

SAFETY MANUAL



VALIANT ENERGY SERVICE

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MANAGEMENT SAFETY POLICY STATEMENT

This Safety Program and Procedures Manual is in place because the management of Valiant Energy Service, LLC recognizes their responsibility to provide a safe workplace for employees. Therefore, safety will be of utmost importance in the planning of all company projects in order to protect employees against occupational accidents, injuries, and illnesses, and to protect the company against unnecessary financial burden and inefficiency.

First and foremost, accidents and injuries to employees affect the personal lives of their families. In addition, accidents, injuries, and damage to property, vehicles, and equipment on the job contribute to interruptions in work and have hidden costs that can dramatically affect the profitability of our company. Therefore, management will take all of the necessary steps of safety planning for all projects, providing employees with all required Personnel Protective Equipment (PPE) and training in order to ensure that accidents of all types are prevented.

Implementing this program on site will be a key accountability factor for site management and for each employee. Safety is everyone's responsibility. If each employee remains alert to the possibility of an accident occurring and takes the necessary actions to ensure that hazards are corrected immediately, potential accidents can be eliminated.

Management will enforce this Safety Manual by requiring the Site Superintendent/Competent Person to: conduct daily inspections, hold employees accountable for working safely and support administered disciplinary action for safety violations by employees.

Working together, we can enjoy a safe workplace and a profitable company future.

Jim Collins

President
Valiant Energy Service, LLC

June 1, 2024

1. MANAGEMENT RESPONSIBILITIES

MANAGEMENT SHALL:

1.1. SAFETY PROGRAM AND PROCEDURES MANUAL:

- 1.1.1. Provide a Safety Program & Procedures Manual and ensure that it is reviewed annually and updates are provided as needed.

1.2. SITE SUPERVISION AND A DESIGNEE:

- 1.2.1. Ensure that each project is assigned a Project Manager, Site Superintendent/Competent Person and a designee who will assume responsibilities when the Site Superintendent/Competent Person is not on site.

1.3. TRAINING:

- 1.3.1. Provide training in the Safety Program and Procedures Manual for the Project Manager, Site Superintendent/Competent Persons and their designee.

1.4. SAFETY PLANNING :

- 1.4.1. Ensure that Advanced Safety Planning is conducted for all projects.

1.5. ACCIDENT PREVENTION PLAN: Support an Accident/Incident Prevention Plan that includes:

- 1.1.1. Daily Site Inspections and Documentation.
- 1.1.2. Weekly Tool Box Talks and Documentation.
- 1.1.3. Employee Disciplinary Action and Documentation.

1.6. ACCIDENT INVESTIGATION REPORTS:

- 1.6.1. Maintain Accident Investigation Reports on file.

1.7. DISCIPLINARY ACTION:

- 1.7.1. Follow-up after inspections. Apply Disciplinary Action for violations of Safety Standards by the Project Manager, Site Superintendent/Competent Person and employees.

1.8. PSEG REQUIREMENTS:

- 1.8.1. PSEG projects require that all sub-contractors be pre-qualified with a review of their safety programs, statistics and training records. This includes a review of their EMR, RIR,

DART and fatalities. All sub-contractors will be included in pre job or kick off meetings, safety orientations and will be subjected to a post project safety performance review.

1.9. PROJECT MANAGER RESPONSIBILITIES

1.9.1.THE PROJECT MANAGER SHALL:

1.9.1.1. SAFETY PROGRAM AND PROCEDURES MANUAL:

1.9.1.1.1. Ensure that the Site Superintendent/Competent Person and designee are familiar with the Safety Program & Procedures Manual and that it is implemented on site.

1.9.1.2. SAFETY PLANNING:

1.9.1.2.1. Ensure that Advanced Safety Planning is conducted for all projects.

1.10. EMPLOYEE SAFETY TRAINING:

1.10.1. Ensure that all employees are trained in the hazards associated with their work assignment.

1.11. ACCIDENT PREVENTION PLAN: Support an Accident Prevention Plan that includes:

1.11.1. Daily Inspections and Documentation.

1.11.2. Weekly Tool Box Talks and Documentation.

1.11.3. Employee Disciplinary Action and Documentation.

1.12. PERIODIC SITE INSPECTIONS:

1.12.1. Perform periodic site inspections and document findings using the Job Site Safety Inspection Checklist.

1.13. ACCIDENT INVESTIGATIONS:

1.13.1. Conduct an accident investigation for all accidents involving employees and/or equipment using the Project Manager's Report of Accident form.

1.14. DISCIPLINARY ACTION:

1.14.1. Apply Disciplinary Action for violations of Safety Standards by the Site Superintendent / Competent Person and employees.

1.15. SITE SUPERINTENDENT/COMPETENT PERSON RESPONSIBILITIES

1.15.1. (In the absence of the Site Superintendent, these responsibilities shall be performed by the Project Manager or the Designee)

THE SITE SUPERINTENDENT/COMPETENT PERSON SHALL:

1.16. PRIOR TO THE START OF WORK:

1.16.1. Hazard Assessment: Conduct a Hazard Assessment of the site to determine safety requirements for all stages of the project using the Job Hazard Assessment.

1.16.2. Public Protection: If applicable, ensure that the public at large is protected from potential hazards related to site operations.

1.16.3. Safety and Personal Protective Equipment (PPE): Ensure that all project required safety equipment and PPE is ordered and a supply maintained.

1.16.4. Employee Safety Training: Ensure that all employees are trained in the hazards associated with their work assignment.

1.16.5. Employee Emergency Response Training: Ensure that all employees are trained in Emergency Response Procedures.

1.17. DURING THE PROJECT:

1.17.1. Safety Program and Procedures Manual: Ensure the onsite implementation of the Safety Program and Procedures Manual.

1.17.2. Employee Safety Training: Ensure safety training is provided for employees assigned new tasks.

1.17.3. Safety Compliance: Ensure that work is performed in compliance with all local, state and federal regulations.

1.17.4. PPE: Ensure that an adequate supply of PPE is available and used by employees when required.

1.17.5. Employee Safety Complaints: Address employee safety complaints immediately.

1.17.6. Monitor the work of Employees: Ensure employee compliance with safety standards by performing daily site inspections using the Job Site Safety Inspection Checklist.

1.17.7. Disciplinary Action: Enforce Disciplinary Action applied by the Site Superintendent for violation of General Safety Rules and safety standards by employees.

1.17.8. Tool Box Talks: Conduct weekly Tool Box Talks and document attendance using the Tool Box Talk Report.

1.17.9. First Aid Kit: Ensure that a fully stocked First Aid Kit is available on site.

1.17.10. Injury/Accident Reporting: Ensure that all injuries, no matter how minor, are treated immediately and that injured employees submit an Employee Report of Accident, Injury and Illness form with Management in the main office within 24 hours of the incident.

1.17.11. Accident Investigation: Ensure that an accident investigation is conducted for all accidents involving employees and/or equipment. Complete a Superintendent's Report of Accident form within 24 hours of the incident.

1.17.12. Near Miss Investigation: Ensure that employees are trained to report all "Near Misses" so an investigation can be conducted to prevent reoccurrence.

1.18. IN THE EVENT OF AN EMERGENCY:

1.18.1. Call the appropriate emergency service and contact the Project Manager immediately.

1.18.2. Restrict access and secure the emergency area.

1.18.3. Try to determine the nature of the emergency, the number of people, the area of property and/or type of equipment affected.

1.18.4. Contact any homes or businesses adjacent to the worksite that may be affected.

1.18.5. Visually inspect the entire project to ensure that it is free of hazards that could cause further injury (traffic, electrical hazards, etc.) and take measures to eliminate hazards that are observed.

1.18.6. Do not require employees to provide First Aid/CPR. Ensure that it is provided on a "Good Samaritan" basis only.

DO NOT ALLOW WORK TO RESUME UNTIL THE AREA HAS BEEN MADE SAFE FOR EMPLOYEES.

1.19. WHEN WORKING WITH A SUBCONTRACTOR:

1.19.1. Subcontractors: Determine if work that will be conducted by Subcontractors can adversely affect other employees on site.

1.19.2. Monitor the work of Subcontractors: Ensure Subcontractor Compliance with safety standards using the Site Safety Inspection Checklist of Subcontractors.

1.19.3. Follow procedure for documenting safety violations.

1.19.4. Perform detailed inspections of Subcontractor work using the Standard Operating Procedures Checklists (located at the beginning of each Subcontractor SOP, when necessary).

1.19.5. Subcontractor Safety Violation Procedure:

- 1.19.5.1. Immediately stop the work of any Subcontractor when an unsafe situation of imminent danger to employees is observed.
- 1.19.5.2. Notify each Subcontractor in writing when a violation of a safety standard is observed or when a generally accepted unsafe situation is found to exist, using the Contractor Safety Violation Notification Form.
- 1.19.5.3. Conduct a follow up inspection to ascertain whether the hazard or the unsafe situation has been corrected.
- 1.19.5.4. Send a second notice with a warning stating that not correcting the hazard or unsafe Situation will result in removal from the worksite.
- 1.19.5.5. Notify management of action taken.

1.19.6. Conduct follow up inspection and notify management if continued noncompliance is observed.

1.20. TRAFFIC CONTROL COORDINATOR RESPONSIBILITIES

THE TRAFFIC CONTROL COORDINATOR SHALL

1.20.1. SAFETY COMPLIANCE

- 1.20.1.1. Ensure that work is performed in compliance with all local, state and federal regulations.

1.21. SAFETY AND EMERGENCY PERSONNEL:

- 1.21.1. Ensure flagmen, emergency fire and medical personnel are available on site, as necessary.

1.22. INSPECTIONS AND HAZARD ASSESSMENT:

- 1.22.1. Conduct and document daily inspection of traffic zone utilizing the Traffic Control Coordinator Inspection Checklist. Identify problem areas that obstruct traffic flow or confuse motorists, i.e. conflicting signs, stripes, detours, etc. and correct deficiencies.

1.23. TRAFFIC CONTROL PLAN:

- 1.23.1. Review and become familiar with the traffic control plan (TCP) for the project.

1.24. WORK ZONE PROTECTION:

- 1.24.1. Ensure the work zone is adequately protected in conformance with the Manual on Uniform Traffic Control Devices (MUTCD) and the TCP.

- 1.24.2. Ensure that all excavations or drop-offs greater than 50 millimeters deep are eliminated, covered, or otherwise protected during non-working periods.

1.25. EQUIPMENT:

- 1.25.1. Ensure that equipment and vehicles are properly stored and packed so as not to create a traffic hazard.
- 1.25.2. Ensure that all construction equipment has operable back-up alarms, retro reflective tape (night work) on all four sides, discuss project entry and exit.

1.26. PERSONAL PROTECTIVE EQUIPMENT:

- 1.26.1. Make sure all personnel are supplied with and using personal protective equipment, i.e. vests, hard hats, hearing protection etc.

1.27. TRAFFIC CONTROL DEVICES:

- 1.27.1. Set-up and remove all traffic control devices in accordance with contract documents.
- 1.27.2. Correct deficiencies of traffic control devices within two-hours of discovery or notification by the Engineer.
- 1.27.3. Reposition traffic control devices displaced by traffic or construction equipment.
- 1.27.4. Cover and/or uncover signs as appropriate.
- 1.27.5. Repair and/or replace damaged traffic control devices.
- 1.27.6. Replace batteries, light bulbs, control panels, and other electrical components.
- 1.27.7. Keep all traffic control devices clean.
- 1.27.8. Add fuel and oil to power units for traffic control devices.
- 1.27.9. Properly store traffic control devices when not in use.

1.28. TOOL BOX TALKS:

- 1.28.1. Hold “Tool Box” meeting prior to having workers begin operations near to discuss hazards, importance of remaining alert, possible additional safety concerns, etc.

1.29. EMPLOYEE RESPONSIBILITIES

EMPLOYEES SHALL:

1.29.1. ACCIDENT PREVENTION:

- 1.29.1.1. Consistently observe work conditions and equipment operations for the purpose of preventing accidents. Report all Near Misses to the Site Superintendent/Competent Person.

1.29.2. PPE:

- 1.29.2.1. Use and maintain all PPE and safety equipment required for safe work performance.

1.29.3. PRECAUTIONARY MEASURES:

- 1.29.4. Correct, where possible, any observed unsafe work conditions or practices within the scope of their work operations and report all other unsafe work actions or conditions to the Site Superintendent/Competent Person.

1.29.5. EQUIPMENT:

- 1.29.6. Examine tools and equipment before use and advise the Site Superintendent/Competent Person of any defects or problems. Report unsafe tools, defective or frayed electrical cords and unguarded machinery to the Site Superintendent/Competent Person.

- 1.29.7. DO NOT USE A DEFECTIVE TOOL OR PIECE OF EQUIPMENT.

- 1.29.8. DO NOT USE TOOLS OR EQUIPMENT IMPROPERLY OR IN A MANNER FOR WHICH THE TOOL OR EQUIPMENT WAS NOT DESIGNED.

1.29.9. STOP WORK :

- 1.29.10. Stop work if conditions are such that there is an imminent danger to life, limb or property. REPORT SUCH CONDITIONS IMMEDIATELY TO THE SITE SUPERINTENDENT/COMPETENT PERSON.

1.29.11.CO-WORKER MOTIVATION:

- 1.29.11.1.1. Encourage co-workers to work safely and assist them in performing their work in a safe manner by informing them of potential problems, unsafe conditions or unsafe actions.

- 1.29.11.1.2. Injury Reporting: Report all injuries regardless of how slight to the Site Superintendent/Competent Person.

1.30. VEHICLE OPERATOR RESPONSIBILITIES

THE VEHICLE OPERATOR SHALL:

1.31. OPERATOR SAFETY COMPLIANCE:

- 1.31.1. Have a valid state driver's license.

- 1.31.2. Immediately notify the Site Superintendent/Competent Person, and discontinue operation of the vehicle if driver's license is lost (expiration, suspension or revocation).
- 1.31.3. Make sure the vehicle contains the registration, current insurance card, valid inspection ticker(s), accident report forms, fire extinguishers, first aid kit with eye wash and chock blocks if required.
- 1.31.4. Observe all vehicle and traffic patterns, laws and signs of the state in which they are working.
- 1.31.5. Do not exceed the legal speed limit. Consider weather and/or road conditions and reduce speed accordingly. Watch for depressions in the road – especially around corners, sewer rates, potholes, etc.

1.31.6. VEHICLE SAFETY COMPLIANCE:

- 1.31.6.1. Conduct a Circle of Safety (visual walk around check) of the vehicle before operating the assigned vehicle. Checks should be made, if applicable, for:
 - 1.31.6.1.1. Conditions of tires, cracked lenses, windshields, rear view mirrors, fluid leaks, Back-up alarm.
 - 1.31.6.1.2. Fire extinguisher.
 - 1.31.6.1.3. Flags and/or signs where required on the vehicle and the condition.
 - 1.31.6.1.4. Running, flashing and signal lights and if they are operating properly.
 - 1.31.6.1.5. Reflectors and license plates to identify if they are in good condition; clean and unbroken.
- 1.31.7. Report all noted defects immediately.
- 1.31.8. Complete a CIRCLE OF SAFETY each time you re-enter your vehicle before proceeding forward or backward to ensure that there are no persons or obstructions in the way.
- 1.31.9. If applicable, make sure any load, either on or in the vehicle, is secured and properly placed.
- 1.31.10. Be certain that wide or high loads have the proper clearance over the entire route of travel.
- 1.31.11. Do not exceed weight limits. Obtain a permit when necessary.

1.32. VEHICLE OPERATOR AND PASSENGER SAFETY:

- 1.32.1. Fasten seatbelts prior to starting the vehicle and ensure that all passengers fasten their seatbelt.
- 1.32.2. Allow NO ONE to ride on fenders, running boards, tailgates, etc.
- 1.32.3. Avoid, if possible, parking vehicle along the highway and exiting from the operator side. When it is not possible to exit on the shoulder, check carefully for oncoming traffic, then make the exit as quickly as possible. Never leave the door open on the traffic side.
- 1.32.4. Avoid jumping off any vehicle. Use the steps and hand tools where provided when entering or exiting.
- 1.32.5. BACK UP AS INFREQUENTLY AND FOR AS SHORT A DISTANCE AS POSSIBLE. Have someone with clear visibility direct them when possible.
- 1.32.6. Turn off the vehicle and set parking brakes before leaving the vehicle. This is especially important when parking on the grade. Use chocks if needed.

1.33. VEHICLE SAFETY PRECAUTIONS:

- 1.33.1. When setting the emergency brake with a standard transmission, make sure the transmission is in reverse gear (or the lowest gear). If there is a curb, cramp the front wheel against it.
- 1.33.2. Turn off vehicle while refueling.

1.34. SUBCONTRACTOR COMPETENT PERSON RESPONSIBILITIES

The management of VALIANT POWER GROUP understands the safety issues that are generated in a multi-employer worksite environment and will enforce the compliance of all safety regulations in a manner that promotes overall workplace safety.

1.34.1. PRIOR TO THE START OF WORK:

- 1.34.1.1. Safety Program, Material Safety Data Sheet (MSDS) and Employee Training: Submit a Safety Program and MSDS for review and acceptance when necessary. Ensure that all employees are trained in the hazards associated with their work.
- 1.34.1.2. Hazard Assessment and PPE: Perform Hazard Assessments for Personal Protective Equipment (PPE) requirements and require use as determined.

1.35. DURING THE PROJECT:

- 1.35.1.1. OSHA Compliance: Ensure that all construction activities are conducted in accordance with applicable federal and state OSHA regulations.
- 1.35.1.2. Precautionary Measures: Take appropriate measures to minimize the possibility of personal injury and/or damage to construction site property.

- 1.35.1.3. Tool Box Meetings: Attend weekly General Contractor Tool Box Meetings.
- 1.35.1.4. Daily Site Inspections: Perform daily safety inspections.
- 1.35.1.5. General Contractor Violation Notification: Correct all violations identified during Site Superintendent/Competent Person Inspections immediately.
- 1.35.1.6. Injury Reporting: Report all injuries to the Site Superintendent /Competent Person.
- 1.35.1.7. MSDS: Ensure that a listing and MSDS of all hazardous chemicals utilized and/or stored on site is provided to the Site Superintendent before the start of work.
- 1.35.1.8. Ensure that employees do not possess or use any intoxicant on project site property.

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MANAGEMENT RESPONSIBILITIES

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2. ACCIDENT PREVENTION & INVESTIGATION

PROJECT ACCIDENT PREVENTION PROCEDURE

This procedure describes the steps that management will take for each project so that employees and clients will understand the VALIANT ENERGY SERVICE, LLC commitment to preventing accidents.

2.2. STEP 1 - PLAN SAFETY INTO EVERY PROJECT:

2.2.1. A Job Hazard Assessment of the project will determine safety requirements for all stages of the project. Being prepared is paramount to operating safe.

2.3. STEP 2 – DESIGNATE A PROJECT MANAGER. SITE SUPERINTENDENT / COMPETENT PERSON AND A DESIGNEE FOR EACH PROJECT:

2.3.1. Project Manager - Has received training in the Safety Program and Procedures Manual and is responsible for the entire project and ensuring it is completed in a safe manner.

2.3.2. Site Superintendent/Competent Person - Has received training in the Safety Program and Procedures Manual and is responsible for the onsite implementation of the requirements of the Safety Program and Procedures Manual.

2.3.3. Designee – Has also received training in the manual and assumes all the responsibilities of the Competent Person when he/she is not on site.

2.4. OTHER RESPONSIBILITIES OF THE COMPETENT PERSON ARE:

2.4.1. Performing Daily Site Inspections.

2.4.2. Conducting Weekly Tool Box Talks.

2.4.3. Enforcing Disciplinary Action.

2.5. ENSURE TRAINING IS PROVIDED FOR EMPLOYEES PRIOR TO THE START OF WORK:

2.5.1. The Job Hazard Assessment conducted by the Site Superintendent/Competent Person will be used to determine issues employees should be trained in.

2.5.2. Training must include General Safety Rules, Hazard Communication, and the Disciplinary Action Policy and Procedure.

2.5.3. Attendance at the training will be documented and kept on file.

2.5.4. Training will be provided if any employee is not currently trained in the work they are required to perform.

- 2.5.5. After the initial training all New Employees added to the work force must be provided training in the hazards associated with the task they will perform.
- 2.5.6. No employee will be asked to perform work for which he has not been trained.

2.6. ENFORCEMENT:

- 2.6.1. The Site Superintendent/Competent Person will be held responsible by the Project Manager for safety compliance on site.
- 2.6.2. Employees will be held responsible by the Project Manager and Site Superintendent/Competent Person for conducting their work safely and for wearing and maintaining all required Personal Protective Equipment (PPE) provided.

2.7. SITE SAFETY INSPECTIONS

2.7.1. SITE SAFETY INSPECTIONS ARE CONDUCTED TO:

- 2.7.1.1. Demonstrate a commitment to operating Safe Work Sites.
- 2.7.1.2. Ensure employees are performing work in a safe manner, per OSHA Regulations.
- 2.7.1.3. Identify and correct hazards that can create accidents.
- 2.7.1.4. Correct changes that may have occurred during off work hours.

2.8. SITE SAFETY INSPECTION REQUIREMENTS:

2.8.1. THE PROJECT MANAGER SHALL:

- 2.8.1.1. Perform periodic inspections when on site using the Job Site Safety Inspection Checklist. A copy of the completed form must be maintained on site.
- 2.8.1.2. Ensure safety violations and unsafe situations are corrected immediately.
- 2.8.1.3. The Site Superintendent / Competent Person or Designee Shall:
- 2.8.1.4. Perform daily inspections at the start of each workday using the Job Site Safety inspection Checklist.
- 2.8.1.5. Ensure safety violations and unsafe situations are corrected immediately.

2.9. DOCUMENTATION:

- 2.9.1. Document the correction of safety violations and unsafe situations.

2.10. TOOL BOX TALKS

2.10.1. PURPOSE OF TOOL BOX TALKS:

Tool Box Talks are conducted to:

- 2.10.1.1. Demonstrate employee Safe Work Expectations.

- 2.10.1.2. Help employees understand their responsibility to do their job safely, which genuinely influences employees' performance.
- 2.10.1.3. Identify and solve safety issues of employees.

2.11. **TOOL BOX TALK REQUIREMENTS:**

- 2.11.1. Conducted weekly by the Site Superintendent/Competent Person and documented.
- 2.11.2. Attended by all employees on site and cover issues related to the work being conducted.
- 2.11.3. Held in the work area and, if possible, at the beginning of the week and day.
- 2.11.4. Used to discuss safety issues related to recent accidents, injuries or near misses.
- 2.11.5. Used to compliment employees on safety achievement. **DO NOT** single out employees for mistakes.
- 2.11.6. Used to review new, difficult or any unusual job aspects. Demonstrate and explain any new equipment.

2.12. The Site Superintendent/Competent Person must submit a **Tool Box Talk Report** following each meeting.

2.13. **DISCIPLINARY ACTION**

This Disciplinary Policy has been developed to prevent the reoccurrence of unsafe acts. When a Safety Procedure or General Safety Rule is not followed, Disciplinary Action will be taken

2.14. **DISCIPLINARY ENFORCEMENT PROCEDURE**

- 2.14.1. Management and/or the Project Manager will determine if there is a violation by the Site Superintendent/Competent Person.
- 2.14.2. The Project Manager will determine if there is a violation by an employee. The Site Superintendent/Competent Person will enforce all employee Disciplinary Action.

2.15. **VIOLATIONS:**

- 2.15.1. First Violation: The employee will be removed from the hazardous exposure and re-instructed by the Site Superintendent/Competent Person in the safety procedure, which must be followed. The employee must agree to comply in the future. A Safety Violation disciplinary Action form describing the unsafe act will be prepared for each employee safety violation; the employee must sign the form. One (1) copy will be furnished to the employee, and one (1) will be maintained on site by the Site Superintendent/Competent Person. The original must be placed in the personnel file.
- 2.15.2. The employee will be removed from the hazardous exposure, re-instructed and required to discuss the matter in detail with the Site Superintendent/Competent Person and shall sign form stating that the employee understands that a third violation will result in termination. A will be submitted in the same manner as the First Violation.

2.15.3. Third Violation: The employee's actions indicate a continuous disregard of safety policy and procedures which have been adopted to protect employees and the public at large from injury and/or death. The employee may be subjected to **TERMINATION**.

2.15.4. ACCIDENT / INCIDENT INVESTIGATION

2.15.4.1. All work related accidents, identify probable causes, and the findings used to develop specific management actions to prevent reoccurrence injuries and illnesses are to be investigated in a professional manner.

2.16. MANAGEMENT SHALL:

2.16.1. Ensure that the Project Manager and Site Superintendent/Competent Person have received Accident/Incident Investigation training.

2.16.2. Ensure all accidents and injuries are properly investigated.

2.16.3. Ensure immediate and long-term corrective actions are taken to prevent reoccurrence.

2.16.4. Maintain Accident Reports permanently on file.

2.16.5. Ensure proper entries are made on the OSHA 300 Log.

2.17. THE SITE SUPERINTENDENT / COMPETENT PERSON SHALL:

2.17.1. Conduct an immediate initial accident investigation.

2.17.2. Collect and preserve all evidence that may be useful in an investigation.

2.17.3. Conduct interviews of witnesses in a professional manner.

2.17.4. Do not attempt to find or assign blame for accidents

2.17.5. Take action to protect people and property from secondary effects of accidents.

2.17.6. Secure medical care for all injured employees.

2.18. EMPLOYEE RESPONSIBILITIES:

2.18.1. Immediately report all accidents, injuries, and near misses to the Site Superintendent.

2.18.2. Report all details utilizing the Employee Report of Accident, Injury or Illness form.

2.18.3. Assist as requested in all accident investigations.

2.19. RECORDKEEPING:

2.19.1. EMPLOYEE ACCIDENT AND INJURY RECORDS

- 2.19.1.1. A Log of Injuries and Illnesses (OSHA 300 Form) shall be maintained on an annual basis from January 1 to December 31st. All recordable information on injuries and illnesses shall be made as soon as possible, but no later than six (6) working days after receipt of the information. Consult the **OSHA Recordable Injuries** form for guidance as to what injuries and illnesses apply.
- 2.19.1.2. Any operation at a given site for more than one (1) year is considered a fixed establishment; therefore a separate OSHA 300 Log shall be maintained for that establishment.
- 2.19.1.3. The OSHA 300 Log of Injuries and Illnesses shall be summarized. This summary (Form 300 A) shall consist of the year's total injuries, illnesses, lost workdays, fatalities. It shall also include the Calendar year the information covers, the company name, the establishment address, certification signature, and date.
- 2.19.1.4. This summary (Form 300 A) shall be completed no later than January 31st and posted in an area where employees can review the data. Posting shall begin on February 1 and remain until April 30th. The OSHA 300 Logs shall be maintained for a period of five (5) years.

2.19.1.5. EMPLOYEE TRAINING RECORDS

- 2.19.1.5.1. Training records must be maintained for three (3) years from the date on which the training occurred.
- 2.19.1.5.2. Upon request, employee-training records will be provided to the employee or the employee's authorized representative within fifteen (15) working days.

2.19.1.6. EMPLOYEE EXPOSURE RECORDS

- 2.19.1.6.1. Employee exposure records i.e., Material Safety Data Sheets, Medical Records, Noise Exposure Record, Respirator Fit Test Records must be maintained for a period of thirty (30) years plus the term of employment for each employee.

2.19.1.7. DEPARTMENT OF LABOR L & I FORMS

- 2.19.1.7.1. The NJ Department of Labor L & I forms will be completed for all injuries and is required by the insurance carrier. A copy will be sent to the Division of Labor and the employee accordingly.

3. SITE OPERATIONS

3.1. GENERAL SAFETY RULES

- 3.1.1. Employees are not permitted to use possess or be under the influence of any intoxicants or illegal drugs while on site.
- 3.1.2. All injuries, regardless of how minor, must be reported immediately to the Site Superintendent/Competent Person.
- 3.1.3. **ALL POSTED** safety rules and warning signs shall be obeyed and shall not be removed or defaced. Violation of safety rules may be cause for immediate dismissal of any employee.
- 3.1.4. All portable power hand tools and electrical cords shall be inspected before using them.
- 3.1.5. Unsafe equipment, tools, defective or frayed electrical cords, and unguarded machinery must be taken out of service immediately, tagged, and sent to be repaired or replaced.

3.2. PROHIBITED ISSUES:

- 3.2.1. Horseplay on the job.
- 3.2.2. Overriding or tampering with safety devices installed on equipment, machinery or vehicles.
- 3.2.3. Tampering with or the unauthorized removal of a fire extinguisher from its assigned location.
- 3.2.4. Getting on or off a vehicle or equipment, while in motion.
- 3.2.5. The operation of any equipment without proper authorization.
- 3.2.6. Butane lighters in welding areas.
- 3.2.7. The loud playing of radios or music or the use of personal entertainment devices.
- 3.2.8. No smoking rules must be observed in posted areas. In areas where smoking is allowed, cigarette butts and matches must be disposed of properly, not in trash drums or waste paper baskets.
- 3.2.9. Seatbelts must be worn in all moving vehicles, when so equipped.
- 3.2.10. No employee will operate any machinery, equipment, or tool, unless he has been properly instructed in its use and is thoroughly familiar with all aspects of its operation.
- 3.2.11. ALL machine guards must be kept in place while machinery is in operation. Tampering with machine guards is prohibited.

- 3.2.12. Hand tools must not be used for any purpose other than the intended use.
- 3.2.13. Electric power tools must be properly grounded before being put into operation.
- 3.3. No employee should remove a cover or guardrail from any opening without specific authority from the Competent Person. If any employee's work requires the removal of a cover or guardrail, that employee is responsible for reinstalling the guardrail prior to leaving the work area.
- 3.4.** Excavations five (5) feet or more in depth or any excavation showing signs of failure must not be entered without the proper protective system in place (trench box, shields, shoring, benching, sloping, etc.).
- 3.5. Employees on foot must:
 - 3.5.1. Remain alert at all times, in all places.
 - 3.5.2. Check surroundings often, listen for warning.
 - 3.5.3. Keep a safe distance from traffic.
 - 3.5.4. Stay behind protective barriers where possible.
 - 3.5.5.** Look out for each other. Warn co-workers. Air horns can be used as a warning device.
- 3.6. Around equipment and vehicles:
 - 3.6.1. Stay out of blind spots.
 - 3.6.2. Communicate with drivers and operators by radio or hand signals.
 - 3.6.3.** All safety cans or containers must be labeled as to its contents.
- 3.7. Handling Emergencies on Site:
 - 3.7.1. When responding to an emergency situation employees should not take any unnecessary risks.
 - 3.7.2. All emergency telephone numbers (hospitals, fire, and police) must be available and posted on site.
 - 3.7.3. A means for outside communication (telephone) must be available to call for emergency assistance. If a cell phone is used for emergency contact, ensure that a signal is available prior to beginning work on site. If a signal is not available, make alternate arrangements for contacting emergency help.
 - 3.7.4. A means of transporting an injured person to a medical facility must be available on site at all times in case emergency assistance cannot arrive in a timely manner.

3.7.5. When an emergency occurs, the Site Superintendent/Competent Person should be notified immediately.

3.8. All questions regarding safety or safety equipment should be directed to the Site Superintendent / Competent Person.

3.9. Willful violation of these or other safety rules will be cause for dismissal.

3.10. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Employees must be required to wear required Personal Protective Equipment (PPE) at the proper times and in the proper manner. **All PPE must be inspected prior to each use.** Failure to wear required PPE is cause for disciplinary action, up to possible termination.

3.10.1. HEAD PROTECTION

3.10.1.1. Hard Hats must be worn on site by all employees when an overhead hazard exists.

3.10.2. EYE PROTECTION

3.10.2.1. ANSI Z 87.1 approved eye protection must be worn when working with all chemicals (liquid or powder form), sledging, hammering, and sawing on metal or concrete, chipping, welding, grinding, working in dusty places, handling of acids, peening and cleaning walls or other operations where eye injuries may result.

3.10.2.2. Additional protection such as face shields and goggles must be worn when performing high hazard tasks.

3.10.3. HEARING PROTECTION

3.10.3.1. Employees will be required to wear approved hearing protection in areas where noise levels exceed 85db(A), regardless of time spent in the area.

3.10.4. FALL PROTECTION

3.10.4.1. When working six (6') ft. or higher above the ground or surface, fall protection:

3.10.4.1.1. Shall be provided and used by employees when required.

3.10.4.1.2. Must be visually inspected by employees before each use.

3.10.5. CLOTHING

3.10.5.1. Must be suitable for the type of work performed.

3.10.5.2. Long pants; no cutoffs or shorts.

- 3.10.5.3. No sleeveless shirts.
- 3.10.5.4. Work shoes must be in good condition and worn at all times.
- 3.10.5.5. Where needed, work gloves, in good condition, and suitable for the task to be performed, must be worn. Other hand protection can be designated by the Site Superintendent/Competent Person.
- 3.10.5.6. Employees are required to wear reflectorized vests when working around moving equipment or vehicular traffic.
- 3.10.5.7. Employees working over or near water, where the danger of drowning exists, shall be supplied with U.S. Coast Guard Approved life jacket or buoyant work vests.
- 3.10.5.8. Employees must not wear loose clothing and jewelry around machinery.

3.11. HOUSEKEEPING

- 3.11.1. Housekeeping is essential to job safety and efficiency.
- 3.11.2. An orderly arrangement of material and equipment on all sites will be maintained at all times.
- 3.11.3. Work sites will be cleaned and materials will be arranged by safe means on a daily basis to preclude the creation of slipping, tripping, and fire hazards.
- 3.11.4. Walkways, aisles, stairways, exits, and passageways shall be kept clear and free from obstruction, debris or loose materials. No storage will be permitted in these areas.
- 3.11.5. Cords and hoses shall be routed and/or taped in a manner that will not present a tripping hazard.
- 3.11.6. Splinters, nails, sharp edges, etc. will be removed or protected to eliminate the possibility of injury.
- 3.11.7. Appropriate trash containers will be placed strategically on the project and used for disposal of scrap materials and other work-generated debris.
- 3.11.8. All solvent waste, oily rags and flammable liquids will be kept in fire-resistant covered containers until removed from the project.
- 3.11.9. All scrap lumber, waste material, and rubbish will be removed from the immediate work area as the work progresses.
- 3.11.10. Lunch or eating areas will be kept clean and free of all food, scraps, wrappers, cups, and other disposable items. Employees shall only store lunch items in designated areas.

3.11.11.The Competent Person is responsible for all employees using hazardous chemicals and responsible for disposing of these chemical safely – consult Material Safety Data Sheets for specific information.

4. EMPLOYEE HEALTH ISSUES

4.1. LIFTING/BACK SAFETY

MANUAL MATERIAL HANDLING (Safe Lifting Procedures)

Use mechanical aids whenever possible. If you must lift material manually, observe the following techniques:

- 4.1.1. Approach the load and size it up (weight, size and shape). Consider your physical ability to handle the load.
- 4.1.2. Spread your feet apart to make yourself more stable; one foot may be placed ahead of the other.
- 4.1.3. Keep the object close to you.
- 4.1.4. Keep your back straight, your chin inward and bend your knees to the degree that is comfortable. Get a good hand hold of the object. Lift the load straight up smoothly and evenly. Pushing with your legs, keep the load close to your body.
- 4.1.5. Lift the object into the carrying position, making no turning or twisting movements until the lift is completed. Never turn at the waist.
- 4.1.6. Once you have looked over your path of travel to make sure it is clear, turn your body by changing the position of your feet. Stack material (in your arms, hand truck, etc.) in such a manner as to permit a full view of where you are walking.
- 4.1.7. Setting the load down is just as important as picking it up. Using your leg and back muscles, comfortably lower the load by bending your knees. When the load is securely positioned, release your grip.
- 4.1.8. When manually handling awkward, bulky or heavy loads request help from a fellow worker. When lifting and carrying with another person, teamwork is important. The load should be equally distributed and movements must be coordinated so both employees start and finish the lift action at the same time and perform turning movements together. When two persons carry a long object, it should be held at the same level by both and on the same side of the body.
- 4.1.9. **NOTE:** Back belts shall not be worn without having received proper instruction in their use and limitations.

4.2. HEAT STRESS

Operations involving **1)** high air temperatures, **2)** radiant heat sources, **3)** high humidity, **4)** direct physical contact with hot objects, **5)** or strenuous physical activities have a high potential for inducing Heat Stress. Outdoor operations conducted in hot weather, especially those that require employees to wear protective clothing, are also likely to cause heat stress among exposed workers.

4.2.1.SYMPTOMS - Symptoms of Heat Stress are:

- 4.2.1.1. Confusion
- 4.2.1.2. Headache
- 4.2.1.3. Weakness
- 4.2.1.4. Extreme Thirst
- 4.2.1.5. Irrational Behavior
- 4.2.1.6. Loss of Consciousness
- 4.2.1.7. Convulsions / Lack of Sweating
- 4.2.1.8. Hot, Dry Skin
- 4.2.1.9. Abnormally High Body Temperature

4.3. SITE SUPERINTENDENT/COMPETENT PERSON RESPONSIBILITIES TO REDUCE THE LIKELIHOOD FOR HEAT STRESS:

- 4.3.1.1. Become familiar with signs and symptoms of Heat Stress and be able to recognize them immediately.
- 4.3.1.2. Provide adequate water to on site.
- 4.3.1.3. Encourage employees to drink more than the amount required to satisfy thirst. Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement.
- 4.3.1.4. Encourage employees to establish a work regimen that will provide adequate rest periods for cooling down. The heat exposure Threshold Limit Values (TLV) may be used for guidelines.
- 4.3.1.5. Provide shaded areas for breaks, if possible.
- 4.3.1.6. If forecast is for extremely high temperatures, consider adjusting work hours to avoid the worst heat of the day.
- 4.3.1.7. Conduct a Tool Box Talk that informs employees of the importance of adequate rest, proper attire and diet in the prevention of Heat Stress.
- 4.3.1.8. Ensure that clothing is not removed in an effort to reduce warmth, which could result in sunburn.

4.4. EMPLOYEE RESPONSIBILITIES TO REDUCE THE LIKELIHOOD FOR HEAT STRESS:

- 4.4.1.1. Become familiar with signs and symptoms of Heat Stress and be able to recognize them immediately.
- 4.4.1.2. Drink plenty of fluids; primarily water.
- 4.4.1.3. Avoid excessive use of caffeine drinks such as coffee, colas or tea.
- 4.4.1.4. Take breaks in a shaded area, if possible area.
- 4.4.1.5.** Remove any impermeable protective garments during rest periods.

4.5. COLD STRESS

When the body is unable to warm itself, cold related stress may result. Four factors contribute to Cold Stress: 1) cold air temperatures, 2) high winds, 3) dampness and 4) contact with cold water surfaces. Most common cold induced illnesses are Hypothermia, Frostbite, and Trench Foot.

4.6. SYMPTOMS - Symptoms of Cold Stress are:

- 4.6.1. Shivering
- 4.6.2. Low body temperature
- 4.6.3. Slurred speech
- 4.6.4. Stomping of the feet
- 4.6.5. Fumbling
- 4.6.6. Cold skin
- 4.6.7. Inability to walk or stand
- 4.6.8. Stinging, aching, and numbness of the affected part of the body (Frostbite)
- 4.6.9. Blisters (Trench Foot)

4.7. SITE SUPERINTENDENT/COMPETENT PERSON RESPONSIBILITIES TO REDUCE THE LIKELIHOOD FOR COLD STRESS:

- 4.7.1. Become familiar with signs and symptoms of Cold Stress and be able to recognize them immediately.
- 4.7.2. Encourage employees to wear warm, protective clothing since that is the most important way to prevent Cold Stress.
- 4.7.3. Provide general or spot heating to increase temperature at the site.

4.7.4. Provide special provisions for keeping worker's hands warm, such as warm air jets or radiant heaters, if work is to be performed with bare hands for more than 10-20 minutes in an environment below 60°F.

4.7.4.1. If fine manual dexterity is not required and the air temperature falls below 60°F for sedentary, 39°F for light, 20°F for moderate work, then gloves should be used.

4.7.5. Whenever cold surfaces below 20°F are within reach, a warning should be given to employees to prevent inadvertent contact by bare skin.

4.7.6. Conduct a Tool Box Talk to inform employees of the importance of adequate rest, proper attire and diet in the prevention of Cold Stress.

4.7.7. Shield the work area if the air velocity at the site is increased by the wind, draft, or ventilation equipment.

4.7.8. Heated warming shelters shall be made available if work is performed continuously in an equivalent chill temperature of 30°F or below. Employees shall be encouraged to use them.

4.7.9. At temperatures below 40°F, metal handles of tools and control bars shall be covered with thermal insulation.

4.7.10.

4.7.11. At air temperatures of 35°F (2°C) or less, employees whose clothing gets wet for any reason must be immediately given a change of clothing and be treated for hypothermia.

