Roof Bracket
- Outrigger
- Pump Jack
- Ladder Jack
- Window Jack
- Horse
- Crawling Boards
- Step, Platforms, and Trestle Ladder

Safety Requirements for Scaffolds

Capacity and Construction

Scaffolds and their components must be capable of supporting without failure at least 4 times the maximum intended load. Each suspension rope, including connecting hardware, used on adjustable and 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 platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and the guardrail supports.

With limited exceptions, each scaffold platform and walkway shall be at least 18 inches (46 cm) wide.

All load-carrying timber members of scaffold framing shall be a minimum of 1,500 fiber (Stress Grade) construction grade lumber.

All planking must be Scaffold Grades, or equivalent, as recognized by approved grading rules for the species of wood used. The maximum permissible span for 2 X 9 inch or wider planks is shown in the following:

- The maximum permissible span for 1-1/4 X 9 inches or wider plank of full thickness shall be 4 feet with medium duty loading of 50 p.s.i.

All planking or platforms must be overlapped (minimum 12 inches) or secured from movement. An access ladder or equivalent safe access must be provided.

Scaffold plank must extend over their end supports not less than 6 inches or more than 18 inches.

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 must be used.

Use

No scaffold shall be erected, moved, dismantled, or altered except under the supervision of competent persons or as requested for corrective reasons by the Safety Department.

Any scaffolding erected with damaged components or if they are in unsafe conditions, they must be tagged as to deem the system out of service, by a competent person. Employees must comply with these tags.

Any scaffold, including accessories such as braces, brackets, trusses, screw legs, ladders, couplers, etc., damaged or weakened from any cause must be repaired or replaced immediately, and shall not be used until repairs have been completed.

Repairs shall be done by the manufacturer or authorized representative.

Repairs shall be documented by the manufacturer or authorized representative.

Overhead protection must be provided for employees on a scaffold exposed to overhead hazards.

Slippery conditions on scaffolds shall be eliminated immediately after they occur. Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.

No welding, burning, riveting, or open flame work shall be performed on any staging suspended by means or fiber of synthetic rope. Only treated or protected fiber or synthetic ropes shall be used for or near any work involving the use of corrosive substances or chemicals.

Wire, synthetic, or fiber rope used for scaffold suspension shall be capable of supporting at least 6 times the intended load.

A safe distance from energized power lines shall be maintained.

Tag lines shall be used to hoist materials to prevent contact.

Suspension ropes shall be protected from contact with heat sources (welding, cutting, etc.) and from acids or other corrosive substances.

Scaffolds shall not be used during high wind and storms.

Ladders and other devices shall not be used to increase working heights on scaffold platforms. Nor should makeshift devices, such as but not limited to boxes and barrels, be used on top of scaffold platforms to increase the working level height of employees.

Scaffolds shall not be moved while employees are on them.

Loose materials, debris, and/or tools shall not be accumulated to cause a hazard.

Scaffold components shall not be mixed or forced to fit which may reduce design strength.

Scaffolds and components shall be inspected at the erection location. Scaffolds shall be inspected before each work shift, after changing weather conditions, or after prolonged work interruptions.

Casters and wheel stems shall be pinned or otherwise secured in scaffold legs. Casters and wheels must be positively locked if in a stationary position.

Tube and coupler scaffolds shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.

Fall Protection and Falling Objects

Employees working on scaffolding that is more than 10 feet above a lower level must be protected from falling by a personal fall arrest system or a guardrail system. The type of fall protection required depends on the type of scaffold being used. The use of personal fall arrest systems used on scaffolds must comply with the Fall Protection section of this Safety Manual (Section 10).

Guardrails and toe boards shall be installed on all open sides and end of platforms more than 10 feet above the ground or floor, except needle beam scaffolds and floats. Scaffolds 4 feet to 10 feet in height having a minimum horizontal dimension in either direction of less than 45 inches shall have standard guardrails installed on all open sides and ends of the platform.

Guardrails must be 2 X 4 inches, or the equivalent in strength, with a mid-rail, when required, of 1 X 4-inch lumber, or the equivalent. Support must be at intervals not to exceed 8 feet. The toe board and the guardrail shall extend along the entire opening.

Guardrail systems shall be installed before the scaffold is released for use by employees other than erection/dismantling crews.

The top edge height of top rails or equivalent member on supported scaffolds manufactured or placed in service after January 1, 2000, shall be installed between 38 inches and 45 inches 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 and 45 inches. When conditions warrant, the height of the top edge may exceed 45-inch height, provided the guardrail system meets all other requirements.

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.

In addition to wearing hardhats each employee on a scaffold will be provided with additional protection from falling hand tools, debris, and other small objects through the installation of toe boards, screens, or guardrail systems, or through the erection of debris nets, catch platforms, or canopy structures that contain or deflect the falling objects.

Supported Scaffolds

The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.

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.

The poles, legs, or uprights of supported scaffolds must be plumb and securely and rigidly 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).

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. Counterweights shall be secured by mechanical means to the outrigger beams to prevent accidental displacement. 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. Sand, gravel and similar materials that can be easily dislocated shall not be used as 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 can support the loads to be imposed.

The use of repaired wire rope as suspension rope is prohibited. Ropes shall be inspected for defects by a competent person prior to each work shift and after every occurrence which could affect a rope's integrity.

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.

Suspended Platforms

Cranes or derricks may be used to hoist and suspend personnel on a work platform or to provide access in unique work situations when such action results in the least hazardous exposure to employees. A case-by-case determination shall be made by the project manager/supervisor and safety representative to ensure that there is no practical alternative to perform the required work and authorize its controlled usage (see Attachments: Man Basket Checklist). Refer to the Personnel Hoisting section of the Crane Operations Section of this Safety Manual for more information.

Crane or Derrick Operational Criteria

- Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.
- When rotation resistant rope is used, the lines shall be capable of supporting, without failure, at least ten times the maximum intended load.
- Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.
- The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.
- The crane must be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed when hoisting employees.
- The total weight of the loaded personnel platform and related rigging shall not exceed 50 percent of the rated capacity for the radius and configuration of the crane or derrick.
- Cranes and derricks with variable angle booms shall be equipped with a properly functioning boom angle indicator, readily visible to the operator.
- Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or have measuring marks on the boom.
- A device that automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component) must be used. The device(s) must prevent such damage/failure at all points where two-blocking could occur.
- Before use for lifting personnel, all cranes and derricks shall be inspected each day, and any deficiencies observed must be corrected.

Personnel Platform Design and Specifications

- The personnel platform and suspension system shall be designed by a qualified engineer.
- The personnel platform itself, except the guardrail system and safety harness anchorages, shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load.
- The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.
- Each personnel platform shall be equipped with a guardrail system and shall be enclosed at least from the toe board to mid-rail with either solid construction or expanded metal having openings no greater than $\frac{1}{2}$ inch.
- A grab rail shall be provided inside the entire perimeter of the personnel platform to minimize hand exposure.
- An access gate should be provided. The access gate shall swing inward and be equipped with a restraining device to prevent accidental opening.

- Employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.
- All welding on a personnel platform and its components shall be performed by a qualified welder and shall be inspected by a qualified person.
- The personnel platform shall be posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

Personnel Platform Loading and Rigging

- The personnel platform shall not be loaded in excess of its rated load capacity.
- The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.
- Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work. They shall not be used for transporting bulk materials.
- Materials or equipment on an occupied platform shall be suitably secured and evenly distributed while the platform is suspended.
- When a wire rope bridle is used to connect the personnel platform to the load line, each bridle leg shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs. Lifting bridles shall consist of four legs.
- Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening.
- Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting, without failure, at least ten times the maximum intended load.
- All eyes in wire rope slings shall be fabricated with thimbles, flemish eye and pressed sleeve fittings in accordance with the Occupational Safety and Health Administration (OSHA) and the American National Standards Institute/American Welding Society (ANSI/AWS).
- Bridles and associated rigging for attaching the personnel platform to the hoist line shall not be used for any other purpose when not hoisting personnel.
- A substantial safety line (wire rope sling) shall be threaded through the eyes of the four bridle lines and secured to the lift line above the overhaul ball.

Trial Lift, Inspection, and Proof Testing

- A trial lift with the unoccupied personnel platform uniformly loaded at least to the anticipated lift weight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned.
- The trial lift shall be performed immediately prior to placing personnel on the platform.
- The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interferences exist (overhead electrical transmission cables, etc.);

and that all configurations necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist's rated capacity.

- The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location.
- After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches above ground level and inspected to ensure that it is secure and properly balanced.
- Employees shall not be hoisted unless the following conditions exist:
 - Hoist ropes shall be free of kinks or other visible defects.
 - Multiple part lines shall not be twisted around each other.
 - The primary attachment shall be centered over the platform.
 - The hoisting system shall be inspected if the load rope is slack to ensure that all ropes are properly seated on drums and in sheaves.
- A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by the responsible supervisor/engineer immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect on any component or structure.
- Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.
- At each new job site, and annually thereafter, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift).
- After proof testing, a supervisor/engineer shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

Safe Work Practices

- Personnel platforms shall not be used during high winds (not to exceed 20 mph), electrical storms, snow, ice, sleet, or other adverse weather conditions which could affect the safety of personnel in the platform or the crane or the derrick operator.
- All employees shall keep all parts of the body inside the platform during raising, lowering, and positioning, with the exception of the signal person.
- If the personnel platform is not landed, it shall be tied to the structure before personnel get off or on.
- Tag lines shall be used where practical such as when swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold.
- The operator shall demonstrate his ability to operate the crane or derrick prior to hoisting employees onto a personnel platform.

- The crane or derrick operator shall remain at the controls at all times when the crane engine is running, and the platform is occupied.
- Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person.
- In situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone, such as by radio, may be used.
- Except over water, employees occupying the personnel platform shall use a body belt/harness system with lanyard appropriately attached to the lower load block or overhaul ball, or a structural member (grabrail) within the personnel platform capable of supporting a full impact for employees using the anchorage.
- No lifts shall be made on another of the crane's or derrick's load lines while personnel are suspended on a platform.
- Hoisting employees while the crane is traveling is prohibited.

Pre-Lift Meeting

- The responsible supervisor/engineer shall pre-plan all activities requiring the use of personnel platforms and document his plan by processing a Pre-Lift Fact Sheet and a Pre-Lift Check Sheet (see Attachments).
- A meeting attended by the crane or derrick operator, signal person(s), employees to be lifted, and the supervisor/engineer responsible for the task to be performed shall be held to review the appropriate requirements of this procedure, fill out the Pre-lift Checklist and the Pre-Lift Fact Sheet (see Attachments).
- This meeting shall be held prior to the trial lift at each new work location and shall be repeated for any employees newly assigned to the operation.

SECTION 24 - Rigging Equipment for Material Handling

Purpose

The purpose of the Rigging Equipment for Material Handling policy is:

- To ensure that operators understand the limitations and safe operations of the equipment.
- To ensure that all equipment is properly maintained and is kept in good working order.
- To ensure that equipment malfunctions are noted before accidents occur.
- To ensure that non-qualified employees do not operate material handling equipment.
- To ensure that operators receive refresher training as necessary.

Responsibilities

Safety Director:

The Safety Director is responsible for developing, periodically reviewing, and revising the Rigging Equipment for Material Handling policy. In addition, the Safety Director will be responsible for the training requirements and will maintain documentation on training and certifications.

Superintendent:

The superintendent is responsible for the enforcement of pre-shift inspections of all rigging, removal and replacement of damaged or worn rigging equipment, and proper rigging equipment utilization during the work shift.

Foreman:

Foreman is to know proper rigging techniques, load capacities of rigging equipment, proper inspection procedures including checklists and documentation, and all-around competency of employees using the rigging equipment.

Employee:

Employees are to have proper training in the use, maintenance, and inspection of all rigging equipment in use. They are to inspect rigging equipment prior to each shift and shall remove any damaged equipment from service. Employees are responsible to know and understand proper load capacities and how to use them, rigging techniques, and proper material handling procedures while using proper rigging equipment.

Safety Requirements for Rigging Equipment for Material Handling

- Inspect rigging equipment for material handling before use on each shift and as necessary during its use to ensure that it is safe. Remove defective rigging equipment from service.
- Rigging equipment must have permanently affixed legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load.
- Do not load rigging equipment in excess of its recommended safe working load.
- No employees shall be allowed under a suspended load.

- When not in use, remove rigging equipment from the immediate work area to prevent a hazard to employees.
- Whenever workers hoist heavy construction materials with hoisting equipment, they should use tag lines to control the loads.
- Mark special custom-design grabs, hooks, clamps, or other lifting accessories for such units as modular panels, prefabricated structures, and similar materials to indicate safe working loads, and proof-test them before use to 125 percent of their rated load.
- Each day before use, the sling and all fastenings and attachments must be inspected for damage or defects by a competent person designated by the employer. Perform additional inspections during sling use where service conditions warrant. Immediately remove damaged or defective slings from service.
- Alloy steel chain slings must also be inspected periodically (at least once every 12 months) to determine the frequency of sling use, severity of service conditions, nature of lifts being made, and experience gained on the service life. Inspection records must be maintained for the most recent inspection.
- Make sure that welded alloy steel chain slings have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer. Do not use alloy steel-chain slings with loads in excess of the rated capacities.
- Check that hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, have a rated capacity at least equal to that of the chain.
- Hooks are to be frequently inspected for latch engagement and damaged or malfunctioning latches. When using a device to close the throat opening of the hook, care shall be taken that the load is not carried by the closing device. The use of a hook with a latch does not preclude the inadvertent detachment of a slack sling or a load from the hook. Visual verification of proper hook engagement is required. When a lock is equipped with a latch, the latch should not be restrained from closing during use.
- Do not use job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments.

SECTION 25 - Severe Weather Program

Purpose

Thunderstorms, tornadoes, high winds, winter storms, and lightning all describe types of potential severe weather conditions. Proper responses to threats of severe weather need to be followed to minimize the possibility of injury and/or property damage.

This program provides general guidance regarding emergency planning and actions to take during severe weather conditions.

Severe Weather Procedures

Thunderstorms

A thunderstorm can be recognized as severe weather because it can include heavy rains, hail, high winds, and lightning.

When a thunderstorm watch/warning is issued, supervision will monitor the National Weather Service for weather advisories.

Employees shall secure all materials and equipment that can be affected by thunderstorms.

When a thunderstorm warning occurs, employees shall be moved to a safe area or away from objects that are easily struck by lightning or damaged by high winds (e.g., trees, steel structures, light poles, cranes, flag poles, etc.).

Avoid contact with electrical appliances and conductive surfaces/structures during thunderstorm warnings.

Work may proceed after the thunderstorm warning has been canceled by the National Weather Service.

