



Safety Manual

Feb. 2019



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Accordingly, this Safety Manual should only be used as a supplement to, and not a substitute for, the latest industry standards and regulations, including the Occupational Safety and Health Act and any standards issued by OSHA or other federal, state and local agencies. You agree to indemnify and hold NSC and its affiliates harmless for any failure to comply with such standards and regulations, whether or not they are reflected in the Safety Manual.



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Chapter 1 SAFETY POLICY

A. Company Policy and Commitment to Safety

Baxmeyer Construction, Inc. is dedicated to providing a safe and healthy work environment for all of our employees. The Company shall follow operating practices that will safeguard employees, the public and Company operations. Furthermore, compliance with all Federal, State, and local safety and health regulations is mandatory. **“We believe all incidents are preventable and want everybody to go home safely every night.”**

Baxmeyer Construction, Inc. maintains a professional and harassment-free work environment in which all employees conduct themselves with respect for one another and for those with whom we deal with on behalf of the company. We prohibit harassment on the basis of age, color, disability, ethnicity, marital or family status, national origin, race, religion, sex, sexual orientation, veteran status, or any other characteristic protected by law.

B. Safety Violation

1. Should any Baxmeyer Construction, Inc. employee commit an unsafe act, intentional or not, this action shall be addressed by the immediate supervisor and reviewed by the Safety Coordinator and Management.
2. It is not required to complete all steps of the disciplinary procedure in every case. Discipline may begin at any step appropriate to the situation. Discipline includes, but is not limited to:
 - a. Verbal Reprimand
 - b. Written Reprimand
 - c. Suspension from Job Site
 - d. Termination of Employment Contract
3. Willful Safety Violation
 - a. Employees committing willful behavior in a manner that results in a Life Threatening safety violation will be terminated immediately
4. Paperwork
 - a. A Safety Violation Notice shall be completed for all written reprimands.
 - b. A copy shall be maintained in the employee’s file and provided to the Supervisor, if corrective action(s) is required.

C. Assignment of Responsibilities

Safety is everyone’s responsibility. Everyone shall have a safe attitude and practice safe behavior at all times. To best administer and monitor our safety policies, the following responsibilities are stated. This list shall not be construed as all-inclusive and is subject to change as needed.

1. Management Responsibilities
 - a. Management has the responsibility for incident prevention in the performance of all company activities.
 - b. Management is responsible for assuring that all operations comply with applicable government regulations and company policies.
 - c. Management displays its concern for the well-being of its employees through its active participation and support of the incident prevention program.

- d. Management has an obligation to support and when necessary to direct all supervisory personnel and the company's safety coordinator in the execution of their duties.

2. Supervisor Responsibilities

- a. The Supervisor must consider both existing and anticipated safety hazards associated with the work place.
- b. The Supervisor must make provisions for employee safeguarding, by allowing for the procurement of personal protective equipment, and safe tools and equipment.
- c. The Supervisor must take into consideration the protection of the public and the protection of the owner's private property.
- d. It is the Supervisors responsibility to plan and conduct all operations with full regard to safety and shall insure compliance with all federal, state, and local safety regulations, all jobsite rules and operating procedures, and implement additional rules and procedures as required to further incident prevention at the worksite and hold the responsibility for incident prevention within their crew.
- e. The Supervisor shall participate in incident investigations, safety meetings, site inspections and general safety awareness.

3. Employee Responsibilities

- a. Employees are responsible for complying with all job safety rules and regulations.
- b. Employees are responsible for reporting all incidents and for correcting and/or reporting any unsafe acts or conditions to their Supervisor.
- c. Employees are encouraged to participate fully in the incident prevention program.
- d. Employees have an obligation to question management and Supervisors concerning any direction(s) or safety precaution(s) they do not understand.
- e. Employees must attend all training sessions to reinforce the skills needed to perform their jobs in a safe manner in and around their work area.

4. Safety Coordinator Responsibilities

- a. The Safety Coordinator will provide safety meeting topics (Toolbox Talks) to the Supervisor to be read and signed at the safety meetings.
- b. The Safety Coordinator is responsible to consult on matters in developing the objectives for jobsite incident prevention programs and their implementation.
- c. The Safety Coordinator shall consult with the company management on safety-related matters, keeping both groups current with inspection results, incident reports, corrective actions, general incident statistics, trends, changes in government safety regulations (OSHA), and other pertinent information.
- d. The Safety Coordinator will help monitor the completion of the OSHA 300 Injury/Illness Log.

D. General Rules

- 1. All Employees are responsible for safety
- 2. Comply with all established safety rules, regulations, procedures, and instructions which are applicable to your own actions and conduct
- 3. Promptly report all incidents, hazards, incidents, and near-miss occurrences to your Supervisor, regardless of whether or not injury or property damage was involved.

4. Do not visit, talk to, or distract another employee who is operating a machine, or who is engaged in a work activity where the possibility of injury exists.
5. Do not participate in horseplay, scuffling, pushing, fighting, throwing things, or practical jokes.
6. Observe all no-smoking signs and regulations.
7. Do not run on work site premises except during emergencies.
8. Use handrails on steps, elevated platforms, scaffolds, or other elevations.
9. Assist others and ask for assistance in lifting and carrying heavy or awkward objects.
10. Personal stereos with headphones (ie: iPods) are not permitted to be worn at the work site.
11. Being under the influence of, possessing, or using alcohol and/or illegal drugs at work site is prohibited.

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Chapter 2 TRAINING & MONITORING

A. Training

Training will be provided in order to assure the requirements of OSHA standards are met and continuously evaluate employee training needs to keep workers safe and healthy on the job.

1. New Employee Orientation

New employees will receive training on the company's safe work practices and expectations, this safety manual, and specific safety and health training for the tasks that they will perform.

2. Safety Coordinator Training

The Safety Coordinator or other designated person will appraise the skill and knowledge level of exposed workers, and provide any additional training, as required.

3. Assessment of employee understanding will be determined through job performance, performance testing, and if employees come forward with concerns.

4. Where safety and health training is needed, appropriate training will be provided to include:

- a. Hazard recognition.
- b. Necessary precautions to be used (best work practices and PPE).

5. Training length and level of detail will be determined by the severity of the hazards and the requirements of OSHA.

6. Records will be maintained with the following information:

- a. Topic(s) covered
- b. Name of trainer
- c. Date of training
- d. Employee name
- e. Verification of employee understanding

B. Toolbox Talks

1. Weekly Tool Box Talks will be conducted on a weekly basis for their employees at the work site
2. All Foremen / Supervisors are required to attend
3. Emergency procedures shall be periodically reviewed
4. Employees shall be reminded to put safety first and look out for their fellow workers
5. Employees shall be encouraged to offer comments and safety suggestions at this time and regularly throughout the day as needed

C. Inspections

Periodic inspections will be conducted to identify hazardous conditions and unsafe behaviors by the Foreman, Project Managers, or Safety Coordinator. The inspection shall look for unsafe practices and conditions that can cause an incident and take corrective action immediately.

Checklist can be found in the Forms section of this manual.

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Chapter 3 SUBSTANCE ABUSE POLICY

A. Substance Abuse Policy

Baxmeyer Construction, Inc. shall balance respect for individual privacy with the need to keep a safe, productive, drug-free environment. No Baxmeyer Construction, Inc. employee may use, store, possess, manufacture, distribute, or be under the influence of illegal substances, or use or be under the influence of alcohol, while performing work for the company.

This policy affects all drivers, mechanics, dispatchers, and any other employee and their supervisors during the time of employment with this company. Anyone who violates this policy is subject to disciplinary action, up to and including termination of employment.

Baxmeyer Construction, Inc. shall have the right to require an employee to submit to testing for illegal substances prior to assignment to projects where customer specifications or governmental regulations mandate such testing. In addition, we shall have the right to implement the Drug and Alcohol Testing Categories as outlined in this policy.

Any employee who is subject to Department of Transportation (DOT) regulations shall be subject to and must pass a DOT drug test prior to employment, and whenever testing is required under DOT regulations and provisions.

B. Drug & Alcohol Free Workplace

1. To ensure that drugs and alcohol do not enter or affect the workplace, Baxmeyer Construction, Inc. reserves the right to conduct reasonable searches of all vehicles, containers, lockers, or other items on company property or worksites in furtherance of this program.
2. Individuals may be requested to display personal property for visual inspection upon request. All personal property searches will take place only in the employee's presence and will occur with the utmost discretion and consideration for the employees involved.
3. Searches for the purposes described herein will be conducted when there is reasonable suspicion that the employee has violated the Substance Abuse Policy, and that evidence of such misconduct may be found during the search.

C. Alcohol Statement

1. It is recognized that alcohol use differs from use of illegal drugs in that alcohol may be legally obtained and used, and each employee has the right to decide whether or not to drink on his own time so long as job safety and job performance are not impaired. However, improper use of alcohol affecting job safety or efficiency is unacceptable.
2. No employee shall consume alcohol or be under the influence of alcohol while on a company jobsite or project during working hours or in a company-owned vehicle at any time. Doing so shall be considered cause for termination.
3. No employee shall perform safety-sensitive functions within four hours after using alcohol.

D. Marijuana Statement

1. It is recognized that medical and/or recreational Marijuana may be a legal option in some locations where the company may perform work, and that each employee has the right to decide whether or not to smoke on his own time so long as job safety and job performance are not impaired.
2. Marijuana usage for any purpose remains illegal under federal law and is a serious risk to health and safety on a work site. The company intends to follow all state and federal laws, but where they conflict, the company will follow the stricter federal law.

3. No employee shall use/consume marijuana or be under the influence of marijuana while on a company jobsite or project during working hours or in a company-owned vehicle at any time. Doing so shall be considered cause for termination.

E. Drug and Alcohol Testing Categories

1. Pre-Employment

Offers of employment may be conditioned on proper cooperation with and participation in controlled substance screening test. Following a conditional employment offer, applicants will be asked to sign a form consenting to a screening test as part of the application process.

Failure to submit to an alcohol or controlled substance test as required in this policy will result in disqualification for employment consideration.

2. Post-Vehicle Accident

An employee is required to submit to a drug/alcohol test when they are driving and are involved in an accident where one of the following situations has occurred:

- a. Any person involved in the accident dies
- b. The driver receives a citation within 8 hours (for alcohol test) or 32 hours (for drug test) of the accident for a moving traffic violation arising from the accident; and,
 - (A.) The accident involved bodily injury to any person who, as a result of the injury, immediately receives medical treatment away from the scene of the accident; or,
 - (B.) One or more of the vehicles incur disabling damage requiring the vehicle to be transported from the scene by a tow truck or other motor vehicle.

3. Post-Incident

If there is a reasonable possibility that drug or alcohol use (by any party involved) caused or contributed to the reported incident, injury or illness, this program allows for involved employees to submit to testing for drugs and alcohol.

Employees may be subject to testing after a work related accident involving medical treatment (other than first aid), or which results in a lost work day to the individual or which involves significant property damage.

4. Random

To the extent allowed by law, employees in safety sensitive or special risk positions will be required to submit to drug testing on a random basis.

Employees selected for random testing shall report to the drug testing laboratory the same day that they are notified that they have been selected so long as proper laboratory facilities are provided during working hours.

5. Reasonable Suspicion

If a competent person has determined that there is reasonable cause or suspicion that an individual is performing work under the influence, then that individual will be required to submit to a drug and alcohol test.

6. Routine Fitness for Duty

Employees will be subject to drug testing if the test is conducted as part of a routinely scheduled employee fitness-for-duty medical examination applicable to all similarly situated employees.

7. Other Additional Testing

Other additional testing may also be conducted as required by applicable state or federal laws or regulations or as deemed necessary by the company.

F. Substance Abuse Testing Policy

1. Failure to submit to an alcohol or controlled substance test as required in this policy will result in employment status to be reclassified as Non-Compliant and employee shall be subject to disciplinary action, up to and including termination of employment.
2. Any employee being notified to submit to a drug and/or alcohol test will sign a Substance Abuse Testing Notification Form regardless of the category in which the testing falls
3. All Substance Abuse testing shall be carried out under the following conditions:
 - a. The company shall be responsible for all expenses incurred in carrying out drug testing, including, but not limited to lost time, travel time, travel expense and all costs of testing, unless stated otherwise in this policy.
 - b. All testing shall be done under the control and supervision of a physician with employee confidentiality protected and only by laboratories listed by current federal standards.
 - c. The substance use prohibitions and the testing procedures provided for under this policy may involve the following drugs or metabolites:

SUBSTANCE	THRESHOLD LIMIT
Alcohol	0.02%
Amphetamines	300 ng/ml
Cocaine metabolites	300 ng/ml
Marijuana metabolites	20 ng/ml
Opiate metabolites	300ng/ml
Phencylidine	25 ng/ml
Barbiturates	300 ng/ml
Benzodiazepines	300 ng/ml
Methadone	300ng/ml
Methaqualone	300ng/ml
Propoxyphene	300 ng/ml

- d. An employee or job applicant who receives a positive confirmed test result may contest or explain the result to the Medical Review Officer (MRO) within five (5) working days after receiving written notification of the test result. If an employee's or job applicant's explanation or challenge is unsatisfactory to the MRO, the positive test result shall be reported to the employer.
- e. An employee testing positive due to a "negative dilute" (a greater concentration of water in a urine specimen than what would be expected) shall have another urine sample collected as soon as possible with minimum advance notice. A second diluted specimen, without a medical reason, will be considered a positive test result.
- f. Drug and alcohol testing records shall be handled with the highest degree of confidentiality, and shall not be distributed to other parties.
 - (A.) If a grievance is brought before the Joint Labor Management Committee as a result of a positive test, the company shall have the right to present, as evidence, any and all employee records including positive test results.
 - (B.) The company shall have the right to document negative or drug-free results for individual employees to customers, government agencies or the Union.

- (1.) In the case of alcohol testing verification, the company will document to the customer, government agency or the Union that all employees employed on the job site are in compliance with the alcohol section of the policy.

G. Substance Abuse Test Failure

1. **FIRST OFFENSE**

Before an employee may return to work, he/she must pass, at his/her own expense and from the same testing office, the same test that was previously failed. The results must be negative and clouded/diluted results are not acceptable.

The company is not required to pay the employee while he/she is not working, and awaiting results from a second test.

Following a negative re-test, the employee may be reassigned to the project or other projects at the company's discretion. First-time violators shall be subject to Random Testing for use at any time without prior notice up to six months following the violation.

2. **SECOND OFFENSE**

Following a second offense, the employee shall be subject to disciplinary action up to and including immediate termination.

Before an employee may be considered for re-employment, he/she must wait a minimum of 30 days before taking and passing, at his/her own expense and from the same testing office, the same test that was previously failed.

Re-employment, even following a negative re-test, shall be a discretionary decision on the part of management.

3. **THIRD OFFENSE**

Third offense for failure of a substance abuse test is grounds for immediate termination without recourse or consideration for re-employment.

H. Joint Labor Management Committee Involvement

In the interest of securing a drug-free work-place, protecting employee rights and securing employment opportunities, suggestions, and issues of concern and compliance problems shall be communicated in writing to the Joint Labor Management Committee.

I. Substance Abuse Policy Acknowledgement Forms

All Baxmeyer Construction, Inc. employees are required to sign a Substance Abuse Policy Acknowledgement Form acknowledging that they have received and read the Substance-Abuse Policy as outlined in this section.

Acknowledgement Form can be found in the Forms section of this manual.

Chapter 4 EMERGENCY & INCIDENT MANAGEMENT

A. Incident/Injury Procedures

If there is an incident while working, it will be investigated and corrective action implemented to prevent future injury. Employees and witnesses must fully cooperate in the investigation.

If there is an injury on the job:

1. In case of an emergency, the employee nearest the stricken person shall call 911 (or the emergency phone number posted in your area)
2. Care for the injured worker immediately, if possible
3. Direct a fellow employee to contact the designated employee who is trained in first-aid and/or CPR to assist in the situation, as well as the nearest Supervisor.

If rescue personnel are summoned via a 9-1-1 call, the Supervisor shall delegate an individual to wait for the rescue team at a designated location and escort them to the injured employee.

4. Simultaneously dispatch available employees to quickly retrieve the first aid kit.
5. If needed, the Supervisor or other designee shall transport the injured worker to the company's designated medical facility to receive appropriate medical attention.

A post-incident drug and/or alcohol test may be conducted in accordance with the Drug-Free Workplace Policy.

6. Injured employees must comply with the medical treatment provided by the treating physician, cooperate with the insurance company and its designees, and abide by the company's return-to-work policy.
7. The Supervisor or Management will decide whether or not to evacuate, inspect or shut down the work site.

B. Evacuation Procedures

1. When alerted by alarm or by the Supervisor to evacuate, employees shall:
2. Properly secure all materials/tools/equipment in their possession and assure all hazardous containers and areas are properly locked.
3. Proceed to the nearest exit and wait in a safe location at the designated meeting location away from the danger.
4. Remain in the designated meeting location until role call is complete and instructions are provided.

C. Reporting an incident/injury

1. All workers have the right to raise a safety or health concern with their employer or OSHA, and/or to report a work-related injury or illness, without being retaliated against.
2. Contact and report to the Supervisor.
3. The Supervisor shall immediately notify the Safety Coordinator of the incident so that a workers' compensation claim or a report only claim can be filed.
4. The employer shall record all work-related injuries per the guidelines in the OSHA Recordkeeping chapter of this manual.

D. Incident Investigation

1. All witnesses to the incident shall be available to speak with the Safety Coordinator and/or the Supervisor and cooperate in all incident investigations.
2. The Safety Coordinator or Supervisor shall complete an Incident Investigation Form which shall be submitted to Management for review.
3. Management and the Safety Coordinator shall evaluate the corrective action(s) taken or suggested and shall approve of any additional corrective actions, as appropriate.

E. Near Miss Report

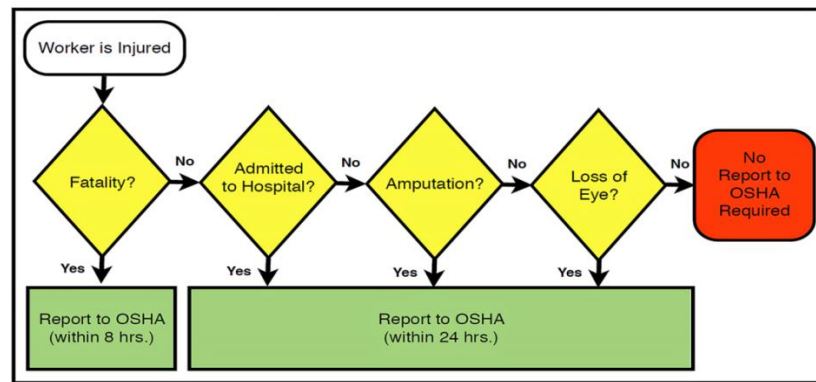
1. If there is a Near Miss while working, it will be investigated and a Near Miss Report will be filled out, including witness statements.
2. This report is NOT intended to be used for retaliatory purposes; rather, it is intended to be a teaching tool designed to improve employee safety awareness, and to identify and prevent potential life-threatening situations before they happen.

F. Training

1. Employees shall be trained at least annually on company policies and procedures with regard to Emergency and Incident Management.
2. Training shall include:
 - a. Procedures to follow in the event of an injury or incident at the worksite
 - b. Evacuation routes, meeting location(s), and roll call procedures
 - c. Company procedure for reporting work related incidents, injuries or illnesses
 - (A.) Employees have the right to report work-related injuries and illnesses
 - (B.) Company is prohibited from and shall not discharge or in any manner discriminate against employees for reporting work-related injuries or illnesses
 - d. Expectations of the employees during an incident, injury, or Near Miss investigation.

All referenced forms can all be found in the Forms section of this manual

Chapter 5 OSHA REPORTING & RECORDKEEPING (29 CFR 1904)



A. Reporting Criteria

1. Report to OSHA within eight (8) hours, if a result of a work-related incident:

a. The death of any employee

If the fatality does not occur during or right after the work-related incident, you still report to OSHA if the fatality occurs within thirty (30) days of the work-related incident

2. Report to OSHA within twenty-four (24) hours, if a result of a work-related incident:

a. The in-patient hospitalization of one or more employees

OSHA defines inpatient hospitalization as a formal admission to the in-patient service of a hospital or clinic for care or treatment (not for observation or diagnostic testing)

b. An employee's amputation

(A.) Amputations include a part, such as a limb or appendage that has been severed, cut off, amputated (either completely or partially); fingertip amputations with or without bone loss; medical amputations resulting from irreparable damage; amputations of body parts that have since been reattached.

(B.) Amputations do not include avulsions, enucleations, de-gloving, scalping, severed ears, or broken/chipped teeth

c. An employee's loss of an eye

3. Reporting Methods

a. By telephone or in person to the local OSHA Area Office that is nearest to the site of the incident – **Leaving a message is not considered reporting**

b. By telephone to the OSHA toll-free central telephone number, 1-800-321-OSHA (1-800-321-6742) – **Leaving a message is not considered reporting**

c. By electronic submission using the reporting application located on OSHA's public Web site at www.osha.gov.

4. Information needed to report

a. The establishment name

b. The location of the work-related incident

c. The time of the work-related incident

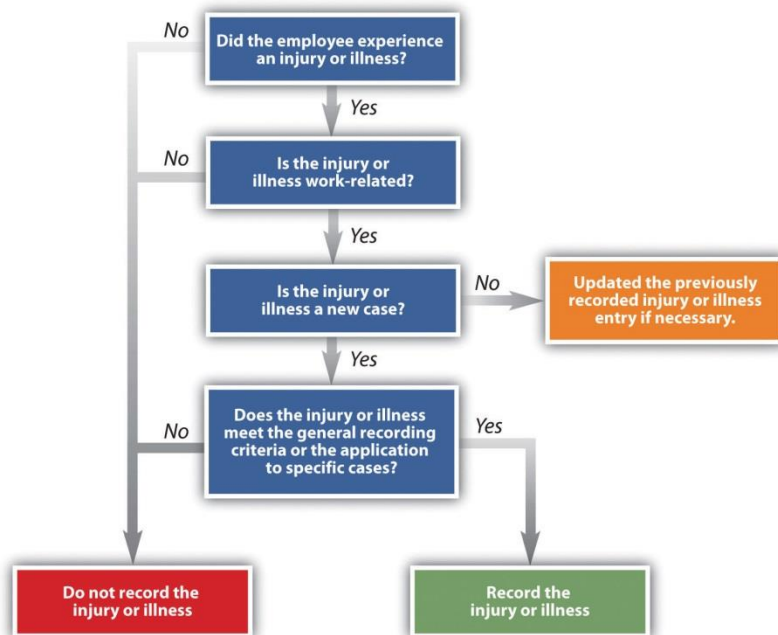
d. The type of reportable event (i.e., fatality, in-patient hospitalization, amputation, or loss of an eye)

e. The number of employees affected by the reportable event

- f. The names of the employees affected by the reportable event
- g. Your contact person and his or her phone number
- h. A brief description of the work related incident

B. Recording Criteria

1. Each employer required by this part to keep records of fatalities, injuries, and illnesses must, in accordance with the requirements of this part, make and maintain an accurate record of each and every fatality, injury, and illness that:
 - a. Is work-related; and
 - b. Is a new case; and
 - c. Meets one or more of the general recording criteria



2. Determination of work-relatedness

- a. An injury or illness must be considered to be work-related if an event or exposure in the work environment either caused or contributed to the resulting condition or significantly aggravated a pre-existing injury or illness
- b. Work-relatedness is presumed for injuries and illnesses resulting from events or exposures occurring in the work environment, unless an exception specifically applies
- c. Exceptions
 - (A.) At the time of the injury or illness, the employee was present in the work environment as a member of the general public rather than as an employee
 - (B.) The injury or illness involves signs or symptoms that surface at work but result solely from a non-work-related event or exposure that occurs outside the work environment
 - (C.) The injury or illness results solely from voluntary participation in a wellness program or in a medical, fitness, or recreational activity such as blood donation, physical examination, flu shot, exercise class, racquetball, or baseball

- (D.) The injury or illness is solely the result of an employee eating, drinking, or preparing food or drink for personal consumption (whether bought on the employer's premises or brought in). For example, if the employee is injured by choking on a sandwich while in the employer's establishment, the case would not be considered work-related

Note: If the employee is made ill by ingesting food contaminated by workplace contaminants (such as lead), or gets food poisoning from food supplied by the employer, the case would be considered work-related.

- (E.) The injury or illness is solely the result of an employee doing personal tasks (unrelated to their employment) at the establishment outside of the employee's assigned working hours
- (F.) The injury or illness is solely the result of personal grooming, self-medication for a non-work-related condition, or is intentionally self-inflicted
- (G.) The injury or illness is caused by a motor vehicle accident and occurs on a company parking lot or company access road while the employee is commuting to or from work

- (H.) The illness is the common cold or flu

Note: contagious diseases such as tuberculosis, brucellosis, hepatitis A, or plague are considered work-related if the employee is infected at work

- (I.) The illness is a mental illness. Mental illness will not be considered work-related unless the employee voluntarily provides the employer with an opinion from a physician or other licensed health care professional with appropriate training and experience stating that the employee has a mental illness that is work-related

3. Determination of new cases

- a. An injury or illness must be considered to be a "new case" if:
 - b. The employee has not previously experienced a recorded injury or illness of the same type that affects the same part of the body, or
 - c. The employee previously experienced a recorded injury or illness of the same type that affected the same part of the body but had recovered completely (all signs and symptoms had disappeared) from the previous injury or illness and an event or exposure in the work environment caused the signs or symptoms to reappear

4. General Recording criteria

An injury or illness must be considered to meet the general recording criteria, and therefore to be recordable, if it results in any of the following:

- a. Death
- b. Days away from work
- c. Restricted work or transfer to another job
- d. Medical treatment beyond first aid

"Medical treatment" means the management and care of a patient to combat disease or disorder. Medical treatment does not include:

- (A.) Visits to a physician or other licensed health care professional solely for observation or counseling
- (B.) The conduct of diagnostic procedures, such as x-rays and blood tests, including the administration of prescription medications used solely for diagnostic purposes (e.g., eye drops to dilate pupils)
- (C.) "First aid" as defined in 29 CFR 1904

- e. Loss of consciousness
- f. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness
 Cancer, chronic irreversible diseases, fractured or cracked bones, and punctured eardrums are generally considered significant injuries and illnesses, and must be recorded at the initial diagnosis even if medical treatment or work restrictions are not recommended, or are postponed

C. OSHA Forms

1. All record keeping documents, are maintained at the company office
2. When an authorized government representative asks for the records you keep under part 1904, you must provide copies of the records within four (4) business hours
3. Every recordable occupational injury or illness shall be logged on the appropriate OSHA forms within seven (7) working days from the time the employer learns of the injury
 - a. OSHA 300 form - Log of Work-Related Injuries and Illnesses
 - b. OSHA300-A form - Summary of Work-Related Injuries and Illnesses
 - c. OSHA 301 form - Injury and Illness Incident Report
4. Additional log forms are available at www.osha.gov

D. Recordkeeping Requirements

1. Covered Employees
 - a. Company must record on the OSHA 300 Log the recordable injuries and illnesses of all employees on your payroll, whether they are labor, executive, hourly, salary, part-time, seasonal, or migrant workers
 - b. Company also must record the recordable injuries and illnesses that occur to employees who are not on your payroll if you supervise these employees on a day-to-day basis
 - c. If the business is organized as a sole proprietorship or partnership, the owner or partners are not considered employees for recordkeeping purposes
2. Annual Summary
 - a. At the end of each calendar year, company must:
 - b. Review that year's OSHA 300 Log to verify that it contains accurate entries for all recordable injuries and illnesses that occurred during the year, and make any additions or corrections necessary to ensure its accuracy
 - c. Verify that each injury and illness recorded on the 300 Log, including any injuries and illnesses added to the Log following your year-end review is accurately recorded on a corresponding 301 Incident Report form
 - d. After you verifying the accuracy of the Log
 - (A.) Complete the OSHA 300A form, with the summary of injuries and illnesses recorded on the Log
 - (B.) Certify the summary

- (1.) A company executive must certify that he or she has examined the OSHA 300 Log and that he or she reasonably believes that the annual summary is correct and complete.
 - (C.) Post the summary
 - (1.) Must be posted from February 1 to April 30 of the year following the year covered on the form
 - (2.) Must be posted in each establishment in a conspicuous place or places where notices to employees are customarily posted
 - (3.) Must not be altered, defaced or covered by other material
3. Form Retention & Updating
- a. Company must save the OSHA 300 Log, the privacy case list (if one exists), the annual summary, and the OSHA 301 Incident Report forms for five (5) years following the end of the calendar year that these records cover.
 - b. Company must make the following additions and corrections to the OSHA Log and Incident Reports (OSHA 300) during the five-year retention period:
 - (A.) The OSHA Logs must contain entries for all recordable injuries and illnesses that occurred during the calendar year to which each Log relates

This means that if a recordable case occurred and you failed to record it on the Log for the year in which the injury or illness occurred, you are under a continuing obligation to record the case during the five-year retention period for that Log
 - (B.) You must make any additions and corrections to the OSHA Log that are necessary to accurately reflect any changes that have occurred with respect to previously recorded injuries and illnesses

If the classification, description, or outcome of a previously recorded case changes, you must remove or line out the original entry and enter the new information
 - c. Company is not required to make additions or corrections to OSHA 301 Incident Reports or the OSHA 300A Annual Summaries during the five-year retention period, but may do so if you wish

E. Annual Electronic Submission

- 1. OSHA has launched, the Injury Tracking Application (ITA). This Web-based form allows required injury and illness data to be electronically submitted to OSHA, based on the guidelines of this section.
- 2. Injury Tracking Application (ITA) website - <https://www.osha.gov/injuryreporting/ita/>
 - a. The data submission process involves four steps:
 - (A.) Creating an establishment
 - (B.) Adding 300A summary data
 - (C.) Submitting data to OSHA
 - (D.) Reviewing the confirmation email.
 - b. The secure website offers three options for data submission:
 - (A.) One option will enable users to manually enter data into a web form
 - (B.) Another option will give users the ability to upload a CSV file to process single or multiple establishments at the same time

- (C.) A third option will allow users of automated recordkeeping systems to transmit data electronically via an application programming interface
 - c. The ITA webpage also includes information on reporting requirements, a list of frequently asked questions and a link to request assistance with completing the form.
3. Who is required to submit
- a. Establishments that had 250 or more employees at any time during the previous calendar year, and are not exempt from maintaining OSHA records.
 - b. Establishments that had 20 or more employees but fewer than 250 employees at any time during the previous calendar year, and are classified in a designated industry.
See Appendix A of this section for designated industries
 - c. Any other establishment that is notified to submit for individual data collection
 - (A.) OSHA will notify you by mail if you will have to submit information as part of an individual data collection
 - (B.) OSHA will also announce individual data collections through publication in the Federal Register and the OSHA newsletter, and announcements on the OSHA Web site
4. What information is submitted
- a. Companies with 250 or more employees submit information found on all 3 forms, except the following:
 - (A.) Log of Work-Related Injuries and Illnesses (OSHA Form 300):
 - (1.) Employee name
 - (B.) Injury and Illness Incident Report (OSHA Form 301):
 - (1.) Employee name
 - (2.) Employee address
 - (3.) Name of physician or other health care professional
 - (4.) Facility name and address if treatment was given away from the worksite
 - b. Designated industry companies with 20 or more, but fewer than 250 employees submit requested information from the OSHA 300A form
5. Reporting Dates
- a. Required information must be submitted by **March 2** of the year after the calendar year covered by the form or forms (ie: March 2, 2019 for 2018 information)
 - b. If you are an employer who must routinely submit the information, then OSHA will **not** notify you about your routine submittal.
 - c. If you are submitting information because OSHA notified you to submit information as part of an individual data collection, then you must submit the information as often as specified in the notification.

F. Safety Inspection Checklist

Supervisors or Safety Coordinator have at their disposal a Safety Inspection Checklist that can be used as a tool to help in avoiding safety violations and remaining in compliance with OSHA standards. Deficiencies shall be immediately corrected.

Checklist can be found in the Forms section of this manual.

Appendix A

Establishments in the following industries with 20 to 249 employees must submit injury and illness summary (Form 300A) data to OSHA electronically

Start with the first 2 digits of your NAIC - that is the prefix per census.gov. If that prefix is on the chart, and no other 3 or 4+ digits are on the chart, then ALL NAICs beginning with that prefix are required to report.

NAIC	Industry	NAIC	Industry
11	Agriculture, forestry, fishing and hunting	4921	Couriers and express delivery services
22	Utilities	4922	Local messengers and local delivery
23	Construction	4931	Warehousing and storage
31-33	Manufacturing	5152	Cable and other subscription programming
42	Wholesale trade	5311	Lessors of real estate
4413	Automotive parts, accessories, and tire stores	5321	Automotive equipment rental and leasing
4421	Furniture stores	5322	Consumer goods rental
4422	Home furnishings stores	5323	General rental centers
4441	Building material and supplies dealers	5617	Services to buildings and dwellings
4442	Lawn and garden equipment and supplies stores	5621	Waste collection
4451	Grocery stores	5622	Waste treatment and disposal
4452	Specialty food stores	5629	Remediation and other waste management services
4521	Department stores	6219	Other ambulatory health care services
4529	Other general merchandise stores	6221	General medical and surgical hospitals
4533	Used merchandise stores	6222	Psychiatric and substance abuse hospitals
4542	Vending machine operators	6223	Specialty (except psychiatric and substance abuse) hospitals
4543	Direct selling establishments	6231	Nursing care facilities
4811	Scheduled air transportation	6232	Residential mental retardation, mental health and substance abuse facilities
4841	General freight trucking	6233	Community care facilities for the elderly
4842	Specialized freight trucking	6239	Other residential care facilities
4851	Urban transit systems	6242	Community food and housing, and emergency and other relief services
4852	Interurban and rural bus transportation	6243	Vocational rehabilitation services
4853	Taxi and limousine service	7111	Performing arts companies
4854	School and employee bus transportation	7112	Spectator sports
4855	Charter bus industry	7121	Museums, historical sites, and similar institutions
4859	Other transit and ground passenger transportation	7131	Amusement parks and arcades
4871	Scenic and sightseeing transportation, land	7132	Gambling industries
4881	Support activities for air transportation	7211	Traveler accommodation
4882	Support activities for rail transportation	7212	RV (recreational vehicle) parks and recreational camps
4883	Support activities for water transportation	7213	Rooming and boarding houses
4884	Support activities for road transportation	7223	Special food services
4889	Other support activities for transportation	8113	Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance
4911	Postal service	8123	Dry-cleaning and laundry services

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Chapter 6 PROTECTING THE PUBLIC (ANSI/ASSE A10.34-2001 (R2012))

A. Responsibility

1. The project manager shall implement this standard as appropriate to the specific size and location of the project and degree of potential hazards to the public. If the enforcing authority, project manager or other responsible party (agent) determines that portions are not applicable and the intent of the standard is still met, then those specific sections should be deleted (or disregarded) where they do not apply.
2. Whenever the project manager or other responsible party (agent) delegates their responsibility, they are not relieved of accountability for oversight (of the activities that were delegated). If the project manager or its agent becomes aware of a situation where an entity that has been delegated responsibility fails to or cannot perform the delegated responsibility adequately, then the project manager or its agent shall be responsible for correction of the deficiency.

B. Exceptions

In cases of practical difficulty or undue hardship, the responsible authority may grant exceptions to the literal requirements of this standard or permit the use of other devices or methods, but only when it is clearly evident that personnel and equipment protection is assured.

C. Pedestrian Hazards

1. Areas for public pedestrian traffic should be clearly marked at the construction site at all times.
2. Public pedestrian traffic areas should be maintained so that slipping, tripping and falling hazards are reduced.
3. Non-level surfaces should be delineated with high visibility markings, signs or notices.
4. Stairs or ramps should have handrails on both sides.
5. Elevated areas should have standard guardrails.
6. The public should be notified of closed pedestrian areas and they should be provided access to safe alternative areas. The expected path to the alternative area(s) should be clearly marked.
7. The contractor should monitor public ingress and egress routes to make sure that construction operations do not block stairways, doors, entrances, exits, paths or hallways.
8. Special attention should be given to the emergency evacuation of buildings, structures and jobsites and how the construction project may affect this evacuation.

D. Lighting

1. Lighting and welding flash on the jobsite that may project to or illuminate areas offsite should be directed or shielded so that they do not create a public hazard.
2. Walking surfaces and other public areas affected by the construction project should be adequately illuminated.

E. Radiation

1. Operations that may produce public radiation exposure hazards should be controlled and shielded.
2. The area must be barricaded to prohibit public access.

3. Signage that designates what type of radiation exposure may cause public harm or injury should be clearly displayed.
4. Ionizing and nonionizing radiation hazards, including nuclear, x-ray, laser, microwaves, ultraviolet and infrared radiation, welding rays or high-radiant heat sources and exposure, should be considered.

F. Machinery and Vehicles

1. Contractors who use cranes, vehicles, machinery, ships, vessels, barges, boats, aircraft or other mobile equipment or devices should conduct an initial and periodic inspection of the equipment.
2. Sufficient barricades, shields, guards, alarms, signs, markings and safety systems should be provided or installed on all equipment.
3. If any machinery, ships, vessels, barges, boats, aircraft or vehicles require special licenses, permits or operator training before they are used, the contractor should secure or provide these before working with that equipment.
4. Areas with mobile equipment that is accessible to the public should be barricaded or guarded before and during the operation of the equipment.
5. Warning signs, fencing, barricading or personnel should be placed at a sufficient distance from the areas to prevent the public from entering the areas by mistake.
6. If loads are hoisted or if other overhead hazards exist, a clear area below, which is sufficient to prevent public hazards, should be barricaded to prevent inadvertent public access.
 - a. The area should be monitored during overhead work to ensure that it remains clear.
7. If noise makes it difficult to hear warnings or signals from mobile equipment, ships, vessels, boats or aircraft, the decibels should be increased so that the warnings or signals can be heard.
 - a. If this cannot be done, visual signals should be established to protect the public.
 - b. Visual or radio contact should be maintained between the operators and those who will provide the signals.

G. Falling and Windborne Objects

1. To prevent construction objects or debris from creating a public hazard, barriers, catch platforms, enclosures, perimeter or vertical debris netting or other administrative or engineering controls must be employed.
2. Public areas adjacent to the jobsite should be protected by sheds, overhangs, perimeter netting systems, platforms, scaffolding or similar structures to protect pedestrians from falling objects or debris.
3. Construction material, tools, debris, waste, equipment or other items should be contained, secured, tied off, removed, braced, enclosed or restrained so that they do not fall, blow away or enter public areas.

H. Security

1. Measures should be established to restrict public access to the jobsite. If access control is not possible, items that may create a hazard should be locked, barricaded or removed.
2. Security systems or personnel may be employed during or after work hours to ensure that the public cannot gain access to the jobsite.

3. Authorities and security personnel should receive a list of those individuals who are authorized to access the jobsite during non-work hours.
4. Local enforcement authorities should be made aware of all security plans and they should receive a list of personnel who will assist them.

I. Pollution

1. Construction operations that generate waste, debris, byproducts or other contaminants that may result in pollution, degradation or contamination should be evaluated and controlled to reduce or eliminate the problem.
2. Project waste should be moved only to facilities that are licensed, certified or qualified to accept and process that kind of waste.
3. Water-borne runoff or contaminants that can be carried to a municipal storm or sanitary sewer system should be evaluated. If the run-off creates a pollution hazard, then steps should be taken to control the contaminants.
4. Onsite sanitation facilities that are not linked to a sanitary sewer system must be provided in accordance with Table I of ANSI Z4.3-1987.

J. Utilities

1. The location of all utilities must be established before the construction starts.
 - a. The utilities should be located and marked as a visual warning to those who may come into contact with them.
 - b. All affected contractors should receive this information in the project documents.
2. Markings, warnings or drawings that show the location of the utilities should be updated as conditions change or as utilities are added or deactivated.
3. The installation of temporary utilities and public exposures must conform to applicable standards.
4. In all cases, the public must be protected from any hazards that the utilities may pose.

K. Hazardous Materials and Substances

1. Hazardous materials should be stored away from the public in approved containers that are properly labeled.
2. Hazardous material storage facilities should be built and located away from the public and separated from each other as required by the presiding authority.
3. Warning signs should be posted at storage areas.
4. Emergency response personnel should receive SDS on the hazardous materials as required by the presiding authority.

L. Injuries and Damage

1. Any public injury or damage should be immediately assessed and action should be taken to secure medical help and to minimize further injury or damage.
2. The public hazard control plan supervisor should be notified immediately of any public injury or damage.

3. The area in which the injury or damage has occurred should be secured until proper investigation and documentation have taken place.

M. Vibrations and Subsidence

1. Construction operations that produce ground or air vibration should be analyzed to prevent damage or subsidence of adjacent land or structures.
2. A pre-operations survey of the surrounding area, structures and accessories should be conducted before any construction activity begins. Any weaknesses or deterioration found during the survey should be reported to the presiding authority before construction.
3. The contractor should provide data that show the maximum limits of expected vibrations or subsidence.
 - a. These limits must not exceed those specified by the presiding authority.
 - b. Seismographic recordings should be made if required.
4. If warranted during the pre-operations survey, structural and geological investigation may be conducted.
5. If there will be blasting at the jobsite, an audible blasting warning signal should be established, published and posted and signage should be posted to warn the public. Blasting mats or administrative controls should be used to reduce any public fly-rock hazards.
6. Adjacent roadways, waterways, airways, sidewalks, buildings and utilities should be monitored periodically during construction operations.
7. All excavations, cuts and trenches in public areas should be backfilled with approved material and then tamped and compacted as soon as possible.
8. Any public areas or structures that are disturbed, cracked or broken during construction operations should be inspected, repaired or replaced.

N. Emergency Action Plan

1. An emergency action plan that outlines the actions and responsibilities to be taken in the event of an emergency should be incorporated in the public hazard control plan.
2. Jobsite personnel should be instructed in the emergency procedures to be followed in the event of an emergency that involves or affects the public.

O. Public Contempt or Protest

1. A plan should be established for dealing with members of the public who purposely place themselves or others at risk by failing to observe or heed warnings, directives or safety precautions.
2. Agencies with authority to control public activity may be notified and work may be ceased until the public is controlled.

P. Threats

1. A plan should be established for handling bomb threats or any other violence communicated to the job site.
2. The plan should include directions for interacting with the authorities.

Chapter 7 SAFETY SPECIFICS

These OSHA standards have been identified as specifically relevant to your organization and beneficial to your organization's safety program.

They are NOT the only OSHA standards with which you are expected to be compliant – they are simply indicated as specifically pertinent.

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Safety Specifics – **Asbestos (29 CFR 1926.1101)**

A. Scope and application

This standard regulates asbestos exposure in all construction work as defined in 29 CFR 1910.12(b), including but not limited to the following:

1. Demolition or salvage of structures where asbestos is present;
2. Removal or encapsulation of materials containing asbestos;
3. Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos;
4. Installation of products containing asbestos;
5. Asbestos spill/emergency cleanup; and
6. Transportation, disposal, storage, containment of and housekeeping activities involving asbestos or products containing asbestos, on the site or location at which construction activities are performed.
7. Coverage under this standard shall be based on the nature of the work operation involving asbestos exposure.
8. This section does not apply to asbestos-containing asphalt roof coatings, cements and mastic

B. Definitions

- **Aggressive method** means removal or disturbance of building material by sanding, abrading, grinding or other method that breaks, crumbles, or disintegrates intact ACM.
- Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered. For purposes of this standard, "asbestos" includes PACM, as defined below.
- **Asbestos-containing material (ACM)** means any material containing more than one percent asbestos.
- **Class I asbestos work** means activities involving the removal of TSI and surfacing ACM and PACM.
- **Class II asbestos work** means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
- **Class III asbestos work** means repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed.
- **Class IV asbestos work** means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.
- **Clean room** means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.
- **Critical barrier** means one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.
- **Decontamination area** means an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

- **Disturbance** means activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM and PACM, no greater than the amount which can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.
- **Employee exposure** means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.
- **Intact** means that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.
- **PACM** means "presumed asbestos containing material".
- **Regulated area** means: an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit. Requirements for regulated areas are set out in paragraph (e) of this section.
- **Removal** means all operations where ACM and/or PACM is taken out or stripped from structures or substrates, and includes demolition operations.
- **Surfacing material** means material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).
- **Surfacing ACM** means surfacing material which contains more than 1% asbestos.
- **Thermal system insulation (TSI)** means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.
- **Thermal system insulation ACM** is thermal system insulation which contains more than 1% asbestos.

C. Permissible exposure limits (PELS)

1. Time-weighted average limit (TWA)

The company shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter of air as an eight (8) hour time-weighted average (TWA), as determined by the method prescribed in 1926.1101 Appendix A, or by an equivalent method.

2. Excursion limit

The company shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes, as determined by the method prescribed in 1926.1101 Appendix A, or by an equivalent method.

D. Multi-employer worksites

1. On multi-employer worksites, an employer performing work requiring the establishment of a regulated area shall inform other employers on the site of the nature of the employer's work with asbestos and/or PACM, of the existence of and requirements pertaining to regulated areas, and the measures taken to ensure that employees of such other employers are not exposed to asbestos.

2. Asbestos hazards at a multi-employer work site shall be abated by the contractor who created or controls the source of asbestos contamination.
3. All employers of employees exposed to asbestos hazards shall comply with applicable protective provisions to protect their employees.
4. All employers of employees working adjacent to regulated areas established by another employer on a multi-employer work-site, shall take steps on a daily basis to ascertain the integrity of the enclosure and/or the effectiveness of the control method relied on by the primary asbestos contractor to assure that asbestos fibers do not migrate to such adjacent areas.
5. All general contractors on a construction project which includes work covered by this standard shall be deemed to exercise general supervisory authority over the work covered by this standard, even though the general contractor is not qualified to serve as the asbestos "competent person" as defined by this section. As supervisor of the entire project, the general contractor shall ascertain whether the asbestos contractor is in compliance with this standard, and shall require such contractor to come into compliance with this standard when necessary.

E. Regulated areas

1. All Class I, II and III asbestos work shall be conducted within regulated areas. All other operations covered by this standard shall be conducted within a regulated area where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed a PEL.
2. The regulated area shall be demarcated in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne asbestos. Where critical barriers or negative pressure enclosures are used, they may demarcate the regulated area. Signs shall be provided and displayed pursuant to the requirements of this section.
3. Access to regulated areas shall be limited to authorized persons and to persons authorized by the Act or regulations issued pursuant thereto.
4. All persons entering a regulated area where employees are required to wear respirators shall be supplied with a respirator selected in accordance with this section.
5. The company shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area.
6. The company shall ensure that all asbestos work performed within regulated areas is supervised by a competent person, the duties of which are set out in this section.

F. Exposure assessments and monitoring

1. General monitoring criteria
 - a. When a workplace or work operation requires exposure monitoring this section, the company shall perform monitoring to determine accurately the airborne concentrations of asbestos to which employees may be exposed.
 - b. Determinations of employee exposure shall be made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee.
 - c. Representative 8-hour TWA employee exposure shall be determined on the basis of one or more samples representing full-shift exposure for employees in each work area.
 - d. Representative 30-minute short-term employee exposures shall be determined on the basis of one or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit for employees in each work area.

2. Initial Exposure Assessment

- a. When a workplace or work operation is covered by this standard, the company shall ensure that a "competent person" conducts an exposure assessment immediately before or at the initiation of the operation to ascertain expected exposures during that operation or workplace.
- b. The assessment must be completed in time to comply with requirements which are triggered by exposure data or the lack of a "negative exposure assessment," and to provide information necessary to assure that all control systems planned are appropriate for that operation and will work properly.
- c. Basis of Initial Exposure Assessment
 - (A.) Unless a negative exposure assessment has been made, the initial exposure assessment shall, if feasible, be based on monitoring conducted.
 - (B.) The assessment shall take into consideration the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of company operations which indicate the levels of airborne asbestos likely to be encountered on the job.
 - (C.) For Class I asbestos work, until the company conducts exposure monitoring and documents that employees on that job will not be exposed in excess of the PELs, or otherwise makes a negative exposure assessment, it shall be presumed that employees are exposed in excess of the TWA and excursion limit.

d. Negative Exposure Assessment

For any one specific asbestos job which will be performed by employees who have been trained in compliance with the standard, it can be demonstrated that employee exposures will be below the PELs by providing data which conform to the following criteria;

- (A.) Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the TWA and excursion limit under those work conditions having the greatest potential for releasing asbestos; or
- (B.) Where the company has monitored prior asbestos jobs for the PEL and the excursion limit within 12 months of the current or projected job, and that:
 - (1.) The monitoring and analysis were performed in compliance with the asbestos standard in effect
 - (2.) The data was obtained during work operations conducted under workplace conditions "closely resembling" the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the current operations
 - (3.) The operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job
 - (4.) The data show that under the conditions prevailing and which will prevail in the current workplace there is a high degree of certainty that employee exposures will not exceed the TWA and excursion limit; or
- (C.) The results of initial exposure monitoring of the current job made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee covering operations which are most likely, during the performance of the entire asbestos job, to result in exposures over the PELs.

3. Periodic monitoring

a. Class I and II operations

The company shall conduct daily monitoring that is representative of the exposure of each employee who is assigned to work within a regulated area who is performing Class I or II work, unless a negative exposure assessment has been made for the entire operation.

b. All operations under the standard other than Class I and II operations

The company shall conduct periodic monitoring of all work where exposures are expected to exceed a PEL, at intervals sufficient to document the validity of the exposure prediction.

c. Exception: When all employees required to be monitored daily are equipped with supplied-air respirators operated in the pressure demand mode, or other positive pressure mode respirator, the company may dispense with the daily monitoring required by this paragraph. However, employees performing Class I work using a control method which is not listed in this section or using a modification of a listed control method, shall continue to be monitored daily even if they are equipped with supplied-air respirators.

4. Termination of monitoring

a. If the periodic monitoring required by this section reveals that employee exposures, as indicated by statistically reliable measurements, are below the permissible exposure limit and excursion limit the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring.

b. Additional monitoring. Notwithstanding the provisions of this section, the company shall institute the exposure monitoring required whenever

(A.) There has been a change in process, control equipment, personnel or work practices that may result in new or additional exposures above the permissible exposure limit and/or excursion limit; or

(B.) When the employer has any reason to suspect that a change may result in new or additional exposures above the permissible exposure limit and/or excursion limit.

c. Such additional monitoring is required regardless of whether a "negative exposure assessment" was previously produced for a specific job.

5. Employee notification of monitoring results

The employer must, as soon as possible but no later than 5 working days after the receipt of the results of any monitoring performed under this section, notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to employees.

6. Observation of monitoring

a. The company shall provide affected employees and their designated representatives an opportunity to observe any monitoring of employee exposure to asbestos conducted in accordance with this section.

b. When observation of the monitoring of employee exposure to asbestos requires entry into an area where the use of protective clothing or equipment is required, the observer shall be provided with and be required to use such clothing and equipment and shall comply with all other applicable safety and health procedures.

G. Methods of compliance

1. Engineering controls and work practices in all operations covered by this section, regardless of the levels of exposure:

- a. Vacuum cleaners equipped with HEPA filters to collect all debris and dust containing ACM and PACM, except as provided in this section in the case of roofing material.
 - b. Wet methods, or wetting agents, to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup, except where it can be demonstrated that the use of wet methods is infeasible due to for example, the creation of electrical hazards, equipment malfunction, and, in roofing, except as provided in this section.
 - c. Prompt clean-up and disposal of wastes and debris contaminated with asbestos in leak-tight containers except in roofing operations, where the procedures specified in this section apply.
2. Control methods to achieve compliance with the TWA permissible exposure limit and excursion limit:
- a. Local exhaust ventilation equipped with HEPA filter dust collection systems
 - b. Enclosure or isolation of processes producing asbestos dust
 - c. Ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter
 - d. Use of other work practices and engineering controls that the Assistant Secretary can show to be feasible
 - e. Wherever the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the permissible exposure limit and/or excursion limit, the company shall use them to reduce employee exposure to the lowest levels attainable by these controls and shall supplement them by the use of respiratory protection that complies with this section.

3. Prohibitions

The following work practices and engineering controls shall not be used for work related to asbestos or for work which disturbs ACM or PACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:

- a. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.
 - b. Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.
 - c. Dry sweeping, shoveling or other dry clean-up of dust and debris containing ACM and PACM.
 - d. Employee rotation as a means of reducing employee exposure to asbestos.
4. Class I Requirements

In addition to the engineering controls, work methods, and control methods outlined, the following engineering controls and work practices and procedures shall be used.

- a. All Class I work, including the installation and operation of the control system shall be supervised by a competent person
- b. For all Class I jobs involving the removal of more than 25 linear or 10 square feet of thermal system insulation or surfacing material; for all other Class I jobs, where negative exposure assessment cannot be produced, or where employees are working in areas adjacent to the regulated area, while the Class I work is being performed, the company shall use one of the following methods to ensure that airborne asbestos does not migrate from the regulated area:

- (A.) Critical barriers shall be placed over all the openings to the regulated area, except where activities are performed outdoors; or
- (B.) Another barrier or isolation method which prevents the migration of airborne asbestos from the regulated area, as verified by perimeter area surveillance during each work shift at each boundary of the regulated area, showing no visible asbestos dust; and perimeter area monitoring showing that clearance levels contained in 40 CFR Part 763, Subpart E, of the EPA Asbestos in Schools Rule are met, or that perimeter area levels, measured by Phase Contrast Microscopy (PCM) are no more than background levels representing the same area before the asbestos work began. The results of such monitoring shall be made known to the company no later than 24 hours from the end of the work shift represented by such monitoring.

(C.) Exception

For work completed outdoors where employees are not working in areas adjacent to the regulated areas, this paragraph is satisfied when the Specific Control Methods for Class I Work are used.

- c. For all Class I jobs, HVAC systems shall be isolated in the regulated area by sealing with a double layer of 6 mil plastic or the equivalent
- d. For all Class I jobs, impermeable dropcloths shall be placed on surfaces beneath all removal activity
- e. For all Class I jobs, all objects within the regulated area shall be covered with impermeable dropcloths or plastic sheeting which is secured by duct tape or an equivalent
- f. For all Class I jobs where a negative exposure assessment cannot be produced, or where exposure monitoring shows that a PEL is exceeded, the company shall ventilate the regulated area to move contaminated air away from the breathing zone of employees toward a HEPA filtration or collection device.

5. Specific control methods for Class I work

Class I asbestos work shall be performed using one or more of the following control methods. Refer to 1926.1101(g)(5) for the specifications and work practices of each method.

- a. Negative Pressure Enclosure (NPE) systems may be used where the configuration of the work area does not make the erection of the enclosure infeasible.
- b. Glove bag systems may be used to remove PACM and/or ACM from straight runs of piping and elbows and other connections.
- c. Negative pressure glove bag systems may be used to remove ACM or PACM from piping.
- d. Negative pressure glove boxes may be used to remove ACM or PACM from pipe runs with the following specifications and work practices.
- e. A water spray process system may be used for removal of ACM and PACM from cold line piping if, employees carrying out such process have completed a 40-hour separate training course in its use, in addition to training required for employees performing Class I work.
- f. A small walk-in enclosure which accommodates no more than two persons (mini-enclosure) may be used if the disturbance or removal can be completely contained by the enclosure with the following specifications and work practices.

6. Alternative control methods for Class I work

Class I work may be performed using a control method which is not referenced in this section, or which modifies a control method referenced in this section, if the following provisions are complied with:

- a. The control method shall enclose, contain or isolate the processes or source of airborne asbestos dust, or otherwise capture or redirect such dust before it enters the breathing zone of employees.
 - b. A certified industrial hygienist or licensed professional engineer who is also qualified as a project designer, shall evaluate the work area, the projected work practices and the engineering controls and shall certify in writing that the planned control method is adequate to reduce direct and indirect employee exposure to below the PELs under worst-case conditions of use, and that the planned control method will prevent asbestos contamination outside the regulated area, as measured by clearance sampling which meets the requirements of EPA's Asbestos in Schools rule issued under AHERA, or perimeter monitoring which meets the criteria of this section.
 - (A.) Where the TSI or surfacing material to be removed is 25 linear or 10 square feet or less , the evaluation required may be performed by a "competent person", and may omit consideration of perimeter or clearance monitoring otherwise required.
 - (B.) The evaluation of employee exposure required shall include and be based on sampling and analytical data representing employee exposure during the use of such method under worst-case conditions and by employees whose training and experience are equivalent to employees who are to perform the current job.
7. Work Practices and Engineering Controls for Class II work
- a. All Class II work shall be supervised by a competent person.
 - b. For all indoor Class II jobs, a negative exposure assessment has not been produced, or where during the job, changed conditions indicate there may be exposure above the PEL or where the ACM is not removed in a substantially intact state, the company shall use one of the following methods to ensure that airborne asbestos does not migrate from the regulated area;
 - (A.) Critical barriers shall be placed over all openings to the regulated area; or,
 - (B.) Another barrier or isolation method which prevents the migration of airborne asbestos from the regulated area, as verified by perimeter area monitoring or clearance monitoring which meets the criteria of this section.
 - (C.) Impermeable dropcloths shall be placed on surfaces beneath all removal activity;
 - c. All Class II asbestos work shall be performed using the work practices and requirements set out above in paragraphs G.1. – G. 3. of this section.
8. Additional Controls for Class II work
- a. General
 - (A.) Class II asbestos work shall also be performed by complying with the work practices and controls designated for each type of asbestos work to be performed and that employees are trained in those work practices and controls.
 - (B.) Where more than one control method may be used for a type of asbestos work, the company may choose one or a combination of designated control methods.
 - (C.) Class II work also may be performed using a method allowed for Class I work, except that glove bags and glove boxes are allowed if they fully enclose the Class II material to be removed.
 - b. For removing vinyl and asphalt flooring materials which contain ACM -OR- In buildings constructed no later than 1980, where the company has not verified the absence of ACM:
 - (A.) Flooring or its backing shall not be sanded.
 - (B.) Vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) shall be used to clean floors.

- (C.) Resilient sheeting shall be removed by cutting with wetting of the snip point and wetting during delamination. Rip-up of resilient sheet floor material is prohibited.
 - (D.) All scraping of residual adhesive and/or backing shall be performed using wet methods.
 - (E.) Dry sweeping is prohibited.
 - (F.) Mechanical chipping is prohibited unless performed in a negative pressure enclosure.
 - (G.) Tiles shall be removed intact, unless the employer demonstrates that intact removal is not possible.
 - (H.) When tiles are heated and can be removed intact, wetting may be omitted.
 - (I.) Resilient flooring material including associated mastic and backing shall be assumed to be asbestos-containing unless an industrial hygienist determines that it is asbestos-free using recognized analytical techniques.
- c. For removing roofing material which contains ACM:
- (A.) Roofing material shall be removed in an intact state to the extent feasible.
 - (B.) Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards.
 - (C.) Cutting machines shall be continuously misted during use, unless a competent person determines that misting substantially decreases worker safety.
 - (D.) When removing built-up roofs with asbestos-containing roofing felts and an aggregate surface using a power roof cutter, all dust resulting from the cutting operation shall be collected by a HEPA dust collector, or shall be HEPA vacuumed by vacuuming along the cut line.
 - (E.) When removing built-up roofs with asbestos-containing roofing felts and a smooth surface using a power roof cutter, the dust resulting from the cutting operation shall be collected either by a HEPA dust collector or HEPA vacuuming along the cut line, or by gently sweeping and then carefully and completely wiping up the still-wet dust and debris left along the cut line.
 - (F.) Asbestos-containing material that has been removed from a roof shall not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane or hoist:
 - (1.) Any ACM that is not intact shall be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift. While the material remains on the roof it shall either be kept wet, placed in an impermeable waste bag, or wrapped in plastic sheeting.
 - (2.) Intact ACM shall be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift.
 - (G.) Upon being lowered, unwrapped material shall be transferred to a closed receptacle in such manner so as to preclude the dispersion of dust.
 - (H.) Roof level heating and ventilation air intake sources shall be isolated or the ventilation system shall be shut down.
 - (I.) Notwithstanding any other provision of this section, removal or repair of sections of intact roofing less than 25 square feet in area does not require use of wet methods or HEPA vacuuming as long as manual methods which do not render the material non-intact are used to remove the material and no visible dust is created by the

removal method used. In determining whether a job involves less than 25 square feet, the employer shall include all removal and repair work performed on the same roof on the same day.

- d. When removing cementitious asbestos-containing siding and shingles or transite panels containing ACM on building exteriors (other than roofs):
 - (A.) Cutting, abrading or breaking siding, shingles, or transite panels, shall be prohibited unless it can be demonstrated that methods less likely to result in asbestos fiber release cannot be used.
 - (B.) Each panel or shingle shall be sprayed with amended water prior to removal.
 - (C.) Unwrapped or unbagged panels or shingles shall be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.
 - (D.) Nails shall be cut with flat, sharp instruments.
- e. When removing gaskets containing ACM:
 - (A.) If a gasket is visibly deteriorated and unlikely to be removed intact, removal shall be undertaken within a glovebag as described in this section.
 - (B.) The gasket shall be immediately placed in a disposal container.
 - (C.) Any scraping to remove residue must be performed wet.
- f. When performing any other Class II removal of asbestos containing material for which specific controls have not been listed:
 - (A.) The material shall be thoroughly wetted with amended water prior to and during its removal.
 - (B.) The material shall be removed in an intact state unless it can be demonstrated that that intact removal is not possible.
 - (C.) Cutting, abrading or breaking the material shall be prohibited unless it can be demonstrated that methods less likely to result in asbestos fiber release are not feasible.
 - (D.) Asbestos-containing material removed, shall be immediately bagged or wrapped, or kept wetted until transferred to a closed receptacle, no later than the end of the work shift.

g. Alternative Work Practices and Controls

Instead of the work practices and controls listed in this section, the company may use different or modified engineering and work practice controls if the following provisions are complied with:

- (A.) It can be demonstrated by data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used, that employee exposure will not exceed the PELs under any anticipated circumstances.
- (B.) A competent person shall evaluate the work area, the projected work practices and the engineering controls, and shall certify in writing, that the different or modified controls are adequate to reduce direct and indirect employee exposure to below the PELs under all expected conditions of use and that the method meets the requirements of this standard. The evaluation shall include and be based on data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used for the

current job, and by employees whose training and experience are equivalent to employees who are to perform the current job.