4.7.12. Encourage the use of hats and hoods to prevent heat loss from the head and to protect ears.

4.8. EMPLOYEE RESPONSIBILITIES TO REDUCE THE LIKELIHOOD FOR COLD STRESS:

4.8.1. Become familiar with signs and symptoms of Cold Stress and be able to recognize them immediately.

4.8.2. Wear several layers of clothing rather than one thick layer. Air captured between layers acts as an insulator.

4.8.3. Wear synthetic fabrics next to the skin as a barrier against sweat. Clothing should not restrict flexibility.

4.8.4. If conditions are wet as well as cold, ensure that the outer clothing worn is waterproof or at least water-repellent. Wind-resistant fabrics may also be required under some conditions.

4.8.5. Wear a hat. 40% of body heat can be lost when the head is exposed.

4.8.6. Tight-fitting footwear restricts blood flow. Footwear should be large enough to allow wearing either one thick or two thin pairs of socks. Wearing too many socks can tighten fit and harm rather than help.

4.8.7. Employees who get hot while working should open their jackets but keep hats and gloves on.

4.8.8. Drink plenty of fluids; primarily water.

4.8.9. Take breaks in a warm area, if possible.

5. EMERGENCY PLANNING

5.1. PURPOSE OF EMERGENCY PLANNING:

- 5.1.1. Preserve life and prevent injuries to employees and the public at large, if applicable.
- 5.1.2. Protect property and equipment.
- 5.1.3. Provide guidelines for emergency action. However, in situations where no guidelines apply, sound judgment should be used to determine the safest course of action.

5.2. GENERAL SITE REQUIREMENTS:

- 5.2.1. When responding to an emergency situation employees should take no unnecessary risks.
- 5.2.2. All emergency telephone numbers (hospitals, fire, and police) must be available and posted in the office trailer of each site.
- 5.2.3. A means for outside communication (telephone) must be available to call for emergency assistance. If a cell phone is used for emergency contact, ensure that a signal is available prior to beginning work on site. If a signal is not available, make alternate arrangements for contacting emergency help.
- 5.2.4. A means of transporting an injured person to a medical facility must be available on site at all times in case emergency assistance cannot arrive in a timely manner.
- 5.2.5. When an emergency occurs, the Site Superintendent/Competent Person and Project Manager should be notified immediately.

5.3. FIRST AID

- 5.3.1. A weatherproof First Aid Kit is readily accessible at each project and must be:
 - 5.3.1.1. Fully stocked with individually sealed packages of each item.
 - 5.3.1.2. Inspected weekly and all expended items replaced immediately.
- 5.3.2. If outside medical assistance cannot arrive on site within five (5) minutes, someone must be trained and designated to administer First Aid.
- 5.3.3. First Aid may be self-administered or on a “Good Samaritan” basis by another employee trained in First Aid requirements.
- 5.3.4. First Aid re-certification is required every three (3) years.

5.4. CARDIOPULMONARY RESUSCITATION (CPR)

5.4.1. Any employee certified in CPR may render CPR on a “Good Samaritan” basis only.

5.4.2. CPR re-certification is required every year if training is provided by the American Red Cross.

5.4.3. CPR re-certification is required every two (2) years, if training is provided by the American Heart Association and the National Safety Council.

5.5. BLOODBORNE PATHOGENS

5.5.1. When there is a possibility of coming into contact with blood, saliva, or other bodily fluid, the person performing First Aid/CPR must use:

5.5.1.1. Exam Quality Gloves for First Aid.

5.5.1.2. Exam Quality Gloves and a Mouthpiece for CPR.

5.5.1.3. Face Shield/Barrier Device.

5.5.2. All incidents should be reported to Management for recordkeeping purposes when there is contact between a victim’s bodily fluids and an employee providing assistance on a “Good Samaritan” basis, or an emergency responder.

5.6. TAKE UNIVERSAL PRECAUTIONS:

5.6.1. Treat all blood and other potentially infectious body fluids as if they were infected:

5.6.2. DO:

5.6.2.1. Cover cuts, rashes, and broken skin.

5.6.2.2. Wash hands and exposed skin with soap and water immediately after exposure to infectious materials or after taking off gloves or other Personal Protective Equipment (PPE).

5.6.2.3. Use antiseptic cleansers or towelettes only if washing facilities aren’t available.

5.6.2.4. Minimize splashing, spraying or spattering of blood droplets or other potentially infectious materials.

5.6.2.5. Place contaminated sharp items in assigned labeled, puncture-resistant, leak proof containers.

5.6.3. DON’T:

5.7. Don’t shear or break contaminated needles or other sharps, and don’t bend, recap, or remove, unless specifically instructed.

5.7.1. Don’t keep food or drink in work areas with exposure potential.

5.7.2. Don't eat, drink, smoke, apply cosmetics or lip balm, or handle contact lenses in work areas with exposure potential.

5.7.3. Don't pipette or suction potentially infectious materials with your mouth.

5.7.4. OSHA requires containers of potentially infectious materials to be Red, or Labeled clearly in orange or orange-red with biohazard symbol, or both.

5.8. EMERGENCY GUIDELINES

SITE SUPERINTENDENT/COMPETENT PERSON RESPONSIBILITIES:

5.8.1. PREPARATION FOR AN EMERGENCY:

5.8.1.1. Post emergency telephone numbers on site and make all employees aware of its location.

5.8.1.2. Identify and establish a roll call area for employees to meet following an emergency situation.

5.8.1.3. Keep a daily record of all employees on site.

5.9. WHEN AN EMERGENCY OCCURS:

5.9.1. Call the appropriate emergency service and contact the Project Manager immediately.

5.9.2. Restrict access and secure the emergency area.

5.9.3. Try to determine the nature of the emergency, the number of people, the area of property and/or type of equipment affected.

5.9.4. Contact any homes or businesses adjacent to the worksite that may be affected.

5.9.5. Take control of the worksite and assign tasks as necessary.

5.9.6. Visually inspect the entire project to ensure that it is free of hazards that could cause further injury (traffic, electrical hazards, etc.) and take measures to eliminate hazards that are observed

5.9.7. Do not require employees to provide First Aid/CPR. Ensure that it is provided on a "Good Samaritan" basis only.

5.10. FOLLOWING AN EMERGENCY:

5.10.1. Do not allow work to resume until the area has been made safe.

5.10.2. Ensure an Accident Investigation is conducted.

5.10.3. Ensure that any damage to property, buildings or equipment is repaired prior to reentry or use by employees.

5.11. EMPLOYEES RESPONSIBILITIES:

5.11.1. WHEN AN EMERGENCY OCCURS:

5.11.1.1. Take no unnecessary risk.

5.11.1.2. Immediately leave the accident area, if you cannot or will not, if trained, provide First Aid or have not been assigned an emergency task.

5.11.1.3. Proceed to the previously designated area for a roll call, if not assigned specific duties.

5.11.1.4. If requested, assist the Site Superintendent/Competent Person and conduct such assistance in the safest possible manner, using all required PPE.

5.11.2. Give no statements to anyone regarding the accident without consulting Management.

5.12. FIRE PREVENTION & PROTECTION

5.12.1. FIRE EXTINGUISHERS

5.12.1.1. Fire extinguisher, rated not less than 10B, must be within fifty (50) feet of the location of more than five (5) gallons of flammable or combustible liquids and where five (5) pounds or more flammable gas are being used on the job-site.

5.12.1.2. Only employees who have received documented fire extinguisher training within the past twelve (12) months should use fire extinguishers.

5.12.1.3. All fire extinguishers subjected to freezing must be properly protected.

5.12.1.4. The Site Superintendent/Competent Person or his designee must inspect monthly all fire extinguishers. All fire extinguishers must also be inspected and tagged yearly.

5.12.1.5. All fire extinguishers must be properly mounted for easy access.

5.12.2. FLAMMABLE AND COMBUSTIBLE MATERIALS

5.12.2.1. Store and handle flammable and combustible materials with regard to their fire characteristics.

5.12.2.2. Materials must be clearly labeled.

5.12.2.3. Store flammable liquids outdoors in an approved manner and dispense only in approved safety containers.

5.12.2.4. Separate and store combustible materials or equipment in non-combustible containers properly.

5.12.2.5. Do not store more than a one (1) day supply of combustible materials or containers in one (1) location on site. Locate supplemental firefighting equipment in the vicinity of these containers and materials.

5.12.3. FLAMMABLE AND COMBUSTIBLE STORAGE

5.12.3.1. Flammable and combustible liquids must be stored and transported in approved and properly labeled containers.

5.12.3.2. Only approved metal safety cans must be used for the handling and use of flammable liquids in quantities of five (5) gallons or less. For quantities of one (1) gallon or less, the original manufacturer's container may be used for storage, use, and handling of flammable liquids.

5.12.3.3. An approved metal safety can with more than a five (5) gallon capacity must have a flash arresting screen, spring closing lid and spout cover and is so designed that it will safely relieve internal pressure when subjected to fire exposure.

5.12.3.4. When twenty-five (25) or more gallons of flammable or combustible liquids are stored, approved storage cabinets or tanks must be used. All applicable fire protection regulations must be complied with.

5.12.3.5. Smoking, hot work or open flames are prohibited in flammable and combustible storage or transfer areas. These areas must be properly posted.

5.12.3.6. Storage of flammable or combustible liquids outside of buildings must be separated from all structures by a minimum of twenty (20) feet. No more than 1,100 gallons will be stored in any one area. Storage areas must be diked to contain spills and graded to divert spills away from structures and underground work areas.

5.12.3.7. Flammable and combustible storage areas must be posted as "NO SMOKING" areas. These storage areas must be fenced or contained in order to prevent unauthorized entry.

5.12.3.8. All inside storage areas for flammable and combustibles must meet or exceed the fire resistance and protection requirements. No more than sixty (60) gallons of flammable and one hundred twenty (120) gallons of combustible liquids may be stored in an indoor approved storage cabinet.

5.12.3.8.1. All work areas must be kept free from debris and material that could possibly constitute a fire hazard. All work areas must be cleaned as necessary to prevent any accumulation of materials and trash. All trash and scrap must be properly stored and/or disposed of in accordance with all applicable federal, state and local laws.

5.12.3.9. Proper safety waste cans must be provided and oily rags, combustible materials, rubbish and debris must be disposed of daily.

5.12.3.10. Temporary firefighting or fire protection equipment must be replaced immediately after use, and removed when the work is complete.

5.12.3.11. Do not fuel equipment while the motor is running.

5.13. **TEMPORARY HEATING EQUIPMENT**

5.13.1. Heaters must bear the UL label (or approved equal).

5.13.2. Trained personnel will be in attendance at all times while heaters are in operation.

5.13.3. A tip-over, shut-off device must be included for space heating equipment.

5.13.4. Do not place clothing or flammable items on or near heaters.

5.14. **ADVERSE WEATHER**

In the event of adverse weather conditions, the Site Superintendent/Competent Person or Project Manager will determine if work can continue without compromising the health and safety of field personnel. Operations shall be suspended until the adverse weather condition no longer exists. Site activities will be limited to daylight hours (unless adequate artificial lighting is provided) and acceptable weather conditions. Inclement working conditions include heavy rain or snow; fog, high winds, and lightning

5.14.1. **REQUIREMENTS**

5.14.2. Projects are to prepare for severe weather problems (hurricane, tornado, and windstorm (etc.)) as soon as possible.

5.14.3. Each project shall have an emergency phone contact list showing the emergency phone numbers of key project personnel. All loose trash shall be removed from the site and exposed areas swept clean.

5.14.4. All loose materials shall be secured or removed from exposed areas. Flying materials constitute a major hazard to employees and property.

5.14.5. Loose materials like gravel and nails shall be placed in tightly closed containers and secured or removed from exposed areas if possible.

5.14.6. Exposed glass should be taped or covered with plywood.

5.14.7. Anticipate and order equipment or supplies needed after the storm for cleanup: i.e. pumps, generators, rope, wire, fuel, plastic, hose, electric cords, etc.

5.14.8. Fill water jugs for drinking water. Ensure there is an adequate supply for a few days.

- 5.14.9. Secure or remove barricades to prevent wind damage.
- 5.14.10. Take pre-storm pictures of the site and structures to assist in documenting storm damage. Take pictures of the area surrounding the job-site, job-site conditions after the job is secure, and the condition of other construction work near the site. These pictures can assist in determining responsibility for damage to surrounding structures.
- 5.14.11. Halt shipment of non-essential materials to the job-site when storm warnings are first received. This will prevent additional material from arriving after the job has been secured.
- 5.14.12. Make sure all site communications are in operating order; issue radios (*fully charged*), as necessary, to key personnel.
- 5.14.13. Store expensive materials and equipment inside secure structures or protected areas.
- 5.14.14. Plan at what point of the storm's intensity electrical power should be shut down and to what areas. Be sure that local utility repair crews are aware of any critical need required for the job-site.
- 5.14.15. When using backup generators, be sure to plug equipment directly into a properly grounded generator. DO NOT connect the generator to the building circuits. Such connections will feed power into the power company utility grid.
- 5.14.16. Maintain an adequate number of employees to handle emergencies if the site or critical operations are to be maintained during storms. Adequate shelter, communications, provisions and emergency supplies need to be available.
- 5.14.17. When a site is to be completely shut down consider arrangements for site security.
- 5.14.18. Consider arrangements with a local radio station to keep employees apprised of site closing, emergencies and return to work calls. Be sure that each employee receives instructions on which station to tune-in and what steps to take in response to the information broadcast.
- 5.14.19. Whenever possible, water flow should be diverted away from underground structures to prevent flooding.
- 5.14.20. After the storm has passed all areas of the project site shall be inspected to identify and abate any hazardous conditions before work resumes.

6. LEAD

***IF LEAD IS ENCOUNTERED THE REQUIREMENTS OF
CFR**

29 ART 1926.62 WILL BE ADHERED.

WORKING SAFELY WITH LEAD

To work with lead and/or lead containing materials, OSHA has established that engineering and work practice controls should be implemented. Engineering controls including include removing or isolating lead and lead containing materials from workers. The most common method used is mechanical Ventilation. If ventilation is used, the system must be evaluated to maximize the effectiveness of the control method.

Work practice controls minimize exposure to workers by altering the way people perform their tasks. Safe work practices include personal hygiene facilities (showers, changing rooms, hand washing facilities, lunch area) and housekeeping practices.

Lead is fairly common heavy metal with a variety of industrial applications. Lead becomes airborne through mechanical or chemical disturbance. Lead dust and/or vapors enter the human body either through inhalation or ingestion. The gastrointestinal tract, central nervous system, kidneys, blood, and gums are targets of lead exposure. Symptoms of exposure include lassitude, insomnia, constipation, abdominal pain, colic, anemia, hypertension, anorexia, low body weight, malnutrition, pallor, and paralysis of the wrist.

7. HEALTH & SAFETY TRAINING

7.1. PURPOSE

Health and Safety Training is intended to address specific training requirements and Valiant Energy Service, LLC philosophy regarding safety by reviewing the issues of general hazards, importance of safety, maintenance of safety, protection against hazards, and general safety practices. OSHA 29 CFR 1926 regulations and standards cover every aspect of work conducted. These regulations establish uniform requirements, which ensure a safe working environment for employees and a healthy environment for the surrounding communities.

7.2. SAFETY ORIENTATION

7.2.1. Each employee shall receive an orientation/indoctrination upon hire. The orientation is designed to provide the employee with information about the company work rules and safety requirements as well as emergency procedures specific to a project. OSHA requires employers to provide basic safety education to employees on a continuing basis. The orientation outline contains the minimum basic information needed to comply with the training requirement.

7.3. TRAINING

7.3.1. COMPETENT PERSON TRAINING

7.3.1.1. Consistent with OSHA 29 CFR 1910.120 paragraph (e)(8), the individual designated as Site Superintendent/Competent Person require an additional eight (8) hours of training. This course includes information on all relevant subjects such as: Regulatory Requirements, Personnel Management, Project Supervision, Health and Safety Plans, and Monitoring Methods.

7.3.2. SITE SPECIFIC TRAINING

7.3.2.1. All workers assigned to a site will participate in site-specific training. This training will cover all the major items found in the program Health & Safety Plan (HASP) as well as procedures pertaining to an individual's specific job responsibilities and tasks.

7.3.3. HAZARD COMMUNICATION TRAINING

7.3.3.1. OSHA's standard for hazard communication requires that all workers be informed of potentially hazardous materials used in their work area. Each employee shall be provided with information and training on hazardous chemicals at their work site at the time of their initial assignment, annually, and whenever a new chemical is introduced into their work site that could present a potential hazard. Please refer to Hazardous Communication Program. (Section HAZCOM). Employee Hazard Communication Training shall be conducted at the beginning of each project. Newly hired personnel will be briefed on the general requirements of the OSHA Hazard

Communication Standard and duty specific hazards by the Site Superintendent/Competent Person before they begin any duties on the work site. Personnel transferred from another site will also be briefed on the duty specific hazards by the Site Superintendent/Competent Person before they begin any duties on the work site.

7.3.4. FIRST AID/CARDIOPULMONARY RESUSCITATION

The Site Superintendent /Competent Person and other essential personnel engaged in field activities on site will be required to complete First Aid and Cardiopulmonary Resuscitation (CPR) training and receive the appropriate certification. First Aid recertification is required every three (3) years.

7.3.4.1. CPR recertification every two (2) years, if training is provided Applegate Associates.

7.3.4.2. CPR recertification every two (2) years, if training is provided by the American Heart Association and the National Safety Council.

7.3.4.3. However, if training is provided by the American Red Cross. CPR recertification is required every one (1) year.

7.3.5. CONFINED-SPACE-ENTRY TRAINING

7.3.5.1. Training will be provided to employees who may have to enter confined spaces such as tanks, vessels, stacks, pits, silos, boilers, ducts, manholes, sewers, underground utility vaults, pipelines, and any open-top-space four (4) feet or more in depth that is not subject to adequate ventilation.

7.3.6. FALL PROTECTION TRAINING

7.3.6.1. All employees shall be trained in the hazards of fall protection and the specific type of fall protection to be used for their task.

7.4. LEAD

7.4.1. If work activities include lead abatement, the Site Superintendent/Competent Person or the designee shall be qualified as a competent person in accordance with CFR 29 Part 1926.62, be certified and/or licensed according to state requirements, and have experience in the administration and supervision of lead abatement projects, including work practices, protective measures for building and personnel, and disposal procedures. Training will include a supervisor and monitoring abatement course by an accredited EPA training center.

7.5. DOCUMENTATION

7.5.1. All training records, certification, and/or accreditation documentation will be maintained in the main office of Valiant Energy Service, LLC.

8. HAZARD COMMUNICATION PROGRAM

THIS WRITTEN HAZARD COMMUNICATION PROGRAM IS AVAILABLE TO ALL EMPLOYEES AND WILL BE MAINTAINED ON SITE. MATERIAL SAFETY DATA SHEETS AND CHEMICAL INVENTORY LISTINGS ARE TO BE MAINTAINED ON SITE AS WELL.

8.1. PURPOSE

This procedure provides direction to ensure the protection of VALIANT ENERGY SERVICE, LLC employees from the dangers associated with hazardous chemicals and materials in the workplace, in accordance with the Hazard Communication Standard.

8.2. SCOPE

This procedure is applicable to all employees on VALIANT ENERGY SERVICE, LLC projects. These instructions describe the requirements for training, material safety data sheets (MSDS), product labels and procedures for covering the hazards of routine and non-routine tasks. These instructions also designate personnel responsible for the implementation and continued compliance of the hazard communication program.

8.3. IMPLEMENTING PERSONNEL

The following personnel have specific duties to perform to ensure the implementation of this program.

8.4. PROJECT MANAGER

The Project Manager Shall:

8.4.1. Ensure that employees under his/her direction are properly trained and the training is documented prior to the start of any work on the job site.

8.4.2. Ensure any employee who is not trained in the Hazard Communication Program is trained and document the training using the Employee Training Record. (Attachment #2).

8.4.3. Maintain Employee Training Records of all employees trained in the Hazard Communication Program.

8.5. SITE SUPERINTENDENT/COMPETENT PERSON

The Site Superintendent/Competent Person Shall:

8.5.1. Implement the Hazard Communication Program.

8.5.2. Ensure that employees under his/her direction are properly trained and the training is documented prior to the start of any work on the job site.

8.5.3. Ensure any employee who is not trained in the Hazard Communication Program is trained and document the training using the Employee Training Record. (Attachment #2).

8.5.4. Ensure that all hazardous chemicals on his job site are properly labeled and use of the material is not allowed until proper labeling is complete.

8.6. EMPLOYEE TRAINING

OVERALL AWARENESS TRAINING

8.6.1. All employees who have a potential to be exposed to hazardous chemicals must be trained in the following:

- 8.6.1.1. How the Hazard Communication Program is implemented in the workplace.
- 8.6.1.2. How to read and interpret information on labels and the Material Safety Data Sheet.
- 8.6.1.3. How to obtain and use the available hazard communication information.
- 8.6.1.4. The hazards related to the chemicals in their work area.
- 8.6.1.5. Protective measures employees can take to protect themselves in the workplace.
- 8.6.1.6.** Methods and observations to detect the presence of a hazardous chemical.

8.7. ROUTINE AND NON-ROUTINE WORK TRAINING

8.7.1. All personnel who work with hazardous materials for routine and non-routine work will receive this additional training:

- 8.7.1.1. A hazard analysis of the work.
- 8.7.1.2. What the hazardous ingredients of the materials are as stated on the MSDS.
- 8.7.1.3. How to recognize exposures as stated on the MSDS.
- 8.7.1.4. The required Personal Protective Equipment (PPE) as stated on the MSDS.
- 8.7.1.5. The reaction of other materials with a hazardous material as stated on the MSDS.
- 8.7.1.6.** Physical hazards of the material.

8.8. EMPLOYEE INFORMATION

8.8.1. All employees must be informed of (Attachment #1) and trained (Attachment #2) in this Hazard Communication Program.

8.8.2. Upon completion of training, they should receive a written copy of this program.

8.8.3. The Site Superintendent is responsible for implementing and making sure that all the workers on his site have been trained in the Hazard Communication Program.

8.9. HAZARDOUS MATERIAL

8.9.1. IDENTIFICATION

8.9.2. All containers of hazardous chemicals that are stored on any VALIANT ENERGY SERVICE, LLC work site must be properly labeled in English.

8.9.3. The labels vary in content and in appearance, but must all contain the following:

8.9.3.1. Identification of the material.

8.9.3.2. Appropriate hazard warnings.

8.9.3.3. Name and address of Producer.

8.9.4. If a warning label from a hazardous chemical is missing, the Site Superintendent or his designee must be responsible for obtaining the necessary warning label information and attaching it to the container.

8.9.5. The Site Superintendent must not allow use of this material until the above steps have been carried out.

8.9.5.1. Chemicals may be transferred from a bulk container to a smaller temporary container for the purpose of immediate use by a worker during his work shift only.

8.9.6. The temporary container must be an approved container for use of the transferred material and must clearly display the appropriate warnings/labeling.

8.9.7. The temporary container is only "TEMPORARY". It may not be used for storage of the chemical.

8.10. INVENTORY

8.10.1. The Site Superintendent must maintain an accurate inventory of all hazardous materials used or stored on his job site and submit to the main office annually.

8.10.2. The chemical inventory sheet for each chemical (Attachment #3) must be completed with the required information. This may serve as a Table of Contents in a notebook kept readily available on each work site.

8.10.3. The Hazardous Material must be entered alphabetically in the notebook.

8.10.4. Any information on new materials and chemicals must be added to the inventory sheet when that item is purchased and brought on site.

8.10.5. When new material is purchased or brought on the job-site a MSDS for that specified material must be supplied to the Site Superintendent by the Project Manager, along with the written requirements for its use (Attachment #4).

8.10.6. Updating of the MSDS must be done on a regular basis by the Site Superintendent.

8.10.6.1. ONLY CHEMICALS THAT ARE ON-SITE REQUIRE AN UPDATED MSDS. The number and quantity of chemical stored on-site is to be limited to immediate need and must be stored in accordance with the recommendations on the Material Safety Data Sheet. (MSDS).

8.10.7. If any material is discovered on site that does not have a corresponding, updated MSDS, that item must not be used and must be placed on hold until an updated or corresponding MSDS is made available. Upon receiving the corresponding MSDS it must be reviewed before the material may be put back into use.

8.10.8. The Site Superintendent is responsible to ensure that the MSDS is then included in the notebook and placed on the Hazardous Materials Inventory list.

8.11. ATTACHMENTS

8.11.1. Attachment #1 - Employee Notification of Hazard Communication Program

8.11.2. Attachment #2 - Employee Training Record

8.11.3. Attachment #3 - Chemical Inventory Record

8.11.4. Attachment #4 - Written Approval Form

Hazard Communication Program Employee Notification

Attachment #1

Job:

Address:

To: All Employees

It is the policy of VALIANT ENERGY SERVICE, LLC to comply with the Hazard Communication Standard. This standard requires that hazard information must be communicated to all employees who work with hazardous materials, through labels, updated MSDS and formal training.

As part of this policy, VALIANT ENERGY SERVICE, LLC has provided a written copy of the Hazard Communication Program. This program is intended to help employees understand the precautions taken to effectively inform you of your rights as well as that of your coworkers and the public. The following are the job-site requirements of this program:

- A written Hazardous Communication Program
- Warning labels on containers
- Hazardous Chemical Inventory list
- Material Safety Data Sheets
- Employee training and information

If there are any questions about this program, they may be directed to the Site Superintendent/Competent Person.

June 1, 2024

Hazard Communication Program Employee Training Record

Attachment #2

Employee Name: _____

Employee I.D. # or S.S. #: _____

Date of training: _____

Was the information covered in this training session informative?

Did employee receive hand-outs pertaining to hazardous chemical?

I certify that I attended the Hazard Communication training as stated on this form. I am also aware that any other information is readily available and that the Site Superintendent/Competent Person can answer any further questions.

Employee Signature

I certify that the above named employee received the training indicated on this form.

Trainer's Signature

Date

June 1, 2024

Hazard Communication Program Inventory of Chemical's

Attachment #3

Site: _____

Date_____

Product Name	Manufacturer / Supplier	Location Stored	Quantity on Hand GAL / LBS	Annual Usage GAL / LBS	MSDS on File & Issue Date

GAL – Liquids
LBS - Solids

June 1, 2024

**Hazard Communication Program
Written Approval for Chemical Use**

Attachment #4

Date: _____

Site: _____

Product Name: _____

The Management of VALIANT ENERGY SERVICE, LLC has reviewed the MSDS for the requested material and has arrived at the following conclusions:

_____ The material may be used provided all the requirements of the Hazard Communication Program and the MSDS are followed.

_____ The material is too toxic. Find an alternate material.

_____ There are no alternatives. The material may be used however the exposure must be maintained as identified on the MSDS in allowable limits. Appropriate Personnel Protective Equipment must be used as suggested on the MSDS.

Name: _____

Title: _____

Management of VALIANT ENERGY SERVICE, LLC

June 1, 2024

9. AERIAL LIFTS

CFR 1926.453

9.1. GENERAL

9.1.1. Aerial Lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to job-sites above ground:

9.1.2. Extensible Boom Platforms

9.1.2.1. Aerial Ladders

9.1.2.2. Articulating Boom Platforms

9.1.2.3. Vertical Towers

9.1.3. Aerial equipment may be made of metal, wood, fiberglass reinforced plastic (FRP), or other material; may be powered or manually operated; and are deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.

9.1.4. Prior to use, all personnel must be trained and demonstrate competency to safely operate an aerial device.

9.1.5. Aerial lifts may be "field modified" for uses other than those intended by the manufacturer provided the modification has been certified in writing by the manufacturer or by any other equivalent entity, such as a nationally recognized testing laboratory, to be in conformity with all applicable provisions of ANSI A92.2-1969 and this section and to be at least as safe as the equipment was before modification.

9.1.6. All personnel will read and adhere to all warning placards on the machines and will become familiar with operator's manual.

9.1.7. A malfunctioning lift will not be operated until repaired as per manufacturer's recommendations. The equipment will be clearly tagged "out of service" and the Competent Person will be promptly notified. The ignition keys will be removed and secured.

9.1.8. The control functions will be plainly marked.

9.1.9. The equipment will only be used on level ground.

9.2. INSPECTIONS

9.2.1. A pre-start inspection will be conducted. The operator will be responsible to ensure this has occurred. The following will be checked:

9.2.1.1. All welds between cylinders and booms for cracks or wear.

9.2.1.2. Pivot pins for security of their locking devices.

9.2.1.3. Exposed cables, sheaves and leveling devices for wear and secure attachment.

9.2.1.4. Hydraulic system for frayed hoses and leaks.

9.2.1.5. Lubrication and fluid levels.

- 9.2.1.6. Boom and basket for cracks or abrasions.
- 9.2.1.7. Load capacity posting.
- 9.2.1.8. Operate boom from ground controls through one complete cycle. Check for unusual noises and uncontrolled movements.

9.3. USE

9.3.1. When using a bucket or other aerial device:

- 9.3.1.1. Ensure that no one is in the area before lowering stabilizers, outriggers or the boom.
- 9.3.1.2. Ensure that each axle is horizontal when vehicle is parked on a hill. Work with the boom pointed uphill beyond the vehicle center.
- 9.3.1.3. Protect a roadway job site with traffic warning signs, lights and barricades. Determine if extended boom movements will interfere with traffic.
- 9.3.1.4. Secure all tools when not in use.
- 9.3.1.5. Maintain the recommended distance from electrical wires unless you and the bucket are certified for electrical work.
- 9.3.1.6. Face the direction of travel.
- 9.3.1.7. Operate hydraulic controls slowly for smooth platform motion.

9.4. DO NOT

- 9.4.1. Stand on top of a bucket or use planks or ladders to gain extra height.
- 9.4.2. Enter or leave a bucket by walking on the boom.
- 9.4.3. Exceed the rated load limit.
- 9.4.4. Ride from one job to another in the bucket.
- 9.4.5. Climb from bucket to another elevated position without being secured to new position.
- 9.4.6. Work above other workers. Clear the area below.
- 9.4.7. Throw tools to or from an elevated bucket.
- 9.4.8. Attempt to slow any air or hydraulic leak by using your hand or body.

9.5. LADDER TRUCKS AND TOWER TRUCKS

9.5.1. 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.

9.6. EXTENDABLE AND ARTICULATING BOOM PLATFORMS

9.6.1. Lift controls must be tested each day prior to use to determine that such controls are in safe working condition.

9.6.2. Only authorized and properly trained persons will be permitted to operate an aerial lift.

9.6.3. Belting off to an adjacent pole, structure or equipment while working from an aerial lift will not be permitted

9.6.4. All employees will always stand firmly on the floor of the basket and will not be permitted to sit or climb on the edge of the basket or use planks, ladders or other devices for a work position.

9.6.5. A body harness must be worn and a lanyard attached to an approved anchorage provided in the basket when working from an aerial lift.

9.6.6. Boom and basket load limits specified by the manufacturer will not be exceeded.

9.6.7. The brakes must be set and when outriggers are used, they must be positioned on pads or a solid surface. Wheel chocks must be installed before using an aerial lift on an incline provided they can be safely installed.

9.6.8. An aerial lift truck must not be moved when the boom is elevated in a working position with men in the basket, except for equipment which is specifically designed for this type of operation.

9.6.9. Climbers must not be worn while performing work from an aerial lift.

9.6.10. Articulating boom and extensible boom platforms, primarily designed as personnel carriers, must have both platform (upper) and lower controls. Upper controls must be in or beside the platform within easy reach of the operator. Lower controls must provide for overriding the upper controls. Controls must be plainly marked as to their function. Lower level controls must not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

9.6.11. The insulated portion of an aerial lift must not be altered in any manner that might reduce its insulating value.

9.6.12. Before moving an aerial lift for travel, the boom(s) must be inspected to see that it is properly cradled and outriggers are in stowed position.

10. MATERIAL HOISTS

- 10.1. The operating rules must be established and posted at the operator's station of the hoist. The operating rules will include signal system and allowable line speed for various loads. Rules and notices must be posted on the car frame or crosshead in a conspicuous location, including the statement "No Riders Allowed." Do not stand underneath load or nearby when hoist is in operation.
- 10.2. No person will be allowed to ride on material hoists except for the purposes of inspection and maintenance.
- 10.3. All entrances of the hoist ways must be protected by substantial gates or bars, which must guard the full width of the landing entrance. All hoist way entrance bars and gates must be painted with diagonal contrasting colors, such as black and yellow stripes.
 - 10.3.1. All bars will not be less than 2 by 4-inch wooden bars or the equivalent, located 2 feet from the hoist way line. Bars must be located not less than 36 inches nor more than 42 inches above the floor.
 - 10.3.2. Gates or bars protecting the entrances to hoistways must be equipped with a latching device.
 - 10.3.3. Overhead protective covering of 2-inch planking, ¾-inch plywood or other solid material of equivalent strength will be provided on the top of every material hoist cage or platform.
 - 10.3.4. The operator's station of a hoisting machine will be provided with overhead protection equivalent to tight planking not less than 2 inches thick. The support for the overhead protection will be of equal strength.
 - 10.3.5. Hoist towers may be used with or without an enclosure on all sides. However, whichever alternative is chosen, the following applicable conditions must be met:
 - 10.3.5.1. When a hoist tower is enclosed, it shall be enclosed on all sides for its entire height with a screen enclosure of 1/2 inch mesh, No. 18 gauge wire or equivalent, except for landing access.
 - 10.3.5.2. When a hoist tower is not enclosed the hoist platform or car shall be totally enclosed on all sides for the full height between the floor and the overhead protective covering with 1/2 inch mesh of No. 14 gauge wire or equivalent. The hoist platform enclosure must include the required gates for loading and unloading. A 6-foot high enclosure shall be provided on the unused sides of the hoist tower at ground level.
- 10.4. Car arresting devices shall be installed to function in case of rope failure.

11. COMPRESSED GAS CYLINDERS

CFR 1926.350 (a-i)

11.1. GENERAL

Cylinders containing compressed gases at high pressures are designed to comply with strict government specifications. However, intentional misuse and/or abuse of the cylinders can result in a potential hazardous situation. The safe handling, storage, and use of compressed gases whenever personnel work with or around compressed gas cylinders ensure a hazard free condition.

11.2. DEFINITIONS

- 11.2.1. **Asphyxiant:** A gas or an agent that produces a decrease of oxygen and increase of the carbon dioxide level in the blood stream.
- 11.2.2. **Flammable Gas:** A gas that is flammable when mixed with air in concentrations of 13 percent or less by volume in air.
- 11.2.3. **Inert Gas:** A gas that is a simple Asphyxiant that displaces oxygen in the air necessary to sustain life. Inert gases can cause rapid suffocation due to resultant oxygen deficiency.
- 11.2.4. **Small Compressed Gas Cylinder:** A cylinder having a maximum water capacity of 1000 lb. (i.e., 120 gallons) or less.
- 11.2.5. **NFPA:** National Fire Protection Association.

11.3. TRANSPORTING, MOVING & STORING COMPRESSED GAS CYLINDERS

- 11.3.1. The valve protection caps must be in place and secure at all times when the cylinder is not in use.
- 11.3.2. When cylinders are to be hoisted, they must be secured on a cradle, sling-board, or pallet. No cylinder will be hoisted or transported by means of magnets or choker slings.
- 11.3.3. All cylinders must be moved by tilting and rolling them on their bottom edges.
- 11.3.4. At no time should they be intentionally dropped, struck or permitted to strike each other.
- 11.3.5. During transportation of cylinders in vehicles, the cylinders must be secured in a vertical position.
- 11.3.6. At no time will the valve protection caps be used for lifting cylinders from one vertical position to another. Bars must not be used under valves or valve protection caps to pry cylinders loose when frozen. ONLY WARM WATER can be used to thaw cylinders.
- 11.3.7. Unless the cylinders are in a special carrier intended for cylinders, regulators must be removed and valve protection caps put in place before cylinders are moved.

- 11.4. A special carrier intended for cylinders, chain or other steadying device must be used to keep cylinders from being knocked over while in use.
- 11.5. The cylinder valve must be closed when work is finished, cylinders are empty or cylinders are moved.
- 11.6. All compressed gas cylinders must be stored & secured in an UPRIGHT position at all times.
- 11.7. The acetylene and oxygen cylinders must be stored apart from one another by a minimum distance of 20 feet or by a five (5)-foot high non-combustible barrier.

11.8. **HANDLING COMPRESSED GAS CYLINDERS**

- 11.8.1. Compressed gas cylinders shall not be used in areas where the cylinder tank may come in contact with any sparks or flames.
- 11.8.2. Compressed gases contained within a cylinder are under extremely high pressure. Therefore, whenever gas is to be withdrawn from a cylinder, pressure reducing valves shall be used. Under no circumstances is gas to be removed from a cylinder without the use of a pressure reducing valve.
- 11.8.3. All cylinder connections, hoses, valves, etc., shall be inspected prior to using the compressed gas cylinder. All connections shall be tight with no leaks. The damaged and/or deteriorated cylinder, valves, couplings, hoses, etc., shall not be used.
- 11.8.4. When opening cylinder valves, gas outlets shall always be pointed away from the user and any other facility personnel standing in the immediate usage area. 5. All cylinder valves shall be Opened slowly using only approved wrenches for the cylinder as provided by the supplier.
- 11.8.5. When using a compressed gas cylinder, the operating wrench shall remain on the cylinder valve at all times.
- 11.8.6. All compressed gas-cylinder valves, couplings, hoses, etc., shall not be lubricated or allowed to come in contact with oil and/or grease.
- 11.8.7. Cylinders of compressed gases shall not be placed in areas where there may be oil and/or grease nor handled with oily and/or greasy hands.
- 11.8.8. After each use of a compressed gas, the cylinder valve shall be fully closed and all gas remaining in the regulator valve shall be slowly purged. The regulator valve shall be removed, the cylinder valve cap shall be installed, and the cylinder tank shall be removed from the work area and returned to its proper storage location.
- 11.8.9. If the contents of a compressed gas cylinder are depleted, the cylinder valve shall be fully closed, and the valve protection cap shall be reinstalled. The cylinder tank shall be

appropriately marked with an EMPTY TANK, sign and the tank shall be stored in a secured upright position.

11.9. PLACING CYLINDERS

11.9.1. Cylinders must be kept far enough away from the actual welding or cutting operations so that sparks, hot slag or flame will not reach them. If this is not possible, fire resistant shields must be provided.

11.9.2. All cylinders must be placed where they cannot become part of an electrical circuit. It is prohibited to strike an electrode against a cylinder to strike an arc.

11.9.3. Fuel gas cylinders must be placed with valve end up whenever they are in use. The fuel gas cylinder must not be placed in any location where they would be subjected to open flame, hot metal or other sources of artificial heat.

11.9.4. AT NO TIME WILL CYLINDERS CONTAINING OXYGEN, ACETYLENE OR OTHER FUEL GAS BE PERMITTED INTO CONFINED SPACES.

11.10. TREATMENT OF CYLINDERS

11.10.1. No cylinder will be permitted, whether full or empty, to be used as rollers or supports.

11.10.2. It is strictly prohibited to mix gases or refill a cylinder. This must only be done by the supplier of the cylinder.

11.10.3. THE CONTENTS OF ANY CYLINDER SHOULD ONLY BE USED FOR PURPOSES INTENDED BY THE SUPPLIER.

11.10.4. At no time during work operations are employees permitted to use a damaged or defective cylinder.

11.11. USE OF FUEL GAS

11.11.1. All employees using fuel gas must be thoroughly instructed in its safe use.

11.11.2. Before a regulator to a cylinder valve is connected, the valve must be opened slightly and closed immediately. This action is termed "**cracking**" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator. The employee cracking the valve must stand to one side of the outlet, **not in front of it**. The valve of a fuel gas cylinder must **not be cracked** where the gas could reach welding work, sparks, flame, or other possible sources of ignition.

11.11.3. The cylinder valve must always be opened slowly to prevent damage to the regulator. A special wrench must be left in position on the stem of the valve, while the cylinder is in use, so that the fuel gas flow can be shut off quickly in case of an emergency. In manifolded or coupled cylinder a special wrench must always be available for immediate use.

11.11.4.Nothing is permitted to be placed on top of a fuel gas cylinder when in use that may damage the safety device or interfere with the quick closing of the valve in an emergency.

11.11.5.Before a regulator is removed from a cylinder valve, the cylinder valve must always be closed and the gas released from the regulator.

11.11.6.In the event a leak is found around the valve stem, the valve must be closed and the gland nut tightened. If this does not stop the leak, the use of the cylinder must be discontinued, properly tagged and immediately removed from the work area. In the event fuel gas should leak from the cylinder valve, rather than from the valve stem and the gas cannot be shut off, the cylinder must be properly tagged and removed from the work area.

11.11.7.In the event a leak should develop at a fuse plug or other safety device, the defective cylinder must be removed from the work area immediately.

11.12. FUEL GAS AND OXYGEN MANIFOLDS

11.12.1.Fuel gas and oxygen manifolds must bear the name of the substance it contains. Letters at least one (1) inch high should either be painted on the manifold or on a sign that can be permanently attached.

11.12.2.Fuel gas and oxygen manifolds must be placed in safe, well-ventilated and accessible locations. AT NO TIME SHOULD FUEL GAS AND OXYGEN BE PERMITTED WITHIN ENCLOSED SPACES.