Tornadoes

When a tornado watch/warning is issued, supervision will monitor the National Weather Service for weather advisories.

Employees shall secure all materials and equipment that can be affected by tornadoes.

When a tornado warning occurs and a jobsite is in the imminent path of a tornado, employees shall be moved to an evacuation shelter.

The evacuation shelter shall be in a reinforced building, basement of a building, an inner hallway on the lower floor of a building, or a similar location away from windows or an evacuation shelter approved by the safety department. Employees shall remain in the evacuation shelter until the tornado warning has been canceled by the National Weather Service.

High Winds

Employees shall secure all materials and equipment that can be affected by high winds.

See the Mobilized Elevated Work Platform Program (Section 20) and the Crane Operation Safety Program (Section 9) in the Ruhlin Safety Manual for wind limitations concerning mobilized elevated work platforms and cranes.

Winter Storm

When a winter storm watch/warning is issued, supervision will monitor the National Weather Service for weather advisories. Management will determine if employees should be released due to deteriorating conditions (e.g., poor sight distance, ice, heavy snowfall, etc.).

Employees shall secure materials and equipment that can be affected by a winter storm.

Lightning

Lightning can be deadly to employees and can easily damage equipment.

When lightning occurs within 5 miles of a jobsite, stop all outdoor work. To help prevent a lightning strike, immediately lower crane booms, excavator booms, and other equipment to the ground.

Employees shall be moved to a safe area or away from objects that are easily struck by lightning (e.g., trees, steel structures, light poles, cranes, flag poles, etc.).

Avoid contact with electrical appliances, conductive surfaces/structures when lightning occurs.

Work may proceed 30 minutes after the last flash of lightning is spotted.

Flash Flood

When a flash flood watch/warning is issued, supervision will monitor the National Weather Service for weather advisories.

Employees shall secure materials and equipment that can be affected by flash floods.

Employees shall not walk or drive through standing water.

SECTION 26 - Engineered Work Plans

Purpose

To establish a process for developing safe construction means and methods relating to field work requiring an Engineered Work Plan, signed and sealed by a Registered Professional Engineer. This includes work involving demolition, steel erection, critical crane lifts, support of earth structures, or any other construction procedure requiring a sealed Engineered Work Plan to perform the work.

Scope

This standard operating procedure describes the steps to be taken by the staff involved in the execution of an Engineered Work Plan. It includes developing a Construction Methods Report (CMR), holding a preparatory meeting prior to construction and notifications leading up to and during construction phase executing an Engineered Work Plan.

Prerequisites

Engineered Work Plans will be prepared either in-house by a company Registered Professional Engineer employee or by an outside Professional Engineer/Consultant. The plans will bear the seal and signature of the Registered Professional Engineer responsible for assembling the plan. Engineered Work Plans are generally a requirement of the contract documents or an outside agency such as OSHA, railroads or County/City, but not limited to these examples. In-house plans will be prepared by or under the supervision of the Chief Engineer.

Responsibilities

Chief Engineer -	prepares, signs and seals or oversees the preparation of sealed Engineered Work Plans. ("Oversees" includes the review and approval of plans prepared by outside firms).
Division Manager -	ensures that this standard operating procedure is properly followed and executed.
Safety Director -	provides oversight and input on applicable Health and Safety Regulations.
Project Manager -	directs preparation of the CMR and moderates the preparatory meeting.
Superintendent -	executes the Engineered Work Plan and CMR in the field.
Project Engineer -	supports the Project Manager and Superintendent in preparing and executing the Engineered Work Plan and CMR.

Procedure

Engineered Work Plans

At the request of the Project Manager, Engineered Work Plans will be produced under the direction of the Company's Chief Engineer. The Engineered Work Plan will be signed and sealed by the Chief Engineer or another Professional Engineer/Consultant that is responsible for preparation of the Engineered Work Plan. The Engineered Work Plan shall be reviewed by the Project Manager during its development to ensure the safety and constructability of the plan and availability of selected equipment. The appropriate Division Manager and the Safety Director shall be notified of submitted Engineered Work Plans.

Construction Methods Report (CMR)

A CMR will be produced under the direction of the Project Manager. The CMR will outline the staff, equipment, materials and step-by-step procedures for executing the Engineered Work Plan in the field.

Provide a copy of the CMR to the Chief Engineer, Safety Director and Division Manager prior to the preparatory meeting to allow input.

CMR's will summarize the Engineered Work Plan and include the following sections:

- Objective
- Safety - Activity Hazard Analysis
- Staff - names and duties
- Equipment
- Special Procedures/Conditions

Engineered Work Plans that include Crane Lifts will reference the Ruhlin Safety Manual (Section 9 Crane Operation Safety) and utilize the Critical Lifting Procedures (see Appendix A - Attachments). The Critical Lift Checklist and Rigging Data sheets (see the Critical Lifting Procedures/Appendix A Attachments) may be used for the CMR.

Preparatory Meeting

A Preparatory Meeting will be held in advance of the field implementation. The preparatory meeting will review the Engineered Work Plan and CMR to assure that all safety measures are in place, the staff is familiar with the work to be performed and properly sized equipment as specified in the Engineered Work Plan is available. The meeting will be moderated by the Project Manager and attended by the Superintendent and field staff responsible for executing the plan. The Chief Engineer, Division Manager and Safety Director will receive a copy of meeting minutes after all Preparatory Meetings.

Engineered Work Plans that include Crane Lifts will reference the Ruhlin Safety Manual (see attachments). The Pre-Lift Planning Meeting form may be used for the Preparatory Meeting.

Field Operations

The Project Manager and Superintendent will keep the Chief Engineer and Safety Director informed of progress or any difficult conditions that appear. Should an unsafe condition occur, stop work and notify the Chief Engineer and Safety Director immediately. Do not proceed with work until the situation is reviewed by the Chief Engineer and Safety Director and they give the release to proceed. All changes to the CMR or Engineered Work Plan must be reviewed and approved by the Chief Engineer. If the stamped Engineered Work Plan requires design changes after the Preparatory Meeting, the process set forth herein must be repeated starting with a subsequent Preparatory Meeting to review the revised Engineered Work Plan.

References

- Critical Lifting Procedures (Crane) - (see Attachments)
- CMR Format

SECTION 27 - Silica Exposure Control Program

Purpose

The purpose of the Silica Exposure Control Program is to protect The Ruhlin Company's employees who may be occupationally exposed to respirable crystalline silica. This program has been prepared in accordance with the Occupational Safety and Health Administration's Silica Standard which is codified in 29 CFR 1926.1153.

The provisions in this program apply to all Ruhlin Company employees who have reasonably anticipated occupational exposure to respirable crystalline silica. This program includes requirements for exposure assessment, engineering and administrative controls, personal protective equipment, housekeeping, medical surveillance and training designed to reduce the risk of potential exposure to silica.

Definitions

Action Level: The means a concentration of airborne respirable crystalline silica of $25 \mu\text{g}/\text{m}^3$, calculated as an 8-hour TWA.

Competent Person: An individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards and who has the authority to take prompt corrective measures to eliminate or minimize them.

Employee Exposure: The exposure to airborne respirable crystalline silica that would occur if the employee were not using a respirator.

High-efficiency Particulate Air Filter (HEPA): A filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter.

Objective Data: Information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating employee exposure to respirable crystalline silica associated with a particular product or material or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

Physician or Other Licensed Health Care Professional (PLHCP): An individual who's legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the particular health care services required by 29 CFR 1926.1153 (i) of this section.