9. Work Practices and Engineering Controls for Class III work

Class III asbestos work shall be conducted using engineering and work practice controls which minimize the exposure to employees performing the asbestos work and to bystander employees.

- a. The work shall be performed using wet methods.
- b. To the extent feasible, the work shall be performed using local exhaust ventilation.
- c. Where the disturbance involves drilling, cutting, abrading, sanding, chipping, breaking, or sawing of thermal system insulation or surfacing material, the company shall use impermeable dropcloths, and shall isolate the operation using mini-enclosures or glove bag systems or another isolation method.
- d. Where a negative exposure assessment is not produced for a job, or where monitoring results show the PEL has been exceeded, the company shall contain the area using impermeable dropcloths and plastic barriers or their equivalent, or shall isolate the operation using a control system listed in and in compliance with this section.
- e. Employees shall wear respirators which are selected, used and fitted pursuant to provisions of this section when performing Class III jobs which involve the disturbance of thermal system insulation or surfacing material, or where a negative exposure assessment is not produced, or where monitoring results show a PEL has been exceeded.

10. Class IV asbestos work

- a. Class IV asbestos jobs shall be conducted by employees trained pursuant to the asbestos awareness training program set out in this section.
- b. All Class IV jobs shall be conducted in conformity with the requirements set out in this section, mandating wet methods, HEPA vacuums, and prompt clean-up of debris containing ACM or PACM.
- c. Employees cleaning up debris and waste in a regulated area where respirators are required shall wear respirators which are selected, used and fitted pursuant to this section.
- d. Employers of employees who clean up waste and debris in, and employers in control of, areas where friable thermal system insulation or surfacing material is accessible, shall assume that such waste and debris contain asbestos.

11. Alternative methods of compliance for installation, removal, repair, and maintenance of certain roofing and pipeline coating materials.

- a. Application
 - (A.) Notwithstanding any other provision of this section, an employer who complies with all provisions of paragraph G.11. when installing, removing, repairing, or maintaining intact pipeline asphaltic wrap, or roof flashings which contain asbestos fibers encapsulated or coated by bituminous or resinous compounds shall be deemed to be in compliance with this section.
 - (B.) If the company does not comply with all provisions of this paragraph or if during the course of the job the material does not remain intact, the provisions of paragraph G.8. of this section apply instead of this paragraph.
- b. Provisions
 - (A.) Before work begins and as needed during the job, a competent person who is capable of identifying asbestos hazards in the workplace and selecting the

appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate such hazards, shall conduct an inspection of the worksite and determine that the roofing material is intact and will likely remain intact.

- (B.) All employees performing work covered by this paragraph shall be trained in a training program that meets the requirements of this section.
- (C.) The material shall not be sanded, abraded, or ground. Manual methods which do not render the material non-intact shall be used.
- (D.) Material that has been removed from a roof shall not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane or hoist. All such material shall be removed from the roof as soon as is practicable, but in any event no later than the end of the work shift.
- (E.) Where roofing products which have been labeled as containing asbestos are installed on non-residential roofs during operations covered by this paragraph, the company shall notify the building owner of the presence and location of such materials no later than the end of the job.
- (F.) All removal or disturbance of pipeline asphaltic wrap shall be performed using wet methods.

H. Respiratory protection

1. General

- a. For employees who use respirators required by this section, the company must provide each employee an appropriate respirator that complies with the requirements of this paragraph.
- b. Respirators must be used during:
 - (A.) Class I asbestos work
 - (B.) Class II asbestos work when ACM is not removed in a substantially intact state
 - (C.) Class II and III asbestos work that is not performed using wet methods, except for removal of ACM from sloped roofs when a negative-exposure assessment has been conducted and ACM is removed in an intact state
 - (D.) Class II and III asbestos work for which a negative-exposure assessment has not been conducted
 - (E.) Class III asbestos work when TSI or surfacing ACM or PACM is being disturbed
 - (F.) Class IV asbestos work performed within regulated areas where employees who are performing other work are required to use respirators
 - (G.) Work operations covered by this section for which employees are exposed above the TWA or excursion limit.
 - (H.) Emergencies
- c. Respirator program
- d. The company must implement a respiratory protection program in accordance with § 1910.134 (b) - (d) (except (d)(1)(iii)), and (f) - (m)), which covers each employee required by this section to use a respirator.
- e. No employee shall be assigned to asbestos work that requires respirator use if, based on their most recent medical examination, the examining physician determines that the

employee will be unable to function normally while using a respirator, or that the safety or health of the employee or other employees will be impaired by the employee's respirator use.

- (A.) Such employees must be assigned to another job or given the opportunity to transfer to a different position that they can perform.
- (B.) If such a transfer position is available, it must be with the same employer, in the same geographical area, and with the same seniority, status, rate of pay, and other job benefits the employee had just prior to such transfer.

2. Respirator selection

The company must:

- a. Select, and provide to employees, the appropriate respirators specified in paragraph) §1910.134(d)(3)(i)(A); however, the company must not select or use filtering facepiece respirators for use against asbestos fibers.
- b. Provide HEPA filters for powered and non-powered air-purifying respirators.
- c. Provide an employee with tight-fitting, powered air-purifying respirator (PAPR) instead of a negative pressure respirator when the employee chooses to use a PAPR and it provides adequate protection to the employee.
- d. Provide employees with an air-purifying half mask respirator, other than a filtering facepiece respirator, whenever the employees perform:
 - (A.) Class II or Class III asbestos work for which no negative exposure assessment is available.
 - (B.) Class III asbestos work involving disturbance of TSI or surfacing ACM or PACM.
- e. Provide employees with a tight-fitting powered air-purifying respirator or a full facepiece, supplied-air respirator operated in the pressure-demand mode and equipped with either HEPA egress cartridges or an auxiliary positive-pressure, self-contained breathing apparatus (SCBA) whenever the employees are:
 - (A.) In a regulated area performing Class I asbestos work for which a negative exposure assessment is not available an,
 - (B.) The exposure assessment indicates that the exposure level will be at or below 1 f/cc as an 8-hour time-weighted average (TWA).
- f. Provide employees with a full facepiece supplied-air respirator operated in the pressure-demand mode and equipped with an auxiliary positive-pressure SCBA whenever the employees are:
 - (A.) In a regulated area performing Class I asbestos work for which a negative exposure assessment is not available and,
 - (B.) The exposure assessment indicates that the exposure level will be above 1 f/cc as an 8-hour TWA.

I. Protective clothing

1. General

The company shall provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that:

- a. Exceed the TWA and/or excursion limit, or
- b. For which a required negative exposure assessment is not produced, or

- c. For any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet of TSI or surfacing ACM and PACM.

2. Laundering

- a. The company shall ensure that laundering of contaminated clothing is done so as to prevent the release of airborne asbestos in excess of the TWA or excursion limit.
- b. Any employer who gives contaminated clothing to another person for laundering shall inform such person of the requirement to effectively prevent the release of airborne asbestos in excess of the TWA and excursion limit.

- 3. Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and be labeled in accordance with this section.

4. Inspection of protective clothing

- a. The competent person shall examine worksuits worn by employees at least once per workshift for rips or tears that may occur during performance of work.
- b. When rips or tears are detected while an employee is working, rips and tears shall be immediately mended, or the worksuit shall be immediately replaced.

J. Hygiene facilities and practices for employees

- 1. Requirements for employees performing Class I asbestos jobs involving over 25 linear or 10 square feet of TSI or surfacing ACM and PACM

a. Decontamination areas

- (A.) The company shall establish a decontamination area that is adjacent and connected to the regulated area for the decontamination of such employees.
- (B.) The decontamination area shall consist of an equipment room, shower area, and clean room in series. Refer to §1926.1101(j)(1)(i) for the requirements of each of these areas.
- (C.) The company shall ensure that employees enter and exit the regulated area through the decontamination area.

b. Decontamination area entry procedures

Employees shall:

- (A.) Enter the decontamination area through the clean room;
- (B.) Remove and deposit street clothing within a locker provided for their use; and
- (C.) Put on protective clothing and respiratory protection before leaving the clean room.
- (D.) Before entering the regulated area, the company shall ensure that employees pass through the equipment room.

c. Decontamination area exit procedures

Employees shall:

- (A.) Remove all gross contamination and debris from their protective clothing before leaving the regulated area.
- (B.) Remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers.
- (C.) Not remove their respirators in the equipment room.
- (D.) Shower prior to entering the clean room.

(E.) Enter the clean room before changing into street clothes after showering.

d. Lunch Areas

Whenever food or beverages are consumed at the worksite where employees are performing Class I asbestos work, the employer shall provide lunch areas in which the airborne concentrations of asbestos are below the permissible exposure limit and/or excursion limit.

2. Requirements for Class I work involving less than 25 linear or 10 square feet of TSI or surfacing ACM and PACM, and for Class II and Class III asbestos work operations where exposures exceed a PEL or where there is no negative exposure assessment produced before the operation.
 - a. The company shall establish an equipment room or area that is adjacent to the regulated area for the decontamination of employees and their equipment which is contaminated with asbestos which shall consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface.
 - b. The area must be of sufficient size as to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area (as determined by visible accumulations).
 - c. Work clothing must be cleaned with a HEPA vacuum before it is removed.
 - d. All equipment and surfaces of containers filled with ACM must be cleaned prior to removing them from the equipment room or area.
 - e. The company shall ensure that employees enter and exit the regulated area through the equipment room or area.
3. Requirements for Class IV work
 - a. The company shall ensure that employees performing Class IV work within a regulated area comply with the hygiene practice required of employees performing work which has a higher classification within that regulated area.
 - b. Otherwise employers of employees cleaning up debris and material which is TSI or surfacing ACM or identified as PACM shall provide decontamination facilities for such employees which are required for Class I work involving less than 25 linear or 10 square feet of TSI or surfacing ACM and PACM, and for Class II and Class III asbestos work operations where exposures exceed a PEL or where there is no negative exposure assessment produced before the operation.
4. Smoking in work areas

Employees shall not smoke in work areas where they are occupationally exposed to asbestos because of activities in that work area.

K. Communication of hazards

1. Hazard communication

This section applies to the communication of information concerning asbestos hazards in construction activities to facilitate compliance with this standard.

- a. Most asbestos-related construction activities involve previously installed building materials. Building owners often are the only and/or best sources of information concerning them. Therefore, they, along with employers of potentially exposed employees, are assigned specific information conveying and retention duties under this section.

- (A.) Employers and building owners shall identify TSI and sprayed or troweled on surfacing materials in buildings as asbestos-containing, unless they determine that the material is not asbestos-containing.
 - (B.) Asphalt and vinyl flooring material installed no later than 1980 must also be considered as asbestos containing unless the company determines that it is not asbestos-containing.
 - (C.) If the employer/building owner has actual knowledge, or should have known through the exercise of due diligence, that other materials are asbestos-containing, they too must be treated as such.
 - (D.) When communicating information to employees pursuant to this standard, owners and employers shall identify "PACM" as ACM.
- b. The company shall include asbestos in the program established to comply with the Hazard Communication Standard (HCS) (§ 1910.1200).
 - c. The company shall ensure that each employee has access to labels on containers of asbestos and safety data sheets, and is trained in accordance with the provisions of HCS and this section.
 - d. The company shall provide information on at least the following hazards: Cancer and lung effects.
2. Duties of building and facility owners
- a. Before work subject to this standard is begun, building and facility owners shall determine the presence, location, and quantity of ACM and/or PACM at the work site.
 - b. Building and/or facility owners shall notify the following persons of the presence, location and quantity of ACM or PACM, at the work sites in their buildings and facilities. Notification either shall be in writing, or shall consist of a personal communication between the owner and the person to whom notification must be given or their authorized representatives:
 - (A.) Prospective employers applying or bidding for work whose employees reasonably can be expected to work in or adjacent to areas containing such material
 - (B.) Employees of the owner who will work in or adjacent to areas containing such material
 - (C.) On multi-employer worksites, all employers of employees who will be performing work within or adjacent to areas containing such materials
 - (D.) Tenants who will occupy areas containing such material
3. Duties of employers whose employees perform work subject to this standard in or adjacent to areas containing ACM and PACM. (Building/facility owners whose employees perform such work shall comply with these provisions to the extent applicable)
- a. Before work in areas containing ACM and PACM is begun; employers shall identify the presence, location, and quantity of ACM, and/or PACM therein.
 - b. Before work under this standard is performed employers of employees who will perform such work shall inform the following persons of the location and quantity of ACM and/or PACM present in the area and the precautions to be taken to insure that airborne asbestos is confined to the area.
 - (A.) Owners of the building/facility
 - (B.) Employees who will perform such work and employers of employees who work and/or will be working in adjacent areas

- c. Within 10 days of the completion of such work, the employer whose employees have performed work subject to this standard, shall inform the building/facility owner and employers of employees who will be working in the area of the current location and quantity of PACM and/or ACM remaining in the area and final monitoring results, if any.
- 4. In addition to the above requirements, all employers who discover ACM and/or PACM on a worksite shall convey information concerning the presence, location and quantity of such newly discovered ACM and/or PACM to the owner and to other employers of employees working at the work site, within 24 hours of the discovery.
- 5. Criteria to rebut the designation of installed material as PACM
 - a. At any time, an employer and/or building owner may demonstrate, for purposes of this standard, that PACM does not contain asbestos. Building owners and/or employers are not required to communicate information about the presence of building material for which such a demonstration has been made. However, in all such cases, the information, data and analysis supporting the determination that PACM does not contain asbestos, shall be retained pursuant to this section.
 - b. An employer or owner may demonstrate that PACM does not contain more than 1 percent asbestos by the following:
 - (A.) Having a completed inspection conducted pursuant to the requirements of AHERA (40 CFR Part 763, Subpart E) which demonstrates that the material is not ACM; or
 - (B.) Performing tests of the material containing PACM which demonstrate that no ACM is present in the material.
 - (1.) Such tests shall include analysis of bulk samples collected in the manner described in 40 CFR 763.86.
 - (2.) The tests, evaluation and sample collection shall be conducted by an accredited inspector or by a CIH.
 - (3.) Analysis of samples shall be performed by persons or laboratories with proficiency demonstrated by current successful participation in a nationally recognized testing program such as the National Voluntary Laboratory Accreditation Program (NVLAP) or the National Institute for Standards and Technology (NIST) or the Round Robin for bulk samples administered by the American Industrial Hygiene Association (AIHA) or an equivalent nationally-recognized round robin testing program.
 - c. The employer and/or building owner may demonstrate that flooring material including associated mastic and backing does not contain asbestos, by a determination of an industrial hygienist based upon recognized analytical techniques showing that the material is not ACM.
- 6. At the entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which contain ACM and/or PACM, the building owner shall post signs which identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed.
 - a. The employer shall ensure, to the extent feasible, that employees who come in contact with these signs can comprehend them.
 - b. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.
- 7. Signs
 - a. Warning signs that demarcate the regulated area shall be provided and displayed at each location where a regulated area is required to be established.

- b. Signs shall be posted at such a distance from such a location that an employee may read the signs and take necessary protective steps before entering the area marked by the signs.
- c. The warning signs shall bear the following information

**DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY**

- d. In addition, where the use of respirators and protective clothing is required in the regulated area under this section, the warning signs shall include the following:

**WEAR RESPIRATORY PROTECTION AND
PROTECTIVE CLOTHING IN THIS AREA**

8. Labels

- a. Labels shall be affixed to all products containing asbestos and to all containers containing such products, including waste containers. Where feasible, installed asbestos products shall contain a visible label.
- b. The company shall ensure that labels of bags or containers of protective clothing and equipment, scrap, waste, and debris containing asbestos fibers bear the following information:

**DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST**

- c. Labels shall also contain a warning statement against breathing asbestos fibers.
- d. The provisions for labels required by this section do not apply where:
 - (A.) Asbestos fibers have been modified by a bonding agent, coating, binder, or other material, provided that the manufacturer can demonstrate that, during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the permissible exposure limit and/or excursion limit will be released, or
 - (B.) Asbestos is present in a product in concentrations less than 1.0 percent.
- e. When a building owner or employer identifies previously installed PACM and/or ACM, labels shall be affixed so that employees will be notified of what materials contain PACM and/or ACM.
 - (A.) The company shall attach such labels in areas where they will clearly be noticed by employees who are likely to be exposed, such as at the entrance to mechanical room/areas.
 - (B.) Signs may be posted in lieu of labels so long as they contain information required for labelling.
 - (C.) The company shall ensure, to the extent feasible, that employees who come in contact with these signs or labels can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

9. Employee Information and Training.

- a. The company shall train each employee who is likely to be exposed in excess of a PEL, and each employee who performs Class I through IV asbestos operations, in accordance with the requirements of this section.
 - (A.) Such training shall be conducted at no cost to the employee.
 - (B.) The company shall institute a training program and ensure employee participation in the program.
- b. Training shall be provided prior to or at the time of initial assignment and at least annually thereafter.
- c. Training for Class I operations and for Class II operations that require the use of critical barriers (or equivalent isolation methods) and/or negative pressure enclosures under this section shall be the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement workers training (40 CFR Part 763, subpart E, appendix C).
- d. Training for other Class II work
 - (A.) For work with asbestos containing roofing materials, flooring materials, siding materials, ceiling tiles, or transite panels, training shall include at a minimum all the elements included in this section and in addition, the specific work practices and engineering controls which specifically relate to that category. Such course shall include "hands-on" training and shall take at least 8 hours.
 - (B.) An employee who works with more than one of the categories of material specified above shall receive training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.
 - (C.) For Class II operations not involving the categories of material specified above, training shall be provided which shall include at a minimum all the elements included in this section and in addition, the specific work practices and engineering controls which specifically relate to the category of material being removed, and shall include "hands-on" training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.
- e. Training for Class III employees shall be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2).
 - (A.) Such a course shall also include "hands-on" training and shall take at least 16 hours.
 - (B.) Exception: For Class III operations for which the competent person determines that the EPA curriculum does not adequately cover the training needed to perform that activity, training shall include as a minimum all the elements included in this section and in addition, the specific work practices and engineering controls which specifically relate to that activity, and shall include "hands-on" training in the work practices applicable to each category of material that the employee disturbs.
- f. Training for employees performing Class IV operations shall be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(1).
 - (A.) Such a course shall include available information concerning the locations of:
 - (1.) Thermal system insulation and surfacing ACM/PACM; and
 - (2.) Asbestos-containing flooring material, or flooring material where the absence of asbestos has not yet been certified; and

- (3.) Instruction in recognition of damage, deterioration, and delamination of asbestos containing building materials
- (B.) Such course shall take at least 2 hours.
- g. Training for employees who are likely to be exposed in excess of the PEL and who are not otherwise required to be trained, shall meet the requirements of the training program.
- h. The training program
 - (A.) The training program shall be conducted in a manner that the employee is able to understand.
 - (B.) In addition to the content required by provisions of this section, the employer shall ensure that each such employee is informed of the following:
 - (1.) Methods of recognizing asbestos, including the requirement to presume that certain building materials contain asbestos;
 - (2.) The health effects associated with asbestos exposure;
 - (3.) The relationship between smoking and asbestos in producing lung cancer;
 - (4.) The nature of operations that could result in exposure to asbestos
 - (5.) The importance of necessary protective controls to minimize exposure including, as applicable, engineering controls, work practices, respirators, housekeeping procedures, hygiene facilities, protective clothing, decontamination procedures, emergency procedures, and waste disposal procedures, and any necessary instruction in the use of these controls and procedures.
 - (6.) Where Class III and IV work will be or is performed, the contents of EPA 20T-2003, "Managing Asbestos In-Place" July 1990 or its equivalent in content;
 - (7.) The purpose, proper use, fitting instructions, and limitations of respirators;
 - (8.) The appropriate work practices for performing the asbestos job;
 - (9.) Medical surveillance program requirements;
 - (10.) The content of this standard including appendices;
 - (11.) The names, addresses and phone numbers of public health organizations which provide information, materials and/or conduct programs concerning smoking cessation;
 - (12.) The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.

10. Access to training materials

- a. The company shall make readily available to affected employees without cost, written materials relating to the employee training program, including a copy of this regulation.
- b. The company shall inform all employees concerning the availability of self-help smoking cessation program material.
- c. Upon employee request, the company shall distribute such material, consisting of NIH Publication No, 89-1647, or equivalent self-help material, which is approved or published by a public health organization listed in § 1926 1101 Appendix J.

L. Housekeeping

1. Vacuuming

Where vacuuming methods are selected, HEPA filtered vacuuming equipment must be used. The equipment shall be used and emptied in a manner that minimizes the reentry of asbestos into the workplace.

2. Waste disposal

Asbestos waste, scrap, debris, bags, containers, equipment, and contaminated clothing consigned for disposal shall be collected and disposed of in sealed, labeled, impermeable bags or other closed, labeled, impermeable containers except in roofing operations where the procedures specified apply.

3. Care of asbestos-containing flooring material

- a. All vinyl and asphalt flooring material shall be maintained in accordance with this paragraph unless the building/facility owner demonstrates that the flooring does not contain asbestos.
- b. Sanding of flooring material is prohibited.
- c. Stripping of finishes shall be conducted using low abrasion pads at speeds lower than 300 rpm and wet methods.
- d. Burnishing or dry buffing may be performed only on flooring which has sufficient finish so that the pad cannot contact the flooring material.

4. Waste and debris and accompanying dust in an area containing accessible thermal system insulation or surfacing ACM/PACM or visibly deteriorated ACM:

- a. Shall not be dusted or swept dry, or vacuumed without using a HEPA filter;
- b. Shall be promptly cleaned up and disposed of in leak tight containers.

M. Medical surveillance

1. General

- a. A medical surveillance program shall be instituted for all employees who:
 - (A.) For a combined total of 30 or more days per year, are engaged in Class I, II and III work or
 - (B.) Are exposed at or above a permissible exposure limit.
 - (C.) For purposes of this paragraph, any day in which a worker engages in Class II or Class III operations or a combination thereof on intact material for one hour or less (taking into account the entire time spent on the removal operation, including cleanup) and, while doing so, adheres fully to the work practices specified in this standard, shall not be counted.
- b. For employees otherwise required by this standard to wear a negative pressure respirator, the company shall ensure employees are physically able to perform the work and use the equipment. This determination shall be made under the supervision of a physician.
- c. All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, and are provided at no cost to the employee and at a reasonable time and place.

2. Medical examinations and consultations

- a. The company shall make available medical examinations and consultations to each employee covered under this section on the following schedules:

- (A.) Prior to assignment of the employee to an area where negative-pressure respirators are worn;
 - (B.) When the employee is assigned to an area where exposure to asbestos may be at or above the permissible exposure limit for 30 or more days per year, or engage in Class I, II, or III work for a combined total of 30 or more days per year, a medical examination must be given within 10 working days following the thirtieth day of exposure;
 - (C.) And at least annually thereafter.
 - (D.) If the examining physician determines that any of the examinations should be provided more frequently than specified, the company shall provide such examinations to affected employees at the frequencies specified by the physician.
 - (E.) Exception: No medical examination is required of any employee if adequate records show that the employee has been examined in accordance with this paragraph within the past 1-year period.
- b. Medical examinations made available shall include:
- (A.) A medical and work history with special emphasis directed to the pulmonary, cardiovascular, and gastrointestinal systems.
 - (B.) On initial examination, the standardized questionnaire contained in Part 1 of § 1926.1101 Appendix D, and, on annual examination, the abbreviated this section.
 - (C.) A physical examination directed to the pulmonary and gastrointestinal systems, including a chest roentgenogram to be administered at the discretion of the physician, and pulmonary function tests of forced vital capacity (FVC) and forced expiratory volume at one second (FEV(1)). Interpretation and classification of chest shall be conducted in accordance with § 1926.1101 Appendix E.
 - (D.) Any other examinations or tests deemed necessary by the examining physician.
3. The company shall provide the following information to the examining physician:
- a. A copy of OSHA standard § 1926.1101 and Appendices D, E, and I;
 - b. A description of the affected employee's duties as they relate to the employee's exposure;
 - c. The employee's representative exposure level or anticipated exposure level;
 - d. A description of any personal protective and respiratory equipment used or to be used; and
 - e. Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

4. Physician's written opinion

The company shall obtain a written opinion from the examining physician. This written opinion shall contain the results of the medical examination and shall include:

- a. The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;
- b. Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and
- c. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.

- d. A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.
5. The company shall instruct the physician not to reveal in the written opinion any specific findings or diagnoses that are unrelated to occupational exposure to asbestos.
6. The company shall provide a copy of the physician's written opinion to the affected employee within 30 days from its receipt.

N. Recordkeeping

1. Objective data relied on pursuant to monitoring.

- a. The company shall establish and maintain an accurate record of objective data reasonably relied upon to demonstrate that products made from or containing asbestos or the activity involving such products or material are not capable of releasing fibers of asbestos in concentrations at or above the permissible exposure limit and/or excursion limit under the expected conditions of processing, use, or handling.
- b. The record shall include at least the following information:
 - (A.) The product qualifying for exemption;
 - (B.) The source of the objective data;
 - (C.) The testing protocol, results of testing, and/or analysis of the material for the release of asbestos;
 - (D.) A description of the operation exempted and how the data support the exemption; and
 - (E.) Other data relevant to the operations, materials, processing, or employee exposures covered by the exemption.
- c. This record shall be maintained for the duration of the company's reliance upon such objective data.

2. Exposure measurements

- a. The company shall keep an accurate record of all measurements taken to monitor employee exposure to asbestos.

NOTE: *The employer may utilize the services of competent organizations such as industry trade associations and employee associations to maintain the records required by this section.*

- b. This record shall include at least the following information:
 - (A.) The date of measurement;
 - (B.) The operation involving exposure to asbestos that is being monitored;
 - (C.) Sampling and analytical methods used and evidence of their accuracy;
 - (D.) Number, duration, and results of samples taken;
 - (E.) Type of protective devices worn, if any; and
 - (F.) Name, social security number, and exposure of the employees whose exposures are represented.
- c. The company shall maintain this record for at least thirty (30) years, in accordance with § 29 CFR 1910.20.

3. Medical surveillance

- a. The company shall establish and maintain an accurate record for each employee subject to medical surveillance in accordance with § 29 CFR 1910.20.

- b. The record shall include at least the following information:
 - (A.) The name and social security number of the employee;
 - (B.) A copy of the employee's medical examination results, including the medical history, questionnaire responses, results of any tests, and physician's recommendations.
 - (C.) Physician's written opinions;
 - (D.) Any employee medical complaints related to exposure to asbestos; and
 - (E.) A copy of the information provided to the physician as required by paragraph (m) of this section.
- c. The company shall ensure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with § 29 CFR 1910.20.

4. Training records

The company shall maintain all employee training records for one (1) year beyond the last date of employment by that employer.

5. Data to Rebut PACM

Where the building owner and the company have relied on data to demonstrate that PACM is not asbestos-containing, such data shall be maintained for as long as they are relied upon to rebut the presumption.

6. Records of Required Notifications

Where the building owner has communicated and received information concerning the identification, location and quantity of ACM and PACM, written records of such notifications and their content shall be maintained by the building owner for the duration of ownership and shall be transferred to successive owners of such buildings/facilities.

7. Availability

The company must comply with the requirements concerning availability of records set forth in § 29 CFR 1910.1020.

8. Transfer of records

The company must comply with the requirements concerning transfer of records set forth in § 29 CFR 1910.1020(h).

O. Competent person

1. On all construction worksites covered by this standard, the employer shall designate a competent person, having the qualifications and authorities for ensuring worker safety and health required by § 1926.20-32.
2. Inspections
 - a. Frequent and regular inspections of the job sites, materials, and equipment shall be made by competent persons.
 - b. For Class I jobs, on-site inspections shall be made at least once during each work shift, and at any time at employee request.
 - c. For Class II, III, and IV jobs, on-site inspections shall be made at intervals sufficient to assess whether conditions have changed, and at any reasonable time at employee request.
 - d. On all worksites where employees are engaged in Class I or II asbestos work, the competent person shall perform or supervise the following duties, as applicable:

- (A.) Set up the regulated area, enclosure, or other containment;
- (B.) Ensure (by on-site inspection) the integrity of the enclosure or containment;
- (C.) Set up procedures to control entry to and exit from the enclosure and/or area;
- (D.) Supervise all employee exposure monitoring required by this section and ensure that it is conducted as required by this section;
- (E.) Ensure that employees working within the enclosure and/or using glove bags wear respirators and protective clothing as required by this section;
- (F.) Ensure through on-site supervision, that employees set up, use and remove engineering controls, use work practices and personal protective equipment in compliance with all requirements;
- (G.) Ensure that employees use the hygiene facilities and observe the decontamination procedures specified in this section;
- (H.) Ensure that through on-site inspection, engineering controls are functioning properly and employees are using proper work practices; and,
- (I.) Ensure that notification requirements are met.

3. Training

- a. For Class I and II asbestos work the competent person shall be trained in all aspects of asbestos removal and handling, including: abatement, installation, removal and handling; the contents of this standard; the identification of asbestos; removal procedures, where appropriate; and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course for supervisors that meets the criteria of EPA's Model Accredited Plan (40 CFR part 763, subpart E, Appendix C), such as a course conducted by an EPA-approved or state-approved training provider, certified by EPA or a state, or a course equivalent in stringency, content, and length.
- b. For Class III and IV asbestos work, the competent person shall be trained in aspects of asbestos handling appropriate for the nature of the work, to include procedures for setting up glove bags and mini-enclosures, practices for reducing asbestos exposures, use of wet methods, the contents of this standard, and the identification of asbestos. Such training shall include successful completion of a course that is consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2), or its equivalent in stringency, content, and length.

P. Mandatory Appendices

1. § 1926.1101 Appendix A

Specifies the procedure for analyzing air samples for asbestos and specifies quality control procedures that must be implemented by laboratories performing the analysis.

2. § 1926.1101 Appendix C

Contains the qualitative and quantitative fit testing procedures

3. § 1926.1101 Appendix D

Contains the medical questionnaires that must be administered to all employees who are exposed to asbestos above the permissible exposure limit, and who will therefore be included in their employer's medical surveillance program.

4. § 1926.1101 Appendix E

Contains the interpretation and classification of chest roentgenograms

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Safety Specifics – Confined Spaces (29 CFR 1926 Subpart AA)

A. Definitions

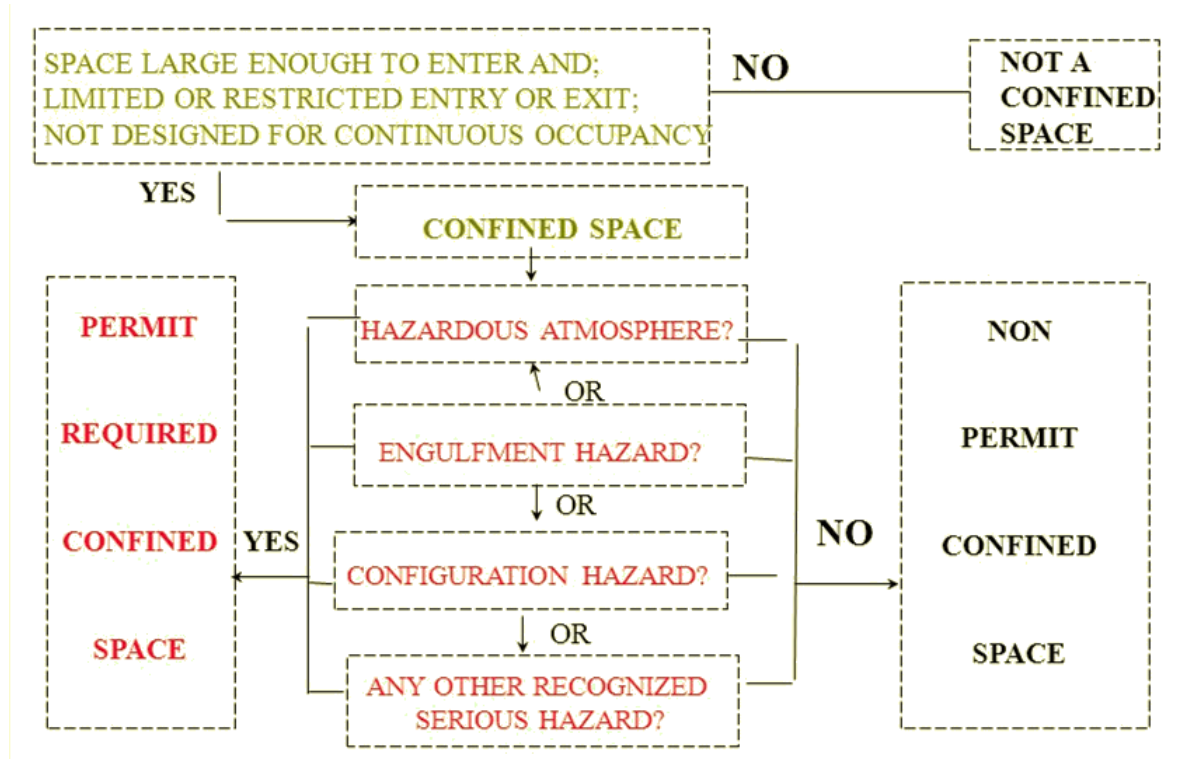
1. Confined Space

A space that is large enough and so configured that an employee can bodily enter and perform assigned work; AND has limited or restricted means for entry or exit (for example, tanks, vessels, coolers, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); AND is not designed for continuous occupancy.

2. Permit-Required Confined Space

- A confined space that has one or more of the following characteristics:
- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential for engulfing an Entrant.
- Has an internal configuration such that an Entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other recognized serious safety or health hazard.

3. Confined Space Decision Flow Chart



B. Responsibilities

1. Managers/Supervisor

- Shall ensure that all employees have been trained and fully understand the requirements of this program.
- Shall provide the necessary equipment to comply with these requirements and ensure that all employees are trained on its use.
- Shall ensure that all confined space assessments have been conducted and documented.

- d. Shall ensure that provisions and procedures are in place for the protection of employees from external hazards including but not limited to pedestrians, vehicles and other barriers and by use of the pre-entry checklist verifying that conditions in the permit space are acceptable for entry during its duration.
 - e. Shall ensure that all Permit-Required Confined Spaces permits are posted.
 - f. Shall ensure an annual review of the program including all entry permits issued that during that annual period.
 - g. Shall ensure that confined spaces are identified properly as either a Non-Permit Confined Space or a Permit-Required Confined Space.
 - h. Shall ensure that all confined spaces that have been identified as “no entry” have signs that state, “DANGER- DO NOT ENTER”.
 - i. Shall ensure signs have been posted at all Permit-Required Confined Space areas that state, “DANGER – PERMIT ENTRY CONFINED SPACE” along with the proper warning word such as “ASPHYXIATE, FLAMMABILITY or TOXIC HAZARD”
 - j. Shall file all permits at the area offices for review. Permits shall be kept on file for one year.
2. Affected Employee
- a. Shall attend Confined Space Entry training commensurate with their duties and when duties change as required.
 - b. Shall comply with all aspects of this program.
 - c. Authorized Entrants, Attendants and Entry Supervisors may be any employee of our company that is authorized by management to work in a confined space setting and that has been trained and is proficient in the understanding of program requirements.
3. Authorized Entry Supervisor
- a. Shall have a tailgate safety meeting, with all workers to be involved in the confined space entry and review the job to be performed and what safety concerns may be present.
 - b. Shall confirm that all isolation, Lock/out and Tag/outs have been completed prior to entry into a confined space.
 - c. Shall ensure that the requirements of this program are followed and maintained.
 - d. Shall test all atmosphere conditions prior to entry and shall complete and maintain the confined space permit form, and have it accessible for review on the job site at all times.
 - e. Shall notify our supervisor of entry into a confined space, and notify the supervisor of any changes that may occur, during an entry.
 - f. If the confined space poses a hazard that cannot be eliminated, the Entry Supervisor must arrange for a rescue services.
 - g. If the confined space poses no hazards to the Entrants, the Entry Supervisor can reclassify the confined space to a Non-Permit Confined Space.
 - h. A stand-by rescue team is not required to be on site for Non-Permit Confined Space entries.
4. Authorized Attendant
- a. Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
 - b. Is aware of possible behavioral effects of hazard exposure in authorized Entrants.

- c. Continuously maintains communication and an accurate count of authorized Entrants in the confined space and ensures that the means used to identify authorized Entrants, and accurately identifies who is in the confined space.
 - d. Remains outside the confined space during entry operations until relieved by another Attendant.
 - e. Our company has procedures to be used by a single attendant monitoring several confined spaces during an emergency. If more than one confined space is to be monitored by a single attendant, the program must include the means and procedures that will be used in order to enable the attendant to respond to emergencies in one or more permit spaces that he/she is monitoring without distraction from all responsibilities. This will include radio communications with emergency responders or other methods of summoning aid, directing entrants to leave the confined spaces, etc. The procedures shall be on the confined space permit.
 - f. Monitors activities inside and outside the confined space to determine if it is safe for Entrants to remain in the space and orders the authorized Entrants to evacuate the confined space immediately under any of the following conditions:
 - (A.) If the Attendant detects a prohibited condition;
 - (B.) If the Attendant detects the behavioral effects of hazard exposure in an authorized Entrant;
 - (C.) If the Attendant detects a situation outside the space that could endanger the authorized Entrants;
 - (D.) If the Attendant cannot effectively and safely perform all the duties required.
 - g. Summon rescue and other emergency services as soon as the Attendant determines that authorized Entrants may need assistance to escape from confined space hazards.
 - h. Takes the following actions when unauthorized persons approach or enter a confined space while entry is underway:
 - (A.) Warn the unauthorized persons that they must stay away from the confined space;
 - (B.) Advise the unauthorized persons to exit the confined space immediately, if they have entered the space;
 - (C.) Inform the authorized Entrants and the Entry Supervisor if unauthorized persons have entered the confined space.
 - i. Performs no duties that might interfere with the Attendant's primary duty to monitor and protect the authorized Entrants.
 - j. Authorized Attendants shall not monitor more than one confined space at a time.
5. Authorized Entrant
- a. Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
 - b. Uses appropriate personal protective equipment properly, e.g., face and eye protection, and other forms of barrier protection such as gloves aprons, coveralls, and breathing equipment;
 - c. Is aware of possible behavioral effects of hazard exposure in authorized Entrants;
 - d. Shall witness and verify calibrated air monitoring data and if approved, sign off, before entry is made.
 - e. Is entitled to request additional monitoring at any time.

- f. Maintain communication with the Attendants to enable the Attendant to monitor the Entrants status as well as to alert the Entrant to evacuate if needed; and
- g. Exit from confined spaces as soon as possible when ordered by an Attendant or Entry Supervisor, when the Entrant recognizes the warning signs or symptoms of an exposure exists, or when a prohibited condition exists, or when an alarm is activated.

C. Procedure

1. Non-Permit Confined Space Entry

- a. If testing of the confined space atmosphere is within acceptable limits without the use of forced air ventilation and the space is properly isolated, the space can be entered by following the requirements for Level I confined space entry.
- b. Entrants and/or their representative shall be given the opportunity to observe and participate in the air monitoring process.
- c. Entrants shall review and sign the confined space permit.
- d. Employees may enter and work in the confined space as long as LEL, O₂, and toxicity hazards remain at safe levels.
 - (A.) Complete our company's Confined Space Entry Permit to document that there are no confined space hazards. Make this certification available to all personnel entering the space.
 - (B.) A trained Attendant must always be outside the confined space. The Attendant must monitor the authorized Entrants for the duration of the entry operation.
- e. Exception
 - (A.) The Attendant requirements for Level I confined space entry may be exempted, if the job assessment is performed and has determined that there are no inherent dangers to allow single person entry.
 - (B.) This provision is intended to permit field operations to enter crankcases, shallow valve boxes, cellars, excavations, etc. without an Attendant being present and all other aspects of the entry permit complied with.
 - (C.) When there are changes in the use and configuration of a confined space that might increase the hazards to the Entrants (e.g., using epoxy coating on a tank floor, welding, painting, etc.), re-evaluate the space. If necessary, reclassify the space as a Permit-Required Confined Space.
- f. Continuously monitor the confined space atmosphere to ensure that it is still safe.
 - (A.) The space must not contain a hazardous atmosphere while personnel are inside.
 - (B.) If a hazardous atmosphere is detected during an entry, personnel must immediately evacuate the space.
 - (C.) Re-evaluate the space to determine how the hazardous atmosphere developed.
- g. The Entry Supervisor shall cancel the entry permit.
- h. Take action to protect personnel before any subsequent activity to re-enter the space takes place.
- i. Reissue our company's Confined Space Entry Permit before allowing Entrants to re-enter the space.
- j. If necessary, reclassify the space as a Permit-Required Confined Space.

2. Permit-Required Confined Space Entry

- a. If the space is properly isolated and results of air monitoring are above acceptable parameters without local exhaust ventilation in operation, classify the entry as a Permit-Required Confined Space.
- b. Complete our company's Confined Space Entry Permit before proceeding with work in a Permit-Required Confined Space.
- c. Entrants and/or their representative shall be given the opportunity to observe and participate in the air monitoring process.
- d. Entrants shall review and sign the confined space permit.
- e. At least one trained Attendant must always be outside the Permit-Required Confined Space.
- f. The Attendant must monitor the authorized Entrants for the duration of the entry operation.
- g. Only authorized Entrants may enter a Permit-Required Confined Space.
- h. All Entrants must sign in and out on the entry permit when entering and leaving a Permit-Required Confined Space.
- i. The back of the permit or a sign-in sheet must be used for this purpose.
- j. Post signs and barricades outside all Permit-Required Confined Spaces to notify personnel that a confined space entry is in progress and unauthorized entry is prohibited.
- k. Conditions must be continuously monitored where Entrants are working to determine that acceptable conditions are maintained during entry.
- l. If a hazardous atmosphere is detected during an entry, personnel must immediately evacuate the space.
 - (A.) The Entry Supervisor shall cancel the entry permit.
 - (B.) Re-evaluate the space to determine how the hazardous atmosphere developed.
 - (C.) Take action to protect personnel before any subsequent activity to re-enter the space takes place.
 - (D.) Re-issue our company's Confined Space Entry Permit before allowing Entrants to re-enter the space.
 - (E.) Employees or their representatives are entitled to request additional monitoring at any time.
- m. The permit must be terminated when the entry operations are complete or when permit conditions change (i.e., hazardous air monitoring results are noted, unsafe behaviors are observed, etc.).
- n. The minimum rescue equipment required for Permit-Required Confined Space entry is covered in the Rescue & Emergency section of this program.
- o. Permit-Required Confined Space entry operations will be reviewed when our company believes that the requirements of this confined space program may not adequately protect personnel.
- p. If deficiencies are found in the program, the program will be revised and personnel will be trained in the new revisions before subsequent entries are authorized.

3. Pre-Job Planning and Space Preparation

- a. The Entry Supervisor must determine that the confined space is properly isolated by blinding, disconnecting, and/or by following local Lockout/Tagout procedures.

- b. The Entry Supervisor must discuss with all Entrants the hazards of the space, communication methods and emergency procedures during the confined space entry.
 - c. Eliminate any condition making it unsafe to open the equipment to atmosphere.
 - d. Promptly guard the opening to prevent an accidental fall through the opening and to protect each employee working in the space from foreign objects entering the space.
 - e. If applicable, wash, steam, ventilate or degas the confined space to properly free it of possible contaminants. Vent vapors to a safe location.
 - f. Do not allow unauthorized personnel to enter a confined space. Barricade and/or guard all confined spaces to prevent entry of unauthorized Entrants.
 - g. If performing hot work in the confined space, precautions must be taken consistent with our company's Hot Work Permit procedure.
 - h. Ensure that vehicle or other equipment exhaust does not enter the space.
4. Pre-Entry Safety Meeting
- a. The Entry Supervisor must declare when the confined space is ready for entry.
 - b. The Entry Supervisor shall hold a pre-entry safety meeting to discuss all requirements and procedures with all authorized Entrant(s) and Attendant(s) involved with the entry. He/she will discuss other concerns such as previous contents, vessel coating, PPE required etc., during this meeting.
 - c. The Entry Supervisor must coordinate entry operations when employees of more than one company are working simultaneously in the confined space. This coordination is necessary so that one company's work does not endanger the employees of another company.
5. Equipment
- a. Check all work equipment to ensure that it has the proper safety features and is approved for the locations where it will be used. The Entry Supervisor shall ensure that all equipment is properly maintained in a safe condition and that Entrants use the equipment properly.
 - b. The following equipment must be considered and may be required when entering a confined space:
 - (A.) Atmospheric Testing and Monitoring Equipment.
 - (B.) Barriers, Shields, and Signs – Post signs and barricades outside all Permit-Required Confined Spaces to notify personnel that a confined space entry is in progress and unauthorized entry is prohibited. Any signs used must state "Danger – Permit Entry Confined Space" along with the proper warning word such as "Asphyxiant, Flammability or Toxic Hazard". All barricades must be capable of preventing a person from inadvertently walking into or kicking an object into the space.
 - (C.) Communications Equipment – Only use intrinsically safe equipment in areas where a hazardous atmosphere may exist. Use a communication system that will keep the Attendant in constant, direct communication with the Entrant(s) working in the confined space. Also, use a communication system that allows the Attendant to summon help from rescue or emergency service.
 - (D.) Entry and Exit Equipment – (For example: ladders may be needed for safe entry and exit).
 - (E.) Lighting Equipment – Needed for safe entry, work within the space and exit. Lighting equipment used in the confined space must be certified safe for the location.

- (F.) Portable electric lighting used in wet and/or other conductive locations (drums, tanks, vessels) must be operated at 12 volts or less. 120 volt lights may be used if protected by a ground-fault circuit interrupter.
- (G.) Personal Protective Equipment – Ensure that personnel wear the required personal protective equipment. For respiratory protection requirements, refer to the Respiratory Protection Program.
- (H.) Rescue and Emergency Equipment – Except if provided by outside rescue services.
- (I.) The Attendants must also have an approved first aid kit.
- (J.) Vacuum Trucks – When used, trucks must be properly grounded or bonded to prevent static sparks.
- (K.) Ventilating Equipment – Local exhaust air movers used to obtain acceptable atmospheric entry conditions (e.g., Copus air movers).
- (L.) Other – Any other equipment necessary for safe entry into and rescue from permit required confined spaces.

6. Air Monitoring

- a. Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order. Monitoring of the space must inform the entrants of the potential hazards and results and they must participate in the permit review and signing.
- b. Air shall be periodically test while continuous ventilation is applied.
- c. Any employee, who enters the space, or that employee's authorized representative, shall be provided an opportunity to observe the pre-entry testing required by this paragraph.
- d. Employees or their representatives are entitled to request additional air monitoring at any time.

7. Ventilation

- a. Continuous forced air ventilation must be used and tested as follows:
- b. An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;
- c. The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;
- d. The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
- e. The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee, who enters the space, or that employee's authorized representative, shall be provided with an opportunity to observe the periodic testing and may request additional monitoring at any time.
- f. If a hazardous atmosphere is detected during entry each employee shall leave the space immediately and the space shall be evaluated to determine how the hazardous atmosphere developed; and measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

8. Multiple Employer Procedure

- a. In order not to endanger the employees of any other employer, the Entry Supervisor shall:

- b. Verify that all contractor employees have been trained in confined space and that all contractor employees fully understand our company's procedures pertaining to Confined Space.
 - c. Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this section.
 - d. Apprise the contractor of the elements, including the hazards identified and the employees experience with the space, that make the space in question a permit space.
 - e. Inform the contractor of any precautions or procedures that our company has implemented for the protection of employees in or near permit spaces where contractor personnel will be working.
 - f. Coordinate entry operations with the contractor, when both our company's personnel and contractor personnel will be working in or near confined spaces.
 - g. Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in confined spaces during entry operations.
 - h. In addition to complying with the confined space requirements that apply to all employees; each contractor, who is retained to perform permit space entry operations, shall:
 - i. Obtain any available information regarding confined space hazards and entry operations from our company's Entry Supervisor.
 - j. Coordinate entry operations with our company's LLC Entry Supervisor, when both our company's personnel and contractor personnel will be working in or near permit spaces.
 - k. Inform our company of the confined space program that the contractor will follow and of any hazards confronted or created in the confined space, either through a debriefing or during the entry operation.
9. Rescue and Emergency Services
- a. General
 - (A.) Rescue service must be on-site for immediately dangerous to life and health (IDLH) conditions while work is being performed.
 - (B.) Rescue services must be either:
 - (C.) Provided by the host facility,
 - (D.) Provided by an outside service which is given an opportunity to examine the entry site, practice rescue and decline as appropriate, or
 - (E.) Provided by our company by selecting a rescue team that is equipped and trained to perform the needed rescue services.
 - (F.) The Attendant shall order the other Entrants not to move the injured nor allow untrained or unauthorized workers into the space that are not trained to handle a confined space rescue.
 - (G.) Material Safety Data Sheet's for substances that an injured Entrant was exposed to must be provided to the medical facility treating the injured worker.
 - b. Permit-Required Confined Space Rescue:
 - (A.) When the Attendant becomes aware of the need for rescue, the Attendant shall immediately summon the onsite rescue team by the agreed upon communication method, verbally, radio or cell phone, without leaving the vicinity of the confined space.

- (B.) The Attendant shall prevent unauthorized personnel from attempting a rescue.
- (C.) After the rescue team has been notified, the Attendant shall alert the Entry Supervisor of the emergency via the same communication methods.
- (D.) The preferred means of providing rescue service is through the use of a qualified outside rescue service vendor. The outside rescue service vendor must be:
 - (1.) Informed of the hazards that they may confront during a rescue;
 - (2.) Provided access to the Permit-Required Confined Space to examine the entry site, practice rescue, and decline as appropriate.
 - (3.) Access to the space allows the rescue service and local supervision to jointly develop appropriate rescue plans.
 - (4.) If the host operator is designated to provide rescue services for our company, the agreement of services must be included in contract for the job.
- (E.) If our company employees are to perform Permit-Required Confined Space rescues, they must be:
 - (1.) Provided and trained in the use of the proper personal protective equipment necessary to make the rescue;
 - (2.) Provided PPE at no cost
 - (3.) Trained to perform the assigned duties;
 - (4.) Required to practice making rescues at least once every 12 months;
 - (5.) Trained in basic first aid and CPR.
 - (6.) A minimum of one member of the rescue team must hold a current certification in first aid and CPR.

c. Non-entry Rescue

- (A.) To facilitate non-entry rescue, an Entrant must be attached to a retrieval system whenever he/she enters a Permit-Required Confined Space with a vertical depth of more than 5 feet.
- (B.) The retrieval equipment is not required if it will increase the overall risk of the entry, e.g., creating an entanglement hazard, or will not contribute to the rescue of the Entrant.
- (C.) Each Entrant shall use a full body harness with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at another point which the employer can establish presents a profile small enough for the successful removal of the entrant.
- (D.) Wristlets may be used instead of the full body harness, if the use of the full body harness is not feasible or creates a greater hazard and that using wristlets is the safest and most effective alternative.
- (E.) The retrieval line must be attached to the "D" ring and the other end of the retrieval line attached to a retrieval device or fixed point located outside the space so that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.

10. Issuance/Reviewing of Permit

- a. Only when all pre-entry requirements are satisfied, the Entry Supervisor shall issue a completed and signed confined space permit. The confined space permit is valid for one shift.
- b. In the event of any unauthorized entry, employee complaints, a hazard not covered by the permit, the occurrence of an injury or near miss the entry permit shall be cancelled and a

review shall be conducted to provide employee protection and for revising the program prior to authorizing subsequent entries.

- c. An annual review of this program, using the cancelled permits retained within 1 year after each entry shall be conducted by the HSE Manager to revise the program as necessary, to ensure that employees are protected. If no confined space entries were performed during a 12 month period, no review is necessary.

11. Termination and Closing or Cancelling of Permits

- a. The Entry Supervisor shall terminate the confined space permit, at the end of the job operation, at the end of the shift or when the Entry Supervisor or Attendant determine that conditions in or near the confined space have changed and is hazardous to the Entrants.
- b. The Entry Supervisor shall, at the conclusion of entry operation, close out the permit and provide the safety department the original copy of the Confined Space Permit.

D. Training

1. Provided

- a. Training shall be provided so that all employees whose work is regulated by this program acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned to them.
- b. Training shall be provided to each affected employee, before the employee is first assigned duties under this program, if a new hazard has been created or special deviations have occurred and before there is a change in assigned duties.
- c. The training shall establish employee proficiency in the duties required by this program and shall introduce new or revised procedures, as necessary.

2. Retraining

- a. Whenever there is a change in confined space operations that presents a hazard about which an employee has not previously been trained.
- b. Whenever the supervisor has reason to believe either that there are deviations from the permit space entry procedures required by this section or that there are inadequacies in the employee's knowledge or use of these procedures.

3. Certification

- a. The supervisor shall certify that the training required by this program has been accomplished.
- b. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training.
- c. The certification shall be available for inspection by employees, their authorized representatives, management, customers, and the safety department.

Safety Specifics – Cranes & Rigging (29 CFR 1926.1400)

A. Scope

1. This standard applies to power-operated equipment, when used in construction that can hoist, lower and horizontally move a suspended load.
2. This standard applies to equipment included above when used with attachments. Such attachments, whether crane-attached or suspended include, but are not limited to: Hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment.
3. This subpart does not cover:
 - a. Machinery that is covered while it has been converted or adapted for a non-hoisting/lifting use. Such conversions/adaptations include, but are not limited to, power shovels, excavators and concrete pumps.
 - b. Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads.
 - c. Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles.
 - d. Digger derricks when used for augering holes for poles carrying electric or telecommunication lines, placing and removing the poles, and for handling associated materials for installation on, or removal from, the poles, or when used for any other work subject to §1926 V of this part.
 - e. Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms.
 - f. Telescopic/hydraulic gantry systems.
 - g. Stacker cranes.
 - h. Powered industrial trucks (forklifts) except when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load.
 - i. Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair.
 - j. Machinery that hoists by using a come-a-long or chainfall.
 - k. Dedicated drilling rigs.
 - l. Gin poles when used for the erection of communication towers.
 - m. Tree trimming and tree removal work.
 - n. Anchor handling or dredge-related operations with a vessel or barge using an affixed A-frame.
 - o. Roustabouts.
 - p. Helicopter cranes.
 - q. Material Delivery
 - (A.) Articulating/knuckle-boom truck cranes that deliver material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting.
 - (B.) Articulating/knuckle-boom truck cranes that deliver material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a properly

functioning automatic overload prevention device. Such sheet goods or packaged materials include, but are not limited to: Sheets of sheet rock, sheets of plywood, bags of cement, sheets or packages of roofing shingles, and rolls of roofing felt.

(C.) This exclusion does not apply when:

- (1.) The articulating/knuckle-boom crane is used to hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure;
- (2.) The material being handled by the articulating/knuckle-boom crane is a prefabricated component. Such prefabricated components include, but are not limited to: Precast concrete members or panels, roof trusses (wooden, cold-formed metal, steel, or other material), prefabricated building sections such as, but not limited to: Floor panels, wall panels, roof panels, roof structures, or similar items;
- (3.) The material being handled by the crane is a structural steel member (for example, steel joists, beams, columns, steel decking (bundled or unbundled) or a component of a systems-engineered metal building (as defined in §1926 subpart R).

B. Ground Conditions

1. The equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met. The requirement for the ground to be drained does not apply to marshes/wetlands.
2. The controlling entity must:
 - a. Ensure that ground preparations necessary to meet the requirements of this section are provided.
 - b. 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) if those hazards are identified in documents (such as site drawings, as-built drawings, and soil analyses) that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to that controlling entity.
3. If there is no controlling entity for the project, the controlling entity requirements must be met by the employer that has authority at the site to make or arrange for ground preparations needed.
4. If the Assembly / Disassembly (A/D) director or the operator determines that ground conditions do not meet the requirements of this section, that person's employer must have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/devices (if necessary), the requirements can be met.
5. This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213 and that comply with applicable Federal Railroad Administration requirements.

C. Assembly / Disassembly

1. When assembling or disassembling equipment (or attachments), the company must comply with all applicable manufacturer prohibitions and must comply with either:
 - a. Manufacturer procedures applicable to assembly and disassembly, or

- b. Employer procedures may be used only where it can be demonstrated that the procedures used meet the requirements in § 1926.1406.

Note: *The company must follow manufacturer procedures when using synthetic slings during assembly or disassembly rigging. (See § 1926.1404(r).)*

2. General

- a. Supervision--competent-qualified person
 - (A.) Assembly/disassembly 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 ("A/D director").
 - (B.) 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 and is considered the A/D director.
- b. The A/D director must understand the applicable assembly/disassembly procedures.
- c. The A/D director must review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories, if any).
- d. Before commencing assembly/disassembly operations, during assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the A/D director must ensure that the crew members understand all of the following:
 - (A.) Their tasks.
 - (B.) The hazards associated with their tasks.
 - (C.) The hazardous positions/locations that they need to avoid.
- e. Protecting assembly/disassembly crew members out of operator view
 - (A.) Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, 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.
 - (B.) Where the operator knows that a crew member went to a location covered above, the operator must 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.
- f. Working under the boom, jib or other components
 - (A.) When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components
 - (B.) Exception. Where it can be demonstrated that that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom.
- g. Capacity limits

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.
- h. Addressing specific hazards

The A/D director supervising the assembly/disassembly operation must address the hazards associated with the operation, which include:

- (A.) Site and ground bearing conditions. Site and ground conditions must be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly
- (B.) Blocking material. The size, amount, condition and method of stacking the blocking must be sufficient to sustain the loads and maintain stability.
- (C.) Proper location of blocking. When used to support lattice booms or components, blocking must be appropriately placed to:
 - (1.) Protect the structural integrity of the equipment, and
 - (2.) Prevent dangerous movement and collapse.
- (D.) Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly must be verified in accordance with § 1926.1417(o)(3) before assembly/disassembly begins.
- (E.) Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) must be suitable for preventing structural damage and facilitating safe handling of these components.
- (F.) Center of gravity.
 - (1.) The center of gravity of the load must be identified if that is necessary for the method used for maintaining stability.
 - (2.) Where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used.
- (G.) Stability upon pin removal. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components must be rigged or supported to maintain stability upon the removal of the pins.
- (H.) Snagging. Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).
- (I.) Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting counterweights.
- (J.) Boom hoist brake failure. Every time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly/disassembly; the brake must be tested prior to such reliance to determine if it is sufficient to prevent boom movement. If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure must be used.
- (K.) Loss of backward stability. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.
- (L.) Wind speed and weather. The effect of wind speed and weather on the equipment.

i. Cantilevered boom sections

Manufacturer limitations on the maximum amount of boom supported only by cantilevering must not be exceeded. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must determine in writing this limitation, which must not be exceeded.

- j. The weight of each of the components must be readily available.
- k. Components and configuration
 - (A.) The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment must be in accordance with:
 - (1.) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or
 - (2.) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications).
 - (B.) Post-assembly inspection. Upon completion of assembly, the equipment must be inspected to ensure compliance with this section.
- l. Shipping pins

Reusable shipping pins, straps, links, and similar equipment must be removed. Once they are removed they must either be stowed or otherwise stored so that they do not present a falling object hazard.
- m. Pile driving

Equipment used for pile driving must not have a jib attached during pile driving operations.
- n. Outriggers and Stabilizers

When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all of the following requirements must be met (except as otherwise indicated):

 - (A.) The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.
 - (B.) The outriggers must be set to remove the equipment weight from the wheels, except for locomotive cranes. This provision does not apply to stabilizers.
 - (C.) When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers.
 - (D.) Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting.
 - (E.) Outrigger and stabilizer blocking must be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam.
 - (F.) For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures must be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures must be met regarding truck wedges or screws.
- o. Rigging

In addition to following the requirements in §1926.251 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the company must ensure that:

 - (A.) The rigging work is done by a qualified rigger.

- (B.) Synthetic slings are protected from: Abrasive, sharp or acute edges, and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression.
- (C.) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations must be followed.

3. Employer Procedures

- a. When using employer procedures instead of manufacturer procedures for assembly/disassembly, the employer must ensure that the procedures:
 - (A.) Prevent unintended dangerous movement, and prevent collapse, of any part of the equipment.
 - (B.) Provide adequate support and stability of all parts of the equipment.
 - (C.) Position employees involved in the assembly/disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized.
- b. Employer procedures must be developed by a qualified person.

4. Disassembly – Booms & Jibs

- a. None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension.
- b. None of the pins (top or bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension.
- c. None of the pins (top or bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support).
- d. None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.

D. Power Line Safety

1. Up to 350 kV – Assembly / Disassembly

- a. Before assembling, disassembling, or operating equipment, it must first be determined if any part of the equipment, load line, or load (including rigging and lifting accessories) could get, in the direction or area of assembly/disassembly, closer than 20 feet to a power line during the assembly/disassembly process.

If so, the company must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows:

- (A.) Option (1)--Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite.
- (B.) 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 encroachment measures specified in this section.
- (C.) Option (3)--Table A clearance. Determine the line's voltage and the minimum clearance distance permitted under Table A

- (1.) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), could get closer than the minimum clearance distance to the power line permitted under Table A.
- (2.) If so, then the company must follow the encroachment 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 clearance distance.