11.12.3.Manifold hose connections, including both ends of the supply hose that lead to the manifold, must be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. ADAPTERS MUST NOT BE USED TO PERMIT THE INTERCHANGE OF HOSE. Hose connections must be kept free of grease and oil.

11.12.4.When not in use, all manifold and header hose connections must be capped.

11.12.5.Placing anything on top of a manifold, which will damage the manifold or interfere with the quick closing of the valves, is not permitted.

11.13. HOSES

11.13.1.Fuel hoses and oxygen hoses must be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses must not be interchangeable. Any single hose having more than one (1) gas passage must not be used.

11.13.2.In the event that parallel sections of oxygen and fuel gas hose are taped together, not more than four (4) inches out of twelve (12) inches shall be covered by tape in order not to interfere with distinguishing colors.

11.13.3.All hoses in use, carrying acetylene, oxygen, natural or manufactured fuel gas or any gas or substance which may ignite or enter into combustion, must be inspected at the beginning of each Working shift. Any defective hose must be removed from service.

11.13.4.All hose couplings must be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

11.13.5.All hoses, cables and other equipment must be kept clear of passageways, ladders and stairs.

11.14. **TORCHES**

11.14.1.All clogged torch tip openings must be cleaned with suitable cleaning wires, drills or other devices designed for this purpose.

11.14.2.Torches in use must be inspected at the beginning of each working shift for leaking at shutoff valves, hose couplings and tip connections. Any defective torch must not be used.

11.14.3.Torches must be lighted with a friction lighter or any other approved device. **AT NO TIME IS THE LIGHTING OF A TORCH WITH MATCHES OR OTHER HOT WORK PERMITTED.**

11.15. **REGULATORS AND GAUGES**

11.15.1.Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use.

11.16. **OIL AND GREASE HAZARDS**

11.16.1.Oxygen cylinders and fittings shall be kept away from oil or grease.

11.16.2.Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves.

11.16.3.Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

12. CONFINED SPACE ENTRY

12.1. CONFINED SPACE ENTRY STATEMENT

In recognition of the special hazards posed to workers and rescuers that enter into confined spaces, the following “Confined Space Entry” Policy and Procedures have been instituted.

12.2. CONFINED SPACE ENTRY POLICY

IN ADDITION, UNTIL THE “COMPETENT PERSON” IS ON-SITE NO ENTRY SHOULD BE MADE.

NO EMPLOYEE WILL BE PERMITTED TO ENTER A "CONFINED SPACE" WITHOUT BEING MADE AWARE OF THE HAZARD(S) RELATED TO THE WORK IN THE "CONFINED SPACE", TRAINING AND WITHOUT THE APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT.

WORK IN A "CONFINED SPACE" WILL NOT START UNTIL DOCUMENTATION HAS BEEN RECEIVED THAT THE FIRE DEPARTMENT AND THE FIRST AID SQUAD IS TRAINED AND EQUIPPED TO PERFORM "CONFINED SPACE ENTRY RESCUE". IN THE EVENT THAT THE FIRE DEPARTMENT AND THE FIRST AID SQUAD CANNOT PERFORM A "CONFINED SPACE ENTRY RESCUE" A TRAINED AND EQUIPPED RESCUE TEAM ON SITE WILL BE PROVIDED IN ACCORDANCE WITH THE PROCEDURES OUTLINED ON PAGE SIX (6) OF THIS PROGRAM.**DEFINITIONS APPLICABLE TO PROCEDURE.**

12.3. CONFINED SPACE has the following characteristics:

12.3.1. Its size and shape allow a person to enter it.

12.3.2. It has limited openings for workers to enter and exit.

12.3.3. It is not designed for continuous occupancy.

12.3.4. **PERMIT REQUIRED CONFINED SPACE** is a space such as a tank, process or treatment vessels, manholes or bin which has limited opening for entry and exit and has potential for containing a serious hazard.

12.3.5. A permit is required for any space if it:

12.3.5.1. is not designed for **continuous** human occupancy.

12.3.5.2. Is large enough and configured so that bodily entry can be performed.

12.3.5.3. Has a limited or restricted entry or access.

12.3.5.4. Contains some type of **serious** hazard.

12.3.6. Some specific examples of a confined space are:

12.3.6.1. Storage vessels

12.3.6.2. Vats

12.3.6.3. Tanks

12.3.6.4. Railroad tank cars tunnels

12.3.6.5. Pipelines

12.3.6.6. Sewers

12.3.6.7. Trenches

12.3.6.8. Furnaces

12.3.6.9. Bins

12.3.6.10. Underground utility vaults

12.3.6.11. Manholes

12.3.7. **PERMIT** - Tells what hazards are in the Permit Required Confined Space and how to control them.

12.3.8. **ATMOSPHERIC TESTING** - Testing the air in all areas and levels of the space before entry. Monitoring continuously or re-testing periodically for as long as the space is occupied and for what is appropriate for the hazard involved.

12.3.9. **OXYGEN CONTENT** - Safe oxygen content must measure between 19.5% and 23.5%.

12.3.10. **FLAMMABILITY** - < 10% LEL/LFL

12.3.11. **ENTRY SUPERVISOR** - The person that verifies that the permit form is filled out completely, that all safety steps listed on permit are taken and then signs the form. The Entry Supervisor is responsible for removing unauthorized people, canceling permit and concluding the operation.

12.3.12. **ATTENDANT** - The person that remains continuously at his post at the entry point to observe conditions and support the entrant(s). **ENTRANT(s)** - Person(s) entering confined space. entrant(s) knows the hazards of the confined space and the signs of exposure. Entrant(s) stays in periodic or constant contact with the attendant.

12.4. RESPONSIBILITIES OF ALL EMPLOYEES

12.4.1. All employees must:

12.4.1.1. Be made aware of the appropriate procedure and controls for entry if they may be exposed to confined space in the course of work.

12.4.1.2. Be made aware that unauthorized entry into a confined space is absolutely forbidden.

12.4.1.3. Be told that the consequences of unauthorized entry into a confined space can be fatal and that their senses are not enough to detect and evaluate the severity associated with atmospheric hazards in a confined space.

12.4.1.4. Be provided the opportunity to observe any monitoring and testing of permit spaces.

12.5. DUTIES OF THE ENTRY SUPERVISOR

12.5.1. To assure that the pre-entry portions of the "Confined Space Entry Permit" are completed before any entry.

12.5.2. To verify that the pre-entry condition exist, but does not actually conduct any of the testing.

12.5.3. To verify that a certified rescue team, equipped with retrieval equipment and trained in "Confined Space Entry Rescue" from the area's First Aid Squad and Fire Department is

available. In the event that the local Fire Department and/or First Aid is not trained and/or equipped,

12.5.4. A CERTIFIED RESCUE TEAM MUST BE ON STANDBY, WITH ALL OF THE NECESSARY PERSONAL PROTECTIVE EQUIPMENT AND RETRIEVAL EQUIPMENT.

12.5.5. To notify the local Fire Department and First Aid, prior to an entry, of the time, location and duration of work in a "Confined Space." This confirms that they are alerted and should be prepared for a possible rescue.

12.5.6. To confirm that appropriate means of communication are in place and operable for the entry team. Communication can be verbal, hand signals, radio or telephone.

12.5.7. To confirm that the proper isolation of the "Confined Space" is in order. Blocking, securing parts, tagout / lockout & posting of area.

12.5.8. The Entry Supervisor may also serve as an attendant.

12.6. **DUTIES OF AN ATTENDANT**

12.6.1. The Attendant must remain outside the confined space entry at all times.

12.6.2. THE ATTENDANT MUST NOT LEAVE HIS POST UNATTENDED AT ANY TIME FOR ANY REASON.

12.6.3. If the Attendant needs to leave his position, then the Attendant must call the entry team out of the "Confined Space" or have another qualified Attendant take his place.

12.6.4. The Attendant is responsible for the "Confined Space Entry Permit."

12.7. **THE ATTENDANT WILL:**

12.7.1. Confirm that correct names of the entry team are posted on the "Confined Space Entry Permit."

12.7.2. Ensure that all applicable parts of the permit are checked off and completed before allowing anyone from the entry team to enter into the "Confined Space."

12.7.3. Ensure that all equipment going into the "Confined Space" is in safe operating condition, such as monitors, detectors, tools, retrieval lines & protective equipment.

12.7.4. Ensure that the entry team has received any special instructions for the work to be performed before entering into "Confined Space."

12.7.5. Take monitor/detector readings before entry, and at hourly intervals. Obtain monitor/detector readings hourly from the Lead person of the entry team.

- 12.7.6. Keep constant contact either, verbally, hand signals or radio with all of the members of the entry team while they are in the "Confined Space."
- 12.7.7. Call out any or all of the entry team if he feels that an immediate hazard exists, when any signs of stress or fatigue are noticed or when he (attendant) needs to leave his post and cannot be replaced by another qualified attendant.
- 12.7.8. Call out any or all of the entry team when any outside situation could pose a hazard to workers or when any change in the integrity of the exit exist.
- 12.7.9. Summon rescue and other services during an emergency.
- 12.7.10. MAKE SURE THAT THE ENTRY TEAM UNDERSTANDS THAT WHEN THE ATTENDANT CALLS THEM OUT FOR ANY OF THE ABOVE REASONS, THAT THEY WILL IMMEDIATELY LEAVE WITHOUT ANY QUESTIONS.
- 12.7.11. Warn any unauthorized persons not to enter or tells them to leave if they have entered a permitted confined space and also alerts workers in the "Confined Space" of an unauthorized entry.

12.7.12. DUTIES OF THE ENTRANT OR ENTRY TEAM

- 12.7.12.1. All entrants must know the emergency action plan and be able to recognize the potential and real hazard associated with the "Confined Space Entry Permit."
- 12.7.12.2. Each entrant must know how to use the proper personal protective equipment required for the entry or rescue and the proper use of protective barriers and shields.
- 12.7.12.3. Each entrant shall use a chest or 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.
- 12.7.12.4. Wristlets may be used in lieu of the chest or full body harness if it is determined that it is the safest and most effective alternative.
- 12.7.12.5. Each entrant must know how to exit the confined space as rapidly as possible without help whenever:
 - 12.7.12.5.1. The Attendant orders an evacuation
 - 12.7.12.5.2. Any alarm from a monitor/detector sounds
 - 12.7.12.5.3. The entrant(s) recognizes the warning signs of exposure to substances that could be found in the confined space.
- 12.7.12.6. All entrants must be aware of the toxic effects or symptoms of hazardous materials that could be encountered in the confined space.

12.7.12.7. All entrants must know how to relay an alarm to the attendant and to attempt self-rescue immediately upon becoming aware of hazardous conditions.

12.7.12.8. All entrants must know any modification of normal work practices that are necessary for permit entry confined space work.

12.8. PRE-PLANNED "CONFINED SPACE" EMERGENCY EVACUATION

12.8.1. Evacuation is determined by the Attendant who has direct communication at all times with the Lead Entrant Person.

12.8.2. Lead Entrant Person must communicate the procedure being used for evacuation to the Attendant.

12.8.3. The Lead Person is responsible for ensuring that all other workers under his command are evacuated.

12.8.4. Self-rescue of all workers will be visually observed by Lead Entrant Person.

12.8.5. Establishing a Buddy System in order to assist in the responsibility of the Lead Entrant Person.

12.8.6. The Attendant will decide whether or not the Rescue Team is to be utilized and how.

12.9. DUTIES OF THE ON-SITE RESCUE TEAM

12.9.1. Be equipped with all rescue and retrieval equipment supplied to them.

12.9.2. Be trained for confined space entry rescue work, including the proper wearing of and use of any personal protective equipment, including respirator, which may be needed during an actual rescue.

12.9.3. Practice drill of a rescue, simulating removal through a representative opening or portal, which has the same size, configuration and accessibility as the confine space where an actual rescue would be required.

12.9.4. Have at least one member of the rescue team certified in basic First Aid and CPR.

12.9.5. In the event that First Aid and/or CPR is to be rendered, *UNIVERSAL PRECAUTIONS must be adhered to in accordance with the Bloodborne Pathogen Standard. (29 CFR 1910.1030)

12.9.6. **UNIVERSAL PRECAUTIONS:** Is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are created as if known to be infectious for HIV, Hepatitis B and other Bloodborne pathogens.

12.10. GUIDELINES FOR RESCUE AND EMERGENCY SERVICES SELECTION:

It is important to select rescue services or teams that are equipped and capable of minimizing harm to both entrants and rescuers if the need arises.

12.10.1. Initial Evaluation - Determine the following when using outside rescue services:

12.11. What are the needs with regards to response time (time for the service to receive notification, arrive at the scene, and set up and be ready for entry)? Arrange for the emergency rescue services to see the operations.

12.12. How quickly can the rescue team or service get from its location to the permit spaces from which rescue may be necessary?

12.13. What is the availability of the rescue service?

12.13.1.1. Does the rescue service meet the following requirements:

12.13.1.2. Provide affected employees with the personal protective equipment (PPE) needed to conduct permit space rescues safely and train affected employees so they are proficient in the use of that PPE, at no cost to those employees; Request copies of training certificates;

12.13.1.3. Train affected employees in basic first-aid and cardiopulmonary resuscitation (CPR).

12.13.1.4. The employer shall ensure that at least one member of the rescue team or service holding a current certification in first aid and CPR is available.

12.13.1.5. Request when most recent “practice drill” was completed. Ensure that affected employees practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces.

12.13.1.6. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

12.13.1.7. Is an adequate method for communications between the attendant, employer and prospective rescuer available so that a rescue request can be transmitted to the rescuer without delay?

12.13.1.8. How much sooner after notification can a prospective rescuer dispatch a rescue team.

12.14. **G GUIDELINES FOR RESCUE AND EMERGENCY SERVICES SELECTION** – continued Performance Evaluation

12.14.1. During a performance evaluation, determine, after observing the rescue service perform a practice rescue whether the service’s training or preparedness is adequate.

12.15. HAZARDS OF PERMIT REQUIRED CONFINED SPACE:

12.15.1. The following are all to be addressed prior to any entry of the Permit Required Confined Space:

12.15.1.1. Identify and evaluate permit space hazards before allowing employee entry.

12.15.1.2. The following are areas to be identified:

12.15.1.3. Hazardous Atmosphere

12.15.1.4. Engulfment

12.15.1.5. Machinery

12.15.1.6. Movement

12.15.1.7. Tagout / Lockout

12.15.1.8. Heat Stress

12.15.1.9. Wedging

12.15.2. Test condition in the permit space before entry operation and monitor the space during entry.

12.15.3. Perform, in the following sequence, appropriate testing for atmospheric hazards: oxygen, combustible gases or vapors, and toxic gases or vapors.

12.15.4. Implement necessary measures to prevent unauthorized entry such as keeping the attendant always at the entrance, proper posting of permit, blocking the "Permit Required" entrance with barrier tape, listing only "AUTHORIZED" PERSONS on the permit.

12.15.5. Entry into the permit required confined space shall only be permitted when there are acceptable entry conditions, isolating the permit space, providing barriers, verifying acceptable entry conditions, purging, flushing or ventilating the permit space. Gas hazards must be eliminated or controlled as necessary for safe permit space entry operation.

12.15.6. Clearly define each employee's job duties following this procedure.

12.15.7. All of the personal protective equipment and any other equipment necessary for safe entry shall be provided, maintained and required for all employees. Examples: testing, monitoring, ventilation, communications, lighting equipment, barriers, shields and ladders.

12.15.8. One attendant shall be stationed outside the permit space for the duration of the entry operation.

12.15.9. Coordinate entry operations when employees of more than one employer are to be working in the permit space.

12.15.10. Review this procedure prior to any work in a permit required confined space or confined space entry.

12.15.11. When an attendant is required to monitor multiple spaces, that are permit required, the procedures to be followed shall be that of an emergency.

12.16. **NON-PERMIT CONFINED SPACES**

12.16.1. A non-permit confined space is a confined space that does not contain atmospheric hazard or have the potential to contain any hazard capable of causing death or serious physical harm. **NON-PERMIT CONFINED SPACES MUST BE REEVALUATED WHEN THERE ARE CHANGES IN THEIR USE OR CONFIGURATION AND WHERE APPROPRIATE, MUST BE RECLASSIFIED.**

12.17. **ATMOSPHERIC TESTING**

12.17.1. The confined space must be checked for both oxygen and combustible gases/vapors before every entry. Due to instrument sensitivity and calibration requirements, several monitors may be needed to ensure that one is always operable. Only properly trained employees should be allowed to use monitoring equipment. The atmosphere must be checked periodically during work activities or monitored continuously.

12.18. **VENTILATION**

12.18.1. Continuous mechanical ventilation is advised throughout the entire confined space entry. Placing an air powered ventilator at the top of an opening which forces air from the top

12.19. **PRE-ENTRY PROCEDURES**

12.19.1. All sections on the "Confined Space Entry Permit" must be completed and checked by the issuer, attendant and entry supervisor.

12.19.2. All possible egress routes must be explained to workers before entering "Confined Space" and recorded in the special instructions section of permit.

12.19.3. Confirm that all individual names of entry team are correctly listed on the permit prior to entry.

12.19.4. IF TESTING AND INSPECTION DATA PROVE THAT A PERMIT REQUIRED CONFINED SPACE NO LONGER POSES HAZARDS, THAT SPACE MAY BE RECLASSIFIED AS A NON- PERMIT CONFINED SPACE.

12.19.5. The employer will document the basis for determining that all hazards in a confined space have been eliminated, through a certification that contain the date, the location of the

space and the signature of the person making the determination. If requested, the certification shall be made available to each employee entering the space.

12.19.6. A space that is reclassified as a Non-Permit Confined Space shall be periodically air monitored to insure that there has been no change in atmospheric conditions.

12.19.7. Standard procedures may now be followed to allow a Non-Permit Required Confined Space Entry.

12.19.8. If hazards arise within a Confined Space that has been classified as a Non-Permit Required Confined Space, each employee will immediately exit the space. The employer shall then reevaluate the space and determine whether it must be reclassified as a Permit Required Confined Space.

12.19.9. All documentation must be maintained for one (1) year after the completion of the job. This is to enable the employer to conduct an annual review of all permits that were issued.

12.19.10. An annual review will also be used to determine if procedures need to be updated, changed or eliminated.

12.20. **PERMITS FOR HOT WORK**

12.20.1. Hot work permits must be issued whenever the following operations are to take place in a "Confined Space".

12.20.2. Welding, burning, grinding, use of powder actuated tools, soldering and work involving open flames, high temperatures or sparks

12.20.3. Use of electrically powered tools or other equipment that contain non-explosion proof motors or parts.

12.20.4. All sub-contractors and suppliers must also meet any of the requirements set forth in these procedures in order to protect themselves and the **TEAM** involved in the work of "Confined Space."

12.20.5. The permit to be used must include the following:

12.20.5.1. Number sequence to identify permit

12.20.5.2. Specific permit space identification

12.20.5.3. Purpose and date of entry

12.20.5.4. Duration of authorization

12.20.5.5. Authorized entrants by name

12.20.5.6. Names of authorized attendant and entry supervisor

- 12.20.5.7. Actual hazards of the identified space
- 12.20.5.8. Control and isolation methods to be used
- 12.20.5.9. Acceptable entry conditions
- 12.20.5.10. Results of initial and periodic atmospheric testing
- 12.20.5.11. Rescue and emergency services to be summoned
- 12.20.5.12. Communication procedures authorized between attendant and entrants
- 12.20.5.13. Equipment to be provided
- 12.20.5.14. Other information as necessary
- 12.20.5.15. Other permits, such as hotwork
- 12.21. ALL CANCELED ENTRY PERMITS SHALL BE KEPT ON RECORD BY THE EMPLOYER FOR ONE (1) YEAR.
- 12.22. **PERSONAL PROTECTIVE EQUIPMENT & SPECIAL EQUIPMENT**
 - 12.22.1.**Retrieval equipment** - If a vertical rescue may be required from the confined space and the depth of the space is more than 3 to 4 feet, a mechanical lifting device is needed. The following should be considered when choosing retrieval equipment:
 - 12.22.1.1. The size of the space and its opening.
 - 12.22.1.2. The location of the opening to the space.
 - 12.22.1.3. Obstacles within the space.
 - 12.22.1.4. The number of workers entering the space.
 - 12.22.1.5. The type of retrieval equipment available
 - 12.22.1.6. Whether or not a rescue of the workers would be vertical or horizontal.
 - 12.22.2.**Fall Protection** - Barricades or covers must be placed at the entrance to the confined space if a potential exists for workers or objects falling into the confined space. When appropriate, workers themselves should wear fall arresting equipment when entering the confined space.
 - 12.22.3.**Entry & Exit** - Special equipment may be required in order to enable workers to safely enter and exit the confined space. Most often this will be a ladder, however, in some cases, a winch device or similar equipment may be needed.

12.22.4. **Warning Signs & Symbols** - Dikes, excavations and valve pits are not easily recognized as confined spaces, these types of areas must have legible signs placed on or near them warning others that a permit is required before entry.

12.23. **TRAINING AND EDUCATION**

12.23.1. Before initial work assignments begin, proper training shall be provided for all workers who are required to work in permit spaces.

12.23.2. Upon completing this training, employers must ensure that employees have acquired the understanding, knowledge and skills necessary for the safe performance of their duties.

12.23.3. Additional training is required when: the job duties change, there is a change in the permit space program or the permit space operation presents a new hazard or when an employee's job performance shows deficiencies.

12.23.4. Training is also required of rescue team members, including cardiopulmonary resuscitation (CPR) and first aid training. Employers must certify that training has been accomplished and up to date.

12.23.5. It shall also be ensured that all employees who are part of the confined space entry team are trained in their assigned duties.

12.23.6. Upon completion of training, employees shall receive a certificate of training that includes the employee's name, signature or initials of trainer and dates of training. The certification must be made available for inspection by employees and their authorized representatives.

12.24. **SPECIFIC CONFINED SPACE ENTRY POLICY FOR NEW CONSTRUCTION:**

12.24.1. In accordance with the Code of Federal Regulations 29 Part 1926 the aforementioned Confined Space Entry Procedures will be applied when the work being conducted is identified as new construction.

12.24.2. The following are OSHA Standards, which apply to Confined Space Entry:

12.24.3. **Safety Training and Education; 29 CFR 1926.21(b)(6)(i) & .21(b)(6)(ii):**

12.24.3.1. All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazard(s) involved, the necessary precautions to be taken and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas.

12.24.3.2. For the purpose of the above statement "confined or enclosed space" means any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined or enclosed spaces include, but are not limited to: Storage Tanks, Process Vessels, Bins,

Boilers, Ventilation or Exhaust Ducts, Sewers, Underground Utility Vaults, Pump Stations, Tunnels, Pipelines, and Open Top Spaces more than four (4) feet in depth such as Pits, Tubs, Vaults and Vessels, Manholes, etc. Welding, Cutting, and Heating in a Confined Space; 29 CFR 1926.353(b),(c),(d),(e).

12.24.4. Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.

12.24.4.1. General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.

12.24.5. Welding, Cutting, and Heating in a Confined Space; 29 CFR 1926.353(b),(c),(d),(e):

12.24.5.1. Local Exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration within safe limits in the breathing zone.

12.24.6. Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.

12.24.7. Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust from clothing, or for cleaning the work area.

12.24.8. When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators in accordance with the requirements of Subpart E - Personal Protective Equipment and Life Saving Equipment. An employee shall be stationed outside of such a confined space to maintain communication with those working within it and to aid them in case of an emergency.

12.24.9. Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing him in case of emergency. A full body harness and lifeline shall be used for this purpose. An employee shall be designated as the attendant for the purpose of maintaining communication with those working within the confined space, so that they are able to observe the welder and should be capable of putting rescue operations into effect.

12.24.10. Trenching/Excavation; 29 CFR 1926.651(g)(1), (2):

12.24.10.1. Where oxygen deficiency (atmospheres containing less than 19.5% oxygen) or a hazardous atmosphere exist or could reasonably be expected to exist, the atmospheres in the excavation shall be tested before employees enter excavation greater than four (4) feet in depth.

12.24.10.2. Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5% oxygen and other hazardous atmospheres. These precautions include proper respiratory protection or ventilation in accordance

with the General Confined Space Entry Policy as outlined on pages 1 through 11 of this Program.

12.24.10.3. Adequate precautions shall be taken to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20% of the lower flammable limit or the gas.

12.24.10.4. When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe. Emergency Rescue Equipment, such as breathing apparatus, a safety harness with lifeline, 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.

12.24.10.5. Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a 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.

12.24.11. Power Transmission and Distribution; 29 CFR 1926. 950(a), (b):

12.24.11.1. Appropriate warning signs shall be promptly placed when covers of manholes, handholes or vaults are removed. The appropriate warning sign depends upon the nature and location of the hazards involved.

12.24.11.2. Before an employee enters a street opening, such as a manhole or an unvented vault, it shall be promptly protected with a barrier, temporary cover, or other suitable guard.

12.24.12. When work is to be performed in a manhole or unvented vault:

12.24.12.1. No entry shall be permitted unless forced ventilation is provided or the atmosphere is found safe by testing for oxygen deficiency and the presence of explosive gases or fumes;

12.24.12.2. Where unsafe conditions are detected, by testing or other means, the work area shall be ventilated and otherwise made safe before entry;

12.24.12.3. Provisions shall be made for an adequate continuous supply of forced air.

12.24.12.4. While work is being performed in manholes, an employee shall be available in the immediate vicinity to render emergency assistance as may be required. This shall not preclude the employee in the immediate vicinity from occasionally entering a manhole to provide assistance other than emergency. This requirement does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole where energized cable or equipment are in service, for the purpose of

inspection, housekeeping, taking readings or similar work if such work can be performed safely.

12.24.12.5. Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of the manhole or excavation shall be tested and found safe or cleared of the combustible gases or liquid.

12.24.13. **Manhole Entry**

12.24.13.1. Appropriate warning signs shall be promptly placed when covers of manholes, handholes or vaults are removed. The appropriate warning sign is dependent upon the nature and location of the hazards involved.

12.24.13.2. Before an employee enters a street opening, such as a manhole or an unvented vault, it shall be promptly protected with a barrier, temporary cover, or other suitable guard.

12.24.13.3. When work is to be performed in a manhole or unvented vault:

12.24.13.3.1. No entry shall be permitted unless forced ventilation is provided or the atmosphere is found safe by testing for oxygen deficiency and the presence of explosive gases or fumes;

12.24.13.3.2. Where unsafe conditions are detected, by testing or other means, the work area shall be ventilated and otherwise made safe before entry;

12.24.13.3.3. Provisions shall be made for an adequate continuous supply of forced air.

12.24.13.3.4. While work is being performed in manholes, an employee shall be available in the immediate vicinity to render emergency assistance as may be required. This shall not preclude the employee in the immediate vicinity from occasionally entering a manhole to provide assistance other than emergency. This requirement does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole, for the purpose of inspection, housekeeping, taking readings or similar work if such work can be performed safely.

12.24.13.4. Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of the manhole or excavation shall be tested and found safe or cleared of the combustible gases or liquid.

12.24.13.5. SMOKING IN ANY MANHOLE IS STRICTLY FORBIDDEN.

12.24.13.6. Ladders used in Manholes shall extend 36 inches above the surface landing.

12.24.13.7. Job made single ladders 30 feet or longer shall not be used.

- 12.24.13.8. Ladders shall be visual inspected prior to each use to insure that they are free from oil, grease and other slipping hazards.
- 12.24.13.9. Ladders that have been found to be defective or show signs of structural defects i.e., missing/broken rungs, split rails, missing cleats shall be tagged as defective and immediately taken out of service.
- 12.24.13.10. Fixed ladders in use where the total length of the climb equals or exceed 24 feet, the fixed ladder will be equipped with one of the following:
- 12.24.13.11. Ladder Safety Device
- 12.24.13.12. Self-retracting lifelines and rest platforms at intervals not to exceed 150 feet.
- 12.24.13.13. A cage or well and multiple ladder sections, each ladder section not to exceed 50 feet in length. Ladder sections shall be offset from adjacent sections and landing platforms shall be provided at a maximum interval of 50 feet.
- 12.24.13.14. Employees shall face the ladder when ascending or descending.
- 12.24.13.15. Each employee shall use at least one (1) hand to grasp the ladder when progressing up and/or down the ladder.
- 12.24.13.16. An employee shall not carry any object or load that could cause the employee to lose balance and fall.

12.25. **CONFINED SPACE ENTRY PERMIT**



VALIANT POWER GROUP
2 Commerce Street, Branchburg, NJ 08876
Phone / Fax: 800 566 0504

Confined Space Entry Permit

JOB SITE: _____ **JOB NUMBER:** _____ **DATE:** _____
TIME: _____

Location of Space or Vessel:

Purpose for Entering Space or Vessel:

Employee: Performing Work:

<u>AM</u>	<u>TIME IN</u>	<u>TIME OUT</u>	<u>PM</u>	<u>TIME IN</u>	<u>TIME OUT</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

PRECAUTIONS	YES	NO
Employee Qualified	_____	_____
Safety Observer	_____	_____
Space / Vessel Clean	_____	_____
Safe / Vessel's Atmosphere	_____	_____
Safe for Entry	_____	_____

Initial Readings - Taken By _____
CO _____ **O₂** _____
H₂S _____ **LEL** _____

Instrument Used for Test: _____
Lines to Vessel Blanked or Disconnected _____
Electrical / Mechanical Lockout Devices _____
12V Safety Lights _____
Radio & Communication Devices _____
Name of Safety Observer _____

PROTECTIVE EQUIPMENT	YES	NO
Belt / Harness / Lifeline	_____	_____
Breathing Apparatus	_____	_____
Warning Signs & Barriers	_____	_____
Protective Gear	_____	_____
Fire Equipment	_____	_____
Forced Ventilation	_____	_____
Tri - Pod Lifter	_____	_____
Misc Equipment	_____	_____

Local Rescue Squad Given Prior Notice ☐

Name of Service _____

Space Re-classification as Non Permit Required ☐ **4/7/2014**

Supervisor / Foreman: _____ **Date:** _____

THIS PERMIT IS VALID FOR THIS SHIFT ONLY

June 1, 2024

13. EQUIPMENT OPERATIONS

13.1. Ground Operations

- 13.1.1. Do not operate any equipment unless you are qualified and authorized to do so.
- 13.1.2. Never approach the rotating super structure of a crane or excavator until you are in view of the operator and received his permission to do so.
- 13.1.3. Be sure to notify the operator if it is necessary for you to work at the rear of the equipment.
- 13.1.4. Do not work, stand or walk under the boom or load of a crane, excavator or front-end loader.
- 13.1.5. Avoid horseplay and all unnecessary conversation when working around machinery. Pay strict attention to your work.
- 13.1.6. Keep all unauthorized persons at a safe distance from your work. They may not be aware of dangerous areas.
- 13.1.7. Pay attention to warning signs and signals.
- 13.1.8. Report all unsafe conditions at once.
- 13.1.9. Report all injuries, regardless of how slight they may seem, to your supervisor for immediate first aid treatment.
- 13.1.10. Do not wear gloves, rings, or loose clothing around moving machinery.
- 13.1.11. Do not attempt to get on or off any equipment while it is in motion.
- 13.1.12. Keep the job site clear of loose planks, logs and other materials that can cause tripping hazards. Such objects, if hit by the wheels of moving equipment, may either fly out or have the end spring up and endanger nearby workers.

13.2. Equipment Operations

- 13.2.1. Do not operate any equipment unless you are qualified and authorized to do so.
- 13.2.2. Inspect daily any equipment to which you are assigned to make certain that it is in safe operating condition.
- 13.2.3. Do not leave a machine running unattended. Always cut off the power and lock all controls before leaving your unit.

- 13.2.4. Use care when getting on or off any equipment. Use grab irons and hand holds when climbing on or off. Do not jump down from equipment, except if contact is made with power lines as noted below.
- 13.2.5. Keep your equipment clean. Grease and oil spilled on the deck or walkways may cause falls and serious injuries.
- 13.2.6. When loading trucks, the driver should stay in the cab if it has overhead protection. If there is no overhead protection the driver should get out and go to a safe area before loading starts.
- 13.2.7. Machine operators should make certain that all oilers and maintenance workers have completed their tasks and are clear of moving machinery before starting any equipment. Do not operate machinery until all guards are in place. See that any guards or inspection plates that have been removed are replaced before starting the equipment.
- 13.2.8. When operating a crane or excavator shovel **be alert** to hazards from overhead wires and underground utilities. Rupture of underground gas mains and careless smoking or other sources of ignition can set off a serious fire or explosion. Contact with electric wires can result in electrocution.
- 13.2.9. **Keep boom clear of overhead wires.** (Minimum clearance 10 feet)
- 13.2.10. If the boom or any other part of a crane or excavator you are operating comes in contact with overhead wires, stay in the cab until the power to the wires can be shut off or until you can be assisted. If an emergency necessitates your leaving the cab, jump clear of the machine, avoiding contact with “live” parts.
- 13.2.11. Do not store cans of gasoline or other flammable liquid in the cab of any equipment.

13.3. **Handling of Loads**

- 13.3.1. When placing slings or cables around loads, avoid holding the hooks in place after securing them to the load. The point of contact between the hook and the load changes when the slack is taken up any the load is lifted. If this change is not anticipated, your hand may get caught between the hook and the load.
- 13.3.2. Allow for the swinging of a load by standing a safe distance from the area through which it must travel.

13.3.3. Before hoisting directions are given, the signalman should make sure that all workers are safely clear of the load to allow for any possible swing when the load leaves the ground.

13.3.4. Do not attempt to guide the load by hand, use a tag line if necessary. Avoid twisting the hoisting cables.

13.3.5. Stand clear while the slings are being withdrawn from under the load as the hook of a sling or chain may catch on the under section of the load and suddenly fly free or tip the load over.

13.3.6. Place the hook directly over the load being lifted to avoid sliding of the load and excessive side loading of the hoisting equipment.

13.3.7. Be sure that all slings, ties, and hooks are properly placed and secured before hoisting.

13.3.8. Always rest a bucket or load on the ground before leaving the equipment. Do not leave a load suspended in air.

13.3.9. When lifting a heavy load, raise it a few inches off the ground first to find out if it is well balanced and to insure that there is no undue stress on any part of the sling. This will also permit testing of the braking apparatus and the equilibrium of the crane or excavator.

13.3.10. When lowering materials into foundations or shaft ways, use safety hooks to insure that the load does not become detached if the cable should slack off due to being caught on bracing or the sides of the shaft.

13.3.11. When securing buckets to load lines, use a safety hook, shackle or “moused” hook. A bucket can come off an open hook if it strikes an obstruction.

13.3.12. Inspect all slings, chains, and hooks daily before use. Tag any defective equipment.

13.4. **Signaling**

13.4.1. Know your signalman. If he is a new man, make sure that he uses the standard system of signals for the particular type of equipment. A short talk between operator, foreman, and signal and will quickly clear up any possibility of misunderstanding along this line.

- 13.4.2. Where several employees are working together, only one person should be designated to give all signals. Signals given by other workmen may cause confusion and faulty interpretation and should be ignored.
- 13.4.3. The operator should take no signals from anyone other than the designated signalman, except for the “STOP” signal, which he should obey at any time from anyone.
- 13.4.4. If oral signals are used, be sure they are repeated and confirmed before any action is taken.
- 13.4.5. Signal men should be posted in any area in which the machine operator’s view is obstructed or where underground or overhead hazards may be encountered. To increase his efficiency, the signalman must be thoroughly briefed on the objects or hazards to be avoided.

13.5. Cranes and Excavators

- 13.5.1. The stability of a crane is highly dependent on the bearing value of the soil. If you are in doubt as to the weight the soil will bear, use heavy planks to spread the weight over a large area.
- 13.5.2. Know the capacity of the equipment and do not allow overloading. Check the capacity plates which are posted on the equipment and which specify the safe load for maximum and minimum positions of the boom and for at least two intermediate stations. If the crane is equipped with outriggers, the plates should specify allowable loads with and without the outriggers.
- 13.5.3. The load capacity of a crane is dependent more upon the balance of the unit than on engine power. Since the ground contact of most cranes is longer than it is wide, the cranes will have greater stability when working to the front or rear than when working to either side.
- 13.5.4. Improve the stability if necessary by adding counterweights, using longer tracks or outriggers, or by raising the boom so that the load is brought closer to the unit, always staying within manufacturer specifications.
- 13.5.5. The slope of the ground affects the stability of the crane and, therefore it should be operated only when it is level.
- 13.5.6. Avoid leaving a crane near the edge of an excavation or in an area that may be made impassible or unstable by rainfall, flash flood, etc.

13.5.7. A crane can lift its maximum load only if the boom is raised so that the load is directly under the boom fall and is close to the unit. Although this will increase stability, booming too close to the cab might cause the boom to fall back on the cab or it might cause an overturn due to the abrupt swing of the boom. The responsibility for avoiding this type of accident rests with the crane operator.

13.5.8. Be alert to the danger of hitting the boom with the load. This may occur while operating with a high boom, or when transporting the load over uneven ground which may cause the crane to roll and pitch, thus causing the load to swing.

13.5.9. Swinging a load requires your undivided attention. Pay strict attention to your work. Do not engage in conversation or allow visitors near the work area.

13.5.10. Extreme care must be taken when swinging loads to make sure that the load does not hit workmen or other objects.

13.5.11. Carefully inspect the boom fall and the boom rigging daily and report any defects for replacements immediately. Pay particular attention to the boom guys; a falling boom can be more disastrous than a falling load.

13.5.12. Use extreme caution when operating near or under overhead wires and, if necessary, use spotters to guide you when the boom approaches a danger area. Keep the boom at least 10 feet away from all overhead wires.

13.6. **Earth Movers**

13.6.1. Operate only machines that you are trained and authorized to operate.

13.6.2. Know the job site.

13.6.2.1. What are the boundaries, where are the haul roads.

13.6.2.2. What are the obstructions and hazards to watch for.

13.6.2.3. What is the condition of material to be moved.

13.6.2.4. Atmospheric conditions, rain, dust, fog, smoke.

13.6.2.5. Utilities in the area requiring caution.

13.6.3. Make a safety check of your machine before starting.

13.6.4. Make a safety check of all machine controls.

13.6.5. Operate at safe speeds with the machine under control.

13.6.6. Use extreme care, when operating around excavations.

13.6.7. When equipment is equipped with Roll-Over Protection (ROPS) use the seat belts provided.

13.6.8. Read and follow the manufacturers recommended procedures.

13.6.9. Keep all parts of machines and their loads at least 10' from all power lines.

13.7. **Backhoes and Excavators**

13.7.1. At times, excavators may be used for purposes other than those for which they were designed such as for the hoisting and placing of materials when a crane is not available. Therefore, many of the safety rules for crane operations also apply to excavators.

13.7.2. Do not swing bucket over workers.

13.7.3. Avoid overloading the bucket. Falling rocks from overloaded buckets can cause serious injuries.

13.7.4. Load trucks from the rear. Do not swing the bucket over the truck cab.

13.7.5. Always lock the boom against swinging before walking or transporting it.

13.7.6. When working on a bank of sand, gravel, or blasted rock, be alert to the possibilities of slides.

13.7.7. Always back the bucket away from the working face of the bank before making repairs or greasing it.

13.7.8. Lower the bucket to the ground before leaving the machine, as the brakes may lose their grip when they cool and let the bucket down. This will also eliminate the possibility of the bucket's dropping due to accidental release by an authorized person.

13.7.9. Load trucks only from the side or rear – never swing over the truck cab. Avoid hitting the truck with the bucket.

13.7.10. Never undercut the machine except under extreme condition. When undercutting must be done, adequate shoring must be provided to prevent cave-ins.

13.7.11. Uneven swings, hoists and sudden braking can overload machine components and make the machine unstable. Avoid them whenever possible.

13.7.12. Boom clearance from power lines must be followed at all times – both when in operation and when traveling.

13.7.13. On steep slopes make a level to work from if possible. Otherwise restrict the downhill swing of the boom and slow the machine working cycle.

13.8. **SECURING EQUIPMENT**

13.8.1. 1. Park in designated areas whenever possible.

13.8.2. If parking area is sloped, park at right angles to the slope and block the wheels.

13.8.3. Lower all attachments (blades, buckets, etc.) to the ground.

13.8.4. All controls should be put in neutral.

13.8.5. Allow the engine to idle and cool down before shutting it off.

13.8.6. Set the parking brake and transmission lock.

13.8.7. Remove any keys.

13.8.8. Install and lock all ant-vandalism guards.

13.9. MAINTENANCE OF EQUIPMENT

13.9.1. Inadequate maintenance is contributing factor in many construction accidents. Many injuries are caused by faulty or defective clutches, brakes, or cables. Inspection and thorough maintenance of equipment is necessary part of the safe and efficient operation of machinery.

13.9.2. When working on equipment, see that it is shut down whenever possible.

13.9.3. Oilers and repairmen should not undertake work around any equipment without first notifying the machine operator or locking out or attaching warning tags to the starting mechanism and controls if the operator cannot be located.