Regulated Area: An area, demarcated by the employer, where an employee's exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL.

Respirable Crystalline Silica: Quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality - Particle Size Fraction Definitions for Health-Related Sampling.

Specialist: An American Board-Certified Specialist in Pulmonary Disease or an American Board-Certified Specialist in Occupational Medicine

Exposure Determination

The Ruhlin Company elected to utilize Table 1 from 1926.1153. However, there may be tasks and situations not covered by Table 1 where monitoring or the use of objective data will be necessary. If a task is not covered in Table 1 The Ruhlin Company will perform an exposure assessment, including air monitoring or the use of

objective data, to ensure that no employees are exposed to an airborne concentration of respirable crystalline silica in excess of 50 µg/m³, calculated as an 8-hour TWA. Employees will have the opportunity, if they wish, to observe any monitoring and employees will be provided with the results of any such monitoring.

Engineering Controls

Engineering controls are the primary means to eliminate or minimize exposure to respirable crystalline silica within the Company. Engineering controls are used everywhere they will reduce employee exposure by either removing, eliminating, or isolating the hazard.

The Company identifies the need for changes in engineering controls through OSHA recommendations, superintendents, and feedback from affected employees. During Core Team Committee meetings, needed procedures and new products will be evaluated by discussions, reviews, and references.

Engineering controls are examined and maintained or replaced on a regular basis as technology advances.

The safety department will identify effective implementation of engineering controls. Superintendents will ensure use of the engineering controls in their area of responsibility. Engineering controls depend on the nature of the task at hand. The task specific engineering controls currently in place at The Ruhlin Company can be found in Table 1.

Some examples of engineering controls include:

- Installing special ventilation
- Setting up closed system to prevent airborne dust.
- Using wet grinding or water sprays
- Substituting materials that do not contain silica.
- Enclosing operations that generate dust

Work Practice Controls

All affected employees must observe the following work practice controls to help reduce the risk of exposure to respirable crystalline silica. Work practice controls also depend on the nature of the task at hand. These work practice controls will be reviewed on a regular basis by the Safety Director to help ensure effectiveness. The task specific work controls currently in place at The Ruhlin Company can be found in Table 1.

Some examples of work practice controls include:

- During dusty work use local exhaust ventilation or containment methods.
- During rock drilling use water through the drill system or use a drill with a dust collection system.
- When sawing tile, concrete, or masonry, use saws that provide water to the blade and do not let slurry dry before cleaning it up.
- Use abrasives that contain less than 1% crystalline silica during abrasive blasting.
- Control dust when you clean by wet sweeping, using vacuums with HEPA filters, avoid dry sweeping and never use compressed air to blow dust.

Restricted Access to Work Areas

When necessary, The Ruhlin Company will restrict access to work areas on a job site where crystalline silica exposure is anticipated using the following procedures:

- Danger tape will demarcate the area where the hazard(s) exist

Housekeeping Practices

The Ruhlin Company does not allow the use of compressed air, dry sweeping, or dry brushing where such activity could contribute to employee exposure to respirable crystalline silica unless other methods that minimize the likelihood of exposure are not feasible. The Company utilizes the following to maintain housekeeping:

- Wet sweeping
- HEPA-filtered vacuuming

Employees are not allowed to use compressed air to clean clothing or surfaces.

Personal Protective Equipment

The Ruhlin Company provides (at no cost to employees) the personal protective equipment necessary to protect employees against respirable crystalline silica. Training on proper utilization of this equipment is provided to our employees during the Silica Exposure training that all employees who have been determined to have occupational exposure receive.

Training and fit testing for proper respirator use is also provided as a part of the Company's Respiratory Protection Program.

The personal protective equipment, including respirators, that is required for specific tasks is listed in Table 1.

Respiratory protection is required:

- Where specified by 29 CFR 1926.1153 Table 1
- For tasks not listed in Table 1, or where The Ruhlin Company does not fully and properly implement feasible engineering and work practice controls:
 - o Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls;
 - o Where exposure exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible; and
 - o During tasks for which the Company has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL.

Refer to the Company Respiratory Protection Program for more information on respirator use, maintenance (including cleaning procedures), fit testing, and training.

Training

All employees with occupational exposure to respirable crystalline silica will receive silica exposure training upon hire.

This training will include:

- A general explanation of what silica is and where it can be found.
- The health hazards associated with respirable crystalline silica, including (but not limited to): cancer, lung effects, immune system effects, and kidney effects.
- Specific tasks at the Company that could result in exposure to respirable crystalline silica.
- Specific measures the Company has implemented to protect employees from exposure to respirable crystalline silica, including engineering controls, work practices, and respirators to be used.
- An explanation of labels on containers of crystalline silica and safety data sheets, including how to interpret pictograms and identify hazards in accordance with the Hazard Communication standard (29 CFR 1910.1200);
- The contents of 29 CFR 1926.1153;

- Danger tape will demarcate the area where the hazard(s) exist.
- The requirements and identity of the competent person designated by the Company.
- The purpose and description of the Company's medical surveillance program as required in 29 CFR 1926.1153 (i).
- And an explanation of the Company's exposure control plan and how employees can obtain a copy of the written plan.
- Employees will be provided with an opportunity for interactive questions and answers with the person conducting the training session.
- Employees will be required to demonstrate knowledge and understanding of the components of the training outlined above.
- Training will be renewed annually or when:
 - o An employee changes job responsibility or is assigned a new task that may result in exposure to silica.
 - o New exposure protection methods are introduced.
 - o An employee demonstrates the need for retraining.

Medical Surveillance

A medical surveillance program will be provided, at no cost, to associates who are exposed to respirable silica above the permissible exposure level and are required to wear respirators for 30 or more days per year. The medical surveillance program will be included.

- Initial examination within 30 days of initial assignment of wearing a respirator, including:
 - o A medical and work history
 - o A physical exam
 - o A chest X-Ray.
 - o A pulmonary function tests.
 - o Tuberculosis testing; and
 - o Any other tests deemed appropriate by the PLHCP.
- Periodic examinations at least every three years unless PLHCP recommends a more frequent interval.

The PLHCP will provide The Ruhlin Company with a medical examination report, which will be shared with the employees.

Recordkeeping

Training Records

Training records will be kept by the safety department and will include the following information:

- The dates of the training sessions.
- The contents or a summary of the training sessions.
- The names of persons conducting the training; and
- The names and job titles of all the people attending the training sessions.

Training records will be maintained for three years from the date on which the training occurred.

Employee training records will be provided upon request for examination and copying to employees, to employee representatives, to the Director of the National Institute for Occupational Safety and Health (NIOSH), and to the Assistant Secretary of Labor for Occupational Safety and Health Administration (OSHA) in accordance with 29 CFR 1910.1020.

Medical Records

The Company will establish and maintain an accurate record for each employee subject to the medical surveillance program, in accordance with 29 CFR 1910.1020. These records will include:

- The name of the employee;
- A copy of the PLHCPs' and specialists' written medical opinions; and
- A copy of the information provided to the healthcare professional.

The Company will ensure that employee medical records are kept confidential and that they are not disclosed or reported without the employee's express written consent to any person within or outside the workplace except as may be required by law.

Medical records will be maintained for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.1020.

Employee medical records will be provided upon request for examination and copying to the affected employee, to anyone having written consent of the affected employee, to the Director National Institute for Occupational Safety and Health (NIOSH), and to the Assistant Secretary Assistant Secretary of Labor for Occupational Safety and Health Administration (OSHA) in accordance with 29 CFR 1910.1020.