Table A

Voltage (kV)	Minimum Clearance Distance(feet)
Up to 50	10
50 to 200	15
200 to 350	20
350 to 500	25
500 to 750	35
750 to 1000	45
Over 1000	As established by the line owner

b. Preventing encroachment/electrocution

Where encroachment precautions are required under Option (2), or Option (3) of this section, all of the following requirements must be met:

- (A.) Conduct a planning meeting with the Assembly/Disassembly director (A/D director), operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/electrocution.
- (B.) If tag lines are used, they must be nonconductive.
- (C.) At least one of the following additional measures must be in place:
 - (1.) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter must:
 - (a.) Be equipped with a visual aid to assist in identifying the minimum clearance distance.
 - (b.) Be positioned to effectively gauge the clearance distance.
 - (c.) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.
 - (d.) Give timely information to the operator so that the required clearance distance can be maintained.
 - (2.) A proximity alarm set to give the operator sufficient warning to prevent encroachment.
 - (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 elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.

- c. Assembly/disassembly below power lines prohibited unless it has been confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.
 - d. Assembly/disassembly inside Table A clearance prohibited unless it has been confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.
 - e. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the company request.
 - f. It must be assumed 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.
 - g. There must be at least one electrocution hazard warning 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.
2. Up to 350 kV – Operations
- a. Before beginning equipment operations, the company must:
 - (A.) Identify the work zone by either:
 - (1.) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or
 - (2.) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.
 - (B.) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories) could get, in the direction or area of assembly/disassembly, closer than 20 feet to a power line during the assembly/disassembly process.
- If so, the company must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows:
- (1.) Option (1)--Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite.
 - (2.) 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 encroachment measures specified in this section.
 - (3.) Option (3)--Table A clearance. Determine the line's voltage and the minimum clearance distance permitted under Table A
 - (a.) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), could get closer than the minimum clearance distance to the power line permitted under Table A.
 - (b.) If so, then the company must follow the encroachment 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 clearance distance.

Table A

Voltage (kV)	Minimum Clearance Distance(feet)
Up to 50	10
50 to 200	15
200 to 350	20
350 to 500	25
500 to 750	35
750 to 1000	45
Over 1000	As established by the line owner

b. Preventing encroachment/electrocution

Where encroachment precautions are required under Option (2), or Option (3) of this section, all of the following requirements must be met:

- (A.) Conduct a planning meeting with the Assembly/Disassembly director (A/D director), operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/electrocution.
- (B.) If tag lines are used, they must be nonconductive.
- (C.) 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.
 - (1.) Line shall be established at:
 - (a.) 20 feet from the power line (if using Option (2) of this section) or
 - (b.) The minimum approach distance under Table A (see § 1926.1408) (if using Option (3) of this section).
 - (2.) If the operator is unable to see the elevated warning line, a dedicated spotter must be used as described in addition to implementing one of the measures described below.
- (D.) Implement at least one of the following measures:
 - (1.) A dedicated spotter who is in continuous contact with the operator.
 - (2.) A proximity alarm set to give the operator sufficient warning to prevent encroachment.
 - (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, as defined in § 1926.1401, installed at a point between the end of the load line (or below) and the load.
- (E.) The requirements of this section do not apply to work covered by § 1926 Subpart V.

- c. 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 company request.
- d. No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless it has been confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, unless one of the following exceptions apply:

- (A.) The work is covered by § 1926 Subpart V.
 - (B.) For equipment with non-extensible 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 Table A of this section minimum clearance distance below the plane of the power line.
 - (C.) 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 Table A of this section minimum clearance distance below the plane of the power line.
 - (D.) It can be demonstrated that compliance with this paragraph is infeasible and meets the requirements of § 1926.1410.
- e. It must be assumed 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.
- f. 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 must be deenergized or the following precautions must be taken:
- (A.) The equipment must be provided with an electrical ground.
 - (B.) If tag lines are used, they must be non-conductive.
- g. Training
- (A.) The company must train each operator and crew member assigned to work with the equipment on all of the following:
 - (1.) The procedures to be followed in the event of electrical contact with a power line. Such training must include:
 - (a.) Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground.
 - (b.) 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.
 - (c.) The safest means of evacuating from equipment that may be energized.
 - (d.) The danger of the potentially energized zone around the equipment.
 - (e.) The need for crew in the area to avoid approaching or touching the equipment and the load.
 - (f.) Safe clearance distance from power lines.
 - (2.) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.
 - (3.) Power lines are presumed to be uninsulated 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.
 - (4.) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used.
 - (5.) The procedures to be followed to properly ground equipment and the limitations of grounding.

(B.) Employees working as dedicated spotters must be trained to enable them to effectively perform their task, including training on the applicable requirements of this section.

(C.) Training under this section must be administered in accordance with § 1926.1430.

h. 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 section, must meet the manufacturer's procedures for use and conditions of use.

3. Over 350 kV

The requirements for Up to 350 kV apply to power lines over 350 kV except:

- a. For power lines at or below 1000 kV, wherever the distance "20 feet" is specified, the distance "50 feet" must be substituted; and
- b. 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.

4. All voltages – Closer than Table A Zone

Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table A of § 1926.1408 to an energized power line is prohibited, except where it has been demonstrated that all of the following requirements are met:

- a. It can be determined that it is infeasible to do the work without breaching the minimum approach distance under Table A of § 1926.1408.
- b. It can be determined that, after consultation with the utility owner/operator, it is infeasible to deenergize and ground the power line or relocate the power line.
- c. Minimum clearance distance
 - (A.) The power line owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution determines the minimum clearance distance that must be maintained to prevent electrical contact in light of the on-site conditions.
 - (B.) The factors that must be considered in making this determination include, but are not limited to:
 - (1.) Conditions affecting atmospheric conductivity
 - (2.) Time necessary to bring the equipment, load line, and load (including rigging and lifting accessories) to a complete stop
 - (3.) Wind conditions
 - (4.) Degree of sway in the power line
 - (5.) Lighting conditions
 - (6.) Other conditions affecting the ability to prevent electrical contact.
 - (C.) This section does not apply to work covered by § 1926 Subpart V.
- d. A planning meeting with the company and utility owner/operator (or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution) is held to determine the procedures that will be followed to prevent electrical contact and electrocution. At a minimum these procedures must include:
- e. The procedures developed to comply with this section are documented and immediately available on-site.

- f. The equipment user and utility owner/operator (or registered professional engineers) meet with the equipment operator and the other workers who will be in the area of the equipment or load to review the procedures that will be implemented to prevent breaching the minimum approach distance established in this section and prevent electrocution.
 - g. The procedures developed to comply with this section are implemented.
 - h. The utility owner/operator (or registered professional engineer) and all employers of employees involved in the work must identify one person who will direct the implementation of the procedures. The person identified in accordance with this paragraph must direct the implementation of the procedures and must have the authority to stop work at any time to ensure safety.
 - i. If a problem occurs implementing the procedures being used to comply with this section, or indicating that those procedures are inadequate to prevent electrocution, the company must safely stop operations and either develop new procedures to comply with this section or have the utility owner/operator deenergize and visibly ground or relocate the power line before resuming work.
 - j. 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 section, must comply with the manufacturer's procedures for and conditions of use.
 - k. The company must train each operator and crew member assigned to work with the equipment in accordance with § 1926.1408.
5. No Load - This section establishes procedures and criteria that must be met for equipment traveling under or near a power line on a construction site with no load. The company must ensure that:
- a. The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this paragraph.
 - b. The clearances specified in Table T of this section are maintained.
 - c. The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached.
 - d. If any part of the equipment while traveling will get closer than 20 feet to the power line, the company must ensure that a dedicated spotter who is in continuous contact with the driver/operator is used.
 - e. When traveling at night, or in conditions of poor visibility, in addition to the measures specified above, the company must ensure that:
 - (A.) The power lines are illuminated or another means of identifying the location of the lines is used.
 - (B.) A safe path of travel is identified and used.

Table T

Voltage (nominal, kV, alternating current)	While traveling - Minimum Clearance Distance(feet)
Up to 0.75	4
Over 0.75 to 50	6
Over 50 to 345	10
Over 345 to 750	16
Over 750 to 1,000	20
Over 1,000	As established by the owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

E. Inspections

1. Modified Equipment

Equipment that has had modifications or additions which affect the safe operation of the equipment

- a. Inspected by a Qualified Person
- b. After such modifications/additions have been completed, prior to initial use
- c. The inspection must include functional testing of the equipment.
- d. Equipment must not be used until an inspection under this paragraph demonstrates that the requirements of this section have been met.

2. Repaired/Adjusted Equipment

Equipment that has had a repair or adjustment that relates to safe operation

- a. Inspected by a Qualified Person
- b. After such a repair or adjustment has been completed, prior to initial use
- c. The qualified person must determine if the repair/adjustment meets manufacturer equipment criteria (where applicable and available).
- d. Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person must determine if a registered professional engineer (RPE) is needed to develop criteria for the repair/adjustment.
 - (A.) If an RPE is not needed, the company must ensure that the criteria are developed by the qualified person and that the repair/adjustments meet the developed criteria.
 - (B.) If an RPE is needed, the company must ensure that the criteria are developed by an RPE and that the repair/adjustments meet the developed criteria.
- e. The inspection must include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment.
- f. Equipment must not be used until an inspection under this paragraph demonstrates that the repair/adjustment meets the requirements of this section.

3. Post Assembly

- a. Inspected by a Qualified Person
- b. Upon completion of assembly to assure that it is configured in accordance with manufacturer equipment criteria
- c. Where manufacturer equipment criteria are unavailable, the qualified person must determine if a registered professional engineer (RPE) is needed to develop criteria for the equipment configuration.
 - (A.) If an RPE is not needed, the company must ensure that the criteria are developed by the qualified person and that the equipment meets the developed criteria.
 - (B.) If an RPE is needed, the company must ensure that the criteria are developed by an RPE and that the equipment meets the developed criteria.
- d. Equipment must not be used until an inspection under this paragraph demonstrates that the equipment is configured in accordance with the applicable criteria.

4. Each Shift

- a. Inspected by a Competent Person
- b. A visual inspection prior to each shift the equipment will be used, which must be completed before or during that shift.

- c. Inspection must consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed. Determinations made in conducting the inspection must be reassessed in light of observations made during operation.
- d. If any deficiency) is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard.
 - (A.) If the deficiency is determined to constitute a safety hazard, the equipment must be taken out of service until it has been corrected.
 - (B.) If any deficiency is identified, the action specified in § 1926.1415 and § 1926.1416 must be taken prior to using the equipment.

5. Monthly

- a. Inspected by a Competent Person
- b. Each month the equipment is in service it must be inspected in accordance with same requirements before Each Shift.
- c. Equipment must not be used until an inspection under this paragraph demonstrates that no corrective action is required.
- d. The following information must be documented and maintained by the company that conducts the inspection for a minimum of three (3) months:
 - (A.) The items checked and the results of the inspection.
 - (B.) The name and signature of the person who conducted the inspection and the date.

6. Annual Comprehensive

- a. Inspected by a Qualified Person
- b. At least every 12 months the equipment must be inspected in accordance with same requirements before Each Shift, with Annual/Comprehensive corrective action requirements in place on Each Shift or Monthly.
- c. In addition, at least every 12 months, the equipment must be inspected by a qualified person, with disassembly required, as necessary, to complete the inspection.
- d. This inspection must include functional testing to determine that the equipment as configured in the inspection is functioning properly.
- e. 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.
 - (A.) 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, except when temporary alternative measures are implemented as specified in § 1926.1416(d) or § 1926.1435(e).
 - (B.) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the company must ensure that the deficiency is checked in the monthly inspections.
- f. The following information must be documented, maintained, and retained for a minimum of 12 months, by the company that conducts the inspection:
 - (A.) The items checked and the results of the inspection.
 - (B.) The name and signature of the person who conducted the inspection and the date.

7. Severe service

Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear

- a. Equipment must stop being used
- b. Inspected by a Qualified Person
- c. Inspect the equipment for structural damage to determine if the equipment can continue to be used safely.
- d. In light of the use/conditions determine whether any items/conditions listed in the Annual/Comprehensive section need to be inspected; if so, the qualified person must inspect those items/conditions.
- e. If a deficiency is found, the company must follow the Annual/Comprehensive deficiency requirements.

8. Equipment not in regular use

Equipment that has been idle for 3 months or more

- a. Inspected by a Qualified Person
- b. Prior to initial use
- c. Monthly Inspection guidelines

9. Other Inspections

Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent schedule of inspection than the requirements of this section must be followed.

F. Wire Rope Inspections

1. Shift inspection

- a. Inspected by a Competent Person
- b. A visual inspection prior to each shift the equipment is used, which must be completed before or during that shift.
- c. The inspection must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies. Untwisting (opening) of wire rope or booming down is not required as part of this inspection.
- d. Apparent Deficiencies
 - (A.) Category I
 - (1.) Significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands.
 - (2.) Significant corrosion.
 - (3.) Electric arc damage (from a source other than power lines) or heat damage.
 - (4.) Improperly applied end connections.
 - (5.) Significantly corroded, cracked, bent, or worn end connections (such as from severe service).

(B.) Category II deficiencies

(1.) Visible broken wires, as follows:

- (a.) In running wire ropes: Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope.
- (b.) In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters.
- (c.) In pendants or standing wire ropes: More than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection.

(2.) A diameter reduction of more than 5% from nominal diameter.

(C.) Category III

- (1.) In rotation resistant wire rope, core protrusion or other distortion indicating core failure.
- (2.) Prior electrical contact with a power line.
- (3.) A broken strand.

e. Critical review items

The competent person must give particular attention to all of the following:

- (A.) Rotation resistant wire rope in use.
- (B.) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends.
- (C.) Wire rope at flange points, crossover points and repetitive pickup points on drums.
- (D.) Wire rope at or near terminal ends.
- (E.) Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.

f. Removal from service

- (A.) If a deficiency in Category I is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard.
- (B.) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until:
 - (1.) The wire rope is replaced, or
 - (2.) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the company must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
- (C.) If a deficiency in Category II is identified, operations involving use of the wire rope in question must be prohibited until:
 - (1.) The company complies with the wire rope manufacturer's established criterion for removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope,
 - (2.) The wire rope is replaced, or

- (3.) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the company must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
- (D.) If a deficiency in Category III is identified, operations involving use of the wire rope in question must be prohibited until:
 - (1.) The wire rope is replaced, or
 - (2.) If the deficiency (other than power line contact) is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. Repair of wire rope that contacted an energized power line is also prohibited. If a rope is shortened under this paragraph, the company must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
- (E.) Where a wire rope is required to be removed from service under this section, either the equipment (as a whole) or the hoist with that wire rope must be tagged-out until the wire rope is repaired or replaced.

2. Monthly inspection

- a. Inspected by a Competent Person
- b. Each month the wire rope is in service it must be inspected in accordance with same requirements as a Shift Inspection.
- c. The inspection must include any deficiencies that the qualified person who conducts the annual inspection determines under this section must be monitored.
- d. Wire ropes on equipment must not be used until an inspection under this paragraph demonstrates that no corrective action is required.
- e. The following information must be documented and maintained by the company that conducts the inspection for a minimum of three (3) months:
 - (A.) The items checked and the results of the inspection.
 - (B.) The name and signature of the person who conducted the inspection and the date.

3. Annual/comprehensive

- a. Inspected by a Qualified Person
- b. At least every 12 months wire ropes in use on equipment must be inspected in accordance with same requirements of a Shift Inspection
- c. In addition, at least every 12 months, the wire ropes in use on equipment must be inspected by a qualified person, as follows:
 - (A.) The inspection for be for deficiencies of the types listed in the Shift Inspection
 - (B.) The inspection must be complete and thorough, covering the surface of the entire length of the wire ropes.
- d. If a deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard.
 - (A.) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until:
 - (1.) The wire rope is replaced, or

- (2.) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the company must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
- (B.) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the company must ensure that the deficiency is checked in the monthly inspections.
- e. The following information must be documented, maintained, and retained for a minimum of 12 months, by the company that conducts the inspection:
 - (A.) The items checked and the results of the inspection.
 - (B.) The name and signature of the person who conducted the inspection and the date.
- 4. Rope lubricants that are of the type that hinder inspection must not be used.
- 5. All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.

G. Wire Rope Selection & Installation

- 1. Original equipment wire rope and replacement wire rope must be selected and installed in accordance with the requirements of this section.
- 2. Selection of replacement wire rope must be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer, or a qualified person.
- 3. Wire rope design criteria

Wire rope (other than rotation resistant rope) must comply with either Option (1) or Option (2) of this section, as follows:

 - a. Option (1). Wire rope must comply with section 5-1.7.1 of ASME B30.5-2004 (incorporated by reference, see § 1926.6) except that section's paragraph (c) must not apply.
 - b. Option (2). Wire rope must be designed to have, in relation to the equipment's rated capacity, a sufficient minimum breaking force and design factor so that compliance with the applicable inspection provisions in § 1926.1413 will be an effective means of preventing sudden rope failure.
- 4. Wire rope must be compatible with the safe functioning of the equipment.
- 5. Wire rope clips used in conjunction with wedge sockets must be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for dead-ending rope in a wedge socket is permitted.
- 6. Socketing must be done in the manner specified by the manufacturer of the wire rope or fitting.
- 7. Prior to cutting a wire rope, seizings must be placed on each side of the point to be cut. The length and number of seizings must be in accordance with the wire rope manufacturer's instructions.

H. Safety Devices

- 1. The following safety devices are required on all equipment covered by this subpart, unless otherwise specified:
 - a. Crane level indicator

- (A.) The equipment must have a crane level indicator that is either built into the equipment or is available on the equipment.
 - (B.) If a built-in crane level indicator is not working properly, it must be tagged-out or removed. If a removable crane level indicator is not working properly, it must be removed.
 - (C.) This requirement does not apply to portal cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.
- b. Boom stops, except for derricks and hydraulic booms
 - c. Jib stops (if a jib is attached), except for derricks
 - d. Equipment with foot pedal brakes must have locks
 - e. Hydraulic outrigger jacks and hydraulic stabilizer jacks must have an integral holding device/check valve
 - f. Equipment on rails must have rail clamps and rail stops, except for portal cranes
 - g. Horn
 - (A.) The equipment must have a horn that is either built into the equipment or is on the equipment and immediately available to the operator.
 - (B.) If a built-in horn is not working properly, it must be tagged-out or removed. If a removable horn is not working properly, it must be removed.
2. Proper operation required
- a. Operations must not begin unless all of the devices listed in this section are in proper working order.
 - b. If a device stops working properly during operations, the operator must safely stop operations.
 - c. If any of the devices listed in this section are not in proper working order, the equipment must be taken out of service and operations must not resume until the device is again working properly.
 - d. Alternative measures are not permitted to be used.

I. Operational Aids

The devices listed in this section are required on all equipment covered by this subpart, unless otherwise specified.

1. Operations must not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired the company uses the specified temporary alternative measures. More protective alternative measures specified by the crane/derrick manufacturer, if any, must be followed.
2. If a listed operational aid stops working properly during operations, the operator must 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 § 1926.1434.
3. Category I operational aids and alternative measures

Operational aids listed in this paragraph that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs.

Exception: If the company documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts. See § 1926.1417(j) for additional requirements.

a. Boom hoist limiting device

- (A.) For equipment manufactured after December 16, 1969, a boom hoist limiting device is required.
- (B.) Temporary alternative measures (use at least one). One or more of the following methods must be used:
 - (1.) Use a boom angle indicator.
 - (2.) Clearly mark the boom hoist 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 keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.
 - (3.) Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.
- (C.) If the equipment was manufactured on or before December 16, 1969, and is not equipped with a boom hoist limiting device, at least one of the measures above must be used.

b. Luffing jib limiting device

Equipment with a luffing jib must have a luffing jib limiting device. Temporary alternative measures are the same as in paragraph (d)(1)(i) of this section, except to limit the movement of the luffing jib rather than the boom hoist.

c. Anti two-blocking device

(A.) Telescopic boom cranes

- (1.) Telescopic boom cranes manufactured after February 28, 1992, must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur.
- (2.) Temporary alternative measures: 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 when extending the boom.

(B.) Lattice boom cranes

- (1.) Lattice boom cranes manufactured after Feb 28, 1992, must be equipped with a device that either 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), or warns the operator in time for the operator to prevent two-blocking. The device must prevent such damage/failure or provide adequate warning for all points where two-blocking could occur.
- (2.) Lattice boom cranes and derricks manufactured after November 8, 2011 must be equipped with a device which 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). The

device(s) must prevent such damage/failure at all points where two-blocking could occur.

- (3.) Exception. The requirements of this section do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, marine operations that do not involve hoisting personnel, and pile driving work.
- (4.) Temporary alternative measures. 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, or use a spotter.

(C.) Articulating cranes

- (1.) Articulating cranes manufactured after December 31, 1999, that are equipped with a load hoist must be equipped with a device that automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device must prevent such damage at all points where two-blocking could occur.
- (2.) Temporary alternative measures: When two-blocking could only occur with movement of the load hoist, 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, or use a spotter. When two-blocking could occur without movement of the load hoist, 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 when extending the boom.

4. Category II operational aids and alternative measures

Operational aids listed in this paragraph that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs.

Exception: If the company documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts.

- a. Boom angle or radius indicator (applies only to those digger derricks manufactured after November 8, 2011)

The equipment must have a boom angle or radius indicator readable from the operator's station. Temporary alternative measures: Radii or boom angle must be determined by measuring the radii or boom angle with a measuring device. (does not apply to articulating cranes)
- b. Jib angle indicator if the equipment has a luffing jib (does not apply to articulating cranes)

Temporary alternative measures: Radii or jib angle must be determined by ascertaining the main boom angle and then measuring the radii or jib angle with a measuring device.
- c. Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length (does not apply to articulating cranes).
- d. Temporary alternative measures. One or more of the following methods must be used:
 - (A.) Mark the boom with measured marks to calculate boom length,
 - (B.) Calculate boom length from boom angle and radius measurements,

- (C.) Measure the boom with a measuring device.
- e. Load weighing and similar devices (applies only to those digger derricks manufactured after November 8, 2011)
 - (A.) Equipment (other than derricks and articulating cranes) manufactured after March 29, 2003 with a rated capacity over 6,000 pounds must have at least one of the following: load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter.
 - (B.) Temporary alternative measures: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information must be provided to the operator prior to the lift.
 - (C.) Articulating cranes manufactured after November 8, 2011 must have at least one of the following: automatic overload prevention device, load weighing device, load moment (or rated capacity) indicator, or load moment (rated capacity) limiter.
 - (D.) Temporary alternative measures: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information must be provided to the operator prior to the lift.
- f. The following devices are required on equipment manufactured after November 8, 2011:
 - (A.) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers.
 Temporary alternative measures: The operator must verify that the position of the outriggers or stabilizers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger or stabilizer deployment.
 - (B.) Hoist drum rotation indicator if the equipment has a hoist drum not visible from the operator's station.
 Temporary alternative measures: Mark the drum to indicate the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.

J. Operation

1. The company must comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.
2. Unavailable operation procedures.
 - a. Where the manufacturer procedures are unavailable, the company must develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments.
 - b. Procedures for the operational controls must be developed by a qualified person.
 - c. 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
 - a. 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.

- b. Where rated capacities are available in the cab only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.
- 4. The operator must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when used for signal communications).
- 5. Leaving the equipment unattended
 - a. The operator must not leave the controls while the load is suspended, except where all of the following are met:
 - (A.) The operator remains adjacent to the equipment and is not engaged in any other duties.
 - (B.) The load is to be held suspended for a period of time exceeding normal lifting operations.
 - (C.) 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 or stabilizer functions.
 - (D.) Barricades or caution lines, and notices, are erected to prevent all employees from entering the fall zone. **No** employees are permitted in the fall zone.
 - b. The provisions this paragraph do not apply to working gear (such as slings, spreader bars, ladders, and welding machines) where the weight of the working gear is negligible relative to the lifting capacity of the equipment as positioned, and the working gear is suspended over an area other than an entrance or exit.
- 6. Tag-out
 - a. Where the company 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.
 - b. Where the company 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.
 - c. Response to "do not operate"/tag-out signs.
 - (A.) 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 person authorized to remove it, or until the operator has verified that:
 - (1.) No one is servicing, working on, or otherwise in a dangerous position on the machine.
 - (2.) The equipment has been repaired and is working properly.
 - (B.) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator must not activate that switch or control until the sign has been removed by a person authorized to remove it, or until the operator has verified that the requirements of this section have been met.
- 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. Storm warning

When a local storm warning has been issued, the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the equipment.
- 9. If equipment adjustments or repairs are necessary:

- a. The operator must, in writing, promptly inform the person designated by the company to receive such information and, where there are successive shifts, to the next operator; and
 - b. The company must 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 must 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 must 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
 - a. The equipment must not be operated in excess of its rated capacity.
 - b. The operator must not be required to operate the equipment in a manner that would violate the rated capacity.
 - c. Load weight. The operator must 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 must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (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 must be provided to the operator prior to the lift; or
 - (B.) The operator must 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 must not proceed with the lift until he/she verifies the weight of the load in accordance with this section.
 14. The boom or other parts of the equipment must not contact any obstruction.
 15. The equipment must not be used to drag or pull loads sideways.
 16. On wheel-mounted equipment, no loads must be lifted over the front area, except as permitted by the manufacturer.
 17. The operator must test the brakes each time a load that is 90% 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% or more of the maximum line pull, this requirement applies to the first lift but not to successive lifts.
 18. Neither the load nor the boom must be lowered below the point where less than two full wraps of rope remain on their respective drums.
 19. Traveling with a load
 - a. Traveling with a load is prohibited if the practice is prohibited by the manufacturer.
 - b. Where traveling with a load, the company must 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 are implemented.

- (C.) For equipment with tires, tire pressure specified by the manufacturer is maintained.
- 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. The brakes must be adjusted in accordance with manufacturer procedures to prevent unintended movement.
- 23. The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.
- 24. Swinging locomotive cranes. 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

The following applies to equipment other than tower cranes:

- a. Equipment must not be operated without the counterweight or ballast in place as specified by the manufacturer.
- b. The maximum counterweight or ballast specified by the manufacturer for the equipment must not be exceeded.

K. Authority to Stop Operation

Whenever there is a concern as to safety, the operator must have the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.

L. Signals

1. General

- a. A signal person must be provided in each of the following situations:
 - (A.) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator.
 - (B.) When the equipment is traveling, the view in the direction of travel is obstructed.
 - (C.) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.
- b. 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.
- c. 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 must safely stop operations requiring signals until it is reestablished and a proper signal is given and understood.
- d. If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop operations. Operations must not resume until the operator and signal person agree that the problem has been resolved.
- e. Only one person may give signals to a crane/derrick at a time, except in circumstances covered by this section.
- f. Anyone who becomes aware of a safety problem must alert the operator or signal person by giving the stop or emergency stop signal

- g. All directions given to the operator by the signal person must be given from the operator's direction perspective.
- h. Where a signal person(s) is in communication with more than one crane/derrick, a system must be used for identifying the crane/derrick each signal is for, as follows:
 - (A.) For each signal, prior to giving the function/direction, the signal person must identify the crane/derrick the signal is for, or
 - (B.) Must use an equally effective method of identifying for which crane/derrick the signal is intended.

2. Types of signals

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

a. Hand signals

- (A.) When using hand signals, the Standard Method must be used (see Appendix A). Exception: Where use of the Standard Method for hand signals is infeasible, or where an operation or use of an attachment is not covered in the Standard Method, non-standard hand signals may be used in accordance with this section.
- (B.) When using non-standard hand signals, the signal person, operator, and lift director (where there is one) must contact each other prior to the operation and agree on the non-standard hand signals that will be used.
- (C.) Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.

b. Voice Signals

- (A.) Prior to beginning operations, the operator, signal person and lift director (if there is one), must 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 added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.
- (B.) Each voice signal must contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.
- (C.) The operator, signal person and lift director (if there is one), must be able to effectively communicate in the language used.

c. Audible signals

A signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.

d. New signals

Signals other than hand, voice, or audible signals may be used where it can be demonstrated that:

- (A.) The new signals provide at least equally effective communication 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.

3. Electronic Transmission of Signals

- a. The device(s) used to transmit signals must be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.

- b. Signal transmission must be through a dedicated channel, except:
 - (A.) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations.
 - (B.) 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.
- c. The operator's reception of signals must be by a hands-free system.

M. Fall Protection

1. Boom walkways

- a. Equipment manufactured after November 8, 2011 with lattice booms 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.
- b. Boom walkway criteria
 - (A.) The walkways must be at least 12 inches wide.
 - (B.) Guardrails, railings and other permanent fall protection attachments along walkways are:
 - (1.) Not required.
 - (2.) Prohibited on booms supported by pendant ropes or bars if the guardrails/railings/attachments could be snagged by the ropes or bars.
 - (3.) Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled).
 - (4.) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.

2. Steps, handholds, ladders, grabrails, guardrails and railings

- a. Fall Protection System requirements under § 1926.502(b) do not apply to equipment covered by this subpart.
- b. The company must maintain in good condition originally-equipped steps, handholds, ladders and guardrails/railings/grabrails.
- c. 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. These devices must meet the following criteria:
 - (A.) Steps, handholds, ladders and guardrails/railings/grabrails must meet the criteria of SAE J185 (May 2003) (incorporated by reference, see § 1926.6) or ISO 11660-2:1994(E) (incorporated by reference, see § 1926.6) except where infeasible.
 - (B.) Walking/stepping surfaces, except for crawler treads, must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).

- 3. Personal fall arrest system components must be used in personal fall arrest and fall restraint systems and must conform to the criteria in § 1926.502(d) except that § 1926.502(d)(15) does not apply to components used in personal fall arrest and fall restraint systems. Either body belts or body harnesses must be used in personal fall arrest and fall restraint systems.

4. For **non**-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 6 feet above a lower level as follows:
 - a. When moving point-to-point:
 - (A.) On non-lattice booms (whether horizontal or not horizontal).
 - (B.) On lattice booms that are not horizontal.
 - (C.) On horizontal lattice booms where the fall distance is 15 feet or more.
 - b. 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.
5. 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.
6. Anchorage criteria
 - a. §1926.502(d)(15) and 1926.502(e)(2) apply to equipment covered by this subpart only to the extent delineated below.

Anchorage for personal fall arrest and positioning device systems.

- (A.) Personal fall arrest systems 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 criteria in § 1926.502(d)(15) would not be met.
 - (B.) Positioning device systems 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 criteria in § 1926.502(e)(2) would not be met.
 - (C.) Attachable anchor devices (portable anchor devices that are attached to the equipment) must meet the anchorage criteria in § 1926.502(d)(15) for personal fall arrest systems and § 1926.502(e)(2) for positioning device systems.
- b. Anchorage for fall restraint systems

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.

7. Anchoring to the load line

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. 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 requirements in § 1926.502(d)(15).
- b. The equipment operator must be at the work site and informed that the equipment is being used for this purpose.
- c. 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).

8. Training

The company must train each employee who may be exposed to fall hazards while on, or hoisted by, equipment covered by this subpart on all of the following:

- a. The requirements in this subpart that address fall protection.
- b. The applicable requirements in § 1926.500 and 1926.502.

N. Work Area Control - Swing Radius Hazards

1. 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:
 - a. Striking and injuring an employee; or
 - b. Pinching/crushing an employee against another part of the equipment or another object.
2. To prevent employees from entering these hazard areas, the company must:
 - a. Train each employee assigned to work on or near the equipment ("authorized personnel") in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure.
 - b. Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas. Exception: When it can be demonstrated that it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas must be clearly marked by a combination of warning signs (such as "Danger--Swing/Crush Zone") and high visibility markings on the equipment that identify the hazard areas. In addition, the company must train each employee to understand what these markings signify.
3. Protecting employees in the hazard area
 - a. Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location.
 - b. Where the operator knows that an employee went to a location covered by paragraph (a)(1) of this section, the operator must not rotate the superstructure until the operator is informed in accordance with a pre-arranged system of communication that the employee is in a safe position.
4. 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 company (if there is only one company operating the multiple pieces of equipment), or multiple companies, must institute such a system.

O. Keeping Clear of the Load

1. Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used, to the extent consistent with public safety.
2. While the operator is not moving a suspended load, no employee must be within the fall zone, except for employees:
 - a. Engaged in hooking, unhooking or guiding a load;
 - b. Engaged in the initial attachment of the load to a component or structure; or
 - c. Operating a concrete hopper or concrete bucket.

3. When employees 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, all of the following criteria must be met:
 - a. The materials being hoisted must be rigged to prevent unintentional displacement.
 - b. Hooks with self-closing latches or their equivalent must be used. Exception: "J" hooks are permitted to be used for setting wooden trusses.
 - c. The materials must be rigged by a qualified rigger.

4. Receiving a load

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

5. During a tilt-up or tilt-down operation:

- a. No employee must be directly under the load.
- b. Only employees essential to the operation are permitted in the fall zone (but not directly under the load). An employee is essential to the operation if the employee is conducting one of the following operations and it can be demonstrated that it is infeasible for the employee to perform that operation from outside the fall zone:
 - (A.) Physically guide the load
 - (B.) Closely monitor and give instructions regarding the load's movement; or
 - (C.) Either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing).

Note: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load.

P. Free Fall and Controlled Load Lowering

1. Boom free fall prohibitions

- a. The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances:
 - (A.) An employee is in the fall zone of the boom or load.
 - (B.) An employee is being hoisted.
 - (C.) The load or boom is directly over a power line, or over any part of the area extending the Table A of § 1926.1408 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.
 - (D.) The load is over a shaft, except where there are no employees in the shaft.
 - (E.) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load.
 - (F.) Lifting operations are taking place in a refinery or tank farm.
- b. The use of equipment in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in paragraph (a)(1) of this section are present and:
 - (A.) The equipment was manufactured prior to October 31, 1984; or
 - (B.) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.

2. Preventing boom free fall. Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited, 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:
 - a. Friction drums must have:
 - (A.) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering.
 - (B.) 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).
 - b. Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure.
 - c. Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this subpart.
 - d. Hydraulic boom cylinders must have an integrally mounted holding device.
3. Preventing uncontrolled retraction
Hydraulic telescoping booms must have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.
4. Load line free fall. In each of the following circumstances, controlled load lowering is required and free fall of the load line hoist is prohibited:
 - a. An employee is directly under the load.
 - b. An employee is being hoisted.
 - c. The load is directly over a power line, or over any part of the area extending the Table A of § 1926.1408 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.
 - d. The load is over a shaft.
 - e. The load is over a cofferdam, except where there are no employees in the fall zone of the load.

Q. Operator Qualification & Certification

1. The company must ensure that, prior to operating any equipment covered under subpart CC, the person is operating the equipment during a pre-qualification/certification training period in accordance with this section, or the operator is qualified or certified to operate the equipment in accordance with the following:
 - a. When a non-military government entity issues operator licenses for equipment covered under subpart CC, and that government licensing program meets the requirements of this section, the equipment operator must either be:
 - (A.) Licensed by that government entity for operation of equipment within that entity's jurisdiction; or
 - (B.) Qualified in compliance with § 1926.1427(d).
 - b. Where the above is not applicable, the certification or qualification must comply one of the other options in this section:
 - (A.) Operator-In-Training

- (B.) Operator Certification and Licensing
- (C.) Certification by an Accredited Crane Operator Testing Organization
- c. Exceptions: Operator qualification or certification under this section is not required for operators of derricks (see § 1926.1436), sideboom cranes (see § 1926.1440), or equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less (see § 1926.1441).

2. Operator-In-Training

The company must provide each operator-in-training with sufficient training, through a combination of formal and practical instruction, 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.

- a. The company must provide instruction on the knowledge and skills listed in this section to the operator-in-training.
- b. The operator-in-training must be continuously monitored on site by a trainer while operating equipment.
- c. The company may only assign tasks within the operator-in-training's ability. However, except as provided in this section, the operator-in-training shall not operate the equipment in any of the following circumstances unless certified in accordance with the Operator Certification and Licensing option in this section
 - (A.) 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 within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV.
 - (B.) If the equipment is used to hoist personnel.
 - (C.) In multiple-equipment lifts.
 - (D.) If the equipment is used over a shaft, cofferdam, or in a tank farm.
 - (E.) In multiple-lift rigging operations, except where the operator's trainer determines that the operator-in-training's skills are sufficient for this high-skill work.
- d. The company must ensure that an operator-in-training is monitored as follows when operating equipment covered by this subpart:
 - (A.) While operating the equipment, the operator-in-training must be continuously monitored by an individual ("operator's trainer") who meets all of the following requirements:
 - (1.) The operator's trainer is an employee or agent of the operator-in-training's employer.
 - (2.) The operator's trainer has the knowledge, training, and experience necessary to direct the operator-in-training on the equipment in use.
 - (B.) While monitoring the operator-in-training, the operator's trainer performs no tasks that detract from the trainer's ability to monitor the operator-in-training.
 - (C.) For equipment other than tower cranes: The operator's trainer and the operator-in-training must be in direct line of sight of each other. In addition, they must communicate verbally or by hand signals. For tower cranes: The operator's trainer and the operator-in-training must be in direct communication with each other.
 - (D.) The operator-in-training must be monitored by the operator's trainer at all times, except for short breaks where all of the following are met:

- (1.) The break lasts no longer than 15 minutes and there is no more than one break per hour.
- (2.) Immediately prior to the break the operator's trainer informs the operator-in-training of the specific tasks that the operator-in-training is to perform and limitations to which he/she must adhere during the operator trainer's break.
- (3.) The specific tasks that the operator-in-training will perform during the operator trainer's break are within the operator-in-training's abilities.

e. Retraining

The company must provide retraining in relevant topics for each operator when, based on the performance of the operator or an evaluation of the operator's knowledge, there is an indication that retraining is necessary.

3. Operator Certification and Licensing

The company must ensure that each operator is certified or licensed to operate the equipment as follows:

a. Licensing

When a state or local government issues operator licenses for equipment covered under subpart CC, the equipment operator must be licensed by that government entity for operation of equipment within that entity's jurisdiction if that government licensing program meets the following requirements:

- (A.) The requirements for obtaining the license include an assessment, by written and practical tests, of the operator applicant regarding, at a minimum, the knowledge and skills listed in this section.
- (B.) The testing meets industry-recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment, and personnel.
- (C.) The government authority that oversees the licensing department/office has determined that the requirements in this section have been met.
- (D.) The licensing department/office has testing procedures for re-licensing designed to ensure that the operator continues to meet the technical knowledge and skills requirements in this section.
- (E.) For the purposes of compliance with this section, a license is valid for the period of time stipulated by the licensing department/office, but no longer than 5 years.

b. Certification

When an operator is not required to be licensed under this section, the operator must be certified by an Accredited Crane operator Testing Organization (§ 1926.1427(d)) or an Audited Employer Program (§ 1926.1427(e)).

c. No cost to employees

Whenever operator certification/licensure is required under this section, the company must provide the certification/licensure at no cost to employees.

d. Provision of testing and training

A testing entity is permitted to provide training as well as testing services as long as the criteria of the applicable governmental or accrediting agency (in the option selected) for an organization providing both services are met.

4. Certification by an Accredited Crane operator Testing Organization

- a. For a certification to satisfy the requirements of this section, the crane operator testing organization providing the certification must:

- (A.) Be accredited by a nationally recognized accrediting agency based on that agency's determination that industry-recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment, and personnel have been met.
 - (B.) Administer written and practical tests that:
 - (1.) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in this section.
 - (2.) Provide certification based on equipment type, or type and capacity.
 - (C.) Have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified.
 - (D.) Have testing procedures for re-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in this section.
 - (E.) Have its accreditation reviewed by the nationally recognized accrediting agency at least every 3 years.
- b. If no accredited testing agency offers certification examinations for a particular type of equipment, an operator will be deemed to have complied with the certification requirements of this section for that equipment if the operator has been certified for the type that is most similar to that equipment and for which a certification examination is available.
 - c. The operator's certificate must state the type of equipment for which the operator is certified.
 - d. A certification issued under this option is portable among employers who are required to have operators certified under this option.
 - e. A certification issued under this paragraph is valid for 5 years.

5. Audited Employer Program

The certification of employee must meet the following requirements:

- a. The written and practical tests must be either:
 - (A.) Developed by an accredited crane operator testing organization (see paragraph (d) of this section); or
 - (B.) Approved by an auditor in accordance with the following requirements:
 - (1.) The auditor is certified to evaluate such tests by an accredited crane operator testing organization.
 - (2.) The auditor is not an employee of the employer.
 - (3.) The approval must be based on the auditor's determination that the written and practical tests meet nationally recognized test development criteria and are valid and reliable in assessing the operator applicants regarding, at a minimum, the knowledge and skills listed in this section.
 - (4.) The audit must be conducted in accordance with nationally recognized auditing standards.
- b. Administration of tests
 - (A.) The written and practical tests must be administered under circumstances approved by the auditor as meeting nationally recognized test administration standards.
 - (B.) The auditor must be certified to evaluate the administration of the written and practical tests by an accredited crane operator testing organization.

- (C.) The auditor must not be an employee of the employer.
- (D.) The audit must be conducted in accordance with nationally recognized auditing standards.

c. Timing of audit

The employer program must be audited within 3 months of the beginning of the program and at least every 3 years thereafter.

d. Requalification

The employer program must have testing procedures for re-qualification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in this section. The re-qualification procedures must be audited in accordance with this section.

e. Deficiencies

If the auditor determines that there is a significant deficiency ("deficiency") in the program, the company must ensure that:

- (A.) No operator is qualified until the auditor confirms that the deficiency has been corrected.
- (B.) The program is audited again within 180 days of the confirmation that the deficiency was corrected.
- (C.) The auditor files a documented report of the deficiency to the appropriate Regional Office of the Occupational Safety and Health Administration within 15 days of the auditor's determination that there is a deficiency.
- (D.) Records of the audits of the company program are maintained by the auditor for 3 years and are made available by the auditor to the Secretary of Labor or the Secretary's designated representative upon request.

f. Audited-program certificate

A certification under this paragraph is:

- (A.) Not portable: Such a certification meets the requirements of this section only where the operator is employed by (and operating the equipment for) the company that issued the certification.
- (B.) Valid for 5 years.

6. Pre-qualification/certification training period

An employee who is not qualified or certified under this section is permitted to operate equipment only as an operator-in-training and only where the requirements of this paragraph are met.

- a. The company must provide each operator-in-training with sufficient training prior to operating the equipment to enable the operator-in-training to operate the equipment safely under limitations established by this section (including continuous monitoring) and any additional limitations established by the company.
- b. The tasks performed by the operator-in-training while operating the equipment must be within the operator-in-training's ability.
- c. Trainer. While operating the equipment, the operator-in-training must be continuously monitored by an individual ("operator's trainer") who meets all of the following requirements:
 - (A.) The operator's trainer is an employee or agent of the operator-in-training's employer.

- (B.) The operator's trainer is either a certified operator under this section, or has passed the written portion of a certification test under one of the options in paragraphs (b) through (e) of this section, and is familiar with the proper use of the equipment's controls.
- (C.) While monitoring the operator-in-training, the operator's trainer performs no tasks that detract from the trainer's ability to monitor the operator-in-training.
- (D.) For equipment other than tower cranes: The operator's trainer and the operator-in-training must be in direct line of sight of each other. In addition, they must communicate verbally or by hand signals. For tower cranes: The operator's trainer and the operator-in-training must be in direct communication with each other.

d. Continuous monitoring

The operator-in-training must be monitored by the operator's trainer at all times, except for short breaks where all of the following are met:

- (A.) The break lasts no longer than 15 minutes and there is no more than one break per hour.
- (B.) Immediately prior to the break the operator's trainer informs the operator-in-training of the specific tasks that the operator-in-training is to perform and limitations to which he/she must adhere during the operator trainer's break.
- (C.) The specific tasks that the operator-in-training will perform during the operator trainer's break are within the operator-in-training's abilities.

e. The operator-in-training must not operate the equipment in any of the following circumstances unless the exception stated in this section is applicable:

- (A.) 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 within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV.
- (B.) If the equipment is used to hoist personnel.
- (C.) In multiple-equipment lifts.
- (D.) If the equipment is used over a shaft, cofferdam, or in a tank farm.
- (E.) In multiple-lift rigging operations, except where the operator's trainer determines that the operator-in-training skills are sufficient for this high-skill work.

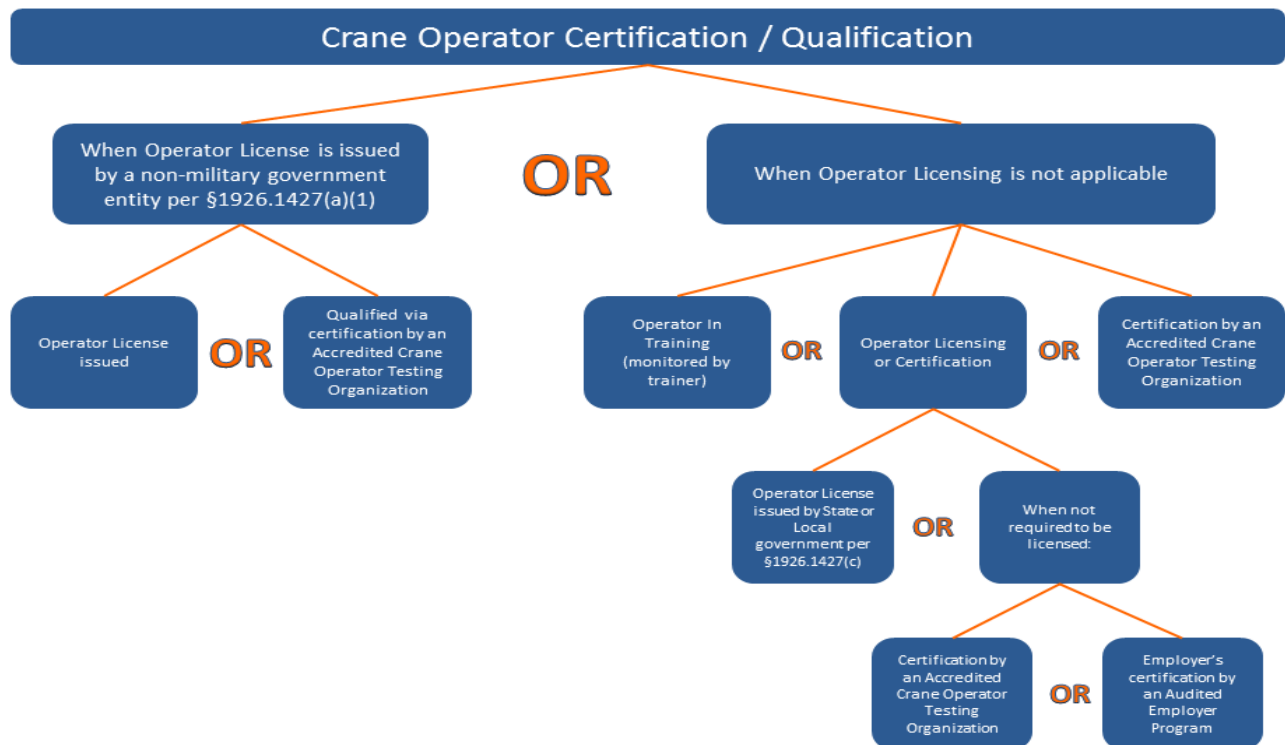
7. Language and literacy requirements.

- a. Tests under this section may be administered verbally, with answers given verbally, where the operator candidate:
 - (A.) Passes a written demonstration of literacy relevant to the work.
 - (B.) Demonstrates the ability to use the type of written manufacturer procedures applicable to the class/type of equipment for which the candidate is seeking certification.
- b. Tests under this section may be administered in any language the operator candidate understands, and the operator's certification documentation must note the language in which the test was given. The operator is only permitted to operate equipment that is furnished with materials required by this subpart, such as operations manuals and load charts that are written in the language of the certification.

8. Certification criteria

Certifications must be based on the following:

- a. A determination through a written test that:
 - (A.) The individual knows the information necessary for safe operation of the specific type of equipment the individual will operate, including all of the following:
 - (1.) The controls and operational/performance characteristics.
 - (2.) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of configurations of the equipment.
 - (3.) Procedures for preventing and responding to power line contact.
 - (4.) Technical knowledge of the subject matter criteria listed in appendix C of this subpart applicable to the specific type of equipment the individual will operate. Use of the appendix C criteria meets the requirements of this provision.
 - (5.) Technical knowledge applicable to the suitability of the supporting ground and surface to handle expected loads, site hazards, and site access.
 - (6.) This subpart, including applicable incorporated materials.
 - (B.) The individual is able to read and locate relevant information in the equipment manual and other materials containing information referred to in paragraph (j)(1)(i) of this section.
- b. A determination through a practical test that the individual has the skills necessary for safe operation of the equipment, including the following:
 - (A.) Ability to recognize, from visual and auditory observation, the items listed in shift inspection.
 - (B.) Operational and maneuvering skills.
 - (C.) Application of load chart information.
 - (D.) Application of safe shut-down and securing procedures.



R. Signal Person Qualifications

1. The company must ensure that each signal person meets the Qualification Requirements prior to giving any signals. This requirement must be met by using either Option (1) or Option (2) of this section.
 - a. 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
 - b. Option (2)--Employer's qualified evaluator

The employer's qualified evaluator assesses the individual and determines that the individual meets the Qualification Requirements and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option is not portable--other employers are not permitted to use it to meet the requirements of this section.
 - c. The company must make the documentation for whichever option is used available at the site while the signal person is employed by the company. The documentation must specify each type of signaling (e.g. hand signals, radio signals, etc.) for which the signal person meets the requirements of this section.
2. If subsequent actions by the signal person indicate that the individual does not meet the Qualification Requirements, the company must not allow the individual to continue working as a signal person until re-training is provided and a re-assessment is made that confirms that the individual meets the Qualification Requirements.
3. Qualification Requirements

Each signal person must:

 - a. 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.
 - b. Be competent in the application of the type of signals used.
 - c. 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.
 - d. Know and understand the relevant requirements of § 1926.1419 through § 1926.1422 and § 1926.1428.
 - e. Demonstrate that he/she meets these requirements through an oral or written test, and through a practical test.

S. Maintenance & Repair Employee Qualifications

Maintenance, inspection and repair personnel are permitted to operate the equipment only where all of the following requirements are met:

1. The operation is limited to those functions necessary to perform maintenance, inspect the equipment, or verify its performance.
2. The personnel either:
 - a. Operate the equipment under the direct supervision of a qualified and certified operator; or
 - b. Are familiar with the operation, limitations, characteristics and hazards associated with the type of equipment.
3. Maintenance and repair personnel must meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed.

T. Training

The company must provide training as follows:

1. Overhead powerlines per § 1926.1408(g)
2. Signal persons

Employee who will be assigned to work as a signal persons who do not meet the requirements of § 1926.1428(c) shall be trained in the areas addressed in that paragraph.

3. Operators

- a. Each operator shall be trained in accordance with § 1926.1427(a) and (b), on the safe operation of the equipment the operator will be using.
- b. The company must train each operator covered under the exception of § 1926.1427(a)(2) on the safe operation of the equipment the operator will be using.
- c. The company must train each operator of the equipment covered by this subpart in the following practices:
 - (A.) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist brake needs to be adjusted. On other types of equipment with a boom, 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. See § 1926.1417(f) and (j) for additional requirements.
 - (B.) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.

4. Competent persons and qualified persons

Each competent person and each qualified person shall be trained with regard to the requirements of this subpart applicable to their respective roles.

5. Crush/pinch points

Each employee who works with the equipment shall be trained to keep clear of holes, and crush/pinch points and the hazards addressed in § 1926.1424 (Work area control).

6. Tag-out

Each operator and each additional employee authorized to start/energize equipment or operate equipment controls (such as maintenance and repair employees), shall be trained in the tag-out and start-up procedures in § 1926.1417(f) and (g).

7. Training administration

- a. Each employee required to be trained under this subpart shall be evaluated to confirm that the employee understands the information provided in the training.
- b. Refresher training in relevant topics shall be provided for each employee when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary.
- c. Whenever training is required under subpart CC, the training shall be provided at no cost to the employee.

U. Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less

The following paragraphs of this section specify requirements when using equipment with a maximum rated hoisting/lifting capacity of 2,000 pounds or less.

1. When using this equipment, the company must comply with the following provisions of this subpart: § 1926.1400-1403; 1406-1411; 1412(c); 1413-1414; 1418-1423; 1425 (except for § 1926.1425(c)(3)); 1426; 1432; and 1434-1438.
2. Assembly/disassembly
 - a. Components and configuration

The company must ensure that:

 - (A.) The selection of components, and the configuration of the equipment, that affect the capacity or safe operation of the equipment complies with either the:
 - (1.) Manufacturer instructions, recommendations, limitations, and specifications. When these documents and information are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or
 - (2.) Approved modifications that meet the requirements of § 1926.1434.
 - (B.) Post-assembly inspection. Upon completion of assembly, the equipment is inspected to ensure that it is in compliance with this section.
 - b. Manufacturer prohibitions

The company must comply with applicable manufacturer prohibitions.
3. Operation--procedures
 - a. The company must comply with all manufacturer procedures applicable to the operational functions of the equipment, including its use with attachments.
 - b. Unavailable operation procedures

The company must:

 - (A.) When the manufacturer's procedures are unavailable, develop, and ensure compliance with, all procedures necessary for the safe operation of the equipment and attachments.
 - (B.) Ensure that procedures for the operational controls are developed by a qualified person.
 - (C.) Ensure that procedures related to the capacity of the equipment are developed and signed by a registered professional engineer familiar with the equipment.
 - c. Accessibility

The company must ensure that:

 - (A.) The load chart is available to the operator at the control station;
 - (B.) Procedures applicable to the operation of the equipment, recommended operating speeds, special hazard warnings, instructions, and operator's manual are readily available for use by the operator.
 - (C.) When rated capacities are available at the control station only in electronic form and a failure occurs that makes the rated capacities inaccessible, the operator immediately ceases operations or follows safe shut-down procedures until the rated capacities (in electronic or other form) are available.
4. Safety devices and operational aids
 - a. The company must ensure that safety devices and operational aids that are part of the original equipment are maintained in accordance with manufacturer procedures.
 - b. Anti two-blocking

The company must ensure that equipment covered by this section manufactured more than one year after November 8, 2010 have either an anti two-block device that meets the requirements of § 1926.1416(d)(3), or is designed so that, in the event of a two-block situation, no damage or load failure will occur (for example, by using a power unit that stalls in response to a two-block situation).

5. The company must train each operator, prior to operating the equipment, on the safe operation of the type of equipment the operator will be using.
6. The company must train each signal person in the proper use of signals applicable to the use of the equipment.
7. The company must ensure that equipment is inspected in accordance with manufacturer procedures.
8. The company must ensure that equipment covered by this section is not used to hoist personnel.
9. The company must ensure that the equipment is designed by a qualified engineer.

Appendix 1 – Cranes & Rigging Standard Hand Signals



Hoist



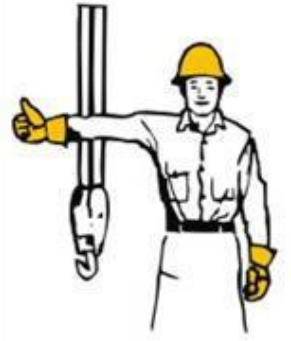
Lower



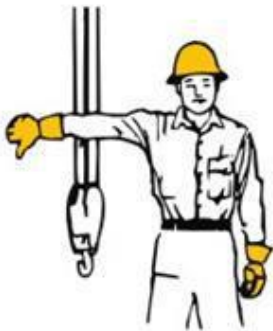
Use Main Hoist



Use Whipline



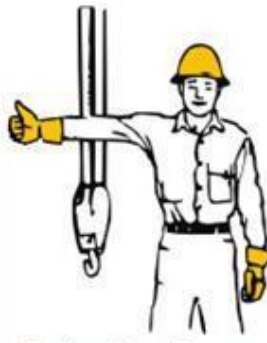
Raise Boom



Lower Boom



Move Slowly



**Raise the Boom
Lower the Load**



**Lower the Boom
Raise the Load**



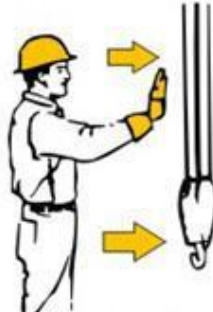
Swing



Stop



Emergency Stop



Travel



Dog Everything



**Travel
(Both Tracks)**



**Travel
(One Track)**



Extend Boom



Retract Boom



**Extend Boom
(One Hand)**



**Retract Boom
(One Hand)**

Safety Specifics – **Electrical Safety (29 CFR 1926.402-408, 416-417)**

A. General Requirements

Note: *This section addresses electrical safety requirements that are necessary for the practical safeguarding of employees in their workplaces with regard to safety-related work practices.*

1. In addition to covering the hazards arising from the use of electricity at jobsites, these regulations also cover the hazards arising from the accidental contact, direct or indirect, by employees with all energized lines, above or below ground, passing through or near the jobsite.
2. Protection of Employees
 - a. No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by deenergizing the circuit and grounding it or by guarding it effectively by insulation or other means.
 - b. In work areas where the exact location of underground electric powerlines is unknown, employees using jack-hammers, bars, or other hand tools which may contact a line shall be provided with insulated protective gloves.
 - c. Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit.
 - (A.) The employer shall post and maintain proper warning signs where such a circuit exists.
 - (B.) The employer shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.
3. Passageways & Open spaces
 - a. Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.
 - b. Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a hazard to employees.
4. In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.
5. When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.
6. Cords and cables.
 - a. Worn or frayed electric cords or cables shall not be used.
 - b. Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

B. Lockout and tagging of circuits

1. Controls that are to be deactivated during the course of work on energized or deenergized equipment or circuits shall be tagged.
2. Equipment or circuits that are deenergized shall be rendered inoperative and shall have tags attached at all points where such equipment or circuits can be energized.
3. Tags shall be placed to identify plainly the equipment or circuits being worked on.

C. Installation Safety Requirements

1. Covered

- a. Installation safety requirements for electrical equipment and installations used to provide electric power and light at the jobsite, both temporary and permanent
- b. Portable and vehicle-mounted generators used to provide power for equipment used at the jobsite.

2. Not Covered

- a. Existing permanent installations that were in place before the construction activity commenced.
- b. Installations used for the generation, transmission, and distribution of electric energy, including related communication, metering, control, and transformation installations.

3. Requirements

- a. All electrical conductors and equipment shall be approved.
- b. The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees.
- c. Listed, labeled, or certified equipment shall be installed and used in accordance with instructions included in the listing, labeling, or certification.
- d. Equipment intended to break current shall have an interrupting rating at system voltage sufficient for the current that must be interrupted.
- e. 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.
- f. Electrical equipment which depends upon the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room air flow over such surfaces is not prevented by walls or by adjacent installed equipment. For equipment designed for floor mounting, clearance between top surfaces and adjacent surfaces shall be provided to dissipate rising warm air. Electrical equipment provided with ventilating openings shall be installed so that walls or other obstructions do not prevent the free circulation of air through the equipment.
- g. Conductors shall be spliced or joined with splicing devices designed for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device designed for the purpose.
- h. Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.
- i. Electrical equipment shall not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment and unless other markings are provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

4. Identification of disconnecting means & circuits

- a. Each disconnecting means required by this subpart for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and

arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

b. 600 Volts, nominal, or less

(A.) Working Space around electric equipment

- (1.) Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.
- (2.) The dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive shall not be less than indicated in Table K-1.

Table K-1

Nominal voltage to ground	Minimum clear distance for conditions (1)		
	(a)	(b)	(c)
	Feet (2)	Feet (2)	Feet (2)
0 - 150	3	3	3
151 - 600	3	3-1/2	4

Footnote(1) Conditions (a), (b), and (c) are as follows: [a] Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. [b] Exposed live parts on one side and grounded parts on the other side. [c] Exposed live parts on both sides of the workplace [not guarded as provided in Condition (a)] with the operator between.

Footnote(2) Note: For International System of Units (SI): one foot=0.3048m.

- (3.) In addition to the dimensions shown, workspace shall not be less than 30 inches (762 mm) wide in front of the electric equipment.
- (4.) Distances shall be measured from the live parts if they are exposed or from the enclosure front or opening if the live parts are enclosed.
- (5.) Walls constructed of concrete, brick, or tiles are considered to be grounded.
- (6.) Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.
- (7.) Working space required shall not be used for storage.
- (8.) When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be guarded.
- (9.) At least one entrance shall be provided to give access to the working space about electric equipment.
- (10.) Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet (914 mm).
- (11.) The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6 feet 3 inches (1.91 m).

(B.) Guarding of live parts

- (1.) Live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

- (a.) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.
 - (b.) By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.
 - (c.) By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.
 - (d.) By elevation of 8 feet (2.44 m) or more above the floor or other working surface and so installed as to exclude unqualified persons.
- (2.) In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.
 - (3.) Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.
- c. Over 600 Volts, nominal
- (A.) Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are considered to be accessible to qualified persons only. A wall, screen, or fence less than 8 feet (2.44 m) in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8-foot (2.44-m) fence.
 - (B.) 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.
 - (C.) Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the applicable provisions of this section.
 - (D.) Installations accessible to unqualified persons
 - (1.) Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock.
 - (2.) Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs.
 - (3.) If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage.
 - (4.) Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.
 - (E.) Workspace about equipment
 - (1.) Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment.
 - (2.) Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches (1.98 m) high (measured vertically from the floor

or platform), or less than 3 feet (914 mm) wide (measured parallel to the equipment).