13.9.4. Use extreme care when working near moving cables or sheaves.

13.9.5. When it is necessary to inch the sheaves into the undesired position so that lubrication points may be reached, the oiler should position himself and direct the operator by means of hand signals. The operator should not move the equipment until the oiler's signals are clearly understood, and, above all, must not anticipate an order.

13.9.6. Before making repairs, be sure the equipment and all heavy parts are suitably blocked.

13.9.7. Because the rear of rotating equipment is a blind spot to the operator, an oiler should not attempt to grease the track between swings of the platform.

13.9.8. Observe the "NO SMOKING" rule, and be sure the engine is shut off when refueling equipment.

13.9.9. Do not attempt to adjust fan belts while the motor is running.

13.9.10. When filling radiators on compressors, power shovels, etc., remove the radiator cap slowly and stand off to one side.

13.9.11. Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before applying pressure to a system, be sure all connections are tight and that lines, tubes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

13.9.12. If injured by escaping fluid, seek medical attention at once. Serious infection or reaction can develop if proper treatment is not administered immediately.

13.10. EQUIPMENT INSPECTION REPORT (DAILY)

Equipment: _____
 Equipment No.: _____
 Week Ending: _____

Capacity: _____
 Owner: _____
 Shift: Day _____ Night: _____

	Mon	Tues	Wed	Thu	Fri	Sat	Sun
Pre-Operation Inspection							
1 Check engine oil, water, gas and battery	()	()	()	()	()	()	()
2 Check hydraulic system for leakage	()	()	()	()	()	()	()
3 Check oil reservoir for level and dirt	()	()	()	()	()	()	()
4 Inspect hoist breake and boom operation	()	()	()	()	()	()	()
5 Condition of all glass	()	()	()	()	()	()	()
6 Check boom and hoist lines for wear	()	()	()	()	()	()	()
7 Grease sheaves	()	()	()	()	()	()	()
8 Check tires	()	()	()	()	()	()	()
9 On air operated cranes - drain water from air tanks	()	()	()	()	()	()	()
Power Plant							
1 Start engine - Warm up	()	()	()	()	()	()	()
2 Check all instruments	()	()	()	()	()	()	()
Hoisting Mechanism							
1 Set outriggers	()	()	()	()	()	()	()
2 Check boom operation up / down; right / left	()	()	()	()	()	()	()
3 Check air pressure on air operated units	()	()	()	()	()	()	()
4 Check brakes	()	()	()	()	()	()	()
Travel Mechanism							
1 Test brakes	()	()	()	()	()	()	()
2 Back up alarm	()	()	()	()	()	()	()
3 Turn signals, lights and horn	()	()	()	()	()	()	()
Equipment							
1 Fire extinguisher	()	()	()	()	()	()	()
Records							
1 Load chart	()	()	()	()	()	()	()
2 Annual inspection report	()	()	()	()	()	()	()

Signature: _____

Date: _____

Unit No. _____

June 1, 2024

14. CRANE PROCEDURE

- 14.1. All employees will comply with the manufacture's specifications and limitations applicable to the operation of all cranes and derricks. Where manufacturer's specifications are not available, the limitations assigned to the equipment must be based on the determinations of a qualified engineer, competent in this field. All of the determinations must be appropriately documented and recorded. Attachments used with cranes must not exceed the capacity, rating or scope recommended by the manufacturer.
- 14.2. A durable clearly legible rating chart of rated load capacities and recommended operating speed, special hazard warnings shall be posted in each crane and securely fixed to the crane cab visible to the operator while operator is at control station.
- 14.3. Hand signals to crane and derrick operators must be those prescribed by the applicable ANSI Standard and these signals must be posted at the job site.
- 14.4. A Competent Person must be designated to inspect all machinery and equipment prior to and during each use, to make sure it is in safe operating condition. Any deficiencies must be repaired and defective parts replaced before continued use.
- 14.5. A thorough, annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor. The employer shall maintain a record of the dates and results of inspections for each hoisting machine and piece of equipment.
- 14.6. Wire rope shall be taken out of service when any of the following conditions exist:
 - 14.6.1. In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;
 - 14.6.2. Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging or any other damage resulting in distortion of the rope structure;
 - 14.6.3. Evidence of any heat damage from any cause;
 - 14.6.4. Reductions from nominal diameter of more than one-sixty-fourth inch for diameters up to and including five-sixteenths inch, one-thirty-second inch for diameters three-eighths inch to and including one-half inch, three-sixty-fourths inch for diameters nine-sixteenths inch to and including three-fourths inch, one sixteenth inch for diameters seven-eighths inch to 1 1/8 inches inclusive, three thirty- seconds inch for diameters 1 1/4 to 1 1/2 inches inclusive;

14.6.5. In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

14.6.6. Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966.

14.6.7. All belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment must be guarded, if such parts are exposed to contact.

14.6.8. Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, must be barricaded to prevent any employee from being struck or crushed by crane.

14.6.9. All exhaust pipes must be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.

14.6.10. Whenever internal combustion engine powered equipment exhausts in enclosed space, tests must be made and recorded to insure that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. (Refer to procedure on "Confined Space Entry").

14.6.11. All windows in cabs must be safety glass or equivalent, with no visible distortion that may interfere with the safe operation of the machine.

14.7. **ELECTRICAL DISTRIBUTION LINES**

14.8. For electrical distribution lines that have not been de-energized and are rated at 50kV or below, a minimum clearance between the lines and any part of the crane or load must be 10 feet.

14.9. For lines rated over 50kV, a minimum clearance between the lines and any part of the crane or load must be 10 feet plus 0.4 inch for each 1 kV over 50 kV.

14.9.1. For equipment in transit with no load and boom lowered, the clearance must be as follows:

14.9.1.1. 4 feet for voltages less than 50kV.

14.9.1.2. 10 feet for voltages over 50kV.

14.9.1.3. 16 feet for voltages up to 750kV.

14.9.2. A person must be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

14.9.3. Any overhead wire must be considered an energized line, unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

14.10. **TRANSMITTER TOWERS**

14.11. Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter must be de-energized or tests must be made to determine if electrical charge is induced on the crane.

14.12. The following precautions must be taken when necessary to dissipate induced voltages:

14.12.1. The equipment must be provided with an electrical ground directly to the upper rotating structure supporting the boom.

14.12.2. Ground jumper cables must be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews must be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load..

14.12.3. Combustible and flammable materials must be removed from the immediate area prior to any crane operations.

14.13. CRANE MAINTENANCE AND SAFETY CHECKLIST

CRANE MAINTENANCE AND SAFETY CHECK					
Manufacturer:			Model:		
Fleet #:		Capacity:		Date:	
Item Name	Item No.	ACPT	FAIL	N/A	Deficiencies
Gauges / Warning Lights	1				
Controll Levers	2				
Fluid Levels / Lubrication	3				
Fluid Leaks	4				
Emergency Service / Brakes	5				
Cab / Door Windows	6				
Backup Alarm / Service Horn	7				
Safety Belt	8				
Fire Extinguisher	9				
Strobe Caution Light	10				
Tires / Wheel Hubs / Lugs	11				
Hydraulic Syatem	12				
Drive Train	13				
Platform / Steps	14				
Guards	15				
Steel Ropes / Cables	16				
Sheaves / Reeving	17				
Hooks / Rigging Accessories	18				
Structural Welds	19				
Outriggers	20				
Boom Swing	21				
Boom Extension	22				
Anti Two Block Device	23				
Insulating Link	24				
Boom Angle Indicator	25				
Load Chart	26				
Warning Decals	27				
Hand Signal Charts	28				
<u>Comments:</u>					
<u>Operator Signature:</u>					

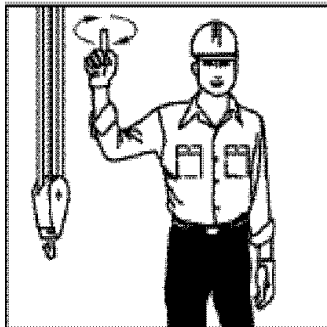
June 1, 2024

14.14 CRANE MAINTENANCE AND SAFETY INSPECTION

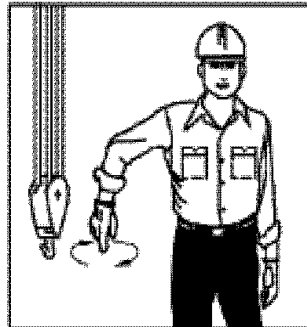
Item No.	Item Name	What to Look For
1	Gauges / Warning Lights	Gauges need to be in good operating condition Check for cracks and moisture Warning lights should function properly
2	Control Levers	Control levers should move freely Check for sticky or rusty linkage and excessive wear
3	Fluid Levels / Lubrication	Check for proper levels on engine oil, hydraulic system, radiator, battery & wheel hub differentials
4	Fluid Leaks	Check under unit before each work shift for leaks Check engine, radiator, hydraulic pumps and motors
5	Emergency Service / Brakes	Check at startup each day and during operation for proper operation of brake Check for damaged brake lines
6	Cab / Door Windows	Check for damaged and missing glass doors Doors need to be secured in the open or closed position during operation
7	Backup Alarm / Service Horn	Check for proper operation
8	Safety Belt	Check belt for worn or ragged edges Belt and buckle must be clean and free from dirt and grease
9	Fire Extinguisher	Should be mounted in cab or in vicinity of refuelling area
10	Strobe Caution Light	Should be operational and visible in all four directions
11	Tires / Wheel Hubs / Lugs	Check for tire pressure Check oil level in wheel hubs Check for loose or missing lug nuts
12	Hydraulic Syatem	Check for damaged hose lines Check pumps, motors & PTO shafts
13	Drive Train	Check transmission, front and rear axles and drive shafts for proper operation
14	Platform / Steps	Check for any damage to platform and steps Must be free from mud, oil and debris
15	Guards	Check for missing guards and guards not installed correctly
16	Steel Ropes / Cables	Check for broken wires, kinking, crushing and bird cages
17	Sheaves / Reeving	Check for nicks, cracks, gouges, and improperly installed wedge sockets heck for excessive wear on pins and bushings
18	Hooks / Rigging Accessories	Check all hooks for cracks and excessive wear Hooks should have safety latches installed
19	Structural Welds	Check all welds for cracks Be observant during the work shift for struycrtural cracks Boom must be free from dents
20	Outriggers	Check ffor leaks, cracks and proper operation
21	Boom Swing	Check for excessive play and smoothness of operation
22	Boom Extension	Check for lubrication and smoothness of operation Check for structural damage
23	Anti Two Block Device	Must function properly, if equipped
24	Insulating Link	Check for proper installation
25	Boom Angle Indicator	Check for proper operation
26	Load Chart	Must be legible
27	Warning Decals	Must be legible
28	Hand Signal Charts	Must be legible

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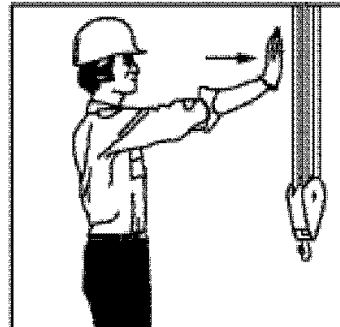
1 CRANE HAND SIGNALS



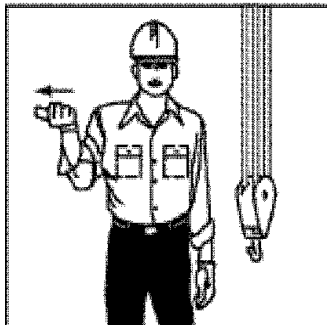
HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circles.



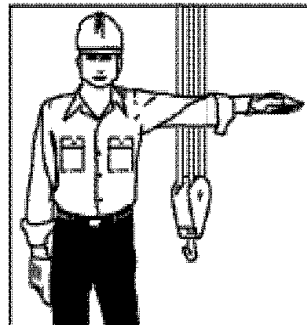
LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.



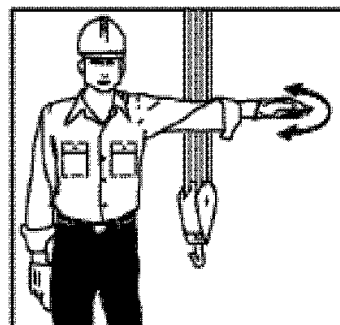
TRAVEL (rail mount or trolley). Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.



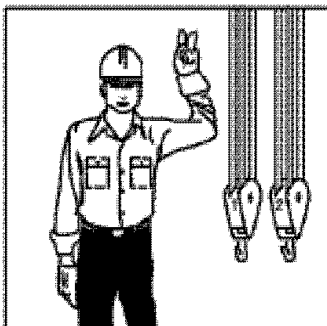
TROLLEY TRAVEL. Palm up, fingers closed, thumb pointing in direction of motion, jerk hand horizontally.



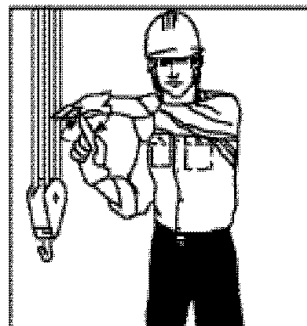
STOP. Arm extended, palm down, hold position rigidly.



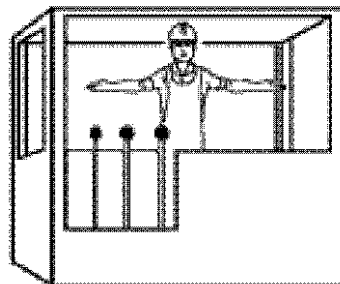
EMERGENCY STOP. Arm extended palm down, move hand rapidly right and left.



MULTIPLE TROLLEYS. Hold up one finger for block marked "1" and two fingers for block marked "2." Regular signals follow.



MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the signal. (HOIST SLOWLY AS SHOWN IN EXAMPLE.)



MAGNET IS DISCONNECTED. Crane operator spreads both hands apart with palms up.

15. FORKLIFTS

15.1. POWERED INDUSTRIAL TRUCKS

- 15.1.1. Only trained and authorized operators shall be permitted to operate a powered industrial truck.
- 15.1.2. Do not allow anyone to stand or pass under the elevated portion of any truck, whether loaded or empty.
- 15.1.3. 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.
- 15.1.4. Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.
- 15.1.5. Employees are prohibited from placing arms or legs between the upright of the mast or outside the running lines of the truck.
- 15.1.6. 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 the brakes will be set.
- 15.1.7. A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.
- 15.1.8. All traffic regulations shall be observed, including plant speed limits. A safe distance (approximately three (3) truck lengths) shall be maintained. The truck shall be operated in such a manner that the driver can always control the vehicle.
- 15.1.9. 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.
- 15.1.10. The driver shall be required to look in the direction of, and keep a clear view of the path of travel.
- 15.1.11. When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.
- 15.1.12. 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.

- 15.1.13. STUNT DRIVING AND HORSEPLAY SHALL NOT BE PERMITTED.
- 15.1.14. The driver shall be required to slow down for wet and slippery floors, and shall not drive through spills. They shall be cleaned up first.
- 15.1.15. Running over loose objects on the roadway surface shall be avoided.
- 15.1.16. 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 in a moderate, even rate.
- 15.1.17. Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered.
- 15.1.18. Only loads within the rated capacity of the truck shall be handled.
- 15.1.19. The long or high (including multi-tiered) loads which may affect capacity shall be adjusted.
- 15.1.20. Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.
- 15.1.21. 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.
- 15.1.22. Operators will use extreme care 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.
- 15.1.23. 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 a safe operating condition.
- 15.1.24. Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.
- 15.1.25. Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting the engine.

- 15.1.26. All repairs shall be made by authorized personnel only.
- 15.1.27. Battery charging installations shall be located in areas designated for that purpose.
- 15.1.28. Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.
- 15.1.29. Emergency eye wash facilities shall be provided.
- 15.1.30. Personal Protective Equipment such as rubber gloves, full face shields and aprons shall be provided and used by employees engaged in battery recharging or changing.
- 15.1.31. SMOKING IS PROHIBITED IN THE BATTERY CHARGING AREA.
- 15.1.32. Precautions shall be taken to prevent open flames, sparks or electric arc in battery charging area.
- 15.1.33. Tools and other metallic objects shall be kept away from the top of uncovered batteries.
- 15.1.34. When charging batteries, acid shall be poured into water; water shall not be poured into acid.
- 15.1.35. Trucks shall be properly positioned and brake applied before attempting to change or charge batteries.

15.2. FORKLIFT OPERATORS DAILY CHECKLIST

Complete before the start of each shift

Date: _____	Truck No.: _____	Building No.: _____	Shift: Day: _____ Night: _____
(Internal) Combustion	(Electric) Electric	Hour Meter: Start: _____	Total Hours: End: _____
Operators Signature: _____		Supervisors Signature: _____	

CHECK ANY DEFECTIVE ITEM WITH AN "X" AND GIVE DETAILS BELOW

() Accelerator	() Hour Meter
() Alarms	() Hydraulic Controls
() Battery Connector	() Lights - Head / Tail
() Battery - Discharge Indicator	() Lights - Warning
() Belts	() Mast
() Brakes - Parking	() Oil Leaks
() Brakes - Service	() Oil Pressure
() Cables	() Overhead Guard
() Engine Oil Level	() Radiator Level
() Forks	() Safety Equipment
() Fuel Level	() Steering
() Gauges	() Tires
() Horn	() Unusual Noises
() Hoses	() Other

Details: _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

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16. FIRE PROTECTION & PREVENTION

16.1. DEFINITIONS

- 16.1.1. COMBUSTIBLE LIQUID - Any liquid having a flash point at or above 100° F. *Class II Liquid* - Flash Point at or above 100° F and below 140° F. *Class IIIA Liquid* - Flash Point at or above 140° F but below 200° F. *Class IIIB Liquid* - Flash Point at or above 200° F.
- 16.1.2. FLAMMABLE - Capable of being easily ignited, burning intensely or having a rapid rate of flame spread.
- 16.1.3. FLAMMABLE LIQUID - Any liquid having a flash point below 100° F. *Class IA Liquid* - Flash Point below 73° F, Boiling Point below 100° F. *Class IB Liquid* - Flash Point below 73° F, Boiling Point above 100° F. *Class IC Liquid* - Flash Point between 73° F and 100° F.
- 16.1.4. SAFETY CAN - An approved closed container, of not more than 5 gallons capacity, having a flash arresting screen, spring closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.
- 16.1.5. Approved safety cans must be used for the handling and use of flammable liquids in quantities of 5 gallons or less. For quantities of one gallon or less, the original manufacture's container may be used for storage, use and handling of flammable liquids.

16.2. EQUIPMENT

- 16.2.1. All firefighting equipment must be conspicuously located.
- 16.2.2. All firefighting equipment must be inspected periodically by site management and maintained in operating condition. Defective equipment must be immediately replaced.
- 16.2.3. A fire extinguisher rated no less than 2A must be located every 3,000 square feet in all buildings. The travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.
- 16.2.4. In multi-story buildings, one or more fire extinguishers, rated not less than 2A, must be provided on each floor. One fire extinguisher must be located adjacent to stairway.
- 16.2.5. Fire extinguisher, rated not less than 10B, must be within 50 feet of the location of more than 5 gallons of flammable or combustible liquids and where 5 pounds or more flammable gas are being used on the job-site.
- 16.2.6. All fire extinguishers must be properly mounted for easy access.
- 16.2.7. Sprinkler systems, if used, should be installed and made operational as soon as construction process and applicable law permits.

16.2.8. Smoke alarms should be installed in office, storage and maintenance facility buildings.

16.3. FLAMMABLE AND COMBUSTIBLE STORAGE

16.3.1. Flammable and combustible liquids must be stored and transported in approved and properly labeled containers. Only approved metal safety cans must be used for the handling and use of flammable liquids in quantities greater than one gallon.

16.3.2. When 25 or more gallons of flammable or combustible liquids are stored, approved storage cabinets or tanks must be used. All applicable fire protection regulations must be complied with.

16.3.3. Smoking, hot work or open flames are prohibited in flammable and combustible storage or transfer areas. These areas must be properly posted.

16.3.4. Storage of flammable or combustible liquids outside of buildings must be separated from all structures by a minimum of 20 feet. No more than 1,100 gallons will be stored in any one area. Storage areas must be diked to contain spills and graded to divert spills away from structures and underground work areas.

16.3.5. Flammable and combustible storage areas must be posted as "NO SMOKING" areas. These storage areas must be fenced or contained in order to prevent unauthorized entry.

16.3.6. All inside storage areas for flammable and combustibles must meet or exceed the fire resistance and protection requirements. No more than 60 gallons of flammable and 120 gallons of combustible liquids must be stored in an indoor approved storage cabinet.

16.3.7. All work areas must be kept free from debris and material that could possibly constitute a fire hazard. All work areas must be cleaned as necessary to prevent any accumulation of materials and trash.

16.3.8. All trash and scrap must be properly stored and/or disposed of in accordance with all applicable federal, state and local laws.

17. LOCKOUT/TAGOUT PROGRAM

17.1. PURPOSE

This program establishes the mandatory procedures for all employees to affix the appropriate energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected movement of machines or equipment during servicing or maintenance operation. The unexpected movement of any machine or equipment included energizing, start-up, and/or the release of stored energy. Stored energy includes, but is not limited to: electrical, mechanical, hydraulic, pneumatic, chemical, or thermal.

17.2. POLICY

The procedures outlined below must be followed to ensure the safety of all our employees while they are in the process of servicing and/or performing maintenance on any machines or equipment.

17.3. RESPONSIBILITIES

17.3.1. Supervisors are responsible to ensure that all employees under their direction are fully aware of, understand and adhere to the Lockout/Tagout procedures.

17.3.2. Employees are responsible to follow the procedures outlined and to report any problems or concerns to their supervisor.

17.4. GENERAL REQUIREMENTS

17.4.1. DE-ENERGIZING MACHINES OR EQUIPMENT

17.4.1.1. The machine or equipment to be worked on shall be disconnected from all electric sources. Control circuit devices, such as push buttons, selector switches, and interlocks may not be used as the sole means for de-energizing machines or equipment.

17.4.1.2. Stored energy that may endanger employees shall be released. Capacitor's shall be discharged and stored non-electrical energy released by appropriate means.

17.4.1.3. Parts of machines or equipment that may move as a result of stored energy release must be blocked or otherwise secured to prevent unexpected movement.

17.4.2. APPLICATION OF LOCKS AND TAGS

17.4.2.1. A lock and tag shall be placed on each disconnecting means used to de-energize the operating circuits of the machine or equipment.

17.4.2.2. A tag shall also be attached to the disconnecting means. The tags supplied by the company are the only ones that will be used. Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

17.4.3. VERIFICATION OF DE-ENERGIZED CONDITION

The requirements of one (1) and two (2) of this section shall be accomplished before any machine or equipment can be considered safe to perform service or maintenance work.

17.4.3.1. A foreman shall operate the machine or equipment operating controls or otherwise verify that the machine or equipment cannot be started. In addition, the foreman shall verify that any parts normally supported by stored energy are blocked or otherwise secured to prevent unexpected movement.

17.4.3.2. A foreman shall use appropriate test equipment to test the electrical circuit elements and electrical parts of the machine or equipment to which employees may be exposed to verify that the circuit elements and electrical parts of the machine or equipment are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or related voltage back feed through specific parts or the circuit have been de-energized and presumed to be safe.

17.4.4. RE-ENERGIZING MACHINES OR EQUIPMENT

17.4.4.1. A foreman shall conduct appropriate tests and shall visually inspect, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, blocks, or securing devices have been removed so the machine or equipment can be safely energized.

17.4.4.2. Any employees potentially exposed to the hazards associated with re-energizing the machine or equipment shall be warned to stay clear of the machine or equipment.

17.4.4.3. The lock and tag shall be removed by the foreman who applied the lock and tag. However, if the foreman is absent from the workplace, the lock and tag may be removed by a qualified person designated to perform this task

17.4.4.3.1. The employer assures that the foreman who applied the lock and tag is not available at the workplace.

17.4.4.3.2. The employer assures that employees are aware that lock and tag have been removed prior to the employee resuming work on the machine or equipment being put back into service.

17.4.4.4. There shall be a visual determination that all employees are clear of the machine or equipment being put back into service.

17.5. A SAMPLE PROCEDURE TO BE FOLLOWED FOR EACH MACHINE OR PIECE OF EQUIPMENT ARE AS FOLLOWS:

17.5.1. AIR COMPRESSOR

17.5.1.1. Shut off air circuit breaker and install locking cover.

17.5.1.2. Block

17.5.1.3. Remove foot pedal and slide locking pin on lower right side of foot pedal bar.

17.5.1.4. Verify the equipment is de-energized by following the section of this procedure entitled

17.5.2. VERIFICATION OF DE-ENERGIZED CONDITION

17.5.2.1. Upon completion of maintenance or servicing re-energizing the machine or equipment shall be accomplished by following the section of this procedure entitled REENERGIZING MACHINES OR EQUIPMENT.

17.5.3. DOCUMENTATION

17.5.3.1. At the time of performing a lockout/tagout procedure the authorized employee shall document the procedure, using the attached form. Upon completion of the lockout/tagout procedure the authorized employee shall submit the form to the main office. This documentation shall be reviewed on an annual basis by management to determine if procedures are adhered to,

CAUTION

UNDER NO CIRCUMSTANCES IS ANYBODY ALLOWED TO REMOVE A LOCK AND TAG OTHER THAN THE EMPLOYEE WHO INSTALLED THEM, UNLESS SPECIFICALLY AUTHORIZED IN WRITING TO DO SO BY THAT EMPLOYEES SUPERVISOR. THE LOCK AND TAG MAY ONLY BE REMOVED AFTER CAREFUL INSPECTION OF THE WORK AREA AND THE EQUIPMENT WHICH HAS BEEN DEENERGIZED.

17.6. LOCKOUT / TAGOUT VERIFICATION

Today's Date: _____

Authorized person performing: _____

Lockout / tagout: _____

Machine: _____

Supervisor has been advised. Supervisor's initials: _____

Start time: _____ End time: _____

Reason for lockout / tagout:

Supervisor has been advised work is completed. Supervisor's initials: _____

Date submitted to Main Office: _____

18. FALL PROTECTION

18.1. DEFINITIONS APPLICABLE TO FALL PROTECTION ANCHORAGE

- 18.1.1. **BODY HARNESS** - Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.
- 18.1.2. **BUCKLE** - Any device for holding the body harness closed around the employee's body.
- 18.1.3. **CONNECTOR** - A device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a karabiner, or it may be an integral component of part of the system (such as a buckle or Dee-ring sewn into a body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).
- 18.1.4. **DANGEROUS EQUIPMENT** - Equipment (such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.
- 18.1.5. **DECELERATION DEVICE** - Any mechanism, such as a rope grab, rip-stitch lanyard, specially woven lanyard, tearing or deforming lanyards, automatic selfretracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.
- 18.1.6. **DECELERATION DISTANCE** - The additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.
- 18.1.7. **EQUIVALENT** - Alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.
- 18.1.8. **FAILURE** - Load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.
- 18.1.9. **FREE FALL** - The act of falling before a personal fall arrest system begins to apply force to arrest the fall.
- 18.1.10. **FREE FALL DISTANCE** - The vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard

elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

18.1.11. GUARDRAIL SYSTEM - A barrier erected to prevent employees from falling to lower levels.

18.1.12.LANYARD - A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchorage.

18.1.13.LIFELINE - A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

18.1.14.LOWER LEVELS - Those areas or surfaces to which an employee can fall. Such area or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.

18.1.15.PERSONAL FALL ARREST SYSTEM - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

18.1.16.SAFETYMONITORING SYSTEM - A safety system in which a "Competent Person" is responsible for recognizing and warning employees of fall hazards.

18.1.17.WORK AREA- That portion of a walking/working surface where job duties are being performed.

18.1.18.ANSI - American National Safety Institute.

18.2. THIS SECTION SETS FORTH REQUIREMENTS AND CRITERIA FOR FALL PROTECTION IN CONSTRUCTION WORKPLACES - covered under 29 CFR 1926.

18.2.1. Exception: The procedure does not apply when employees are making an inspection, investigation or assessment of workplace conditions prior to the actual start of construction work or after all construction work has been completed.

18.2.2. The following areas are not covered under 29 CFR 1926. Each of the following is covered under their own standard.

18.2.2.1. Scaffolds

18.2.2.2. Certain cranes and derricks.

18.2.2.3. Employees performing steel erection work in buildings.

18.2.2.4. Employees working on certain types of equipment used in tunneling operations.

18.2.2.5. Employees engaged in the construction of electric transmission and distribution lines and equipment.

18.2.2.6. Employees working on stairways and ladders.

18.3. DUTY TO HAVE FALL PROTECTION

18.3.1. GENERAL

- 18.3.1.1. This procedure sets forth requirement for employers to provide fall protection systems.
- 18.3.1.2. 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.
- 18.3.1.3. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.

18.4. UNPROTECTED SIDES & EDGES

- 18.4.1. Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is six feet (6') 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.

18.4.2. Leading Edges

- 18.4.2.1. Each employee who is constructing a leading edge six feet (6') or more above lower levels shall be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems.
- 18.4.2.2. Exception: When the employer can demonstrate that it is infeasible or creates a greater hazard to use these systems, the employer shall develop and implement a fall protection plan which meets the requirements in this section under Fall Protection Plan.
- 18.4.2.3. Each employee on a walking/working surface six feet (6') or more above a lower level where leading edges are under construction, but who is not engaged in the leading edge work, shall be protected from falling by a guardrail system, safety net system, or personal fall arrest system. If a guardrail system is chosen to provide the fall protection, and a controlled access zone has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.

18.4.3. Hoist Areas

- 18.4.3.1. Each employee in a hoist area shall be protected from falling six feet (6') or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems, (or chain, gate or guardrail) or portions thereof, are removed to facilitate the hoisting operation, and an employee must lean through the access opening or out over the edge of the access opening, that employee shall be protected from fall hazards by a personal fall arrest system.

18.4.4. Holes

- 18.4.4.1. Each employee on working/working surfaces shall be protected from falling through holes (including skylights) more than six feet (6') above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes.
- 18.4.4.2. Each employee on a walking/working surface shall be protected from tripping in or stepping into or through holes (including skylights) by covers.
- 18.4.4.3. Each employee on a walking/working surface shall be protected from objects falling through holes (including skylights) by covers.

18.4.5. Formwork & Reinforcing Steel

- 18.4.5.1. Each employee working on the face of formwork or reinforcing steel shall be protected from falling six feet (6') or more to lower levels by personal fall arrest systems, safety net systems, or positioning device systems.

18.4.6. Ramps, Runways and Other Walkways

- 18.4.6.1. Each employee on ramps, runways, and other walkways shall be protected from falling six feet (6') or more to lower levels by guardrail systems.

18.4.7. Excavations

- 18.4.7.1. Each employee at the edge of an excavation six feet (6') or more in depth shall be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier.
- 18.4.7.2. Each employee at the edge of a well, pit, shaft and similar excavation six feet (6') or more in depth shall be protected from falling by guardrail systems, fences, barricades or covers.

18.4.8. Dangerous Equipment

- 18.4.8.1. Each employee less than six feet (6') above dangerous equipment shall be protected from falling into or onto the dangerous equipment by guardrail systems or by equipment guard.
- 18.4.8.2. Each employee six feet (6') or more above dangerous equipment shall be protected from fall hazards by guardrail systems, personal fall arrest systems or safety net systems.

18.4.9. Wall Openings

- 18.4.9.1. Each employee working on, at, above, or near wall openings, including those with chutes attached, where the outside bottom edge of the wall opening is six feet (6') or more above lower levels and the inside bottom edge of the wall opening is less than

thirty nine, inches (39") above the walking/working surface, shall be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.

18.4.10. Protection From Falling Objects

18.4.10.1. 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:

18.4.10.1.1. a. Erect toeboards, screens, or guardrail systems to prevent objects from falling from higher level.

18.4.10.1.2. Erect a canopy structure and keep potential fall objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced.

18.4.10.1.3. 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.

18.5. FALL PROTECTION SYSTEMS CRITERIA AND PRACTICES

Fall protection systems required shall comply with applicable provision of this procedure. Employers shall provide and install all fall protection systems required by this procedure for an employee and shall comply with all other pertinent requirements of this procedure before that employee begins the work that necessitates the fall protection.

18.5.1. Guardrail Systems - Guardrail systems and their use shall comply with the following:

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

18.5.1.2. 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 (21") high.

18.5.1.3. Midrails, when used, shall be installed at a height midway between the top edge of the guardrail system and the walking/working level.

18.5.1.4. 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.

18.5.1.5. Intermediate members (such as balusters), when used between posts, shall be not more than 19 inches (19") apart.

- 18.5.1.6. Other structural member (such as additional midrails and architectural panels) shall be installed such that there are no openings in the guardrail system that are more than nineteen inches (19") wide.
- 18.5.1.7. Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds applied within two inches (2") of the top edge, in any outward or downward direction, at any point along the top edge.
- 18.5.1.8. When the 200-pound test load specified in this procedure is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 29 inches above the walking/working level.
- 18.5.1.9. Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150 pounds applied in any downward or outward direction at any point along the midrail or other member. 10. Guardrail systems shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
- 18.5.1.10. The ends of all, top rails and midrails shall not overhang the terminal posts, except where such overhand does not constitute a projection hazard.
- 18.5.1.11. Steel banding and plastic banding shall not be used as top rails or midrails.
- 18.5.1.12. Top rails and midrails shall be at least one-quarter inch (1/4") nominal diameter or thickness to prevent cuts and lacerations. If work rope is used for top rails, it shall be flagged at not more than six (6') feet intervals with high visibility material.
- 18.5.1.13. 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.
- 18.5.1.14. When guardrail systems are used at holes, they shall be erected on all unprotected sides or edges of the hole.
- 18.5.1.15. When guardrail systems are used around holes used for the passage of materials, the hole shall have not more than two (2) sides provided with removable guardrail section to allow the passage of materials. When the hole is not in use, it shall be closed over with a cover, or a guardrail system shall be provided along all unprotected sides or edges. When guardrail systems are used around holes, which are used as point of access (such as ladder ways) they shall be provided with a gate, or be so offset that a person cannot walk directly into the hole.
- 18.5.1.16. Guardrail systems used on ramps and runways shall be erected along each unprotected side or edge.

18.5.1.17. Manila, plastic or synthetic rope being used for top rails or midrails shall be inspected as frequently as necessary to ensure that it continues to meet the strength requirements.

18.5.2. Safety Net Systems - Safety Net Systems and their use shall comply with the following. 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 below such level. When nets are used on bridges, the potential fall area from the walking/working surface to the net shall be unobstructed.

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

18.5.2.2. 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

- 18.5.2.2.1. Up to 5 feet.....
- 18.5.2.2.2. More than 5 feet up to 10 feet.
- 18.5.2.2.3. More than 10 feet
- 18.5.2.2.4. 8 feet
- 18.5.2.2.5. 10 feet
- 18.5.2.2.6. 13 feet

18.5.2.3. 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 the drop test specified in the following sections.

18.5.2.4. Safety nets and their installations shall be capable of absorbing an impact force equal to that produced by the drop test.

18.5.2.5. Safety nets and safety net installations shall be drop tested at the jobsite after initial installation and before being used as a fall protection system, whenever relocated, after major repair, and at six month intervals if left in one place. The drop test shall consist of a 400 pound bag of and 30 + or - 2 inches in diameter dropped into the net the highest walking/working surface at which employees are exposed to fall from hazards, but not from less than forty-two inches (42") above that level.

18.5.2.6. When the employer can demonstrate that it is unreasonable to perform the drop test required, the employer, or a designated competent person, shall certify that the net and net installation is in compliance by preparing a certification record prior to the net being used as a fall protection system. The certification record must include an identification of the net and net installation for which the certification record is being prepared, the date that it was determined that the identified net and net installation were in compliance and the signature of the person making the determination and certification. The most recent certification record for each net and net installation shall be available at the jobsite for inspection.

18.5.2.7. 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.

18.5.2.8. 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.

18.5.2.9. The maximum size of each safety net mesh opening shall not exceed 36 square inches nor be longer than six (6") inches on any side, and the opening, measured center-to-center of mesh ropes or webbing, shall not be longer than six (6") inches. All mesh crossings shall be secured to prevent enlargement of the mesh opening.

18.5.2.10. Each safety net (or section of it) shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds.

18.5.2.11. Connections between safety net panels shall be as strong as integral net components and shall be spaced not more than 6 inches (6") apart.

18.5.3. Personal Fall Arrest Systems - Personal fall arrest systems and their use shall comply with the following provisions set forth below:

18.5.3.1. The use of a body belt in a positioning device system is acceptable and is regulated under positioning devices of this procedure.

18.5.3.1.1. Connectors shall be drop forged, pressed or formed steel, or made of equivalent material.

18.5.3.1.2. Connectors shall have a corrosion resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.

18.5.3.1.3. Dee-rings and snaphooks shall have minimum tensile strength of 5,000 pounds.

18.5.3.1.4. Dee-rings and snaphooks shall be proof tested to a minimum tensile load of 3,600 pounds without cracking, breading or taking permanent deformation.

18.5.3.1.5. Snaphooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook by depression of the snaphook keeper by the connected member, or 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. Effective January 1, 1998, only locking type snaphooks shall be used.

18.5.3.1.6. Unless the snaphook is a locking type and designed for the following connection, snaphooks shall not be engaged:

18.5.3.1.6.1. directly to webbing, rope or wire rope,
18.5.3.1.6.2. to each other

- 18.5.3.1.6.3. to a dee-ring to which another snaphook or other connector is attached. to a horizontal lifeline
- 18.5.3.1.6.4. to any object which is incompatibly shaped or dimensions in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself.
- 18.5.3.1.7. On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical life lines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.
- 18.5.3.1.8. 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 (2).
- 18.5.3.1.9. Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds.
- 18.5.3.1.10. When vertical lifelines are use, each employee shall be attached to a separate lifeline.
 - 18.5.3.1.10.1. During the construction of elevator shafts, two employees may be attached to the same lifeline in the hoistway, provided both employees are working atop a false car that is equipped with guardrails, the strength of the lifeline is 10,000 pounds per employee attached and all other criteria specified for lifelines have been met.
- 18.5.3.1.11. Lifelines shall be protected against being cut or abraded.
- 18.5.3.1.12. Self-retracting lifelines and lanyards which automatically limit free fall distance to two feet (2') feet or less, shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- 18.5.3.1.13. Self retracting lifelines and lanyards which do not limit free fall distance to two (2') feet or less, rip stitch lanyards and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- 18.5.3.1.14. Ropes and straps (webbing) used lanyards, lifelines, and strength components of body harnesses shall be made from synthetic fibers.
- 18.5.3.1.15. 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 per employee attached or shall be designed, installed and used as follows:

- 18.5.3.1.15.1. As part of a complete personal fall arrest system which maintains a safety factor of at least two.
- 18.5.3.1.15.2. Under the supervision of a qualified person.
- 18.5.3.1.16. Personal fall arrest systems, when stopping a fall, shall:
 - 18.5.3.1.16.1. Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness.
 - 18.5.3.1.16.2. Be rigged such that an employee can neither free fall more than six (6') feet nor contact any lower level.
 - 18.5.3.1.16.3. Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.
 - 18.5.3.1.16.4. Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of six (6') feet or the free fall distance permitted by the system, whichever is less.
- 18.5.3.1.17. 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.
- 18.5.3.1.18. 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.
- 18.5.3.1.19. 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.
- 18.5.3.1.20. 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.
- 18.5.3.1.21. 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.
- 18.5.3.1.22. Personal fall arrest systems shall not be attached to guardrail systems, they shall not be attached to hoists except as specified in other areas of these procedure.
- 18.5.3.1.23. When a personal fall arrest system is used at hoist areas, it shall be rigged to allow the movement of the employee only as far as the edge of the walking/working surface.
- 18.5.4. Positioning Device Systems - Positioning device systems and their use shall conform to the following:

- 18.5.4.1. Positioning devices shall be rigged such that an employee cannot free fall more than two (2') feet.
- 18.5.4.2. 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, whichever is greater.
- 18.5.4.3. Connectors shall be drop forged, pressed or formed steel or made of equivalent materials.
- 18.5.4.4. Connectors shall have a corrosion resistant finish and all surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.
- 18.5.4.5. Connecting assemblies shall have a minimum tensile strength of 5,000 pounds.
- 18.5.4.6. Dee rings and snaphooks shall be proof tested to a minimum tensile load of 3,600 pounds without cracking, breading, or taking permanent deformation.
- 18.5.4.7. Snaphooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook by depression of the snaphook keeper by the connected member, or 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. As of January 1, 1998, only locking type snaphooks shall be used.
- 18.5.4.8. Unless the snaphook is a locking type and designed for the following connections, snaphooks shall not be engaged.
 - 18.5.4.8.1. Directly to webbing, rope or wire rope.
 - 18.5.4.8.2. To each other.
 - 18.5.4.8.3. To a dee ring to which another snaphook or other connector is attached.
 - 18.5.4.8.4. To a horizontal lifeline.
 - 18.5.4.8.5. To any object which is incompatible shaped or dimensions in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself.
- 18.5.4.9. Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration and defective components shall be removed from service.
- 18.5.4.10. Harnesses and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) not to hoist materials.
- 18.5.5. Warning Line System - Warning line systems and their use shall comply with the following.
 - 18.5.5.1. Warning Line System shall consist of ropes, wires, or chains and supporting stanchions erected as follows:

- 18.5.5.2. The rope, wire, or chain shall be flagged at not more than six (6') foot intervals with high visibility material.
- 18.5.5.3. The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than thirty four (34") inches from the walking/working surface and its highest point is not more than thirty nine (39") inches from the walking/working surface.
- 18.5.5.4. 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 horizontally against the stanchion, thirty (30") inches above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof or platform edge.
- 18.5.5.5. The rope, wire or chain shall have minimum tensile strength of 500 pounds and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to stanchions.
- 18.5.5.6. 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 that stanchion tips over.
- 18.5.5.7. No employee shall be allowed in the area between an edge and a warning line unless the employee is performing work in that area.
- 18.5.6. Controlled Access Zones - Controlled Access zones and their use shall conform to the following:
 - 18.5.6.1. 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.
 - 18.5.6.2. When control lines are used, they shall be erected not less than six (6') feet nor more than twenty five (25') feet from the unprotected or leading edge, except when erecting precast concrete members.
 - 18.5.6.3. When erecting precast concrete members, the control line shall be erected not less than six (6') feet nor more than sixty (60') feet or half the length of the member being erected, whichever is less, from the leading edge.
 - 18.5.6.4. 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.
 - 18.5.6.5. The control line shall be connected on each side to a guardrail system or wall.
 - 18.5.6.6. When used to control access to areas where overhand bricklaying and related work are taking place:
 - 18.5.6.6.1. The controlled access zone shall be defined by a control line erected not less than ten (10') feet nor more than fifteen (15') feet from the working edge.