Air Monitoring Data

The Company will establish and maintain an accurate record of all exposure measurements taken to assess employee exposure to respirable crystalline silica as a time-weighted average over an 8-hour shift. These records shall include at least the following information:

- The date of measurement for each sample taken.
- The task(s) monitored.
- Sampling and analytical methods used.
- Number, duration, and results of samples taken.
- Identity of the laboratory that performed the analysis.
- Type of personal protective equipment worn by the monitored associates; and
- Name and job classification of all associates represented by the monitoring, indicating which associates were actually monitored.

Air monitoring records will be maintained for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.1020.

Air monitoring records will be provided upon request for examination and copying to the affected employees, to employee representatives, to the Director of the National Institute for Occupational Safety and Health (NIOSH), and to the Assistant Secretary of Labor for Occupational Safety and Health Administration (OSHA) in accordance with 29 CFR 1910.1020.

Objective Data

If objective data is relied upon to comply with the requirements of 29 CFR 1926.1153 in lieu of air monitoring, the Company will establish and maintain an accurate record of all data. This record shall include:

- The crystalline silica-containing material in question.
- The source of the objective data.
- The testing protocol and results of testing.
- A description of the process, task, activity, material, or exposures on which the objective data were based; and

- Other data relevant to the process, task, activity, material, or exposures on which the objective data were based.

The Company will review and update objective data records as necessary on an annual basis. Objective data records will be maintained for at least 30 years in accordance with 29 CFR 1910.1020.

Objective data records will be provided upon request for examination and copying to employees, to employee representatives, to the Director of the National Institute for Occupational Safety and Health (NIOSH), and to the Assistant Secretary of Labor for Occupational Safety and Health Administration (OSHA) in accordance with 29 CFR 1910.1020.

Exposure Control Plan

This Company's Exposure Control Program will be reviewed and updated at least annually and whenever necessary to reflect new or modified tasks and procedures which affect occupational exposure and to reflect new or revised employee positions with occupational exposure. The review and update of this plan will also reflect changes in technology that eliminate or reduce exposure to respirable crystalline silica, and document annually that the Company has considered and implemented effective controls designed to eliminate or minimize occupational exposure.

When performing the annual program review, the Company will solicit input from field employees who are potentially exposed to crystalline silica and are affected by the control measures currently in place.

Responsibilities

The Company provides a safe workplace for all associates, and to complying with federal division and state occupational health and safety standards. It is the Company's policy to comply with the requirements of the OSHA Silica Standard and its amendments. The safety director, division managers, project managers, superintendents and competent persons share responsibility for minimizing their occupational exposure to respirable crystalline silica. The Exposure Control Program shall be implemented where field employees' duties can be expected to result in occupational exposure to respirable crystalline silica.

To ensure that this program is implemented and maintained in accordance with the procedures listed, the following Company personnel are given the following responsibilities.

Safety Director

The Safety Director will be responsible for coordinating the following Exposure Control Program elements:

- Identify employee job classifications in which occupational exposure to respirable crystalline silica may occur (Exposure Determination).
- Assist engineering with identification of engineering controls.
- Train employees initially and annually on silica exposure and control as outlined in this program and maintain training records.
- Select proper personal protective equipment (PPE) and respiratory protection, labels and signs.
- Assist departments with the Silica Standard compliance.
- Prepare and distribute this program to employees, and OSHA and NIOSH representatives; and
- Annually review the program for effectiveness and update as necessary. The update shall be required to reflect changes in technology that eliminate or reduce exposure to respirable crystalline silica.

Safety Department

The Safety Department will be responsible for coordinating the following Exposure Control-Program element:

- Maintaining training records for all program participants.

Division Managers/Project Managers/Superintendents

Division managers/project managers/superintendents will be responsible for coordinating the following Exposure Control Program elements:

- Circulate Silica Exposure Control Program after receiving it from the Safety Department.
- Assure availability of personal protective equipment and respiratory protection.
- Ensure new hires do not engage in activities with potential exposure until they have received training.
- Encourage full participation of all field employees identified on the exposure determination.
- Help to develop and implement Site Specific Silica Exposure Control Plans
- Permit attendance at training sessions, during normal work hours.
- Enforce the use of engineering and administrative controls.
- Enforce the use of personal protective equipment and respirators.
- Enforce housekeeping requirements.
- Require associates to follow safe work practices.
- Restrict access to work areas, as necessary to minimize exposures to silica.

Competent Person

- Conduct frequent and regular inspections of the job site, materials, and equipment.
- Implement the written exposure control program.
- Enforce the use of engineering and administrative controls.
- Enforce the use of personal protective equipment and respirators.
- Enforce housekeeping requirements.
- Restrict access to work areas, as necessary to minimize exposures to silica.

Field Employees

Field employees will be responsible for participating in the following Exposure Control Program elements:

- Attend initial and annual training on silica in accordance with the current Silica Standard.
- Use the appropriate engineering controls, safe work practices, and PPE provided; and
- Comply with procedures outlined in this plan

Silica Exposure Control Forms

See attachments.

Section 28 - Stairways and Ladders Program

Purpose

The purpose of the stairways and ladders program is to provide guidance for stairway construction and the safe use of ladders on jobsites.

Stairways

There are many different types and sizes of tool and office trailers in the Ruhlin inventory; therefore, it is the superintendent's responsibility to measure the access to trailers located on the jobsite and use that data to determine the proper protective systems to utilize.

The following information is intended to highlight the criteria of OSHA Subparts M (fall protection) and X (stairways and ladders).

1. Stairways that will not be a permanent part of the structure on which construction work is being performed must have landings of not less than 30 inches (76 cm) in the direction of travel and extend at least 22 inches (56 cm) in width at every 12 feet (3.7 m) or less of vertical rise.
2. Stairs must be installed between 30° and 50° from horizontal.
3. All parts of stairways must be free of hazardous projections, such as protruding nails.
4. Slippery conditions on stairways must be eliminated before the stairways are used to reach other levels.
5. Stairways having four or more risers or rising more than 30 inches (76 cm), whichever is less, must be equipped with at least one handrail and one stair rail system along each unprotected side or edge.
6. Stair rails installed after March 15, 1991, must be not less than 36 inches (91.5 cm) from the upper surface of the stair rail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
7. Mid rails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members must be provided between the top rail of the stair rail system and the stairway steps. Other structural members, when used, must be installed such that there are no openings in the stair rail system that are more than 19 inches (48 cm) wide.
8. Handrails and the top rails of stair rail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 n) applied within 2 inches (5 cm) of the top edge, in any downward or outward direction, at any point along the top edge.

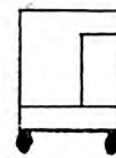
9. The height of handrails must be not more than 37 inches (94 cm) nor less than 30 inches (76 cm) from the upper surface of the handrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
10. Handrails must provide an adequate handhold for employees grasping them to avoid falling. The ends of stair rail systems and handrails shall be constructed so as not to constitute a projection hazard.
11. Unprotected sides and edges of stairway landings shall be provided with guardrail systems.