- (3.) The depth shall be as required in Table K-2. The workspace shall be adequate to permit at least a 90-degree opening of doors or hinged panels.

Table K-2

Nominal voltage to ground	Conditions (1)		
	(a)	(b)	(c)
	Feet (2)	Feet (2)	Feet (2)
601 – 2,500	3	4	5
2,501 – 9,000	4	5	6
9,001 – 25,000	5	6	9
25,001 – 75 kV	6	8	10
Above 75 kV	8	10	12

Footnote(1) Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or tile are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace [not guarded as provided in Condition (a)] with the operator between.

Footnote(2) NOTE: For SI units: one foot=0.3048 m.

- (4.) The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in Table K-2 unless otherwise specified in this section.
- (5.) Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back.
- (6.) Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of 30 inches (762 mm) horizontally shall be provided.
- (7.) At least one entrance not less than 24 inches (610 mm) wide and 6 feet 6 inches (1.98 m) high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches (1.22 m) in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to such entrance, they shall be guarded.

D. Wiring Design & Protection

1. Grounded & Grounding conductors

- a. A conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors. A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

- b. No grounded conductor shall be attached to any terminal or lead so as to reverse designated polarity.
- c. A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug shall not be used for purposes other than grounding.

2. Ground Fault Protection

- a. The company will use ground fault circuit interrupters or assured equipment grounding conductor program to protect employees on the job site. These requirements are in addition to any other requirements for equipment grounding conductors.
- b. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection.
- c. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.
- d. Ground Fault Protection Program
 - (A.) The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:
 - (B.) A written description of the program, including the specific procedures adopted by the employer, shall be available at the jobsite for inspection and copying.
 - (C.) The employer shall designate one or more competent persons to implement the program.
 - (D.) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.
 - (E.) The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:
 - (1.) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.
 - (2.) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.
 - (F.) All required tests shall be performed:
 - (1.) Before first use
 - (2.) Before equipment is returned to service following any repairs
 - (3.) Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over)

- (4.) At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months
- (G.) The employer shall not make available or permit the use by employees of any equipment which has not met the requirements of this section.
- (H.) Tests performed shall be recorded. This test record shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection.
- e. Outlet devices shall have an ampere rating not less than the load to be served and shall comply with the following:
 - (A.) A single receptacle installed on an individual branch circuit shall have an ampere rating of not less than that of the branch circuit.
 - (B.) Where connected to a branch circuit supplying two or more receptacles or outlets, receptacle ratings shall conform to the values listed in Table K-4.

Table K-4 – Receptacle Ratings for Various Size Circuits

Circuit Rating Amperes	Receptacle Rating Amperes
15	Not over 15
20	15 or 20
30	30
40	40 or 50
50	50

- (C.) The rating of an attachment plug or receptacle used for cord- and plug-connection of a motor to a branch circuit shall not exceed 15 amperes at 125 volts or 10 amperes at 250 volts if individual overload protection is omitted.
- f. Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.
- g. Disconnecting for service
 - (A.) Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.
 - (B.) If over 600 volts, nominal
 - (1.) Service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.
 - (2.) Signs warning of high voltage shall be posted where unauthorized employees might come in contact with live parts.
- h. Overcurrent protection
 - (A.) 600 volts, nominal, or less. The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

- (1.) Conductors and equipment shall be protected from overcurrent in accordance with their ability to safely conduct current. Conductors shall have sufficient ampacity to carry the load.
 - (2.) Except for motor-running overload protection, overcurrent devices shall not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.
 - (3.) Except for devices provided for current-limiting on the supply side of the service disconnecting means, all cartridge fuses which are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means. This disconnecting means shall be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.
 - (4.) Overcurrent devices shall be readily accessible. Overcurrent devices shall not be located where they could create an employee safety hazard by being exposed to physical damage or located in the vicinity of easily ignitable material.
 - (5.) Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise injured by their operation.
 - (6.) Circuit breakers
 - (a.) Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.
 - (b.) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position.
 - (c.) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers shall be marked "SWD."
- (B.) Over 600 volts, nominal. Feeders and branch circuits over 600 volts, nominal, shall have short-circuit protection.
- i. Grounding for systems, circuits & equipment
- (A.) The following systems which supply premises wiring shall be grounded:
- (1.) Three-wire DC systems. All 3-wire DC systems shall have their neutral conductor grounded.
 - (2.) Two-wire DC systems. Two-wire DC systems operating at over 50 volts through 300 volts between conductors shall be grounded unless they are rectifier-derived from an AC system complying with this section.
 - (3.) AC circuits, less than 50 volts. AC circuits of less than 50 volts shall be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.
 - (4.) AC systems, 50 volts to 1000 volts. AC systems of 50 volts to 1000 volts shall be grounded under any of the following conditions, unless exempted by this section:
 - (a.) If the system can be so grounded that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts;
 - (b.) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

- (c.) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or
 - (d.) If a service conductor is uninsulated.
- (5.) Exceptions. AC systems of 50 volts to 1000 volts are not required to be grounded if the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, provided all of the following conditions are met:
- (a.) The system is used exclusively for control circuits,
 - (b.) The conditions of maintenance and supervision assure that only qualified persons will service the installation,
 - (c.) Continuity of control power is required, and
 - (d.) Ground detectors are installed on the control system.
- (B.) Portable and vehicle-mounted generators
- (1.) Under the following conditions, the frame of a portable generator need not be grounded and may serve as the grounding electrode for a system supplied by the generator:
 - (a.) The generator supplies only equipment mounted on the generator and/or cord- and plug-connected equipment through receptacles mounted on the generator, and
 - (b.) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.
 - (2.) Under the following conditions the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:
 - (a.) The frame of the generator is bonded to the vehicle frame, and
 - (b.) The generator supplies only equipment located on the vehicle and/or cord- and plug-connected equipment through receptacles mounted on the vehicle or on the generator, and
 - (c.) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame, and
 - (d.) The system complies with all other provisions of this section.
 - (3.) Neutral conductor bonding. A neutral conductor shall be bonded to the generator frame if the generator is a component of a separately derived system. No other conductor need be bonded to the generator frame.
- (C.) For AC premises wiring systems the identified conductor shall be grounded.
- (D.) Grounding connections
- (1.) For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

- (2.) For an ungrounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.
- (E.) The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.
- (F.) Supports, enclosures, and equipment
- (1.) Metal enclosures for service equipment shall be grounded.
- (2.) Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:
- (a.) If within 8 feet (2.44 m) vertically or 5 feet (1.52 m) horizontally of ground or grounded metal objects and subject to employee contact.
 - (b.) If located in a wet or damp location and subject to employee contact.
 - (c.) If in electrical contact with metal.
 - (d.) If in a hazardous (classified) location.
 - (e.) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method.
 - (f.) If equipment operates with any terminal at over 150 volts to ground; however, the following need not be grounded:
 - Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;
 - Metal frames of electrically heated appliances which are permanently and effectively insulated from ground; and
 - The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet (2.44 m) above ground or grade level.
- (3.) Exposed noncurrent-carrying metal parts of cord- and plug-connected equipment which may become energized shall be grounded in the following conditions:
- (a.) If in a hazardous (classified) location.
 - (b.) If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.
 - (c.) Unless exempted:
 - Hand held motor-operated tools;
 - Cord- and plug-connected equipment used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;
 - Portable and mobile X-ray and associated equipment;
 - Tools likely to be used in wet and/or conductive locations;
 - Portable hand lamps.

(d.) Exemptions: Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.

(4.) The metal parts of the following nonelectrical equipment shall be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand-operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over 1kV between conductors.

j. Methods of grounding

- (A.) Noncurrent-carrying metal parts of fixed equipment, if required to be grounded, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.
- (B.) A conductor used for grounding fixed or movable equipment shall have capacity to conduct safely any fault current which may be imposed on it.
- (C.) Electric equipment is considered to be effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment in paragraph (f)(8)(i) of this section. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

E. Wiring methods, components, and equipment

1. General

- a. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.
- b. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type shall be installed in any duct used for vapor removal or in any shaft containing only such ducts.

2. Temporary Wiring

- a. Temporary wiring shall be removed immediately upon completion of construction or the purpose for which the wiring was installed.
- b. Feeders shall originate in a distribution center. The conductors shall be run as multiconductor cord or cable assemblies or within raceways; or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet (3.05 m) apart.
- c. Branch circuits shall originate in a power outlet or panelboard. Conductors shall be run as multiconductor cord or cable assemblies or open conductors, or shall be run in raceways. All conductors shall be protected by overcurrent devices at their ampacity. Runs of open conductors shall be located where the conductors will not be subject to physical damage, and the conductors shall be fastened at intervals not exceeding 10 feet (3.05 m). No

branch-circuit conductors shall be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment shall contain a separate equipment grounding conductor if the branch circuit is run as open conductors.

- d. Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor, and all receptacles shall be electrically connected to the grounding conductor. Receptacles for uses other than temporary lighting shall not be installed on branch circuits which supply temporary lighting. Receptacles shall not be connected to the same ungrounded conductor of multiwire circuits which supply temporary lighting.
- e. Disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.
- f. All lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.
- g. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension.
- h. Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.
- i. A box shall be used wherever a change is made to a raceway system or a cable system which is metal clad or metal sheathed.
- j. Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points, if protection is provided to avoid damage.
- k. Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage.

NOTE: The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400-4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).

- l. For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

3. Cabinets, boxes, and fittings

- a. Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.
- b. All pull boxes, junction boxes, and fittings shall be provided with covers. If metal covers are used, they shall be grounded. In energized installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.
- c. In addition to other requirements in this section for pull and junction boxes, the following shall apply to these boxes for systems over 600 volts, nominal:
 - (A.) Boxes shall provide a complete enclosure for the contained conductors or cables.
 - (B.) Boxes shall be closed by covers securely fastened in place. Underground box covers that weigh over 100 pounds (43.6 kg) meet this requirement. Covers for boxes shall be permanently marked "HIGH VOLTAGE." The marking shall be on the outside of the box cover and shall be readily visible and legible.

4. Knife switches

Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be so placed that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical, a locking device shall be provided to ensure that the blades remain in the open position when so set.

5. Switchboards and panelboards

Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to qualified persons. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures designed for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches shall be dead when open.

6. Enclosures for damp or wet locations.

- a. Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures shall be weatherproof.
- b. Switches, circuit breakers, and switchboards installed in wet locations shall be enclosed in weatherproof enclosures.

7. Conductors for general wiring

All conductors used for general wiring shall be insulated unless otherwise permitted in this Subpart. The conductor insulation shall be of a type that is suitable for the voltage, operating temperature, and location of use. Insulated conductors shall be distinguishable by appropriate color or other means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

8. Flexible cords and cables

- a. Permitted uses. Flexible cords and cables shall be suitable for conditions of use and location. Flexible cords and cables shall be used only for:
 - (A.) Pendants
 - (B.) Wiring of fixtures
 - (C.) Connection of portable lamps or appliances
 - (D.) Elevator cables
 - (E.) Wiring of cranes and hoists
 - (F.) Connection of stationary equipment to facilitate their frequent interchange
 - (G.) Prevention of the transmission of noise or vibration
 - (H.) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair
- b. If used as permitted, the flexible cord shall be equipped with an attachment plug and shall be energized from a receptacle outlet.
- c. Prohibited uses. Flexible cords and cables shall not be used:
 - (A.) As a substitute for the fixed wiring of a structure
 - (B.) Where run through holes in walls, ceilings, or floors
 - (C.) Where run through doorways, windows, or similar openings, except as permitted

- (D.) Where attached to building surfaces
 - (E.) Where concealed behind building walls, ceilings, or floors
 - d. Flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.
 - e. Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.
 - f. Flexible cords and cables shall be protected by bushings or fittings where passing through holes in covers, outlet boxes, or similar enclosures.
9. Portable cables over 600 volts, nominal

Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2000 volts shall be shielded for the purpose of confining the voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables shall not be operated with splices unless the splices are of the permanent molded, vulcanized, or other equivalent type. Termination enclosures shall be marked with a high voltage hazard warning, and terminations shall be accessible only to authorized and qualified personnel.

10. Fixture wires

- a. Fixture wires shall be suitable for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be identified.
- b. Fixture wires may be used:
 - (A.) For installation in lighting, fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use
 - (B.) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures
- c. Fixture wires shall not be used as branch-circuit conductors except as permitted for Class 1 power-limited circuits.

11. Equipment for general use

- a. Lighting fixtures, lampholders, lamps, and receptacles
 - (A.) Fixtures, lampholders, lamps, rosettes, and receptacles shall have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet (2.44 m) above the floor may have exposed parts.
 - (B.) Fixtures, lampholders, rosettes, and receptacles shall be securely supported. A fixture that weighs more than 6 pounds (2.72 kg) or exceeds 16 inches (406 mm) in any dimension shall not be supported by the screw shell of a lampholder.
 - (C.) Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall be identified and attached to the screw shell and the identified blade of the attachment plug. In addition, portable handlamps shall comply with the following:
 - (1.) Metal shell, paperlined lampholders shall not be used
 - (2.) Handlamps shall be equipped with a handle of molded composition or other insulating material

- (3.) Handlamps shall be equipped with a substantial guard attached to the lampholder or handle
 - (4.) Metallic guards shall be grounded by the means of an equipment grounding conductor run within the power supply cord
 - (D.) Lampholders of the screw-shell type shall be installed for use as lampholders only. Lampholders installed in wet or damp locations shall be of the weatherproof type.
 - (E.) Fixtures installed in wet or damp locations shall be identified for the purpose and shall be installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.
- b. Receptacles, cord connectors, and attachment plugs (caps)
- (A.) Receptacles, cord connectors, and attachment plugs shall be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating. Receptacles connected to circuits having different voltages, frequencies, or types of current (ac or dc) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.
 - (B.) A receptacle installed in a wet or damp location shall be designed for the location.
- c. Appliances
- (A.) Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, shall have no live parts normally exposed to employee contact.
 - (B.) A means shall be provided to disconnect each appliance.
 - (C.) Each appliance shall be marked with its rating in volts and amperes or volts and watts.
- d. Motors
- (A.) This paragraph applies to motors, motor circuits, and controllers.
 - (B.) In sight from. If specified that one piece of equipment shall be in sight from another piece of equipment, one shall be visible and not more than 50 feet (15.2 m) from the other.
 - (C.) Disconnecting means -
 - (1.) A disconnecting means shall be located in sight from the controller location. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.
 - (2.) The disconnecting means shall disconnect the motor and the controller from all ungrounded supply conductors and shall be so designed that no pole can be operated independently.
 - (3.) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:
 - (a.) The controller disconnecting means shall be capable of being locked in the open position.
 - (b.) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

- (4.) The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.
- (5.) The disconnecting means shall be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.
- (6.) An individual disconnecting means shall be provided for each motor, but a single disconnecting means may be used for a group of motors under any one of the following conditions:
 - (a.) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist;
 - (b.) If a group of motors is under the protection of one set of branch-circuit protective devices; or
 - (c.) If a group of motors is in a single room in sight from the location of the disconnecting means.

(D.) Motor overload, short-circuit, and ground-fault protection

Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions do not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(E.) Protection of live parts-all voltages

- (1.) Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following:
 - (a.) By installation in a room or enclosure that is accessible only to qualified persons;
 - (b.) By installation on a balcony, gallery, or platform, so elevated and arranged as to exclude unqualified persons; or
 - (c.) By elevation 8 feet (2.44 m) or more above the floor.
- (2.) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, insulating mats or platforms shall be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

e. Transformers

- (A.) The following paragraphs cover the installation of all transformers, except:
 - (1.) Current transformers;
 - (2.) Dry-type transformers installed as a component part of other apparatus;
 - (3.) Transformers which are an integral part of an X-ray, high frequency, or electrostatic-coating apparatus;

- (4.) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits.
 - (B.) The operating voltage of exposed live parts of transformer installations shall be indicated by warning signs or visible markings on the equipment or structure.
 - (C.) Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35 kV shall be in a vault.
 - (D.) If they present a fire hazard to employees, oil-insulated transformers installed indoors shall be in a vault.
 - (E.) Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires which may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.
 - (F.) Transformer vaults shall be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches shall be so arranged that a vault door can be readily opened from the inside.
 - (G.) Any pipe or duct system foreign to the vault installation shall not enter or pass through a transformer vault.
 - (H.) Materials shall not be stored in transformer vaults.
- f. Capacitors
- (A.) Drainage of stored charge. All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, shall be provided with an automatic means of draining the stored charge and maintaining the discharged state after the capacitor is disconnected from its source of supply.
 - (B.) Over 600 volts. Capacitors rated over 600 volts, nominal, shall comply with the following additional requirements:
 - (1.) Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed caution signs to prevent switching load current.
 - (2.) For series capacitors the proper switching shall be assured by use of at least one of the following:
 - (a.) Mechanically sequenced isolating and bypass switches
 - (b.) Interlocks
 - (c.) Switching procedure prominently displayed at the switching location

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Safety Specifics – Excavations & Trenching (29 CFR 1926.650)

A. Policy

Employees shall not enter a trench or excavation unless it is absolutely necessary. If entry is to be made into a trench or excavation greater than four (4) feet deep, specific precautions detailed in this procedure must be taken. Excavation work activities shall be conducted safely with associated exposures eliminated and/or controlled.

B. Risk Assessment

1. A Competent Person shall prepare a Site Safety Plan and follow Subsurface Investigation procedure prior to and during excavation work activities to assess the identifiable hazards associated with work areas, occupations, and tasks.
2. Company associates, in accordance with OSHA, require that a competent person be on site during trenching/excavation activity or employee entry into the trench or excavation.
3. A competent person must have the following qualifications:
 - a. Be able to identify and predict trenching/excavation hazards.
 - b. Have authority to eliminate hazards and stop work if necessary.
 - c. Understand, implement, and meet the requirements of the standard.
 - d. Be able to evaluate shoring systems.
 - e. Be able to perform soil classification tests.

C. Work Plan (> 5 Ft. in depth)

1. A Competent Person shall develop a work plan for every excavation exceeding five feet in depth based on the Site Safety Plan, Subsurface Investigation and the other requirements of this section.
2. The Excavation Work Safety Plan shall include:
 - a. Identification of hazard in the work area related to excavation equipment
 - b. Describe the excavation protection system(s) to be provided
 - c. Describe the soil type and the correct procedures for the selection, fit, use and maintenance of the excavation protection systems
 - d. Describe procedures for excavation
 - e. Describe the method of prompt, safe removal of injured workers
 - f. Be available on the job site
 - g. Signature of the Competent Person

D. Training

1. Initial training of employees shall occur during orientation for employees who foreseeably will be engaged in excavation work. Hazard recognition and excavation protection systems shall be included in the training
2. Site specific training shall occur before the start of excavation work activities, including hazards and controls noted in the Site Safety Plan and the other provisions of the written plan.

E. Inspections

1. When employee exposure in an excavation is reasonably anticipated, an inspection shall be conducted by a Competent Person:
2. Prior to the start of work each day
3. As needed throughout the shift
4. After every rainstorm or water accumulation
5. When an unusual occurrence affects the integrity of the excavation

Note: Where 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 shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

F. Personal Protective Equipment

Minimum Personal Protective Equipment shall consist of:

1. Approved Hardhats
2. Approved Safety Glasses
3. Approved Safety-toe Boots
4. If exposed to vehicular traffic, employees shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of high-visibility material (and be reflective if working in dim light or at night)

G. Specific engineering control options

1. Excavation protection system configurations that require development by a Registered Professional Engineer (RPE)
 - a. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with 1926.652(b) and (c).
 - b. RPE designs shall be in written form and will include at least the following:
 - (A.) The protective system configurations that were determined to be safe for the particular project
 - (B.) The identity of the RPE approving the design
 - c. At least one copy of the design shall be maintained at the jobsite.

2. Sloping and Benching Systems (excavation depth > 5 ft., < 20 ft.)

Note: Suitable sloping or benching shall occur at >4 feet in depth for unstable soil (Type C).

- a. General
 - (A.) Employees shall 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.
- b. Classifying Soil
 - (A.) Soil and rock deposits shall be classified in accordance with Section I. Classifying Soil of this requested program.

c. Maximum allowable slope

- (A.) The maximum allowable slope for a soil or rock deposit shall be determined from Table B below

**Table B-1
Maximum Allowable Slopes**

Soil or rock type	Max allowable slopes (H:V) (1) for excavations < 20 feet deep (3)
Stable Rock	Vertical (90°)
Type A (2)	3/4:1 (53°)
Type B	1:1 (45°)
Type C	1 ½:1 (34°)
<p><i>Footnote(1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.</i></p> <p><i>Footnote(2) A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).</i></p> <p><i>Footnote(3) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.</i></p>	

- (B.) The actual slope shall not be steeper than the maximum allowable slope
- (C.) When additional weight loads to the system are present from stored material or equipment, operating equipment, or traffic, a Competent Person shall determine the degree to which the slope must be reduced below the maximum allowable slope, and will assure that such reduction is achieved.

3. Support and Shielding Systems (excavation depth > 5 ft., < 20 ft.)

a. General

- (A.) Installation of a support system shall be closely coordinated with the excavation of trenches.
- (B.) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.
- (C.) Employees shall not be allowed in shield systems when shields are being installed, removed, or moved vertically.
- (D.) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields. This means that the access and egress methods shall be included from within the protection of the shielding system.
- (E.) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

b. Materials and equipment.

- (A.) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.
- (B.) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer.
- (C.) When material or equipment that is used for protective systems is damaged, a Competent Person shall examine the material or equipment 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 shall be removed from service. Manufactured material or equipment, in this case, shall be evaluated and approved by the manufacturer or a Registered Professional Engineer before being returned to service.

4. Installation and removal of support

- a. Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.
- b. Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.
- c. Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.
- d. Before temporary removal of individual members 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.
- e. 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.
- f. Backfilling shall progress together with the removal of support systems from excavations.

H. Specific Excavation Hazard Controls

1. Underground Installations

- a. Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the work may proceed, provided the employees do so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.
- b. When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.
- c. While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

2. Warning system for mobile equipment

When mobile equipment is operated adjacent 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 shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

3. Employee Protection

- a. Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals

as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

- b. Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.
- c. Exposure to Falling Loads
 - (A.) Whether inside or outside of an excavation, no employee shall be permitted underneath a load being handled by lifting or digging equipment.
 - (B.) Employees shall stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.
 - (C.) Operators of such vehicles may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

4. Inspections

- a. Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.
- b. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift.
- c. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.
- d. Where 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 shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

5. Access and Egress

- a. Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a Competent Person.
- b. Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.
- c. Structural members used for ramps and runways shall be of uniform thickness.
- d. Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.
- e. Structural ramps used in lieu of steps shall be provided with cleats or other surface treatment on the top surface to prevent slipping.
- f. A means of egress from trench excavations shall always be maintained. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

6. Hazardous Atmospheres

- a. Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.
- b. Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

7. Water Accumulation

- a. Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.

The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.
- b. If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.
- c. If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.

8. Fall protection

- a. If employees or equipment are required to cross over excavations, walkways or bridges with standard guardrails shall be provided.
- b. Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a full-body harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.
- c. Excavations shall be barricaded to prevent employees and others from falling into them. The edge of an excavation 6 feet (1.8 m) or more in depth shall be protected from falling by guardrail systems, fences, barricades, or covers.

I. Classifying Soils

1. Classification of soil and rock deposits

- a. Each soil and rock deposit shall be classified by a Competent Person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions detailed in 1926.Subpart P Appendix A.
- b. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a Competent Person using tests described within this section.
- c. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

- d. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a Competent Person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

2. Acceptable visual and manual tests

a. Visual tests

- (A.) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.
- (B.) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.
- (C.) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil fall off a vertical side, the soil could be fissured. Small falls are evidence of moving ground and are indications of potentially hazardous situations.
- (D.) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.
- (E.) Observe the opened side of the excavation to identify layered systems.
- (F.) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.
- (G.) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

b. Manual tests

(A.) Plasticity

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 for a length of at least 2 inches. Cohesive material can be successfully rolled into threads without crumbling.

(B.) Dry strength

If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps that break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered un-fissured.

(C.) Thumb penetration

- (1.) The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure.

- (2.) This test shall be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences.
- (3.) If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(D.) Other strength tests

Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shear vane.

(E.) Drying test

- (1.) The basic purpose of the drying test is to differentiate between cohesive material with fissures, un-fissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry, then:
 - (2.) If the sample develops cracks as it dries, significant fissures are indicated
 - (3.) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an un-fissured cohesive material and the unconfined compressive strength shall be determined
 - (4.) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular

Safety Specifics – Fall Protection (29 CFR 1926 Subpart M)

A. Duty to Have Fall Protection

1. The employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.
2. Each employee on a walking/working surface (horizontal and vertical surface – including ramps, runways and other walkways) with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems as detailed in 29 CFR 1926.502.
3. Employers shall provide and install all fall protection systems required for an employee, and shall comply with all other pertinent requirements before that employee begins the work that necessitates the fall protection. This includes employees who are:
 - a. Constructing a leading edge 6 feet (1.8 m) or more above lower levels
 - b. 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
 - c. In a hoist area where there is risk of falling 6 feet (1.8 m) or more to lower levels
 - d. On walking/working surfaces that has holes (including skylights)
 - e. On the face of formwork or reinforcing steel
 - f. At the edge of an excavation 6 feet (1.8 m) or more in depth
 - g. Working at ANY height over dangerous equipment

B. Fall Protection Selection

1. Providing fall protection requires an assessment of each fall situation at a given jobsite:
 - a. Inspect the area to determine what hazards exist or may arise
 - b. Identify the hazards and select the appropriate measures and equipment
 - c. Give specific and appropriate instructions to workers to prevent exposure to unsafe conditions
 - d. Ensure employees follow procedures given and understand training provided
 - e. Apprise ourselves of the steps our specialty subcontractors have taken to meet their fall protection requirements
2. When selecting and purchasing fall protection equipment and supplies, they shall be approved for the purpose for which they are intended.
3. All fall protection systems selected for each application will be installed before an employee is allowed to go to work in an area that necessitates the protection.

C. Personal Fall Arrest Systems (PFAS)

1. The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.
2. 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.
3. Personal fall arrest systems, when stopping a fall, shall:

- a. Limit maximum arresting force on an employee to 1,800 pounds (8 kN)
 - b. Be rigged such that an employee can neither free fall more than 6 feet (1.8 m), nor contact any lower level
 - c. Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 m)
 - d. Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 m), or the free fall distance permitted by the system, whichever is less
4. Connecting / Anchoring
- a. Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists.
 - b. Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2 kN) per employee attached, or shall be designed, installed, and used as follows:
 - (A.) As part of a complete personal fall arrest system which maintains a safety factor of at least two
 - (B.) Under the supervision of a qualified person
5. Components
- a. Body belts are not acceptable as part of a personal fall arrest system.
 - b. 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.
 - c. Harnesses and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.
 - d. Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.
 - e. Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
 - f. Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.
 - g. Snaphooks shall be a locking type snaphook designed and used to prevent disengagement of the snaphook by the contact of the snaphook keeper by the connected member.
6. Lifelines
- a. Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.
 - b. When vertical lifelines are used, each employee shall be attached to a separate lifeline.
 - c. Lifelines shall be protected against being cut or abraded.
 - d. Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses shall be made from synthetic fibers.

- e. 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.

7. Orthostatic Intolerance / Suspension Trauma

- a. An accumulation of blood in the legs reduces the amount of blood in circulation. During severe venous pooling, the reduction in quantity and/or quality (oxygen content) of blood flowing to the brain causes fainting. This reduction also can have an effect on other vital organs. If these conditions continue, they potentially may be fatal.
- b. Risks associated with a fall
 - (A.) Following a fall, a worker may remain suspended in a harness.
 - (B.) Unconscious/immobile workers suspended in their harness will not be able to move their legs.
 - (C.) During the static upright position, venous pooling is likely to occur and cause orthostatic intolerance, especially if the suspended worker is left in place for some time.
 - (D.) Depending on the length of time the worker is suspended, unconsciousness, venous pooling, and any resulting orthostatic intolerance may lead to death.
 - (E.) Venous pooling and orthostatic intolerance can be exacerbated by other circumstances related to the fall.
 - (1.) Shock or the experience of the event that caused the fall
 - (2.) Other injuries
 - (3.) Fit/positioning of the harness
 - (4.) Environmental condition
 - (5.) Worker's psychological state
 - (F.) Unless the worker is rescued promptly using established safe procedures, venous pooling and orthostatic intolerance could result in serious or fatal injury, as the brain, kidneys, and other organs are deprived of oxygen.
 - (1.) Research shows that suspension in a fall arrest device can result in unconsciousness, followed by death, in less than 30 minutes.
 - (2.) While not common, such fatalities often are referred to as "harness induced pathology" or "suspension trauma."
- c. Suspension Trauma Relief Straps
 - (A.) One of the ways to slow the progression of suspension trauma is to stand up.
 - (B.) A worker can stand in a harness by employing suspension trauma relief straps.
 - (C.) Suspension trauma relief straps typically come packaged in two pouches that attach to each side of a harness.
 - (D.) During a fall event, the worker can deploy the trauma relief straps - creating a loop that the worker can put his feet into and press against to simulate standing up, allowing the leg muscles to contract and can relieve pressure from the leg straps to help improve circulation.
- d. Post-Fall Procedures
 - (A.) Continuous monitoring of the suspended worker for signs and symptoms of suspension trauma.
 - (B.) Ensuring that a worker receives standard trauma resuscitation once rescued.

- (C.) If the worker is unconscious, keeping the worker's air passages open and obtaining first aid.
- (D.) Monitoring the worker after rescue and ensuring the worker is evaluated by a health-care professional. The worker should be hospitalized if appropriate. Possible delayed effects, such as kidney failure, which is not unusual in these cases, are difficult to assess on the scene.

D. Positioning Systems

1. Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet (.6m).
2. Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration and defective components shall be removed from service.
3. Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater.
4. Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
5. Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.
6. Saphooks shall be a locking type saphook designed and used to prevent disengagement of the saphook by the contact of the saphook keeper by the connected member.
7. Body belts, harnesses, and components shall be used only for employee protection and not to hoist materials.

E. Safety Net Systems

1. Safety nets shall be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level. When nets are used on bridges, the potential fall area from the walking/working surface to the net shall be unobstructed.
2. Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical Distance from Working Level to Horizontal Plane of Net	Minimum Required Horizontal Distance of Outer Edge of Net from the Edge of the Working Surface
Up to 5 Feet	8 Feet
More than 5 feet and Up to 10 Feet	10 Feet
More than 10 Feet	13 Feet

3. Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to drop test requirements.
4. Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence which could affect the integrity of the safety net system.
5. Materials, scrap pieces, equipment, and tools which have fallen into the safety net shall be removed as soon as possible from the net and at least before the next work shift.

F. Guardrail Systems

1. Top edge height of top rails, or equivalent guardrail system members, shall be 42 inches (1.1 m) plus or minus 3 inches (8 cm) above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria.

Note: When employees are using stilts, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the height of the stilts.
2. Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches (53 cm) high.
 - a. Midrails, when used, shall be installed at a height midway between the top edge of the guardrail system and the walking/working level.
 - b. Screens and mesh, when used, shall extend from the top rail to the walking/working level and along the entire opening between top rail supports.
 - c. Intermediate members (such as balusters), when used between posts, shall be not more than 19 inches (48 cm) apart.
 - d. Other structural members (such as additional midrails and architectural panels) shall be installed such that there are no openings in the guardrail system that are more than 19 inches (.5 m) wide.
3. Guardrail systems shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
4. The ends of all top rails and midrails shall not overhang the terminal posts, except where such overhang does not constitute a projection hazard.
5. Steel banding and plastic banding shall not be used as top rails or midrails.
6. Top rails and midrails shall be at least one-quarter inch (0.6 cm) nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, it shall be flagged at not more than 6-foot intervals with high-visibility material.
7. When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.
8. When guardrail systems are used at holes, they shall be erected on all unprotected sides or edges of the hole.
9. For guardrail systems used around holes through which materials may be passed:
 - a. When materials are being passed through the hole, not more than two sides of the guardrail system are removed; and
 - b. When materials are not being passed through the hole, the hole must be guarded by a guardrail system along all unprotected sides or edges or closed over with a cover.
10. 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.
11. Guardrail systems used on ramps and runways shall be erected along each unprotected side or edge.

G. Warning Line Systems

1. The warning line shall be erected around all sides of the roof work area.

- a. When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet (1.8 m) from the roof edge.
 - b. When mechanical equipment is being used, the warning line shall be erected not less than 6 feet (1.8 m) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 m) from the roof edge which is perpendicular to the direction of mechanical equipment operation.
 - c. Points of access, materials handling areas, storage areas, and hoisting areas shall be connected to the work area by an access path formed by two warning lines.
 - d. When the path to a point of access is not in use, a rope, wire, chain, or other barricade, equivalent in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area, or the path shall be offset such that a person cannot walk directly into the work area.
2. Warning lines shall consist of ropes, wires, or chains, and supporting stanchions erected as follows:
 - a. The rope, wire, or chain shall be flagged at not more than 6-foot (1.8 m) intervals with high-visibility material;
 - b. The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches (.9 m) from the walking/working surface and its highest point is no more than 39 inches (1.0 m) from the walking/working surface;
 - c. After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion, 30 inches (.8 m) above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge;
 - d. The rope, wire, or chain shall have a minimum tensile strength of 500 pounds (2.22 kN), and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in paragraph (f)(2)(iii) of this section; and
 - e. The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.
 3. No employee shall be allowed in the area between a roof edge and a warning line unless the employee is performing roofing work in that area.
 4. Mechanical equipment on roofs shall be used or stored only in areas where employees are protected by a warning line system, guardrail system, or personal fall arrest system.

H. Controlled Access Zones

1. When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.
 - a. When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge, except when erecting precast concrete members.
 - b. When erecting precast concrete members, the control line shall be erected not less than 6 feet (1.8 m) nor more than 60 feet (18 m) or half the length of the member being erected, whichever is less, from the leading edge.
 - c. The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

- d. The control line shall be connected on each side to a guardrail system or wall.
2. When used to control access to areas where overhand bricklaying and related work are taking place:
 - a. The controlled access zone shall be defined by a control line erected not less than 10 feet (3.1 m) nor more than 15 feet (4.5 m) from the working edge.
 - b. The control line shall extend for a distance sufficient for the controlled access zone to enclose all employees performing overhand bricklaying and related work at the working edge and shall be approximately parallel to the working edge.
 - c. Additional control lines shall be erected at each end to enclose the controlled access zone.
 - d. Only employees engaged in overhand bricklaying or related work shall be permitted in the controlled access zone.
3. Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:
 - a. Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.
 - b. Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m). [50 inches (1.3 m) when overhand bricklaying operations are being performed] from the walking/working surface.]
4. On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, controlled access zones shall be enlarged, as necessary, to enclose all points of access, material handling areas, and storage areas.
5. On floors and roofs where guardrail systems are in place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

I. Covers

1. Covers for holes in floors, roofs, and other walking/working surfaces
2. Covers located in roadways and vehicular aisles shall be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover.
3. All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.
4. All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.
5. All covers shall be color coded or they shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard.

J. Protection from Falling Objects

1. When an employee is exposed to falling objects, the employer shall have each employee wear a hard hat and shall implement one of the following measures:
 - a. Erect toeboards
 - (A.) Toeboards shall be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.

- (B.) Toeboards shall be a minimum of 3 1/2 inches (9 cm) in vertical height from their top edge to the level of the walking/working surface. They shall have not more than 1/4 inch (0.6 cm) clearance above the walking/working surface.
 - (C.) Toeboards shall be solid or have openings not over 1 inch (2.5 cm) in greatest dimension.
- b. Erect guardrail systems

Guardrail systems, when used as falling object protection, shall have all openings small enough to prevent passage of potential falling objects.
 - c. Erect canopies

Canopies shall be strong enough to prevent collapse and to prevent penetration by any objects which may fall onto the canopy.
 - d. 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.
- 2. During the performance of overhand bricklaying and related work:
 - a. No materials or equipment except masonry and mortar shall be stored within 4 feet (1.2 m) of the working edge.
 - b. Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept clear from the work area by removal at regular intervals.
 - 3. During the performance of roofing work:
 - a. Materials and equipment shall not be stored within 6 feet (1.8 m) of a roof edge unless guardrails are erected at the edge.
 - b. Materials which are piled, grouped, or stacked near a roof edge shall be stable and self-supporting.

K. Training

- 1. Under no circumstances shall employees work in areas where they might be exposed to fall hazards, do work requiring fall protection devices, or use fall protection devices until they have successfully completed an approved fall protection training program.
- 2. The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.
- 3. The employer shall assure that each employee has been trained, as necessary, by a competent person qualified in the following areas:
 - a. The nature of fall hazards in the work area
 - b. The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used
 - c. The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used
 - d. The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs
 - e. The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection

4. Workers who wear fall arrest devices while working, and those who may perform rescue activities, should also be trained in orthostatic intolerance/suspension trauma
 - a. How orthostatic intolerance/suspension trauma may occur
 - b. The factors that may increase a worker's risk
 - c. How to recognize the signs and symptoms identified in this bulletin
 - d. The appropriate rescue procedures and methods to diminish risk while suspended
 - (A.) "Pumping" legs frequently to activate the muscles
 - (B.) Use of Suspension Trauma Relief Straps
5. Certification
 - a. The employer shall verify employee training by preparing a written certification record. The written certification record shall contain:
 - (A.) The name or other identity of the employee trained
 - (B.) The date(s) of the training
 - (C.) Signature of the person who conducted the training or the signature of the employer
 - b. If the employer relies on training conducted by another employer or completed prior to the effective date of this section, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of actual training.
6. Retraining
 - a. When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required, the employer shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:
 - b. Changes in the workplace render previous training obsolete
 - c. Changes in the types of fall protection systems or equipment to be used render previous training obsolete
 - d. Inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill

L. Enforcement

Constant awareness of and respect for fall hazards, and compliance with all safety rules are considered conditions of employment. The Project Manager reserves the right to issue disciplinary warnings to employees, up to and including termination, for failure to follow the guidelines of this program.

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Safety Specifics – Fire Prevention (1926.150)

A. Firefighting Equipment

1. The company shall be responsible for the development of a fire protection program to be followed throughout all phases of the construction and demolition work, and shall provide for the firefighting equipment as specified.
2. Access to all available firefighting equipment shall be maintained at all times.
3. All firefighting equipment, provided by the employer, shall be conspicuously located.
4. All firefighting equipment shall be periodically inspected and maintained in operating condition. Defective equipment shall be immediately replaced.

B. Ignition Hazards

1. Electrical wiring and equipment for light, heat, or power purposes shall be installed in compliance with OSHA Electrical regulations.
2. Internal combustion engine powered equipment shall be so located that the exhausts are well away from combustible materials. When the exhausts are piped to outside the building under construction, a clearance of at least 6 inches shall be maintained between such piping and combustible material.
3. Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: "No Smoking or Open Flame."
4. Portable battery powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, shall be of the type approved for the hazardous locations.
5. The nozzle of air, inert gas, and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that contain hazardous concentrations of flammable gases or vapors, shall be bonded to the tank or vessel shell. Bonding devices shall not be attached or detached in hazardous concentrations of flammable gases or vapors.

C. Temporary Heating Devices (29 CFR 1926.154)

1. Ventilation

- a. Fresh air shall be supplied in sufficient quantities to maintain the health and safety of the workmen. If no fresh air is available, mechanical ventilation shall be provided.
- b. When heaters are used in confined spaces, sufficient ventilation must be used to insure proper combustion to maintain the health and safety of the workmen.

2. Clearance and Mounting

Temporary heating devices shall be installed to provide clearance to combustible material not less than the amount shown below:

Heating Appliances	Minimum Clearance (inches)		
	Sides	Rear	Chimney Connection
Room heater, circulating type	12	12	18
Room heater, radiant type	36	36	18

D. Open yard storage.

1. Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.

2. Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of 50 feet by 150 feet is produced.
3. The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.
4. When there is a danger of an underground fire, that land shall not be used for combustible or flammable storage.
5. Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure.
6. Portable fire extinguishing equipment, suitable for the fire hazard involved, shall be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A, shall be placed so that maximum travel distance to the nearest unit shall not exceed 100 feet.

E. Indoor storage.

1. Storage shall not obstruct, or adversely affect, means of exit.
2. All materials shall be stored, handled, and piled with due regard to their fire characteristics.
3. Non-compatible materials, which may create a fire hazard, shall be segregated by a barrier having a fire resistance of at least 1 hour.
4. Material shall be piled to minimize the spread of fire internally and to permit convenient access for firefighting. Stable piling shall be maintained at all times. Aisle space shall be maintained to safely accommodate the widest vehicle that may be used within the building for firefighting purposes.
5. Clearance of at least 36 inches shall be maintained between the top level of the stored material and the sprinkler deflectors.
6. Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.
7. A clearance of 24 inches shall be maintained around the path of travel of fire doors unless a barricade is provided, in which case no clearance is needed. Material shall not be stored within 36 inches of a fire door opening.

F. Flammable Liquids

1. Only approved containers and portable tanks shall be used for storage and handling of flammable liquids.
2. Flammable liquids shall not be stored in areas used for exits, stairways, or normally used for the safe passage of people.
3. Quantities of flammable liquid in excess of 25 gallons shall be stored in an acceptable or approved cabinet. Cabinets shall be labeled in conspicuous lettering, "Flammable-Keep Away from Open Flames."
4. Not more than 60 gallons of Category 1, 2 and/or 3 flammable liquids or 120 gallons of Category 4 flammable liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.

G. Fire Extinguishers

1. A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.
2. One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.
3. Extinguishers subject to freezing temperature shall be protected from freezing.
4. Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.
5. Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1970.
6. Location
 - a. A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.
 - b. At least one portable fire extinguisher, having a rating of not less than 20-B units, shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable liquids.
 - c. At least one portable fire extinguisher having a rating of not less than 20-B units shall be located not less than 25 feet, nor more than 75 feet, from any flammable liquid storage area located outside.

H. Sprinkler System

1. If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as applicable laws permit following completion of each story.
2. During demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only by properly authorized persons. Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves shall be checked daily at close of work to ascertain that the protection is in service.

I. Fire alarm devices.

1. An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.
2. Alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.

J. Fire cutoffs.

1. Fire walls and exit stairways, required for the completed buildings, shall be given construction priority. Fire doors, with automatic closing devices, shall be hung on openings as soon as practicable.
2. Fire cutoffs shall be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

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Safety Specifics – First Aid & Medical Services (1926.50, 1910.151)

A. Procedures

1. Prior to the commencement of each project, provisions shall be made for prompt medical attention in case of serious injury.
 - a. Ensure properly trained first-aid providers are on-site if there is no infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees.”
 - b. Pre-Plan for the nearest available communications, and/or hospitals and physicians.
 - c. Emergency information will be posted in a conspicuous place at the job site.
2. Where the eyes or body of any person 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 for immediate emergency use.
3. For incidents requiring more than on-site first aid, refer to the chapter titled “Emergency & Incident Management” of this manual.

B. First Aid Kit

1. First aid supplies shall be readily accessible and identifiable when required.
2. The contents of the first aid kit shall be placed in a weatherproof container with individual sealed packages for each type of item, and shall be checked by the employer before being sent out on each job.
3. When larger operations or multiple operations are being conducted at the same location, the company should determine the need for additional first aid kits at the worksite, additional types of first aid equipment and supplies and additional quantities and types of supplies and equipment in the first aid kits.
4. If it is reasonably anticipated that employees will be exposed to blood or other potentially infectious materials while using first aid supplies, employers are required to provide appropriate personal protective equipment (PPE) in compliance with the provisions of the Occupational Exposure to Blood borne Pathogens standard, § 1910.1030(d)(3) (56 FR 64175). This standard lists appropriate PPE for this type of exposure, such as gloves, gowns, face shields, masks, and eye protection.
5. First aid kit shall be checked on a weekly basis by the Foreman, or designated representative. First aid kits shall contain, at a minimum, supplies that met ANSI/ISEA Z308.1-2015:
 - a. Class A - designed to treat common workplace injuries

<ul style="list-style-type: none"> ➤ 16 - 1" x 3" adhesive bandages ➤ 1 adhesive tape, 2.5 yards ➤ 10 - 1/57 oz. antibiotic applications ➤ 10 - 1/57 oz. antiseptics ➤ 1 breathing barrier ➤ 1 - 4" x 4" burn dressings, gel soaked ➤ 10 - 1/32 oz. burn treatments ➤ 1 - 4"x5" cold pack ➤ 2 - 1.9 square inch eye coverings with means of attachment 	<ul style="list-style-type: none"> ➤ 1 - 1 fluid oz. eye/skin wash ➤ 1 first aid guide ➤ 6 - 1/32 oz. hand sanitizers ➤ 2 pair medical exam gloves ➤ 1 - 2"x4 yd. roller bandage ➤ 1 pair scissors ➤ 2 - 3"x3" sterile pads ➤ 2 - 5"x9" trauma pads ➤ 1 triangular bandage
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- b. Class B - have a broader range of supplies that can be helpful in more complex or high-risk environments
- 50 - 1" x 3" adhesive bandages
 - 2 adhesive tapes, 2.5 yards
 - 25 - 1/57 oz. antibiotic applications
 - 50 - 1/57 oz. antiseptics
 - 1 breathing barrier
 - 2 - 4" x 4" burn dressings, gel soaked
 - 25 - 1/32 oz. burn treatments
 - 2 - 4"x5" cold packs
 - 2 - 1.9 square inch eye coverings with means of attachment
 - 1 - 1 fluid oz. eye/skin wash
 - 1 first aid guide
 - 10 - 1/32 oz. hand sanitizers
 - 4 pair medical exam gloves
 - 2 - 2"x4 yd. roller bandages
 - 1 pair scissors
 - 1 splint
 - 1 tourniquet
 - 4 - 3"x3" sterile pads
 - 4 - 5"x9" trauma pads
 - 2 triangular bandages

C. Eye Wash Stations

1. Eyewash stations will be located in any work areas that present a risk to an eye injury
 - a. Concrete or Grout mixing
 - b. Chemical exposure
2. All employees will be trained on the locations of the eye wash stations and their proper use.
3. Eyes will be flushed for a minimum of 15 minutes in the event of chemical exposure and medical assistance will be sought if necessary.

D. Training

1. Employees shall be trained in the First Aid program at least annually.
2. Training shall cover:
 - a. Location(s) of first aid kit(s), as well as how and when to use such supplies
 - b. Interacting with the local EMS system
 - c. PPE with regard to providing first aid treatment
 - d. The effects of stress, fear of infection, panic; how they interfere with performance; and what to do to overcome these barriers to action
 - e. Assessing the scene and victim(s)
 - f. Response to non-life threatening emergencies
 - Wounds
 - Burns
 - Temperature extremes
 - Musculoskeletal injuries
 - Eye injuries
 - Mouth/Tooth injuries
 - Bites & Stings
 - g. Response to life threatening emergencies

For incidents requiring more than on-site first aid, refer to the chapter titled "Emergency & Incident Management" of this manual.

Safety Specifics – **Hand & Power Tools (29 CFR 1926.301)**

A. Hand Tools & Equipment

1. Any tool or piece of equipment that is identified as unsafe will be tagged/locked to prevent use, will be rendered inoperable, or shall be physically removed from its place of operation.
2. All tools and equipment (both, company and employee-owned) used by employees in workplace will be in good condition.
3. Hand tools such as chisels, punches, etc., which develop mushroomed heads during use will be reconditioned or replaced as necessary.
4. Broken or fractured handles on hammers, axes and similar equipment shall be replaced immediately.
5. Worn or bent wrenches will be replaced.
6. Handles used on files and similar tools will be appropriate and in good condition.
7. Employees will be trained regarding the hazards caused by faulty or improper use of tools.
8. Safety glasses, face shields, etc., will be used while using hand tools or equipment that might produce flying materials or be subject to breakage.
9. Jacks will be checked periodically to assure they are in good operating condition.
10. Tool cutting edges will be kept sharp so the tool will move smoothly without binding or skipping.
11. Eye and face protection will be used when driving hardened or tempered nails.

B. Portable (Power Operated) Tools and Equipment

1. Any power operated tool or piece of equipment that is identified as unsafe will be tagged/locked to prevent use, will be rendered inoperable, or shall be physically removed from its place of operation.
2. Grinders, saws, and similar equipment will be provided with appropriate safety guards.
3. Power tools will be used with the correct shield, guard, or attachment, recommended by the manufacturer.
4. Portable circular saws will be equipped with guards above and below the base shoe.
5. Rotating or moving parts of equipment will be guarded to prevent physical contact.
6. Cord-connected, electronically operated tools and equipment will be effectively grounded or of the approved double insulated type.
7. Effective guards shall be in place over belts, pulleys, chains, sprockets, on equipment such as concrete mixers, air compressors, etc.
8. Portable fans will be provided with full guards or screens having openings ½ inch or less.
9. Ground-fault circuit interrupters shall be provided on all temporary electrical 15 and 20- ampere circuits, used during periods of construction.
10. Pneumatic and hydraulic hoses on power-operated tools will be checked regularly for deterioration or damage.
11. Power cords will not be used to tie or lower portable electric tools.
12. All electrical cords will be kept clear from where vehicles might drive over them.
13. Table saws will be equipped with hood guards over the blade above the table, which will automatically adjust to the thickness and remain in contact with the material being cut.

C. Abrasive Wheel Equipment – Grinders

1. Any grinder that is identified as unsafe will be tagged/locked to prevent use, will be rendered inoperable, or shall be physically removed from its place of operation.
2. The work rest used will be kept adjusted to within 1/8 inch of the wheel.
3. The adjustable tongue on the topside of the grinder will be used and kept adjusted to within ¼ inch of the wheel.
4. Side guards will cover the spindle, nut and flange and 75 percent of the wheel diameter.
5. Bench and pedestal grinders will be permanently mounted.
6. Goggles or face shields will always be worn when grinding.
7. The maximum RPM rating of each abrasive wheel will be compatible with the RPM rating of the grinder motor.
8. Fixed or permanently mounted grinders will be connected to their electrical supply system with metallic conduit or other permanent wiring method.
9. Each grinder will have an individual on and off control switch.
10. Each electrically operated grinder will be effectively grounded.
11. When abrasive wheels are mounted, they will be visually inspected and ring tested.
12. Dust collectors and powered exhausts will be provided on grinders used in operations that produce large amounts of dust.
13. Splashguards will be mounted on grinders that use coolant to prevent the coolant from reaching employees.

D. Powder-Actuated Tools

1. Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool.
2. The tool shall be tested each day before loading to see that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure.
3. Any tool found not in proper working order, or that develops a defect during use, shall be immediately removed from service and not used until properly repaired.
4. Personal protective equipment shall be in accordance with Subpart E of this part.
5. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any employees. Hands shall be kept clear of the open barrel end.
6. Loaded tools shall not be left unattended.
7. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.
8. Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.
9. No fastener shall be driven into a spalled area caused by an unsatisfactory fastening.
10. Tools shall not be used in an explosive or flammable atmosphere.
11. All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

Safety Specifics – Hazard & Risk Assessment (29 CFR 1910.1200)

A. Hazard & Risk Identification

The Safety Manager shall conduct a baseline worksite hazard assessment which is a formal process in place to identify the various tasks that are to be performed and the accompanying identified potential hazards. The results are included in a report of the results of the hazard assessment and the methods used to control or eliminate the hazards identified. The hazard assessment report must be signed and have the date on it.

1. Inputs into the baseline hazard identification include, but are not limited to:
 - a. Scope of work
 - b. Legal and other requirements
 - c. Previous incidents and non-conformances
 - d. Sources of energy, contaminants and other environmental conditions that can cause injury
 - e. Walk through of work environment
2. Hazards identifications (as examples) are to include:
 - a. Working Alone
 - b. Thermal Exposure
 - c. Isolation of Energy
 - d. Hearing Protection
 - e. Musculoskeletal Disorders
 - f. Bloodborne Pathogens
 - g. Confined Spaces
 - h. Driving
 - i. General Safety Precautions
 - j. Any other established policy or procedure by the company or site specific work scope

B. Guidelines

1. All identified hazards are assessed for risk and risk controls are assigned within the worksite hazard assessment for that specific hazard.
2. Employees and/or sub-contractors are actively involved in the hazard identification process. The program provides processes to ensure employees and/or sub-contractors are actively involved in the hazard identification process and hazards are reviewed with all employees concerned.
3. Employees are trained in the hazard identification process. Employees will be trained in the hazard identification process including the use and care of proper PPE.
4. Unsafe hazards must be reported immediately and addressed by the supervisor. The supervisor discusses the worksite hazard assessment with employees at the respective work location during the employee's documented orientation.

C. Review of Hazard Assessment

1. Existing worksite hazard identifications are formally reviewed annually or repeated at reasonably practicable intervals to prevent the development of unsafe and unhealthy working

conditions and specifically updated when new tasks are to be performed that have not been risk assessed, when a work process or operation changes, before the construction of a new site or when significant additions or alterations to a job site are made.

2. The respective supervisor or project manager advises the Safety Manager when additional hazards are introduced into the work place in order to revise planning and assessment needs.

D. Risk Assessment

Hazards are classified and ranked based on severity. The program identifies hazards are classified/prioritized and addressed based on the risk associated with the task. (See the risk analysis matrix outlining severity and probability.

RISK ASSESSMENT MATRIX									
CONSEQUENCE					PROBABILITY				
Severity	People	Assets	Environment	Reputation	A	B	C	D	E
					Not Done	Rarely	Once a week	Several Times in a Week	Multiple Times in a Day
0	No health effect	No damage	No effect	No impact					
1	Slight health effect	Slight damage	Slight effect	Slight impact					
2	Minor health effect	Minor damage	Minor effect	Limited impact					
3	Major health effect	Localized damage	Localized effect	Considerable impact					
4	Single fatality	Major damage	Major effect	National impact					
5	Multiple fatalities	Extensive damage	Massive effect	Global impact					
Key	Manage for continuous improvement (Low)			Incorporate risk reduction measures (Medium)			Intolerable (High)		

E. Risk Controls/Methods

1. The following describes how identified hazards are addressed and mitigated:
 - a. Risk assessed hazards are compiled with and addressed and mitigated through dedicated assignment, appropriate documentation of completion, and implemented controls methods including engineering or administrative controls and PPE required into the worksite hazard assessment of the site specific HSE plan. No work will begin before the worksite assessment is completed. Additionally, no risk assessed as High (Intolerable) shall be performed.
 - b. If an existing or potential hazard to workers is identified during a hazard assessment, the company must take measures to eliminate the hazard, or if elimination is not reasonably practicable, control the hazard. If reasonably practicable, the company must eliminate or control a hazard through the use of engineering controls. If a hazard cannot be adequately controlled using engineering controls, the company must use administrative controls that control the hazard to a level as low as reasonably achievable. If the hazard cannot be adequately controlled using engineering and/or administrative controls, the company must ensure that the appropriate personal protective equipment (PPE) is used by workers affected by the hazard. The company may use a combination of engineering controls, administrative controls, and personal protective equipment if there is a greater level of worker safety because a combination is used.

2. Emergency Control of Hazards

Only those employees competent in correcting emergency controls of hazards may be exposed to the hazard and only the minimum number of competent employees may be exposed during hazard emergency control. An example is a gas leak in a building. Only those personnel with training on fire safety, gas supply shut off and other related controls will attempt to resolve the emergency control of a hazard. The company will make every possible effort to control the hazard while the condition is being corrected or under the supervision of company emergency response personnel in every emergency.

3. Certification of Hazard Assessment

The Safety Manager completes and signs the certification of hazard assessment for the worksite hazard assessment (also see PPE Program) and includes it within the site specific HSE plan. Hazards assessments are reviewed annually and updated when new tasks are to be performed that have not been risk assessed.

4. Job Safety Analysis (JSA)

For those jobs with the highest injury or illness rates, jobs that are new to our operation, jobs that have undergone major changes in processes and procedures or jobs complex enough to require written instructions will have a Job Safety Analysis performed. Completed JSAs are available from the Safety Manager.

5. Site Specific HSE Plan (SSSP)

Each work location has a site specific HSE plan. Each employee reporting to a location shall receive a documented orientation from a company supervisor that includes the SSSP for that site. The SSSP contains the company Health and Safety Policy, site specific safety requirements as well as a PPE matrix and a signed site specific worksite hazard assessment for that location, which the company has a responsibility to provide.

F. Review Process






The hazard assessment program will be reviewed to ensure no new hazards derived from the corrective measures. The review shall include a management of change consideration as well. The safety committee shall be involved in the review process as well.

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Safety Specifics – Hazard Communications & I.D. (29 CFR 1926.59)

A. Container Labeling

1. The company will verify that all containers received for use will be clearly labeled by the manufacturer with the following:
 - a. Name, address and telephone number of the manufacturer
 - b. Product identifier
 - c. Signal word
 - d. Hazard statement(s)
 - e. Precautionary Statement(s)
 - f. GHS Pictogram(s)
2. Existing labels will not be removed or defaced on incoming containers unless containers are to be immediately marked with required information.
3. All materials on site are to be stored in their original container with the label attached.
4. Any material with a label missing or illegible shall be reported to the supervisor immediately for proper labeling.
5. All labels **must** include pictograms included in the Global Harmonization System (GHS). The pictograms found on all labeling must be according to the current requirements.

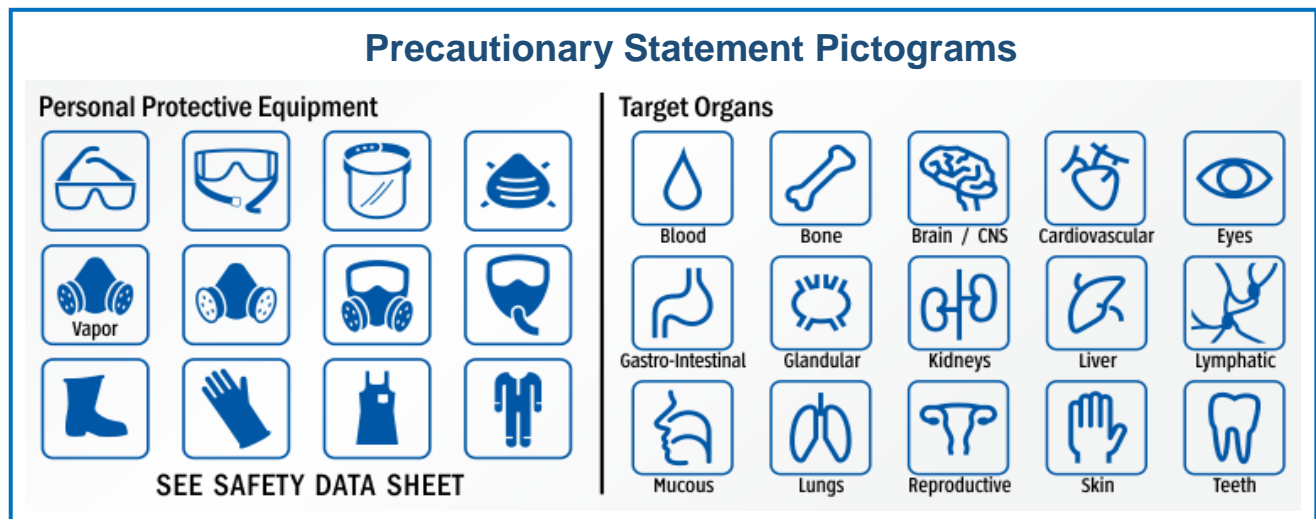
GHS PICTOGRAMS		
<p>Health Hazard</p> <p>Carcinogens, respiratory sensitisers, reproductive toxicity, target organ toxicity, germ cell mutagens</p>		<p>Flame</p> <p>Flammable gases, liquids, & solids; self-reactives; pyrophorics;</p>
<p>Gas Cylinder</p> <p>Compressed gases; liquefied gases; dissolved gases</p>		<p>Exclamation Mark</p> <p>Irritant, dermal sensitiser, acute toxicity (harmful)</p>
<p>Corrosion</p> <p>Skin corrosion; serious eye damage</p>		<p>Exploding Bomb</p> <p>Explosives, self-reactives, organic peroxides</p>
<p>Flame Over Circle</p> <p>Oxidisers gases, liquids and solids</p>		<p>Environment</p> <p>Aquatic toxicity</p>
<p>Skull & Crossbones</p> <p>Acute toxicity (severe)</p>		

6. Workplace Labels

- a. Employers have the option to create their own workplace labels. They can either provide all of the required information that is on the label from the chemical manufacturer or, the product identifier and words, pictures, symbol, or a combination thereof, which, in combination with other information immediately available to employees, provide specific information regarding the hazards of the chemicals.
- b. If an employer has an in-plant or workplace system of labeling that meets the requirements of HazCom 1994, the employer may continue to use this system in the workplace as long as this system, in conjunction with other information immediately

available to the employees, provides the employees with the information on all of the health and physical hazards of the hazardous chemical.

- (A.) This workplace labeling system may include signs, placards, process sheets, batch tickets, operating procedures, or other such written materials to identify hazardous chemicals.
 - (B.) Any of these labeling methods or a combination thereof may be used instead of a label from the manufacturer, importer or distributor as long as the employees have immediate access to all of the information about the hazards of the chemical.
- c. Workplace labels must be in English. Other languages may be added to the label if applicable.
 - d. If an employer transfers hazardous chemicals from a labeled container to a portable container that is only intended for immediate use by the employee who performs the transfer, no labels are required for the portable container.
 - e. Employers may use additional instructional or precautionary symbols that are not included in OSHA's HCS pictograms on the workplace labels.
 - (A.) An example of an instructional or precautionary pictogram is a person with goggles, denoting that goggles must be worn while handling the given chemical. Including both types of pictograms on workplace labels is acceptable.