- 18.5.6.6.2. The control line shall extend for a distance sufficient for the controlled access zone to enclose all employees at the working edge and shall be approximately parallel to the working edge.
 - 18.5.6.6.3. Additional control lines shall be erected at each end to enclose the controlled access zone.
 - 18.5.6.6.4. Control lines shall consist of ropes, wires, tapes or equivalent materials, and supporting stanchions as follows:
 - 18.5.6.6.4.1.1. Each line shall be fagged or otherwise clearly marked at not more than six-foot (6') intervals with high visibility material.
 - 18.5.6.6.4.1.2. Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than thirty nine (39") inches from the walking/working surface and its highest point is not more than forty five (45") inches from the walking/working surface.
 - 18.5.6.6.5. Each line shall have a minimum breaking strength of 200 pounds.
 - 18.5.6.6.6. On floors and roofs where guard rail 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.
 - 18.5.6.6.7. On floors and roofs where guard rail 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.
- 18.5.7. Safety Monitoring Systems- Safety monitoring systems and their use shall comply with the following:
- 18.5.7.1. The employer shall designate a competent person to monitor the safety of other employees and the employer shall ensure that the safety monitor complies with the following requirements:
 - 18.5.7.1.1. The safety monitor shall be competent to recognize fall hazards.
 - 18.5.7.1.2. The safety monitor shall warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner.
 - 18.5.7.1.3. The safety monitor shall be on the same walking/working surface and within visual sighting distance of the employee being monitored.
 - 18.5.7.1.4. The safety monitor shall be close enough to communicate orally with the employee.
 - 18.5.7.1.5. The safety monitor shall not have other responsibilities, which could take the monitor's attention from the monitoring function.
 - 18.5.7.1.6. No employee, other than an employee engaged in the work or an employee covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.
 - 18.5.7.1.7. Each employee working in a controlled access zone shall be directed to comply promptly with fall hazard warning from safety monitors.

18.5.8. Covers - Covers for holes in floors, roofs and other walking/working surfaces shall meet the following:

18.5.8.1. 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.

18.5.8.2. All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that maybe imposed on the cover at any one time.

18.5.8.3. All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.

18.5.8.4. All covers shall be color coded or they shall be marked with the work "**HOLE**" or "**COVER**" to provide warning of the hazard.

18.5.9. Protection From Falling Objects - Falling object protection shall comply with the following:

18.5.9.1. Toeboards, when used as falling object protection, shall be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.

18.5.9.2. Toeboards shall be capable of withstanding, without failure, a force of a least 50-pound applied in any downward or outward direction at any point along the toeboard.

18.5.9.3. Toeboards shall be a minimum of 3 ½ inches in vertical height from their top edge to the level of the walking/working surface. They shall have not more than 1/4inch clearance above the walking/working surface. The toeboard shall be solid or have opening not over one (1") inch in greatest dimension.

18.5.9.4. Where tools, equipment, or materials are piled higher than the top edge of a toeboard, paneling or screening shall be erected from the walking/working surface or toeboard to the top of a guardrail system's top rail or midrail, for a distance sufficient to protect employee below.

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

18.5.9.6. During the performance of overhand bricklaying and related work:

18.5.9.6.1. No materials or equipment except masonry and mortar shall be stored within four (4') feet of the working edge.

18.5.9.6.2. 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.

19. PERSONAL PROTECTIVE EQUIPMENT

19.1. CRITERIA FOR PERSONAL PROTECTIVE EQUIPMENT

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.

19.2. EMPLOYEE-OWNED EQUIPMENT

Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

19.3. DESIGN

All personal protective equipment shall be of safe design and construction for the work to be performed.

19.4. OCCUPATIONAL FOOT PROTECTION

Safety-toe foot wear for employees shall meet the requirements and specification in American National Standard for Men's Safety-toe foot wear.

19.5. HEARING PROTECTION

19.5.1. Wherever it is not feasible to reduce the noise levels or duration of exposure to 85 dba, ear protective devices shall be provided and used.

19.5.2. Ear protective devices inserted in the ear shall be fitted or determined individually by competent persons.

19.5.3. Plain cotton is not an acceptable protective device.

19.6. HEAD PROTECTION

19.6.1. Hard hats must be worn where there is a possible danger of head injury from impact, falling or flying objects, electrical shock or burns.

19.7. EYE AND FACE PROTECTION

19.7.1. Eye and face protection must be worn when machines or operations present potential eye or face injury from physical, chemical or radiation agents.

19.7.2. All eye and face protection shall meet ANSI Standards.

19.7.3. Eye and face protection equipment shall be clean and in good repair. The use of this type equipment with structural or optical defects shall be prohibited.

19.7.4. Employees whose vision requires the use of corrective lenses in spectacles, when required by this regulation to wear eye protection, shall be protected by goggles or spectacles of one of the following types:

19.7.5. Spectacles whose protective lenses provide optical correction.

19.7.6. Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

19.7.7. Goggles that incorporate corrective lenses mounted behind the protective lenses.

19.7.8. Protectors shall meet the following minimum requirements:

19.7.8.1. They shall provide adequate protection against the particular hazards for which they are designed.

19.7.8.2. They shall be reasonably comfortable when worn under the designated conditions.

19.7.8.3. They shall fit snugly and shall not unduly interfere with the movements of the wearer.

19.7.8.4. They shall be durable.

19.7.8.5. They shall be capable of being disinfected.

19.7.8.6. They shall be capable of being cleaned easily.

19.7.8.7. Every protector shall be distinctly marked to facilitate identification only of the manufacturer.

19.7.8.8. When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.

19.8. PROTECTION AGAINST LASER / RADIANT ENERGY

19.8.1. 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

19.8.2. All protective goggles shall bear a label identifying the following data.

- 19.8.2.1. The laser wavelengths for which use is intended.
- 19.8.2.2. The optical density of those wavelengths.
- 19.8.2.3. The visible light transmission.

20. RESPIRATORY PROTECTION PROGRAM

20.1. In the control of occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective is to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering and/or administrative controls. (example: general and local ventilation, enclosure or isolation and substitution of less hazardous processes or materials) When effective engineering and/or administrative controls are not feasible, or while they are being instituted, appropriate respiratory protection is required.

20.2. **Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee.** The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program which shall include the requirements outlined.

20.3. DEFINITIONS

20.3.1. Air-Purifying Respirator - a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element. Atmosphere-Supplying Respirator - a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

20.3.2. Canister or Cartridge - a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

20.3.3. Demand Respirator - an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

20.3.4. Emergency Situation - any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

20.3.5. Employee Exposure - exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

20.3.6. End-of-Service-Life Indicator (ESLI) - a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

20.3.7. Escape-only Respirator - a respirator intended to be used only for emergency exit.

- 20.3.8. Filter or Air Purifying Element - a component used in respirators to remove solid or liquid aerosols from the inspired air.
- 20.3.9. Filtering Facepiece (Dust Mask) - a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.
- 20.3.10. Fit Factor - a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.
- 20.3.11. Fit Test - the use of a protocol to qualitatively or quantitatively evaluate the Fit of a respirator on an individual.
- 20.3.12. Helmet - a rigid respiratory inlet covering that also provides head protection against impact and penetration.
- 20.3.13. High Efficiency Particulate Air Filter (HEPA) - a filter that is at least 99.97% efficient in removing mono-disperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100 and P100.
- 20.3.14. Hood - a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.
- 20.3.15. IDLH - (Immediately Dangerous to Life or Health) an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
- 20.3.16. Interior Structural Firefighting - the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage.
- 20.3.17. Loose-Fitting Facepiece - a respiratory inlet covering that is designed to form a partial seal with the face.
- 20.3.18. Negative Pressure Respirator (tight fitting) - a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.
- 20.3.19. Oxygen Deficient Atmosphere - an atmosphere with an oxygen content below 19.5% by volume.

- 20.3.20. PLHCP - Physician or other licensed health care professional – an individual whose legally permitted scope of practice allows him or her to independently provide, or be delegated the responsibility to provide, some or all the health care services required.
- 20.3.21. Positive Pressure Respirator - a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.
- 20.3.22. Powered Air-Purifying Respirator (PAPR) - an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
- 20.3.23. Pressure Demand Respirator - positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.
- 20.3.24. Qualitative Fit Test - pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
- 20.3.25. Quantitative Fit Test - assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
- 20.3.26. Respiratory Inlet Covering - that portion of the respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with a nose clamp.
- 20.3.27. Self-Contained Breathing Apparatus - (SCBA) an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
- 20.3.28. Service Life - the period of time that a respirator, filter or sorbent or other respiratory equipment provides adequate protection to the wearer.
- 20.3.29. Supplied-Air Respirator - an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
- 20.3.30. Tight-Fitting Facepiece - a respiratory inlet covering that forms a complete seal with the face.
- 20.3.31. User Seal Check - an action conducted by the respirator user to determine if the respirator is properly sealed to the face.

20.4. PURPOSE AND SCOPE

The practices and procedures described here constitute the program under which respirator protection is to be effectively utilized.

20.4.1. GENERAL REQUIREMENTS

- 20.4.1.1. The employer shall 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.
- 20.4.1.2. The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.
- 20.4.1.3. The employer shall identify and evaluate the respiratory hazard(s) to include an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.
- 20.4.1.4. The employer shall select from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

20.4.2. Respirators for IDLH Atmospheres

- 20.4.2.1. The following respirators shall be provided for employee use in IDLH atmospheres:
 - 20.4.2.1.1. a full facepiece pressure demand SCBA certified by NIOSH with 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.
 - 20.4.2.1.2. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.
 - 20.4.2.1.3. All oxygen-deficient atmospheres shall be considered IDLH, and the respirator(s) used must be those discussed in numbers 1 & 2 on the previous page. **Exception:** If the employer 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.

20.4.3. Respirators for Atmospheres that are not IDLH

- 20.4.3.1. The respirator selected shall:

- 20.4.3.1.1. adequately protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations
- 20.4.3.1.2. be appropriate for the chemical state and physical form of the contaminant
- 20.4.3.1.3. protect against gases and vapors, the employer shall provide an atmosphere - supplying respirator, or an air-purifying respirator that is equipped with an end-of-service- life indicator (ESLI) certified by NIOSH
- 20.4.3.1.4. if there is no ESLI appropriate for conditions in the employer's workplace, the employer shall 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. The employer shall describe in the respirator program the information and data relied upon and the basis for reliability of the data.

20.4.4. For protection against particulates, the employer shall provide:

- 20.4.4.1. An atmosphere-supplying respirator
- 20.4.4.2. 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
- 20.4.4.3. 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.

20.4.5. MEDICAL EVALUATION

- 20.4.5.1. 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. The minimum requirements for medical evaluation that employers must implement to determine the employee's ability to use a respirator are:
 - 20.4.5.1.1. 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.
 - 20.4.5.1.2. Select a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical evaluation questionnaire or an

initial medical examination that obtains the same information as the medical questionnaire.

20.4.5.1.3. The medical evaluation shall obtain the information requested by the questionnaire.(attached)

20.4.5.1.4. Provide a follow-up medical examination for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of Appendix C or whose medical examination demonstrates the need for a follow-up medical examination.

20.4.5.1.5. The follow-up medical examination shall include any medical tests, consultations

20.4.5.1.6. diagnostic procedures that the PLHCP deems necessary to make a final 6. The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content.

20.4.5.1.7. Every employee shall have an opportunity to discuss the questionnaire and examination results with the PLCHP.

20.4.5.1.8. The following supplemental information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:

20.4.5.1.8.1. the type and weight of the respirator to be used by the employee

20.4.5.1.8.2. the duration and frequency of respirator use (including use for rescue and escape)

20.4.5.1.8.3. the expected physical work effort

20.4.5.1.8.4. additional protective clothing and equipment to be worn

20.4.5.1.8.5. Temperature and humidity extremes that may be encountered.

20.4.5.1.9. 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.

20.4.5.1.10. The PLHCP must be provided with a copy of the written respiratory protection program.

20.4.5.1.11. When the employer replaces a PLHCP, the employer must ensure that the new PLHCP obtains this information.

20.4.5.1.12. Written recommendation shall be obtained from the PLHCP in determining the employee's ability to use a respirator. The recommendation shall provide only the following information:

20.4.5.1.12.1. any limitations on respirator use related to the medical condition of the employee

20.4.5.1.12.2. or related to the workplace conditions in which the respirator will be used

20.4.5.1.12.3. including whether or not the employee is medically able to use the respirator

20.4.5.1.12.4. the need, if any, for follow-up medical evaluations

20.4.5.1.12.5. a statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

20.4.5.1.13. 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 employer 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.

20.4.5.1.14. Additional medical evaluations that comply with the requirements of this section shall be provided if:

20.4.5.1.14.1. an employee reports medical signs or symptoms that are related to ability to use a respirator

20.4.5.1.14.2. a PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated

20.4.5.1.14.3. information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation

20.4.5.1.14.4. 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.

20.4.6. FIT TESTING

- 20.4.6.1. 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.
- 20.4.6.2. All employees using a tight-fitting facepiece respirator are required to pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT).
- 20.4.6.3. All employees using a tight-fitting facepiece respirator must be 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.
- 20.4.6.4. An additional fit test shall be conducted whenever the employee reports, or the employer, 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.
- 20.4.6.5. If, after passing a QLFT or QNFT, the employee subsequently notifies the employer, 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 be retested.
- 20.4.6.6. The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol.
- 20.4.6.7. A QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
- 20.4.6.8. 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 tightfitting full facepiece, the QNFT has been passed with that respirator.
- 20.4.6.9. 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.
- 20.4.6.10. 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 face-piece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator or facepiece.

20.4.6.11. 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.

20.4.6.12. 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.

20.4.7. USE OF RESPIRATORS

20.4.7.1. Facepiece Seal Protection

20.4.7.1.1. Use of respirators shall not be permitted, if the following conditions exist:

20.4.7.1.1.1. facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function, or b. any condition that interferes with the face-to-facepiece seal or valve function.

20.4.7.1.1.2. 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.

20.4.7.1.1.3. For all tight-fitting respirators, the employer shall ensure that employees perform a user seal check each time they put on the respirator using the procedures.

20.4.7.2. Continuing Respirator Effectiveness

20.4.7.2.1. 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, the employer shall reevaluate the continued effectiveness of the respirator.

20.4.7.2.2. Employees shall exit the respirator use area for the following reasons:

20.4.7.2.2.1. to wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use

20.4.7.2.2.2. upon detection of vapor or gas breakthrough, changes in breathing resistance

20.4.7.2.2.3. leakage of the facepiece

20.4.7.2.2.4. to replace the respirator or the filter, cartridge, or canister elements.

20.4.7.2.3. If the employee detects vapor or gas breakthrough, changes in breathing resistance leakage of the facepiece, the employer must replace or repair the respirator before allowing the employee to return to the work area.

20.4.7.3. Procedures for IDLH Atmospheres

20.4.7.3.1. For all IDLH atmospheres, the following items shall be in place:

20.4.7.3.1.1. One (1) employee or, when needed, more than one employee, is located outside the IDLH atmosphere.

20.4.7.3.1.2. Visual, voice, or signal line communication shall be maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere.

20.4.7.3.1.3. Employee(s) located outside the IDLH atmosphere shall be trained and equipped to provide effective emergency rescue.

20.4.7.3.1.4. The employer or his designee is notified before the employee(s) located outside the IDLH atmosphere attempt to provide emergency rescue

20.4.7.3.1.5. The employer or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation.

20.4.7.3.1.6. Employee(s) located outside the IDLH atmospheres are equipped with:

20.4.7.3.1.7. Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either

20.4.7.3.1.8. Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would not increase the overall risk resulting from entry

20.4.7.3.1.9. Equivalent means for rescue where retrieval equipment is not required.

20.4.7.4. Procedures for Interior Structural Firefighting for IDLH Atmospheres.

20.4.7.4.1. At least two (2) employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times.

20.4.7.4.2. At least two (2) employees are located outside the IDLH atmosphere

20.4.7.4.3. All employees engaged in interior structural firefighting use SCBAs.

20.4.8. MAINTENANCE AND CARE OF RESPIRATORS

20.4.8.1. Cleaning and Disinfecting Respirators

20.4.8.2. Each employee that uses a respirator, shall be supplied with a clean, sanitary, and in good working order. The employer shall ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2 of this section, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness. The respirators shall be cleaned and disinfected at the following intervals:

20.4.8.2.1. 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;

20.4.8.2.2. Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals.

20.4.8.2.3. Respirators maintained for emergency use shall be cleaned and disinfected after each use;

20.4.8.2.4. Respirators used in fit testing and training shall be cleaned and disinfected after each use.

20.4.8.3. Respirator Storage

20.4.8.3.1. All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the facepiece and the exhalation valve.

20.4.8.3.2. Emergency respirators shall be:

20.4.8.3.2.1. Kept accessible to the work area.

20.4.8.3.2.2. Stored in compartments or in covers that are clearly marked as containing emergency respirators.

20.4.8.3.2.3. Stored in accordance with any applicable manufacturer instructions.

20.4.8.4. Respirator Inspection

20.4.8.4.1. All respirators used in routine situations shall be inspected before each

20.4.8.4.2. All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use.

20.4.8.4.3. Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

20.4.8.4.4. Respirator inspections include the following:

20.4.8.4.4.1. a check for 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.

20.4.8.4.4.2. A check of elastomeric parts for pliability and signs of deterioration.

20.4.8.4.4.3. Self-contained breathing apparatus shall be inspected monthly. 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. The employer shall determine that the regulator and warning devices function properly.

20.4.8.4.5. For respirators maintained for emergency use:

20.4.8.4.5.1. 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.

20.4.8.4.5.2. 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.

20.4.8.5. Respirator Repairs

20.4.8.5.1. Respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired are adjusted in accordance with the following procedures:

20.4.8.5.1.1. repairs or adjustments to the 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 that respirator

20.4.8.5.1.2. repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed

20.4.8.5.1.3. Reducing and admission valves, regulators and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

20.4.8.6. Breathing Air Quality and Use

20.4.8.6.1. The following specifications for compressed air, compressed oxygen, liquid air liquid oxygen are as follows:

20.4.8.6.1.1. compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen

20.4.8.6.1.2. compressed breathing air shall meet at least the requirements for Type 1- Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1 – 1989, to include:

20.4.8.6.1.2.1. oxygen content (v/v) of 19.5 – 23.5%,

- 20.4.8.6.1.2.2. hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less
- 20.4.8.6.1.2.3. carbon monoxide (CO) content of 10 ppm or less
- 20.4.8.6.1.2.4. carbon dioxide content of 1,000 ppm or less
- 20.4.8.6.1.2.5. Lack of noticeable odor.
- 20.4.8.6.2. Compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.
- 20.4.8.6.3. Oxygen concentration greater than 23.5% is used only in equipment designed for oxygen service or distribution.
- 20.4.8.6.4. Cylinders used to supply breathing air to respirators must meet the following requirements:
 - 20.4.8.6.4.1. cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178)
 - 20.4.8.6.4.2. cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Type 1 – Grade D breathing air
 - 20.4.8.6.4.3. the moisture content in the cylinder does not exceed a dew point of -50°F (-45.6°C) at 1 atmosphere pressure.
 - 20.4.8.6.4.4. Compressors used to supply breathing air to respirators shall be constructed and situated to:
 - 20.4.8.6.4.4.1. prevent entry of contaminated air into the air-supply system
 - 20.4.8.6.4.4.2. minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56°C) below the ambient temperature,
 - 20.4.8.6.4.4.3. 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.

20.4.8.6.4.4.4. 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.

20.4.8.6.4.4.5. The carbon monoxide levels in the breathing air for compressors that are not oil lubricated must not exceed 10ppm.

20.4.8.6.4.4.6. For oil-lubricated compressors, a high-temperature or carbon monoxide alarm, or both shall be used 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 10ppm.

20.4.8.6.4.4.7. Breathing air couplings are incompatible with outlets for non-respirable work-site air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

20.4.8.6.4.4.8. Breathing gas containers marked in accordance with NIOSH respirator certification standard, 42 CFR part 84.

20.4.8.7. Identification of Filters, Cartridges, and Canisters

20.4.8.7.1. All filters, cartridges, and canisters used in the workplace must be labeled and color coded with the NIOSH approval label.

20.4.8.7.2. Labels are not to be removed and must remain legible.

20.4.8.8. Training and Information

20.4.8.8.1. The supervisor as well as every employee who is required to wear a respirator shall be trained in the proper use of the assigned respiratory protection.

20.4.8.8.2. This training includes:

20.4.8.8.2.1. description of the respirator

20.4.8.8.2.2. intended use and limitations of the respirator

20.4.8.8.2.3. proper wearing, adjustment and testing for fit

20.4.8.8.2.4. the engineering and administrative controls being used and the need for respirators to provide protection

20.4.8.8.2.5. the reason for selecting a particular type of respirator

20.4.8.8.2.6. cleaning and storage methods

20.4.8.8.2.7. Inspection and maintenance procedures.

20.4.8.8.3. Retraining shall be administered annually, and when the following situations occur:

20.4.8.8.3.1. changes in the workplace or the type of respirator render previous training obsolete

20.4.8.8.3.2. inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the necessary understanding or skill

20.4.8.8.3.3. any other situation arises in which retraining appears necessary to ensure safe respirator use.

20.4.8.9. Program Evaluation

20.4.8.9.1. The respiratory training program shall be evaluated annually by the program coordinator to determine its continued effectiveness.

20.4.8.9.2. Evaluations of the workplace shall be conducted as necessary to ensure that the provisions of the current program are being effectively implemented and that it continues to be effective. Factors to be assessed include, but are not limited to:

20.4.8.9.2.1. respirator fit (including the ability to use the respirator without interfering with effective workplace performance)

20.4.8.9.2.2. appropriate respirator selection for the hazards to which the employee is exposed

20.4.8.9.2.3. proper respirator use under the workplace conditions the employees encounters

20.4.8.9.2.4. proper respirator maintenance.

20.4.8.10. Recordkeeping

20.4.8.10.1. The following records shall be maintained in the main office.

20.4.8.10.1.1. Medical evaluation.

20.4.8.10.1.2. Fit testing.

20.4.8.10.1.2.1. a record of the qualitative and quantitative fit tests administered, including:

20.4.8.10.1.2.1.1. the name or identification of the employee tested

20.4.8.10.1.2.1.2. type of fit test performed

20.4.8.10.1.2.1.3. specific make, model, style, and size of respirator tested

20.4.8.10.1.2.1.4. date of test

20.4.8.10.1.2.1.5. The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.

20.5. RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

Appendix A – Part A Section 1 (Mandatory)

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee:

Can you read (circle one): Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A ~ Section 1 (Mandatory)

The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____

2. Your name: _____

3. Your age (to nearest year): _____

4. Sex (circle one): Male/Female

5. Your height: _____ ft. _____ in.

6. Your weight: _____ lbs.

7. Your job title: _____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____

9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

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11. Check the type of respirator you will use (you can check more than one category):
a. _____ N, R, or P disposable respirator (filter-mask, non- cartridge type only).
b. _____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
12. Have you worn a respirator (circle one): Yes/No
If "yes," what type(s)
-

RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

Appendix A – Part A Section 2 (Mandatory)

Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month: Yes/No
2. Have you ever had any of the following conditions?
- | | |
|---|--------|
| a. Seizures (fits): | Yes/No |
| b. Diabetes (sugar disease): | Yes/No |
| c. Allergic reactions that interfere with your breathing: | Yes/No |
| d. Claustrophobia (fear of closed-in places): | Yes/No |
| e. Trouble smelling odors: | Yes/No |
3. Have you ever had any of the following pulmonary or lung problems?
- | | |
|--|--------|
| a. Asbestosis: | Yes/No |
| b. Asthma: | Yes/No |
| c. Chronic bronchitis: | Yes/No |
| d. Emphysema: | Yes/No |
| e. Pneumonia: | Yes/No |
| f. Tuberculosis: | Yes/No |
| g. Silicosis: | Yes/No |
| h. Pneumothorax (collapsed lung): | Yes/No |
| i. Lung cancer: | Yes/No |
| j. Broken ribs: | Yes/No |
| k. Any chest injuries or surgeries: | Yes/No |
| l. Any other lung problem that you've been told about: | Yes/No |
4. Do you currently have any of the following symptoms of pulmonary or lung illness?
- | | |
|---|--------|
| a. Shortness of breath: | Yes/No |
| b. Shortness of breath when walking fast on level ground
or walking up a slight hill or incline: | Yes/No |
| c. Shortness of breath when walking with other people at an
ordinary pace on level ground: | Yes/No |
| d. Have to stop for breath when walking at your own pace
on level ground: | Yes/No |

- | | |
|---|--------|
| e. Shortness of breath when washing or dressing yourself: | Yes/No |
| f. Shortness of breath that interferes with your job: | Yes/No |
| g. Coughing that produces phlegm (thick sputum): | Yes/No |
| h. Coughing that wakes you early in the morning: | Yes/No |
| i. Coughing that occurs mostly when you are lying down: | Yes/No |
| j. Coughing up blood in the last month: | Yes/No |
| k. Wheezing: | Yes/No |
| l. Wheezing that interferes with your job: | Yes/No |
| m. Chest pain when you breathe deeply: | Yes/No |
| n. Any other symptoms that you think may be related to lung problems: | Yes/No |

RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

Appendix A – Part A Section 3 (Mandatory)

5. Have you **ever had** any of the following cardiovascular or heart problems?
- | | |
|---|--------|
| a. Heart attack: | Yes/No |
| b. Stroke: | Yes/No |
| c. Angina: | Yes/No |
| d. Heart failure: | Yes/No |
| e. Swelling in your legs or feet (not caused by walking): | Yes/No |
| f. Heart arrhythmia (heart beating irregularly): | Yes/No |
| g. High blood pressure: | Yes/No |
| h. Any other heart problem that you've been told about: | Yes/No |
6. Have you **ever had** any of the following cardiovascular or heart symptoms?
- | | |
|---|--------|
| a. Frequent pain or tightness in your chest: | Yes/No |
| b. Pain or tightness in your chest during physical activity: | Yes/No |
| c. Pain or tightness in your chest that interferes with your job: | Yes/No |
| d. In the past two years, have you noticed your heart skipping or missing a beat: | Yes/No |
| e. Heartburn or indigestion that is not related to eating: | Yes/No |
| f. Any other symptoms that you think may be related to heart or circulation problems: | Yes/No |
7. Do you **currently** take medication for any of the following problems?
- | | |
|--------------------------------|--------|
| a. Breathing or lung problems: | Yes/No |
| b. Heart trouble: | Yes/No |
| c. Blood pressure: | Yes/No |
| d. Seizures (fits): | Yes/No |
8. If you've used a respirator, have you **ever had** any of the following problems?
(If you've never used a respirator, check the following space and go to question 9:) _____
- | | |
|---|--------|
| a. Eye irritation: | Yes/No |
| b. Skin allergies or rashes: | Yes/No |
| c. Anxiety: | Yes/No |
| d. General weakness or fatigue: | Yes/No |
| e. Any other problem that interferes with your use of a | |

respirator:	Yes/No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire:	Yes/No

RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

Appendix A – Part A Section 4 (Mandatory)

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):	Yes/No
11. Do you currently have any of the following vision problems?	
a. Wear contact lenses:	Yes/No
b. Wear glasses :	Yes/No
c. Color blind:	Yes/No
d. Any other eye or vision problem:	Yes/No
12. Have you ever had an injury to your ears, including a broken ear drum:	Yes/No
13. Do you currently have any of the following hearing problems?	
a. Difficulty hearing:	Yes/No
b. Wear a hearing aid:	Yes/No
c. Any other hearing or ear problem:	Yes/No
14. Have you ever had a back injury:	Yes/No
15. Do you currently have any of the following musculoskeletal problems?	
a. Weakness in any of your arms, hands, legs, or feet:	Yes/No
b. Back pain:	Yes/No
c. Difficulty fully moving your arms and legs:	Yes/No
d. Pain or stiffness when you lean forward or backward at the waist:	Yes/No
e. Difficulty fully moving your head up or down:	Yes/No
f. Difficulty fully moving your head side to side:	Yes/No
g. Difficulty bending at your knees:	Yes/No
h. Difficulty squatting to the ground:	Yes/No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs:	Yes/No
j. Any other muscle or skeletal problem that interferes with using	

a respirator:

Yes/No

RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

Appendix A – Part B Section 1

Part B

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.

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: Yes/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: Yes/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: Yes/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:

Asbestos: Yes/No

Silica (e.g., in sandblasting): Yes/No

Tungsten/cobalt (e.g., grinding or welding this material): Yes/No

Beryllium: Yes/No

Aluminum: Yes/No

Coal (for example, mining): Yes/No

Iron: Yes/No

Tin: Yes/No

Dusty environments: Yes/No

Any other hazardous exposures: Yes/No

If "yes," describe these exposures: _____

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4. List any other 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? Yes/No

If "yes," were you exposed to biological or chemical agents (either in training or combat):Yes/No

RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

Appendix A – Part B Section 2

8. Have you ever worked on a HAZMAT team? Yes/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):

Yes/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. HEPA Filters: Yes/No

b. Canisters (for example, gas masks): Yes/No

c. Cartridges: Yes/No

11. How often are you expected to use the respirator(s)

(circle "yes" or "no" for all answers that apply to you)?:

a. Escape only (no rescue): Yes/No

b. Emergency rescue only: Yes/No

c. Less than 5 hours **per week**: Yes/No

d. Less than 2 hours **per day**: Yes/No

e. 2 to 4 hours per day: Yes/No

f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:

a. **Light** (less than 200 kcal per hour):

Yes/No

If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of a light work effort are **sitting** while writing, typing, drafting, or performing light assembly work; or **standing** while operating a drill press (1-3 lbs.) or controlling machines.

b. **Moderate** (200 to 350 kcal per hour):

Yes/No

If "yes," how long does this period last during the average shift:_____hrs._____mins.

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 lbs.) at trunk level; **walking** on a level surface about 2 mph or down a 5-degree grade about 3 mph; or **pushing** a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. **Heavy** (above 350 kcal per hour):

Yes/No

If "yes," how long does this period last during the average shift: _____ hrs. _____ mins.

Examples of heavy work are **lifting** a heavy load (about 50 lbs.) 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; climbing stairs with a heavy load (about 50 lbs.).

RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

Appendix A – Part B Section 3

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator:

Yes/No

If "yes," describe this protective clothing and/or equipment: _____

14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes/No

15. Will you be working under humid conditions:

Yes/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) (for example, confined spaces, life-threatening gases):

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

a. Name of the first toxic substance: _____

b. Estimated maximum exposure level per shift: _____

c. Duration of exposure per shift: _____

d. Name of the second toxic substance: _____

e. Estimated maximum exposure level per shift: _____

f. Duration of exposure per shift: _____

g. Name of the third toxic substance: _____

h. Estimated maximum exposure level per shift: _____

i. Duration of exposure per shift: _____

j. The name(s) of any other toxic substances that you'll 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 (for example, rescue, security):

21. SCAFFOLDS

21.1. DEFINITIONS

21.1.1. SCAFFOLD - Any temporary elevated platform and its supporting structure used for supporting workmen, materials or both.

21.1.2. LIGHT DUTY SCAFFOLD - A scaffold designed and constructed to carry a working load not to exceed 25 pounds per square foot.

21.1.3. HEAVY DUTY SCAFFOLD - A scaffold designed and constructed to carry a working load not to exceed 75 pounds per square foot.

21.1.4. MIDRAIL - A rail approximately midway between the guardrail and platform, secured to the uprights erected along the exposed sides and ends of platforms.

21.1.5. MAXIMUM RATED LOAD - The total of all loads including the working load, the weight of the scaffold and such other loads as may be reasonably anticipated.

21.1.6. TOEBOARD - A barrier secured along the sides and ends of a platform to guard against the falling of material.

21.1.7. COMPETENT PERSON - Means 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. Valiant Power Group Construction Company, Inc.

21.2. USE

21.2.1. Scaffolds and scaffold components shall not be loaded in excess of their maximum intended loads or rated capacities, whichever is less.

21.2.2. The use of shore or lean to scaffolds is prohibited.

21.2.3. Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift, and after any occurrence which could affect a scaffold's structural integrity.

21.2.4. Each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least four (4) times the maximum intended load applied or transmitted to it. Any part of a scaffold damaged or weakened shall be immediately repaired or replaced, braced to meet these provisions, or removed from service until repaired.

21.2.5. Scaffold shall not be moved horizontally while employees are on them, unless they have been designed by a registered professional engineer specifically for such movement.

21.2.5.1. The clearance between scaffolds and power lines shall be as follows: Scaffolds shall not be erected, used, dismantled, altered, or moved such that they or any conductive material handled on them might come closer to exposed and energized power lines than as follows:

21.2.5.1.1.1. CLEARANCE CHART

21.2.5.1.1.1.1. Insulated Lines Voltage Minimum Distance Alternatives

Less than 300 volts 3 feet(0.9m) 2 times the
More than 50 kv 10 feet(3.1m) plus 4.0 length of the inches 10cm)
for each line insulator, 1kv over 50 kv but never less than 10 feet

- Uninsulated Lines Voltage Minimum Distance Alternatives Less than 50kv 10 feet 2 times the More than 50 kV 10 feet plus 4.0 inches length of the for each 1 kV over 50 kV line insulator but never less than 10 feet
- Exception To Clearance Chart
Scaffolds and materials may be closer to power lines than specified on previous page where such clearance is necessary for performance of work, and only after the utility company, or electrical system operator, has been notified of the need to work closer and the utility company, or electrical system operator, has deenergized the lines, relocated the lines, or installed protective coverings to prevent accidental contact with the lines.

21.2.6. Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.

21.2.7. Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.

21.2.8. Where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or equivalent measures to control the loads shall be used.

- 21.2.9. Suspension ropes supporting adjustable suspension scaffolds shall be of a diameter large enough to provide sufficient surface area for the functioning of brake and hoist mechanisms.
- 21.2.10. Suspension ropes shall be shielded from heat producing processes. When acids or other corrosive substances are used on a scaffold, the ropes shall be shielded, treated to protect against the corrosive substances, or shall be of a material that will not be damaged by the substance being used.
- 21.2.11. Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for employees to be on the scaffold and those employees are protected by personal fall arrest system or wind screens. Windscreens shall not be used unless the scaffold is secured against the anticipated wind forces imposed.
- 21.2.12. Debris shall not be allowed to accumulate on platforms.
- 21.2.13. Makeshift devices, such as but not limited to boxes and barrels, shall not be used on top of scaffold platforms to increase the working level height of employees.
- 21.2.14. Ladders shall not be used on scaffolds to increase the working level height of employees, except on large area scaffolds where employers have satisfied the following criteria:
- 21.2.14.1. When the ladder is placed against a structure that is not part of the scaffold, the scaffold shall be secured against the sideways thrust exerted by the ladder;
 - 21.2.14.2. The platform units shall be secured to the scaffold to prevent their movement
 - 21.2.14.3. The ladder legs shall be on the same platform or other means shall be provided to stabilize the ladder against unequal platform deflection
 - 21.2.14.4. The ladder legs shall be secured to prevent them from slipping or being pushed off the platform.
- 21.2.15. Platforms shall not deflect more than 1/60 of the span when loaded.
- 21.2.16. To reduce the possibility of welding current arcing through the suspension wire rope when performing welding from suspended scaffolds, the following precautions shall be taken, as applicable:
- 21.2.16.1. An insulated thimble shall be used to attach each suspension wire rope to its hanging support (such as cornice hook or outrigger). Excess suspension wire rope and any additional independent lines from grounding shall be insulated
 - 21.2.16.2. The suspension wire rope shall be covered with insulating material extending at least four feet (4') above the hoist. If there is a tail line below the hoist, it shall be insulated to prevent contact with the platform. The portion of the tail line that hangs

free below the scaffold shall be guided or retained or both, so that it does not become grounded

21.2.16.3. Each hoist shall be covered with insulated protective cover

21.2.16.4. In addition to a work lead attachment required by the welding process, a grounding conductor shall be connected from the scaffold to the structure. The size of this conductor shall be at least the size of the welding process work lead, and this conductor shall not be in series with the welding process of the work piece

21.2.16.5. If the scaffold grounding lead is disconnected at any time, the welding machine shall be shut off

21.2.16.6. An active welding rod or uninsulated welding lead shall not be allowed to contact scaffold or its suspension system

21.3. **FALL PROTECTION**

21.3.1. Each employee on a scaffold more than ten feet (10') above a lower level shall be protected from falling to that lower level.

21.3.1.1. Each employee on a walkway located within a scaffold shall be protected by a guardrail system (with minimum 200 pound toprail capacity) installed within nine and one half inches (9 1/2") of and along at least one side of the walkway.

21.3.1.2. Effective September 2, 1997 the employer shall have a competent person determine the feasibility and safety of providing fall protection for employees erecting or dismantling supported scaffolds. Employers are required to provide fall protection for employees erecting or dismantling supported scaffolds where the installation and use of such protection is feasible and does not create a greater hazard.

21.4. **FABRICATED FRAME SCAFFOLDS (tubular welded frame scaffolds)**

21.4.1. When moving platforms to the next level, the existing platform shall be left undisturbed until the new end frames have been set in place and braced prior to receiving the new platforms.

21.4.2. Frames and panels shall be braced by cross, horizontal or diagonal braces, or combination thereof, which secure vertical members together laterally. The cross braces shall be of such length as will automatically square and align vertical members so that the erected scaffold is always plumb, level, and square. All brace connection shall be secured.

21.4.3. Frames and panels shall be joined together vertically coupling or stacking pins or equivalent means.

21.4.4. Where uplift can occur which would displace scaffold end frames or panels, the frames or panels shall be locked together vertically by pins or equivalent means.

21.4.5. Brackets used to support cantilevered loads shall:

- 21.4.5.1. Be seated with side brackets parallel to the frames and end brackets at 90 degrees to the frames;
- 21.4.5.2. Not be bent or twisted from these positions;
- 21.4.5.3. Be used only to support personnel, unless the scaffold has been designed for other loads by a qualified engineer and built to withstand the tipping forces caused by those other loads being placed on the bracket supported section of the scaffold.

21.4.6. Scaffolds over 125 feet in height above their base plates shall be designed by a registered professional engineer, and shall be constructed and loaded in accordance with such design.

21.5. TRAINING REQUIREMENTS

21.5.1. The employer shall have each employee who performs work while on a scaffold trained in 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 shall include the following areas as applicable:

21.5.1.1. The nature of any electrical hazards, fall hazards and falling object hazards in the work area.

21.5.1.2. The correct procedures for dealing with electrical hazards and for erecting, maintaining and disassembling the fall protection systems and falling object protection systems being used.

21.5.1.3. The proper; use of the scaffold, and the proper handling of materials on the scaffold.

21.5.1.4. The maximum intended load and the load carrying capacities of the scaffolds to be used.

21.5.1.5. The employer shall have each employee who is involved in erecting, disassembling, moving, operating, repair, maintaining or inspecting a scaffold trained by a competent person to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable:

21.5.1.5.1. The nature of scaffold hazards.

21.5.1.5.2. The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting and maintaining the type of scaffold in question.