**SKID TRAILER
NO STAIRWAY**



**STANDARD
TRAILER**



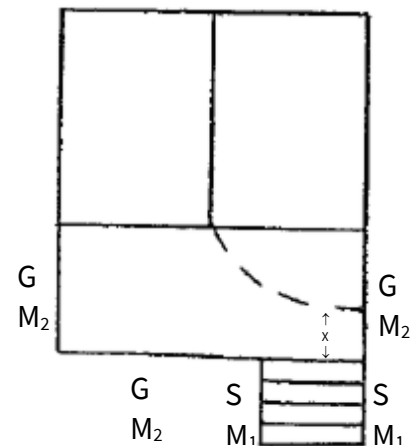
**TRAILER WITH RECESSED
ACCESS DOOR**

TYPICAL STANDARD TRAILER PROTECTIVE SYSTEM

X	=	< 20"
S	=	Stair rail no less than 30" high
M ₁	=	Mid rail half the distance from steps to stair rail
G	=	Guardrail 42" high
M ₂	=	Mid rail 21" high

Additional Notes:

1. Riser height and tread depth shall be uniform.
2. Platform shall have guardrail protection when over 4 feet in height.
3. Guardrail shall be 2"x 4" material, able to withstand a 200 lb. load.
4. Mid rail shall be at least 1"x 6" material.
5. Space the upright posts no greater than 8 ft. apart.
6. Removable stair rail and guardrail may be used to accommodate loading from trucks to the platform. Use caution to ensure that removable systems are replaced once loading is completed.
7. Trailers with recessed access doors must have a minimum of 20" between the outer swing radius of the door and the edge of the platform.



Ladders

1. Step ladders shall never be used as a straight ladder. Always use ladders for their intended purpose.
2. Never stand on or work from the top two steps of a step ladder.
3. Always comply with the weight restrictions on all ladders.
4. When working from a ladder, keep at least half of your body on the inside of the side rails.
5. Ladders must extend and be secured 3 feet (36 inches) above top landing.
6. When ladders are used to gain access to an elevation, the top or bottom must be secured against movement. Maintain three-points of contact on ladders (2 feet, 1 hand or 2 hands, 1 foot).
7. Ladders constructed on the jobsite must conform to OSHA 1926.1053 standards and to ANSI standards.
8. Ladders must be inspected prior to use and defective ladders must be removed from service. Ladders must also be inspected periodically for defects.
9. Ladder rungs must be uniformly spaced.
10. All extension ladders shall be placed at a 4:1 ratio.

SECTION 29 - Definitions

Unless otherwise defined in the applicable sections of this Safety Manual, the following definitions apply:

Accepted Engineering Practices: Those requirements which are compatible with standards of practice required by a registered professional engineer.

Acute Effect: Usually refers to effects which occur rapidly as a result of short-term exposures and are of short duration.

A/D Director (Assembly/Disassembly Director): An individual who meets the requirements in 29 CFR 1926, Subpart CC for an A/D Director (including knowledge and understanding the applicable assembly/disassembly procedures), irrespective of the person's formal job title or whether the person is non-management or management personnel.

Affected Employee - An employee whose job requires him or her to operate or use a machine or piece of equipment or work in an area where service or maintenance is being performed under lock-out.

Assembly/Disassembly: The assembly and/or disassembly of equipment covered under 29 CFR 1926, Subpart CC. With regard to tower cranes, "erecting and climbing" replaces the term "assembly," and "dismantling" replaces the term "disassembly." Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.

Alternate Confined Space: A confined space that the only hazard is a potential or actual hazardous atmosphere which can be controlled solely through continuous forced air ventilation.

Aluminum Hydraulic Shoring: A pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

Anchorage: A secure point of attachment for lifelines, lanyards or deceleration devices.

Attachments: Any device that expands the range of tasks that can be done by equipment. Examples include, but are not limited to: an auger, drill, magnet, pile-driver, and boom-attached personnel platform.

Attendant: An individual stationed outside one or more permit spaces that monitors conditions within the space(s) and prevents unauthorized entry.

Authorized Entrant: A worker who is authorized by the entry supervisor to enter a permit space.

Authorized Person: A person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.

Authorized Employee - A person who locks out machines or equipment in order to perform service or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing service or maintenance which exposes them to potentially hazardous energy.

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

Blocking (also referred to as "cribbing"): Wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support lattice boom sections during assembly/disassembly and under outrigger and stabilizer floats.

Body Harness: Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Boom (equipment other than tower crane): an inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.

Boom (tower cranes): On tower cranes, if the "boom" (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a boom.

Boom Angle Indicator: A device which measures the angle of the boom relative to horizontal.

Boom Hoist Limiting Device: Includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.

Boom Length Indicator: Indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.

Boom Stop: Includes boom stops, (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.

Boom Suspension System: A system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.

Brace: A rigid connection that holds one scaffold member in a fixed position with respect to another member. Brace also means a rigid type of connection holding a scaffold to a building or structure.

Builder: The builder/constructor of equipment

Carcinogenic: Capable of causing cancer.

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

Ceiling Limit: The maximum amount of toxic substance allowed in workroom air at any time during the day.

Center of Gravity: The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.

Certified Welder: A welder who meets nationally recognized certification requirements applicable to the task being performed.

Chromium (VI) [Hexavalent Chromium or Cr (VI)]: Chromium with a valence of positive six in any form and in any compound.

- Action level: A concentration of airborne chromium (VI) of 2.5 micrograms/cubic meter of air (2.5 µg/m³) calculated as an 8-hour time-weighted average (TWA).

Chronic Effect: Generally occurs as a result of long-term exposure and is long in duration.

Climbing: The process in which a tower crane is raised to a new working height, either by adding additional tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised inside the structure (inside climbing).

CMR: Construction Methods Report

Combustible Liquid: Any liquid having a flash point at or above 100°F (37.8°C).

Combustible: Able to catch fire and burn.

Come-A-Long: A mechanical device typically consisting of a chain or cable attached at each end that is used to facilitate movement of materials through leverage.

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 the authorization to take prompt corrective measures to eliminate them.

Concentration: The amount of one substance in another substance.

Confined Space: A space that is large enough and so arranged that an employee can bodily enter it; has limited or restricted means for entry and exit; and is not designed for continuous employee occupancy.

Controlled Access Zone (CAZ): An area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems or safety net systems and access to the zone is controlled.

Controlled Load Lowering: Lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.

Controlling Contractor: The employer with overall responsibility for construction at the worksite. The controlling contractor is responsible for coordinating entry operations when there is more than one entry employer and when other activities on the site could foreseeably result in a hazard in the permit space. In addition, controlling contractors must provide any information they have about any permit space hazards and precautions previously used in the space.

Controlling Entity: An employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project—its planning, quality and completion.

Counterweight: A weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.

Coupler: A device for locking together the component tubes of a tube and coupler scaffold.

Crawler Crane: Equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.

Crossover Points: Locations on a wire rope which is spooled on a drum where one layer of rope climbs up on and crosses over the previous layer. This takes place at each flange of the drum as the rope is spooled onto the drum, reaches the flange, and begins to wrap back in the opposite direction.

Crystalline Silica: The most common mineral in the earth's crust. It is a major component of sand, quartz, rock and mineral ores. Sand and granite contain large amounts of crystalline silica.

Deceleration Device: Any mechanism, such as a rope grab, rip-stitch lanyard, specially woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards etc., which serves to dissipate a substantial amount of energy during a fall arrest or otherwise limit the energy imposed on an employee during fall arrest.

Decomposition: Breakdown of a chemical.

Dedicated Channel: A line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).

Dedicated Pile-Driver: A machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.

Dedicated Spotter (Power Lines): To be considered a dedicated spotter, the requirements of 29 1926.1428 (signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and the equipment, load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the applicable minimum approach distance is not breached.