- f. Employers may continue to use rating systems such as National Fire Protection Association (NFPA) diamonds or HMIS requirements for workplace labels as long as they are consistent with the requirements of the Hazard Communication Standard and the employees have immediate access to the specific hazard information as discussed above.
 - (A.) An employer using NFPA or HMIS labeling must, through training, ensure that its employees are fully aware of the hazards of the chemicals used.

B. Safety Data Sheets (SDS)

1. Any product having a hazardous warning on its label requires a SDS.
2. The manufacturer, distributor, or vendor shall provide the SDS for the hazardous product.
3. All SDS shall be forwarded to the Project Manager and reviewed by the Job Superintendent and Subcontractor using the product to determine safe work practices and personal protection, as needed. The SDS will be maintained and keep accessible by the subcontractor on site.

4. The SDS must provide the 16 sections listed:

- Identification
- Hazard(s) identification
- Composition/information on ingredients
- First-aid measures
- Fire-fighting measures
- Accidental release measures
- Handling and storage
- Exposure control/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicology information
- Ecological information
- Disposal Consideration
- Transport information
- Regulatory information
- Other information

C. Employee Training and Information

1. The Subcontractors will provide training to their employees when hired and routinely thereafter on the hazardous nature of chemical products. Training will include:
2. The Hazard Communication Policy
3. Chemicals present in their workplace operations
4. Physical and health effects of the hazardous chemicals
5. Appropriate work practices and controls when using chemicals.
6. Emergency and first-aid procedures
7. How to read labels and review an SDS to obtain appropriate hazard information
8. Location of the SDS file and written hazard communications program

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Safety Specifics – Hazardous Materials (29 CFR 1926 Subpart D)

A. Administrative Duties

1. Project management is responsible for notifying the Safety Department of any hazardous chemicals or substances that are to be brought on the jobsite.
2. The legal storage, use, and disposal of hazardous chemicals or substances are the responsibility of the project management.
3. If hazardous chemicals are going to be used, project management will implement a Hazard Communication Program that will include training, SDS, and labeling.
4. Use of chemicals may result in hazardous waste; in such cases, the Contractor will institute a Hazardous Waste Program to address hazardous waste storage and disposal in accordance with the code of federal regulations, state regulations, and other requirements delineated in the bid and contract documents.
 - a. All employees, supervisors, and management working on site exposed to hazardous substances, health hazards, or safety hazards shall receive training meeting the requirements of 29 CFR 1910.120(e)(1) before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards.
5. When personnel exposure to chemicals, particulates, aerosols or fumes is reasonably expected to exist and exceed allowable limits, then project management will put an Industrial Hygiene Program in place.

B. Storage and Containment

1. Flammable liquids
 - a. Storage tanks shall be made of steel except as provided in paragraphs 29 CFR 1910.106(b)(1)(i)(b) through (e).
 - b. Above Ground Tanks
 - (A.) The distance between any two flammable liquid above-ground storage tanks shall not be less than 3 feet.
 - (B.) Where unstable flammable liquids are stored, the distance between such tanks shall not be less than one-half the sum of their diameters.
 - (C.) When tanks are compacted in three or more rows or in an irregular pattern, greater spacing or other means shall be provided so that inside tanks are accessible for firefighting purposes.
 - (D.) The minimum separation between a liquefied petroleum gas container and a flammable liquid storage tank shall be 20 feet
 - c. Underground Tanks
 - (A.) Underground tanks or tanks under buildings shall be so located with respect to existing building foundations and supports that the loads carried by the latter cannot be transmitted to the tank.
 - (B.) Underground tanks shall be set on firm foundations and surrounded with at least 6 inches of noncorrosive, inert materials such as clean sand, earth, or gravel well tamped in place.
 - (C.) Tanks shall be covered with a minimum of 2 feet of earth, or shall be covered with not less than 1 foot of earth, on top of which shall be placed a slab of reinforced concrete not less than 4 inches thick.

2. Explosives & Blasting Agents

- a. No person shall store, handle, or transport explosives or blasting agents when such storage, handling, and transportation of explosives or blasting agents constitute an undue hazard to life.
- b. All Class A, Class B, Class C explosives, and special industrial explosives, and any newly developed and unclassified explosives, shall be kept in magazines
- c. Blasting caps, electric blasting caps, detonating primers, and primed cartridges shall not be stored in the same magazine with other explosives.
- d. Ground around magazines shall slope away for drainage. The land surrounding magazines shall be kept clear of brush, dried grass, leaves, and other materials for a distance of at least 25 feet.

3. Liquid Petroleum Gas

- a. Flammable liquids must be kept in covered containers or tanks when not actually in use.
- b. NO SMOKING within 15 feet of the fuel tank.
- c. NO SMOKING while fueling tanks.
- d. At least one approved portable fire extinguisher having a rating of not less than 20-B:C. must be 30 feet from the fuel tank.
- e. Storage Containers
 - (A.) Only approved containers and portable tanks shall be used for storing and handling flammable and combustible liquids.
 - (B.) All fuel tanks have to be double walled or must have a containment field under the tank.
- f. Storage area for LP-Gas Containers
 - (A.) Storage of LP-Gas within buildings is prohibited.
 - (B.) Containers shall be in a suitable ventilated enclosure or otherwise protected against tampering.
 - (C.) Fuel storage tank site location must conform to NFPA guidelines listed below for Property Line distance and OSHA guidelines of 20 feet from any building or structure.

NFPA 30 – Table 22.4.1.1 (b)

Capacity, gal	Property Line, ft.	Important Bldg. or Public Way ft. (m)
<275	5	5
276-750	10	5
751-12,000	15	5
12,001-30,000	20	5
30,001-50,000	30	10
50,001-100,000	50	15
100,001-500,000	80	25
500,001-1,000,000	100	35
1,000,001-2,000,000	135	45
2,000,001-3,000,000	165	55
>3,000,000	175	60

4. Other Hazardous Materials

a. Petroleum Contaminated Materials

- (A.) Petroleum contaminated materials, such as used in oil filters and old hydraulic hoses, will be retained and safely stored, until disposal, in an area or container where discharge of petroleum is prevented or contained.
- (B.) Disposal will be in accordance with regulations.

b. Grease and Gear Lube

- (A.) Solid lubricants will be stored in a protected area where containers will not be damaged.
- (B.) Spent containers will be appropriately disposed of in accordance with regulations.
- (C.) Accidental discharges will be recovered.

c. Motor Oil, Hydraulic Oil, and Liquid Gear Lube

- (A.) Unused motor oil, and other liquid lubricants, will be stored in protected areas where the containers will are not damaged.
- (B.) Bulk containers will be placed in a lined area. Spent containers will be disposed of in accordance with regulations.
- (C.) Absorbent material will be available and used to recover any oil which is accidentally discharged during transfer operations or at any other time. Used oil will be recovered, stored in the same manner as new oil, and disposed of in accordance with regulations. Used oil cannot be stored in open containers. All equipment using hydraulic hoses and cylinders will be inspected on a regular basis, absorbent pads and other spill recovery materials will be available to mitigate discharges to the environment in case of equipment failure. When equipment operating on or adjacent to waterways is found to have a petroleum leak which cannot be immediately repaired or controlled, it will be removed from service until repairs can be made.

d. Solvent and Paints

- (A.) Solvent and paints will be stored in a protected area where the containers will not be damaged.
- (B.) Spent solvents will be retained and disposed of in accordance with regulations, as will left over paints.
- (C.) Accidental discharges will be recovered.

e. Cement and Epoxies

- (A.) Cement and epoxies will be stored in dry protected areas.
- (B.) Cleaning of ready mix trucks and disposal of left over ready mix will only be accomplished in an appropriate manner.
- (C.) Left over epoxy will be stored and disposed of in accordance with regulations.

f. Lead/Acid Batteries

- (A.) Lead / acid batteries will be stored in a protected area.
- (B.) Used batteries, which cannot be recharged, will be returned to the dealer or to a battery recycling facility.

g. Antifreeze

- (A.) Antifreeze will be stored in the same manner as liquid petroleum.

- (B.) Spent antifreeze will be recovered and retained until proper disposal is accomplished.
- (C.) Antifreeze accidentally discharged will be recovered with absorbent materials.

C. Spills / Releases

In the event of a Hazardous Material Spill/Release the following procedures will be followed:

1. Notification to project management and to the appropriate state regulatory agency when required by the SWPPP of the discharge of oil or hazardous substances is required as follows:
 - a. Discharge to water – as soon as discharge is noticed.
 - b. Discharge to land – as soon as discharge is noticed.
 - c. Spills/ Releases that are Immediately Dangerous to Life or Health (IDLH):
 - (A.) Notify Project Management Immediately
 - (B.) Call 911 from a safe location and provide the following information to the dispatcher:
 - (1.) Nature of the emergency
 - (2.) Chemical involved
 - (3.) Location of Spill/Release
 - (C.) Remain on scene to meet response personnel and provide additional information.
 - d. Spills/Releases that can be cleaned up by contractor:
 - (A.) Attempt to clean up spill/release if superintendent has determined it is safe to do so.
 - (B.) Guidelines include:
 - (1.) You are thoroughly familiar with the hazards of the material (reference SDS)
 - (2.) You have been trained to deal with spills/releases of the size in question
 - (3.) You have the proper Personal Protective equipment (PPE), should it be necessary
 - (4.) The appropriate absorbent/neutralizers are readily available
 - (C.) It is essential that you collect/contain all spill cleanup waste for proper disposal. **DO NOT PLACE IN OR AROUND THE REGULAR TRASH.** Contact local authorities for waste removal.
 - e. Spills/Releases that are not IDLH but require technical assistance:

If superintendent has determined that clean up requires technical assistance, contact local authorities immediately.
2. All employees will be briefed on emergency response procedures and the use of emergency response equipment and materials. The contact phone numbers for spill reporting, spill or hazardous material emergency response organizations, and the fire department will be posted at the jobsite.

Safety Specifics – Hearing Conservation (29 CFR 1926.101)

A. Audiometric Testing

1. Each new employee whose work exposes them to noise levels above the “OSHA action level” will receive an audiometric test as part of a pre-screening physical examination to establish a baseline audiogram against which subsequent audiograms can be compared as required by the OSHA Standard.
2. Annually, all employees who are exposed to noise levels exceeding the 85 dB standard will be given a follow-up audiometric examination to monitor for any significant changes in their hearing ability.
3. Employees will be formally notified if there is any change in their hearing as the result of the testing. The OSHA Standard has defined this shift as a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 200, 3000 and 4000 hz in either ear. In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in the OSHA Standard.
4. When audiometric testing is required, each affected employee must not be exposed to any workplace noise for at least 14 hours prior to his/her test. This requirement may be met by wearing hearing protectors which will reduce the employee’s exposure to a sound level of 80 db(A) or below.
5. Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometer does not need to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.
6. An audiologist, otolaryngologist or physician will review problem audiograms and shall determine whether there is a need for further evaluation. The company will provide to the person performing this evaluation the following information:
 - a. A copy of the 29 CFR 1910.95 Hearing Conservation.
 - b. The baseline audiogram and most recent audiogram of the employee to be evaluated.
 - c. Measurement of background sound pressure in the audiometric test room as required in 29 CFR 1910.95 Appendix D.
 - d. Records of audiometric calibrations as required by 20 CFR 1910.95 Appendix E.
7. If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined by OSHA, the employee will be informed of this fact, in writing, by the company within 21 days of determination.
8. Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the company will ensure that the following steps are taken when a standard threshold shift occurs:
 - a. An employee not using hearing protectors will be fitted with hearing protectors, trained their use and care, and required to use them; and
 - b. An employee already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

- c. Refer the employee for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the company suspect that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
 - d. Inform the employee of the need for an otological examination if a medical pathology of the ear which is unrelated to the use of hearing protector is suspected.
9. If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour Time-Weighted Average (TWA) average of 90 decibels indicates that a standard threshold shift is not persistent the company:
- a. Will inform the employee of the new audiometric interpretations: and
 - b. May stop the required use of hearing protectors for that employee

B. Employee Education and Training

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

C. Monitoring and Analysis of Workplace Noise Levels

- 1. The company periodically or as necessary, conducts noise level surveys of the workplace. The results of these surveys will be made available to employees upon request.
- 2. Any job area or company location found to be in excess of the allowable designated noise levels that cannot be brought into compliance with the noise standard will be designated as an area where hearing protectors are to be worn. When signs are posted employees must wear hearing protection. The signs may read as follows:

**NOTICE:
HEARING PROTECTION
REQUIRED IN THIS AREA**

D. Provide Suitable Engineering Controls

Where appropriate, the company will provide engineering controls to reduce noise exposure. Due to the complexity of most job sites, it is difficult if possible to institute effective engineering controls for most noise exposures. Shall this be the case, then employees will be required to wear suitable hearing protection.

E. Provide Hearing Protectors Where Required

- 1. The company will provide and required employees with hearing protectors if his/her 8 hour TWA is above the 85dB (A).

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

F. Responsibilities

1. Company

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

2. Jobsite Supervisors

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

REMEMBER - The Company determines if a unit or work area is classified as a high noise area. After the determination is made, the company's employees will be instructed to wear the appropriate hearing protection.

G. Recordkeeping

1. All record-keeping for this program will be maintained in the office. Records will include:
2. Audiometric tests
3. Noise surveys
4. Employee training
5. Engineering controls implemented
6. Record of purchase of hearing protector

H. Work Requiring Hearing Protectors

There are many jobs or types of work that generally produces noise level that intermittently or for short durations exceed the permissible TWA. It is the policy of the company to require all workers who are engaged in these jobs to wear hearing protectors. Some are:

Activities and/or Equipment Typically Resulting in High Noise Level	Estimated Average Noise Level dB(A)
Air Arc Gouging	115
Air compressor	95
Chain saw	107
Electric Disc Grinder	100
Forklift inside a trailer	98
Heavy equipment working	100
Impact tools	108
Pneumatic chipping hammer	110
Abrasive blasting	100
Welding machines	95

I. Hearing Protectors

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

2. EAR PLUGS

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

3. EAR MUFFS

Adjustable muffs can be worn in three positions:

Position	NRR
Over the Head	24 (depends on the NRR of the Ear Muff)
Under the Chin	20
Behind the Head	20

J. Computing the Hearing Protection Level

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

$$\begin{array}{rcl}
 \text{(subtract 7 from the NRR)} & \text{NRR of 29} & - 7 = 22 \text{ dB(A)} \\
 \text{(divide by 2)} & 22 \text{ dB(A)} & / 2 = 11 \text{ dB(A)} \\
 \text{(subtract from the Noise Level)} & 95 \text{ dB(A)} & - 11 = 84 \text{ dB(A)}
 \end{array}$$

Therefore, this device offers a protection level of 84 dB(A)

Safety Specifics – Heat & Cold Stress (General Duty Clause; NIOSH)

A. Assignment of Responsibilities

1. Management Responsibilities

- a. Maintain, review and update the Heat and Cold Stress Program as needed.
- b. Provide monitoring (upon request) and assist employees with the development of procedures to minimize the adverse effects of heat and cold stress in the workplace.
- c. Provide training to employees affected by heat and cold.
- d. Train employees to administer proper first aid on heat- and cold-induced injuries or illnesses as well as emergency response procedures.

2. Supervisor Responsibilities

- a. Review and comply with the provisions outlined in this program.
- b. Ensure all employees are properly trained before working in extreme temperature conditions.
- c. Assess the day-to-day heat or cold stresses on employees.
- d. Assess employees work load and assigning work and rest schedules as needed.
- e. Take personal factors into consideration before assigning a task where there is a possibility of a heat related illness occurring.
- f. Ensure all employees have the appropriate personal protective equipment (PPE) prior to working in extreme temperature conditions.

3. Employee Responsibilities

- a. Review and comply with the provisions outlined in this program, including PPE use.
- b. Complete training before working in extreme temperature conditions and be familiar with the signs and symptoms of heat and cold weather hazards.
- c. Report heat and cold stress concerns to their supervisor.

B. Heat Related Illnesses: Signs, Prevention & Treatment

1. While working in hot weather conditions, the human body may not be able to maintain a normal temperature just by sweating. If this happens, heat-related illnesses may occur. The physical factors which contribute to this condition shall be considered prior to performing any tasks in hot weather.
2. Common Health Problems - Heat
 - a. Heat stroke – This is the most serious heat related effect. Heat stroke occurs when the body temperature increases above 104 - 106 F. Signs and symptoms of heat stroke are confusion, loss of consciousness and lack of perspiration. This condition must be treated as a medical emergency and the employee must receive immediate medical attention.
 - b. Heat exhaustion – Signs and symptoms of heat exhaustion include headache, nausea, dizziness, weakness, irritability, confusion, thirst, heavy perspiration and a temperature 104 or greater. Employees experiencing heat exhaustion shall be moved to a cool area, given fluids to drink and given cold compresses for their head, face and neck. Employees shall also be taken to a clinic or emergency room to be monitored by medical personnel.
 - c. Heat cramps – Signs and symptoms of heat cramps include muscle pains usually caused by the loss of body salts/fluids. Employees shall replace fluid loss by drinking water and/or carbohydrate-electrolyte replacement liquids (e.g. Gatorade) every 15 to 20 minutes.

- d. Heat rash – Heat rash is caused by excessive perspiration and looks like a red cluster of pimples or small blisters. Heat rash usually appears on the neck, upper chest, in the groin, under the breasts and in elbow creases. Treatment for heat rash is to provide a cooler, less humid environment.
- e. Dehydration – Dehydration is a major factor in most heat disorders. Signs and symptoms of dehydration include increasing thirst, dry mouth, weakness or light-headedness (particularly if worse upon standing), and a darkening of the urine or a decrease in urination. Dehydration can be reversed or put back in balance by drinking fluids that contain electrolytes that are lost during work related activities. Avoid caffeinated drinks.

3. Prevention methods - Heat

- a. Acclimation – Acclimation is a process by which the physical processes of an employee’s body adjusts to the environment over a period of time. Based on data obtained from OSHA, this process usually takes five to seven days. This process could take up to three weeks depending on the individual and their work environment. According to the American Industrial Hygiene Association, the process requires a consistent work level for at least two hours each day during the acclimation period in order for an employee to become acclimatized..
- b. Engineering Controls – For employees working indoors, the best way to prevent heat-related illness is to make the work environment cooler. Where and if possible, use air conditioning to cool the work area. Alternatively, increase the general ventilation as much as possible by opening windows or doors. When available, use cooling fans to aid in increasing ventilation.
- c. Safe Work Practices – For employees working outdoors or working indoors without air conditioning or ventilation, take scheduled breaks in cool areas. Ensure there is plenty of cool, potable drinking water and take water breaks as needed. Employees shall always be provided with access to shaded area. Immediately report any problems to a supervisor. Supervisors shall consider scheduling the hottest work for the coolest part of day, assigning extra employees to high demand tasks, and using work-saving devices (e.g. power tools, hoists or lifting aids) to reduce the body’s work load. All employees shall watch out for the safety of their coworkers.

Work / Rest and Water Consumption Table						
<i>Applies to average sized, heat acclimated person wearing long sleeved shirt and pants or cloth overalls</i>						
	Easy Work		Moderate Work		Hard Work	
	Walking/Working on hard surface at 2.5 mph with < 30lb load		Walking/Working on loose sand, water, reeds at 2.5 mph with minimal load Walking/Working on hard surface at 3.5 mph with < 40lb load		Walking/Working on hard surface at 3.5 mph, ≥ 40lb load Walking/Working on loose sand at 2.5 mph with minimal load Wearing protective coveralls (ie: Tyvek) and/or respirator	
Heat Category	Easy Work		Moderate Work		Hard Work	
	Work/Rest (min)	Water Intake (qt/hr)	Work/Rest (min)	Water Intake (qt/hr)	Work/Rest (min)	Water Intake (qt/hr)
1 White Flag	NL	½	NL	¾	40/20 min	¾
2 Green Flag	NL	½	50/10 min	¾	30/30 min	1
3 Yellow Flag	NL	¾	40/20 min	¾	30/30 min	1
4 Red Flag	NL	¾	30/30 min	¾	20/40 min	1
5 Black Flag	50/10 min	1	20/40 min	1	10/50 min	1

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The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hours of work in the specified heat category. Fluid needs can vary based on individual differences (± ¼ qt/hr)


NL = no limit to work time per hour

Rest = minimal physical activity (sitting or standing) accomplished while in the shade

CAUTION: Hourly fluid intake should not exceed 1-½ quarts. Daily fluid intake should not exceed 12 quarts


Operational requirements should be considered in the application of this heat management tool.

- d. Heat Index – The Heat Index is a single numeric value that uses both temperature and humidity to inform the public on how the weather outdoors “feels”. The higher the Heat Index, the hotter the weather feels. OSHA has used the Heat Index to assign protective measures for workers as the Heat Index increases. These protective measures may reduce the likelihood of heat related illnesses.
 - (A.) The heat index is a simple tool and a useful guide for employers/employees making decisions about protecting employees in hot weather. It does not account for certain conditions that contribute additional risk, such as physical exertion. Consider taking the steps at the next highest risk level to protect employees from the added risks posed by:
 - (1.) Working in the direct sun (can add up to 15°F to the heat index value)
 - (2.) Wearing heavy clothing or protective gear
 - (B.) Under most circumstances, fluid intake shall not exceed 6 cups per hour or 12 quarts per day. This makes it particularly important to reduce work rates, reschedule work, or enforce work/rest schedules.



Heat index Chart

How To Use: Find the temperature on the left-hand side, then move to the right and find the relative humidity value on the top. Where the two columns meet is the Heat Index Value.
Add up to 15 in direct sun with no available shade



		R E L A T I V E H U M I D I T Y %																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
TEMPERATURE	140	125																				
	135	120	128																			
	130	117	122	131																		
	125	111	116	123	131	141																
	120	107	111	116	123	130	139	145														
	115	103	107	111	115	120	127	135	143	151												
	110	99	102	105	108	112	117	123	130	137	143	150										
	105	95	97	100	102	105	109	113	118	123	129	135	142	149								
	100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
	95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136				
90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122			
85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108	
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91	
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	71	71	71	71	71	72	

Heat Category/Flag Color

1 White Flag Low Risk	2 Green Flag Caution	3 Yellow Flag Extreme Caution	4 Red Flag At Risk	5 Black Flag High Risk
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C. Cold Related Illnesses: Signs, Prevention & Treatment

1. During cold weather, an employee’s body will use energy to maintain a normal internal body temperature. This will result in a shift of blood flow from employee’s extremities (hands, feet and legs) and outer skin to the employee’s core (chest and abdomen). If this happens, cold-related illnesses and injuries may occur if exposed to cold conditions for an extended period of time.
2. Common health problems - Cold
 - a. Hypothermia – Hypothermia is a potentially serious health condition. Hypothermia occurs when body heat is lost faster than it can be replaced. When the core body temperature

drops to approximately 95°F, the onset of symptoms normally begins. The employee may begin to shiver, lose coordination, have slurred speech, and fumble with items in the hand. The employee's skin will likely be pale and cold. As the body temperature continues to fall these symptoms will worsen and shivering will stop. Once the body temperature falls to around 85°F severe hypothermia will develop and the person may become unconscious, and at 78°F, vital organs may begin to fail. Treatment depends on the severity of the hypothermia. For cases of mild hypothermia move to warm area and stay active. Remove wet clothes and replace with dry clothes or blankets, cover the head. To promote metabolism and assist in raising internal core temperature drink a warm (not hot) sugary drink. Avoid drinks with caffeine. For more severe cases do all the above, plus contact emergency medical personnel (Call 911 for an ambulance), cover all extremities completely, place very warm objects, such as hot packs or water bottles on the victim's head, neck, chest and groin. Arms and legs shall be warmed last. In cases of severe hypothermia, treat the employee very gently and do not apply external heat to re-warm. Hospital treatment is required.

- b. Frostbite – Frostbite occurs when the skin actually freezes and loses water. In severe cases, amputation of the frostbitten area may be required. While frostbite usually occurs when the temperatures are 30° F or lower, wind chill factors can allow frostbite to occur in above freezing temperatures. Frostbite typically affects the extremities, particularly the feet and hands. The affected body part will be cold, tingling, stinging or aching followed by numbness. Skin color turns red, then purple, then white, and is cold to the touch. There may be blisters in severe cases. Do not rub the area to warm it. Wrap the area in a soft cloth, move the employee to a warm area, and contact medical personnel. Do not leave the employee alone. If help is delayed, immerse in warm (maximum 105 °F), not hot, water. Do not pour water directly on affected part. If there is a chance that the affected part will get cold again do not warm. Repeated heating and cooling of the skin may cause severe tissue damage.
- c. Dehydration – It is easy to become dehydrated during cold weather. Signs of dehydration include increasing thirst, dry mouth, weakness or light-headedness (particularly if worse upon standing), and a darkening of the urine or a decrease in urination. Dehydration can be reversed or put back in balance by drinking fluids that contain electrolytes (i.e. Gatorade) that are lost during work related activities. Avoid caffeinated drinks

3. Prevention method - Cold

- a. Acclimation – Employees exposed to the cold shall be physically fit, without any circulatory, metabolic, or neurologic diseases that may place them at increased risk for hypothermia. A new employee shall not be required to work in the cold full time during the first days of employment until they become adjusted to the working conditions and required protective clothing. New employees shall be introduced to the work schedule slowly and be trained accordingly.
- b. Engineering Controls – For employees working indoors, the best way to prevent cold-related illness is to make the work environment warmer. Where and if possible, use heaters to warm the work area. Alternatively, decrease the general ventilation as much as possible by closing windows or doors.
- c. Safe Work Practices – For employees working outdoors or working indoors without heat, take scheduled breaks in warm areas. If available, use wind barricades to block the wind from the employees. Ensure there is plenty of water to drink and take water breaks as needed. Immediately report any problems to a supervisor. Supervisors shall consider scheduling the most work for the warmest part of day, assigning extra employees to high demand tasks that will require longer periods in cold areas. All employees shall watch out for the safety of their coworkers. All employees will be informed of dangers associated with working around unstable snow and ice build-ups. All regularly used walkways and travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.

Warm-Up and Break Chart – 4 hour shift

Schedule applies to any 4-hour work period with moderate to heavy work activity; with warm up periods of ten (10) minutes in a warm location and with an extended break (ie: lunch) in a warm location at the end of the 4-hour work period.

Air Temperature -Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°F (approximate)	°C (approximate)	Maximum Work Period	# of Breaks	Maximum Work Period	# of Breaks	Maximum Work Period	# of Breaks	Maximum Work Period	# of Breaks	Maximum Work Period	# of Breaks
-15 to -19	-26 to -28		1 Normal		1 Normal	75 min.	2	55 min.	3	40 min.	4
-20 to -24	-29 to -31		1 Normal	75 min.	2	55 min.	3	40 min.	4	30 min.	5
-25 to -29	-32 to -34	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-Emergency work should cease 	
-30 to -34	-35 to -37	55 min.	3	40 min.	4	30 min.	5	Non-Emergency work should cease 			
-35 to -39	-38 to -39	40 min.	4	30 min.	5	Non-Emergency work should cease 					
-40 to -44	-40 to -42	30 min.	5	Non-Emergency work should cease 							
-45 & below	-43 & below	Non-Emergency work should cease 									

- d. Wind Chill -. Wind Chill is the term used to describe the rate of heat loss from the human body, resulting from the combined effect of low air temperature, and wind speed.
- (A.) The Wind Chill Temperature is a single value that takes both air temperature, and wind speed into account.
 - (B.) For example, when the air temperature is 40°F, and the wind speed is 35mph, the wind chill temperature is 28°F; this measurement is the actual effect of the environmental cold on the exposed skin.

Wind Chill Chart

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

T=Air Temperature (F) V=Wind Speed (m/hr)

		T E M P E R A T U R E F																	
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
W I N D	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times:

30 Min

10 Min

5 Min

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- e. Personal Protective Equipment (PPE) – PPE is an important factor in preventing cold stress related illnesses and injuries. Cold weather supplies will be regularly inspected and restocked when necessary. Employees shall adhere to the following recommendations when dressing for work in a cold environment:
 - (A.) Wear at least three layers of clothing; an inner layer of wool, silk or synthetic to wick moisture away from the body; a middle layer of wool or synthetic to provide insulation even when wet; an outer wind and rain protection layer that allows some ventilation to prevent overheating.
 - (B.) Wear a hat or hood; up to 40% of body heat can be lost when the head is left exposed.
 - (C.) Wear insulated boots or other footwear.
 - (D.) Do not wear tight clothing; loose clothing provides better ventilation.
 - (E.) Keep a change of clothing available in case work clothes become wet.
- f. All employees shall be under constant protective observation by a co-worker or supervisor for cold weather symptoms.

D. Training

1. Supervisors shall be trained in prevention measures for heat and cold related illnesses and well as emergency response procedures.
2. All employees shall receive initial and annual training regarding the health effects of Heat and/or Cold Stress prior to working in such conditions.
3. All workers shall be trained to administer proper first aid treatment on cold induced injuries or illnesses.
4. The company can provide heat or cold stress training upon request.
5. All training records shall be maintained in the employees personnel file and maintained by the supervisor. Training records are maintained in the office for training programs.

Safety Specifics – Housekeeping

A. General

1. While OSHA regulations require that each working surface be cleared of debris, including solid and liquid waste, at the end of each workshift or job, whichever occurs first, to fully realize the benefit of a clean workplace, it is recommended that good housekeeping be maintained throughout the course of the job and workday.
2. Good Housekeeping is evidenced by (but not limited to):
 - a. Floors free from grease and oil spillage
 - b. Properly identified passageways
 - c. Unobstructed accesses and exits
 - d. Neat and orderly machinery and equipment
 - e. Well-nested hoses and cords
 - f. Properly stored materials
 - g. Removal of excess waste material or debris from the working area
 - h. Walkways free from ice and snow
 - i. Surfaces, including elevated locations, free from accumulated dust
 - j. Adequate lighting
3. Each employee shall follow a daily a daily cleanup to including the following:
 - a. Keep floors, stairways, aisles, and other passageways clear of tools, equipment, trash, and other materials
 - b. Close drawers
 - c. Put tools away when they're not in use, and cover any sharp edges
 - d. Stack materials carefully so they won't fall or block sprinkler access
 - e. Clean up all spills immediately and properly, or call someone who can
 - f. Report any loose or broken flooring or any broken equipment
 - g. Keep food and beverages away from the work area
 - h. Properly dispose of all trash
 - i. Keep paper and other combustibles away from lights and electrical equipment
 - j. Prevent dirt or grease buildup on machinery and equipment
 - k. Keep containers of flammables closed when not in use
 - l. Don't place tools or equipment on the edges of shelves or tables

B. Materials, Waste, and Scrap

1. During the course of construction, alteration, or repairs, 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. Materials shall be stored in an orderly manner. Work site storage areas and walkways must be maintained free of dangerous depressions, obstructions, and debris.
3. The entire work site shall be orderly and debris must be disposed of in dumpsters, or off site, in accordance with all EPA regulations.

4. Combustible scrap and debris shall be removed at regular intervals during the course of construction. Safe means shall be provided to facilitate such removal.
5. Containers shall be provided for the collection and separation of waste, trash, oily and used rags, and other refuse.
 - a. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc. shall be equipped with covers.
 - b. Garbage and other waste shall be disposed of at frequent and regular intervals.

C. Walking Working Surfaces

1. Surface conditions

- a. All places of employment, passageways, storerooms, service rooms, and walking-working surfaces are kept in a clean, orderly, and sanitary condition.
- b. The floor of each workroom is maintained in a clean and, to the extent feasible, in a dry condition. When wet processes are used, drainage must be maintained and, to the extent feasible, dry standing places, such as false floors, platforms, and mats must be provided.
- c. Walking-working surfaces are maintained free of hazards such as sharp or protruding objects, loose boards, corrosion, leaks, spills, snow, and ice.

2. Loads

The employer must ensure that each walking-working surface can support the maximum intended load for that surface.

3. Access and egress

The employer must provide, and ensure each employee uses, a safe means of access and egress to and from walking-working surfaces.

4. Inspection, maintenance, and repair

- a. The employer must ensure:
- b. Walking-working surfaces are inspected, regularly and as necessary, and maintained in a safe condition;
- c. Hazardous conditions on walking/working surfaces are corrected or repaired before an employee uses the walking-working surface again. If the correction or repair cannot be made immediately, the hazard must be guarded to prevent employees from using the walking-working surface until the hazard is corrected or repaired; and
- d. When any correction or repair involves the structural integrity of the walking-working surface, a qualified person performs or supervises the correction or repair.

D. Construction

1. During the course of construction, alteration, or repairs, 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. Combustible scrap and debris shall be removed at regular intervals during the course of construction. Safe means shall be provided to facilitate such removal.
3. Containers shall be provided for the collection and separation of waste, trash, oily and used rags, and other refuse.
 - a. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc. shall be equipped with covers.

- b. Garbage and other waste shall be disposed of at frequent and regular intervals.

E. Chemicals

1. Chemicals or hazardous liquids shall be stored and secured properly.
2. Each container should be properly labeled for easy and accurate identification.
3. The workplace must provide a hazardous communication program which includes safety data sheets, training and proper warning labels.

F. Pathogens

1. All pathogens must be treated as if they are contaminated with infectious diseases.
2. An exposure control plan shall be in place that explains the strategies and procedures used to control and contain the pathogens.
3. Employees must be trained in the plan, and the plan must be reviewed and updated at least once a year.
4. The workplace must provide employees with protective gear and sanitizing chemicals to clean the pathogenic area.
5. The facility must provide an easily accessible hand-washing station stocked with antiseptic cleaner and paper towels.

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Safety Specifics – Ladders & Stairways (29 CFR 1926 Subpart X)

A. General

1. A stairway or ladder shall be provided at all personnel points of access where there is a break in elevation of 19 inches (48 cm) or more, and no ramp, runway, sloped embankment, or personnel hoist is provided.
2. Employees shall not use any spiral stairways that will not be a permanent part of the structure on which construction work is being performed.
3. A double-cleated ladder or two or more separate ladders shall be provided when ladders are the only mean of access or exit from a working area for 25 or more employees, or when a ladder is to serve simultaneous two-way traffic.
4. When a building or structure has only one point of access between levels, that point of access shall be kept clear to permit free passage of employees. When work must be performed or equipment must be used such that free passage at that point of access is restricted, a second point of access shall be provided and used.
5. When a building or structure has two or more points of access between levels, at least one point of access shall be kept clear to permit free passage of employees.
6. The company shall provide and install all stairway and ladder fall protection systems required and shall comply with all other pertinent requirements of this subpart before employees begin the work that necessitates the installation and use of stairways, ladders, and their respective fall protection systems.

B. Stairways

1. General

The following requirements apply to all stairways as indicated:

- a. Stairways that will not be a permanent part of the structure on which construction work is being performed shall 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.
 - b. Stairs shall be installed between 30 deg. and 50 deg. from horizontal.
 - c. Riser height and tread depth shall be uniform within each flight of stairs, including any foundation structure used as one or more treads of the stairs. Variations in riser height or tread depth shall not be over 1/4-inch (0.6 cm) in any stairway system.
 - d. Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width of the platform to less than 20 inches (51 cm).
 - e. Metal pan landings and metal pan treads, when used, shall be secured in place before filling with concrete or other material.
 - f. All parts of stairways shall be free of hazardous projections, such as protruding nails.
 - g. Slippery conditions on stairways shall be eliminated before the stairways are used to reach other levels.
- #### 2. Temporary service

The following requirements apply to all stairways as indicated:

- a. Except during stairway construction, foot traffic is prohibited on stairways with pan stairs where the treads and/or landings are to be filled in with concrete or other material at a later date, unless the stairs are temporarily fitted with wood or other solid material at least

to the top edge of each pan. Such temporary treads and landings shall be replaced when worn below the level of the top edge of the pan.

- b. Except during stairway construction, foot traffic is prohibited on skeleton metal stairs where permanent treads and/or landings are to be installed at a later date, unless the stairs are fitted with secured temporary treads and landings long enough to cover the entire tread and/or landing area.
- c. Treads for temporary service shall be made of wood or other solid material, and shall be installed the full width and depth of the stair.

3. Stair rails and handrails

The following requirements apply to all stairways as indicated:

- a. Stairways having four or more risers or rising more than 30 inches (76 cm), whichever is less, shall be equipped with:
 - (A.) At least one handrail; and
 - (B.) One stair rail system along each unprotected side or edge.
- b. Winding and spiral stairways shall be equipped with a handrail offset sufficiently to prevent walking on those portions of the stairways where the tread width is less than 6 inches (15 cm).
- c. Stair rails shall 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.
- d. Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members, shall be provided between the top rail of the stairrail system and the stairway steps.
 - (A.) Midrails, when used, shall be located at a height midway between the top edge of the stair rail system and the stairway steps.
 - (B.) Screens or mesh, when used, shall extend from the top rail to the stairway step, and along the entire opening between top rail supports.
 - (C.) When intermediate vertical members, such as balusters, are used between posts, they shall be not more than 19 inches (48 cm) apart.
 - (D.) Other structural members, when used, shall be installed such that there are no openings in the stair rail system that are more than 19 inches (48 cm) wide.
- e. 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.
- f. The height of handrails shall 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.
- g. When the top edge of a stair rail system also serves as a handrail, the height of the top edge shall be not more than 37 inches (94 cm) nor 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.
- h. Stair rail systems and handrails shall be so surfaced as to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.
- i. Handrails shall provide an adequate handhold for employees grasping them to avoid falling.
- j. The ends of stair rail systems and handrails shall be constructed so as not to constitute a projection hazard.

- k. Handrails that will not be a permanent part of the structure being built shall have a minimum clearance of 3 inches (8 cm) between the handrail and walls, stairrail systems, and other objects.
- l. Unprotected sides and edges of stairway landings shall be provided with guardrail systems. Guardrail system criteria are contained in § 1926 Subpart M.

C. Ladders

1. General

The following requirements apply to all ladders as indicated, including job-made ladders.

- a. Ladders shall be capable of supporting the following loads without failure:
 - (A.) Each self-supporting portable ladder:
 - (1.) At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load.
 - (2.) The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction.
 - (3.) Ladders built and tested in conformance with the applicable provisions of appendix A of this subpart will be deemed to meet this requirement.
 - (B.) Each portable ladder that is not self-supporting:
 - (1.) At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladders shall sustain at least 3.3 times the maximum intended load.
 - (2.) The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction when the ladder is placed at an angle of 75 1/2 degrees from the horizontal.
 - (3.) Ladders built and tested in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.
 - (C.) Each fixed ladder:
 - (1.) At least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments (the number and position of additional concentrated loads of 250 pounds (114 kg) each, determined from anticipated usage of the ladder, shall also be included), plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices.
 - (2.) Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds (114 kg) applied in the middle of the step or rung.
 - (3.) Ladders built in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.
- b. Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.
- c. Rungs, cleats, and steps of portable ladders (except as provided below) and fixed ladders (including individual-rung/step ladders) shall be spaced not less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, as measured between center lines of the rungs, cleats, and steps.

- (A.) Rungs, cleats, and steps of step stools shall be not less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, as measured between center lines of the rungs, cleats, and steps.
 - (B.) Rungs, cleats, and steps of the base section of extension trestle ladders shall not be less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, as measured between center lines of the rungs, cleats, and steps. The rung spacing on the extension section of the extension trestle ladder shall be not less than 6 inches (15 cm) nor more than 12 inches (31 cm), as measured between center lines of the rungs, cleats, and steps.
- d. The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches (41 cm).
 - e. The minimum clear distance between side rails for all portable ladders shall be 11 1/2 inches (29 cm).
 - f. The rungs of individual-rung/step ladders shall be shaped such that employees' feet cannot slide off the end of the rungs.
 - g. The rungs and steps of fixed metal ladders manufactured after March 15, 1991, shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.
 - h. The rungs and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.
 - i. Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.
 - j. A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.
 - k. When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.
 - l. Except when portable ladders are used to gain access to fixed ladders (such as those on utility towers, billboards, and other structures where the bottom of the fixed ladder is elevated to limit access), when two or more separate ladders are used to reach an elevated work area, the ladders shall be offset with a platform or landing between the ladders. (The requirements to have guardrail systems with toeboards for falling object and overhead protection on platforms and landings are set forth in subpart M of this part.)
 - m. Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
 - n. Wood ladders shall not be coated with any opaque covering, except for identification or warning labels which may be placed on one face only of a side rail.
 - o. The minimum perpendicular clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches (18 cm), except in the case of an elevator pit ladder, for which a minimum perpendicular clearance of 4 1/2 inches (11 cm) is required.
 - p. The minimum perpendicular clearance between the center line of fixed ladder rungs, cleats, and steps, and any obstruction on the climbing side of the ladder shall be 30 inches (76 cm), except as provided in paragraph (a)(15) of this section.
 - q. When unavoidable obstructions are encountered, the minimum perpendicular clearance between the centerline of fixed ladder rungs, cleats, and steps, and the obstruction on the climbing side of the ladder may be reduced to 24 inches (61 cm), provided that a deflection device is installed to guide employees around the obstruction.

- r. Through fixed ladders at their point of access/egress shall have a step-across distance of not less than 7 inches (18 cm) nor more than 12 inches (30 cm) as measured from the centerline of the steps or rungs to the nearest edge of the landing area. If the normal step-across distance exceeds 12 inches (30 cm), a landing platform shall be provided to reduce the distance to the specified limit.
- s. Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches (38 cm) on each side of the centerline of the ladder.
- t. Fixed ladders shall be provided with cages, wells, ladder safety devices, or self-retracting lifelines where the length of climb is less than 24 feet (7.3 m) but the top of the ladder is at a distance greater than 24 feet (7.3 m) above lower levels.
- u. Where the total length of a climb equals or exceeds 24 feet (7.3 m), fixed ladders shall be equipped with one of the following:
 - (A.) Ladder safety devices; or
 - (B.) Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet (45.7 m); or
 - (C.) A cage or well, and multiple ladder sections, each ladder section not to exceed 50 feet (15.2 m) in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet (15.2 m).
- v. Cages for fixed ladders shall conform to all of the following:
 - (A.) Horizontal bands shall be fastened to the side rails of rail ladders, or directly to the structure, building, or equipment for individual-rung ladders;
 - (B.) Vertical bars shall be on the inside of the horizontal bands and shall be fastened to them;
 - (C.) Cages shall extend not less than 27 inches (68 cm), or more than 30 inches (76 cm) from the centerline of the step or rung (excluding the flare at the bottom of the cage), and shall not be less than 27 inches (68 cm) in width;
 - (D.) The inside of the cage shall be clear of projections;
 - (E.) Horizontal bands shall be spaced not more than 4 feet (1.2 m) on center vertically;
 - (F.) Vertical bars shall be spaced at intervals not more than 9 1/2 inches (24 cm) on center horizontally;
 - (G.) The bottom of the cage shall be at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder. The bottom of the cage shall be flared not less than 4 inches (10 cm) all around within the distance between the bottom horizontal band and the next higher band;
 - (H.) The top of the cage shall be a minimum of 42 inches (1.1 m) above the top of the platform, or the point of access at the top of the ladder, with provision for access to the platform or other point of access.
- w. Wells for fixed ladders shall conform to all of the following:
 - (A.) They shall completely encircle the ladder;
 - (B.) They shall be free of projections;
 - (C.) Their inside face on the climbing side of the ladder shall extend not less than 27 inches (68 cm) nor more than 30 inches (76 cm) from the centerline of the step or rung;
 - (D.) The inside clear width shall be at least 30 inches (76 cm);

- (E.) The bottom of the wall on the access side shall start at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder.
- x. Ladder safety devices, and related support systems, for fixed ladders shall conform to all of the following:
 - (A.) They shall be capable of withstanding without failure a drop test consisting of an 18-inch (41 cm) drop of a 500-pound (226 kg) weight;
 - (B.) They shall permit the employee using the device to ascend or descend without continually having to hold, push or pull any part of the device, leaving both hands free for climbing;
 - (C.) They shall be activated within 2 feet (.61 m) after a fall occurs, and limit the descending velocity of an employee to 7 feet/sec. (2.1 m/sec.) or less;
 - (D.) The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9 inches (23 cm) in length.
- y. The mounting of ladder safety devices for fixed ladders shall conform to the following:
 - (A.) Mountings for rigid carriers shall be attached at each end of the carrier, with intermediate mountings, as necessary, spaced along the entire length of the carrier, to provide the strength necessary to stop employees' falls.
 - (B.) Mountings for flexible carriers shall be attached at each end of the carrier. When the system is exposed to wind, cable guides for flexible carriers shall be installed at a minimum spacing of 25 feet (7.6 m) and maximum spacing of 40 feet (12.2 m) along the entire length of the carrier, to prevent wind damage to the system.
 - (C.) The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.
- z. The side rails of through or side-step fixed ladders shall extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For a parapet ladder, the access level shall be the roof if the parapet is cut to permit passage through the parapet; if the parapet is continuous, the access level shall be the top of the parapet.
- aa. For through-fixed-ladder extensions, the steps or rungs shall be omitted from the extension and the extension of the side rails shall be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where ladder safety devices are provided, the maximum clearance between side rails of the extensions shall not exceed 36 inches (91 cm).
- bb. For side-step fixed ladders, the side rails and the steps or rungs shall be continuous in the extension.
- cc. Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches (1.1 m) above an access level or landing platform either by the continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.

2. Use

The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated

- a. When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in

mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

- b. Ladders shall be maintained free of oil, grease, and other slipping hazards.
- c. Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.
- d. Ladders shall be used only for the purpose for which they were designed.
- e. Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).
- f. Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.
- g. Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.
- h. Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
- i. Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.
- j. Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- k. The area around the top and bottom of ladders shall be kept clear.
- l. The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.
- m. Ladders shall not be moved, shifted, or extended while occupied.
- n. Ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized electrical equipment, except as provided in §1926.955(b) and (c).
- o. The top or top step of a stepladder shall not be used as a step.
- p. Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- q. Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.
- r. Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with "Do Not Use" or similar language, and shall be withdrawn from service until repaired.
- s. Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired. The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:
 - (A.) Immediately tagged with "Do Not Use" or similar language,

- (B.) Marked in a manner that readily identifies it as defective;
- (C.) Or blocked (such as with a plywood attachment that spans several rungs).
- t. Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
- u. Single-rail ladders shall not be used.
- v. When ascending or descending a ladder, the user shall face the ladder.
- w. Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- x. An employee shall not carry any object or load that could cause the employee to lose balance and fall.

D. Training

The company shall provide a training program for each employee using ladders and stairways, as necessary. The program shall enable each employee to recognize hazards related to ladders and stairways, and shall train each employee in the procedures to be followed to minimize these hazards.

1. The company shall ensure that each employee has been trained by a competent person in the following areas, as applicable:
 - a. The nature of fall hazards in the work area;
 - b. The correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used;
 - c. The proper construction, use, placement, and care in handling of all stairways and ladders;
 - d. The maximum intended load-carrying capacities of ladders and
 - e. The standards contained in 29 CFR 1910 Subpart X.
2. Retraining shall be provided for each employee as necessary so that the employee maintains the understanding and knowledge acquired through compliance with this section.

Safety Specifics – Lead Exposure Compliance (29 CFR 1926.62)

A. Exposure Assessment

1. Protection of Employees during Exposure Assessment

- a. When tasks are presumed to generate lead exposures greater than the permissible exposure limit (PEL) of 50 ug/m³ of air averaged over an eight hour period, we treat affected employees as if they were exposed above the PEL and implement procedures to protect workers until we perform an employee exposure assessment and document that an employee's lead exposure is not above the PEL.
- b. Tasks estimated to generate a TWA of 50 ug/m³ of air include:
 - (A.) Manual demolition of structures (e.g. Dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems where lead coatings or paint are present.
 - (B.) Spray painting with lead paint
- c. Tasks estimated to generate a TWA of 500 ug/m³ of air include:
 - (A.) Using lead containing mortar or lead burning.
 - (B.) Rivet busting, and power tool cleaning without dust collection systems.
 - (C.) Cleanup activities, where dry expendable abrasives are used, and abrasive blasting enclosure movement and removal where lead containing coatings or paint are present.
- d. Based on historical data from previous lead removal/abatement jobs, we will take measures as recommended in 29 CFR 1926.62 to protect our employees. These measures include but are not limited to:
 - (A.) Appropriate respiratory protection (protection factor of 10, 25, 50, or 100 depending on the tasks involved and the estimated exposures).
 - (B.) Proper personal protective clothing and equipment
 - (C.) Change areas
 - (D.) Hand washing facilities
 - (E.) Biological monitoring
 - (F.) Training

2. Initial Determination

- a. We assess each new project to determine if employees may be exposed to lead at or above the action level of 30 ug/m³ of air as an eight hour TWA. This initial determination can be based on:
 - (A.) Employee exposure monitoring.
 - (B.) Objective data demonstrating that under expected conditions, specific processes, operations, or activities involving lead cannot result in employee exposure to lead at or above the action level.
 - (C.) Previous monitoring for lead exposures within the last 12 months during work operations conducted under workplace conditions closely resembling the processes, types of materials, control methods, work practices, and environmental conditions used and prevailing in your operations.
- b. We base initial determinations on employee exposure data. Our employee exposure monitoring data includes:

- (A.) Information, observations, or calculations which would indicate employee exposure to lead.
- (B.) Previous measurements of airborne lead.
- (C.) Any employee complaints of symptoms which may be attributable to exposure to lead.

3. Initial Determination Results

- a. If our initial determination reveals employee exposures to be below the action level, an independent third party air-monitoring agency will be employed to conduct periodic air monitoring during operations to confirm that airborne lead levels are below the action level. If our initial determination reveals employee exposures to be at the action level but at or below the PEL, an independent air monitoring agency will be employed to conduct air monitoring and personal air sampling of 25% of the represented work force.
- b. If our initial determination reveals that employee's exposures will be above the PEL, attempts will be made through administrative and engineering controls to reduce exposures below the PEL. Monitoring will be conducted every six months until two consecutive results are below the action level. If the controls fail to reduce the exposure level, employees shall wear the appropriate level of PPE necessary to reduce exposures below the PEL.
- c. Additional Exposure Assessments
- d. If changes in equipment, process, control, personnel or tasks occur after initial determination, we reevaluate to determine if employees are exposed to higher concentrations of lead. We will employ an independent third party air-monitoring agency to conduct periodic air monitoring of the work site to determine if changes occur in the exposure levels.

B. Employee Notification

Within five (5) working days of completing an exposure assessment we notify each employee in writing of his/her assessment results including corrective actions taken. Our procedure for this notification process is that we will post all air monitoring results for employees to review within five (5) working days.

C. Methods of Compliance

- 1. This program is our written strategy and schedule for protecting our workers from lead exposure. It incorporates all relevant information that relates to this goal, so that we determine whether we appropriately analyzed problems and solutions (including alternatives) relating to lead exposure.
- 2. This program is intended to reduce employee exposure to at or below the PEL. When all feasible engineering and work practice controls that can be instituted are not sufficient to reduce employee exposure to acceptable levels, appropriate respiratory protection will be provided to supplement such controls.
- 3. Our job sites, equipment, and materials are regularly inspected. This company reviews this program at least every six months to revise it as necessary. For most projects, lead abatement activities are expected to be the primary cause of our lead exposures.
- 4. To reduce and maintain employee exposures to lead at or below the PEL, we have implemented state-of-the art engineering and work practices to include, but not limited to; wet methods, negative air systems, necessary PPE.

D. Work Practice Programs

1. Our jobs are typically multi-employer worksites. The procedure we use to cooperate with other contractors and inform all employees of potential exposure to lead shall be that the contractor must supply this organization a copy of lead worker and/or lead supervisor licenses for all employees who may be exposed to lead from lead abatement activities. All contractor employees shall receive a site safety orientation to include the hazards of lead of the site prior to beginning work.
2. As an employer we want to keep our employees fully informed of all aspects of this plan. Our Job Site Supervisor/Competent Person will make frequent and regular inspections of the job site, materials, and equipment, and ensure a copy of this written plan is available at the worksite. We review and update our written plan every six months to reflect the current status of the program.

E. Respiratory Protection

1. As our engineering controls and work practices are generally sufficient to reduce exposures to at or below the PEL without the use of respirators, unless an employee specifically requests a respirator, respiratory protection will not be routinely used on our worksites.
2. During our exposure assessment to document that our employees are not exposed above the PEL, we treat employees performing certain operations as if they were exposed above the PEL. This means providing respiratory protection. Our respirator program includes a copy of the requirements of 29 CFR 1926.62(f), 29 CFR 1926.62 App. B, and 29 CFR 1910.134 and is included in this plan. We provide NIOSH approved respirators, recommended in Table 1 of 29 CFR 1926.62, to employees who request them. Any employee may ask his supervisor for a respirator and one will be provided upon that request in accordance with company policy.
3. We provide powered air purifying respirators (PAPR) instead of respirators recommended in Table 1 of 29 CFR 1926.62 to employees exposed to 1250 ug/m³ of air or more who request them. Any employee who requests a PAPR through his supervisor will be provided one upon that request in accordance with company policy.

F. Protective Work Clothing and Equipment

1. We provide personal protective equipment as interim protection for employees during exposure assessment, since our employees may be exposed to lead (1) above the PEL without regard to the use of respirators, or (2) to lead compounds which may cause skin or eye irritation. This outline of our Protective Work Clothing and Equipment policy is included as part of the site plan when required. We provide protective clothing and equipment at no cost to our employees.
2. The types of protective clothing provided by our company shall include, but is not limited to: Cotton tyvek coveralls, with hood; Saranex coated tyvek coveralls with hood; latex gloves with taped interfaces, safety glasses, and hardhats where necessary. This equipment is considered disposable, and is to be disposed of at the job site.
3. We will replace or repair any damaged equipment providing the employee notifies his supervisor of the damage to his protective clothing.

G. Housekeeping

1. Our company believes that a rigorous housekeeping program is necessary in jobs where lead exposure or the potential of lead exposure to keep airborne lead levels below permissible limits. This requires a regular housekeeping schedule adapted to exposure conditions on the site. For our projects our housekeeping procedures will include but are not limited to:

2. Vacuuming floors and other surfaces where lead accumulates to minimize the likelihood of lead becoming airborne.
3. Shoveling or wet sweeping (permitted only where vacuuming or other equally effective methods have been tried and found ineffective).
4. Use of HEPA filters on vacuum cleaners.
5. Emptying vacuums so that lead is not reintroduced into the workplace.

H. Hygiene Facilities and Practices

We provide lunch rooms, changing, shower & hygiene facilities for our workers when lead is above the PEL. We prohibit smoking, eating, applying cosmetics, and the presence of tobacco products, foodstuffs, or cosmetics in all work areas where employees are exposed to lead above the PEL. We make sure worker will comply with these requirements through regular inspections by supervisory personnel. Employees who fail to follow accepted/proscribed hygiene and safety procedures will be subject to disciplinary actions as prescribed by company policy.

I. Medical Surveillance

1. Our company supports the practices necessary for early detection of lead exposure. The medical surveillance program supplements the primary goals of the lead exposure control program of preventing disease through elimination or reduction of airborne concentrations of lead, and sources of ingestion. The medical surveillance provisions incorporate both initial and ongoing medical surveillance.
2. We provide initial medical surveillance to employees who are occupationally exposed to airborne lead levels at or above the PEL. This monitoring consists of sampling blood and analyzing it for lead and zinc protoporphyrin levels. Where this initial biological monitoring indicates that an employee's blood lead level is at or above 40 ug/dl of whole blood, we provide biological monitoring every two (2) months. This frequency will continue until two consecutive blood samples and analysis indicates that the employee's blood lead level is below 40 ug/dl of whole blood. Otherwise, employees will be biologically monitored on a semi-annual basis.
3. All medical examinations, procedures, and blood lead level sampling/analysis shall be conducted by licensed healthcare practitioners and/or physicians. Our medical surveillance program shall meet the requirements of 29 CFR 1926.62 including provision for employee notification of medical surveillance results.

4. Medical Removal Protection

We remove employees from work who have exposures to lead at or above the action level each time a periodic and a follow-up blood sample indicate that the blood lead levels are at or above 50 ug/dl of whole blood. We also remove employees from work who have exposures to lead at or above the action level when a health care professional determines that they have medical conditions which, when exposed to lead, places them at greater risk for those health problems. Employees who are removed from work will receive all wages, benefits, for a period of 18 months without loss of seniority or promotion opportunities. The company reserves the right to place an employee in a position, of equal responsibility, where the employee will not be exposed occupationally to lead.

J. Employee Education and Training

1. Employees can do much to protect themselves from the risks of occupational lead exposure if they know about them. In our training programs we inform employees of the specific hazards associated with their work environment, protective measures which can be taken, and their

rights under the standard (Including the contents of 29 CFR 1926.62 and appendices A & B) prior to the time of initial assignment and annually thereafter.

2. All affected employees are required to attend the training program. The training shall be provided prior to the time of initial job assignment. Training shall be provided at least annually. The employees will be informed of the specific nature of the operations that could result in exposure to lead above the action level. Employees shall be informed of the purpose, proper selection, fitting, use, and limitation of respirators. Employees shall be informed of the engineering controls used to control exposure.
3. The employees shall be informed of the purpose & a description of the medical surveillance program & the medical removal program. The training requirements of 29 CFR 1926.62(l) shall be reviewed and complied with.

K. Signs

Because exposure to lead is a serious health hazard, we post signs that warn employees of lead hazards and of the possible need to use respirators and other protective equipment in the area. Appropriate lead warning signs will be provided at all entrances and exits to the work area. Additionally, employees will be instructed as to the meanings of the various signs at the worksite during training.

L. Recordkeeping

1. We maintain accurate biological and environmental monitoring records of employee exposures to potentially toxic materials, including lead. We allow employees unlimited access to their records.
2. We include the following exposure monitoring records:
 - a. Exposure assessment
 - b. Medical surveillance results
 - c. Medical removals
 - d. Objective data for exemption from requirement for initial monitoring
 - e. Procedures for making records available
 - f. Procedures for transfer of records

M. Observation of Monitoring

We provide our employees or their representatives the opportunity to observe exposure monitoring of toxic materials or harmful physical agents. When an observer is present, supervisory personnel shall ensure that the observer is provided with the following:

1. An explanation of the measurement procedures being used.
2. Allowing the observation of all steps related to the measurement procedures.
3. The dissemination of the results when returned by the laboratory.
4. Providing the observer with the proper personal protective equipment.
5. Assuring that observers comply with all applicable safety and health procedures

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Safety Specifics – **Machine Guarding (29 CFR 1926.300)**

A. General Requirements for all machines

1. Machine guarding.

- a. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks.
- b. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible.
- c. The guard shall be such that it does not offer an accident hazard in itself.
- d. Point of operation guarding.
 - (A.) Point of operation is the area on a machine where work is actually performed upon the material being processed.
 - (B.) The following are some of the machines which usually require point of operation guarding:
 - (1.) Guillotine cutters
 - (2.) Shears
 - (3.) Alligator shears
 - (4.) Power presses
 - (5.) Milling machines
 - (6.) Power saws
 - (7.) Jointers
 - (8.) Portable power tools
 - (9.) Forming rolls and calendars
 - (C.) The point of operation of machines, whose operation exposes an employee to injury, shall be guarded. The guarding device shall be designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.
- e. Revolving drums, barrels, and containers shall be guarded by an enclosure which is interlocked with the drive mechanism, so that the barrel, drum, or container cannot revolve unless the guard enclosure is in place.
- f. When the periphery of the blades of a fan is less than seven (7) feet above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than one-half (1/2) inch.

2. Anchoring fixed machinery.

Machines designed for a fixed location shall be securely anchored to prevent the machine from walking or moving.

B. Woodworking Machinery

1. Machine Construction

- a. Machines shall be constructed so that it is free from sensible vibration with the largest tool mounted and running at full speed.

- b. All belts, pulleys, gears, shafts, and moving parts shall be guarded in accordance with the specific requirements of 29 CFR 1910.219.
- c. It is recommended that each power-driven woodworking machine be provided with a disconnect switch that can be locked in the off position.

2. Controls & Equipment

- a. A mechanical or electrical power control shall be provided on each machine to make it possible for the operator to cut off the power from each machine without leaving his position at the point of operation.
- b. On applications where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power.
- c. Power controls and operating controls shall be located within easy reach of the operator while he is at his regular work location, making it unnecessary for him to reach over the cutter to make adjustments.

3. Hoods and Guards

- a. All woodworking machinery – such as table saws, swing saws, radial saws, band saws, jointers, tenoning machines, boring and mortising machines, shapers, planers, lathes, sanders, veneer cutters, and other miscellaneous woodworking machinery – must be enclosed or guarded, except that part of the blade doing the actual cutting, to protect the operator and other employees from hazards inherent to the operation (§§1910.213(c) through (r)).
- b. Hoods, shields, or enclosures shall be made of adequate strength to resist blows and strains incidental to reasonable operation, adjusting, and handling, and shall be so designed as to protect the operator from flying splinters and broken saw teeth, contact with in-running rolls, and sawdust.
- c. Where an exhaust system is used, the guard shall form part of or the entire exhaust hood and shall be constructed of sheet metal of a thickness not less than one-sixteenth inch in thickness; and if cast iron is used, it shall be not less than three-sixteenths inch in thickness.

4. Restarts

In operations where injury to the operator might result if motors were to restart after power failures, provision must be made to prevent machines from automatically restarting upon restoration of power (§1910.213(b)(3)).

5. Band saws

Blades must be enclosed or guarded except for the working portion of the blade between the bottom of the guide rolls and the table. Band saw wheels must be fully encased. The outside periphery of the enclosure must be solid. The front and back must be either solid or wire mesh or perforated metal (§1910.213(i)(1)).