21.5.1.5.3. The design criteria, maximum intended load carrying capacity and intended use of the scaffold.

21.5.1.5.4. Any other pertinent requirements of the scaffolding standard.

21.5.1.5.5. When the employer has reason to believe that an employee lacks the skill or understanding need for safe work involving the erection, use or dismantling of scaffolds, the employer shall retrain each such employee so that the requisite proficiency is regained. Retraining is required in at least the following situation:

21.5.1.5.5.1. Where changes at the worksite present a hazard about which an employee has not been previously trained.

21.5.1.5.5.2. 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.

21.5.1.5.5.3. Where inadequacies in an affected employee's work involving scaffolds indicate that, the employee has not retained the requisite proficiency.

21.5.2. The additional requirements for the aforementioned procedures are in effect.

21.5.2.1. Access for employees erecting or dismantling supported scaffolds shall be in accordance with the following:

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

21.5.2.3. Hook-on or attachable ladders shall be installed as soon as scaffold erection has progressed to a point that permits safe installation and use.

21.5.2.4. When erecting or dismantling tubular welded frame scaffolds, end frames, with horizontal members that are parallel, level and are not more than twenty two (22") inches apart vertically may be used as climbing devices for access, provided they are erected in a manner that creates a usable ladder and provides good hand hold and foot space.

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

22. STAIRWAY AND LADDER PROCEDURE

22.1. DEFINITIONS

- 22.1.1. CLEAT - A ladder crosspiece of rectangular cross section placed on edge upon which a person may step while ascending or descending a ladder.
- 22.1.2. DOUBLE-CLEAT LADDER - A ladder similar in construction to a single-cleat ladder but with a center rail to allow simultaneous two-way traffic for employees ascending or descending.
- 22.1.3. EQUIVALENT - Alternative designs, materials or methods that demonstrates it will provide an equal or greater degree of safety for employees than the method or item specified.
- 22.1.4. EXTENSION TRESTLE LADDER - A self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable extension section, with a suitable means for locking the ladders together.
- 22.1.5. FAILURE - Load refusal, breakage or separation of component parts. Load refusal is the point where the structural members lose their ability to carry the loads.
- 22.1.6. FIXED LADDER - A ladder that cannot be readily moved or carried because it is an integral part of a building structure.
- 22.1.7. HANDRAIL - A rail used to provide employees with a handhold for support.
- 22.1.8. MAXIMUM INTENDED LOAD - The total load of all employees, equipment, tools, materials transmitted loads and other loads anticipated to be applied to a ladder component at any one time.

22.1.9. POINT OF ACCESS - All areas used by employees for work related passage from one area or level to another. Such open areas include doorways, passageways, stairway openings, studded walls and various other permanent or temporary openings used for such travel.

22.1.10. PORTABLE LADDER - A ladder that can be readily moved or carried.

22.1.11. RISER HEIGHT - The vertical distance from the top of a tread to the top of the next higher tread or platform/landing or the distance from the top of platform/landing to the top of the next higher tread or platform/landing.

22.1.12. TREAD DEPTH - The horizontal distance from front to back of a tread.

22.1.13. STAIRRAIL SYSTEM - A vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels. The top surface of a stair rail system may also be an handrail.

22.2. STAIRWAYS

22.2.1. Riser height and tread depth must 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 must not be over 1/4 inch in any stairway system.

22.2.2. Where doors or gates open directly on a stairway, a platform must be provided and the swing of the door must not reduce the effective width of the platform to less than 20 inches.

22.2.3. Metal pan landings and metal pan treads, when used, must be secured in place before filling with concrete or other material.

22.2.4. All parts of stairways must be kept free of hazardous projections, such as protruding nails.

22.2.5. Slippery conditions on stairways must be eliminated before the stairways are used to reach other levels.

22.3. TEMPORARY SERVICE

22.3.1. Except during stairway construction, foot traffic will not be permitted 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 must be replaced when worn below the level of the top edge of the pan.

22.3.2. Except during stairway construction, foot traffic will not be permitted 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.

22.3.3. Tread for temporary service will be made of wood or other solid material and will be installed the full width and depth of the stair.

22.4. STAIRRAILS AND HANDRAILS

22.4.1. Stairways having four or more risers or rising more than thirty (30") inches, whichever is less, shall be equipped with at least one handrail and one stairrail system along each unprotected side or edge.

22.4.2. Midrails, screens, mesh, intermediate vertical members or equivalent intermediate structural members, must be provided between the top rail of the stairrail system and the stairrail steps.

22.4.3. Midrails, when used, must be located at a height midway between the top edge of the stairrail system and the stairway steps.

22.4.4. Screens or mesh, when used, must extend from the top rail to the stairway step and along the entire opening between top rail supports.

22.4.5. When intermediate vertical members, such as balusters, are used between posts, they shall not be more than nine teen (19") inches apart.

22.4.6. Other structural members, when used, will be installed such that there are no openings in the stairrail system that are more than 19 inches wide.

22.4.7. Handrails and the top rails of stairrail systems will be capable of withstanding, without failure, a force of at least 200 pounds applied within two (2") inches of the top edge, in any downward or outward direction, at any point along the top edge.

22.4.8. The height of handrails must not be more than thirty seven (37") inches not less than Thirty (30") inches 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 read.

22.4.9. When the top edge of a stairrail system also serves as a handrail, the height of the top edge will not be more than thirty seven (37") inches nor less than thirty six (36") inches from the upper surface of the stairrail system to the surface of the tread, in

22.4.10. Stairrail systems and handrails should be surfaced as to prevent injury to employees from punctures or lacerations and to prevent snagging of clothing.

22.4.11. Handrails will provide an adequate handhold for employees grasping them to avoid falling.

22.4.12. The ends of stairrail systems and handrails will be constructed so as not to constitute a projection hazard.

22.4.13. Handrails that will not be a permanent part of the structure being built must have a minimum clearance of 3 inches between the handrail and walls, stairrail system and other objects.

22.4.14. Unprotected sides and edges of stairway landings will be provided with a guard rail system.

22.5. LADDERS

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

22.5.1.1. Ladders shall be capable of supporting the following loads without failure.

22.5.1.1.1. Self-Supporting Portable Ladder:

22.5.1.1.1.1. 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.

22.5.1.1.1.2. Portable Ladder that is not self-supporting:
At least four times the maximum intended load, except that each extra heavy duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load.

22.5.1.1.1.3. Fixed Ladder:
At least two loads of 250 pounds each, concentrated between any two consecutive attachments, plus anticipated loads caused by ice buildup, winds, rigging and impact loads resulting from the use of ladder safety devices. Each step or rung shall be capable of

supporting a single concentrated load of at least 250 pounds applied in the middle of the step or rung.

- 22.5.1.1.2. All ladder rungs, cleats and steps should be parallel, level and uniformly spaced when the ladder is in position for use.
- 22.5.1.1.3. All rungs, cleats and steps of portable ladders and fixed ladders shall be spaced not less than 10 inches apart, nor more than 14 inches apart, as measured between center lines of the rungs, cleats and steps.
- 22.5.1.1.4. All rungs, cleats, and steps of step stools shall be not less than 8 inches apart, nor more than 12 inches apart, as measured between center lines of the rungs, cleats and steps.
- 22.5.1.1.5. Rungs, cleats, and steps of the base section of extension trestle ladders shall not be less than 8 inches nor more than 18 inches 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 not be less than 6 inches nor more than 12 inches, as measured between center lines of the rungs, cleats, and steps.
- 22.5.1.1.6. 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.
- 22.5.1.1.7. The minimum clear distance between side rails for all portable ladders shall be 11½ inches.
- 22.5.1.1.8. The rungs of individual-rung/step ladders must be shaped such that employee's feet cannot slide off the end of the rungs.
- 22.5.1.1.9. The rungs and steps of portable metal ladders must be corrugated, knurled, dimpled, coated with skid-resistant material or otherwise treated to minimize slipping.
- 22.5.1.1.10. No ladder will be tied or fastened together to provide longer sections unless the ladder is specifically designed for such use.
- 22.5.1.1.11. A metal spreader or locking device should be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.

- 22.5.1.1.12. When two or more separate ladders are used to reach an elevated work area, the ladders must be offset with a platform or landing between the ladders.
- 22.5.1.1.13. 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.
- 22.5.1.1.14. All ladder components must be surfaced to prevent injury to an employee from punctures or lacerations and to prevent snagging of clothing.
- 22.5.1.1.15. 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 the side rail.
- 22.5.1.1.16. The minimum perpendicular clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches, except in the case of an elevator pit ladder, for which a minimum perpendicular clearance of 4 ½ inches is required.
- 22.5.1.1.17. 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, except as provided in number 18 of this section.
- 22.5.1.1.18. 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, provided that a deflection device is installed to guide employees around obstruction.
- 22.5.1.1.19. Through fixed ladders at their point of access/egress shall have a step-across distance of not less than 7 inches nor more than 12 inches 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, a landing platform shall be provided to reduce the distance to the specified limit.
- 22.5.1.1.20. Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches on each side of the centerline of the ladder.

22.5.1.1.21. 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, but the top of the ladder is at a distance greater than 24 feet above lower levels.

22.5.1.1.22. Where the total length of a climb equals or exceeds 24 feet, fixed ladders shall be equipped with one of the following:

22.5.1.1.22.1. Ladder safety devices; or

22.5.1.1.22.2. Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet; or

22.5.1.1.22.3. A cage well, and multiple-ladder section not to exceed 50 feet in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet.

22.5.1.1.23. 23. Cages for fixed ladders shall conform to all the following:

22.5.1.1.23.1. Horizontal bands shall be fastened to the side rails of rail ladders, or directly to the structure, building, or equipment for individual-rung ladders;

22.5.1.1.23.2. Vertical bars shall be on the inside of the horizontal bands and shall be fastened to them;

22.5.1.1.23.3. Cages shall extend not less than 27 inches, or more than 30 inches 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 in width;

22.5.1.1.23.4. The inside of the cage shall be clear of projections
Horizontal bands shall be spaced not more than 4 feet on center vertically;

22.5.1.1.23.5. Vertical bars shall be spaced at intervals not more than 9 ½ inches on center horizontally;

22.5.1.1.23.6. The bottom of the cage shall be at a level not less than 7 feet nor more than 8 feet above the point of access to the bottom of the ladder. The bottom of the ladder shall be flared not less than 4 inches all around within the distance between the bottom horizontal band and the next higher band;

- 22.5.1.1.23.7. The top of the cage shall be a minimum of 42 inches above the top of the platform,
- 22.5.1.1.23.8. or the point of access at the top of the ladder, with provision for access to the platform or other point of access.
- 22.5.1.1.24. Wells for fixed ladders shall conform to all the following:
 - 22.5.1.1.24.1. They shall completely encircle the ladder;
 - 22.5.1.1.24.2. They shall be free of projections;
 - 22.5.1.1.24.3. Their inside face on the climbing side of the ladder shall extend not less than 27 inches nor more than 30 inches from the centerline of the step or rung;
 - 22.5.1.1.24.4. The inside clear width shall be at least 30 inches;
 - 22.5.1.1.24.5. The bottom of the wall on the access side shall start at a level not less than 7 feet nor more than 8 feet above the point of access to the bottom of the ladder.
- 22.5.1.1.25. Ladder safety devices, and related support systems, for fixed ladders shall conform to all the following:
 - 22.5.1.1.25.1. They shall be capable of withstanding without failure a drop test consisting of an 18-inch drop of a 500-pound weight;
 - 22.5.1.1.25.2. 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;
 - 22.5.1.1.25.3. They shall be activated within 2 feet after a fall occurs, and limit the descending velocity of an employee to 7 feet/sec. Or less;
 - 22.5.1.1.25.4. The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9 inches in length.
- 22.5.1.1.26. The mounting of ladder safety devices for fixed ladders shall conform to the following:

22.5.1.1.26.1. 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.

22.5.1.1.26.2. 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 and maximum spacing of 40 feet along the entire length of the carrier, to prevent wind damage to the system.

22.5.1.1.26.3. The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.

22.5.1.1.27. The side rails of through or side-step fixed ladders shall extend 42 inches above 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.

22.5.1.1.28. 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 nor more than 30 inches clearance between side rails of the extensions shall not exceed 36 inches.

22.5.1.1.29. For side-step fixed ladders, the side rails and the steps or rungs shall be continuous in the extension.

22.5.1.1.30. Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches above an access level or landing platform either by the continuation of the rung spacing as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.

22.5.2. LADDER USE

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

22.5.2.1.1. All ladders must not be loaded beyond the maximum intended load for which they were built, or beyond their manufacturer's rated capacity.

22.5.2.1.2. All ladders must be kept free of oil, grease and other slipping hazards.

- 22.5.2.1.3. All ladders must be used only on stable and level surfaces, unless secured to prevent accidental displacement.
- 22.5.2.1.4. Ladders should not be used on slippery surfaces unless secured or provided with slip resistant feet to prevent accidental displacement.
- 22.5.2.1.5. Ladders placed in any location where they can be displaced by workplace activities, traffic must be secured to prevent accidental displacement, or a barricade must be used to keep the activities of traffic away from the ladder.
- 22.5.2.1.6. All the areas around the top and bottom of the ladders must be kept clear.
- 22.5.2.1.7. It is absolutely forbidden to move, shift or extend ladders while occupied.
- 22.5.2.1.8. Cross-bracing on the rear section of stepladders will not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- 22.5.2.1.9. All ladders must be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.
- 22.5.2.1.10. When ascending or descending a ladder the user must face the ladder.
- 22.5.2.1.11. Each employee must use at least one hand to grasp the ladder when progressing up and/or down the ladder
- 22.5.2.1.12. Any employee using a ladder will not carry any object or load that could cause the employee to lose balance and fall.
- 22.5.2.1.13. When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet 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.

22.5.2.1.14. Ladders shall be used only for the purpose for which they are designed.

22.5.2.1.15. 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).

22.5.2.1.16. 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.

22.5.2.1.17. 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.

22.5.2.1.18. The top o top step of a step-ladder shall not be used as a step.

22.5.2.1.19. 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.

22.5.2.1.20. 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:

22.5.2.1.20.1. Immediately tagged with “DO NOT USE” or similar language,

22.5.2.1.20.2. Marked in a manner that readily identifies it as defective;

22.5.2.1.20.3. Or blocked (such as with a plywood attachment that spans several rungs.)

22.5.2.1.21. Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

22.5.2.1.22. Single-rail ladders shall not be used.

22.6. LADDER INSPECTION LOG

Location: _____

Date: _____

Ladder ID: _____

Type: _____

Wood Ladders		Yes	No	N/A
1	Are wooden components free from splits and cuts			
2	Are joints between steps and side rails tight			
3	Are hardware and fittings securely attached			
4	Are all metal bearings of locks, wheels, pulleys etc lubricated			
5	Is the rope on extension ladders in good condition			
6	Is the ladder equipped with safety feet			
7	Are safety feet securely attached and in good condition			
Fiberglass / Metal Ladders				
1	Are the ladders free from structural defects or accident hazards such as sharp objects			
2	Are all screw, rivets, bolts and welds intact			
3	Is the metal protected from corrosion			
4	Are rungs or steps corrugated or treated with non-skid materials			
5	Do the bottom of the four rails have insulting, non-skid material to protect employees			
6	On a stepladder, is there a locking device or metal spreader strong enough to hold the front and back sections open			
7	Are straight ladders built with at least 12 inches side rails			
8	Are ladders clean and free from oil and grease			

23. BLOODBORNE PATHOGEN EXPOSURE CONTROL

23.1. Policy

23.1.1. Where there is a reasonable or anticipated occupational exposure to Bloodborne Pathogens as a result of performing job duties Valiant Power Group will maintain a written exposure control plan for the protection of personnel against HBV (Hepatitis B) and HIV (Aids), along with any pathogenic microorganism that is present in human blood and can infect and cause disease in persons who are exposed to blood containing the pathogen.

23.2. Description

23.2.1. The purpose of this program is to provide control measures and procedures to be followed to prevent occupational exposure to Bloodborne pathogens and other potentially infectious materials. This program covers all Valiant Power Group employees who may render medical assistance as part of their job duties. Although employees are generally expected to **voluntarily** render first aid, Valiant Power Group will apply the provisions of this program to all employees trained in first aid and those who render aid to fellow employees. A written control plan for occupational exposure to Bloodborne pathogens will be maintained and is available for employees to review. Valiant Power Group employees **are not required** to render first aid or CPR, unless the performance of first aid is a part of an employee's designated job duty, such as a member of a site specific emergency medical response team. Valiant Power Group trains many employees in first aid and CPR as part of the Company's ongoing safety program. Understanding the seriousness of injuries and illnesses and the associated first aid procedures instills a positive attitude toward working safely. When emergency situations occur, the Company wants employees to have all the skills necessary to handle the situation, but under no circumstances will any employee be forced to perform first aid or CPR against their personal judgment. If employees have questions regarding the performance of first aid or CPR, they should contact their supervisor, their safety compliance specialist, or the Safety Department.

23.2.1.1. Additionally:

23.2.1.1.1. All required PPE will be provided to exposed employees, at no cost.

23.2.1.1.2. Hand washing facilities or towelettes / waterless hand antiseptic items to be provided for use.

23.2.1.1.3. Any employee with occupational exposure will be afforded the Hepatitis B vaccine at no cost.

23.3. Training

23.3.1. At initial assignment for affected employees.

23.3.2. Annually thereafter.

23.4. Documentation / Record Retention

23.4.1. Employee Medical and/or Exposure Records - 30 years after separation (also must be kept duration of employment)

23.4.2. Employee Training Records - 3 years after separation

23.4.3. Bloodborne Pathogen Control Program - 1 year after revised, superseded, or obsolete

23.5. Post Incident Issues

23.5.1. All exposed items, equipment or other surfaces, will be cleaned utilizing antiseptic solutions to ensure that post incident exposure will be removed.

24. TOOL SAFETY

24.1. GENERAL REQUIREMENTS

- 24.1.1. All hand and power tools and similar equipment, whether furnished by the employer or employee shall be maintained in a safe condition.
- 24.1.2. Damaged tools or equipment will be removed from service and tagged **“DEFECTIVE”**.
- 24.1.3. Only appropriate tools will be used for the job.
- 24.1.4. Wrenches will not be altered by the addition of handle-extensions or “cheaters”.
- 24.1.5. Files will be equipped with handles and not used to punch or pry.
- 24.1.6. A screwdriver will not be used as a chisel or pry bar.
- 24.1.7. Guards will not be removed from portable grinding tools or ground leads broken off on portable electric tool plugs.
- 24.1.8. Portable electric tools will not be lifted or lowered by means of the power cord. Proper rigging will be used.
- 24.1.9. Electric cords will not be exposed to damage from vehicular or foot traffic.
- 24.1.10. In locations where the use of a portable power tool is difficult, the tool will be supported by means of rigging of adequate strength.
- 24.1.11. Small pieces of metal when being drilled on a power machine must not be held in the operator’s hands.
- 24.1.12. Pieces of metal will be held tightly in a vise or clamp while being drilled.

24.2. TOOL SAFETY

24.2.1. Guarding

- 24.2.1.1. When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.
- 24.2.1.2. Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating or moving parts of equipment shall be guarded if such parts are exposed to contact by employees or otherwise create a hazard. Guarding shall meet the requirements as set forth in American National Standards Institute, Safety Code for Mechanical Power-Transmission Apparatus.

24.2.2. Types of Guarding

- 24.2.2.1. 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. Examples of guarding methods are barrier guards, two-hand tripping devices, electronic safety devices, etc.

24.2.3. Point of Operation Guarding

- 24.2.3.1. Point of operation is the area on a machine where work is actually performed upon the material being processed.

- 24.2.3.2. The point of operation of machines whose operation exposes an employee to injury, shall be guarded. The guarding device shall be in conformity with any appropriate standards therefore, or, in the absence of applicable specific standards, shall be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

- 24.2.3.3. Special hand tools for placing and removing material shall be such as to permit easy handling of material without the operator placing a hand in the danger zone. Such tools shall not be in lieu of other guarding required by this section, but can only be used to supplement protection provided.

- 24.2.3.4. The following are some of the machines which usually require point of operation guarding:

- 24.2.3.4.1. guillotine cutters
- 24.2.3.4.2. shears
- 24.2.3.4.3. alligator shears
- 24.2.3.4.4. power presses
- 24.2.3.4.5. milling machines
- 24.2.3.4.6. power saws
- 24.2.3.4.7. jointer
- 24.2.3.4.8. portable power tools
- 24.2.3.4.9. forming rolls and calendars

24.2.4. Exposure of Blades - When the periphery of the blades of a fan is less than 7 feet (2.128 m) above the floor or working level, the blades shall be guarded. The guards shall have openings no larger than ½ inch (1.27cm).

24.2.5. Anchoring Fixed Machinery - Machines designed for a fixed location shall be securely anchored to prevent walking or moving.

24.2.6. Guarding of Abrasive Wheel Machinery – Exposure Adjustment Safety guard, where the operator stands in front of the opening, shall be constructed so that the peripheral protecting member can be adjusted to the constantly decreasing diameter of the wheel. The maximum angular exposure above the horizontal plane of the wheel spindle shall never be exceeded, and the distance between the wheel periphery and the adjustable tongue or the end of the peripheral member at the top shall never exceed ¼ inch (0.635 cm). (See Figures I-1 through I-6.)

24.2.7. Bench and Floor Stands - The angular exposure of the grinding wheel periphery and sides for safety guards used on machines known as bench and floor stands should not exceed 90° or one-fourth of the periphery. The exposure shall begin at a point not more than 65° above the horizontal plane of a wheel spindle. (See Figures I-7 and I-8.)

24.2.8. Cylindrical Grinders - The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on cylindrical grinding machines shall not exceed 180°. This exposure shall begin at a point not more than 65° above the horizontal plane of the wheel spindle. (See Figures 1-11 and 1-12.)

24.2.9. Personal Protective Equipment - All employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazard. All personal protective equipment shall meet the requirements and be maintained accordingly.

24.3. Switches

24.3.1. All hand-held power platen sanders, grinders with wheels 2 inch diameter or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks one fourth of an inch wide or less must be equipped with only an "on-off" control.

24.3.2. The following tools and other hand tool of similar construction must be equipped with a momentary contact "on-off" control and may have a lock-on control, so that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

24.3.2.1. Power Drills

24.3.2.2. Disc Sanders

24.3.2.3. Horizontal Grinders

24.3.2.4. Tappers

24.3.2.5. Belt Sanders

24.3.2.6. Vertical Grinders

24.3.2.7. Fastener Drivers

24.3.2.8. Saber Saws

24.3.2.9. Angle Grinders

24.3.2.10. Reciprocating Saws

24.3.3. Circular Saws, Chain Saws and all percussion tools without positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

24.4. Hand Tools

24.4.1. No employee will be permitted to use or to issue to others for use, unsafe hand tools.

24.4.2. When jaws are sprung to the point that slippage occurs, then no wrench, adjustable, pipe, end or socket wrenches will be used.

24.4.3. All impact tools, such as drift pins, wedges, and chisels, must never become mushroomed headed. Any impact tool in this condition must be disposed of and replaced.

24.4.4. All tools that have a wooden handle must be kept free of splinter or cracks and the wooden handle must be securely in place to prevent the end of tool from flying off.

24.5. Power-Operated Hand Tools

24.5.1. All electric power operated tools shall be properly grounded (3 prong) or must be of the approved double-insulated type (UL Listed).

24.5.2. At no time during the use of Power Operated Hand Tools may the connected cord be used for hoisting or lowering.

24.6. Pneumatic Power Tools

24.6.1. Pneumatic power tools must at all-time be secured to the hose or whip by a positive mean to prevent the tool from becoming accidentally disconnected.

24.6.2. All pneumatic power tools must have safety clips or retainers securely installed and maintained to prevent the attachments from being accidentally expelled.

- 24.6.3. All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fasteners feed, which operate at more than 100 p.s.i. pressure at the tool shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.
- 24.6.4. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and personal protective equipment. The 30 p.s.i. requirement does not apply to concrete for, mill scale and similar cleaning purposes.
- 24.6.5. The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.
- 24.6.6. When an employee is not fully knowledgeable of the proper use of a certain pneumatic power tool, he should review the manufacturer's guidelines prior to the use of that tool and these guidelines must not be exceeded.
- 24.6.7. At no time should any of the hoses be used for hoisting or lowering.
- 24.6.8. All hoses exceeding ½-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.
- 24.6.9. Airless spray guns (1,000 pounds or more per square inch) must be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of any fluid until the time that the safety device is manually released.
- 24.6.10. A diffuser nut which prevents high pressure, high velocity release, while the nozzle tip is removed, in addition to a nozzle tip guard, must be used to prevent the tip from coming into contact with the operator.

24.7. Fuel Powered Tools

- 24.7.1. All fuel powered tools must be stopped while being refueled, serviced, or maintained. Any flammable or hazardous fuel being transported or handled in a quantity of one (1) gallon or more must be in an approved metal safety can, in accordance with the guidelines of the Hazard Communication Program.
- 24.7.2. At any time when a fuel-powered tool is used in enclosed spaces, the proper PPE (personal protective equipment) must be used and the guidelines for the Hazard Communication Program must be applied.

24.8. Abrasive Wheels and Tools

- 24.8.1. All grinding machines must be supplied with sufficient power to maintain the spindle speed at safe levels under all normal conditions of operations.

24.8.2. All floor and bench-mounted grinders will be provided with work rests. The work rests must be kept at a distance not to exceed one-eighth inch from the surface of the wheel.

24.8.3. Cup type wheels used for external grinding must be protected by either a revolving cup guard or a band type guard when possible or a wheel equipped with safety flanges must be used.

24.8.4. All safety guards are required to be mounted to maintain proper alignment with the wheel and the guard and its fastenings must be of sufficient strength to retain fragments of the wheel in case of accidental breakage.

24.8.5. All abrasive wheels must be closely inspected prior to use and ring tested before mounting to ensure that they are free from cracks and defects.

24.8.5.1. All employees using abrasive wheels must wear appropriate eye protection when the machine is not equipped with permanently attached eye shields.

24.8.6. Jacks

24.8.6.1. All jacks must be used in accordance with manufacturer's directions. All jacks must have the manufacturer's rated capacity legibly marked on the jack and this marked rate shall not be exceeded.

24.8.6.2. All jacks shall have a positive stop to prevent over travel.

24.8.6.3. When it is necessary to provide a firm foundation, the base of the jack shall be blocked or cribbed. Where there is a possibility of slippage of the metal cap of the jack, a wood block shall be placed between the cap and the load.

24.8.6.4. After the load has been raised, it shall be cribbed, blocked, or otherwise secured at once.

24.8.6.5. Hydraulic jacks exposed to freezing temperatures shall be supplied with adequate antifreeze liquid.

24.8.6.6. All jacks shall be properly lubricated at regular intervals.

24.8.6.7. Each jack shall be thoroughly inspected at times which depend upon the service conditions.

24.8.6.8. Inspections shall not be less frequent than the following:

24.8.6.8.1. For constant or intermittent use at one locality, once every six (6) months.

24.8.6.8.2. For jacks sent out of shop for special work, when sent out and when returned.

24.8.6.8.3. For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

24.8.6.9. Repair or replacement parts shall be examined for possible defects.

24.8.6.10. Jacks that are out of order shall be tagged accordingly and shall not be used until repairs are made.

25. Hearing Conservation and Noise Exposure

25.1. General

25.1.1. Whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response), protection against the effects of noise exposure shall be provided. In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program should be administered. Valiant Power Group is committed to providing a safe work environment for all its employees. The nature of the work performed, exposure to excessive noise may be likely. Compliance with the requirements is the responsibility of all affected employees, but will be coordinated by the Site Safety Officer (SSO). Failure for employees to abide by the requirements stated herein may result in disciplinary action, including termination.

25.1.2. For all employees exposed to noise levels of 85 dB (TWA) and above:

25.1.2.1. Establish and Maintain a Baseline audiogram

25.1.2.2. Must be performed within 6 months of the initial exposure

25.1.2.3. Not to be performed within 14 hours of exposure to work related noise.

25.1.2.4. Provide for annual audiogram, and notify the employee in writing within 21 days of a threshold shift, as determined by testing.

25.1.2.5. When a standard threshold shift occurs, provided hearing protection shall be re-evaluated refitted, and /or changed as necessary and a medical re-evaluation may be required

25.1.2.6. Training on noise hazards

25.2. Common Jobsite Equipment Noise Levels

25.2.1. Equipment / decibels Equipment / decibels

25.2.2. Pneumatic chip hammer or grinder / 102-113 Earth Tamper / 90-96

25.2.3. Jackhammer / 96-111 Crane / 90-96

25.2.4. Concrete joint cutter / 99-102 Hammer / 87-95

25.2.5. Portable saw / 88-102 Bull Dozer / 87-94

25.2.6. Stud welder / 101 Front-end loader / 85-94

25.2.7. Bulldozer / 93-96 Backhoe / 84-93

25.2.8. The noise levels change. If the noise from a piece of equipment is 94 decibels at 10 feet away, the noise level at 70 feet away would be approximately 82 decibels. A crane lifting a load can make 96 decibels of noise; at rest, it may make less than 80 decibels.

25.2.9. The SSO will coordinate implementation of this program, and is responsible for performing sound level measurements and documenting the results of the measurements, posting high noise areas, evaluating adequacy of hearing protection, and identification and notification of affected employees.

25.2.10. Employees are expected to alert the SSO to work activities or equipment that has significant noise levels. Identified employees will cooperate with all scheduled audiometric testing, participate in annual training, and wear personal protective equipment when required.

25.2.11. Permissible Noise Exposure:

Sound level duration dBA slow response Hrs/day Decibels (A)	
8.....	90
6.....	92
4.....	95
3.....	97
2.....	100
1-1/2.....	102
1.....	105
1/2.....	110
1/4 or less.....	115

25.3. *Exposure Assessment*

25.3.1. Area monitoring may be performed to identify areas that exceed the limiting values and repeated whenever there is a change in the area or equipment which could significantly change the noise level exposure. All affected personnel are provided the opportunity to observe any measurements of noise exposure. The use of engineering or administrative controls shall be implemented where feasible to reduce employee exposure levels. When not feasible, suitable hearing protection (hearing protection capable of attenuating noise levels to less than 90 dBA) shall be provided at no cost to the employee. Hearing protection shall be evaluated for specific noise conditions and environments.

25.4. *Employee Training*

25.4.1. Employees training will include hearing conservation of all individual assigned to work identified as having an exposure level in excess of the action level of 85 dBA.

25.4.2. Initial training will be provided upon assignment to such a work.

25.4.3. OSHA requires the implementation of a hearing conservation program whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level

(TWA) of 85 decibels measured on the A scale for occupational noise. Training will be provided annually thereafter.

25.4.4. Training shall be updated to remain consistent with changes in PPE and work processes. The training shall address:

25.4.4.1. The effects of noise on hearing

25.4.4.1.1. The basic elements of the noise reduction and hearing conservation program

25.4.4.1.2. The specific nature of operations that could result in over exposure to noise

25.4.4.1.3. The use of engineering controls to reduce noise exposure

25.4.4.1.4. The fitting, use, and maintenance of personal protective equipment associated with the employee's job assignment

25.4.4.1.5. The location of high noise areas and the identification of such areas

25.4.4.1.6. The purpose and description of the audiometric testing program

25.4.4.1.7. The requirements for recordkeeping and employee access to records.

25.4.4.2. Prior to the use of a hearing protection device employees should be oriented as to the use and limitations of the device.

25.4.5. ***Recordkeeping***

25.4.5.1. Noise exposure measurement records shall be retained for a period not less than 2 years.

25.4.5.2. All audiometric records shall be maintained confidential and kept under lock and key.

25.4.5.3. Only the Safety Director and the President shall have access to cabinet. Audiometric test records shall be retained for the duration of the affected employee's employment. Audiometric test records shall include:

25.4.5.3.1. Name and job classification of the employee

25.4.5.3.2. Date of the audiogram

25.4.5.3.3. The examiner's name

25.4.5.3.4. Date of the last acoustic or exhaustive calibration of the audiometer

25.4.5.3.5. Employee's most recent noise exposure assessment.

26. GROUND FAULT CIRCUIT INTERRUPTERS

26.1. DEFINITIONS APPLICABLE TO THIS PROCEDURE

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

26.1.2. Ground-Fault Circuit Interrupter - A device for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit. 1. One or more competent person on-site shall implement this GFCI Program.

26.2. This procedure applies to all construction sites covering all cord sets, receptacles that 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.

26.3. Each cord set, attachment cap, plug and receptacle or cord set and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, will 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.

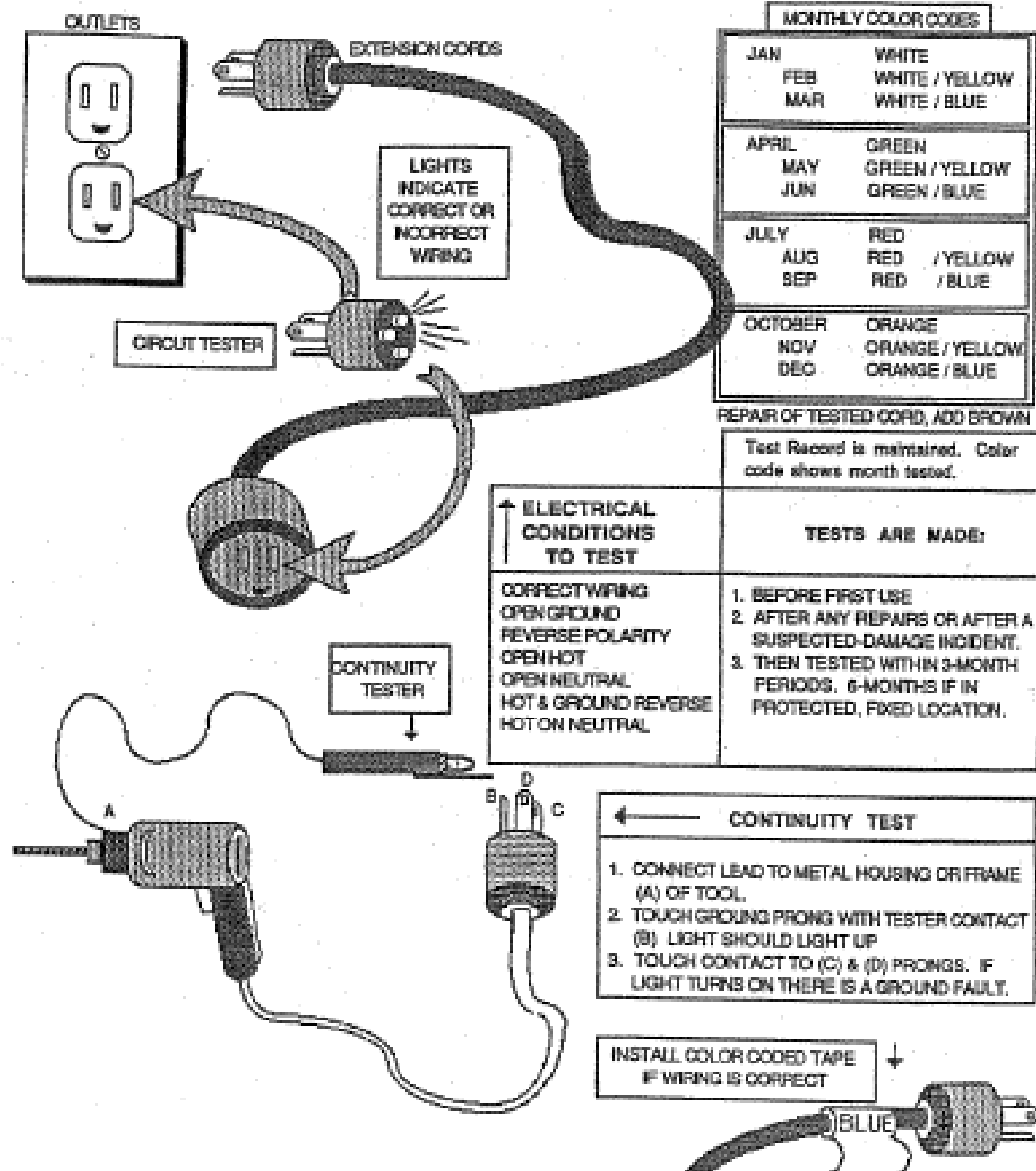
ANY EQUIPMENT FOUND DAMAGED OR DEFECTIVE SHALL NOT BE USED UNTIL PROPERLY REPAIRED AND TAGGED AS DEFECTIVE OR OUT OF SERVICE.

26.4. Only heavy-duty extension cords shall be used and be tagged as UL Approved by a testing laboratory.

26.5. All 120-volt, single-phase, 15 and 20 ampere receptacle outlets on construction sites that are not a part of the permanent wiring of the building or structure and that are used by employees shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, do not need to be protected with ground fault circuit interrupters.

ASSURED GROUNDING PROGRAM

CFR 1926.404 (b)(1)(i)



27. ELECTRICAL SAFETY

27.1. Program

27.1.1. The purpose of this program is to prevent injuries and accidents and protect employees from low voltage electrical hazards.

27.1.2. “Low Voltage” is defined by OSHA as work performed directly on or in proximity of systems of 600 volts, nominal, or less. Work specific safety procedures for preventing electric shock or other injuries resulting from direct/indirect electrical contact to employees working on or near energized or de-energized parts will be developed and implemented as required.

27.2. Scope

27.2.1. This program applies to all work operations involving electrical systems of 600 volts or less where employees may be exposed to live parts and/or those parts that have been de-energized. Any work on energized equipment may be done only after it has been determined that this type of work must be performed with the equipment energized.

27.3. Responsibilities

27.3.1. The goal of the electrical safety program is to ensure that all employees receive training and understand the hazards associated with electric energy and are capable of performing the necessary steps to protect themselves and their coworkers in accordance with their assigned task.

27.3.2. Primary responsibilities include:

27.3.2.1. Hazard identification.

27.3.2.2. Training.

27.3.2.3. Reporting/correcting safety hazards.

27.3.2.4. Are aware of electrical safety issues.

27.3.2.5. Comply with safe operating procedures when working with electrical equipment.

27.3.2.6. Attend appropriate safety training.

27.3.2.7. Personal Protective Equipment requirements.

27.4. Program Components

27.4.1. All employees use electric powered equipment, electricity is used continuously, usually without incident.

27.4.2. Voltages as low as 12 volts can be dangerous. When working with or around electrical equipment, one may inadvertently become part of an electrical circuit. Only trained and authorized or qualified individuals should do any repair or work on electrical equipment.

27.5. General Work Practices / Precautions

27.5.1. Use extension cords only as temporary power sources

27.5.2. Do not connect too many pieces of equipment to the same circuit or outlet as the circuit or outlet could become overloaded.

27.5.3. Be sure that ground-fault circuit interrupters (GFCI) are used in high-risk areas such as wet locations (GFCI's are designed to shut off electrical power within as little as 1/40 of a second).

27.5.4. Plug strips, such as those used on computers, should be plugged directly into outlets and not into extension cords or other plug strips.

27.5.5. Inspect all equipment daily prior to shift, for defects or damage.

27.5.6. All cords that are worn, frayed, abraded, corroded or otherwise damaged must be replaced.

27.5.7. Grasp the plug to remove it from a socket - never pull the cord.

27.5.8. Keep all cords away from heat, oil and sharp edges.

27.5.9. Always follow the manufacturer's instructions for use and maintenance of all electrical tools and appliances.

27.5.10. Always unplug electrical appliances before attempting any repair or maintenance.

27.5.11. All electrical devices must be properly grounded with approved three wire plugs unless they are "double insulated". Grounding provides a safe path for electricity to the ground, preventing leakage of current in circuits or equipment.

27.5.12. All electrical equipment used should be UL or FM approved.

27.5.13. All portable ladders to have non-conducting side rails.

27.5.14. Keep cords out of the way of foot traffic so they don't become tripping hazards or become damaged by traffic.

27.5.15. Never use electrical equipment in wet areas or run cords across wet floors.

27.5.16. Ensure energized parts of electrical equipment operating at 50 volts or more are guarded against accidental contact.

27.5.17.Only properly trained, qualified employees shall work on electrical equipment or energized systems. They must adhere to approach distances as specified in Table S5.

27.5.18.Know how to respond to emergencies such as electric shock incidents or fires.

27.5.19.All equipment, materials and vehicular traffic, in the proximity of high voltage, must maintain a clearance of at least 10 feet.

27.5.20.Protective measure to insure the safe distance, i.e barriers, warning devices, etc., shall be erected and maintained.

27.5.21.While working in a confine space where electrical hazards exist, must be provided with protective shields, barriers or insulating materials.

27.5.22.When electrical hazards exist, only non-conductive apparel will be worn, or apparel that is rendered non-conductive by appropriate coverings.

27.5.23.While working under overhead lines clearances must be maintained, unless the lines have been de-energized and grounded.

27.5.24.ALL unqualified employees must maintain a minimum of a 10' clearance from energized lines.