Density: How much space a given weight of substance takes up. Gold is a very dense substance because a small piece of it weighs a lot. Styrofoam is not very dense because it weighs very little but takes up a lot of space. The density of a substance is usually compared to water, which has been given a density value of one (1). Substances more dense than water (which sink in water) have a density greater than one (1); substances that float on water have a density of less than one (1).

Dermal: By the skin or through the skin.

Directly Under the Load: A part or all of an employee is directly beneath the load.

Dismantling: Includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).

Drum Rotation Indicator: A device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.

Encroachment: Where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this subpart requires to be maintained from a power line.

Energy Isolating Device - A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

- A manually-operated electrical circuit breaker.
- A disconnect switch.
- Manually-operated switches by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently.
- A mechanical, locked-on device that prevents tools which have been unplugged to be plugged back in without removing the device.
- Push buttons, selectors, switches and other control circuit-type devices are not energy isolating devices.

Engineered Work Plan: A work plan required by an owner, agency, or for the safe performance of a project work task, prepared, signed and sealed by a Professional Engineer prior to commencing the work activity on a specific phase of a project.

Engulfment: 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, crushing, or the substance suffocates the individual

Entry Employer: An employer who decides that an employee it directs will enter a permit space. There may be more than one entry employer if the employees of multiple employers must enter the space. Each entry employer is responsible for complying with all provisions in the Confined Spaces standard except those specifically imposed on the controlling contractor and host employer.

Entry Permits: Written or printed documents that are provided by the employer who designated the space a permit space to allow and control entry into a permit space and that contains the information specified in 29 CFR 1926.1206.

Entry Supervisor: A qualified person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by 29 CFR 1926, Subpart AA..

Excavation: Any man-made cut, cavity, hole, trench or depression in an earth surface, formed by earth removal.

Explosive Limits: The amounts of vapor in air sufficient to form explosive mixtures. Explosive limits are expressed as Lower Explosive Limits and Upper Explosive Limits. These give the range of vapor concentrations in air that will explode if heated. Explosive limits are expressed as a percentage of vapor in the air.

Failure: The breakage, displacement or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Fall Zone: The area (including but not limited to the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.

Flammable Limits: See Explosive Limits.

Flammable Liquid: Any liquid having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100 °F (37.8 °C) and having a flashpoint at or below 199.4 °F (93 °C). **Flammable:** Capable of being easily ignited, burning intensely, or having a rapid rate of flame spread.

Flange Points: Points of contact between rope and drum flange where the rope changes layers.

Flash Point: The temperature at which it gives off vapor sufficient to form an ignitable mixture with the air near the surface of the liquid or within the vessel used as determined by appropriate test procedure and apparatus as specified in 29 CFR 1926.155. Provides an indication of how flammable a substance is. Not to be confused with Ignition Temperature.

Floating Cranes/Derricks: Equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.

Free Fall (of the load line): Only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).

Free Surface Effect: The uncontrolled transverse movement of liquids in compartments which reduce a vessel's transverse stability.

Guardrail System: A barrier erected to prevent employees from falling to lower levels.

Hazardous Atmosphere: An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic or otherwise harmful, may cause death, illness or injury.

Hazardous Chemical: Any chemical that is a physical hazard or health hazard.

Health Hazard: Anything that can have a harmful effect on health under the conditions in which it is used or produced. There can be both Acute and Chronic health hazards

Heat cramps: Caused by the loss of body salts and fluid during sweating. Low salt levels in muscles cause painful cramps. Tired muscles—those used for performing the work—are usually the ones most affected by cramps. Cramps may occur during or after working hours.

Heat exhaustion: The body's response to loss of water and salt from heavy sweating. Signs include headache, nausea, dizziness, weakness, irritability, thirst, and heavy sweating.

Heat rash: Also known as prickly heat, is skin irritation caused by sweat that does not evaporate from the skin. Heat rash is the most common problem in hot work environments.

Heat stroke: The most serious form of heat-related illness, happens when the body becomes unable to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat. Signs include confusion, loss of consciousness, and seizures. Heat stroke is a medical emergency that may result in death! Call 911 immediately.

Hoist: A mechanical device for lifting and lowering loads by winding a line onto or off a drum.

Hoisting: The act of raising, lowering or otherwise moving a load in the air with equipment covered by this standard. As used in this standard, "hoisting" can be done by means other than wire rope/hoist drum equipment.

Hole: A gap or void 2 inches (5.1 cm) or more in its least dimension in a floor, roof or other walking/working surface.

Host Employer: The employer that owns or manages the property where the construction work is taking place. Where the host employer has information about permit space hazards on the site, it must share that information with the controlling contractor, who is then responsible for sharing it with the other employers on the site.

Ignition Temperature: The lowest temperature at which a substance will catch on fire and continue to burn. The lower the ignition temperature, the more likely the substance is going to be a fire hazard.

Immediate Danger to Life or Health (IDLH): Any activity or situation that is likely to result in serious injury, death or significant environmental or property damage.

Inflammable: Same as **Flammable**.

Ingestion: Swallowing.

Insulating Link/Device: An insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.

Job Hazard Analysis (JHA): The process of planning and detailing the safety controls for specific activities in the work to be performed.

Jib Stop (also referred to as a jib backstop): The same type of device as a boom stop but is for a fixed or luffing jib.

Lanyard: A flexible line of rope, wire rope or strap that generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

Lead: Metallic lead, all inorganic lead compounds and organic lead soaps; excluded from this definition are all other organic lead compounds.

- **Action Level:** Employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms/cubic meter of air (30 ug/m(3)) averaged over an 8-hour period.

Leading Edge: The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking or formwork sections are placed, formed or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.

Lifeline: A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline) or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline) and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Load: Refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment.

Load Moment (or rated capacity) Indicator: A system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.

Load Moment (or rated capacity) Limiter: A system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment, e.g., hoisting, telescoping out, or luffing out. Typically, those functions which decrease the severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.

Lockout device - A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Maximum Intended Load: The total load of all employees, equipment, tool, materials, transmitted, wind, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

Mechanically Powered Hoist: A hoist which is powered by other than human energy.

mg/kg: A way of expressing dose - milligrams (mg) of a substance per kilogram (kg) of body weight. Example: A 100 kg (220 pound) person given 10,000 mg (about 0.02 pounds) of a substance would be getting a dose of 100 mg/kg (10,000 mg/100 kg).

mg/m: A way of expressing the concentration of a substance in air- milligrams (mg) of substance per cubic meter (m) of air.

Milligram (mg): One one-thousandth of a gram.

Mobile Crane: A lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road.

Moving Point-to-Point: The times during which an employee is in the process of going to or from a work station.

Multi-Purpose Machine: A machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch. When configured with the forks/tongs, it is not covered by this subpart. When configured with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch, it is covered by this subpart.

Mutagenic: Capable of changing cells in such a way that future cell generations are affected. Mutagenic substances are usually considered suspect carcinogens.

National Institute for Occupational Safety and Health (NIOSH): SAFETY Institute for Occupational Safety and Health, U.S. Department of Health and Human Services. NIOSH does research on occupational safety and health questions and makes recommendations to OSHA.

Nationally Recognized Accrediting Agency: An organization that, due to its independence and expertise, is widely recognized as competent to accredit testing organizations. Examples of such accrediting agencies include, but are not limited to, the National Commission for Certifying Agencies and the American National Standards Institute.

Nonconductive: Means that, because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).