6. Circular Table Saws

- a. Circular saws must have a hood over the portion of the saw above the table mounted so that the hood will automatically adjust itself to the thickness of and remain in contact with the material being cut (§§1910.213(c)(1), (d)(1), and (e)(1)).
- b. Circular table saws must be furnished with a spreader to prevent material from squeezing the saw or being thrown back on the operator. The spreader must be made of hard tempered steel, or its equivalent.

- (A.) The spreader must be attached so that it will remain in true alignment with the saw even when either the saw or table is tilted. The provision of a spreader in connection with grooving, dadoing, or rabbeting is not required.
 - (B.) Each circular resaw (other than self-feed saws with a roller or wheel at back of the saw) must be provided with a spreader fastened securely behind the saw.
 - (C.) The spreader must be slightly thinner than the saw kerf and slightly thicker than the saw disk (§§1910.213(c)(2) and (e)(2)).
- c. Circular table saws used for ripping must have nonkickback fingers or dogs (§1910.213(f)(2)).

7. Rip Saws

- a. Rip saws must have a spreader aligned with the blade and must be no thinner than the blade. The provision of a spreader in connection with grooving, dadoing, or rabbeting is not required (§§1910.213(c)(2) and (e)(2)).
- b. Rip saws must have nonkickback fingers or dogs (§1910.213(c)(3)).

8. Inverted Swing or Sliding Cut-off Saws

Inverted swing or sliding cut-off saws must be provided with a hood that will cover the part of the saw that protrudes above the top of the table or material being cut (§1910.213(g)(4)).

9. Radial Saws

- a. Radial saws must have an upper guard that completely encloses the upper half of the saw blade. The sides of the lower exposed portion of the blade must be guarded by a device that will automatically adjust to the thickness of and remain in contact with the material being cut (§1910.213(h)(1)).
- b. Radial saws used for ripping must have non-kickback fingers or dogs (§1910.213(h)(2)).
- c. Radial saws must have an adjustable stop to prevent the forward travel of the blade beyond the position necessary to complete the cut in repetitive operations (§1910.213(h)(3)).
- d. Radial saws must be installed so that the cutting head will return to the starting position when released by the operator (§1910.213(h)(4)).

10. Self-feed Circular Saws

- a. Self-feed circular saws, feed rolls and blades must be protected by a hood or guard to prevent the hand of the operator from coming into contact with the in-running rolls at any point (§1910.213(f)(1)).

11. Swing or Sliding Cut-off Saws

- a. Swing or sliding cut-off saws must be provided with a hood that will completely enclose the upper half of the saw (§1910.213(g)(1)).
- b. Swing or sliding cut-off saws must be provided with limit stops to prevent the saws from extending beyond the front or back edges of the table (§1910.213(g)(3)).
- c. Swing or sliding cut-off saws must be provided with an effective device to return the saw automatically to the back of the table when released at any point of its travel (§1910.213(g)(2)).

C. Abrasive Wheel Machinery

- 1. Abrasive wheels must be used only on machines provided with safety guards with the following exceptions:

- a. Wheels used for internal work while within the work being ground (§1910.215(a)(1)(i) and §1910.243(c)(1)(i)(a))
- b. Mounted wheels, used in portable operations, 2 inches (5 centimeters) and smaller in diameter (§1910.215(a)(1)(ii) and §1910.243(c)(1)(i)(b))
- c. Type 16, 17, 18, 18R, and 19 cones, plugs, and threaded hole pot balls where the work offers protection (§1910.215(a)(1)(iii) and §1910.243(c)(1)(i)(c)).

2. Guards

- a. Abrasive wheel safety guards must cover the spindle end, nut, and flange projections. Safety guards must also be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings must exceed the strength of the guard, except:
 - (A.) Safety guards on all operations where the work provides a suitable measure of protection to the operator may be so constructed that the spindle end, nut, and outer flange are exposed (§1910.215(a)(2)(i) and §1910.243(c)(1)(ii)(b))
 - (B.) Where the nature of the work is such as to entirely cover the side of the wheel, the side covers of the guard may be omitted (§1910.215(a)(2)(i) and §1910.243(c)(1)(ii)(b))
 - (C.) The spindle end, nut, and outer flange may be exposed on portable machines designed as portable saws, as well as on other machines designed for, and used with, type 6, 11, 27, and 28 abrasive wheels, cutting off wheels, and tuck pointing wheels (§1910.215(a)(2)(ii) and §1910.243(c)(1)(ii)(c))
- b. Abrasive wheel safety guards for bench and floor stands and for cylindrical grinders must not expose the grinding wheel periphery for more than 90 degrees or ¼ of the periphery (bench and floor stands) and 180 degrees (cylindrical grinders).
 - (A.) The exposure must begin at a point not more than 65 degrees above the horizontal plane of the wheel spindle. The protecting member must be adjustable for variations in wheel size so that the distance between the wheel periphery and adjustable tongue (tongue guard) or end of the peripheral member at the top must never exceed ¼ inch (6 millimeters) (§§1910.215(b)(3) through (4), and (b)(9)).

3. Work Rests

- a. Work rests on offhand grinding machines must be used to support the work.
- b. They must be of rigid construction and designed to be adjustable to compensate for wheel wear.
- c. Work rests must also be kept adjusted closely to the wheel with no more than a 1/8 inch (3.2 millimeters) opening. This will prevent the work from being jammed between the wheel and the rest, which may cause wheel breakage.
- d. During any wheel adjustments the wheel must be motionless and wheel rests must be securely clamped after each adjustment (§1910.215(a)(4)).
- e. Only use the grinding wheel for intended product.

Safety Specifics – **Material Handling (1926.250)**

A. General

1. All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.
2. Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loads shall not be exceeded.
3. Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas shall be kept in good repair.
4. When a difference in road or working levels exist, means such as ramps, blocking, or grading shall be used to ensure the safe movement of vehicles between the two levels.

B. Material Storage

1. Material stored inside buildings under construction shall 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.
2. Each employee required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with personal fall arrest equipment.
3. Noncompatible materials shall be segregated in storage.
4. Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.
5. Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary.
6. Portable and powered dockboards shall be strong enough to carry the load imposed on them.
 - a. Portable dockboards shall be secured in position, either by being anchored or equipped with devices which will prevent their slipping.
 - b. Handholds, or other effective means, shall be provided on portable dockboards to permit safe handling.

C. Stacking Materials

1. To help prevent injuries when stacking materials:
 - a. Stack lumber no more than 16 feet high if it is handled manually, and no more than 20 feet if using a forklift
 - b. Remove all nails from used lumber before stacking
 - c. Stack and level lumber on solidly supported bracing
 - d. Ensure that stacks are stable and self-supporting
 - e. Do not store pipes and bars in racks that face main aisles to avoid creating a hazard to passersby when removing supplies
 - f. Stack bags and bundles in interlocking rows to keep them secure
 - g. Stack bagged material by stepping back the layers and cross-keying the bags at least every ten layers (to remove bags from the stack, start from the top row first)

2. During materials stacking activities:
 - a. Store baled paper and rags inside a building no closer than 18 inches to the walls, partitions, or sprinkler heads
 - b. Band boxed materials or secure them with cross-ties or shrink plastic fiber
 - c. Stack drums, barrels, and kegs symmetrically
 - d. Block the bottom tiers of drums, barrels, and kegs to keep them from rolling if stored on their sides
 - e. Place planks, sheets of plywood dunnage, or pallets between each tier of drums, barrels, and kegs to make a firm, flat, stacking surface when stacking on end
 - f. Chock the bottom tier of drums, barrels, and kegs on each side to prevent shifting in either direction when stacking two or more tiers high
 - g. Stack and block poles as well as structural steel, bar stock, and other cylindrical materials to prevent spreading or tilting unless they are in racks
3. Additional measures:
 - a. Paint walls or posts with stripes to indicate maximum stacking heights for quick reference
 - b. Observe height limitations when stacking materials
 - c. Consider the need for availability of the material

D. Moving Materials Manually

1. Attach handles or holders to loads
2. Wear appropriate personal protective equipment
3. Properly stack and secure all materials prior to lifting or moving to prevent sliding, falling, or collapse
4. Seek help in the following:
 - a. When a load is so bulky that you cannot properly grasp or lift it
 - b. When you cannot see around or over a load
 - c. When you cannot safely handle a load
5. Use proper lifting techniques
 - a. Place your feet close to the load, shoulder width apart for good balance
 - b. Bend knees to the degree comfortable and get a good hand hold
 - c. Then, using both leg and arm muscles, lift the load
 - d. Lift the load smoothly and evenly while pushing with your legs and keeping the load close to your body
6. Using the following personal protective equipment prevents needless injuries when manually moving materials:
 - a. Hand and forearm protection, such as gloves, for loads with sharp or rough edges
 - b. Eye protection
 - c. Steel-toed safety shoes or boots
 - d. Metal, fiber, or plastic metatarsal guards to protect the instep area from impact or compression

7. Use blocking materials to manage loads safely
 - a. Use caution when placing blocks under a raised load to ensure that the load is not released before removing their hands from under the load.
 - b. Blocking materials and timbers should be large and strong enough to support the load safely.
 - c. Do not use materials with cracks, rounded corners, splintered pieces, or dry rot for blocking

E. Moving Materials Mechanically

1. Avoid overloading equipment when moving materials mechanically by letting the weight, size, and shape of the material being moved dictate the type of equipment used.
 - a. All materials-handling equipment has rated capacities that determine the maximum weight the equipment can safely handle and the conditions under which it can handle that weight.
 - b. Ensure that the equipment-rated capacity is displayed on each piece of equipment and is not exceeded except for load testing.
2. Take precautions when stacking and storing material
3. When picking up items with a powered industrial truck:
 - a. Center the load on the forks as close to the mast as possible to minimize the potential for the truck tipping or the load falling
 - b. Avoid overloading a lift truck because it impairs control and causes tipping over
 - c. Do not place extra weight on the rear of a counterbalanced forklift to allow an overload
 - d. Adjust the load to the lowest position when traveling
 - e. Follow the truck manufacturer's operational requirements
 - f. Pile and cross-tier all stacked loads correctly when possible
4. Rigging Equipment for Material Handling
 - a. Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.
 - b. Employers must ensure that rigging equipment:
 - (A.) Has permanently affixed and legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load;
 - (B.) Not be loaded in excess of its recommended safe working load as prescribed on the identification markings by the manufacturer; and
 - (C.) Not be used without affixed, legible identification markings, required by paragraph (a)(2)(i) of this section.
 - c. Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.
 - d. Slings
 - (A.) Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

- (B.) Slings shall not be shortened with knots or bolts or other makeshift devices.
- (C.) Sling legs shall not be kinked.
- (D.) Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- (E.) Slings shall be padded or protected from the sharp edges of their loads.
- (F.) Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
- (G.) Safe operating temperatures. Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200 °F (93.33 °C). When nonfiber core wire rope slings of any grade are used at temperatures above 400 °F (204.44 °C) or below minus 60 °F (15.55 °C), recommendations of the sling manufacturer regarding use at that temperature shall be followed.

F. Disposal

1. Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used. For the purpose of this paragraph, an enclosed chute is a slide, closed in on all sides, through which material is moved from a high place to a lower one.
2. When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. Signs warning of the hazard of falling materials shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.
3. All scrap lumber, waste material, and rubbish shall be removed from the immediate work area as the work progresses.
4. Disposal of waste material or debris by burning shall comply with local fire regulations.
5. All solvent waste, oily rags, and flammable liquids shall be kept in fire resistant covered containers until removed from worksite.

Safety Specifics – Mechanized Equipment (29 CFR 1926.600)

A. General

1. All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment.
2. 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.
3. 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.
4. Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set.
5. All cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any machine.
6. Equipment maintenance shall be performed as recommended by the manufacturer.
7. All inspections must be documented and copies will be provided to Management upon request.
8. Defective equipment will be removed from service immediately and until repairs can be made. Equipment not in use do to damage should be tagged out.

B. Motor Vehicles

1. Motor vehicles as covered by this part are those vehicles that operate within an off-highway jobsite, not open to public traffic.
2. All vehicles shall have a service brake system, an emergency brake system, and a parking brake system. These systems may use common components, and shall be maintained in operable condition.
3. Whenever visibility conditions warrant additional light, all vehicles, or combinations of vehicles, in use shall be equipped with at least two headlights and two taillights in operable condition.
4. All vehicles, or combination of vehicles, shall have brake lights in operable condition regardless of light conditions.
5. All vehicles shall be equipped with an adequate audible warning device at the operator's station and in an operable condition.
6. No employer shall use any motor vehicle equipment having an obstructed view to the rear unless:
7. The vehicle has a reverse signal alarm audible above the surrounding noise level or the vehicle is backed up only when an observer signals that it is safe to do so.
8. All vehicles with cabs shall be equipped with windshields and powered wipers. Cracked and broken glass shall be replaced. Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields shall be equipped with operable defogging or defrosting devices.
9. All haulage vehicles, whose pay load is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

10. Tools and material shall be secured to prevent movement when transported in the same compartment with employees.
11. Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried.
12. Seat belts and anchorages shall be installed in all motor vehicles.
13. Trucks with dump bodies shall be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.
14. Operating levers controlling hoisting or dumping devices on haulage bodies shall be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.
15. Trip handles for tailgates of dump trucks shall be so arranged that, in dumping, the operator will be in the clear.
16. All rubber-tired motor vehicle equipment manufactured on or after May 1, 1972, shall be equipped with fenders.
 - a. Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.
17. All vehicles in use shall be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use with any defects being corrected before the vehicle is placed in service

<ul style="list-style-type: none"> ➤ Service brakes, including trailer brake connections ➤ Parking system (hand brake) ➤ Emergency stopping system (brakes) ➤ Tires ➤ Horn ➤ Steering mechanism; ➤ Coupling devices 	<ul style="list-style-type: none"> ➤ Seat belts ➤ Operating controls ➤ Safety devices. ➤ Lights ➤ Reflectors ➤ Windshield wipers ➤ Defrosters ➤ Fire extinguishers
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C. Material Handling Equipment

1. Earthmoving equipment

- a. These rules apply to the following types of earthmoving equipment: scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment.
- b. Seat belts
 - (A.) Seat belts shall be provided on all equipment covered by this section and shall meet the requirements of the Society of Automotive Engineers, J386-1969, Seat Belts for Construction Equipment. Seat belts for agricultural and light industrial tractors shall meet the seat belt requirements of Society of Automotive Engineers J333a-1970, Operator Protection for Agricultural and Light Industrial Tractors.
 - (B.) Seat belts need not be provided for equipment which is designed only for standup operation.
 - (C.) Seat belts need not be provided for equipment which does not have roll-over protective structure (ROPS) or adequate canopy protection.

c. Access roadways and grades.

- (A.) No employer shall move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely the movement of the equipment and vehicles involved.
- (B.) Every emergency access ramp and berm used by an employer shall be constructed to restrain and control runaway vehicles.

d. Brakes

- (A.) All earthmoving equipment shall have a service braking system capable of stopping and holding the equipment fully loaded, as specified in Society of Automotive Engineers SAE-J237, Loader Dozer-1971, J236, Graders-1971, and J319b, Scrapers-1971.
- (B.) Brake systems for self-propelled rubber-tired off-highway equipment shall meet the applicable minimum performance criteria set forth in the following Society of Automotive Engineers Recommended Practices:
 - (1.) Self-Propelled Scrapers SAE J319b-1971.
 - (2.) Self-Propelled Graders SAE J236-1971.
 - (3.) Trucks and Wagons SAE J166-1971.
 - (4.) Front End Loaders and Dozers SAE J237-1971.

e. Fenders

Pneumatic-tired earth-moving haulage equipment (trucks, scrapers, tractors, and trailing units) whose maximum speed exceeds 15 miles per hour, shall be equipped with fenders on all wheels to meet the requirements of Society of Automotive Engineers SAE J321a-1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment.

f. Rollover protective structures (ROPS)

Rollover protective structures and supporting attachment shall meet the minimum performance criteria detailed in 29 CFR 1926.1001 and 1926.1002, as applicable or shall be designed, fabricated, and installed in a manner which will support, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

g. Audible alarms.

- (A.) All bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.
- (B.) No employer shall permit earthmoving or compacting equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level or an employee signals that it is safe to do so.

h. Scissor points

Scissor points on all front-end loaders, which constitute a hazard to the operator during normal operation, shall be guarded.

2. Industrial trucks

- a. Lift trucks, stackers, etc., shall have the rated capacity 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.

- b. No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.
- c. If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.
- d. Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin. The steering knob shall be mounted within the periphery of the wheel.
- e. All high lift rider industrial trucks shall be equipped with overhead guards which meet the configuration and structural requirements as defined in paragraph 421 of American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial Trucks.
- f. All industrial trucks in use shall meet the applicable requirements of design, construction, stability, inspection, testing, maintenance, and operation, as defined in American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial Trucks.
- g. Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.
- h. Whenever 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.
 - (A.) Use of a safety platform firmly secured to the lifting carriage and/or forks.
 - (B.) Means shall be provided whereby personnel on the platform can shut off power to the truck.
 - (C.) Such protection from falling objects as indicated necessary by the operating conditions shall be provided.

D. Pile Driving Equipment

1. General

- a. Boilers and piping systems which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Power Boilers (section I).
- b. All pressure vessels which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Pressure Vessels (section VIII).
- c. Overhead protection, which will not obscure the vision of the operator and which meets the requirements of Subpart N of this part, shall be provided. Protection shall be the equivalent of 2-inch planking or other solid material of equivalent strength.
- d. Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block.
- e. A blocking device, capable of safely supporting the weight of the hammer, shall be provided for placement in the leads under the hammer at all times while employees are working under the hammer.

- f. Guards shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves.
 - g. When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads.
 - h. Fixed leads shall be provided with ladder, and adequate rings, or similar attachment points, so that the loft worker may engage his safety belt lanyard to the leads. If the leads are provided with loft platforms(s), such platform(s) shall be protected by standard guardrails.
 - i. Steam hose leading to a steam hammer or jet pipe shall be securely attached to the hammer with an adequate length of at least 1/4-inch diameter chain or cable to prevent whipping in the event the joint at the hammer is broken. Air hammer hoses shall be provided with the same protection as required for steam lines.
 - j. Safety chains, or equivalent means, shall be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.
 - k. Steam line controls shall consist of two shutoff valves, one of which shall be a quick-acting lever type within easy reach of the hammer operator.
 - l. Guys, outriggers, thrustouts, or counterbalances shall be provided as necessary to maintain stability of pile driver rigs.
2. Engineers and winchmen shall accept signals only from the designated signalmen.
 3. All employees shall be kept clear when piling is being hoisted into the leads.
 4. When piles are being driven in an excavated pit, the walls of the pit shall be sloped to the angle of repose or sheet-piled and braced.
 5. When steel tube piles are being "blown out", employees shall be kept well beyond the range of falling materials.
 6. When it is necessary to cut off the tops of driven piles, pile driving operations shall be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.
 7. When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

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Safety Specifics – Personal Protective Equipment (PPE) (29 CFR Subpart E)

A. Criteria for Personal Protective Equipment

1. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.
2. Where employees provide their own protective equipment, the company shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.
3. All personal protective equipment shall be of safe design and construction for the work to be performed.

B. Hazard Assessment

1. Although not specifically addressed by the construction standards, § 1910.132(d)(1) states that the employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE).
2. When choosing PPE, you should consider such hazards as heat, impact, penetration, compression, chemical, electrical, light radiation, harmful dust and falls.
3. Guidelines for Selecting Personal Protective Equipment (PPE)
 - a. Work-practice controls should be implemented before utilizing PPE to control worker exposures to hazards in the workplace. This is based on OSHA's hierarchy of controls which includes: engineering controls, administrative controls and work-practice controls. PPE alone should not be relied on to provide protection against hazards. PPE should be used in conjunction with engineering controls and administrative controls. PPE is viewed as the last line of defense.
 - b. Familiarize yourself with the potential hazards in the area and the types of PPE that are available
 - c. Consider the hazards associated with the environment (impact velocities, masses, projectable shape, radiation intensities, etc.)
 - d. Consider the following basic hazard categories:
 - (A.) Impact (falling/flying objects)
 - (B.) Penetration (sharp objects piercing foot/hand)
 - (C.) Compression (roll-over or pinching objects)
 - (D.) Chemical exposure (inhalation, ingestion, skin contact, eye contact or injection)
 - (E.) Temperature extremes (heat/cold)
 - (F.) Dust/flying debris (grinding, chipping, sanding, etc.)
 - (G.) Radiation (non-ionizing: UV/IR/light, welding, brazing, cutting, furnaces, etc.)
 - (H.) Noise (mechanical rooms, machines, jackhammers, etc.)
 - (I.) Electrical (shock, short circuit, arcing, static)
 - e. Select PPE that ensures a greater level of protection than the minimum required to protect workers from the hazards

- f. Fit the worker with the PPE and give instructions on its use and care. It is very important that workers be made aware of all warning labels and limitations of their PPE

C. Payment for protective equipment

1. Except as provided by this section, the protective equipment, including personal protective equipment (PPE), used to comply with this part, shall be provided by the company at no cost to employees.
2. The company is not required to pay for non-specialty safety-toe protective footwear (including steel-toe shoes or steel-toe boots) and non-specialty prescription safety eyewear, provided that the employer permits such items to be worn off the job-site.
3. When the company provides metatarsal guards and allows the employee, at his or her request, to use shoes or boots with built-in metatarsal protection, the company is not required to reimburse the employee for the shoes or boots.
4. The company is not required to pay for:
 - a. Everyday clothing, such as long-sleeve shirts, long pants, street shoes, and normal work boots; or
 - b. Ordinary clothing, skin creams, or other items, used solely for protection from weather, such as winter coats, jackets, gloves, parkas, rubber boots, hats, raincoats, ordinary sunglasses, and sunscreen.
5. The company must pay for replacement PPE, except when the employee has lost or intentionally damaged the PPE.
6. Where an employee provides adequate protective equipment he or she owns pursuant to this section, the company may allow the employee to use it and is not required to reimburse the employee for that equipment. The company shall not require an employee to provide or pay for his or her own PPE, unless the PPE is excepted by this section.

Note to § 1926.95(d): When the provisions of another OSHA standard specify whether or not the company must pay for specific equipment, the payment provisions of that standard shall prevail.

D. Occupational Foot Protection

1. Safety-toe footwear for employees shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1-1967.
2. This ANSI standard requires that the safety shoes meet a compression test and an impact test.
3. The best way to determine if the ANSI standard requirement has been met by the shoe manufacture is to look for the "ANSI Z41.1" marking in the shoe.

E. Head Protection

1. Employees working in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock and burns, shall be protected by protective helmets.
2. The company must provide each employee with head protection that meets the specifications contained in any of the following consensus standards:
 - a. American National Standards Institute (ANSI) Z89.1-2009, "American National Standard for Industrial Head Protection," incorporated by reference in §1926.6;
 - b. American National Standards Institute (ANSI) Z89.1-2003, "American National Standard for Industrial Head Protection," incorporated by reference in §1926.6; or

- c. American National Standards Institute (ANSI) Z89.1-1997, "American National Standard for Personnel Protection-Protective Headwear for Industrial Workers-Requirements," incorporated by reference in §1926.6.
- 3. The company must ensure that the head protection provided for each employee exposed to high-voltage electric shock and burns also meets the specifications contained in Section 9.7 ("Electrical Insulation") of any of the consensus standards identified above.
- 4. OSHA will deem any head protection device that the company demonstrates is at least as effective as a head protection device constructed in accordance with one of the consensus standards identified above to be in compliance.

F. Hearing Protection

- 1. Wherever it is not feasible to reduce the noise levels or duration of exposures to those specified in Table D-2, Permissible Noise Exposures, in §1926.52, ear protective devices shall be provided and used.
- 2. Ear protective devices inserted in the ear shall be fitted or determined individually by competent persons.
- 3. Plain cotton is not an acceptable protective device.

G. Eye and Face Protection

1. General requirements

- a. The company shall ensure that each affected employee uses appropriate eye or face protection when 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.
- b. The company shall ensure that each affected employee uses eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g. clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.
- c. The company shall ensure that each affected employee who wears prescription lenses while engaged in operations that involve eye hazards wears eye protection that incorporates the prescription in its design, or wears eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.
- d. Eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer.
- e. Protectors shall meet the following minimum requirements:
 - (A.) They shall provide adequate protection against the particular hazards for which they are designed.
 - (B.) They shall be reasonably comfortable when worn under the designated conditions.
 - (C.) They shall fit snugly and shall not unduly interfere with the movements of the wearer.
 - (D.) They shall be durable.
 - (E.) They shall be capable of being disinfected.
 - (F.) They shall be easily cleanable.

2. Criteria for protective eye and face protection

- a. Protective eye and face protection devices must comply with any of the following consensus standards:
 - (A.) ANSI/ISEA Z87.1-2010, Occupational and Educational Personal Eye and Face Protection Devices, incorporated by reference in § 1926.6;
 - (B.) ANSI Z87.1-2003, Occupational and Educational Personal Eye and Face Protection Devices, incorporated by reference in § 1926.6; or
 - (C.) ANSI Z87.1-1989 (R-1998), Practice for Occupational and Educational Eye and Face Protection, incorporated by reference in § 1926.6;
- b. Protective eye and face protection devices that the employer demonstrates are at least as effective as protective eye and face protection devices that are constructed in accordance with one of the above consensus standards will be deemed to be in compliance with the requirements of this section.

3. Protection against radiant energy

- a. Selection of shade numbers for welding filter

Table E-1 shall be used as a guide for the selection of the proper shade numbers of filter lenses or plates used in welding. Shades more dense than those listed may be used to suit the individual's needs.

Table E-1 – Filter Lens Shade Numbers for Protection Against Radiant Energy

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

- b. Laser protection

- (A.) Employees whose occupation or assignment requires exposure to laser beams shall be furnished suitable laser safety goggles which will protect for the specific wavelength of the laser and be of optical density (O.D.) adequate for the energy involved.
- (B.) Table E-2 lists the maximum power or energy density for which adequate protection is afforded by glasses of optical densities from 5 through 8.
- (C.) Output levels falling between lines in this table shall require the higher optical density.

Table E-2-Selecting Laser Safety Glass

Intensity, CW maximum power density (watts/cm ²)	Attenuation	
	Optical density (O.D.)	Attenuation factor
10-2	5	10 ⁵
10-1	6	10 ⁶
1.0	7	10 ⁷
10.0	8	10 ⁸

(D.) All protective goggles shall bear a label identifying the following data:

- (1.) The laser wavelengths for which use is intended;
- (2.) The optical density of those wavelengths;
- (3.) The visible light transmission.

H. Reflective PPE – ANSI 107-2015

Background Material and Retroreflective Requirements

Garment Type	Type "O"	Type "R"		Type "P"		Supplemental Items	Accessories		
Designation	Off-road	Roadway		Fire, Police, EMS Personnel		Garments with Legs, including Gaiters	Gloves	Arm or Leg Bands	Headwear
Performance Class	Class 1	Class 2	Class 3	Class 2	Class 3	Class E	NA	NA	NA
Background Material Amounts	217 in ²	775 in ^{2*}	1240 in ^{2**}	450 in ²	775 in ²	465 in ²	10 in ²	24 in ²	78 in ²
Retroreflective Material Amounts	155 in ²	201 in ²	310 in ²	201 in ²	310 in ²	109 in ²	10 in ²	24 in ²	10 in ²
Width Minimums of Retroreflective Material	1"	1.38" 1" for split trim designs	2" 1" for split trim designs	2" 1" for split trim designs	2" 1" for split trim designs	2" 1" for split trim designs	1"	1"	1"
Previous Standard and Class	ANSI 107 Class 1	ANSI 107 Class 2	ANSI 107 Class 3	ANSI 207	NEW!	ANSI 107 Class E	NEW!	NEW!	Headwear

*Type R, Class 2 garments can have the smallest size in the size range compliant to the standard with a minimum of 540 in² in background material to accommodate smaller workers. All larger sizes must have a minimum of 775 in². No reduction in retroreflectivity is allowed and 201 in² is still the required minimum.

** Type R, Class 3 garments can have the smallest size in the size range compliant to the standard with a minimum of 1000 in² in background material to accommodate smaller workers. All larger sizes must have a minimum of 1240 in². No reduction in retroreflectivity is allowed and 310 in² is still the required minimum.

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Safety Specifics – Powered Industrial Trucks (29 CFR 1926.602, 1910.178)

A. General

1. All new powered industrial trucks acquired and used by an employer shall meet the design and construction requirements for powered industrial trucks established in the "American National Standard for Powered Industrial Trucks, Part II, ANSI B56.1-1969.
2. Approved trucks shall bear a label or some other identifying mark indicating approval by the testing laboratory.
3. Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without manufacturer's prior written approval.
4. If the truck is equipped with front-end attachments other than factory installed attachments, the user shall request that the truck be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.
5. The user shall see that all nameplates and markings are in place and are maintained in a legible condition.

B. Forklift Classifications

The following are classes of commonly-used powered industrial trucks. This classification does not include all powered industrial trucks covered by the OSHA standard.

Class I: Electric Motor Rider Trucks

Class II: Electric Motor Narrow Aisle Trucks

Class III: Electric Motor Hand Trucks or Hand/Rider Trucks

Class IV: Internal Combustion Engine Trucks (Solid/Cushion Tires)

Class V: Internal Combustion Engine Trucks (Pneumatic Tires)

Class VI: Electric and Internal Combustion Engine Tractors

Class VII: Rough Terrain Forklift Trucks

C. Operator Training

1. Safe operation.
 - a. The employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of training and evaluation.
 - b. Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the training required.
2. Training program implementation.
 - a. Trainees may operate a powered industrial truck only:
 - (A.) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and
 - (B.) Where such operation does not endanger the trainee or other employees.
 - b. Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.

- c. All 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.

3. Training program content

- a. Powered industrial truck operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.

- (A.) Truck-related topics:

- (1.) Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate
- (2.) Differences between the truck and the automobile
- (3.) Truck controls and instrumentation: where they are located, what they do, and how they work

- (B.) Engine or motor operation

- (C.) Steering and maneuvering

- (D.) Visibility (including restrictions due to loading)

- (E.) Fork and attachment adaptation, operation, and use limitations

- (F.) Vehicle capacity

- (G.) Vehicle stability

- (H.) Any vehicle inspection and maintenance that the operator will be required to perform

- (I.) Refueling and/or charging and recharging of batteries

- (J.) Operating limitations

- (K.) Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate

- b. Workplace-related topics:

- (A.) Surface conditions where the vehicle will be operated

- (B.) Composition of loads to be carried and load stability

- (C.) Load manipulation, stacking, and unstacking

- (D.) Pedestrian traffic in areas where the vehicle will be operated

- (E.) Narrow aisles and other restricted places where the vehicle will be operated

- (F.) Hazardous (classified) locations where the vehicle will be operated

- (G.) Ramps and other sloped surfaces that could affect the vehicle's stability

- (H.) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust

- (I.) Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation

4. Refresher training and evaluation.

- a. Refresher training, including an evaluation of the effectiveness of that training, shall be conducted to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.
- b. Refresher training in relevant topics shall be provided to the operator when:

- (A.) The operator has been observed to operate the vehicle in an unsafe manner
 - (B.) The operator has been involved in an accident or near-miss incident
 - (C.) The operator has received an evaluation that reveals that the operator is not operating the truck safely
 - (D.) The operator is assigned to drive a different type of truck
 - (E.) A condition in the workplace changes in a manner that could affect safe operation of the truck
- c. An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.

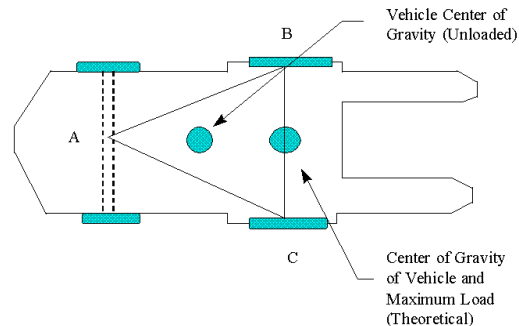
5. Certification

The employer shall certify that each operator has been trained and evaluated as required. The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

D. Stability Triangle

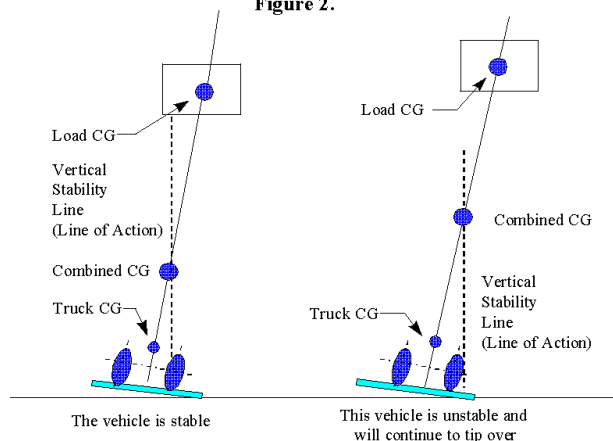
1. Almost all counterbalanced powered industrial trucks have a three-point suspension system, that is, the vehicle is supported at three points. This is true even if the vehicle has four wheels. The truck's steer axle is attached to the truck by a pivot pin in the axle's center. When the points are connected with imaginary lines, this three-point support forms a triangle called the stability triangle. Figure 1 depicts the stability triangle:

Figure 1.



2. When the vehicle's line of action, or load center, falls within the stability triangle, the vehicle is stable and will not tip over. However, when the vehicle's line of action or the vehicle/load combination falls outside the stability triangle, the vehicle is unstable and may tip over. (See Figure 2.)

Figure 2.



E. Truck Operations

1. Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.
2. No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.
3. Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.
4. The employer shall prohibit arms or legs from being placed between the uprights of the mast or outside the running lines of the truck.
5. When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the truck is parked on an incline.
 - a. A powered industrial truck is unattended when the operator is 25 ft. or more away from the vehicle which remains in his view or whenever the operator leaves the vehicle and it is not in his view.
6. A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car. Trucks shall not be used for opening or closing freight doors.
7. Brakes shall be set and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semitrailer during loading or unloading when the trailer is not coupled to a tractor. The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven onto.
8. There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.
9. An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.
10. A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.
11. Only approved industrial trucks shall be used in hazardous locations.
12. Fire aisles, access to stairways, and fire equipment shall be kept clear.

F. Traveling

1. All traffic regulations shall be observed, including authorized plant speed limits. A safe distance shall be maintained approximately three truck lengths from the truck ahead, and the truck shall be kept under control at all times.
2. The right of way shall be yielded to ambulances, fire trucks, or other vehicles in emergency situations.
3. Other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations shall not be passed.
4. The driver shall be required to slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
5. Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.

6. The driver shall be required to look in the direction of, and keep a clear view of the path of travel.
7. Grades shall be ascended or descended slowly.
 - a. When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.
 - b. On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.
8. Under all travel conditions the truck shall be operated at a speed that will permit it to be brought to a stop in a safe manner.
9. Stunt driving and horseplay shall not be permitted.
10. The driver shall be required to slow down for wet and slippery floors or surfaces.
11. Dockboard or bridgeplates, shall be properly secured before they are driven over. Dockboard or bridgeplates shall be driven over carefully and slowly and their rated capacity never exceeded.
12. Motorized hand trucks must enter confined areas with load end forward.
13. Running over loose objects on the roadway surface shall be avoided.
14. While negotiating turns, speed shall be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel shall be turned at a moderate, even rate.

G. Loading.

1. Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered.
2. Only loads within the rated capacity of the truck shall be handled.
3. The long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.
4. Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.
5. A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.
6. Extreme care shall be used when tilting the load forward or backward, particularly when high tiering. Tilting forward with load engaging means elevated shall be prohibited except to pick up a load. An elevated load shall not be tilted forward except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load shall be used.

H. Operation of the truck.

1. If at any time a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, the truck shall be taken out of service until it has been restored to safe operating condition.
2. Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.
3. Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.
4. No truck shall be operated with a leak in the fuel system until the leak has been corrected.

5. Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

I. Maintenance of industrial trucks.

1. Any power-operated industrial truck not in safe operating condition shall be removed from service. All repairs shall be made by authorized personnel.
2. Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards shall be conducted only in locations designated for such repairs.
3. Trucks in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.
4. All parts of any such industrial truck requiring replacement shall be replaced only by parts equivalent as to safety with those used in the original design.
5. Industrial trucks shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts. Additional counterweighting of fork trucks shall not be done unless approved by the truck manufacturer.
6. Industrial trucks shall be examined before being placed in service, and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such examination shall be made at least daily.
 - a. Where industrial trucks are used on a round-the-clock basis, they shall be examined after each shift. Defects when found shall be immediately reported and corrected.
7. Water mufflers shall be filled daily or as frequently as is necessary to prevent depletion of the supply of water below 75 percent of the filled capacity. Vehicles with mufflers having screens or other parts that may become clogged shall not be operated while such screens or parts are clogged.
8. Any vehicle that emits hazardous sparks or flames from the exhaust system shall immediately be removed from service, and not returned to service until the cause for the emission of such sparks and flames has been eliminated.
9. When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle shall be removed from service and not returned to service until the cause for such overheating has been eliminated.
10. Industrial trucks shall be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100 °F.) solvents shall not be used. High flash point (at or above 100 °F.) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard shall be consonant with the agent or solvent used.
11. Industrial trucks originally approved for the use of gasoline for fuel may be converted to liquefied petroleum gas fuel provided the complete conversion results in a truck which embodies the features specified for LP or LPS designated trucks. Such conversion equipment shall be approved. The description of the component parts of this conversion system and the recommended method of installation on specific trucks are contained in the "Listed by Report."

Safety Specifics – **Respiratory Protection (29 CFR 1910.134)**

A. Responsibilities

1. A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee.
2. The company shall provide the respirators which are applicable and suitable for the purpose intended.
3. The company shall be responsible for the establishment and maintenance of a respiratory protection program, which shall include the requirements outlined in this section. The program shall cover each employee required by this section to use a respirator.

B. Respiratory Protection Program

1. In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the company, a written respiratory protection program shall be established and implemented by the company.
 - a. The written program shall:
 - b. Be administered by a suitably trained program administrator
 - c. Contain worksite-specific procedures.
 - d. Be updated as necessary to reflect those changes in workplace conditions that affect respirator use.
 - e. Include as applicable:
 - (A.) Procedures for selecting respirators for use in the workplace
 - (B.) Medical evaluations of employees required to use respirators
 - (C.) Fit testing procedures for tight-fitting respirators
 - (D.) Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations
 - (E.) Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators
 - (F.) Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators
 - (G.) Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations
 - (H.) Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance
 - (I.) Procedures for regularly evaluating the effectiveness of the program
2. Where respirator use is not required (Voluntary Use)
 - a. An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard.
 - b. If voluntary respirator use is deemed permissible, provide the respirator users with the information contained in Appendix D to 1910.134 - "Information for Employees Using Respirators When Not Required Under the Standard" (an optional Acknowledgement form is provided for recordkeeping purposes).

- c. Establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user.
 - (A.) The company is not required to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering facepieces (dust masks).
- d. Dust Masks - When worn voluntarily:
 - (A.) Before allowing their use, ensure that the masks themselves do not pose a hazard to workers
 - (B.) Provide the information found in Appendix D to 1910.134 - "Information for Employees Using Respirators When Not Required Under the Standard" (an optional Acknowledgement form is provided for recordkeeping purposes).
 - (C.) The company is not required to:
 - (1.) Include voluntary dust mask use in a written respiratory protection program
 - (2.) Determine medical clearance for the workers
 - (3.) Provide a Fit Test
 - (4.) Provide training
- 3. The company shall designate a program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.
- 4. The company shall provide respirators, training, and medical evaluations at no cost to the employee.

C. Respirator Selection

1. General Requirements

- a. Select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.
- b. Select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.
- c. Identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the company cannot identify or reasonably estimate the employee exposure, the atmosphere shall be considered to be *immediately dangerous to life or health* (IDLH).
- d. Select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. IDLH atmospheres

- a. Employees shall be provided the following respirators for use in IDLH atmospheres:
 - (A.) A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or
 - (B.) A combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.

- b. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.
- c. All oxygen-deficient atmospheres shall be considered IDLH.
 - (A.) **Exception:** *If the company demonstrates that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II of this section (i.e., for the altitudes set out in the table), then any atmosphere-supplying respirator may be used.*

3. Atmospheres not IDLH

- a. The company shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.
 - (A.) Use the assigned protection factors (APFs) listed in Table 1 to select a respirator that meets or exceeds the required level of employee protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.

Table 1 - Assigned Protection Factors ⁵

Type of Respirator ^{1 2}	Quarter Mask	Half Mask	Full Facepiece	Helmet / Hood	Loose-Fitting Facepiece
Air-Purifying Respirator	5	10 ³	50		
Powered Air-Purifying Respirator (PAPR)		50	1,000	25/1,000 ⁴	25
Supplied-Air Respirator (SAR) or Airline Respirator					
Demand Mode		10	50		
Continuous Flow Mode		50	1,000	25/1,000 ⁴	25
Pressure-Demand or other Positive-Pressure Mode		50	1,000		
Self-Contained Breathing Apparatus (SCBA)					
Demand Mode		10	50	50	
Pressure-Demand or other Positive-Pressure mode (eg: open/closed circuit)			10,000	10,000	
NOTES:					
¹ The company may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.					
² The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.					
³ This APF category includes filtering facepieces, and half masks with elastomeric facepieces.					
⁴ The company must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.					
⁵ These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, the company must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).					

- b. The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.
- c. For protection against gases and vapors, the employer shall provide:
 - (A.) An atmosphere-supplying respirator
 - (B.) An air-purifying respirator, provided that:
 - (1.) The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant
 - (2.) If there is no ESLI appropriate for conditions in the workplace, implement a change schedule for canisters and cartridges that is based on objective

information or data that will ensure that canisters and cartridges are changed before the end of their service life. Describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.

- d. For protection against particulates, the employer shall provide:
 - (A.) An atmosphere-supplying respirator; or
 - (B.) An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or
 - (C.) For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.

D. Medical Evaluation

1. Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee.
2. The company shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. An employee's medical evaluations may be discontinued when the employee is no longer required to use a respirator.
3. Medical evaluation procedures
 - a. Identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.
4. Follow-up medical examination
 - a. Ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of the attached Medical Evaluation Questionnaire or whose initial medical examination demonstrates the need for a follow-up medical examination.
 - b. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.
5. Administration of the medical questionnaire and examinations
 - a. 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.
 - b. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content.
 - c. The company shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.
6. Supplemental information for the PLHCP.
 - a. The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:
 - (A.) The type and weight of the respirator to be used by the employee
 - (B.) The duration and frequency of respirator use (including use for rescue and escape)
 - (C.) The expected physical work effort

- (D.) Additional protective clothing and equipment to be worn
- (E.) Temperature and humidity extremes that may be encountered
- b. Any supplemental information provided previously to the PLHCP regarding an employee need not be provided for a subsequent medical evaluation if the information and the PLHCP remain the same.
- c. The employer shall provide the PLHCP with a copy of the written respiratory protection program and a copy of this section.

7. Medical determination

- a. In determining the employee's ability to use a respirator, the employer shall:
- b. Obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information:
 - (A.) Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator.
 - (B.) The need, if any, for follow-up medical evaluations.
 - (C.) A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.
- c. If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the company shall provide a PAPR if the PLHCP's medical evaluation finds that the employee can use such a respirator. If a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the employer is no longer required to provide a PAPR.

8. Additional medical evaluations

- a. At a minimum, the employer shall provide additional medical evaluations that comply with the requirements of this section if:
- b. An employee reports medical signs or symptoms that are related to ability to use a respirator
- c. A PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated
- d. Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation
- e. A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

E. Respirator Fit Test

1. Before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used.
2. Ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this paragraph.
3. Ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually thereafter.

4. Conduct an additional fit test whenever the employee reports, or the company, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.
5. If after passing a QLFT or QNFT, the employee subsequently notifies the company, program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator facepiece and to be retested.
6. The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of 29 CFR 1910.134.
7. QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
8. If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.
9. Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.
 - a. Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.
 - b. Quantitative fit testing of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.
 - c. Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

F. Use of Respirators

1. Facepiece seal protection
 - a. Respirators with tight-fitting facepieces shall not be worn by employees who have:
 - (A.) Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function
 - (B.) Any condition that interferes with the face-to-facepiece seal or valve function.
 - b. If an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.
 - c. For all tight-fitting respirators, ensure that employees perform a user seal check each time they put on the respirator using the procedures below or procedures recommended by the respirator manufacturer that the employer demonstrates are as effective as below. User seal checks are not substitutes for qualitative or quantitative fit tests.

(A.) Facepiece Positive and/or Negative Pressure Checks

(1.) Positive pressure check

- (a.) Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

(2.) Negative pressure check

- (a.) Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

(B.) Manufacturer's Recommended User Seal Check Procedures

- (1.) The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

2. Continuing respirator effectiveness

- a. Appropriate surveillance shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, reevaluate the continued effectiveness of the respirator.
- b. Employees shall be required to leave the respirator use area:
- (A.) To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use.
- (B.) If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece/
- (C.) To replace the respirator or the filter, cartridge, or canister elements.
- c. If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, the respirator must be repaired or replaced by the company before allowing the employee to return to the work area.

3. Procedures for IDLH atmospheres

- a. For all IDLH atmospheres, the employer shall ensure that:
- b. One employee or, when needed, more than one employee is located outside the IDLH atmosphere
- c. Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere
- d. The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue

- e. The company or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue
- f. The company or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation
- g. Employee(s) located outside the IDLH atmospheres are equipped with:
 - (A.) Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
 - (B.) Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
 - (C.) Equivalent means for rescue where retrieval equipment is not required.

G. Maintenance and Care

1. Cleaning & Disinfecting

- a. The employer shall provide each respirator user with a respirator that is clean, sanitary, and in good working order.
- b. The employer shall ensure that respirators are cleaned and disinfected using the procedures below, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness.
 - (A.) Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
 - (B.) Wash components in warm water (110° F maximum), with mild detergent or cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
 - (C.) Rinse components thoroughly in clean, warm (110° F maximum), preferably running water. Drain.
 - (D.) When the cleaner used does not contain a disinfecting agent, respirator components shall be immersed for two minutes in one of the following:
 - (1.) Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110° F, or,
 - (2.) Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100cc of 45% alcohol) to one liter of water at 110°F, or,
 - (3.) Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
 - (E.) Rinse components thoroughly in clean, warm (110° F maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
 - (F.) Components shall be hand-dried with a clean lint-free cloth or air-dried.
 - (G.) Reassemble face piece, replacing filters, cartridges, and canisters where necessary.

- (H.) Test the respirator to ensure that all components work properly.
- c. The respirators shall be cleaned and disinfected at the following intervals:
 - (A.) Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.
 - (B.) Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals.
 - (C.) Respirators maintained for emergency use shall be cleaned and disinfected after each use.
 - (D.) Respirators used in fit testing and training shall be cleaned and disinfected after each use.

2. Storage

- a. Respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture and damaging chemicals. They shall be packed or stored to prevent deformation of the face piece. Emergency respirators shall, in addition, be kept accessible to the work area and stored in easily identifiable coverings. Refer to manufacturer's instructions for other recommendations.

3. Inspection

a. Routine Use Respirators

- (A.) Inspect before each use and during cleaning
- (B.) Inspection to include:
 - (1.) A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters
 - (2.) A check of elastomeric parts for pliability and signs of deterioration

b. Emergency Use Respirators

- (A.) Inspected at least monthly and in accordance with the manufacturer's recommendations
- (B.) Shall be checked for proper function before and after each use
- (C.) Emergency escape-only respirators shall be inspected before being carried into the workplace for use
- (D.) For respirators maintained for emergency use, the employer shall:
 - (1.) Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator.
 - (2.) Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

c. Self-Contained Breathing Apparatus

- (A.) Inspected monthly
- (B.) Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level.

(C.) Determine that the regulator and warning devices function properly.

4. Repairs

- a. Ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures:
- b. Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator
- c. Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed
- d. Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

H. Breathing Air Quality and Use

1. Ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:
 - a. Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen
 - b. Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
 - (A.) Oxygen content (v/v) of 19.5-23.5%
 - (B.) Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less
 - (C.) Carbon monoxide (CO) content of 10 ppm or less
 - (D.) Carbon dioxide content of 1,000 ppm or less
 - (E.) Lack of noticeable odor
2. Ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.
3. Ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.
4. Ensure that compressors used to supply breathing air to respirators are constructed and situated so as to:
 - a. Prevent entry of contaminated air into the air-supply system
 - b. Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56 deg.C) below the ambient temperature
 - c. Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.
 - d. Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. The tag shall be maintained at the compressor.
5. For compressors that are not oil-lubricated, ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

6. For oil-lubricated compressors, the use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.
7. Ensure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.
8. Use only the respirator manufacturer's NIOSH-approved breathing-gas containers, marked and maintained in accordance with Quality Assurance provisions of the NIOSH approval for the SCBA

I. Identification of Filters, Cartridges, and Canisters

All filters, cartridges and canisters used in the workplace shall be labeled and color coded with the NIOSH approval label. That label shall not be removed and shall remain legible.

J. Training

1. The company shall provide effective training to employees who are required to use respirators. The training will be comprehensive, understandable, and recur annually and more often if necessary.
2. Ensure that each employee can demonstrate knowledge of at least the following:
 - a. Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
 - b. What the limitations and capabilities of the respirator are
 - c. How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions
 - d. How to inspect, put on and remove, use, and check the seals of the respirator
 - e. What the procedures are for maintenance and storage of the respirator
 - f. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators
3. The training shall be conducted in a manner that is understandable to the employee.
4. Provide the training prior to requiring the employee to use a respirator in the workplace.
5. An company who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified is not required to repeat such training provided that, the employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.
6. Retraining shall be administered annually, and when the following situations occur:
 - a. Changes in the workplace or the type of respirator render previous training obsolete
 - b. Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill
 - c. Any other situation arises in which retraining appears necessary to ensure safe respirator use.
7. The basic advisory information on respirators, as presented in Appendix D of 29 CFR 1910.134, shall be provided by the employer in any written or oral format, to employees who wear respirators when such use is not required by this section or by the employer.

K. Program Evaluation

1. The company shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.
2. The company shall regularly consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected.

L. Recordkeeping

1. The company shall establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

2. Medical evaluation

Records of medical evaluations required by this section must be retained and made available in accordance with 29 CFR 1910.1020.

3. Fit testing

- a. A record shall be established of the qualitative and quantitative fit tests administered to an employee including:
 - (A.) The name or identification of the employee tested
 - (B.) Type of fit test performed
 - (C.) Specific make, model, style, and size of respirator tested
 - (D.) Date of test
 - (E.) The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs
- b. Fit test records shall be retained for respirator users until the next fit test is administered.

4. Written Program

The company shall maintain a written copy of the current respirator program.

Safety Specifics – Scaffolding & Aerial Lifts (29 CFR 1926.450)

A. Scaffolding

1. Capacity

- a. Taking into account the OSHA rules we must apply and the engineering/manufacturing requirements of our scaffolds, the following rules apply.
- b. Each scaffold and scaffold component we use will support, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it.
- c. When we use non-adjustable suspension scaffolds, each suspension rope, including connecting hardware, will support, without failure, at least six times the maximum intended load applied or transmitted to that rope.

2. Platform Construction

- a. Each scaffold plank will be installed so that the space between adjacent planks and the space between the platform and uprights is no more than one inch wide. If, in certain situations, we need to make this space wider, we will attach our demonstration in the appendix to this plan.
- b. Except for outrigger scaffolds (3 inches) and plastering and lathing operations (18 inches), the front edge of all platforms will not be more than 14 inches from the face of the work, unless we have a guardrail or personal fall arrest system in place that meets regulations.
- c. The following additional construction and safety information is included depending on the type of scaffold being erected.
 - (A.) Supported Scaffolds
 - (1.) Supported scaffolds with a height to base width ratio of more than four to one (4:1) must be restrained from tipping by guying, tying, bracing, or equivalent means.
 - (2.) Supported scaffold poles, legs, posts, frames, and uprights will always bear on base plates and mud sills or other adequate firm foundations.
 - (B.) Suspension Scaffolds
 - (1.) Before a scaffold is used, all direct connections will be evaluated by our competent person. Our competent person will confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads that will be imposed.
 - (2.) When winding drum hoists are used on a suspension scaffold, they will never contain less than four wraps of the suspension rope at the lowest point of scaffold travel.

3. Gaining Access to Scaffolds

- a. We know that getting to the working platform is critical to the safety of our employees. This section outlines the mechanical requirements for gaining access to scaffold platforms such as:

➤ Ladders	➤ Stair rails
➤ Ramps and walkways	➤ Direct access from another scaffold
- b. Portable, hook-on, and attachable ladders will be positioned so as not to tip the scaffold.
- c. All stair rail systems and handrails will be surfaced to prevent injury to our employees from punctures or lacerations, and to prevent snagging of their clothes.

4. Fall Protection Plan

- a. Fall protection planning is critical to the safety and well-being of our employees. Our fall protection plan follows the OSHA requirements which are different depending on the type of scaffold we are using.
- b. Fall protection will be provided for any employee on a scaffold more than 10 feet above a lower level.
- c. This fall protection plan for our working employees is for the various types of scaffolds that we may encounter in the workplace:
 - (A.) Workers on a boatswains' chair, catenary scaffold, float scaffold, needle beam scaffold, or ladder jack scaffold shall be protected by a personal fall arrest system
 - (B.) Workers on a single-point or two-point adjustable suspension scaffold shall be protected by both a personal fall arrest system and guardrail system
 - (C.) Workers on a crawling board (chicken ladder) shall be protected by a personal fall arrest system, a guardrail system (with minimum 200 pound toprail capacity), or by a three-fourth inch (1.9 cm) diameter grabline or equivalent handhold securely fastened beside each crawling board
 - (D.) Workers on a self-contained adjustable scaffold shall be protected by a guardrail system (with minimum 200 pound toprail capacity) when the platform is supported by the frame structure, and by both a personal fall arrest system and a guardrail system (with minimum 200 pound toprail capacity) when the platform is supported by ropes.
 - (E.) Workers on a walkway located within a scaffold shall be protected by a guardrail system (with minimum 200 pound toprail capacity) installed within 9 1/2 inches (24.1 cm) of and along at least one side of the walkway.
 - (F.) Workers performing overhand bricklaying operations from a supported scaffold shall be protected from falling from all open sides and ends of the scaffold (except at the side next to the wall being laid) by the use of a personal fall arrest system or guardrail system (with minimum 200 pound toprail capacity).
 - (G.) For all scaffolds not otherwise specified, workers shall be protected by the use of personal fall arrest or guardrail

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

- a. Install all guardrail systems with openings small enough to prevent passage of potential falling objects.
- b. Prevent tools, materials, or equipment that inadvertently fell from our scaffolds from striking employees by barricading the area below the scaffold.

6. Using Scaffolds

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

- b. Scaffolds and scaffold components will never be loaded in excess of their maximum intended loads or rated capacities.
- c. Debris must not be allowed to accumulate on platforms.

7. Specific Procedures

- a. In addition to the general procedures in this written safety plan, there are procedures that apply to specific types of scaffolds. The safety rules for these specific types of scaffolds are found in 1926.452.
- b. Prohibited Practices
 - (A.) Scaffold components manufactured by different manufacturers will never be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained.
 - (B.) Unstable objects will never be used to support scaffolds or platform units. Footings must be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
 - (C.) Cross braces will never be used as a means of access.
 - (D.) The use of shore or lean-to scaffolds is prohibited.

B. Aerial Lifts

1. Anytime aerial lifts, including: (1) extensible boom platforms, (2) aerial ladders, (3) articulating boom platforms, (4) vertical towers, or (5) a combination of any such devices, are used to elevate employees to job-sites above ground, the following safety rules will apply:
2. Only authorized persons shall operate an aerial lift.
3. Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.
4. Approved fall protection shall be worn and a lanyard attached to a lanyard anchoring point when working from an aerial lift.
5. Boom and basket load limits specified by the manufacturer shall not be exceeded.
6. For electrical lines rated 50 kV or below, a minimum clearance between the lines and any part of the aerial lift, employee, tools/equipment, or load shall be 10 feet. For lines greater than 50 kV, our competent person will determine clearance distances using the rule of 4" additional clearance or every 10 kV greater than 50 kV.
7. Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition. Tests shall be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition.
8. All aerial lifts shall have a reverse signal alarm audible above the surrounding noise level or the vehicle is backed up only when an observer signals that it is safe to do so.
9. No aerial lift this company owns or uses will be 'field modified' for uses other than those intended by the manufacturer unless:
 - a. The manufacturer certifies the modification in writing, or
 - b. Any other equivalent entity, such as a nationally recognized testing lab, certifies the aerial lift modification conforms to all applicable provisions of ANSI A92.2-1969, and the OSHA rules at 1926.453. The lift must be at least as safe as the equipment was before modification.

C. Ladder Trucks and Tower Trucks:

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

D. Extensible and articulating boom platforms:

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

E. Duties of Competent and Qualified Persons

1. Definition

- a. Competent person-One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- b. Qualified person-One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

2. Duties of a Competent Person:

- a. We will not intermix scaffold components manufactured by different manufacturers unless the components fit together without force and the scaffold's structural integrity is maintained. Scaffold components manufactured by different manufacturers will not be modified in order to intermix them unless our competent person determines the resulting scaffold is structurally sound.
- b. Before a suspension scaffold is used, direct connections must be evaluated by our competent person who will confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed.
- c. Prior to each work shift and after every occurrence which could affect a rope's integrity, suspension scaffold ropes will be inspected by our competent person. Ropes will be replaced if any of the conditions outlined in 1926.451(d)(10) exist.
- d. Scaffolds will be erected, moved, dismantled, or altered only under the supervision and direction of a competent person.

3. Duties of a Qualified Person:

- a. The following tasks will only be done by the person we have deemed competent or qualified to perform
- b. Scaffolds must be designed by a qualified person and shall be constructed and loaded in accordance with that design.
- c. Swaged attachments or spliced eyes on wire suspension ropes of suspension scaffolds will not be used unless they are made by the wire rope manufacturer or a qualified person.
- d. We will have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of

scaffold being used and to understand the procedures to control or minimize those hazards.

- e. If any unsafe condition is noted which might impact the ability of the scaffolding system to safely perform its intended functions and protect personnel, the scaffolding system will be immediately tagged at all access points, "Danger: Do Not Use" These tags shall be designed in accordance with specifications detailed in 29 CFR 1910.145 & 1926.200. These tags are commercially available through Labelmaster as Product number HT-117 by calling 1-800-621 -5808.
- f. Implement the company's disciplinary plan in accordance with our corporate policies and procedures program when requirements of this program are not met or unqualified individuals alter, dismantle, or erect our scaffolding systems.

F. Training

1. Employees Who Use Scaffolds.

- a. Our employees who perform work on scaffolds will be trained by a qualified person to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training will include the following areas as applicable:
 - b. The nature of and the correct procedures for dealing with electrical hazards.
 - c. The nature of and the correct procedures for erecting, maintaining, and disassembling the fall protection and falling object protection systems used.
 - d. The proper use of the scaffold, and the proper handling of materials on the scaffold.
 - e. The maximum intended load and the load-carrying capacities of the scaffolds used.
 - f. Any other pertinent requirements of the OSHA rules.

2. Employees Who Erect, Disassemble, Move, Operate, Repair, Maintain, or Inspect Scaffolds:

- a. Our employees who erect, disassemble, move, operate, repair, maintain, or inspect scaffolds will be trained by our competent person to recognize the hazards associated with the work being done. The training will include the following topics as applicable:
 - b. The nature of scaffold hazards.
 - c. The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question.
 - d. The design criteria, maximum intended load-carrying capacity, and intended use of the scaffold.
 - e. Any other pertinent requirements of this subpart.

3. Employees Who Need Retraining:

- a. When we have reason to believe that one of our employees lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, we will retrain the employee so that the requisite proficiency is regained. Retraining will be done in at least the following situations:
 - b. Where changes at the worksite present a hazard about which the employee has not been previously trained.
 - c. Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained.
 - d. Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.

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Safety Specifics – Silica Exposure (26 CFR 1926.1153)

A. Scope

This section applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 µg/m³) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

B. Recordkeeping

1. Objective data

- a. The employer shall make and maintain an accurate record of all objective data relied upon to comply with the requirements of this section. This record shall include at least the following information:
 - b. The crystalline silica-containing material in question;
 - c. The source of the objective data;
 - d. The testing protocol and results of testing;
 - e. A description of the process, task, or activity on which the objective data were based;
 - f. Other data relevant to the process, task, activity, material, or exposures on which the objective data were based.
2. The employer shall ensure that records are maintained and made available in accordance with 29 CFR 1910.1020.

C. Education and Training

1. Hazard communication

- a. The employer shall include respirable crystalline silica in the program established to comply with the hazard communication standard (HCS) (29 CFR 1910.1200).
- b. The employer shall ensure that each employee has access to labels on containers of crystalline silica and safety data sheets, and is trained in accordance with the provisions of HCS.