27.6. Defective Electrical Equipment

27.6.1. Report malfunctioning equipment or devices to your supervisor. Typical issues include:

27.6.1.1. Damaged cords, plugs or outlets.

27.6.1.2. Receiving a shock when touching the equipment.

27.6.1.3. Arcing, sparking, smoking, or otherwise malfunctioning equipment.

27.6.2. Any electrical equipment not operating properly to be:

27.6.2.1. Taken out of service immediately.

27.6.2.2. Tagged or labeled as “Do Not Use” .

27.6.2.3. Reported to the appropriate individual for repair.

28. HIGH-VOLTAGE PROXIMITY

- 28.1. Trained Spotter a designated employee with documented training in the requirements of the New Jersey High Voltage Proximity Act and related OSHA Regulations for working in proximity to high voltage lines, and other task specific training as determined necessary by the employer to assist in safe operation of a crane. The spotter shall not perform any other duties while acting as the spotter.
- 28.2. A Consultation with NJ Dept. of Labor (DOL) must be conducted prior to the start of work. Note: If a contractor decides to use the pre-approval crane method as referenced in the “trained spotter” definition, the crane contractor or operator must strictly adhere to this method, as well as having the warning signs and notifying your company/owner of the utility lines in order to be in compliance. The contractor would otherwise use the standard method of notifying the D.O.L. for a consultation (pre-approval, if the lines cannot be de-energized or de-energized far enough to where there is no possibility to get within 10- feet of the high-voltage lines).
- 28.3. Any overhead wire shall be considered an energized line unless and until the person owning such line or the electrical utility authorities indicates that it is not an energized line and it has been visibly grounded.
- 28.4. Notify the utility at least five (5) working days before any work begins which requires the utility to identify voltages and clearances, or de-energize, insulate or relocate lines. Minimum clearance between the lines and any part of the equipment or load shall be ten feet (10').
- 28.5. A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means; (spotter)
- 28.6. An approved durable warning sign legible at a distance of twelve feet (12') reading “Unlawful to Operate this Equipment within 10 Feet of High-Voltage Lines” shall be posted and maintained on all equipment or at the work-site.
- 28.7. An Emergency Response Procedure shall be adhered, if a power line falls.
- 28.8. IT IS UNLAWFUL TO OPERATE MACHINERY SO THAT ANY PART OF THE EQUIPMENT CAN COME WITHIN TEN FEET (10') OF A HIGH VOLTAGE LINE (i.e., a 100 ft. crane must operate at least 110 ft. away)

28.9. AERIAL LIFTS, CRANES, BOOM DEVICES

- 28.9.1. here there is potential for proximity or contact with energized lines or equipment, work shall not begin until a safety meeting is conducted and appropriate steps taken to identify, mark, and warn against accidental contact. The supervisor will review operations daily to ensure compliance.
- 28.9.2. Where the operator's visibility is impaired, a spotter shall guide the operator. Hand signals shall be used and clearly understood between operator and spotter. When visual contact is impaired, the spotter and operator shall be in radio contact.

28.9.3. Aerial lifts, cranes, and boom devices shall have appropriate warning decals.

28.10. EMERGENCY RESPONSE

28.10.1. If a power line falls:

28.10.1.1. Keep everyone at least 10 feet away

28.10.1.2. Use flagging to protect motorists from fallen or low wires

28.10.1.3. Call the utility, police or fire department immediately

28.10.1.4. Place 'guards' around the area

28.10.1.5. Do not attempt to move the wire(s) or touch anything that is touching the wire(s)

28.10.1.6. Be alert to water or other conductors present

28.10.1.7. Crews shall have emergency numbers readily available. These numbers shall include local utility, police/fire and medical assistance.

28.10.1.8. If an individual becomes energized, DO NOT TOUCH the individual nor anything in contact with the person. Call for emergency medical assistance and the utility immediately. If the person is no longer in contact, CPR, rescue breathing or first aid should be administered immediately, but only by a trained person. It is safe to touch the victim once contact is broken or the source de-energized.

28.10.1.9. Wires that contact vehicles or equipment will cause arcing, smoke and possibly fire.

28.10.1.10. Occupants should remain in the cab and wait for the utility. If necessary to jump from a vehicle, leap with both feet as far away from the vehicle as possible, without touching the equipment. Jumping free of the vehicle is the last resort.

29. EXCAVATION

CFR 1926.650-652

29.1. DEFINITIONS

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

29.1.2. **Cohesive Soil** - clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical side slopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

29.1.3. **Granular Soil** - gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

29.1.4. **Registered Professional Engineer** - a person who is registered as a professional engineer in the state where the work is to be performed.

29.1.5. **Shield (Shield System)** - a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be either pre-manufactured or job built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

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

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

29.1.8. **Soil Classification System** - a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and

performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.

29.1.9. Support System - a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

29.1.10. Unconfined compressive strength means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

29.2. SPECIFIC EXCAVATION REQUIREMENTS

29.2.1. Competent Person A Competent Person must be present during all excavating/trenching operations. If the Competent Person finds any failures or hazardous conditions, all employees shall be removed immediately from the situation.

29.2.2. A Competent Person shall:

29.2.2.1. Be capable of identifying existing and predictable hazards in the surroundings or work conditions that are unsanitary, hazardous or dangerous. The Competent Person shall also have the authority to take prompt corrective measures to eliminate any of the above.

29.2.2.2. Make daily inspections of excavation, adjacent areas and protective systems for evidence of a situation that could result in possible cave-ins, failure of protective system, hazardous atmosphere, or other hazardous conditions. The Competent Person shall use the attached checklist to conduct these inspections. These inspections are required when employee exposure can be reasonably anticipated and also during the course of work.

29.2.2.3. Any tabulated data for protective system being used must be available on-site.

29.2.2.4. Determine the type of soil, A, B, C, or stable rock.

29.2.2.5. Determine if underground utilities (gas, water, sewer and telephone) are present before starting any excavation/trenching. Contact the proper utility companies in advance of excavating/trenching by using the One Call System at 1-800-272-1000.

- 29.2.2.6. While the excavation/trench is open, underground installations must be protected, supported, or removed to safeguard employees.
- 29.2.2.7. Any excavation/trench **5 feet or more** in depth must have the proper protective system in place.
- 29.2.2.8. Ladders used in excavations must be secured and extended 3 feet above the edge of the trench.
- 29.2.2.9. Structural ramps used by employees must be designed by a Competent Person.
- 29.2.2.10. Structural ramps used for equipment must be designed by a registered professional engineer.
- 29.2.2.11. Ramps constructed of materials must be of uniform thickness, cleated together on the bottom and equipped with no slip surface.
- 29.2.2.12. Employees must be protected from cave-ins when entering or exiting the excavation/trench.
- 29.2.2.13. In areas where employees are exposed to public vehicular traffic, they must be provided with and must wear warning vests made of reflectorized or high visibility material.
- 29.2.2.14. No employee in an excavation/trench must be permitted beneath loads handled by lifting or digging equipment.
- 29.2.2.15. When mobile equipment is working near an excavation/trench or may be required to approach the edge, the proper warning system must be utilized. (i.e., barricades, stop logs, hand or mechanical signals.)
- 29.2.2.16. Employees must not work in an excavation/trench in which there is an accumulation of water.
- 29.2.2.17. Proper precautions must be taken to control water accumulation by using special supports, shield systems, (for cave-ins) and adequate means of water removal.
- 29.2.2.18. Water removal equipment and operations must be monitored by a Competent Person to ensure proper operations.

29.2.2.19. Any excavation/trench subject to water accumulation and/or runoff from heavy rains are required to be inspected each time by a Competent Person prior to the entry of any person or startup of work.

29.2.2.20. Any employee working in excavation/trench must be protected from excavated material and equipment. All excavated material shall be kept back 2 feet from the top of excavation and the upper most parts shall be sloped back to a distance where any material that could roll or fall will not enter into the excavation/trench.

29.2.2.21. Retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavation may also be used separately or in combination with sloping.

29.2.2.22. Standard guardrails must be provided where employees or equipment are required or permitted to cross over excavation.

29.2.2.23. At all remotely located excavation/trenching adequate physical barrier protection must be provided.

29.2.2.24. All wells, pits, shafts, etc. must be barricaded or covered.

29.2.2.25. Upon completion of exploration, any temporary well, pit, shaft, etc. must be back-filled.

29.2.3. Vehicle Traffic

29.2.3.1. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high visibility material.

29.2.3.2. Consideration for the close proximity of vehicles to the edge of the trench must be taken into consideration when designing protective systems. The Gross Vehicle weight of a loaded dump truck or excavator must be added to the design and specifications of any protective systems.

29.2.3.3. Vibrations from passing traffic, heavy equipment, soil compactors, jackhammers, etc. must be considered and may require additional protective measures above the minimum OSHA guidelines.

29.2.4. Emergency Rescue Equipment

29.2.4.1. Emergency rescue equipment, such as breathing apparatus, a safety harness and retractable lifeline, 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.

29.2.5. Access and Egress

29.2.5.1. Means of egress from trench excavations. 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.

29.2.6. Exposure to Falling Loads

29.2.7. No employee shall be permitted underneath loads handled by lifting or digging equipment, backhoe buckets, etc.

29.2.8. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

29.2.9. 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.

29.2.10. Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations.

29.2.11. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations

29.3. Protection from Hazards Associated With Water Accumulation

29.3.1. 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.

29.3.2. 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.

29.4. Stability of Adjacent Structures

29.4.1. Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

29.4.2. Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

29.4.2.1. A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure.

29.4.2.2. The excavation is in stable rock. c. A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity

29.4.2.3. A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

29.4.2.4. Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

29.4.2.5. Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

29.5. Protection from Cave-Ins/ Collapse Of Sidewalls

29.5.1. Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when:

29.5.1.1. Excavations are made entirely in stable rock.

29.5.1.2. Excavations are less than 5 feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

29.5.1.3. Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

29.5.1.4. The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the following:

29.5.1.4.1. Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

29.5.1.4.2. Determination of slopes and configurations using soil classification requirements. Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in determining soil type.

29.6. **Inspections**

29.6.1. 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.

29.6.2. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. 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

29.7. **SOIL CLASSIFICATION**

29.7.1. All types of protective systems must be based on the type of soil. All soil must be classified in accordance with OSHA's regulation "29 CFR 1926 SUBPART P, APPENDIX A". The methods of soil classification are outlined below:

29.7.2. Each soil and rock deposit shall be classified by a Competent Person as Stable Rock, Type A, Type B, or Type C.

29.7.2.1. **Stable Rock** – Natural solid mineral matter that can be excavated with vertical sides and remain

29.7.2.2. **Type A** – Cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

29.7.2.2.1. The soil is fissured.

29.7.2.2.2. The soil is subject to vibration from heavy traffic, pile driving, or similar effects.

29.7.2.2.3. The soil has been previously disturbed.

29.7.2.2.4. The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H:1V) or greater.

29.7.2.2.5. The material is subject to other factors that would require it to be classified as a less stable material.

29.7.2.3. **Type B** – Cohesive soil with an unconfined comprehensive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam; Previously disturbed soils except those which would be otherwise classified as Type C soil; Soil that meets the unconfined comprehensive strength or cementation requirements for Type A, but is fissured or subject to vibration; or Dry rock that is not stable; or Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than 4 horizontal to 1 vertical (4H:1V), but only if the material would otherwise be classified as Type B.

29.7.2.4. Type C – Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or granular soils including gravel, sand, and loamy sand; or Submerged soil or soil from which water is freely seeping; or Submerged rock that is not stable, or Material in a slope, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H: 1V) or steeper.

29.8. SOIL CLASSIFICATION

29.8.1. Basis of Classification

29.8.1.1. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis.

29.8.1.2. Such analyses shall be conducted by a competent person using tests or other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

29.8.2. Reclassification

29.8.2.1. 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.

29.8.2.2. The deposit shall be reclassified as necessary to reflect the changed circumstances.

29.8.3. Visual Tests

29.8.3.1. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

29.8.3.2. 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.

29.8.3.3. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

29.8.3.4. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

29.8.4. Manual Tests

29.8.4.1. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

29.8.4.2. 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. Cohesive material can be

successfully rolled into threads without crumbling. For example, if at least a 2 inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.

29.8.4.3. 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.

29.8.4.4. If the soil is dry and falls into clumps which 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.

29.8.4.5. 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 unfissured.

29.8.4.6. Thumb Penetration: The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. This test should 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.

29.8.4.7. Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only 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.

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

29.9. PROTECTIVE SYSTEMS

29.9.1. Design of support systems, shield systems, and other protective systems using Manufacturer's Tabulated Data/ Trench Boxes/ Aluminum or Hydraulic Shoring/ Interlocking Steel Plates:

29.9.1.1. Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C of OSHA regulation 29 CFR 1926 Subpart P Excavations.

29.9.1.2. Designs for aluminum hydraulic shoring shall be in accordance with the manufacturers tabulated data, but if manufacturer's tabulated data cannot be

utilized, designs shall be in accordance with appendix D of the OSHA regulation 29 CFR 1926 Subpart P Excavations.

29.9.1.3. Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

29.9.1.4. Trenches that use trench boxes as a support system shall be shielded or supported to a height at least 18 inches above the top of the vertical side.

29.9.1.5. Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

29.9.1.6. At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available upon request.

29.9.2. Installation and Removal of Support Systems

29.9.2.1. Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

29.9.2.2. 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.

29.9.2.3. Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

29.9.2.4. 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.

29.9.2.5. 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.

29.9.2.6. Backfilling shall progress together with the removal of support systems from excavations.

29.10. **Benching and Sloping Requirements:**

MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V)(1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP(3)
STABLE ROCK TYPE A (2) TYPE B TYPE C	VERTICAL (90 Deg.) 3/4:1 (53 Deg.) 1:1 (45 Deg.) 1 1/2:1 (34 Deg)

Footnote (1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

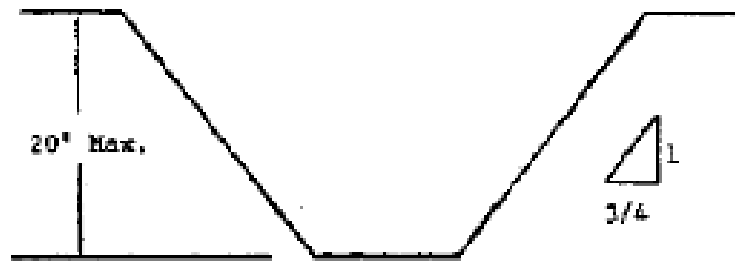
Footnote(2) A short-term maximum allowable slope of 1/2H:1V (63 degrees) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53 degrees).

Footnote (3) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

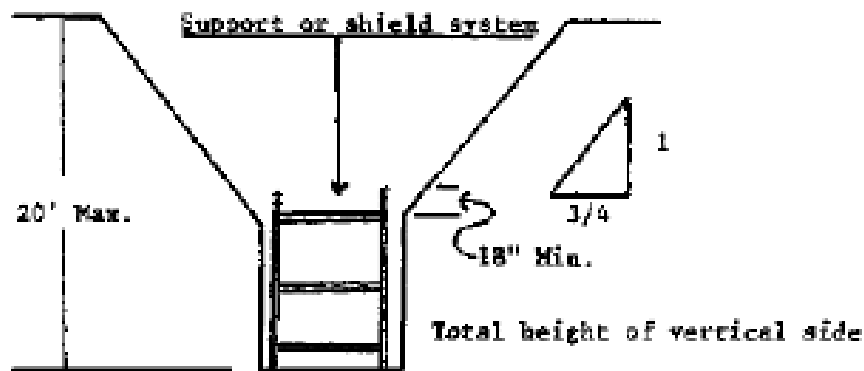
29.10.1. **Excavations Made in Type A Soil.**

29.10.1.1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.

29.10.1.2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench height of 4 feet.

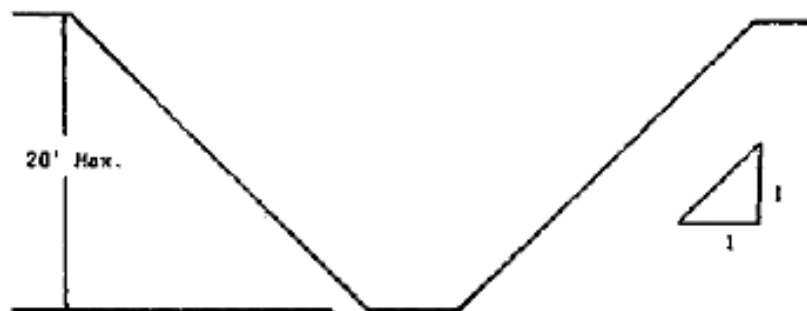


- 29.10.1.3. All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side

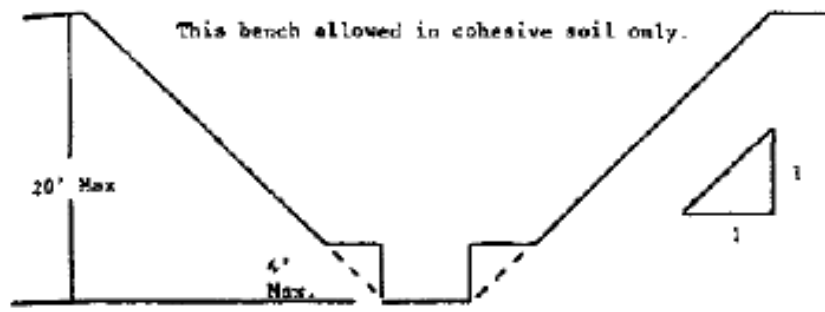


29.10.2. Excavations Made in Type B Soil.

- 29.10.2.1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.



29.10.2.2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench of 4 feet high:



29.10.3. Excavations Made in Type C Soil

29.10.3.1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.



29.10.3.2. Type C soil cannot be benched, it is not cohesive enough to hold the edge required in benching.

29.10.3.3. Sloping and benching systems not designed in accordance to the previous OSHA required sloping and benching shall be approved by a registered professional engineer.

Customer

Project Description

~~Preliminary Draft~~

Site Specific Safety Plan



VALIANT ENERGY SERVICE, LLC

Date

June 1, 2024

Valiant Energy Service, LLC

Occupational Safety and Health Requirements

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Valiant Energy Service, LLC

Occupational Safety and Health Requirements

The special occupational safety and health requirements listed herein shall not relieve Valiant Energy Service, LLC from complying with the regulations issues by:

June 1, 2024

- Occupational Safety and Health Administration (OSHA)
- Environmental Protection (EPA)
- Mine Safety and Health Act (MSHA)
- National Fire Protection (NFPA)
- Department of Transportation (DOT)
- American National Standards Institute (ANSI)
- Manufacturer Interactions
- And any other contractual requirements, including other federal, state or local regulations that may be applicable.

1) OCCUPATIONAL SAFETY AND HEALTH PROGRAM:

A) Submittal

- i) Prior to notice to proceed and within a maximum of 30 calendar days after the award of each subcontract, Valiant Energy Service, LLC shall submit an Occupational Safety and Health (OS& H) Program, in accordance with this document, for Customer Occupational Safety and Health Approval.
- ii) This OS& H Program must include all aspects of work expected and be specific to the contracted scope of work.
- iii) Should Valiant Energy Service, LLC wish to re-submit a previously approved OS& H program from another project, the program must be updated as necessary to address any such division of the safety representatives' responsibilities as well as site-specific requirements.

- B) Program Content - This written OS& H program includes, as a minimum:
- i) A table of contents.
 - ii) A statement of Valiant Energy Service, LLC's occupational safety and health policy.
 - iii) Valiant Energy Service, LLC OS& H goals and objectives and performance indicators. These must include the following OS& H goals as a minimum:
 - (a) No fatalities
 - (b) No restricted or lost time injuries or illnesses
 - (c) No accidents involving property or causing environmental pollution
 - (d) OSHA total recordable cases rate, lost-time frequency rate and lost-time severity rates of at least 10% below the national averages as listed by the Bureau of Labor Statistics (BLS)
 - (e) No unprotected exposures to hazardous materials above the permissible exposure limits.

2) VALIANT ENERGY SERVICE, LLC SAFETY REPRESENTATIVE:

- A) The name and qualifications of the Valiant Energy Service, LLC's representative administering the OS& H program is subject to Customer approval at the construction site.
- B) This designee must have direct access to the Corporate Safety Director with full authority to make safety related changes and resolve safety issues by whatever means up to and including issuing a "stop work order", especially in imminent danger situations.
- C) The Valiant Energy Service, LLC OS& H representative shall be on site during any work being performed under the subcontract. In the event of absence, an alternate representative meeting the above requirements, and approved by Customer may be appointed to cover said work.

3) HAZARD COMMUNICATION:

- A) Valiant Energy Service, LLC shall submit a hazardous materials list and current Material Safety Data Sheet (MSDS) for each product to Customer OS& H for review prior to the notice to proceed. Valiant Energy Service, LLC shall submit revisions to the hazardous materials list as new products are identified for use and prior to bringing them on site.

4) HEARING CONSERVATION:

- A) A continuous, effective Hearing Conservations Program in accordance with 29CFR 1926.54 and 29CFR 1926.101 shall be implemented when applicable.

5) SAFETY INSPECTIONS:

- A) Valiant Energy Service, LLC safety representative shall conduct daily safety inspections of the worksite and document the findings and corrective actions. These document inspections shall be made available upon request by Customer in order to verify compliance with contract agreement.
- B) Valiant Energy Service, LLC safety representative shall conduct a weekly inspection of all the work areas with Customer OS& H. Prompt action is required by Valiant Energy Service, LLC to correct noted unsafe practices or unsafe conditions.
- C) Valiant Energy Service, LLC senior management has ultimate responsibility to take prompt and decisive actions to correct unsafe acts and unsafe conditions.
- D) Valiant Energy Service, LLC is required to provide to Customer OS& H a written response to the inspection findings within 24 hours (one working day) of being notified of the findings unless otherwise directed by Customer.

6) PROTECTIVE CLOTHING:

- A) Valiant Energy Service, LLC personnel shall wear as a minimum long pants, shirts with a minimum 3” sleeve, hard hats, sturdy leather work boots (ankle high), safety glasses with attached rigid site shields at all times while within the construction worksite.
- B) Metatarsal protection is required when using ground operated earth tamping or compacting equipment.
- C) During extreme cold weather, above the ankle boots with insulations liners may be worn.
- D) Safety glasses, including all components (frames, lenses and side shields) shall conform to ANSI Standard Z87.1. Slip-on, flimsy plastic shields are not permitted.
- E) Impact and chemical resistant mono-goggles, conforming to ANSI Standard Z87.1, worn over prescription glasses, will be permitted only on an interim basis until personnel are furnished the above specified safety glasses by Valiant Energy Service, LLC Mono-goggles shall not be used as an ongoing substitute for safety glasses, except for visitors.

7) RESPIRATORY EQUIPMENT:

- A) Any and all work requiring respirators shall comply with 29CFR 1926.103 and/or 29CFR 1926.58. Documentation of medical examination, fit testing and training must be made available to Customer before work commences..
- B) Persons wearing respirators shall be clean-shaven to establish proper fit.

8) WARNING BARRICADES:

June 1, 2024

- A) Black and yellow rope will be used and supported by stands or posts around all Valiant Energy Service, LLC controlled areas.
- B) Stands or posts shall be spaced no more than 25 feet apart. Stands or posts subjected to wind shall be weighted or otherwise secured so they remain erect.
- C) Signs shall be liberally used around the construction area and appropriate for the hazard.
- D) Signs are subject to Customer OS& H approval.

9) TEMPORARY FACILITIES:

- A) Customer Construction Supervisor must be contacted for placement of temporary facilities.
- B) The location of portable buildings intended for occupancy or storage shall allow for Fire Department access and minimize fire exposure, as well as conforming to the following requirements:
 - i) Facilities on site for a period greater than 30 days and used for storage purposes only must be tied down and proper access maintained.
 - ii) Facilities occupied as office, break and/or lunch areas shall be tied down before occupancy begins.
 - iii) Facilities occupied as office, break and/or lunch areas shall use the Life Safety Code – NFPA 101 – for the arrangement of corridors, hallways, exits and fire alarms, doors and locks.
 - iv) All electrical wiring shall be installed to meet the National Electrical Code (NEC NFPA 70), with particular attention given to Article 550.
 - v) All temporary wiring shall comply with the lockout/tagout policy included in this site-specific plan.

10) VALIANT ENERGY SERVICE, LLC VEHICLES:

- A) All vehicles used for construction purposes shall be clearly marked with Valiant Energy Service, LLC name in one (1) inch high letters (minimum) on each side of the vehicle. “Makeshift” signs made of cardboard or similar non-permanent material, or markings using non-permanent lettering such as marking pen, will not be acceptable.
- B) The driver and all passengers will wear seat belts at all times while the vehicle is in motion.

11) CONSTRUCTION EQUIPMENT:

- A) All vehicles and equipment shall be leak-free before arrival and maintained as such during the duration of the job.
- B) Truck-mounted, hydraulic, telescoping boom cranes shall be equipped with an anti-two block device.

- C) All heavy equipment shall be identified with Valiant Energy Service, LLC name.
- D) Equipment shall be utilized only for the purpose for which the manufacturer designed it. Any deviation shall be with written manufacturer approval.
- E) At no time will anyone on the ground be in bodily contact with heavy equipment without the specific knowledge and consent of the operator.
- F) Rigging from the bucket, boom, backhoes, front-end loaders or dozers, etc., to lay pipe, erect steel, pick and carry, etc., shall not be permitted unless a properly installed and tested lifting eye or lug has been attached to the bucket or boom by the manufacturer, or manufacture written approval and directions. Lifting capacities and configurations must be specified in the manufacturer's operating manual.
- G) All hooks shall be equipped with a self-closing throat latch.
- H) Valiant Energy Service, LLC shall develop and document a comprehensive rigging equipment inspection program. This program shall include permanent labeling of equipment with alpha/numeric characters so as to be uniquely identifiable.
- I) Customer OS& H reserves the right to inspect any vehicles, equipment or tools before use and will be the determining authority.

12) SCAFFOLDING:

- A) Valiant Energy Service, LLC shall be responsible for erecting, inspecting, and tagging scaffolding for use by its employees.
- B) Valiant Energy Service, LLC's competent person shall affix a tag to the scaffold indicating its approved use and/or limitations.

13) FALL PROTECTION:

- A) 100% fall protection is required when greatest fall potential is equal to or greater than six (6) feet.
- B) Required equipment is full body harness and, if side "D" rings are provided, they shall only be used for positioning at work area.

- C) Shock absorbing lanyards (maximum 4 foot long and double-locking snap hooks). Two lanyards are required to accomplish 100% tie-off.
- D) Standard guardrails (if practical).
- E) Fall protection requirements are applicable to ladders (when used as a work platform), steel erection and roofing.
- F) Riding headache balls or climbing columns is strictly forbidden on any Customer construction project.

14) ELECTRICAL:

- A) Valiant Energy Service, LLC shall provide ground fault circuit interrupter protection (GFCI) for all cord sets, receptacles and electrical tools, including connections to generators and equipment connected by cord and plug, for use by employees.
- B) Assured grounding programs are not an acceptable method of electrical protection on any Valiant Energy Service, LLC construction project.
- C) Lockout/Tagout: Valiant Energy Service, LLC shall utilize their own Lockout/Tagout program, as reviewed by Customer OS& H, before commencing any work. (see Section 36, Page 18 of this plan).
- D) Any deviations, as listed in the attached Lockout/Tagout document shall be incorporated.
- E) Electrical conductors shall not be connected to a power source until all field installation work associated with the equipment, device or apparatus has been completed.
- F) Valiant Energy Service, LLC shall submit for review a Task-Specific JOB HAZARD ANALYSIS when working on or near energized electrical services.

15) GAS CYLINDERS:

- A) Capped cylinders on a cart shall be considered in use.

- B) All other cylinders shall be secured by full tie-off.

16) PROJECTING MATERIALS/OBJECTS:

- A) Reinforcing steel or similar material projecting from horizontal or vertical surfaces shall be capped or otherwise protected to prevent the possibility of impaling personnel.

17) PERSONNEL IN PIPE BRIDGES:

- A) Valiant Energy Service, LLC shall provide means of access and egress adjacent to the work area for personnel working in pipe bridges. Walking on, crawling along, sitting on, or working from pipe or cable trays will not be permitted unless authorized by Customer.

18) CONFINED SPACES:

- A) Confined space work shall be conducted in accordance with OSHA 1920.146, as well as section 37 (page 19) of this plan.

19) EXCAVATIONS AND PENETRATION:

- A) All excavations on site shall be treated as “Class C” soil unless hard rock strata is encountered or soil is otherwise classified by a Professional Engineers’ signature.
- B) Any employee who cannot readily escape from an excavation shall be protected against cave-in hazards, including benching, shoring or the use of trench boxing.
- C) Hand excavation is required when underground utilities are known to be within two (2) feet vertically and five (5) feet horizontally of the designated location (AKA the 2’ X 5’ rule).

20) ENVIRONMENTAL MANAGEMENT SYSTEM FOR WORKING WITH HAZARDOUS MATERIALS (Storage, Handling and/or Shipping):

- A) All chemicals and materials shall be properly labeled and strictly controlled. Storage and use must comply with the Material Safety Data Sheet (MSDS).

- B) In addition to the original labels, Valiant Energy Service, LLC shall use an NFPA 704, or equivalent, label to allow for quick determination of the hazard involved.
- C) All drums and containers that have been emptied shall be labeled "EMPTY" and the original labels removed or obscured.
- D) During transfer of flammable or hazardous liquids, a catch pan or impermeable membrane shall be placed under the transfer equipment to contain spills and protect the environment.
- E) Valiant Energy Service, LLC shall be responsible for all spills, wet or dry, as a result of equipment failure an/or negligence.
- F) Hazardous liquids (including, but not limited to, gasoline, diesel fuel, lubricating oil, antifreeze, chlorine and cleaning chemicals) shall not be allowed to enter the dignitary or storm sewer systems, waterways, drainage ditches or the ground.
- G) In the event of a spill, Customer shall be notified immediately. All efforts shall be made by Valiant Energy Service, LLC to contain the spill as long as it does not pose a threat to the health and/or safety of personnel.
- H) Only approved absorbent material shall be used to contain and/or absorb any spill.
- I) All electrical conduit-threading operations shall have full containment catch pans with oil absorbent material, not allowing any floor contamination.

21) FIRE PROTECTION:

- A) Smoking will be permitted only in designated areas approved by Customer.
- B) Valiant Energy Service, LLC shall furnish butt cans and maintain their designated smoking areas.
- C) Gasoline powered tools or equipment are not permitted inside buildings unless prior written approval is obtained from Customer.
- D) Valiant Energy Service, LLC shall furnish and maintain a sufficient number of fire extinguishers in work areas and include the following criteria:
 - i) Operation instructions and nameplates must be clearly visible.
 - ii) Seals or tamper indicators must be in place and not broken.
 - iii) There should be no evidence of damage, corrosion, leakage or clogged nozzles.

- iv) Maintenance, testing and recharging shall be performed in accordance with manufacturer's recommendation.
- E) Oily rags shall be kept in marked, fire-resistive metal containers with self-closing lids, or in an equivalent approved container, and removed from the premises daily. Container shall be marked "OILY RAGS ONLY" and not used for any other waste.
- F) Any plastic, tarpaulin or other material used to construct a hut, tent or similar protective structure, shall be flame retardant.
- G) Valiant Energy Service, LLC will adhere to site-specific "Fire Watch" and "Hot Work Permit" procedures.
- H) All fires, regardless of size, shall be immediately reported to Customer.

22) EXPLOSIVES:

- A) Explosives shall not be used in the performance of work unless specified by contract documents.
- B) Prior to the arrival of any explosives on site, an Explosives Use Plan must be submitted by Valiant Energy Service, LLC to Customer for approval and subsequent issue of an Explosives Use Permit.
- C) No unpermitted explosive transportation, storage or use is allowed on any Customer job site.

23) TEMPORARY HEATING DEVICES:

- A) Temporary heating devices shall be UL or FM listed and meet the following requirements:
 - i) No open flames.
 - ii) Equipped with an automatic tip-over shutoff device.
 - iii) Shall be indirect heating device.

24) COMPRESSED AIR:

- A) Quick make-up air connections shall be secured by a whip check at each connection.

25) HOUSEKEEPING:

- A) Housekeeping is to be an ongoing process throughout each work shift and not performed only at the end of the day's work.
- B) Should Valiant Energy Service, LLC fail to maintain the cleanliness and orderly arrangement of the worksite, Customer may, after serving written notice, stop the work at the worksite until Valiant Energy Service, LLC has satisfactorily cleaned the area.

26) STORM AND WATER MANAGEMENT CONTROLS:

- A) Minimize the area of disturbance during construction.
- B) Comply with all environmental regulations in place.

27) OS& H VIOLATIONS:

- A) Valiant Energy Service, LLC shall develop a disciplinary action plan for violators of OS& H policy, procedure, rule or regulation. This policy, procedure shall be reviewed by Customer for approval before starting any contract work.
- B) Customer reserves the right to remove from the site, and deny re-entry to, any employee who is:
 - i) Found to be in an imminent danger situation.
 - ii) Advising an employee to work in an unsafe condition/position.
 - iii) Willfully violating OS& H policy, procedure, rule or regulation.
- C) In the event of OSHA violations or unsafe practices involving imminent danger to personnel, immediate action shall be taken to stop work and correct the hazardous situation.
- D) If violations continue or corrective actions are not taken, Customer has the option to invoke any and all remedies under the subcontract.

28) AIR MONITORING:

- A) In areas requiring air monitoring, it shall be the responsibility of Valiant Energy Service, LLC to perform or have this service performed.
- B) If Valiant Energy Service, LLC chooses to have the service performed by an outside agency as a sub-tier, that agency will be subject to Customer approval.
- C) If self-performance is chosen, Valiant Energy Service, LLC must:

- i) Use equipment that is suitable and durable for the intended purpose and approved, in advance, by Customer OS& H.
- ii) Equipment shall be calibrated each day before the first use and after the last use. This calibration shall be documented on a calibration log and kept on the job site, and made available for review by Customer OS& H upon request.
- iii) The employee(s) performing monitoring shall be approved by Customer OS& H and have documented training and/or experience on file for review at any time.

29) TRAINING:

- A) Valiant Energy Service, LLC shall ensure that required safety training is carried out and documented before personnel start work and continues throughout all phases of construction activity as required. All employees shall be informed of their responsibility to work safely and prevent occupational injury. Training shall include:
 - i) Orientation:
 - (a) Site Access - Valiant Energy Service, LLC OS& H representative must attend a Customer Site Access Training (SAT) prior to beginning work on site. This training includes the Construction Orientation.
 - (b) Job Specific - Valiant Energy Service, LLC's safety representative shall conduct a safety orientation covering Valiant Energy Service, LLC's OS& H Program, all permit requirements, site conditions and other safety-related items before employees start work on a particular job. This training shall be documented and subject to review by OS& H at any time. It is the responsibility of the Valiant Energy Service, LLC superintendent and/or site safety representative to orient employees to specific hazards that may be encountered in the job area before work commences.
 - (c) Task Specific - The lead crafts-person shall conduct a task-specific orientation for routing activities and especially for tasks, which are non-routine.

30) MEETINGS:

- A) Pre-Construction
 - i) A pre-construction meeting shall be held to discuss Valiant Energy Service, LLC OS& H program in detail, as well as Customer Policy and Procedure. In all matters of interpretation, Customer will be the final determining authority.
 - ii) Valiant Energy Service, LLC Corporate Safety Director or representative and the job site safety representative shall attend this meeting.
- B) Plan of the Day (POD)
 - i) Valiant Energy Service, LLC shall conduct a POD every morning at the job site unless otherwise directed in the Special Conditions of the contract. This meeting will discuss the days' activities and answer employee questions concerning any permits for the day or other special activity. This meeting should last a minimum of 10 minutes.

- ii) All Valiant Energy Service, LLC and sub-tier employees shall attend.

31) WEEKLY MEETINGS:

A) Valiant Energy Service, LLC:

- i) Valiant Energy Service, LLC safety representatives shall meet weekly with Customer OS& H to discuss area safety and the Tool Box topic for the next week.
- ii) Valiant Energy Service, LLC's job supervisor shall hold a Tool Box Safety Meeting for all of its construction personnel weekly to emphasize project-specific occupational safety, health, fire protection, etc. This meeting should last at least 15 minutes.

B) Customer:

- i) Shall conduct a monthly Subcontractors Safety Meeting. The meeting is open for all subcontractor management personnel.
- ii) Attendance by Valiant Energy Service, LLC's designated safety representative and site supervisor is required.
- iii) Changes to rules and regulations due to Customer, state or federal regulations or national consensus standards will be announced in this meeting with official copies to follow in regular distributions.
- iv) Customer shall provide Valiant Energy Service, LLC with information that can be used by them at weekly meetings. Subjects that may be included, among others, are: standards and regulations, causes of accidents, methods of prevention, attitudes, motivations, hazards recognition, company rules and policy.

32) WORK EXECUTION:

- A) Valiant Energy Service, LLC shall ensure that no employee shall work alone (be out of hearing and/or visual range) during the performance of hazardous tasks.

33) HOT WORK PERMITS:

- A) A Construction Safe Work Permit (CSWP) will be secured.

- B) A CSWP shall be completed and fully approved prior to the commencement of any welding or other “hot work”. The CSWP will be issued to Valiant Energy Service, LLC’s superintendent or foreman in charge of the work crew. No hot work will be permitted without issuance of the CSWP.

34) JOB HAZARD ANALYSIS (JHA):

- A) Construction activities that are not covered in Valiant Energy Service, LLC’s OS& H program, or are considered to be high risk, shall be addressed using a JHA.
- B) The JHA shall address:
 - i) Personnel safety hazards expected on the project.
 - ii) The type of safety equipment and/or procedures to be used to eliminate or control the hazards.

35) REPORTING AND RECORD KEEPING:

- A) VALIANT ENERGY SERVICE, LLC SAFETY REPRESENTATIVE
 - i) Valiant Energy Service, LLC’s job safety representative ensures that required safety training is documented before personnel start work. A copy of the documentation required to demonstrate OS& H compliance shall be maintained and accessible to Customer at the job site.
- B) ACCIDENTS, INCIDENTS AND INJURIES
 - i) Secure the area to prevent further injury and to facilitate an investigation
- C) PROVIDE MEDICAL TREATMENT
 - i) Call emergency site-specific telephone number, if required.
 - ii) Provide in-field treatment (First Aid) by designated first aid certified employees.
- D) NOTIFY Customer OS& H
 - i) Initial notification (verbal) immediately, but no later than one (1) hour.
 - ii) Supervisor’s Accident/Incident Investigation Report (written) prior to the end of the shift.
 - iii) Unlimited participation in the Accident/Incident investigation.
- E) TRAINING RECORDS
 - i) All training provided to employees shall be documented by a sign-in sheet that will verify attendance. This shall serve as a record of training and must be available at the job site at all times for Customer review. These records will include:
 - (a) Printed name, signature and “S” numbers of all attendees.

- (b) Meeting topic (outlines or lesson plan attached).
- (c) Questions/comments/suggestions from employees and responses.
- (d) Printed name and signature of person conducting meeting.
- ii) Competent person
 - (a) Employees trained as “Competent Person” in any area shall have documented training and/or experience for review by Customer at any time.
 - (b) The competent person must also have documentation on his person at all times while serving in that capacity
- iii) Respirator training
 - (a) When required, respirator training, fit test and medical certification shall be maintained for Customer review at all times.
- iv) Asbestos
 - (a) Certification of asbestos training and medical fit testing for respirator shall be on file at the job site for Customer review at all times.
- F) DAILY REPORTS
 - i) Force Report
 - (a) Valiant Energy Service, LLC shall report, in writing, the work location, number and names of people on site and any significant occupational safety and health issues to the Customer Construction Supervisor on a daily basis prior to 0900 hours.
 - (b) A copy shall be maintained in the Valiant Energy Service, LLC’s job site files and readily accessible in the event of an emergency evacuation.
 - ii) Site Inspections
 - (a) A copy of all inspections, as described on page 5, section 5 of this document, shall be maintained on file for Customer review at any time.
 - (b) All corrective/disciplinary actions shall also be a part of this file.
- G) MONTHLY REPORTS
 - i) Safety Meeting Reports shall be maintained at Valiant Energy Service, LLC’s job site for review.

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- ii) Total number of man hours for the month, including the number of recordable incidents, lost workday cases and number of lost work days for the month, shall be turned in to Customer OS& H site office on the last Friday of each month. Numbers shall reflect all hours worked on site by craft and management supervision for that month.

H) EXCEPTIONS TO REQUIRMENTS

- i) If Valiant Energy Service, LLC believes they cannot perform their contract under the above safety requirements, they shall notify Customer in writing what their concern is and how they will meet the intent of the requirement. Customer will not give a variance to occupational safety and health requirements without a plan to meet the intent of the requirement.