Non-Permit Confined Space: A confined space that does not meet the requirements for a permit-required confined space, as defined in this subpart.. However, if a hazard is introduced into a non-permit space, the space will likely have to be reclassified as a *permit required confined space/permit space*.

Odor Threshold: The lowest concentration of a substance's vapor, in the air, that can be smelled. Odor thresholds are highly variable depending on the individual who breathes the substance and the nature of the substance.

Operational Aids: Devices that assist the operator in the safe operation of the crane by providing information of automatically taking control of a crane function. These include, but are not limited to, the devices listed in 29 1926.1416 ("listed operational aids").

Operational Controls: Levers, switches, pedals and other devices for controlling equipment operation.

Operator: A person who is operating the equipment.

Other Employee - An employee whose work operations are or may be in an area where energy-control procedures may be utilized. For additional definitions, see 29 CFR 1910.147(b).

Outriggers (Scaffold): The structural member of a supported scaffold used to increase the base width of a scaffold in order to provide greater stability for the scaffold.

Overhand Bricklaying and Related Work: The process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

Oxidizer: Any substance that reacts violently with oxygen or that gives off large amounts of energy in a chemical reaction.

PEL (Permissible Exposure Limit): The same as TLV. PEL is often used in OSHA Standards instead of TLV.

Pendants: Includes both wire and bar types. Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. Bar type: Instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.

Permit-Required Confined Space or Permit Space (PRCS): A confined space that contains or has the 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; or contains any other recognized serious safety or health hazard such as exposed wiring or anything that interferes with an employee's ability to exit without assistance.

Personal Fall Arrest System: A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline or suitable combination of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

Ph: A measure of how acidic or caustic (basic) a substance is on a scale of 1-14. Ph 1 indicated that a substance is very acidic; Ph 7 indicates that a substance is neutral and Ph 14 indicates that a substance is very caustic (basic).

Platform: A work surface elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

Positioning Device System: A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface (such as a wall) and work with both hands free while leaning.

Power Lines: Electric transmission and distribution lines.

PPM (Parts per Million): Generally used to express small concentrations of one substance in a mixture.

Proximity Alarm: A device that provides a warning of proximity to a power line and that has been listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.

Qualified Evaluator (not a third party): A person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in 29 CFR 1926, Subpart CC for a signal person.

Qualified Evaluator (third party): An entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in 29 CFR 1926, Subpart CC for a signal person.

Qualified Person: A person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.

Qualified Rigger: A rigger who meets the criteria for a qualified person.

Ramp: An inclined walking or working surface that is used to gain access to one point from another and is constructed from earth or from structural materials such as steel or wood.

Range Control Limit Device: A device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.

Range Control Warning Device: A device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.

Rated Capacity: The maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.

Reactivity: The ability of a substance to undergo change usually by combining with another substance or by breaking down. Certain conditions (such as heat and light) may cause a substance to become more reactive. Highly reactive substances may explode.

Repetitive Pickup Points: Refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.

Rope Grab: A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking or both.

Running Wire Rope: A wire rope that moves over sheaves or drums.

Runway: A firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

Safety Monitoring System: A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Safety Data Sheet (SDS): An SDS provides workers and emergency personnel with procedures for handling or working with that substance in a safe manner, and includes information such as physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures.

Scaffold: Any temporary elevated (supported or suspended) platform and its supporting structure used for supporting employees or materials or both, except this term does not include crane or derrick suspended personnel platforms.

Self-Retracting Lifeline Lanyard: A deceleration device containing a drum-wound line that can be slowly extracted from or retracted onto the drum under slight tension during normal employee movement and which, after onset of a fall, automatically locks the drum and arrests the fall.

Shall: Means mandatory.

Sheeting: The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

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

Should: Means recommended.

Sideboom Crane: A track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting lowering or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.

Silicosis: A disease of the lungs caused by inhalation of fine crystalline silica dust. Silicosis increases the risk of lung infections, tuberculosis and cancer. It has no cure but it is preventable.

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

Snaphook: A connector comprised of a hook-shaped member with a normally closed keeper or similar arrangement which may be opened to permit the hook to receive an object; when released, automatically closes to retain the object. Snaphooks are generally one of two types.

1. Locking Type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection
2. Non-Locking Type with a self-closing keeper that remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

Solubility: The amount of a substance that can be dissolved in solution, usually water.

Special Hazard Warnings: Warnings of site-specific hazards (for example, proximity of power lines).

Stability (flotation device): The tendency of a barge, pontoons, vessel or other means of flotation to return to an upright position after having been inclined by an external force.

Structural Ramp: A ramp built of steel or wood usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

Subcontractor: Is a firm that has sole contractual responsibility for execution of the construction work related to a project and for compliance with all safety, health and environmental codes, standards and regulations.

Support System: A structure such as underpinning, bracing or shoring which provides support to an adjacent structure, underground installation or the sides of an excavation.

Tagline: A rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.

Teratogenic: Capable of causing birth defects.

Tilt Up or Tilt Down Operation: Means raising/lowering a load from the horizontal to vertical or vertical to horizontal.

TLV (Threshold Limit Value): The average 8-hour occupational exposure limit. The actual exposure level may vary but the average must not exceed the TLV. TLV's are calculated to protect most workers for a working lifetime.

Toeboard: A low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Tower Crane: A type of lifting structure which utilizes a vertical mast or tower to support a working boom (jib) in an elevated position. Loads are suspended from the working boom. While the working boom may be of the fixed type (horizontal or angled) or have luffing capability, it can always rotate to swing loads, either by rotating on the top of the tower (top slewing) or by the rotation of the tower (bottom slewing). The tower base may be fixed in one location or ballasted and moveable between locations. Mobile cranes that are configured with luffing jib and/or tower attachments are not considered tower cranes under this section.

Toxic Substance: Any substance that causes acute or chronic injury to the human body or that is suspected of being able to cause disease or injury under some conditions. Many toxic substances are chemicals or chemical mixtures but there are other kinds of toxic substances as well (bacteria and viruses for example).

Travel Bogie (tower cranes): An assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.

Trench Box (Shield): A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses.

Trench: A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

Trim: Angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of floatation.

Two Blocking: A condition in which a component that is uppermost on the hoist line such as the load block, hook block, overhaul ball, or similar component, comes in contact with the boom tip, fixed upper block or similar component. This binds the system and continued application of power can cause failure of the hoist rope or other component.

Unprotected Sides and Edges: Any side or edge (except at entrances to points of access) of a walking/working surface, e.g. floor, roof, ramp or runway where there is no wall or guardrail system at least 39 inches (1.0m) high.

Upperworks: The revolving frame of equipment on which the operating machinery (and many cases the engine) are mounted along with the operator's cab. The counterweight is typically supported on the rear of the upper structure and the boom or other front end attachment is mounted on the front.

Uprights: The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

Vapor Density: The density of the gas given off by a substance. It is usually compared with air which has a vapor density set at 1. If the vapor is denser than air (greater than 1) it will sink to the ground; if it is less dense than air (less than 1), it will rise.

Vapor: The gas given off by a solid or liquid substance at ordinary temperatures.

Volatility: A measure of how quickly a substance forms vapors at ordinary temperatures. Vapor pressure is a measure of volatility. The lower the vapor pressure, the lower the volatility.

Wales: Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

Walking/Working Surface: Any surface, whether horizontal or vertical, on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Wire Rope: A flexible rope constructed by laying steel wires into various patterns of multi-wired strands around a core system to produce a helically wound rope.