2. Employee Information and Training

- a. Training is required prior to using silica-containing materials or working in an environment known to contain airborne concentrations of Silica. Periodic refresher training is also required. We will train all silica dust in the following:
 - b. Specific tasks in the workplace that could result in exposure to respirable crystalline silica
 - c. Specific measures the employer has implemented to protect employees from exposure to respirable crystalline silica, including engineering controls, work practices, and respirators to be used
 - d. Hazards associated with exposure to silica dust
 - (A.) Cancer
 - (B.) Lung effects
 - (C.) Immune system effects
 - (D.) Kidney effects

- e. The risks of exposure to silica to include:
 - (A.) Signs and symptoms of silica disease
 - (B.) Safe work procedures to be followed (e.g., setup of enclosures, disposal of silica waste, personal decontamination)
 - (C.) Use of respirators and other personal protective equipment (e.g., donning and doffing of personal protective equipment, and cleaning and maintenance of respirators)
 - (D.) Use of control systems (e.g., LEV and wet methods)
 - (E.) How to seek first aid (for example, the location and use of eyewash stations)
 - (F.) How to report an exposure to silica dust
 - (G.) The purpose and a description of the medical surveillance program

D. Written exposure control plan.

1. The employer shall establish and implement a written exposure control plan that contains at least the following elements:
 - a. A description of the tasks in the workplace that involve exposure to respirable crystalline silica;
 - b. A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task;
 - c. A description of the housekeeping measures used to limit employee exposure to respirable crystalline silica; and
 - d. A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposures generated by other employers or sole proprietors.
2. The employer shall review and evaluate the effectiveness of the written exposure control plan at least annually and update it as necessary.
3. The employer shall make the written exposure control plan readily available for examination and copying, upon request, to each employee covered by this section, their designated representatives, the Assistant Secretary and the Director.
4. The employer shall designate a competent person to make frequent and regular inspections of job sites, materials, and equipment to implement the written exposure control plan.

E. Specified Exposure Control Methods – Table 1 (Appendix A)

1. For each employee engaged in a task identified on Table 1 in the Forms section of this manual, the employer shall fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on Table 1, unless the employer assesses and limits the exposure of the employee to respirable crystalline silica in accordance with section D – Alternative Exposure Control Methods of this program.
2. When implementing the control measures specified in Table 1, each employer shall:
 - a. For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust.
 - b. For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust.

- c. For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:
 - (A.) Is maintained as free as practicable from settled dust;
 - (B.) Has door seals and closing mechanisms that work properly;
 - (C.) Has gaskets and seals that are in good condition and working properly;
 - (D.) Is under positive pressure maintained through continuous delivery of fresh air;
 - (E.) Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 μm range (e.g., MERV-16 or better).
 - (F.) Has heating and cooling capabilities.

- 3. Where an employee performs more than one task on Table 1 during the course of a shift:
 - a. The total duration of all tasks combined is **more than four hours**, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift.
 - b. The total duration of all tasks on Table 1 combined is **less than four hours**, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.

F. Alternative Exposure Control Methods – **Other than Table 1**

- 1. For tasks not listed in Table 1, or where the employer does not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1:
- 2. Permissible exposure limit (PEL)
 - a. The employer shall ensure that no employee is exposed to an airborne concentration of respirable crystalline silica in excess of 50 $\mu\text{g}/\text{m}^3$, calculated as an 8-hour time-weighted average (TWA).
- 3. Exposure assessment
 - a. The employer shall assess the exposure of each employee who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the action level in accordance with either the performance option or the scheduled monitoring option.
 - b. Performance option

The employer shall assess the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to respirable crystalline silica.
 - c. Scheduled monitoring option
 - (A.) The employer shall perform initial monitoring to assess the 8-hour TWA exposure for each employee on the basis of one or more personal breathing zone air samples that reflect the exposures of employees on each shift, for each job classification, in each work area. Where several employees perform the same tasks on the same shift and in the same work area, the employer may sample a representative fraction of these employees in order to meet this requirement. In representative sampling, the employer shall sample the employee(s) who are expected to have the highest exposure to respirable crystalline silica.
 - (B.) If initial monitoring indicates that employee exposures are below the action level, the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring.

- (C.) Where the most recent exposure monitoring indicates that employee exposures are at or above the action level but at or below the PEL, the employer shall repeat such monitoring within six months of the most recent monitoring.
 - (D.) Where the most recent exposure monitoring indicates that employee exposures are above the PEL, the employer shall repeat such monitoring within three months of the most recent monitoring.
 - (E.) Where the most recent (non-initial) exposure monitoring indicates that employee exposures are below the action level, the employer shall repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken seven or more days apart, are below the action level, at which time the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring, except as otherwise provided in Reassessment of Exposure guidelines
- d. Reassessment of exposures
- The employer shall reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the action level, or when the employer has any reason to believe that new or additional exposures at or above the action level have occurred.
- e. Methods of sample analysis
- The employer shall ensure that all samples taken to satisfy the monitoring requirements of this program are evaluated by a laboratory that analyzes air samples for respirable crystalline silica.
- f. Employee notification of assessment results
- (A.) Within five working days after completing an exposure assessment, the employer shall individually notify each affected employee in writing of the results of that assessment or post the results in an appropriate location accessible to all affected employees.
 - (B.) Whenever an exposure assessment indicates that employee exposure is above the PEL, the employer shall describe in the written notification the corrective action being taken to reduce employee exposure to or below the PEL.
- g. Observation of monitoring
- (A.) Where air monitoring is performed to comply with the requirements of this section, the employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to respirable crystalline silica.
 - (B.) When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, the employer shall provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.
- h. Recordkeeping of Air monitoring data
- (A.) The employer shall make and maintain an accurate record of all exposure measurements taken to assess employee exposure to respirable crystalline silica. This record shall include at least the following information:
 - (1.) The date of measurement for each sample taken.
 - (2.) The task monitored.
 - (3.) Sampling and analytical methods used.

- (4.) Number, duration, and results of samples taken.
- (5.) Identity of the laboratory that performed the analysis.
- (6.) Type of personal protective equipment, such as respirators, worn by the employees monitored.
- (7.) Name, social security number, and job classification of all employees represented by the monitoring, indicating which employees were actually monitored.

- (B.) The employer shall ensure that records are maintained and made available in accordance with 29 CFR 1910.1020.

4. Methods of compliance

a. Engineering and work practice controls

- (A.) The employer shall use engineering and work practice controls to reduce and maintain employee exposure to respirable crystalline silica to or below the PEL, unless the employer can demonstrate that such controls are not feasible.
- (B.) Wherever such feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, the employer shall nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them with the use of respiratory protection that complies with the requirements of paragraph (e) of this section.

b. Abrasive blasting

- (A.) In addition to the engineering and workplace controls, the employer shall comply with other OSHA standards, when applicable, such as 29 CFR 1926.57 (Ventilation), where abrasive blasting is conducted using crystalline silica containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica.

G. Housekeeping

1. The employer shall not allow dry sweeping or dry brushing where such activity could contribute to employee exposure to respirable crystalline silica unless wet sweeping, HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure are not feasible.
2. The employer shall not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to employee exposure to respirable crystalline silica unless:
 - a. The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air
 - b. No alternative method is feasible

H. Respiratory protection

1. Where respiratory protection is required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph and 29 CFR 1910.134 which includes a respiratory protection program.
2. Respiratory protection is required:
 - a. Where specified by Table 1
 - b. For tasks not listed in Table 1, or where the employer does not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1:

- (A.) Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls.
- (B.) Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible.
- (C.) During tasks for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL.

I. Medical surveillance

1. The employer shall make medical surveillance available at no cost to the employee, and at a reasonable time and place, for each employee who will be required under this section to use a respirator for 30 or more days per year.
 - a. The employer shall ensure that all medical examinations and procedures required by this section are performed by a Physician or other licensed health care professional (PLHCP).
2. Recordkeeping
 - a. The employer shall make and maintain an accurate record for each employee covered by medical surveillance. The record shall include the following information about the employee:
 - (A.) Name and social security number;
 - (B.) A copy of the PLHCPs' and specialists' written medical opinions; and
 - (C.) A copy of the information provided to the PLHCPs and specialists.
 - b. The employer shall ensure that records are maintained and made available in accordance with 29 CFR 1910.1020.
3. Initial examination
 - a. The employer shall make available an initial (baseline) medical examination within 30 days after initial assignment, unless the employee has received a medical examination that meets the requirements of this section within the last three years. The examination shall consist of:
 - b. A medical and work history, with emphasis on: past, present, and anticipated exposure to respirable crystalline silica, dust, and other agents affecting the respiratory system; any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing); history of tuberculosis; and smoking status and history.
 - c. A physical examination with special emphasis on the respiratory system.
 - d. A chest X-ray.
 - e. A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio.
 - f. Testing for latent tuberculosis infection.
 - g. Any other tests deemed appropriate by the PLHCP.
4. Periodic examinations

The employer shall make available medical examinations at least every three years, or more frequently if recommended by the PLHCP.
5. Information provided to the PLHCP. The employer shall ensure that the examining PLHCP has a copy of this standard, and shall provide the PLHCP with the following information:

- a. A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to respirable crystalline silica.
 - b. The employee's former, current, and anticipated levels of occupational exposure to respirable crystalline silica.
 - c. A description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used or will use that equipment.
 - d. Information from records of employment-related medical examinations previously provided to the employee and currently within the control of the employer.
6. PLHCP's written medical report for the employee.
- a. The employer shall ensure that the PLHCP explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of each medical examination performed.
 - b. The written report shall contain:
 - (A.) A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to respirable crystalline silica and any medical conditions that require further evaluation or treatment.
 - (B.) Any recommended limitations on the employee's use of respirators
 - (C.) Any recommended limitations on the employee's exposure to respirable crystalline silica.
 - (D.) A statement that the employee should be examined by a specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.
7. PLHCP's written medical opinion for the employer
- a. The employer shall obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion shall contain only the following:
 - (A.) The date of the examination.
 - (B.) A statement that the examination has met the requirements of this section.
 - (C.) Any recommended limitations on the employee's use of respirators.
 - b. If the employee provides written authorization, the written opinion shall also contain either or both of the following:
 - (A.) Any recommended limitations on the employee's exposure to respirable crystalline silica.
 - (B.) A statement that the employee should be examined by a specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.
 - c. The employer shall ensure that each employee receives a copy of the written medical opinion within 30 days of each medical examination performed.
8. Additional examinations
- a. If the PLHCP's written medical opinion indicates that an employee should be examined by a specialist, the employer shall make available a medical examination by a specialist within 30 days after receiving the PLHCP's written opinion.
 - b. The employer shall ensure that the examining specialist is provided with all of the information that the employer is obligated to provide to the PLHCP

- c. The employer shall ensure that the specialist explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of the examination. The written report shall contain:
 - (A.) A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to respirable crystalline silica and any medical conditions that require further evaluation or treatment.
 - (B.) Any recommended limitations on the employee's use of respirators
 - (C.) Any recommended limitations on the employee's exposure to respirable crystalline silica.
- d. The employer shall obtain a written opinion from the specialist within 30 days of the medical examination. The written opinion shall contain:
 - (A.) The date of the examination.
 - (B.) Any recommended limitations on the employee's use of respirators.
 - (C.) Any recommended limitations on the employee's exposure to respirable crystalline silica.

Appendix A - Table 1

Specified Exposure Control Methods when Working with Materials Containing Crystalline Silica

Equipment / Task Number and Description		Engineering & Work Practice Control Methods	Req'd Respiratory Protection & Minimum Assigned Protection Factor (APF)	
			≤ 4 hrs/shift	> 4 hrs/shift
1	Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	NONE	NONE
2	Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. <ul style="list-style-type: none"> - When used outdoors - When used indoors or in an enclosed area. 	NONE APF 10	APF 10 APF 10
3	Handheld power saws for cutting fibercement board (with blade diameter of inches or less)	For tasks performed outdoors only: Use saw equipped with commercially available dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	NONE	NONE
4	Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. <ul style="list-style-type: none"> - When used outdoors. - When used indoors or in an enclosed area. 	NONE APF 10	NONE APF 10
5	Drivable saws	For tasks performed outdoors only: Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	NONE	NONE
6	Rig-mounted core saws or drills	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	NONE	NONE
7	Handheld and stand-mounted drills (including impact and rotary hammer drills)	Use drill equipped with commercially available shroud or cowling with dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	NONE	NONE
8	Dowel drilling rigs for concrete	For tasks performed outdoors only: Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	APF 10	APF 10
9	Vehicle-mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector. OR	NONE	NONE
		Operate from within an enclosed cab and use water for dust suppression on drill bit.	NONE	NONE

Appendix A - Table 1 (cont'd)

Equipment / Task Number and Description		Engineering & Work Practice Control Methods	Req'd Respiratory Protection & Minimum Assigned Protection Factor (APF)	
			≤ 4 hrs/shift	> 4 hrs/shift
10	Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact. <ul style="list-style-type: none"> – When used outdoors. – When used indoors or in an enclosed area. OR Use tool equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. <ul style="list-style-type: none"> – When used outdoors. – When used indoors or in an enclosed area. 	NONE APF 10	APF 10 APF 10
		Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	APF 10	APF 25
11	Handheld grinders for mortar removal (<i>i.e., tuckpointing</i>)	Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	APF 10	APF 25
12	Handheld grinders for uses other than mortar removal	For tasks performed outdoors only: Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism <ul style="list-style-type: none"> – When used outdoors. – When used indoors or in an enclosed area. 	NONE NONE	NONE APF 10
		Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use machine equipped with dust collection system recommended by the manufacturer. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	NONE NONE	NONE NONE
13	Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use machine equipped with dust collection system recommended by the manufacturer. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	NONE NONE	NONE NONE

Appendix A - Table 1 (cont'd)

Equipment / Task Number and Description		Engineering & Work Practice Control Methods	Req'd Respiratory Protection & Minimum Assigned Protection Factor (APF)	
			≤ 4 hrs/shift	> 4 hrs/shift
14	Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	NONE	NONE
15	Large drivable milling machines (half-lane and larger)	For cuts of any depth on asphalt only: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions.	NONE	NONE
		For cuts of four inches in depth or less on any substrate: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions. OR	NONE	NONE
		Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	NONE	NONE
16	Crushing machines	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.	NONE	NONE
17	Heavy equipment and utility vehicles used to abrade or fracture silica containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab	NONE	NONE
		When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	NONE	NONE
18	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: demolishing, abrading, or fracturing silica containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions. OR	NONE	NONE
		When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	NONE	NONE

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Safety Specifics – **Welding, Cutting & Hot Work (29 CFR 1926.350)**

A. Administrative Duties

1. The Project Manager is responsible for implementing and maintaining the written Welding, Cutting, Hot Work Procedures. These procedures are kept in the written Safety and Health manual and our corporate offices. Copies can be obtained from the Project Manager.
2. Prior to any welding or cutting is to be performed, the Project Manager shall ensure that the area has been inspected and that the requirements of this program have been met. If acceptable conditions are found, the Project Manager may then authorize the welding and/or cutting operation through the use of a written permit.

B. Training

1. It is the policy of our company to permit only trained and authorized personnel to operate welding and cutting equipment. The Project Manager will identify all new employees in the employee orientation program and make arrangements with department management to schedule training.
2. The Project Manager or designee will conduct initial training and evaluation: This instructor(s) must have the necessary knowledge, training, and experience to train new welding and cutting equipment operators.
3. Initial Training
 - a. Our instruction includes both classroom instruction and practical training.
 - b. During training, we covers the operational hazards of our welding and cutting operations, including:
 - (A.) Hazards associated with the particular make and model of the welding and cutting equipment.
 - (B.) Hazards of the workplace/duties of the fire watch including fire extinguishing equipment.
 - (C.) General hazards that apply to the operation of all or most welding and cutting equipment.
 - c. Each potential welder or cutter who has received training in any of the elements of our training program for the types of equipment which that employee will be authorized to operate and for the type of workplace in which the welding and cutting equipment will be operated need not be retrained in those elements before initial assignment in our workplace if we have written documentation of the training and if the employee is evaluated to be competent.
4. Training Certification
 - a. After an employee has completed the training program, the instructor will determine whether the potential welder or cutter can safely perform the job. At this point, the trainee will take a performance test or practical exercise through which the instructor(s) will decide if the training has been adequate. All welding and cutting trainees are tested on the equipment they will be operating.
 - b. The Project Manager is responsible for keeping records certifying that each employee who has successfully completed training and testing. Each certificate includes the name of the employee, the date(s) of the training, and the signature of the person who did the training and evaluation.

5. Performance Evaluation

Each certified welder or cutter is evaluated to verify that the welder or cutter has retained and uses the knowledge and skills needed to operate safely. This evaluation is done by the Project Manager. If the evaluation shows that the welder or cutter is lacking the appropriate skills and knowledge, the welder or cutter is retrained. When a welder or cutter has an accident or near miss or some unsafe operating procedure is identified, we also do retraining.

6. Current Welders and Cutters

- a. Under no circumstances may an employee operate welding or cutting equipment until he/she has successfully completed this company's welding and cutting training program. This includes all new welders and cutters regardless of claimed previous experience.
- b. All employees have a general obligation to work safely with and around welding and cutting operations. If welding cannot be conducted safely the welding and cutting shall not be performed.

C. Operating Procedures

1. Compressed Gas Cylinders

- a. Handling, storage, and use of compressed gases around the job site represents a number of hazards. Questions shall be resolved through supervisors or use of the Compressed Gas Association Pamphlet P-1-1965.
- b. Approved practices that our employees must follow include:
 - (A.) Keep valve protection cap in place at all times when a cylinder is not in use.
 - (B.) When cylinders are hoisted, secure them on a cradle, sling board, or pallet.
 - (C.) Move cylinders by tilting and rolling on their bottom edges. Care in handling is required.
 - (D.) Secure cylinders in an upright position at all times, especially when moving them by machine.
 - (E.) Use carriers or carts provided for the purpose when cylinders are in use.
 - (F.) When in use, isolate cylinders from welding or cutting operations, or suitably shield. Care will be taken to prevent them from becoming part of an electrical circuit.
 - (G.) Maintain a distance of at least 20 feet or provide a non-combustible barrier at least five feet high in separating fuel gas cylinders from oxygen cylinders. This applies to indoor and outdoor storage.
 - (H.) The Project Manager will designate
 - (1.) Well-ventilated storage areas for cylinders inside buildings.
 - (2.) Locations for fuel gas and oxygen manifolds in well-ventilated areas.
 - (3.) Care will be taken to keep storage areas out of traffic areas or other situations where they could be knocked over, damaged or be tampered with.
- c. Prohibited practices that our employees must comply with include:
 - (A.) Use of valve protection caps for lifting cylinders.
 - (B.) Use of damaged or defective cylinders. The Project Manager will provide appropriate tags and designate an appropriate storage area for these cylinders.
 - (C.) Mixing of gases.
 - (D.) Use of a magnet or choker sling when hoisting cylinders.

- (E.) Use of a bar to pry cylinders from frozen ground. Warm, not boiling, water is used to thaw cylinders.
- (F.) Taking oxygen, acetylene, or other fuel gas or manifolds with these gases into confined spaces.

2. Gas Welding and Cutting

- a. Safe practices in using compressed gases and torches include:
 - (A.) Cracking cylinders and attaching regulators according to industry practice.
 - (B.) Putting caps on header hose connections and manifolds when not in use.
 - (C.) Keeping all hoses, regulators, cylinders, valve protection caps, couplings, apparatus, and torch connections free of grease and oil, especially those involving oxygen.
 - (D.) Using fuel gas hose and oxygen hose of different colors.
 - (E.) Inspections: * All hoses before every shift; * All torches. Only devices designed for the purpose will be used to clean torch tips.
 - (F.) Use only friction lighters to ignite torches.
 - (G.) Removal of torches and hoses and positive shut-off of gas sources from confined spaces when leaving a confined space project for any substantial period of time.
- b. Prohibited practices include:
 - (A.) Interchange of hoses, including use of adapters, between fuel gas and oxygen sources.
 - (B.) Placement of anything on or near a manifold or cylinder top that may interfere with the prompt shut-off in case of an emergency.
 - (C.) Taping more than four inches out of every 12 inches in joining fuel gas and oxygen hoses.
 - (D.) Using defective hose or torches.
 - (E.) Use of oxygen for personal cooling, cleaning off of surfaces, ventilation or blowing dust from clothing.

3. Arc Welding and Cutting

- a. Safe practices in using arc welders include:
 - (A.) Use of holders, cable, and other apparatus specifically designed for the purpose, matched to the job and other components and in good repair.
 - (B.) Following Department Of Transportation standards for welding on natural gas pipelines.
 - (C.) When leaving electrode holders unattended, electrodes are removed and holders placed so that accidental electrical contact is not made.
 - (D.) Turning off the arc welding or cutting machine when it is to be left unattended for a substantial period of time or when it is being moved.
 - (E.) Immediate reporting of any defective equipment to the Project Manager.
 - (F.) Use of non-combustible or flame-proof screens to protect employees and passersby from arc rays wherever practicable.
 - (G.) Keeping chlorinated solvents at least 200 feet from an inert-gas metal-arc welder or providing adequate shielding. Surfaces prepared with chlorinated solvents will be thoroughly dry before welding.

b. Prohibited practices include:

- (A.) Using cables with repairs or splices within 10 feet of the holder that are not equivalent in insulating value to the original cable.
- (B.) Use of pipelines with flammable gases or liquids or conduits with electrical circuits as ground return.
- (C.) Dipping hot electrode holders into water.

4. Fire Prevention

a. The Project Manager will use this guide to assess fire hazards at a job site:

- (A.) When the object to be welded, cut or heated can be moved, and a fire-resistant, safe workspace is available, then the welding, cutting, brazing, or heating must be done in that space.
- (B.) When the object to be welded, cut, or heated cannot be moved, and all fire hazards can be moved to a safe distance, then the welding, cutting, brazing or heating can be done.
- (C.) When the object to be welded, cut, or heated cannot be moved, and 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.
- (D.) When there is a welding, cutting, or heating task, and concentrations of flammable paints, dusts, or other flammable compounds are present, then welding, cutting, brazing or heating is not allowed.

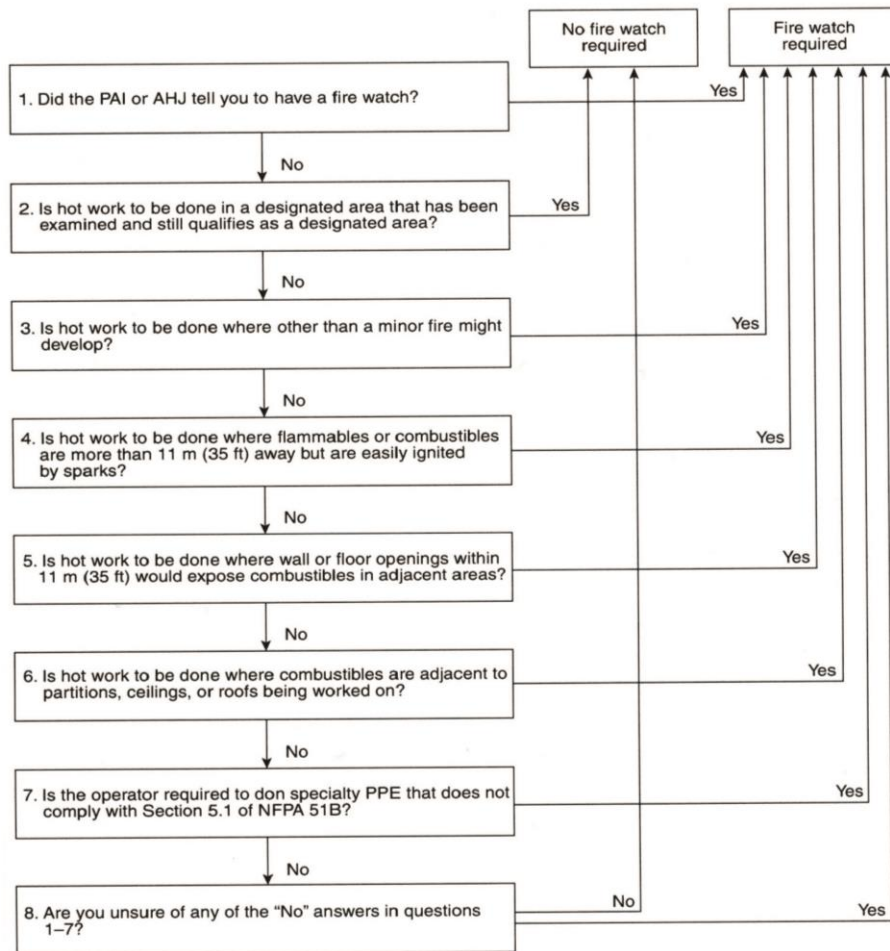
b. All employees will be required to:

- (A.) Wear flame-resistant clothing.
- (B.) Have a fire watch in attendance when they are welding.
- (C.) Remove all combustible material at least 35 feet from the work area and to move away from combustible materials or cover combustibles with fire resistant material.
- (D.) Not weld in atmospheres containing dangerously reactive or flammable gases, vapors, liquid, or dust.
- (E.) Clean and purge containers which may have held combustible material before applying heat.
- (F.) Get a hot work permit and follow its safety precautions.
- (G.) The company will provide suitable fire extinguishing equipment based on the Project Manager's assessment of hazards. The Project Manager will ensure the equipment is maintained for immediate use.

5. Fire Watches

- a. Where a fire watch is required, the Permit Authorizing Individual (PAI) shall be responsible for ensuring that a fire watch is on site.
- b. Where a fire watch is NOT required, the PAI shall **make a final check one half hour after the completion of hot work operations to detect and extinguish smoldering fires.**
- c. The fire watch shall be trained to understand the inherent hazards of the work site and of the hot work, and have authority to stop operations if unsafe conditions develop.
- d. The fire watch shall ensure that safe conditions are maintained during operations.
- e. The fire watch shall have fire-extinguishing equipment readily available and shall be trained in its use.

- f. The fire watch shall watch for fires in all exposed areas and try to extinguish them only when the fires are obviously within the capacity of the equipment available. If the fire watch determines that the fire is not within the capacity of the equipment, the fire watch shall sound the alarm immediately.
- g. A fire watch shall be required by the PAI when hot work is performed in a location where other than a minor fire might develop or where the following conditions exist:
 - (A.) Combustible materials in building construction or contents are closer than 11 m (35 ft) to the point of operation.
 - (B.) Combustible materials are more than 11 m (35 ft) away from the point of operation but are easily ignited by sparks.
 - (C.) Wall or floor openings within a 11-m (35-ft) radius expose combustible materials in adjacent areas, including concealed spaces in walls or floors.
 - (D.) Combustible materials are adjacent to the opposite side of partitions, walls, ceilings, or roofs and are likely to be ignited.
- h. A fire watch shall be maintained for at least 1/2 hour after completion of hot work operations in order to detect and extinguish smoldering fires.
- i. More than one fire watch shall be required if combustible materials that could be ignited by the hot work operation cannot be directly observed by the initial fire watch.
- j. For single ply and torch applied roofing systems, a fire watch shall be conducted for at least 1hour after torches have been extinguished as per NFPA 241.



NFPA 51B

6. Ventilation

- a. The Project Manager will determine the number, location, and capacity of ventilation devices.
- b. Where ventilation is not sufficient to provide clean, respirable air, respirators will be specified according to the provisions in the Personal Protective Equipment section.
- c. Ventilation will be sufficient to protect passersby as well as the welder.
- d. Employees will be required to:
 - (A.) Know the symptoms of fumes and gases and get out of the area if they shall develop.
 - (B.) Perform atmospheric tests.
 - (C.) Keep a safe distance from the fume or gas plume.

7. Personal Protective Equipment

- a. Air line respirators will be provided for confined space jobs when sufficient ventilation cannot be provided without blocking the exit. Employees will be trained on the proper use of their respirators.
- b. When known or unknown toxic materials are present in a job, respirators will be provided that match the hazard for all employees. The hazards include zinc or zinc-bearing base or filler metals, lead base metals, cadmium-bearing filler metals, chromium-bearing or chromium-coated metals, mercury, nitrogen dioxide, and beryllium. Due to beryllium's extreme danger, both ventilation and air line respirators will be used.
- c. Where screens are not sufficient to protect welders and passersby from arc radiation, the company will provide eye protection with appropriate helmets, ANSI approved filter lens goggles, or hand shields. The helmets and shields will be maintained in good repair.
- d. When a toxic preservative is detected on a surface in a confined space, airline respirators will be provided (or the toxic coating will be stripped from at least four inches around the heated area).
- e. Other PPE used may include
 - (A.) Flame resistant aprons to protect against heat and sparks.
 - (B.) Leggings and high boots for heavy work.
 - (C.) Ankle-length safety shoes worn under pant legs to keep from catching slag.
 - (D.) Shoulder cape and skull cap to protect against overhead welding.
 - (E.) Ear plugs or ear muffs on very noisy jobs like high velocity plasma torches.
 - (F.) Insulated gloves to protect against contact with hot items and radiation exposure.
 - (G.) Safety helmets to protect against sharp or falling objects.
- f. Employees are asked to wear wool, leather, or cotton treated clothing to reduce flammability for gas shielding arc welding. Long sleeves and pants without cuffs/front pockets are recommended to avoid catching sparks.

8. Confined Spaces

- a. Confined spaces, such as manholes, tunnels, trenches and vaults, are particularly hazardous working areas made more dangerous by welding. These spaces shall be identified by signage and all employees will be made aware of them. Ventilation is a primary consideration and will be required by the Project Manager or other competent employee designated by the company in accordance with the company's Confined Space Program.

- b. When welding or cutting is suspended for any substantial period of time, such as lunch or overnight, torches and hoses and/or electrodes and leads shall be removed from the confined space. Additionally, valves will be shut and welders shall be disconnected from their power sources.
- c. An employee will be stationed outside the confined space to maintain communication with those entering and ready to render emergency assistance when respirators are used.
- d. When confined spaces are entered through a manhole or similar small opening, the company will provide a means of quickly removing a worker. An attendant with a rescue procedure will observe the worker at all times and be able to put the rescue plan into effect.
- e. Limited work spaces, hazardous atmospheres, slippery floor surfaces and interior surfaces of the space will be evaluated for flammability.

9. Flammable, Toxic, or Hazardous Materials

- a. The company will designate a competent person to test the flammability and/or composition of unknown coatings.
- b. When a coating is found to be highly flammable or contain potentially toxic materials, such as lead-painted surfaces, it will be stripped from the area to prevent fire or unnecessary exposure to the welder/cutter.

10. Electrical Equipment

- a. Approved safe practices include:
- b. Arc welding will not be done while standing on damp surfaces or in damp clothing.
- c. Equipment will be properly grounded, installed, and operated.
- d. Defective equipment will not be used.
- e. Well-insulated electrode holders and cables will be used.
- f. Employees shall insulate themselves from both the work and the metal electrode and holder.
- g. Welding cables must not be wrapped around the welder's body.
- h. Employees shall wear dry gloves and rubber-soled shoes.
- i. No damaged or bare cables and connectors will be used.
- j. In case of electric shock, a victim shall not be touched. Current shall be turned off at the control box and then help called for. After the power is off, cardio-pulmonary resuscitation (CPR) may be performed if necessary.

11. Fall Protection

- a. A platform with railings, or safety harness and lifeline will be used when welding or cutting above ground or floor levels and there are falling hazards.
- b. A clear welding or cutting area will be maintained to prevent slips, trips, and falls.

12. First Aid/Medical Services

- a. First Aid equipment/Medical Services shall be available at all times in accordance with our First Aid/Medical Services written program.

D. Inspections

A number of inspections are required under the welding and cutting regulations. To make inspections efficient, we have compiled a list of inspection items to be checked before welding or

cutting. The Project Manager or designated representative shall make inspections at the beginning of each shift utilizing the Inspection Checklist. Shall any deficiencies are safety hazards be identified during the inspections shall immediately take the equipment out of service and notify the Project Manager. The Project Manager shall not allow the equipment to be returned to service until it has been repaired by qualified personnel and its safety has been assured

E. Maintenance

1. Any deficiencies found in our welding and cutting equipment are repaired, or defective parts replaced, before continued use. However, no modifications or additions that affect the capacity or safe operation of the equipment may be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, must be changed accordingly. In no case may the original safety factor of the equipment be reduced.
2. While defective parts may be found, we prefer to invest time and effort into the proper upkeep of our equipment, which results in day-to-day reliability. Keeping up with the manufacturer's recommended maintenance schedules, and completing the proper records, will also increase our welding and cutting equipment's longevity.

F. Recordkeeping

The Project Manager is responsible for maintaining inspection records for each project. Upon completion of the project, records shall be forwarded to the corporate office for review.

Chapter 8 SUPPLEMENTAL SAFETY PROGRAMS

These Supplemental Safety Programs have been identified as specifically relevant to your organization and beneficial to your organization's safety program.

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Supplemental Safety Programs – **Vehicle & Driving Safety**

A. Company Vehicle Limitations

1. Company vehicles may be used for company business only, unless prior permission is obtained.
2. Employees are not to perform repairs or maintenance on company vehicles, other than routine fluid additions.
3. Employees may not drive a company vehicle before signing a Driver Distraction and Vehicle Use Policy Acknowledgement form, found in the Forms section of this manual.

B. Pre-Departure Safety Check

1. Verify that all loads and heavy equipment are evenly distributed, secured, and not in excess of the manufacturer's specifications and legal limits for the vehicle.
2. Cover all loose materials and/or debris before entering public roads.
3. Towing Safety
 - a. Ensure that hitches good shape
 - b. Trailers, kettles, etc. should be securely closed.
 - c. Verify that safety chains are secured.
4. Perform a 360 walk-around for vehicle safety
 - a. Inspect for vehicle damage and immediately report any damage to the supervisor if not previously observed.
 - b. Check windshield for cracks that could interfere with vision.
 - c. Make sure dirt or snow is removed from lights on all sides of the vehicle.
 - d. Brush or clean off snow or ice on all windows to ensure complete vision.
 - e. Check to ensure the license plates and inspection tag on vehicle/trailer are current.
5. Check fuel level to be certain the destination can be reached.
6. Ensure that there is a first aid kit and inspected fire extinguisher in the company vehicle.
7. Ensure driver is rested and alert for driving.

C. Driving Safety

1. Operators of company on- or-off road vehicles shall be qualified by possession of a valid, current driver's license for the type of vehicle being driven.
2. Only authorized employees will drive a motor vehicle in the course and scope of work or operate a company owned vehicle.
3. Drivers will be appropriately assessed, licensed and trained to operate the vehicle they have been authorized to operate.
4. No non-employee passengers shall be on trucks used to deliver goods.
5. Reversing / Backing up
 - a. Backing is prohibited whenever practicable.
 - b. Where backing is required, drivers, when parking, shall make every effort to park the vehicle in a manner that allows the first move when leaving the parking space to be forward.

- c. Drivers must have either a reversing alarm, use a spotter or walk around the truck/trailer prior to backing.
 - d. A spotter outside the vehicle must always be used when towing.
6. Passenger compartments are to be free from loose objects that might endanger passengers in the event of an incident. Any vehicle with non-segregated storage shall be equipped with a cargo net or equivalent to separate the storage area.
 7. Vehicles (light vehicles, heavy vehicles and trailers) may not be modified without the endorsement of the manufacturer and maintained in safe working order.
 8. Signs, stickers or labels are to be fitted in such a manner that they do not obstruct the driver's vision or impede the driver's use of any controls.

D. Driving Practices

1. Obey all federal and local driving laws or regulations as well as company requirements.
2. Immediately report any restriction or change to their driving privileges to the supervisor.
3. Seat belts shall always be worn by all occupants whenever the vehicle is in motion; only seats fitted with three-point inertia-reel type seatbelts shall be used. All vehicles capable of more than 10 mph/15 kph shall have seat belts installed.
4. Both hands on the wheel.
5. Slow down around construction, large vehicles, wildlife, fog, rain, snow, or anything else that adds a hazard to your driving.
6. Vehicles shall only be operated for their intended use.
7. Leave an extra margin of distance between vehicles to allow for a longer stopping distance.
8. Drive for conditions, not just the speed limit.
9. Alcohol or illegal drugs are not allowed in a company or company-leased vehicle at any time.
10. Drivers shall not operate a motor vehicle while under the influence of alcohol, illegal drugs, or prescription or over-the counter medications that might impair their driving skills.
11. Immediately report any citation, warning, traffic violation, collision, vehicle damage or near miss associated with company or customer vehicle operation or while driving on company duties to the supervisor.

E. Vehicle Accident Reporting

1. If involved in a vehicle accident while in a Company vehicle
2. Contact the office immediately, and let them know that the accident has occurred and what, if any injuries, have been sustained.
3. Make no admission of fault, while remaining courteous and respectful to any other drivers or passengers involved, witnesses, and first responders.
4. Use the Accident Checklist and accompanying forms that are included in the Forms section of this manual to collect information regarding the accident

Chapter 9 FORMS

These forms are provided as additional resources, templates, and/or tools that can be used with your safety program.

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Baxmeyer Construction, Inc.



Emergency Action Plan Guide

Note: *The following emergency action plan is provided only as a guide to assist employers and employees in complying with the requirements of 29 CFR 1910.38, as well as to provide other helpful information. It is not intended to supersede the requirements of the standard. An employer shall review the standard for particular requirements which are applicable to their individual situation and make adjustments to this program that are specific to their company. An employer will need to add information relevant to their particular facility in order to develop an effective, comprehensive program.*

Emergency Action Plan Date _____ / _____ / _____

Project Name: _____

POLICY

It is the policy of this company to take every possible action to comply with all emergency regulations and protect employees in emergency situations.

EMERGENCY PLAN COORDINATOR

_____ (name of person or title) is responsible for making sure this emergency action plan is kept up to date, practices, and reviewed periodically.

The Emergency Plan Coordinator can be reached at (location and phone number): _____

REPORTING PROCEDURES

(List the types of emergencies that could occur at your workplace and how employees shall report them. Options include internal telephone numbers, intercom, public address systems, etc. Employees must also notify external emergency responders if the company uses them for assistance in emergencies.)

Type of Emergency	How to Report (Phone Numbers)
Fire	
Explosion	
Weather	
Bomb threat	
Chemical Spill/Leak	
Violence	
Medical	
Other (list)	

Reporting procedures are posted (locations): _____

EVACUATION PROCEDURES

Emergency Escape Procedures and Routes

Emergency escape routes shall be assigned to each person and an emergency escape route chart is posted on the workplace bulletin board, indicating by Department, a primary and a secondary exit or escape route in the event emergency evacuation is necessary. Department supervisors are to insure all employees within their department are familiar with this plan.

Procedure for Employees Who Remain to Operate Critical Operations Before They Evacuate

Employees may need to be maintained (not immediately evacuated) in order to secure critical operations before evacuation. Critical plant operations may include the monitoring of plant power supplies, water supplies, and other essential services which cannot be shut down for every emergency. They may also include those persons needed for chemical or manufacturing processes which must be shut down in stages or steps.

The following lists these employees and their duties:

Name	Title	Work Area	Special Assignment

The preceding individuals have received special instructions and training by their immediate supervisors to ensure their safety in carrying out the designated assignments. A training record describing the instructions provided and the detailed procedures to be followed is maintained in the Emergency Plan Coordinator's Office.

Employee Accountability Procedures after Evacuations

When an evacuation signal is given, each supervisor involved will assume a station in the vicinity of the designated exit. The supervisor will insure all personnel are evacuated and will provide assistance to employees requiring same.

Once evacuated, all employees will then proceed to a previously designated accounting area for an additional head count by their supervisor. Supervisors will then report their department's status to the workplace manager or individual in charge. No one is to re-enter the building for any reason until the Fire Department or other responsible agency has notified us the building is safe for re-entry.

Alarm System

The alarm system shall provide warning for necessary emergency action. The alarm shall be capable of being perceived above ambient noise or light levels of noise. The alarms used for different actions shall be distinctive and might include horn blasts, sirens, or even public address systems.

Alarm systems for notifying all employees in case of an emergency are:

Alarm System	Action to be Taken

Severe Weather/Tornado

When a hazardous weather alert is announced, all employees shall immediately go to their designated tornado refuge area. All employees shall stay in the tornado refuge area until given the all clear sign.

Tornado refuge areas are located (*locations*): _____

Training

The following personnel have been trained to assist in the safe and orderly emergency evacuation of other employees.

Name	Title	Work Area	Special Assignment

1. Training is provided for employees when:

- When the plan is initiated
- When employee’s required actions and responsibilities change
- When there are any changes to the plan
- Initially for new employees
- Refresher training annually

2. Items reviewed during training:

- Emergency escape procedures
- Escape route assignments
- Fire extinguisher locations and training
- Procedures to account for employees
- Major workplace fire hazards
- Employee training programs
- Fire prevention practices
- Means of reporting fire and other emergencies
- Alarm system/s
- Proper housekeeping
- Emergency action plan availability
- Hazardous Weather Procedures
- Medical Emergencies
- Any other emergency procedures needed for this facility (bomb threat, workplace violence, etc).

Emergency drills for fire, evacuation, tornado, medical, etc., will be conducted approximately every six months. Everyone is expected to participate to ensure they know exactly what to do shall an emergency situation arise.

FIRE EXTINGUISHERS

(Specify whether or not employees are expected to use fire extinguishers prior to evacuating. Use of fire extinguishers requires additional training and procedures. In most cases employees are at less risk if they do not use fire extinguishers. Each organization must determine its own policy regarding fire extinguisher use.)

RESCUE AND MEDICAL DUTIES

It may become necessary in an emergency to rescue personnel and perform some specified medical duties, including first-aid treatment. All employees assigned to perform such duties will have been properly trained and equipped to carry out their assigned responsibilities properly and safely.

(Most small businesses rely on local resources such as hospitals or fire departments to provide rescue and medical services. Where that is the case, list those resources. If employees have such duties include a list of these individuals and the training they have received.)

Name	Location Assignment	Special Assignment	Training Provided

All personnel performing emergency rescue and medical duties must follow these instructions:

CHAIN OF COMMAND AND EMERGENCY PHONE NUMBERS

For more information about this plan, contact the Emergency Action Coordinator.

The following people shall be contacted during off-hours emergencies:

Name	Telephone Number



Baxmeyer Construction, Inc.



Incident Investigation Report

Investigator: _____ Report Date: ____ / ____ / ____

Incident Resulted In: Near Miss Equipment Damage Property Damage Injury Fatality

When did the incident occur? Date: ____ / ____ / ____ Time: ____ : ____ a.m./p.m.

Is the incident/injury reportable to OSHA? No Yes – Date reported to OSHA: ____ / ____ / ____

Involved Employee Information:

Name: _____
LAST FIRST MI

Address: _____
STREET CITY STATE ZIP

Home Phone: _____ Mobile Phone: _____

D.O.B.: _____ Gender: _____ SS# _____ - _____ - _____

Occupation: _____

Was the employee Drug Tested? No Yes – Results: _____

Was the employee Alcohol Tested? No Yes – Results: _____

Employer Information:

Company Name: _____

Supervisor's Name: _____
LAST FIRST MI

Telephone: _____ Fax Number: _____

Company Address: _____
STREET CITY STATE ZIP

Witness Information:

No Witnesses

Name: _____
LAST FIRST MI

Statement Attached? Yes No (If no, explain) _____

Name: _____
LAST FIRST MI

Statement Attached? Yes No (If no, explain) _____

Name: _____
LAST FIRST MI

Statement Attached? Yes No (If no, explain) _____

Incident Investigation Report (cont'd)

Incident Information:

When was the incident reported to supervisor? Date: ____ / ____ / ____ Time: ____ : ____ a.m./p.m.

Job Site Address: _____
STREET CITY STATE ZIP

Specific Location Where Incident Occurred: _____

The incident occurred while working: Inside Outside

Conditions *(if outside)*: Sunny Excessive Heat Dry Rainy Snowy Excessive Cold

What was the involved employee doing at the time of the incident?

Describe how did the incident occurred:

Describe any Property damage:

Describe any Equipment damage:

What environmental factors (unsafe conditions) contributed to the incident? *(see supplemental information)*

What behavioral factors (unsafe acts) contributed to the incident? *(see supplemental information)*

What corrective actions have been taken to prevent incident recurrence?

Incident Investigation Report (cont'd)

Injury Information:

When was the injury reported to supervisor? Date: ____ / ____ / ____ Time: ____ : ____ a.m./p.m.

Type of Medical Treatment administered: (check all applicable)

- None
- On-Site first aid
- Doctor/Clinic visit
- EMT/Paramedic
- Emergency Room
- Hospital Stay



Type of Injury/Illness that was incurred: (check all applicable)

- Abrasion
- Allergic Reaction
- Animal Bite
- Asphyxiation
- Blister
- Burns
- Cardiovascular
- Concussion
- Contusion (bruise)
- Crushing Injury
- Dermatitis
- Dislocation
- Electrocutation
- Exposure-Chemical
- Exposure-Radiation
- Eye Cases
- Fracture
- Hearing Loss-Temp.
- Hernia
- Laceration
- Poisoning
- Puncture
- Repetitive Motion
- Splinter
- Sprain (joint)
- Sting-Insect Bite
- Strain (muscle)
- Temperature-Extreme Hot or Cold
- Unclassified

Injury Caused by: (check all applicable)

- Burns
- Caught in/between
- Climbing
- Cut/Puncture
- Electrical Shock
- Explosion
- Fall - Elevation
- Fall - Same Level
- Fall - Climbing
- Falling Object
- Irritation
- Lifting./Handling
- Motor Vehicle
- Natural Disaster
- Reaching for...
- Struck against...
- Struck by...
- Violence

Body Part that was injured: (check all applicable)

- Head
- Face
- Ear R L
- Eye R L
- Nose
- Mouth
- Throat
- Neck
- Back
- Chest
- Stomach
- Kidney R L
- Buttock R L
- Groin R L
- Hip R L
- Leg R L
- Knee R L
- Ankle R L
- Foot R L
- Toes R L
(circle) 
- Shoulder R L
- Arm R L
- Elbow R L
- Wrist R L
- Hand R L
- Fingers R L
(circle) 

Medical Treatment Information:

Hospital/Clinic Name: _____ Telephone: _____

Address: _____
STREET CITY STATE ZIP

Attending Physician: _____ Telephone: _____

Address: _____
STREET CITY STATE ZIP

Recommendation of the doctor: Return to Regular Work Restricted Work Days off Work

Number of Days to be off Work: _____ Date to Return to Restricted Work: ____ / ____ / ____

Number of Restricted Work: _____ Date to Return to Regular Work: ____ / ____ / ____

Incident Supplemental Information

Note: Each incident will involve at least one of the following conditions as a contributing factor.

Environmental Factors (Unsafe Conditions)

Conditions	Definition of Condition	Suggested Corrective Action
Unsafe procedures	Hazardous Process. Management failed to make adequate plans for safety.	A. Pre-Project Planning B. Formulation of Safe Procedures
Improperly guarded	Work areas, machines, or equipment that is unguarded or inadequately guarded.	A. Inspection B. Checking plans, blueprints, purchase orders, contracts, & materials for safety C. Include guards in original design, order, & contract D. Provide guards for existing hazards
Defective through use	Buildings, machines, or equipment that have become rough, slippery, sharp edged, worn, cracked, broken, or otherwise defective through use or abuse.	A. Inspection B. Proper Maintenance
Defective through design	Failure to provide for safety in the design, construction, and installation of buildings, machinery, & equipment. Too large, too small, not strong enough.	A. Source of supply must be reliable B. Checking plans, blueprints, purchase orders, contracts, & materials for safety C. Correction of defects
Unsafe clothing or personal protective equipment	Management's failure to provide or specify the use of goggles, respirators, safety shoes, hard hats, & other articles of safe dress or apparel.	A. Provide safe apparel or personal protective equipment. B. Specify the use or non-use of certain apparel or protective equipment on certain jobs.
Unsafe housekeeping facilities	Unsuitable layout or lack of equipment necessary for good housekeeping (i.e. shelves, boxes, bins, aisle markers, etc.)	A. Provide suitable layout and equipment necessary for good housekeeping.
Improper ventilation	Poorly or not ventilated area	A. Improve ventilation

Behavioral Factors (Unsafe Acts)

Factor	Definition of Factor	Suggested Corrective Action
Lack of knowledge or skill	Unaware of safe practice; Unpracticed or unskilled. Not properly instructed or trained.	A. Job training B. Improved hiring practices
Improper attitude	Worker was properly trained and instructed, but failed to follow instructions.	A. Supervision B. Discipline C. Improved hiring practices
Physical Deficiencies	Worker has impaired eyesight or hearing, heart trouble, hernia, previous injuries, etc.	A. Pre-employment physicals B. Periodic physicals C. Proper placement of workers D. Identification of workers with temporary physical deficiencies
Substance Abuse	Worker was under the influence of (illegal or prescribed) drugs or alcohol while completing task	

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Baxmeyer Construction, Inc.



Incident / Near Miss Witness Statement

Witness Information:

Name: _____
LAST FIRST MI

Address: _____
STREET CITY STATE ZIP

Home Phone: _____ Mobile Phone: _____

Name of Employer: _____

Supervisor's Name: _____
LAST FIRST MI

Telephone: _____ Fax Number: _____

Employer's Address: _____
STREET CITY STATE ZIP

Incident Information:

When did the incident occur? Date: ____ / ____ / ____ Time: ____ : ____ a.m./p.m.

The incident occurred while working: Inside Outside

Conditions (if outside): Sunny Excessive Heat Dry Rainy Snowy Excessive Cold

Please state your involvement in the incident: *(the more detail, the better – continue on back, if needed)*

Did you report the incident to anyone? Yes _____ No (If no, explain)

The events recounted on this Incident/Near Miss Report are true and complete to the best of my recollection.

PRINT SIGNED _____
DATE ____ / ____ / ____

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Baxmeyer Construction, Inc.



Near Miss Report

This form is not intended to result in retaliatory action by the company or by National Safety Consulting. This report is strictly intended to: improve employee awareness and the predictive module in NSC's auditing software. This will assist in identifying where a potential incident MIGHT happen; to evaluate the safety hazards; and to determine, as a team, where we can better improve on-site training, techniques, and behavior.

Who is Reporting: _____ Report Date: ____ / ____ / ____

Date and Time of Near Miss: Date: ____ / ____ / ____ Time: ____ : ____ a.m./p.m.

Potentially Involved Company: _____

Specific Location of the Near Miss: Inside Outside Where on the project? _____

Conditions (if outside): Sunny Humid Excessive Heat Rainy Icy Snowy Excessive Cold

Potential Injuries? No Yes (describe) _____

Potential Property Damage? No Yes (describe) _____

Potential Equipment Damage? No Yes (describe) _____

Were behavioral factors (unsafe acts) related to the near miss? No Yes (describe below)

Were environmental factors related to the near miss? No Yes (describe below)

Describe the Near Miss (including what job was being done, what the employee was doing before the near miss, and any behavioral or environmental factors):

Near Miss Report information sent to National Safety Consulting: No Yes ____ / ____ / ____

PRINT SIGNED DATE

Near Miss Report received by National Safety Consulting & Entered into Predictive Solutions

PRINT SIGNED DATE

NSC's recommended action, if any to be taken:

Further Investigation Training Additional program(s) Other: _____

PRINT SIGNED DATE

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Baxmeyer Construction, Inc.



Safety Training / Meeting Sign In Sheet

Trainer: _____ Meeting Type: _____ Date: ____ / ____ / ____

Print Name	Job Title	Signature
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Safety Topics Covered:

- | | | |
|--|---|--|
| <input type="checkbox"/> Confined Space | <input type="checkbox"/> Incident Investigation | <input type="checkbox"/> Safety Manual Orientation |
| <input type="checkbox"/> Driver Safety | <input type="checkbox"/> Incident Reporting | <input type="checkbox"/> Supervisor's Training |
| <input type="checkbox"/> Drug-Free Workplace Program | <input type="checkbox"/> Industrial Hygiene | <input type="checkbox"/> Teamwork |
| <input type="checkbox"/> Emergency Procedures | <input type="checkbox"/> Injuries or Incident Review | <input type="checkbox"/> Tools, Equipment, Machinery |
| <input type="checkbox"/> Fire Protection | <input type="checkbox"/> Lockout/Tagout | <input type="checkbox"/> Vehicle Safety |
| <input type="checkbox"/> First Aid Training | <input type="checkbox"/> Materials Handling/Back Safety | <input type="checkbox"/> Violence Prevention Program |
| <input type="checkbox"/> Hazardous/Flammable Materials | <input type="checkbox"/> Personal Protective Equipment | <input type="checkbox"/> Welding |
| <input type="checkbox"/> Housekeeping | <input type="checkbox"/> Powered Industrial Truck | <input type="checkbox"/> Other _____ |
| | <input type="checkbox"/> Pre-Project Planning | |

Comments: _____

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Baxmeyer Construction, Inc.



Safety Inspection Check List

Inspector: _____ Title: _____ Date: ____ / ____ / ____

1 = Satisfactory 2 = Needs some attention 3 = Needs immediate action

Item	Grade	Comments
Housekeeping		
General neatness of work area, lunchrooms, restrooms. Housekeeping maintained		
Aisles are properly marked, clear & in good condition		
Aisle widths maintained		
Mats, gratings, etc. used when drainage is needed		
Floor openings & holes marked and protected		

Fire Prevention		
Fire extinguisher available & functional, where required		
No smoking signs posted & enforced		
Ventilation adequate		
Exposures from dust, fumes, vapors, etc. controlled		

Flammable Gases & Liquids, Batteries		
Proper storage, use & handling of flammable & combustible materials in approved cans and/or cabinets		
Proper handling of compressed gases & materials		
Storage drums for flammable liquids properly grounded & bonded		
Batteries are charged in a properly vented room		
No open flames exist in the battery charging room		
Fuel tanks are always filled when the equipment engine is turned off		

Tools, Machinery & Equipment		
Electrical & portable tools and outlets properly grounded		
Covers in place on all electrical fuse & outlet boxes		
Approved machines guards in place at points of operation & over foot treadles		
Only authorized tools are used to place & remove materials from machinery		
Proper guarding of gears, pulleys, conveyors, chains, etc.		
Machines firmly anchored to prevent moving		
Weight of load does not exceed equipment rating to handle it		
Mobile equipment equipped with a horn, capacity sign & overhead guard		
Lockout/Tagout program in use for designated equipment		

Continued on back

Safety Inspection Check List (Page 2)

1 = Satisfactory

2 = Needs some attention

3 = Needs immediate action

Item	Grade	Comments
Ladders		
Ladders inspected, in good condition, and free from sharp edges & splinters		
Ladders have proper safety feet		
Cages & wells used as required (on fixed ladders only)		
Step ladders do not exceed 20 feet in length		

Stairs & Exits		
Stair handrails are 30-34 inches above surface		
A handrail is in place on every stairway with at least 4 risers (steps)		
Risers conform to proper height and are uniform		
Standard railings are in place on open sides of exposed stairs		
Building exits are marked & adequate		
Exit routes are not blocked and well illuminated		
Lighting on exit signs conform to government standards (5 foot candles)		

General Work Environment & Personal Protective Equipment		
Noise levels conform to government standards		
Compressed air for cleaning under 30 PSI		
Separate lunch rooms provided when toxic materials are present		
Number of restroom facilities available conforms to federal standards		
Separate restroom facilities provided for men & women		
Personnel trained in first aid & first aid kits are available		
Personal protective equipment provided & used		
Proper respirators & masks used when necessary		

OSHA Postings & Records		
OSHA poster is properly displayed		
Capacity signs posted through-out the building		



Baxmeyer Construction, Inc.



Safety Violation Notice

Employee Name: _____

Department: _____ Violation Date: ____ / ____ / ____

A safety and health survey of your operation has revealed non-compliance of certain safety rules, procedures, programs, and/or local, state, or federal regulations. As a condition of the company's safety policy, you are required to maintain a safe work environment and to prevent unsafe actions of yourself, co-workers, and/or your employees.

This warning is for your protection and safety. The violation(s) noted and corrective action(s) are indicated below.

Rule Violated	Violation Description	Corrective Action Required*
1)		
2)		
3)		

Corrective Action Required*

- | | |
|--|--|
| 1 = Cease operation until corrective action is complete | 4 = Change procedure/work method |
| 2 = Warn personnel and instruct them on proper safety procedures | 5 = Initiate and complete corrective action (include date) |
| 3 = Provide proper equipment necessary | 6 = Other (specify above) |

Comments: _____

Disciplinary Action Imposed

- Verbal Reprimand along with this notice
- Written Reprimand with a last chance warning
- Suspension from Work Site (from ____ / ____ / ____ until ____ / ____ / ____)
- Termination of Employment Contract

Supervisor: _____ Date: ____ / ____ / ____

Employee: _____ Date: ____ / ____ / ____

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Baxmeyer Construction, Inc.



Substance Abuse Testing Notification Form

To be signed by the employee and returned to the Company

Date: ____ / ____ / ____ Employee Name: _____

Test Date: ____ / ____ / ____ Test Time: _____ am / pm

Testing Location: _____

- Test Reason:
- Pre-Employment
 - Post-Vehicle Accident
 - Post-Incident
 - Random
 - Reasonable Suspicion
 - Routine Fitness for Duty
 - Other: _____

Testing Authority: *(check all that apply)*

- DOT Drug (Urine Specimen)
- Non-DOT Drug (Urine Specimen)
- Non-Observed
- DOT Breath Alcohol
- Non-DOT Breath Alcohol
- Observed

I acknowledge that on/at the date and time noted below I have been notified by my employer that I am required to submit to a drug and/or alcohol test on/at the date and time above.

If I do not submit to this request, I will be considered to be in violation of the Substance Abuse Policy, will be reclassified to a non-compliant status and will be subject to the reinstatement requirements as defined in this policy.

This document will be retained in my confidential testing files along with the final determination of all drug and/or alcohol testing results.

Date Notification Received: ____ / ____ / ____ Time: _____ am / pm

Signature: _____

Employee Information

You are to proceed immediately to the collection site, unless you have a scheduled date/time noted above. Should you fail to arrive within the reasonable amount of time allowed, you will be deemed to have refused the test.

Random Testing: If required, your name has been selected for drug and/or alcohol testing by a computerized program of random selection. Your selection does not imply that the company has a specific cause to suspect you of using alcohol or prohibited drugs; rather, that the Random Testing program is being utilized.

Non-Observed Drug Specimen: You may provide a urine specimen (at least 45 ml) in the privacy of a stall.

Observed Specimen (after previous DOT violation or when instructed by an MRO): You will be asked to provide a urine specimen (at least 45 ml) in view of a person of your same gender. You will be asked to raise clothing above the waist, lower clothing worn below the waist, and turn around so the observer can detect the use of any unauthorized device.

Urine Collections: If you are unable to provide a sufficient quantity of urine, you will be given a waiting period and encouraged to drink liquids during such time. If you are unable to provide a sufficient urine specimen in the allotted time you will need to be evaluated by a licensed physician or the Medical Review Officer (MRO) to determine if there is a valid medical reason for the insufficient urine sample ("shy bladder"). If not, you will be deemed to have refused to provide the required urine specimen. If you refuse to provide the required specimen, adulterate the specimen, substitute the urine of another person, or the test result is positive for prohibited drugs, you will be considered in violation of the Substance Abuse Policy

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Baxmeyer Construction, Inc.

Substance Abuse Policy Acknowledgement Form

To be signed by the employee and returned to the Company

By signing this document, I am acknowledging and agreeing to the following:

- I have received a copy of the Substance Abuse Policy used by this company.
- I have read and understand the Substance Abuse Policy and agree to abide by the policy in all respects.
- I understand that I may not use, store, possess, manufacture, distribute, or be under the influence of illegal substances, or use or be under the influence of alcohol, while performing work for the company.
- I am aware that the failure to abide by any part of this policy will result in disciplinary action, up to and including termination of my employment with the Company.

If I have any questions regarding these procedures, I will consult with my supervisor, manager, and/or company representative as soon as possible.

Print Name: _____ Date: ____ / ____ / ____

Signature: _____

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Safety Specifics

Forms affiliated with your relevant Safety Specifics that have been provided as additional resources, templates, and/or tools for use with your safety program.

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Baxmeyer Construction, Inc.



Confined Space Entry Permit

Permit Date: ____ / ____ / ____ Permit Number: _____

Permit Valid until: Date: ____ / ____ / ____ Time: ____ : ____ am / pm

Entry Supervisor Name: _____

Confined Space Location/Description/ID Number: _____

Purpose of Entry: _____

Communication Procedures (including equipment): _____

Rescue & Emergency Procedures (See phone numbers on Page 2): _____

Hazards of Confined Space:

Hazard	YES	NO	Hazard	YES	NO
Oxygen deficiency			Electrical hazard		
Combustible gas/vapor			Mechanical hazard		
Combustible dust			Engulfment hazard		
Carbon Monoxide			Entrapment hazard		
Hydrogen Sulfide			Thermal hazard		
Toxic gas/vapor			Slip or fall hazard		
Toxic fumes			Other:		
Skin- chemical hazards			Other:		

Special Requirements and/or Equipment:

Special Requirements	YES	NO	Special Equipment	YES	NO
Hot Work Permit Required			Breathing apparatus- respirator		
Lockout/Tagout			Escape harness required		
Lines broken, capped, or blanked			Tripod emergency escape unit		
Purge-flush and vent			Lifelines		
Secure Area-Post and Flag			Lighting (explosive proof/low voltage)		
Ventilation			PPE- goggles, gloves, clothing, etc.		
Other:			Fire Extinguisher		
Other:			Other:		
Other:			Other:		

Confined Space Entry Permit (Continued)

Air Monitoring: ***DO NOT ENTER IF PERMISSIBLE ENTRY LEVELS ARE EXCEEDED***

Substance Monitored	Time Monitored	Permissible Entry Level (PEL)	Monitoring Results					
% of Oxygen	: am / pm	PEL: 19.5% - 23.5%						
% of LEL	: am / pm	PEL: Less than 10%						
Carbon Monoxide	: am / pm	PEL: 35 PPM (8 hr.)						
Hydrogen Sulfide	: am / pm	PEL: 10 PPM (8 hr.)						
Other:	: am / pm	PEL:						
Other:	: am / pm	PEL:						
Other	: am / pm	PEL:						

Person Testing	Instrument Name	Model	Serial Number	Date Last Calibrated

Remarks: _____

Authorized Entrants:

Authorized Attendants:

Supervisor Authorization – All conditions satisfied:

Signature

Telephone Number

Remarks: _____

Emergency Contact Phone Numbers:

Ambulance	Rescue Team
Fire	Other
Safety	Other



Baxmeyer Construction, Inc.



Confined Space Entry & Attendant Log

Permit Information:

Permit Date: ____ / ____ / ____ Permit Number: _____

Confined Space Location/Description/ID Number: _____

Special Instructions for Attendants: _____

Attendant(s):

On Duty Time	Signature	Off Duty Time	Signature
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	

Entrant(s):

Enter Time	Signature	Exit Time	Signature
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	
: am / pm		: am / pm	

Confined Space Entry & Attendant Log (continued)

Duties of Authorized Attendants

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Be aware of possible behavioral effects of hazard exposure in authorized Entrants;
- Continuously maintain an accurate count of authorized Entrants in the permit space and accurately identify who is in the permit space;
- Communicate with authorized Entrants as necessary to monitor Entrant status and to alert Entrants of the need to evacuate space;
- Monitor activities inside and outside the space to determine if it is safe for Entrants to remain in the space and order the authorized Entrant to evaluate the permit space immediately under any of the following conditions;
 - Detection of a prohibited condition;
 - Detection of behavioral effects of hazard exposure in an authorized Entrant;
 - Detection of a situation outside the space that could endanger the authorized Entrants; or
 - If the Attendant cannot effectively and safely perform all of his/her required duties.
- Summon rescue and other emergency services as soon as the Attendant determines the authorized Entrant may need assistance to escape from permit space hazards;
 - Take the following actions when an unauthorized person approach or enter a permit space while entry is underway:
 - Warn the unauthorized person that they must stay away from the permit space.
 - Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and
 - Inform the authorized Entrants and the Entry Supervisor if unauthorized persons have entered the permit space;
- Perform non-entry rescue as specified by the plan.
- Perform no duties that might interfere with the Attendant's primary duty to monitor and protect the authorized Entrants.
- Wear a distinctive color (e.g., orange) vest at all times while performing the duties of an Attendant.



Baxmeyer Construction, Inc.



Crane Pre-Shift Inspection by a Qualified Person

Crane:		Date:	
Inspector:			
Equipment Type:		Equipment Model:	
Manufacturer:		Serial Number:	

Note any deficiencies or other observations that could pose a risk of injury or property damage.

Circle		Item or Function Inspected	Notes
Yes	No	Control mechanisms for maladjustments interfering with proper operation	
Yes	No	Control and drive mechanisms for apparent excessive wear of components and contamination by lubricants, water or other foreign matter	
Yes	No	Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation	
Yes	No	Hydraulic system for proper fluid level	
Yes	No	Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat	
Yes	No	Wire rope reeving for compliance with the manufacturer's specifications	

Wire Rope Category I			
Yes	No	Significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands	
Yes	No	Significant corrosion	
Yes	No	Electric arc damage (from a source other than power lines) or heat damage	
Yes	No	Improperly applied end connections	
Yes	No	Significantly corroded, cracked, bent, or worn end connections (such as from severe service).	

Wire Rope Category II			
Yes	No	Visible broken wires, as follows:	
Yes	No	In running wire ropes: Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope.	
Yes	No	In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters.	
Yes	No	In pendants or standing wire ropes: More than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection	
Yes	No	A diameter reduction of more than 5% from nominal diameter.	

Wire Rope Category III			
Yes	No	In rotation resistant wire rope, core protrusion or other distortion indicating core failure.	
Yes	No	Prior electrical contact with a power line.	
Yes	No	A broken strand.	

Wire Rope Critical Review Items			
Yes	No	The competent person must give particular attention to all of the following:	
Yes	No	Rotation resistant wire rope in use	
Yes	No	Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends.	
Yes	No	Wire rope at flange points, crossover points and repetitive pickup points on drums.	
Yes	No	Wire rope at or near terminal ends.	
Yes	No	Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.	
Yes	No	Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation	
Yes	No	Tires (when in use) for proper inflation and condition	
Yes	No	Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions	
Yes	No	The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup.	
Yes	No	Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view.	
Yes	No	Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling.	
Yes	No	Safety devices and operational aids for proper operation	

Signature of Inspector _____



Baxmeyer Construction, Inc.



Crane Lifting Plan

General			
Project			
Location of Lifting operation			
Contractor carrying out the lifting operation		Date / Time of lifting operation	
		Validity period of lifting operation	

Details of the Load(s)			
Description of the load(s)			
Overall dimensions			
Weight of load(s)	<input type="checkbox"/> KG <input type="checkbox"/> LBS <input type="checkbox"/> Tons	<input type="checkbox"/> Known Weight <input type="checkbox"/> Estimated Weight	
Centre of gravity	<input type="checkbox"/> Obvious <input type="checkbox"/> Estimated <input type="checkbox"/> Determined by drawing		

Details of the Lifting Equipment / Lifting Gears			
Type of lifting equipment			
Maximum SWL as certified on the LM cert		Date of last certification	
Max boob/jib length		Fly jib / offset	
Intended load radius	(distance between the load and the crane)	SWL at this radius	
Type of lifting gears			
Combined weight of the lifting gears	<input type="checkbox"/> KG <input type="checkbox"/> LBS <input type="checkbox"/> Tons	Certification of lifting gears	<input type="checkbox"/> Yes <input type="checkbox"/> No

Personnel Involved in Lifting Operations		
Position	Name	Qualifications/Experience
Site Supervisor		
Lifting Supervisor		
Crane Operator / Lifting Equipment Operator		
Rigger		
Signalman		
Others		

Physical & Environmental Consideration (please include any details in the space provided)		
Ground Conditions	Is the ground made safe (e.g. placing steel plate)? Details:	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Are the outriggers evenly extended? Details:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Obstacles	Are there any overhead obstacles such as power lines? Details:	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Are there nearby buildings or structure, equipment or stacked materials that may obstruct lifting operation from being carried out safely? Details:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Lighting	Is the lighting condition adequate? Details:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Demarcation	Has the zone of operation been barricaded(with warning signs and barriers) to prevent unauthorized access? Details:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Environment	Do not proceed with the lifting operation under the following circumstances: <input type="checkbox"/> Thunderstorm & Lightning strikes in the area. (Ground must be rechecked after a thunderstorm) <input type="checkbox"/> Strong winds that may sway the suspended load <input type="checkbox"/> Other circumstances:	

Sequence / Special Precautions

Blank area for Sequence / Special Precautions.

Sketch of the zone of operation

Blank area for Sketch of the zone of operation.

Applied by: Name _____ Date _____
Signature _____ Time _____

Prepared by: Name _____ Date _____
Signature _____ Time _____

Assessed by: Name _____ Date _____
Signature _____ Time _____

Approved by: Name _____ Date _____
Signature _____ Time _____

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Baxmeyer Construction, Inc.



Crane Pre-Lift Checklist

Is the crane configured in accordance with the lift plan?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has the crane been inspected and the conditions found to be acceptable?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has the rigging equipment been inspected, secured, and found to be in acceptable condition?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the supporting surface stable?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are proper crane mats placed under outrigger floats and at a 90-degree angle to the outrigger cylinders? Are crawler cranes on proper mats?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are outriggers (if applicable) fully extended with tires off the ground?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the crane within 1-degree of level? Has the levelness of the crane been checked with a 4-foot carpenter's level or other acceptable method? (<i>The "target" level in the crane cab can be used for initial leveling but should not be considered reliable for critical lifts</i>)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the exact weight known?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the location of the center of gravity of the load known and the crane hook positioned directly above the center of gravity?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Was the load radius measured exactly? For heavy lifts, has the potential increasing load radius due to deflections in the boom, tire, and/or carrier been considered?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Was the boom length determined exactly?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Was the boom angle determined exactly?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are wind conditions acceptable? <i>If wind speeds are in excess of 30 mph, the lift should not be made; if wind speeds are more than 20 mph., consider postponing the lift.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the rope reeving balance to prevent boom twist?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the rigging capacity acceptable?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the weight of the rigging known?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has the clearance between the boom and the load been considered and is it sufficient?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has the clearance between the boom tip and block been considered and is it sufficient?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the crane operator experienced and qualified?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has a qualified crane signalperson been assigned and method of communication between the crane operator and signalperson been established?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is a person assigned to control the load with the use of a tagline?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the area clear of obstacles (including power lines, pipelines, and unnecessary personnel)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has a pre-lift meeting between the crane operator, signalperson, supervisor, and other affected persons been conducted?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Name of person completing checklist

Signature

Date

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Baxmeyer Construction, Inc.



Fall Protection - Fall Rescue Plan

Project Name: _____ Date of Plan: ____ / ____ / ____

Project Address: _____

Superintendent:

Foreman:

Designated Qualified Person:

Designated Competent Person:

Fall Protection Used on Site

Equipment	Manufacturer	Model #
Full Body Harness		
Shock-Absorbing Lanyard		
Work Positioning Lanyard		
Self-Retracting Lifeline (SRL)		
Restraint Line		
Horizontal Lifeline		
Vertical Lifeline		
Incline Line		
Rope Grab		
Deceleration Device		

Equipment	Manufacturer	Model #
Locking Snap Hooks		
Locking Carabiners		
Controlled Descent / Self-Rescue		
Relief Straps		
Anchorage		
Safety Nets		
Other:		
Other:		
Other:		
Other:		

Communication

What communication systems will be used between the suspended worker and supervisor / rescue team?

- Direct voice Mobile Phone Two-way Radio
 Whistle Other: _____

Emergency Contact

In the event of a fall from height, the supervisor will immediately alert the Rescue Team and First Aid Attendant(s). If the rescue team cannot affect a rescue within 5 minutes, call 9-1-1 at once.

Rescue Team Members:

First Aid Attendant(s):

Rescuer Safety

Rescuers are trained and competent to use of rescue equipment Yes No

Rescue training records are current Yes No

Sufficient number of rescuers is available Yes No

Rescue equipment is appropriate for nature of work Yes No

Obstructions in the way of reaching the suspended worker (Detail):

Reaching the Suspended Worker

- Rescue ladder Pull up through floor/roof Elevator
- Aerial equipment from the ground Pull in through window/balcony Crane man basket
- Climb/Repel down structure Keys to building & roof Remote rescue kit
- Suspended access equipment

Equipment needed to ensure rescue within 5 minutes to minimize suspension trauma

- Rescue ladder Rescue kit – Haul-up Descent rescue kit
- Aerial truck Elevated work platform Crane man basket
- Rescue kit - Winch Low height rescue kit Stretcher
- Suspended access equipment Climbing/Rope rescue system First aid kit

If Suspended Worker is injured

Injured suspended worker can be rescued within 5 minutes Yes No

Qualified first aid respondent who understands suspension trauma present Yes No

Proximity to emergency care services has been taken into consideration Yes No

Proximity to a hospital services has been taken into consideration Yes No

Who will alert emergency services and the hospital? (Detail):

Protecting others during rescue

- Set up protective cones/barriers Assign someone to direct traffic Close the road/site
- Other:

Protection of accident scene

- Prevent further injury or damage Set up barriers Preserve wreckage
- Take photographs Notify Safety Department Notify Employer

Who will conduct the Incident Investigation? (Detail):

Who will quarantine all involved fall-arrest equipment further investigation? (Detail):

Other Considerations

Unusual features of building / structure (Detail):

Expected weather conditions (Detail):

Language barriers (agency / contract staff) (Detail):

Approval of Fall Rescue Plan

Print Name: _____ Date: ____/____/____

Signature: _____ Phone: _____

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Hazard & Risk Assessment Form

Certificate of Hazard Assessment Statement for:

Individual Tasks	Risk Level per Matrix	Hazards Associated with Task	Procedures & Engineering and/or Administrative Controls	Appropriate PPE for Task

Hazard & Risk Assessment Form (cont'd)

												I certify that a worksite Hazard & Risk Assessment was performed for the Jobsite listed above	Signature of Safety Manager	Printed name of Safety Manager	Date



Hazard & Risk Assessment - Job Safety Analysis Form

Location/Dept:		Date:	<input type="checkbox"/> New <input type="checkbox"/> Revision JSA NO:	
Task:				
Supervisor:				
Analysis By:				
Reviewed By:				
Approved By:				
Team Members:				
Specific rules and procedures to be followed:				
Sequence of Basic Job Steps		Potential Injury or Hazards	Recommendations to Eliminate or Reduce Potential Hazards	
Check Items Required to do this Job				
<input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Leather Gloves	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Fire Extinguisher	<input type="checkbox"/> Atmospheric Testing
<input type="checkbox"/> Hart Hats	<input type="checkbox"/> Work Vest	<input type="checkbox"/> Goggles (Type?)	<input type="checkbox"/> Lockout/Tagout	<input type="checkbox"/> Traffic Controls
<input type="checkbox"/> Safety Shoes	<input type="checkbox"/> Fall Harness	<input type="checkbox"/> Flame Resistant Clothing	<input type="checkbox"/> Warning Signs	<input type="checkbox"/> Other

Instructions for Completing the Hazard & Risk Assessment - Job Safety Analysis Form

Select an employee to help you with the JSA: someone who is experienced in the job, willing to help and a good communicator. The employees play an important role in helping you identify job steps and hazards. In summary, to complete this form you shall consider the purpose of the job, the activities it involves, and the hazards it presents. In addition, observing an employee performing the job, or “walking through” the operation step by step may give additional insight into potential hazards. Here’s how to do each of the three parts of a Job Safety Analysis:

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE
<p>Examining a specific job by breaking it down into a series of steps or tasks, will enable you to discover potential hazards employees may encounter.</p> <p>Each job or operation will consist of a set of steps or tasks. For example, the job might be to move a box from a conveyor in the receiving area to a shelf in the storage area. To determine where a step begins or ends, look for a change of activity, change in direction or movement.</p> <p>Picking up the box from the conveyor and placing it on a hand truck is one step. The next step might be to push the loaded hand truck to the storage area (a change in activity). Moving the boxes from the truck and placing them on the shelf is another step. The final step might be returning the hand truck to the receiving area.</p> <p>Be sure to list all the steps needed to perform the job. Some steps may not be performed each time; an example could be checking the casters on the hand truck. However, if that step is generally part of the job it shall be listed.</p>	<p>A hazard is a potential danger. The purpose of the Job Safety Analysis is to identify ALL hazards – both those produced by the environment or conditions and those connected with the job procedure. To identify hazards, ask yourself these questions about each step:</p> <p>Is there a danger of the employee striking against, being struck by, or otherwise making injurious contact with an object?</p> <p>Can the employee be caught in, by or between objects? Is there a potential for slipping, tripping, or falling?</p> <p>Could the employee suffer strains from pushing, pulling, lifting, bending, or twisting?</p> <p>Is the environment hazardous to safety and/or health (toxic gas, vapour, mist, fumes, dust, heat, or radiation)?</p> <p>Close observation and knowledge of the job is important. Examine each step carefully to find and identify hazards – the actions, conditions, and possibilities that could lead to an accident. Compiling an accurate and complete list of potential hazards will allow you to develop the recommended safe job procedures needed to prevent accidents.</p>	<p>Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the hazards that could lead to an accident, injury or occupational illness.</p> <p>Begin by trying to: (1) engineer the hazard out; (2) provide guards, safety devices, etc.; (3) provide personal protective equipment; (4) provide job instruction training; (5) maintain good housekeeping; (6) ensure good ergonomics (positioning the person in relation to the machine or other elements).</p> <p>List the required or recommended personal protective equipment necessary to perform each step of the job.</p> <p>Give a recommended action or procedure for each hazard.</p> <p>Serious hazards shall be corrected immediately. The JSA shall then be changed to reflect the new conditions.</p> <p>Finally, review your input on all three columns for accuracy and completeness with affected employees. Determine if the recommended actions or procedures have been put in place. Re-evaluate the job safety analysis as necessary.</p>



Baxmeyer Construction, Inc.



Hearing Conservation Follow-Up Training Record

Manager or Supervisor: _____

The employee listed below recently was found to have a confirmed significant shift in the hearing threshold (as defined by OSHA). An investigation and additional training is required. When this form is completed and reviewed with the employee, please file in the office.

Employee Name: _____
Print or type First MI Last

Social Security Number or Employee Number / /
Reported Date

Job Category: _____
(Current Assignment)

The Potential for noise exposure and specific requirements for using hearing protection in their area shall be reviewed with this employee within 2 weeks. If hearing protection requirements have not been established in this work area, it must be done as soon as possible.

The retraining for this employee shall include:

- The temporary and permanent effects of noise on hearing
- Established hearing protection requirements
- Any questions the employee may have on the use of hearing protection
- The proper use of hearing protection
- Comments the employee has on potential off-the-job noise exposure

Comments on discussion held: _____

As the Manager or Supervisor, I have discussed the above items with the employee named above:

Signature: _____ Date: _____ / _____ / _____

Print Name: _____

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Baxmeyer Construction, Inc.



Personal Protective Equipment Hazard Assessment

Company: _____

Location: _____ Date: ___ / ___ / ___

Observe the layout of the work area, operations being performed and any hazards present. This form aligns the body part that could potentially be exposed to a hazard and it is addressed by putting a check mark in either the yes or no box.

Head Hazards

Description of hazards:

Tasks that can cause head hazards include, but are not limited to, working below other workers who use tools and materials which could fall, working on energized electrical equipment, welding, working with chemicals and working under machinery or processes which might cause materials or objects to fall.

- Dust/Flying Debris Yes No _____
- Chemical Exposure Yes No _____
- Electrical Shock Yes No _____
- Impact Yes No _____
- UV/IR Radiation Yes No _____
- Low Clearance Yes No _____
- Other: _____ Yes No _____

Eye and Face Hazards

Description of hazards:

Tasks that can cause eye or face hazards include, but are not limited to, working with chemicals, chipping, grinding, furnace operations, sanding, welding, UV radiation and woodworking.

- Dust/Flying Debris Yes No _____
- Chemical Exposure Yes No _____
- High Heat / Cold Yes No _____
- Impact Yes No _____
- UV/IR Radiation Yes No _____
- Other: _____ Yes No _____

Hearing Hazards

Description of hazards:

Tasks that can cause hearing hazards include, but are not limited to, working with or around loud machinery or tools in mechanical rooms, machining, grinding, sanding, pneumatic equipment, grounds equipment, generators, chillers, motors, saws, jackhammers or similar equipment.

- Loud Noise Yes No _____
- Impact Noise Yes No _____
- Other: _____ Yes No _____

Personal Protective Equipment Assessment – Page 2 of 3

Respiratory Hazards

Description of hazards:

Tasks that are associated with respiratory hazards include, but are not limited to, welding, grinding spray painting, working in confined spaces, chemical processing and potential exposure to asbestos, lead, silica or other particulate hazards. Exposures to these and other respiratory hazards can make you sick or can be deadly. These hazards come in the form of gases, vapors, dusts, mists, fumes, smoke, sprays and fog.

Chemical Exposure – Gases

- or Vapors Yes No _____
- Dust or Particulate Yes No _____
- Fumes Yes No _____
- Oxygen Deficiency Yes No _____
- Other: _____ Yes No _____

Hand and/or Arm Hazards

Description of hazards:

Tasks that can cause hand hazards include, but are not limited to, exposure to cut or abrasion hazards, working with chemicals, working with very hot or cold objects or materials and exposure to sharps.

- Chemical Exposure Yes No _____
- Cuts/Abrasion Yes No _____
- Puncture Yes No _____
- High Heat/Cold Yes No _____
- UV/IR Radiation Yes No _____
- Electrical Shock Yes No _____
- Other: _____ Yes No _____

Foot and/or Leg Hazards

Description of hazards:

Tasks that can cause foot hazards include, but are not limited to, carrying or handling materials that could be dropped, performing manual material handling, welding, cutting, electrical work and working with chemicals.

- Chemical Exposure Yes No _____
- Compression Yes No _____
- Impact Yes No _____
- Puncture Yes No _____
- Electrical Shock Yes No _____
- Slippery/Wet Surfaces Yes No _____
- High Heat/Cold Yes No _____
- Molten Metal Yes No _____
- Other: _____ Yes No _____

Personal Protective Equipment Assessment – Page 3 of 3

Other Hazards Requiring PPE

Description of hazards:

Do hazards exist that require PPE for the Body? Chemical exposure, abrasive blasting, welding, cutting or brazing, chipping, sanding or grinding, electrical arc hazards and bloodborne pathogens are some examples of hazards that can affect the body. These hazards may require PPE to protect clothing and skin from harm or contamination.

Chemical Exposure	<input type="checkbox"/> Yes	<input type="checkbox"/> No	_____
High Heat/Cold	<input type="checkbox"/> Yes	<input type="checkbox"/> No	_____
Hazardous Particulate ie:			
Asbestos/Lead/etc.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	_____
Non-Hazardous Particulate	<input type="checkbox"/> Yes	<input type="checkbox"/> No	_____
Electrical Arc	<input type="checkbox"/> Yes	<input type="checkbox"/> No	_____
Cuts/Abrasions	<input type="checkbox"/> Yes	<input type="checkbox"/> No	_____
Other: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	_____

I certify that on the date noted on page one (1) of this form, a comprehensive assessment of workplace hazards requiring the use of Personal Protective Equipment was conducted at this facility to the best of my knowledge, and based on the current conditions.

Signature: _____ Date: ____ / ____ / ____

Print Name: _____ Title: _____

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Baxmeyer Construction, Inc.



Respiratory Protection Medical Evaluation Questionnaire

Part A Section 1. (Mandatory)

Must be provided by every employee who has been selected to use any type of respirator (please print)

Today's Date: _____ / _____ / _____ Your Name: _____

Age: _____ Sex: Male Female Height: _____ ft. _____ in. Weight: _____ lbs.

Your Job Title _____

Phone number where you can be reached by the health care official who will review this questionnaire () _____ - _____

The best time to reach you at this number Morning Afternoon Evening Night

Has your employer told you how to contact the health care official who will review this questionnaire? Yes No

Check the type of respirator you will use (you can mark more than one category):

- N, R, or P disposable respirator (filter-mask, non-cartridge type only).
- Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

Have you worn a respirator before? No Yes – What type(s): _____

Part A Section 2. (Mandatory)

1. Questions 1-9 must be answered by every employee who has been selected to use any type of respirator (please mark Yes or No) Do you currently smoke tobacco, or have you smoked tobacco in the last month?	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Have you ever had any of the following conditions?	
a. Seizures	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Diabetes (sugar disease)	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Allergic reactions that interfere with your breathing	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Claustrophobia (fear of closed-in places)	<input type="checkbox"/> Yes <input type="checkbox"/> No
e. Trouble smelling odors	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Have you ever had any of the following pulmonary or lung problems?	
a. Asbestosis	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Asthma	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Chronic bronchitis	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Emphysema	<input type="checkbox"/> Yes <input type="checkbox"/> No
e. Pneumonia	<input type="checkbox"/> Yes <input type="checkbox"/> No
f. Tuberculosis	<input type="checkbox"/> Yes <input type="checkbox"/> No

g. Silicosis	<input type="checkbox"/> Yes <input type="checkbox"/> No
h. Pneumothorax (collapsed lung)	<input type="checkbox"/> Yes <input type="checkbox"/> No
i. Lung cancer	<input type="checkbox"/> Yes <input type="checkbox"/> No
j. Broken ribs	<input type="checkbox"/> Yes <input type="checkbox"/> No
k. Any chest injuries or surgeries	<input type="checkbox"/> Yes <input type="checkbox"/> No
l. Any other lung problem that you've been told about	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. Do you currently have any of the following symptoms of pulmonary or lung illness?	
a. Shortness of breath	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Shortness of breath when walking with other people at an ordinary pace on level ground	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Have to stop for breath when walking at your own pace on level ground	<input type="checkbox"/> Yes <input type="checkbox"/> No
e. Shortness of breath when washing or dressing yourself	<input type="checkbox"/> Yes <input type="checkbox"/> No
f. Shortness of breath that interferes with your job	<input type="checkbox"/> Yes <input type="checkbox"/> No
g. Coughing that produces phlegm (thick sputum)	<input type="checkbox"/> Yes <input type="checkbox"/> No
h. Coughing that wakes you early in the morning	<input type="checkbox"/> Yes <input type="checkbox"/> No
i. Coughing that occurs mostly when you are lying down	<input type="checkbox"/> Yes <input type="checkbox"/> No
j. Coughing up blood in the last month	<input type="checkbox"/> Yes <input type="checkbox"/> No
k. Wheezing	<input type="checkbox"/> Yes <input type="checkbox"/> No
l. Wheezing that interferes with your job	<input type="checkbox"/> Yes <input type="checkbox"/> No
m. Chest pain when you breathe deeply	<input type="checkbox"/> Yes <input type="checkbox"/> No
n. Any other symptoms that you think may be related to lung problems	<input type="checkbox"/> Yes <input type="checkbox"/> No
5. Have you ever had any of the following cardiovascular or heart problems?	
a. Heart attack	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Stroke	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Angina	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Heart failure	<input type="checkbox"/> Yes <input type="checkbox"/> No
e. Swelling in your legs or feet (not caused by walking)	<input type="checkbox"/> Yes <input type="checkbox"/> No
f. Heart arrhythmia (heart beating irregularly)	<input type="checkbox"/> Yes <input type="checkbox"/> No
g. High blood pressure	<input type="checkbox"/> Yes <input type="checkbox"/> No
h. Any other heart problem that you've been told about	<input type="checkbox"/> Yes <input type="checkbox"/> No
6. Have you ever had any of the following cardiovascular or heart symptoms?	
a. Frequent pain or tightness in your chest	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Pain or tightness in your chest during physical activity	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Pain or tightness in your chest that interferes with your job	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. In the past two years, have you noticed your heart skipping or missing a beat	<input type="checkbox"/> Yes <input type="checkbox"/> No
e. Heartburn or indigestion that is not related to eating	<input type="checkbox"/> Yes <input type="checkbox"/> No
f. Any other symptoms that may be related to heart or circulation problems	<input type="checkbox"/> Yes <input type="checkbox"/> No

7. Do you currently take medication for any of the following problems?	
a. Breathing or lung problems	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Heart trouble	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Blood pressure	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Seizures	<input type="checkbox"/> Yes <input type="checkbox"/> No
8. If you've used a respirator, have you ever had any of the following problems? <i>(If you've never used a respirator, check the following space and go to question 9.)</i>	
a. Eye irritation	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Skin allergies or rashes	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Anxiety	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. General weakness or fatigue	<input type="checkbox"/> Yes <input type="checkbox"/> No
e. Any other problem that interferes with your use of a respirator	<input type="checkbox"/> Yes <input type="checkbox"/> No
9. Would you like to talk to the health care professional who will review this questionnaire about any of your answers?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you ever lost vision in either eye (temporarily or permanently)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
11. Do you currently have any of the following vision problems?	
a. Wear contact lenses	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Wear glasses	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Color blind	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Any other eye or vision problem	<input type="checkbox"/> Yes <input type="checkbox"/> No
12. Have you ever had an injury to your ears, including a broken eardrum?	<input type="checkbox"/> Yes <input type="checkbox"/> No
13. Do you currently have any of the following hearing problems?	
a. Difficulty hearing	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Wear a hearing aid	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Any other hearing or ear problem	<input type="checkbox"/> Yes <input type="checkbox"/> No
14. Have you ever had a back injury?	<input type="checkbox"/> Yes <input type="checkbox"/> No
15. Do you currently have any of the following musculoskeletal problems?	
a. Weakness in any of your arms, hands, legs, or feet	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Back pain	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Difficulty fully moving your arms and legs	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Pain and stiffness when you lean forward or backward at the waist	<input type="checkbox"/> Yes <input type="checkbox"/> No
e. Difficulty fully moving your head up or down	<input type="checkbox"/> Yes <input type="checkbox"/> No
f. Difficulty fully moving your head side to side	<input type="checkbox"/> Yes <input type="checkbox"/> No
g. Difficulty bending at your knees	<input type="checkbox"/> Yes <input type="checkbox"/> No
h. Difficulty squatting to the ground	<input type="checkbox"/> Yes <input type="checkbox"/> No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs.	<input type="checkbox"/> Yes <input type="checkbox"/> No
j. Any other muscle or skeletal problem that interferes with using a respirator	<input type="checkbox"/> Yes <input type="checkbox"/> No

Part B Section 1. (Optional)

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire. (please print)

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If "yes," name the chemicals if you know them:		
3. Have you ever worked with any of the materials, or under any of the conditions, listed below:		
a. Asbestos	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. Silica (e.g., in sandblasting)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
c. Tungsten/cobalt (e.g., grinding or welding this material)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
d. Beryllium	<input type="checkbox"/> Yes	<input type="checkbox"/> No
e. Aluminum	<input type="checkbox"/> Yes	<input type="checkbox"/> No
f. Coal (for example, mining)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
g. Iron	<input type="checkbox"/> Yes	<input type="checkbox"/> No
h. Tin	<input type="checkbox"/> Yes	<input type="checkbox"/> No
i. Dusty environments	<input type="checkbox"/> Yes	<input type="checkbox"/> No
j. Any other hazardous exposures	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If "yes," describe these exposures:		
4. List any second jobs or side businesses you have		
5. List your previous occupations:		
6. List your current and previous hobbies		
7. Have you been in the military services?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If "yes," were you exposed to biological or chemical agents (either in training or combat)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
8. Have you ever worked on a hazardous material team?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If "yes," name the medications if you know them		

10. Will you be using any of the following items with your respirator(s)?	
a. High-efficiency purifying air filters	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Canisters (e.g., gas masks)	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Cartridges	<input type="checkbox"/> Yes <input type="checkbox"/> No
11. How often are you expected to use the respirator(s)? Circle "yes" or "no" for all answers that apply to you)	
d. Escape only (no rescue)	<input type="checkbox"/> Yes <input type="checkbox"/> No
e. Emergency rescue only	<input type="checkbox"/> Yes <input type="checkbox"/> No
f. Less than five hours per week	<input type="checkbox"/> Yes <input type="checkbox"/> No
g. Less than two hours per day	<input type="checkbox"/> Yes <input type="checkbox"/> No
h. Two to four hours per day	<input type="checkbox"/> Yes <input type="checkbox"/> No
i. More than four hours per day	<input type="checkbox"/> Yes <input type="checkbox"/> No
12. During the period you are using the respirator(s), is your work effort:	
a. Light (less than 200 kcal per hour) <i>Examples of a light work effort are sitting while writing, typing, drafting or performing light assembly work and standing while operating a drill press (1 to 3 pounds) or controlling machines</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
If "yes," how long does this period last during the average shift? _____ hrs. _____ min.	
b. Moderate (200 to 350 kcal per hour)? <i>Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 pounds) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; and pushing a wheelbarrow with a heavy load (about 100 pounds) on a level surface</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
If "yes," how long does this period last during the average shift? _____ hrs. _____ min.	
c. Heavy (above 350 kcal per hour)? <i>Examples of heavy work are lifting a heavy load (about 50 pounds) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; and climbing stairs with a heavy load (about 50 pounds)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
If "yes," how long does this period last during the average shift? _____ hrs. _____ min.	
13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If "yes," describe this protective clothing and/or equipment	
14. Will you be working under hot conditions (temperature exceeding 77 F)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
15. Will you be working under humid conditions?	<input type="checkbox"/> Yes <input type="checkbox"/> No
16. Describe the work you'll be doing while you're using your respirator(s):	
17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (e.g., confined spaces, life-threatening gases):	

18. Provide the following information, if you know it, for each toxic substance you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance:

Estimated maximum exposure level per shift:

Duration of exposure per shift:

Name of the second toxic substance:

Estimated maximum exposure level per shift:

Duration of exposure per shift:

Name of the third toxic substance:

Estimated maximum exposure level per shift:

Duration of exposure per shift:

The name of any other toxic substances you will be exposed to while using your respirator

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (e.g., rescue, security):

Signature (Mandatory)

I certify that all questions on this Respiratory Medical Evaluation Form have been answered completely and honestly, to the best of my ability.

_____ / _____ / _____
Employee Signature Date

Printed Name



Baxmeyer Construction, Inc.



Respiratory Protection Supplied Air Pre-Job Checklist

Date:	Location:
Unit:	Equipment:
Supervisor:	Crew:
Bottle Watch:	Safety Standby:

Cylinders & Associated Equipment	Yes	No	Hoses and Fittings	Yes	No
Pressure: All bottles, i.e. 6 paks must be changed at 500 psi (SCBAs will be full for rescue or standby work 2000 psi)			Serviceable condition		
			Connected properly		
			No leaks		
Gauges					
Valve and check valve			Face piece and Regulator	Yes	No
Cylinder Valve Cover(s)			Lens is clean		
Alarm			Tear off Lens Present		
Regulator-coupling secured			Face seal (fit check)		
SCBA Frame and Harness Assembly	Yes	No	Head straps		
			Purge valve		
Waist belt			Exhalation valve & diaphragm		
Shoulder straps			Adequate air flow		
Snaps, buckles, clips					

Task Related Checklist	✓
Proper permits at location and displayed	
Hazard analysis completed and displayed	
Safe work and emergency plans understood by all crew members	
Personnel certified to perform supplied air work	
Standby attendant trained and procedures reviewed	
Bottle watch trained and procedures reviewed	
Area barricaded with red tape and tagged "supplied air being used"	
Emergency bypass off	
Damaged equipment tagged and removed from service	
Backup cylinder determined	

Note:

- Cylinders which show evidence of exposure to high heat or impact damage shall be removed from service and retested prior to recharging.
- Do not use tools to open or close the purge valve (finger-tight only).
- Route hose lines in a manner that does not restrict access/egress.
- Make sure your work does not endanger others in your immediate area or downwind.
- Do not remove the face piece if product exposure obstructs your vision. Use tear off lens or wipe it off and move safely out of the hazardous environment.

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Baxmeyer Construction, Inc.



Respiratory Protection Individual Respiratory Fit Test Record

Employee (print): _____ Title: _____

Department: _____ Emp. ID #: _____

Type of Respirator Used: _____ Model #: _____

Conditions that could affect respirator fit:

- | | |
|---|--|
| <input type="checkbox"/> Clean Shaven | <input type="checkbox"/> 2 + Days Beard Growth |
| <input type="checkbox"/> Facial Scar | <input type="checkbox"/> Glasses |
| <input type="checkbox"/> 1-2 Day Beard Growth | <input type="checkbox"/> Moustache |
| <input type="checkbox"/> Dentures Absent | <input type="checkbox"/> None of the Above |

Fit Checks

Negative Pressure: Pass Fail N/A

Positive Pressure: Pass Fail N/A

Qualitative Fit Test:

Bitrex™ Solution Aerosol: Pass Fail N/A

Saccharin Solution: Pass Fail N/A

Acknowledgement:

Employee Signature: _____ Date: ____ / ____ / ____

Test Conducted by (print name): _____ Date: ____ / ____ / ____

Reviewed by (print name): _____ Date: ____ / ____ / ____

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Baxmeyer Construction, Inc.



Silica – Individual Equipment / Task Exposure Control Plan

*Fill out this form ENTIRELY for EACH Job / Task that may be affected by and/or create Respirable Silica
Plan should be reviewed frequently / regularly by a designated Competent Person*

Project Name: _____ Project Number: _____

New Plan Review of Existing Plans Date: ____ / ____ / ____ Time: ____ : ____ AM / PM

Source of respirable silica: _____

Equipment / Task Number from OSHA Standard Table 1 _____ ** OR ** Description of job / task:

ALL personnel on the task or working in affected area are trained in Silica Exposure? Yes No

Description of control method(s) used to protect worker(s) from exposure:

Engineering / Work Practice Controls OSHA Standard Table 1 or Other

Respiratory Protection Controls OSHA Standard Table 1 or Other

Other Personal Protective Equipment (PPE) required:

Housekeeping Method(s) used to control exposure:

Method(s) to restrict access to affected area:

Competent Person Completing Plan:

PRINT SIGNED _____ / ____ / ____
DATE

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Baxmeyer Construction, Inc.



Silica – Inspection of Exposure Control Plan

Complete inspection prior to beginning job / task, and then periodically during the job / task

Engineering / Work Practice Controls		Problem noted (DETAIL)	Problem corrected (DETAIL)
Available at site	<input type="checkbox"/> Y <input type="checkbox"/> N		
Operating correctly / appropriately	<input type="checkbox"/> Y <input type="checkbox"/> N		
Effective in dust control	<input type="checkbox"/> Y <input type="checkbox"/> N		
Respiratory & Other Required PPE			
Available at site	<input type="checkbox"/> Y <input type="checkbox"/> N		
Used appropriately	<input type="checkbox"/> Y <input type="checkbox"/> N		
In place before work starts	<input type="checkbox"/> Y <input type="checkbox"/> N		
Housekeeping			
Vacuum used properly	<input type="checkbox"/> Y <input type="checkbox"/> N		
Large pieces picked up	<input type="checkbox"/> Y <input type="checkbox"/> N		
Pre-filters in place	<input type="checkbox"/> Y <input type="checkbox"/> N		
Vacuum attachments used	<input type="checkbox"/> Y <input type="checkbox"/> N		
Collection bags in place	<input type="checkbox"/> Y <input type="checkbox"/> N		
Waste properly disposed of	<input type="checkbox"/> Y <input type="checkbox"/> N		
Access Restricted			
Access to exposure adequately restricted	<input type="checkbox"/> Y <input type="checkbox"/> N		
Other			

Competent Person Completing Inspection:

_____ / _____ / _____
 PRINT SIGNED DATE

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Baxmeyer Construction, Inc.



Silica – Multiple Equipment / Task Exposure Control Plan

Fill out this form ENTIRELY for projects containing MULTIPLE Jobs / Tasks that may be affected by and/or create Respirable Silica (include a copy of OSHA Standard Table 1 for reference)

Plan should be reviewed frequently / regularly by a designated Competent Person

Project Name: _____ Project Number: _____

New Plan Review of Existing Plans Date: ____ / ____ / ____ Time: ____ : ____ AM / PM

Project Manager: _____ Superintendent: _____

Supervisor: _____ Competent Person: _____

Scope of Work: _____

Project Start Date: ____ / ____ / ____ Estimated End Date: ____ / ____ / ____

ALL personnel on the task or working in affected area are trained in Silica Exposure? Yes No

Jobs / Tasks Being Conducted and Controls to be taken:

OSHA Standard Table 1 Equipment/Task Number **OR** Task Description	Exposure Control Method(s) Description (Use Chart A below for Codes to be used, separated by commas)				
	Engineering / Work Practice	Respiratory	Housekeeping	Other PPE	Access Restriction
# _____ ** OR ** Description:	<input type="checkbox"/> OSHA Table 1 **OR** Description	<input type="checkbox"/> OSHA Table 1 **OR** Description	Description	Description)	Description)
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			

Jobs / Tasks Being Conducted and Controls to be taken (cont'd):

OSHA Standard Table 1 Equipment/Task Number **OR** Task Description	Exposure Control Methods (Use Chart A for Codes to be used, separated by commas)				
	Engineering / Work Practice	Respiratory	Housekeeping	Other PPE	Access Restriction
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			
# _____ ** OR **	<input type="checkbox"/> Table 1 **OR**	<input type="checkbox"/> Table 1 **OR**			

Chart A – Exposure Control Method Codes (Add control methods used that are not listed)									
Engineering controls		Respiratory Protection		Housekeeping		Other PPE		Access Restriction	
E1	Exhaust fan	R1	None	H1	Wet sweeping	P1	Gloves	A1	Signage
E2	LEV	R2	APF 5	H2	Floor sweep compounds	P2	Coveralls	A2	Barriers
E3	Dust Shroud(s)	R3	APF 10	H3	Filtered vacuuming	P3	Eye Protection	A3	Work Schedules
E4	Water Spray	R4	APF 25	H4	Disposal bags	P4	Rubber Boots	A4	
E5	Integrated Water Delivery System	R5	APF 50	H5		P5		A5	
E6	Disposable PPE	R6	APF 1,000	H6		P6		A6	
E7		R7		H7		P7		A7	
E8		R8		H8		P8		A8	

Competent Person Completing Plan:

_____ / _____ / _____
 PRINT SIGNED DATE



Baxmeyer Construction, Inc.



Welding, Cutting & Hot Work Inspection Checklists

WELDING

- Are only authorized and trained personnel permitted to use welding, cutting or brazing equipment? 29 CFR 1910.252(a)(2)(xiii)(C)
- Does each operator have a copy of the appropriate operating instructions and are they directed to follow them? 29 CFR 1910.253(a)(4), (d)(6), (f)(7)(A)
- Are pressure-reducing regulators used only for the gas and pressures for which they are intended? 29 CFR 1910.253(e)(6)(i)
- Is grounding of the machine frame and safety ground connections of portable machines checked periodically? 29 CFR 1910.254(d)(3); 255(b)(9), (c)(6); 29 CFR 1926.351(c)(4)
- Are only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used? 29 CFR 1910.253(a)(3)
- Is a check made for adequate ventilation in and where welding or cutting is performed? 29 CFR 1910.252(c)(1)(iii), (2)(i); 29 CFR 1926.353
- When working in confined places, are environmental monitoring tests taken and means provided for quick removal of welders in case of an emergency? 29 CFR 1910.252(c)(4); 29 CFR 1926.353(b)(3)

WELDING EQUIPMENT

- Is necessary personal protective equipment available? 29 CFR 1910.252(b)(2); 29 CFR 1926.353
- Are only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used? 29 CFR 1910.253(a)(3)
- Is open circuit (No Load) voltage of arc welding and cutting machines as low as possible and not in excess of the recommended limits? 29 CFR 1910.254(b)(3)(i)-(iv)
- Is grounding of the welding machine frame and safety ground connections of portable machines checked periodically? 29 CFR 1910.254(d)(3); .255(b)(9), (c)(6)

EQUIPMENT MARKINGS

- Is red used to identify acetylene (and other fuel-gas) hose, green for oxygen hose, and black for inert gas and air hose? 29 CFR 1910.253(e)(5)(i)
- Are empty compressed gas cylinders appropriately marked and their valves closed? 29 CFR 1910.101(b); .253(b)(1)(ii), (2)(iii), (5)(ii)(H); 29 CFR 1926.350(a)(8)

COMPRESSED GAS CYLINDER MANAGEMENT

- Are compressed gas cylinders regularly examined for obvious signs of defects, deep rusting, or leakage? 29 CFR 1910.254(d)(4); 255(e); 29 CFR 1926.350(c)(3)
- Is care used in handling and storage of cylinders, safety valves, relief valves, etc., to prevent damage? 29 CFR 1910.253 (b)(2)(ii), (5)(iii)(B); 29 CFR 1926.350
- Are liquefied gases stored and shipped valve-end up with valve covers in place? 29 CFR 1910.253(b)(5)(iii)(A); 29 CFR 1926.350
- Before a regulator is removed, is the valve closed and gas released from the regulator? 29 CFR 1910.253(b)(5)(iii)(D); 29 CFR 1926.350

- Are cylinders, cylinder valves, couplings, regulators, hoses, and apparatus kept free of oily or greasy substances? 29 CFR 1910.253(b)(5)(i)
- Are the cylinders kept away from elevators, stairs, or gangways? 29 CFR 1910.253(b)(2)(ii); 29 CFR 1926.350(a)(11)
- Is it prohibited to use cylinders as rollers or supports? 29 CFR 1910.253(b)(5)(ii)(K); (29 CFR 1926.350(c)(1))
- Is care taken not to drop or strike cylinders? 29 CFR 1910.253(b)(5)(ii)(B); 29 CFR 1926.350(a)(3)
- Unless secured on special trucks, are regulators removed and valve-protection caps put in place before moving cylinders? 29 CFR 1910.253(b)(5)(ii)(D); 29 CFR 1926.350(a)(6)
- Do cylinders without fixed hand wheels have keys, handles, or non-adjustable wrenches on stem valves when in service? 29 CFR 1910.253(b)(5)(ii)(E)
- Are empty compressed gas cylinders appropriately marked and their valves closed? 29 CFR 1910.253(b)(1)(ii), (2)(iii), (5)(ii)(H); 29 CFR 1926.350(a)(8)
- Are fuel gas cylinders and oxygen cylinders separated by distance, fire resistant barriers, etc., while in storage? 29 CFR 1910.253(b)(4)(iii); 29 CFR 1926.350(a)(10)

PERSONAL PROTECTIVE EQUIPMENT

- Are all employees required to use personal protective equipment (PPE) as needed? 29 CFR 1910.132(a); 29 CFR 1926.95(a)
- Is PPE functional and in good repair? Does it have ANSI or ASTM specifications marked on it? 29 CFR 1910.132(e); 29 CFR 1926.95(a)
- Are employees exposed to the hazards created by welding, cutting, or brazing operations protected with personal protective equipment and clothing? 29 CFR 1910.252(b)(3); 29 CFR 1926.353
- Is personal protective equipment provided and are all employees required to use PPE as needed to protect against eye and face injury? 29 CFR 1910.132(a); .133(a)(1); 29 CFR 1926.353(e)(2); 29 CFR 1926.353
- Are protective goggles or face shields provided and worn where there is any danger of flying particles or corrosive materials? 29 CFR 1910.133(a)(1); 29 CFR 1926.102
- Are approved safety glasses required to be worn at all times in areas where there is a risk of eye injuries such as punctures, abrasions, contusions, or burns? 29 CFR 1910.133(a)(2); 29 CFR 1926.102
- Are appropriate safety glasses, face shields, etc., used while using hand tools or equipment which might produce flying materials or be subject to breakage? 29 CFR 1910.133(a)(1); 29 CFR 1926.102
- Are employees who need corrective lenses (glasses or contacts) in working environments having harmful exposures required to wear only approved safety glasses, protective goggles, or use other medically approved precautionary procedures? 29 CFR 1910.133(a)(3); 29 CFR 1926.102
- Is appropriate foot protection required where there is the risk of foot injury? 29 CFR 1910.132(a); .136(a)
- Is appropriate hand protection required where there is the risk of hand injury? 29 CFR 1910.132(a); .138(a)
- Are hard hats provided and worn where danger of falling objects exists? 29 CFR 1910.135(a)(1)
- Are hard hats inspected periodically for damage to the shell and suspension system? 29 CFR 1910.135(b)

AIR EMISSIONS

- If welding creates hazardous air emissions, is the welding area appropriately marked to indicate this? 29 CFR 1910.252(c)(iv)(A)-(C); 29 CFR 1926.353
- If welding creates hazardous air emissions, have ventilation or local exhaust systems been provided to keep fumes below the maximum allowable concentrations? 29 CFR 1910.252(c)(iii); 29 CFR 1926.353

FIRE PREVENTION

- Are precautions taken to prevent the mixture of air or oxygen with flammable gases, except at a burner or in a standard torch? 29 CFR 1910.253(a)(1)
- Are signs reading DANGER NO SMOKING, MATCHES, OR OPEN LIGHTS or the equivalent, posted in welding areas?
- Are provisions made to never crack a fuel-gas cylinder valve near sources of ignition? 29 CFR 1910.253(b)(5)(iii)(C); 29 CFR 1926.352(c); 29 CFR 1926.352(h)
- When welding is done on walls, are precautions taken to protect combustibles on the other side? 29 CFR 1910.252(a)(2)(x); 29 CFR 1926.352(f)
- Before hot work is begun, are used drums, barrels, tanks, and other containers so thoroughly cleaned that no substances remain that could explode, ignite, or produce toxic vapors? 29 CFR 1910.252(a)(3)(i); 29 CFR 1926.352(i)
- If welding gases are stored, are oxygen and acetylene separated by a 5-foot noncombustible barrier? 29 CFR 1910.253(b)(4)(i)-(iii); 29 CFR 1926.350(a)(10)
- Are compressed gas cylinders kept away from sources of heat? 29 CFR 1910.253(b)(2)(i)
- Is combustible scrap, debris, and waste stored safely and removed from the work site promptly? 29 CFR 1910.252 (a)(2)(i), (vii), (xiv)(C)(2)
- Are fire watchers assigned when welding or cutting is performed in locations where a serious fire might develop? 29 CFR 1910.252(a)(2)(iii)(A); 29 CFR 1926.352(e)
- Are provisions made for personnel to perform fire watch duties under appropriate circumstances? 29 CFR 1910.252(d)(4)(iv); 29 CFR 1926.352(e)

FIRE ALARM SYSTEMS

- If you have a non-supervised fire alarm system, is it tested bimonthly? 29 CFR 1910.165(d)(2)
- If you have a supervised employee alarm system (that is, does the alarm have a device that indicates system malfunction), is it tested yearly? 29 CFR 1910.165(d)(4)

PORTABLE FIRE EXTINGUISHERS

- Are appropriate fire extinguishers mounted, located, and identified so that they are readily accessible to employees? 29 CFR 1910.157(c)(1); 29 CFR 1926.352(d)
- Are all fire extinguishers inspected and recharged regularly, and noted on the inspection tag? 29 CFR 1910.157(e)
- Are portable fire extinguishers provided in adequate number and type? 29 CFR 1910.157(d)

AISLES

- Are aisles marked? 29 CFR 1910.22(b)(2)
- Are aisle widths maintained? 29 CFR 1910.22(b)(1)
- Are aisles in good condition? 29 CFR 1910.22(b)(1)
- Are aisles and passageways properly illuminated? 29 CFR 1910.22
- Are aisles kept clean and free of obstructions? 29 CFR 1910.22(b)(1)

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Baxmeyer Construction, Inc.



Welding, Cutting & Hot Work Permit

This Hot Work permit is required for any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: Brazing, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing and Welding.

Instructions:

1. Verify precautions listed below or do not proceed with work.
2. Complete this permit and issue to person(s) performing the work.
3. Retain this copy in the project file.

Name of Company		
/ /	: AM PM	: AM PM
Date Time Issued Permit Expires:		
Location/Building & Floor (Be SPECIFIC)		
Name of Hot Work Permit Authorizing Individual (PAI): I verify that the hot work location has been examined and the precautions checked on the Precautions Checklist to minimize the chance of fire.		
Name		
Signature		
Name of Person(s) Performing Hot Work:		
Description of Work Being Performed:		
Person(s) Performing Fire Watch:		
Other Information:		

Y N/A

Security has been contacted to ensure that sprinklers are not impaired.

Requirement within 35 ft. (11 m.) of work

- Flammable liquids, combustible dust, and oily deposits removed.
- Explosive atmosphere in area eliminated.
- Floors swept clean.
- Combustible building construction covered with fire-resistive covering.
- Remove other combustible materials where possible. Otherwise protect them with fire-resistive covering.
- All wall, floor, and machinery openings covered.
- Fire-resistive tarpaulins suspended beneath work.
- Electrical cable trays and switch gear protected with fire-resistive tarpaulins or metal shields.
- Ducts and conveyors, systems cleaned, protected and/or shut off.

Work on walls or ceilings

- Construction is noncombustible and without combustible covering or insulation.
- Combustibles on other side of walls moved away or a fire watch provided on the opposite side of the wall from the work.

Work on enclosed equipment

- Enclosed equipment cleaned of all combustibles.
- Container purged of flammable liquids/vapors.
- Pressurized vessels, piping, and equipment removed from service, isolated and verified.

Fire Watch / Hot Work area monitoring

- Fire watch will be provided during and for 60 minutes after hot work is completed on torch applied roofs.
- The hot work area will be periodically inspected during the 3 hours after the fire watch leaves the high hazard area as designated by the PAI.
- Proper class of extinguisher must be within 10 feet.
- Fire watch is trained in their duties.
- Fire watch is required for adjoining area above and below.

Other precautions taken:

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Supplemental Safety Program Forms

Forms affiliated with your Supplemental Safety Programs that have been provided as additional resources, templates, and/or tools for use with your safety program.

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Baxmeyer Construction, Inc.



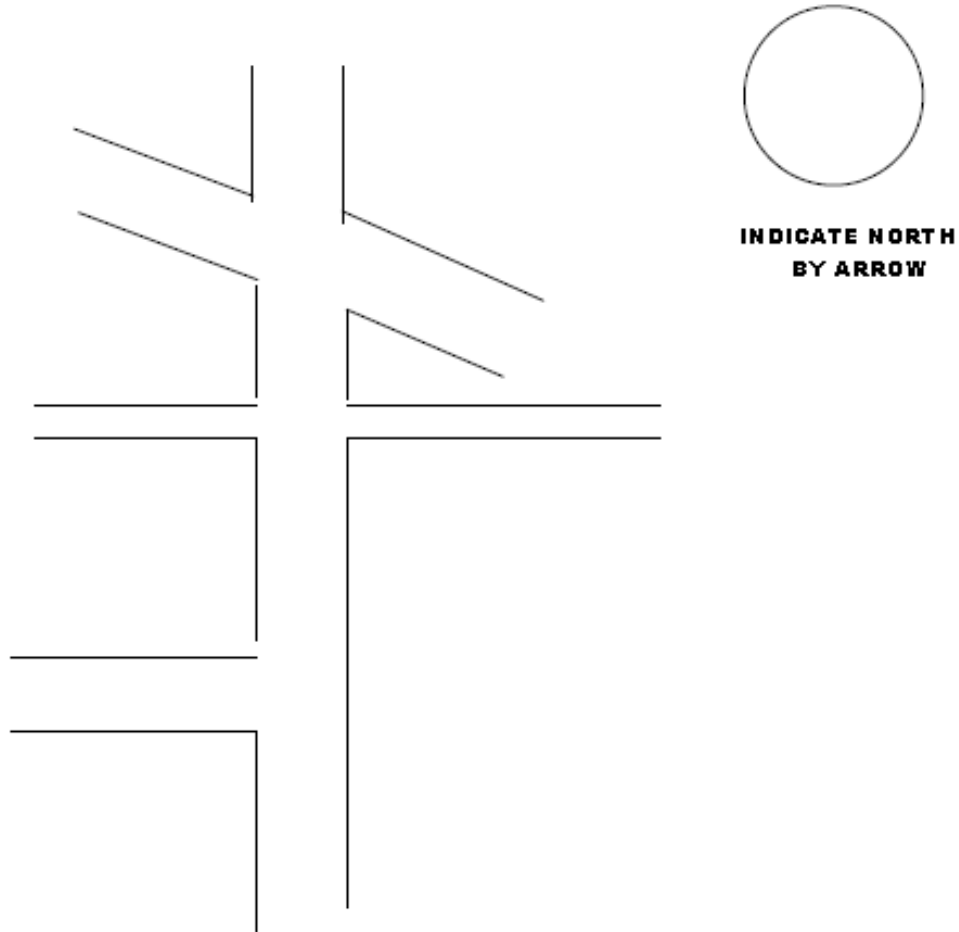
Vehicle & Driving – Accident Check List & Forms

At the time of the accident

1. Stop immediately! Offer assistance. Give first aid to the injured.
2. Call ambulance if anyone appears to be injured.
3. Make no admission of fault.
4. Be courteous. Do not argue.
5. Telephone or radio your supervisor. If another employee is with you, ask them to do it.
6. Call police to investigate and advise them of facts only. Do not admit you were guilty of any law violation.
7. Do not move vehicle unless necessary.
8. If you feel all right, fill out Appendix 1 and give it to your supervisor as soon as he/she reaches the scene.
9. It is most important for you to immediately get the names of any witnesses on Appendix 2, as many people do not want to get involved and will leave the scene without leaving their names.
10. An employee of the company should take pictures of all vehicles involved and the accident scene.
11. Ask and responding officers where you can obtain a copy of the Accident Report.
12. As best you can, describe and diagram the accident on the back side of this form.

Use one of these outlines to sketch the scene of your accident, writing in street or highway names or numbers.

- Mark your vehicle no.1— other no.2.
- Show positions prior to and after collision.
- Locate where witnesses were.



Date of Accident _____ / _____ / _____ Time of Accident _____ : _____ am/pm

Road Conditions: Dry Wet Icy Snowy Construction Zone: Yes No

Describe what happened: _____



Baxmeyer Construction, Inc.



Vehicle & Driving Accident Check List

Appendix 1

Vehicle # in the Diagram: _____

Driver Information

Driver's License Number _____ State: _____

Name _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Vehicle Information

Color _____ Year _____

Make _____ Model _____

VIN _____ License Plate _____

Insurance Information

Insurance Company _____

Policy Number _____

Telephone _____ ..Fax _____

Emergency Services Information

Police Officer Name _____ Badge Number _____

Report Number _____ Telephone _____

Location of Accident

Continued on Back

Vehicle # in the Diagram: _____

Passenger Information

Name _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Passenger Information

Name _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Passenger Information

Name _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Passenger Information

Name _____

Address _____

Telephone _____ Cell Phone _____

Email _____



Baxmeyer Construction, Inc.



Vehicle & Driving Accident Check List

Appendix 2

Witness Information

Name _____ Age _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Location at the scene _____

Remarks _____

Witness Information

Name _____ Age _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Location at the scene _____

Remarks _____

Witness Information

Name _____ Age _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Location at the scene _____

Remarks _____

Witness Information

Name _____ Age _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Location at the scene _____

Remarks _____

Witness Information

Name _____ Age _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Location at the scene _____

Remarks _____

Witness Information

Name _____ Age _____

Address _____

Telephone _____ Cell Phone _____

Email _____

Location at the scene _____

Remarks _____



Baxmeyer Construction, Inc.



Vehicle & Driving – Driver Distraction Policy Acknowledgement

To be signed by the employee and returned to the Company

Baxmeyer Construction, Inc. recognizes that distracted driving is a growing problem and we are committed to minimizing this hazard. Distracted driving includes any non-driving activity a person engages in while driving that has the potential to distract him/her from the primary task of driving. Distracted Driving Activities include, but are not limited to: talking on a cell phone, texting, eating or drinking, using a smart phone or tablet, setting or resetting a GPS device, reading email, watching a video, changing a radio station, CD, etc.

Distractions may cause any one of or a combination of the following sensory deficits:

- Visual – taking your eyes off the road
- Manual – taking your hands off the steering wheel
- Cognitive – taking your mind off your driving

Distracted driving can result in injury, death, or significant property damages. Distracted driving can also lead to litigation if it is determined that an accident/incident was the result of cell phone use, texting, etc. Plaintiff attorneys may subpoena cell phone records to implicate both employee and employer to seek major damage awards.

Baxmeyer Construction, Inc. employees will adhere to the following policies:

- Cell phones are not to be used when driving for company business
- Company issued cell phones are not to be used while driving company vehicles
- Pull over in a safe place if you need to make or answer a call or text
- Absolutely no texting, emailing, or browsing on a device is allowed while driving
- Only hands-free or Bluetooth devices are acceptable

Employees found to be in violation of these policies will be subject to disciplinary action

Your signature below certifies your agreement to comply with the Driver Distraction policy.

Signature: _____ Date: ____ / ____ / ____

Print Name: _____

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Baxmeyer Construction, Inc.



Vehicle & Driving – Vehicle Use Policy Acknowledgement

To be signed by the employee and returned to the Company

I, the undersigned individual agree that, upon assuming employment with Baxmeyer Construction, Inc. (hereafter referred to as the “Company”), agree to abide by the following when a Company vehicle is in my care, custody or control:

1. I will use the Company vehicle only for Company business and never for personal use unless specifically authorized, in writing, by my supervisor or other Company personnel having authority to authorize such use.
2. If personal use of the Company vehicle is specifically authorized, only I will drive the vehicle.
3. I will adhere to the safety rules as outlined in the Vehicle Safety Program of this safety manual while operating any Company vehicle.
4. When used for Company business, only company employees or other persons being transported for business purposes will be allowed to ride in or enter the Company vehicle, and only other authorized company personnel will be permitted to drive it.
5. I will not drive the Company vehicle while consuming alcoholic beverages or other drugs or while under the influence of alcohol or other drugs, nor will I allow anyone else to do so.
6. I understand the violation of this Vehicle Use Policy may result in disciplinary action up to and including termination of my employment.
7. I will obey all traffic laws, ordinances, and regulations pertaining to the operation of motor vehicles. I will pay any fines, parking tickets, or other assessments for violations of traffic laws, ordinances, or regulations imposed on me. I acknowledge that fines paid by me for any violations of such motor vehicle laws, ordinances, or regulations are totally my responsibility and will not be reimbursed by the Company.
8. I will wear a seatbelt at all times, and will require all passengers to do the same.
9. Prior to driving the Company vehicle. I will check tires, lights, wipers, horn, turn signals, rear view mirrors, and brakes to be sure they appear to be in safe operating condition. If defects are noted, I will promptly report them and/or have them repaired as appropriate.
10. In the event of an accident, I will promptly comply with the Company vehicle accident reporting procedure.
11. I understand that if I am involved in an accident with the Company vehicle, and the Company's insurance assumes responsibility for payment of resulting claims, I may be required to attend a defensive driving course.
12. I understand that if I am involved in an accident with the Company vehicle, and there is a reasonable possibility that drug or alcohol use (by any party involved) caused or contributed to the accident, I may be required to submit to drug and/or alcohol testing.
13. It is my responsibility to alert my supervisor or other Company personnel having authority to govern the Company vehicle program if my driver's license has expired, been revoked, or been suspended.

These policies have been fully explained to me and I understand the contents of the Company Vehicle Use Policy Acknowledgement. I am aware that the failure to abide by this policy will result in disciplinary action, up to and including termination of my employment with the Company.

Signature: _____ Date: _____ / _____ / _____

Print Name: _____

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Baxmeyer Construction, Inc.

Safety Manual Acknowledgement Form

To be signed by the employee and returned to the Company

The rules, programs, and procedures stated above in the Baxmeyer Construction, Inc. safety manual are not intended to cover all the possible situations you will face on the job. Baxmeyer Construction, Inc. encourages and expects employees to act in a safe and responsible manner at all times, both on and off the job.

I have read the Baxmeyer Construction, Inc. Safety Manual, understand it, and agree to abide by it. I understand that violation of these rules may lead to disciplinary action, including termination of employment.

Signature: _____ Date: ____ / ____ / ____

Print Name: _____

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Chapter 10 ADDENDUMS & ADDITIONS

Write in each Addendum/Addition as received

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End Safety Manual