36) **LOCKOUT AND TAGOUT POLICY AND PROCEDURES:**

- A) When the task to be performed requires qualified employees to work on or near energized electrical circuits and there is a danger of injury due to electrical shock or unexpected equipment start-up, all applicable circuits shall be disconnected and then locked-out and tagged. A life, possibly yours, depends solely on this procedure.
- B) Control circuit devices or electrical interlocks, which disconnect circuits indirectly, shall not be used as the sole disconnecting means for de-energized circuits.
- C) Both locks and tags are required to be placed on the disconnecting device. Locks shall be designated for lockout purposes only and furnished by the Safety Department. Tags shall supplement the locks in preventing accidental operation of the disconnecting device, and shall identify the employee's name authorized to lock-out the circuit, employers name, the time and date of lock-out, and shall include a statement prohibiting unauthorized removal.
- D) Following lockout of the disconnecting device the qualified employee shall verify that the circuits are de-energized and that operating control devices cannot restart equipment. All high voltage circuits shall be grounded.
- E) In the event of shift changes, provisions shall be implemented to assure a coordinated change in qualified employee assignments and the transfer of lock-out/tag-out devices.
- F) An individual, other than the employee placing the lockout device, shall be designated to authorize the safe removal of the lockout device in the absence of the employee, and his name shall be placed on the tag.
- G) Prior to restoration of electrical power, the qualified employee shall visually inspect that all tools, electrical jumpers, grounds and mechanical restraints have been removed. Furthermore, all affected employees shall be notified and visually verified to be clear of hazard.

- H) Only the employee who placed that device shall remove each lock-out/tag-out device or the authorized person designated in his absence.
- I) Work with no locks or tags shall be permitted when the circuits or equipment is de-energized for minor maintenance, adjusting, or servicing and the disconnecting device is adjacent to the circuit parts and equipment being worked on, and provided the disconnecting is clearly visible to all employees affected by the work, and work does not extend beyond the work shift.
- J) All procedures herein shall interact on all jobsites, including multi-employer worksites and all owner/client regulations shall interact as well in providing total safety in energizing and de-energizing circuitry.
- K) Apprentice electricians shall not work on any energized equipment or lines.

37) **CONFINED SPACES/EXCAVATION POLICY AND PROCEDURES**

- A) Although safety while working in confined spaces is not addressed in the Hazard Communication Standard, when employees are working in confined spaces they may be exposed to hazardous chemicals. This section shall serve to give an overall view of confined spaces and safety precautions that should be taken while working under these conditions.
- B) Confined space means a space that is large enough that an employee can bodily enter and perform assigned work for a limited amount of time. Confined spaces are not designed for continuous occupation.
- C) Some examples of confined spaces are:

Tank cars	Bins	Boilers	Sewers
Process vessels	Silos	Tunnels	Vaults
Crawl spaces	Pipelines	Manholes	Wells
Excavation Project	Storage tanks		
- D) Employees may be called upon to go into a confined space such as those listed above to do inspections, testing, repairs, and maintenance or cleaning. In any event, certain precautions are necessary in order to ensure the safety of the employees.
- E) Why are confined spaces dangerous? Dangerous vapors and gases can accumulate in confined spaces. Fires, explosions, and physical hazards can also injure or kill an unprotected person. Many problems happen because workers enter confined spaces infrequently. Before entering, employees must be trained by a supervisor.
- F) ENTRY PERMIT
 - i) The Supervisor/Foreman is responsible for obtaining an entry permit for any confined space. Permit shall identify the following:

- (a) The permit space to be entered.
- (b) The purpose of the entry.
- (c) The date and authorized duration of the entry permit.
- (d) Authorized entrants.
- (e) Name of attendants.
- (f) The Entry Supervisor.
- (g) The hazards of the permit space to be entered.
- (h) Means to control the hazard.
- (i) Initial and periodical test results.
- (j) Rescue and emergency services that can be summoned.
- (k) Type of communication contact equipment.

G) DUTIES OF THE SUPERVISOR/FOREMAN

- i) The Supervisor/Foreman has certain duties that must be addressed for working in a confined space.

- ii) Supervisor/Foreman must obtain an entry permit.

- iii) Supervisor/Foreman must obtain all safety program equipment to be utilized for entry, including but not limited to:
 - Body harness
 - Tripod hoist
 - Lifelines
 - Calibrated direct reading instrument
 - Ventilation equipment
 - Fire Extinguisher
 - Intrinsically safe two-way radios
 - GFCI circuit
 - Applicable explosion proof equipment
 - All personal protective equipment
 - Ascertain lockout/Tagout of all lines, electrical circuits, tubing, and/or other products pursuant to the confined space.
 - Oversee initial space atmosphere testing.
 - Ascertain all relevant workers to confined space entry are trained under OSHA 1910.146 regulations.
 - Notify all employees (contractors, subcontractors and owners) about information regarding confined spaces.
 - Notify outside **rescue services** about date, location, time of entry, and available routes to the job site.
 - Make sure a confined space trained Attendant (Buddy) is present at any confined space.
 - Make sure all confined spaces are clearly marked.
 - Know the hazards that may be faced.
 - Terminates the entry and cancels the permit when necessary.
 - Remove unauthorized individuals.

H) DUTIES OF THE ATTENDANT

- i) Know the hazards that may be faced, including signs or symptoms and consequences of exposure.
- ii) Maintain a count of authorized entrants.
- iii) Remain outside the permit space.
- iv) Communicate frequently with entrants.
- v) Monitor activities inside and outside of confined space.
- vi) Summon rescue and/or emergency services if necessary.
- vii) Perform non-entry rescue.
- viii) Knowledge of CPR or access to someone with knowledge.

I) MAJOR DANGERS

- i) Oxygen Deficiency—Many confined space deaths are caused by a lack of oxygen. There is only one sure way to know if there is enough oxygen—test for oxygen levels with special instruments, which will be provided by your employer upon request.
- ii) Causes for oxygen deficiency include:
 - (a) Fire or Explosion
 - (b) Corrosion or Rust
- iii) Displacement of Oxygen by other gases
- iv) Combustibility
 - (a) Fire and explosion are serious dangers in a confined space. Things will ignite more easily in trapped air. Poor ventilation and static electricity, friction, equipment or chemical reactions could cause a deadly explosion. Chemicals, paint, petroleum products, and solvents are all explosion risks in a confined space.
- v) Toxicity

- (a) While you won't be able to see or smell most toxics, they present two types of risks in a confined space.
 - (b) Irritation—even just a small amount of exposure to some toxic substances can affect your respiratory or nervous system. Over exposure could kill you!!!
- vi) Chemical Asphyxiation—when some toxics get into your system, they can cut off your oxygen supply or get into your lungs, which will asphyxiate you. Some symptoms of asphyxiation include:
- (a) Headache
 - (b) Dizziness
 - (c) Drowsiness
 - (d) Nausea
- vii) Sulphur Dioxide—is colorless, but has a heavy odor. It is highly toxic even in small amounts.
- viii) Hydrogen Sulfide—is produced in petroleum and sewage treatment and other industrial processes. It can cut off your breathing once it gets into your body.
- ix) PHYSICAL HAZARDS
- (a) Physical dangers found in confined spaces can cause serious illness or even death. Some areas of concern are:
 - Mechanical—moving parts from machinery that have not been properly disconnected or locked out can cause serious injury or death.
 - Noise—sounds reverberate and you could develop hearing problems from too much noise exposure. Even if your hearing is just temporarily affected, you might not be able to hear important directions or warnings.
 - Excavation and failure of underground installation—suffocation due to “cave-ins” on an excavation project should always be a major concern. Review excavation standards with your immediate supervisor before performing any work of this type.
 - Falling—if you stumble in a confined space, you could easily be trapped, especially if you are in an area with low oxygen levels or toxic gases. Rungs and railings in damp environments may not be sound—Don't Trust Them!
 - Health and other problems—temperature can build up quickly in a confined space and cause exhaustion, dizziness, etc. Snakes, rodents and spiders could bite you. Live wires could cause electrocution.

- J) While you are in a confined space:
- i) Keep alert
 - ii) Keep area ventilated

- iii) Test for oxygen deficiency, combustibility and toxicity
 - iv) Wear your respirator
 - v) Wear all required safety equipment
 - vi) Take all the equipment you need for the job when you enter the area
 - vii) Don't smoke or eat
 - viii) Finish the job as quickly as possible, then get out
- K) If you must rescue someone from a confined space:
- i) Remove victim with harness and ropes rather than going into the area yourself
 - ii) Get more help before going into rescue someone. Don't even try if you are not properly trained or equipped
 - iii) Make sure ventilation equipment is operating properly
 - iv) Wear respirator and protective clothing
 - v) Once victim is out, give artificial respiration if necessary
 - vi) Get emergency medical help immediately
 - vii) Close off the area

If you are not sure if you are working in a confined space, see your Supervisor or Forman before proceeding with any work!!

**COMPLIANCE WITH OSHA HAZARD COMMUNICATION STANDARD 1926.59
REGARDING CONFINED SPACES**

June 1, 2024

We, as an employer, are required by OSHA to provide information to our employees about the hazardous chemicals to which they are exposed.

The OSHA standard also requires distribution to transmit the required information to employers through the use of Material Safety Data Sheets supplied by the manufacturers.

Effective immediately, **all** material shipped to Valiant Energy Service, LLC must have Material Safety Data Sheets forwarded to our office prior to the delivery. Since the OSHA standard has existed for some time, you should have little difficulty in obtaining these sheets from the manufacturers. Some obvious examples are lubricants, pipe/wire joint compounds, contact cleaners, adhesive/sealers, solvents/degreasers, rust inhibitors, Scotchkoat and oils. Other examples of installation materials may be aluminum and copper wire (not only due to the metal, but also the insulation) and any asbestos-related or other fiber type materials. **Such materials may be used during confined space operations.**

Permit required Confined Spaces may be re-classified as “Non-Permit Required” providing all hazards are abated without entry into the space, and all basic monitoring and ventilation be used during entry into the non-permit required confined space. The supervisor shall notify the Corporate Safety Office of any re-classification procedure. (See next page for “Guide to Selection of Respirators”)

GUIDE TO SELECTION OF RESPIRATORS

HAZARD	RESPIRATOR
• Oxygen Deficiency	
Immediately dangerous to life or health	Any positive pressure or SCBA (Self Contained Breathing Apparatus)
Not immediately dangerous to health	Any positive pressure life SCBA or supplied air respirator
• Gas and Vapor Contaminants	
Immediately dangerous to life or health	Positive pressure SCBA Combination positive pressure SAR (Supplied Air Respirator) with auxiliary self-contained air supply
Not immediately dangerous to life or health	Any positive pressure SAR Chemical cartridge respirator
• Particulate contaminants	Any positive pressure SAR including abrasive blasting respirator. Powered air purifying respirator equipped with high efficiency filters. Any air-purifying respirator with a specific particulate filter.
• Gaseous and particulate contaminants	
Immediately dangerous to life or health	Positive pressure SCBA. Combination pressure SAR with auxiliary self-contained air supply.
Not immediately dangerous to life or health	Any positive pressure supplied air respirator. Gas mask. Chemical cartridge respirator.
• Escape from contaminated atmosphere that may be immediately dangerous to your health	Any positive pressure SCBA. Gas mask. Combination positive life pressure SAR with escape SCBA.
• Firefighting	Any positive pressure SCBA.

(Additional information on Respiratory Protection may be found in OSHA 3079)

June 1, 2024

1. ROLES AND RESPONSIBILITIES:

1.1. VALIANT ENERGY SERVICE, LLC shall be responsible for the safety of its employees and sub-contractor employees.

1.2. Superintendent (General Foreman)

The Superintendent will have the responsibility for monitoring and enforcing VALIANT ENERGY SERVICE, LLC's and Owner's safety requirements. The Superintendent has full authority to immediately correct any safety hazard as they deem appropriate.

The Superintendent shall:

1.2.1. Be in charge of the day-to-day details of this project-specific safety plan

1.2.2. Serve as the Competent Person and delegate other qualified employee's as necessary to serve as a Competent Person

1.2.3. Review specific tasks of the workers

1.2.4. Walk the site to investigate potential safety hazards

1.2.5. Where hazards are observed, take prompt corrective action

1.2.6. Walk the job site at the end of each day to ensure a safe environment.

1.3. Competent Person

The Competent Person shall be the Superintendent, foreman, or any other employee designated by the Superintendent. The Competent Person is defined by OSHA as an individual who can identify hazards and has the authority to take prompt corrective action. Competent Person supervision is necessary for activities such as scaffolding work, lockout procedures, live circuit work, welding and hot work.

1.4. Employees and Sub-Contractors

VALIANT ENERGY SERVICE, LLC and Sub-Contractor employees are responsible for following all site and company safety requirements.

- Each individual is responsible for his or her safety
- Each employee is responsible for reporting to supervision any incidents including near-miss incidents
- Each employee has the authority to refuse work or to request that others stop work if that employee believes the conditions to be unsafe

2. MEETINGS AND JOB SAFETY BRIEFS:

- 2.1. VALIANT ENERGY SERVICE, LLC shall have regular safety meetings with their employees sufficient to communicate safety issues.

Each crew shall conduct a JHA (Job Hazard Analysis) prior to each day's work; when there are changes to the work order or plan, and when a new worker joins the crew additional briefs are required. Each worker must have the opportunity to voice concern. The work cannot begin until each worker signs off on the JHA stating that they discussed the work and agree with the plan. Both Safety meetings and JHA's shall be documented in writing.

3. EMERGENCIES:

- 3.1. To report Facility Emergencies by phone such as Fires, Leaks/Spills, Medicals, or Security Emergencies: In-House Phone Dial ext. **xxx** when dialing from an outside Phone Call **(xxx) xxx-xxxx**

For non-life threatening conditions (injuries) contact your supervisor who shall then arrange for first aid or transport to medical facilities.

4. SAFETY COMPLIANCE:

- 4.1. The Supervisor will perform daily inspections of the work site.

- 4.2. All employees are required to wear PPE when in the designated construction area and when they are exposed to any hazards.

4.3. Employees who observe potential safety noncompliance issues shall immediately notify the supervisor.

4.4. The supervisor shall take corrective actions to eliminate the hazard.

4.5. If an individual is observed to be operating in a manner that creates an imminent danger to persons or property, it is the responsibility of any employee observing the hazard to stop the job or that portion of the job impacted until the issue has been resolved to the satisfaction of the Superintendent or other designated Competent Person.

5. STANDARD PPE:

5.1. Safety glasses, Goggles, Hard Hat, Visibility Vest with Company name on back, Work Boots with safety toe, Gloves

5.2. You will need added protection for many jobs- make sure you are using the proper PPE for the job you are performing

6. HAZARDS TO KEEP IN MIND:

6.1. Falls, Electrocution, Pinch Points, Caught Between, Overhead Work, Health Hazards, Sprains/Strains, Moving Parts/Equipment, Flammable Materials, Chemicals, Excessive- Noise, Hot Surfaces,

6.2. *As conditions change(weather-rain ,snow, wind ,ice ,mud ,heat ,cold,)you need to review These items on your JHA/SPA*

6.3. Review Daily JHA and ensure that all employees have been trained on its contents

7. TASK-HAZARDS-AND CONTROLS (Typical):

Task	Hazard	Controls
Mobilization	Employees not familiar with the site	All workers to attend site and customer orientation
Install Conduit	Cutting and Threading	Threading machines and oil Buckets in good condition. No leaks. Proper PPE - Power tools must be inspected and have GFCI protection and twist-lock type connectors.
Set Equipment	Struck by	Keep all personal away from lift area. Set up a Controlled Access Zone .Use tag lines, and stay out from under lift. Use a spotter. Inspect all rigging for proper rating and condition.
	Pinch Points	Keep hands and fingers clear, wear the proper gloves for the task, watch your body position
	Sprains/Strains	Proper ergonomic practices, good housekeeping-proper footing
	Energized Lines/Wires	Maintain proper distance for live lines (at least 10') De-energize when possible, use proper rated tools for the job and PPE. Follow NFPA 70 E
Duct Bank	Under ground Utilities	Call before you dig, Customer must sign off on any underground work.
	Slips/Falls	Level ground near excavation, use proper barricade system to keep out unauthorized personal, keep area clear of tripping hazards be aware of muddy conditions Inspect all fall protection equipment and ladders prior to use.

Install wire / cable	Falls	Use Full-Body harness, Lanyard(single/double or two singles) with shock absorber when exposed to a fall>6'-100% tie-off, when using a ladder use the right size ladder for the job and follow all rules on ladder. Ladder must be tied off. If using a lift you must be trained, tied-off and follow all safety rules. If using a scaffold it must be signed off by a "Scaffold Competent Person" look for the tag and inspect before using
	Sprains/Strains	Use good ergonomic practices when pulling cable. Warm-up prior to starting a pull. Make sure reels are set-up properly Inspect them prior to use.
	Contact with live circuits	All circuits to be turned off and verified
Wiring Devices	Cuts/Lacerations	Proper PPE(Gloves). Follow site rules pertaining to knives(No personal knives and No fixed blade knives)Utility knives must have an automatic retracting blade
	Contact with live circuits	All circuits to be turned off and verified(follow the Customer LOTO procedure)
	Falls	Use Full-Body harness, Lanyard(single/double or two singles) with shock absorber when exposed to a fall>6'-100% tie-off, when using a ladder use the right size ladder for the job and follow all rules on ladder. Ladder must be tied off. If using a lift you must be trained, tied-off and follow all safety rules.
Wiring Devices	Slips/Trips	Proper housekeeping- don't allow trash or scrap to accumulate, keep your area neat, Clean as you go.
Energizing	Electrocution/Flash	Make sure all safety devices have been put in place(Covers, Barrier,) Test circuits for

	any shorts/faults to ground. Wear the proper PPE.
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Section 32

Transmission and Distribution Operations

32-1 General

Electrical equipment and lines shall always be considered as energized unless they are positively proven to be de- energized and properly grounded.

IF IT ISN'T GROUNDED - IT ISN'T DEAD!

- a. Only authorized employees shall work on or near energized lines or equipment.
- b. No employee shall approach any exposed ungrounded line wire or apparatus unless he is insulated from other conducting surfaces or uses adequate protective devices.
- c. Employees shall report immediately to their nearest foreman or supervisor any defective line, or tool or other condition which in their judgment may be dangerous either to persons or property or likely to interrupt or delay service.
- d. Electrical equipment and lines shall always be considered as “live” unless they are positively known to be dead and grounded. Before starting to work, preliminary inspection or test shall be made to determine what conditions exist. Extreme care shall be exercised when handling common neutral conductors as high voltage may be encountered. Any line or circuit to be worked on as de-energized, has to be Identified, Isolated and Tested before grounding can take place.
- e. Secondary windings of current or series transformers shall be short circuited before any instrument or other device connected in the circuit is removed or disconnected.

f. No work shall be performed in inclement weather on high voltage equipment or lines when conditions are such as to materially increase the hazards of the operations being performed, 2excepting emergency work necessary to restore service or demanded by the public interest.

g. Employees working in rain shall be furnished with rain coats and slush boots. This equipment shall not be considered to be protection from energized circuits.

32-2 Flexible Protective Equipment (Rubber, Synthetics, Etc.)

a. Employees shall not touch or work on any exposed energized lines or apparatus except when wearing Protective equipment approved for the voltage to be contacted.

b. When work is to be done on or near energized lines or equipment, all energized and grounded conductors, guy wires or equipment within reach of any part of the body shall be covered with protective equipment, except that part of the conductor on which the employee is working.

c. When working on energized lines or apparatus, including the installation of protective devices, work should be done from below, if possible.

d. In applying flexible protective equipment, an employee shall always protect the nearest and lowest wires first, protecting himself as he progresses. In removing rubber protective equipment, the reverse order shall be maintained.

e. Flexible blankets shall not be used on the ground without protecting them from physical damage and moisture by means of a tarpaulin, canvas, or protective mat.

f. Protective equipment shall be put on before entering the work area within which energized lines or apparatus may be reached, and the protective equipment shall not be removed until the employee is completely out of reach of this area.

g. To avoid corona and ozone damage, rubber protective equipment shall not be allowed to remain in place on energized lines or apparatus overnight or for more than one eight-hour period, unless approved by the supervisor in charge.

h. Line hose, hoods, blankets, line guards, etc., shall be visually inspected before each job.

i. Line hose and hoods shall be visually inspected and electrically retested upon indication that insulating value is suspect and rubber blankets electrically retested every six (6) months or as required when physical inspection reveals defects.

Where visual inspection indicates that there may be reason to suspect the electrical integrity of flexible protective equipment, an electrical test shall be performed before reissuing the equipment for service.

j. Flexible protective devices shall be stored in special compartments on trucks and elsewhere where they will not be subjected to damage from tools or other equipment.

k. Bare communications conductors shall be treated as energized lines and shall be protected accordingly.

l. Electrical cords or electric power tools shall not be used near or above lines or equipment exceeding 250 volts.

32-3 Use and Care of Rubber Gloves and Sleeves

a. Only qualified employees or those under the continuous supervision of an experienced journeyman shall work on lines or equipment which are energized.

- b. When rubber glove work is authorized to be performed, use the following chart.

Classes of rubber gloves manufactured, proof- test voltage and maximum use voltages as specified by ANSI.

	AC Proof-Test	DC Proof Test	Maximum Use
<u>Class of Glove</u>	<u>Voltage rms</u>	<u>Voltage avg</u>	<u>Voltage AC rms</u>
1	10,000	40,000	7,500
2	20,000	50,000	17,000
3	30,000	60,000	26,500
4	40,000	70,000	36,000

- c. Employees shall wear rubber gloves and sleeves cradle to cradle. This shall apply to all energized and de-energized primary and secondary circuits.
- d. Employees shall wear rubber gloves and sleeves when performing work on a de-energized transmission line that is above an energized under build.
- e. Rubber gloves with leather protectors and sleeves shall also be worn by employees on the ground when:
1. Working on or within reaching distance of any electrical equipment and/or conductor which are not effectively grounded and which may become energized (I.E. URD, Sub-Stations, Traffic Signals).

2. While a pole or other conductive structure is being set or removed from proximity of energized primary lines. They shall be put on before pole is raised and worn until pole is set and secured. Also, see Rule 31-18.

3. Required by supervision.

4. Opening and closing manually operated oil circuit breakers, air break switches, fuses, or fuse doors on cutouts.

5. Making tests to determine if lines are de-energized, and applying and removing grounds.

f. When working with rubber protective equipment on energized circuits or apparatus the following minimum conditions shall be met, in addition to all other rules governing the use of protective equipment.

1. Employees shall not make physical contact with energized conductors or grounds, with other than his rubber gloves.

2. Where the voltage exceeds 5000 volts between a single phase and ground employees shall be isolated from all grounds (wooden poles shall be considered as grounds in this case) by using approved supplementary insulation such as aerial baskets, a lineman's platform, or other approved insulated devices. All equipment used for lineman protection shall be tested.

g. Rubber gloves shall never be worn inside out or without leather protectors. They shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of them. Leather protectors or over gloves shall not be worn except when in use over rubber gloves.

h. Rubber gloves and sleeves shall be inspected for corona cracks or other damage and the gloves shall be given an air test each day while in use, at the beginning of the work period and at any other time when their condition is in doubt. They shall be given a visual inspection before each use.

- i. Rubber gloves and sleeves when not in use shall be kept in canvas bags or other approved containers and stored where they will not become damaged from sharp objects or exposed to direct sunlight. They shall never be folded while stored nor shall other objects be placed upon them.
- j. Rubber gloves shall be stored in the glove bag with the cuffs down to permit drainage, better ventilation and reduce the possibility of damage.
- k. Suitable size gloves and sleeves shall be provided by the employer.
- l. Inner liners may be worn if desired.
- m. Rubber gloves shall be laboratory tested after thirty
(30) days of being issued to the employee.
- n. Rubber sleeves shall be laboratory tested after sixty
(60) days of being issued to the employee.
- o. An efficient method of numbering and stamping shall be used showing the date of the last laboratory test on sleeves, blankets and gloves.
- p. Gloves or sleeves that have been electrically tested and sealed in plastic bags but not issued for service shall not be placed into service unless they have been tested within the previous twelve (12) months. Date of issuance shall be stamped on the glove when distributed.

32-4 Protective Equipment

- a. Line hose and hoods shall be visually inspected and electrically retested upon indication that insulating value is suspect and rubber blankets electrically retested every six (6) months or as required when physical inspection reveals defects.
- b. Line hose may be folded back over itself for inspection purposes.
- c. Rubber blankets should be rolled or stored flat, never folded.
- d. Rubber goods should not be thrown from poles or structures but should be raised and lowered by hand line with a suitable canvas bag or container.
- e. Defective rubber goods shall not be used.
- f. Oil shall not be allowed to contact the rubber; if it does, it shall be wiped off at once.

32-5 Climbing and Working on Poles

- a. Before ascending, individual climber shall inspect and test all poles to assure all poles are in safe condition for the work to be performed and that they are capable of sustaining the additional or unbalanced stresses to which they will be subjected.
- b. Where poles or structures may be unsafe for climbing, they shall not be climbed until made safe by guying, bracing or by other adequate means.
- c. Wires shall not be attached to or removed from a pole or structure until it is certain the pole or structure will withstand the altered strain.

d. Poles shall be thoroughly tested before they are climbed. If a pole is not strong enough to sustain a lineman's weight by reason of its condition or its placement (such as in soft ground), it shall be guyed or otherwise secured throughout the time any work is being performed on it. If the pole to be climbed is being replaced and the new pole is set adjacent to it, the old pole may be lashed to the new one in lieu of guying.

e. When poles are encountered which are unsafe to climb (ice, badly chewed, wide cracks, shell rot, etc.), an alternate means of climbing shall be used (use belt around pole while climbing) or the use of an aerial bucket shall be considered.

f. Employees shall not wear their climbers while driving or riding in vehicles or when doing work on the ground, on ladders (except hook ladders), in aerial lifts or on platforms in which the wearing of climbers creates a hazard.

g. Gaffs on climbers shall be kept within safe length limits (1-1/4 inches min.), properly shaped, and sharp.

h. Employees shall not work on an elevated pole or structure without first securing themselves with a safety strap.

i. Only approved belts and straps shall be used.

j. Metal hooks, chains, etc., for holding tools or tape shall not be attached to body belts. Leather or other non- conducting material shall be used for this purpose.

k. The safety strap shall not be put around a pole above the uppermost pole attachment position, except where pole top or attachment is above eye level. It shall not be used on pole steps, cross arm braces, insulators, insulator pins, conductors, rotten or otherwise weak cross arms or on attachments that are being moved. When it is necessary to safety off to a cross arm, the safety strap shall never be placed

beyond the outside cross arm attachment. It shall be so placed that it will not be cut by line equipment or twisted or fouled by material that may give way under strain.

l. Employees shall not trust their weight to guy wires, pins, braces, conductors, or other such equipment that might prove unstable.

m. When two or more employees are to work on the same pole at the same time, one shall reach the working position before the next leaves the ground. They shall descend the pole one at a time.

n. When climbers are stored in the truck or tool room, they shall be placed where the sharp points will not damage other equipment or cause personal injury.

o. Gaff guards shall be used on climbers when not on the pole.

p. The sliding of guy wires to descend poles or structures is strictly forbidden.

32-6 Working On Energized Lines with Live-Line Tools

a. All live-line tools to be removed from service and inspected every two (2) years. If, during that inspection, any defects are found that could compromise the dielectric properties of the tool, then it shall be removed from service, repaired and refinished, and tested before returning the tool to service.

b. Lines of #6 copper, #6 ACSR, and #8A copper weld or smaller shall not be worked on with live-line tools except in specific instances where continuity of service is vital and then only upon special authorization.

c. Planned work with live-line tools shall not be started during unfavorable weather.

- d. Before work with live-line maintenance tools is begun, the dispatcher or person having jurisdiction shall be notified. If during live-line tools work, an interruption of service occurs, the dispatcher or other person having jurisdiction shall be notified immediately.
- e. Only tools approved by the Company shall be used in live-line maintenance work.
- f. A careful check shall be made to see that the condition of the structure and lines at the point of the work is such that the job may be performed safely. In addition, the adjacent spans and structures shall be carefully checked for defects in conductors, tie wires, insulators, and other equipment.
- g. Under no circumstances shall a lineman depend on another workman to hold a live conductor clear of him.
- h. Positive control shall be maintained during the movement of any conductor.
- i. While live-line work is in progress, no other work of any nature shall be performed on the same pole or structure.
- j. All live-line tools, when not in use, shall be kept in canvas bags or weatherproof boxes provided for that purpose; these containers shall be stored in dry and, if possible, a warm place.
- k. Live-line tools shall never be laid directly on the ground or against sharp objects such as barb wire fences. Special tool holders or tarpaulins shall be used for this purpose.
- l. All live-line tools shall be visually inspected before use each day. Tools to be used shall be wiped clean, and if any hazardous defects are indicated, these tools shall be removed from service.
- m. When practical, the automatic reclosing feature of circuit interrupting devices shall be made inoperative before work begins.

- n. Careful attention shall be given to avoid mechanical overloading of live-line tools.
- o. When installing or removing jumpers, only one connection shall be made at a time. Jumper ends not connected shall be secured in such a manner as to prevent unintended contacts.
- p. Plan each job carefully to provide the maximum clear working space. Guard against contact with conductors other than the one being worked on.
- q. Approved protection devices shall be placed in position on any and all conductors energized above 5000 volts when such conductors are within reach of any part of the Employee's body when live line tools are being used. Such conductor guards shall be installed by means of appropriate live line tools.
- r. Only clean and dry synthetic rope shall be used on energized conductors above 5KV. Link sticks shall be used between the rope and energized conductor on all voltages.
- s. Care shall be exercised to prevent the ends of the tie wires, armor rods, or other conductive material from contacting the structure or attached hardware during removal from or installation on energized conductors.

32-7 Working On Energized Lines

- a. All journeymen working on energized conductors and/ or electrical equipment over 500 volts shall be assisted by a journeyman, or a qualified apprentice, on the same pole, structure or location. (Two separate poles or structures may be considered one for the purpose of this rule if both linemen can step to the other pole or structure without descending to the ground to do so.)
- b. In no case, when working together in pairs, shall linemen work simultaneously on energized wires or equipment of different phases or polarities.

- c. Before starting work the lineman shall get himself in such a position that the presence of the second man does not increase the hazard.
- d. Qualified apprentices may, under the supervision of a Journeyman, work on energized conductors and/or equipment. Qualified apprentices shall be determined by the Joint Apprenticeship and Training Committee.
- e. Energized conductors and/or equipment shall be handled in accord with the Safety rules, regulations and safe working procedures of the Utility on whose property the work is performed, provided a copy of such procedures, is made available.
- f. Crew Compliment for Live Line Work. A crew of two (2) qualified employees can handle single phase primary conductors and routine 3 phase primary conductors. The more complex projects, such as sleeving primary, heavy corner and junction poles, etc., should be handled by a minimum of three (3) or more qualified employees, depending upon field conditions determined by the immediate supervisor.

32-8 Working On De-Energized Lines and Equipment

- a. General. All conductors and equipment shall be treated as energized until tested to be de-energized and grounded.
- b. New construction. New lines or equipment may be considered de-energized and worked as such where:
 - 1. The lines or equipment are grounded, or
 - 2. The hazard of induced voltages is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.

- c. Communication conductors. Bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating materials.
- d. Workmen working on de-energized lines shall work under the tagging orders on whose property the work is performed.
- e. Testing equipment of adequate capacity shall be used to determine whether or not a line and/or equipment is de-energized.
- f. Grounding equipment shall be used when working on all de-energized circuits and/or equipment.
- g. Rubber gloves and sleeves must be worn when sticks are used to test, switch, phase-out, or ground circuits and/or equipment.
- h. Men working in de-energized areas must use barricades, signs, tags, and/or other safety means to designate energized lines and/or equipment.
- i. All tools shall be kept in good working condition, properly stored, and must be restricted to the use for which they are intended.
- j. See Rule No. 31-16 for Grounding Procedures and Requirements.

32-9 Dispatching and Clearances

- a. All oral communications about dispatching and clearances shall be recorded by the person receiving them and read back to the person giving them.
- b. Under no circumstances shall clearances be granted or released on a predetermined time basis.

c. When two or more crews are working on the same line or apparatus and are not under the supervision of the same general foreman or other supervisor, each crew foreman shall request and release his own clearance independently in accordance with these rules.

d. A Hold Card shall be attached to each switch that is providing clearance on a cleared line or apparatus.

e. The handles of switches providing clearances for working on lines or apparatus shall be locked or blocked open or closed in addition to being Hold Carded.

f. Under no circumstances shall Hold Cards be removed or the line or apparatus be put in service until so ordered by the dispatcher.

g. Before ordering Hold Cards removed and line or equipment returned to service, the load dispatcher shall require that the same person who received the clearance shall report that the line or equipment may be re-energized.

EXCEPTION: If the person who received the clearance must leave the work before it is completed, he shall so inform the dispatcher, giving the name of the man who will take his place. In such cases, the dispatcher shall communicate with both men, releasing the one who is leaving and accepting the other as authorized to report for him. Clear entries of all such authorized changes shall be made on the dispatcher's records, and Hold Cards or Tags.

h. When it is necessary to obtain a working clearance on any line or apparatus not under the jurisdiction of a dispatcher, the request shall be made directly to the person having jurisdiction.

i. After de-energizing the line or apparatus and attaching Hold Cards to each switch providing clearance on the line or apparatus, the employee shall report back to the person making the request that the line or apparatus is out of service and that work may be begun after adequate grounds have been installed.

j. A line or apparatus shall not be put back in service, nor the Hold Cards removed until the person to whom clearance was given releases their clearance.

EXCEPTION: If the person who received the clearance must leave the work before it is completed, the Employee shall so inform the person having jurisdiction, giving the name of the person who is to take his place. In such cases, the person having jurisdiction shall communicate with both men, releasing the man who is leaving and accepting the other as authorized to report for him.

k. When the work is completed, the grounds removed and all men are clear, the employee who received the clearance, or his properly authorized substitute, shall report to the person having jurisdiction that the line or apparatus is ready for service.

32-10 Series Street Lighting Circuits

a. Before a series street lighting circuit is opened and work is started, one of the following procedures shall be followed:

1. Circuit shall be visibly disconnected from the source of supply by opening disconnecting switches or other absolute cutouts, and Hold Cards shall be attached to such disconnects or cutouts. Dependence shall not be placed on time switches or other automatic devices.

2. Circuit shall be properly jumpered to avoid an open-circuit condition.

b. All series street lighting circuits shall be considered as energized, and worked on in accordance with Rules Nos. 31-2 and 31-3.

32-11 Working on Transformers

- a. The primary leads of a distribution transformer shall be considered energized at full voltage until both the primary and the secondary leads have been disconnected, or it has been determined that the secondary circuit to which it is attached is not energized from other transformers.
- b. The cases of all transformers connected to a source of supply shall be considered as being energized at the full primary voltage unless they are adequately grounded.
- c. Employees shall not stand on or otherwise contact transformer cases while working on or near energized circuits.

32-12 Hoisting Cables-Conductive Material

- a. Wire rope or other conductive material shall not be used to raise transformers, poles, or any other equipment or materials near energized lines, except:
 - 1. When the wire rope is rigged a sufficient distance below all energized wires to prevent the possibility of electrical contact between the energized wires and the wire rope or conductive material being raised; or
 - 2. When the wire rope and any conductive material being raised are adequately protected; or
 - 3. When energized lines and equipment are adequately protected.

CHART NO. 3-1

APPROXIMATE TRANSFORMER WEIGHTS (WEIGHT IN POUNDS)

50	1230	2225
75	1505	2545
100	1720	2635

NOTE: Old-type transformers with cast iron cases may weigh about 50% more than the weights listed above and will require correspondingly larger rope and blocks. The weights given are for standard distribution transformers.

- b. Use of wire rope as a hoist line shall be discontinued when it becomes worn, deteriorated or damaged to a degree that is unsafe.
- c. Metallic slings (chain or cable) shall not be used near energized equipment.
- d. Whenever possible, chain slings shall not be used for hoisting purposes.
- e. Positive control of wire rope shall be maintained at all times.
- f. Synthetic hoisting and pulling lines and ropes shall not be considered as non-conductive, unless properly maintained to preserve their insulating qualities.

32-13 Working On Capacitors

a. Line capacitors shall be considered at full voltage until they have been disconnected from the line, and the terminals short-circuited and discharged to ground by an approved method.

The terminals shall not be short-circuited until the capacitors have been de-energized for at least five minutes.

b. Employee shall wear rubber gloves and use a hot stick while shorting and grounding terminals.

c. Employees shall not come in contact with an ungrounded capacitor case until the capacitor has been disconnected from the circuit and the terminals shorted.

d. The exposed terminals of line capacitors in storage shall be shorted.

32-14 Stringing or Removing De-Energized Conductors

a. Prior to stringing operations, a briefing shall be held setting forth the plan of operation and specifying the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed, and the clearance authorization required.

b. Where there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced voltage buildup, to further protect the employee from the hazards of the conductor, the conductor being installed or removed shall be grounded or provisions made to insulate or isolate the employee.

c. If the existing line is de-energized, proper clearance authorization shall be secured and the line grounded on both sides of the crossover or, the line being strung or removed shall be considered and worked as energized.

d. When crossing over energized conductors in excess of 500 volts, rope nets or guard structures shall be installed unless provision is made to isolate or insulate the employee or the energized conductor. Where practical the automatic reclosing feature of the circuit interrupting device shall be made inoperative. In addition, the line being strung shall be grounded on either side of the crossover or considered and worked as energized.

e. Conductors being strung in or removed shall be kept under positive control by the use of adequate tension reels, guard structures, tielines, or other means to prevent accidental contact with energized circuits.

f. A transmission clipping crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged. When working on bare conductors, clipping and tying crews shall work between grounds at all times. The grounds shall remain intact until the conductors are clipped in, except on deadend structures.

32-15 Stringing Adjacent to Energized Lines

a. Prior to stringing parallel to an existing energized transmission line, a competent determination shall be made to ascertain whether dangerous induced voltage buildups will occur, particularly during switching and ground fault conditions. When there is a possibility that dangerous induced voltage may exist, the provisions of subparagraphs (b) through (j) shall be followed.

b. When stringing adjacent to energized lines, the tension stringing method or other methods that preclude unintentional contact between the lines being pulled and any employee shall be used.

c. All pulling and tensioning equipment shall be isolated, insulated or effectively grounded.

d. A ground shall be installed between the tensioning reel setup and the first structure in order to ground each bare conductor and overhead ground conductor during stringing operations.

e. During stringing operations, each bare conductor and overhead ground conductor shall be grounded at the first tower adjacent to both the tensioning and pulling setup and in increments so that no point is more than

2 miles from a ground.

f. The grounds shall be left in place until conductor installation is completed.

g. Such grounds shall be removed as the last phase of aerial cleanup.

h. Except for moving type grounds, the grounds shall be placed and removed with a hot stick.

i. Conductors and overhead ground conductors shall be grounded at all deadend or catch-off points.

j. A ground shall be located at each side and within 10 feet of working areas where conductors or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.

k. All conductors and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.

l. Work on deadend towers shall require grounding on all de-energized lines.

m. Grounds may be removed as soon as the work is completed, provided that the line is not left open circuited at the isolated tower at which work is being completed.

n. When performing work from the structures, clipping crews and all others working on conductors or overhead ground conductors shall be protected by individual grounds installed at every work location.

32-16 Grounding

- a. Personal protective grounds shall be applied so as to create a zone of equalized potential for those working on de-energized lines or equipment.
- b. New lines or equipment may be considered de- energized and worked as such where:
 - 1. The lines or equipment are grounded, or
 - 2. The hazard of induced voltages is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.
- c. Bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating materials.
- d. De-energized conductors and equipment that are to be grounded shall first be tested for the presence of voltage.
- e. Adequate capacity cables and clamps shall be provided for grounding. They shall be inspected for defects prior to being used.
- f. Grounds (personal) shall be installed at each worksite.
A grounding bracket shall be attached to the pole at a point below the work area.
- g. Attaching grounds.

1. When attaching grounds, the ground end shall be attached first, and the other end shall be attached and removed by means of insulated tools and rubber gloves.
 2. When removing grounds, the grounding device shall first be removed from the line or equipment using insulated tools and rubber gloves.
-
- h. Where the making of a ground is impracticable, or the conditions resulting there from would be more hazardous than working on the lines or equipment without grounding, the grounds may be omitted and the line or equipment worked as energized.
 - i. Grounds may be temporarily removed only when necessary for test purposes and extreme caution shall be exercised during the test procedures.
 - j. Grounding to tower shall be made with a tower clamp capable of conducting the anticipated fault current.
 - k. A ground lead, to be attached to either a tower ground or driven ground, shall be capable of conducting the anticipated fault current and shall have a minimum conductance of No. 2 AWG copper.
 - l. Grounding equipment shall be of sufficient carrying capacity to actuate protective devices such as oil circuit breakers, relays, etc., without destroying the grounding equipment.

32-17 Pole Hauling and Temporary Storage

- a. The trailing end of a load of poles shall be marked by a red flag during the day and a red light at night. As an additional precaution, warning flags or lights may be placed in the center of long loads. An employee shall be used for flagging when necessary.
- b. If it becomes necessary to store poles at the location where they are to be set, they shall be so placed that they will not interfere with traffic.

- c. If poles left on or near streets, highways or walkways overnight create a hazard, they shall be safeguarded by red lights or well-lighted warning signs.
- d. Poles shall be placed or blocked so that they will not roll.
- e. Employees shall not remain on a pole pile while poles are being hoisted.
- f. Poles loaded on a truck or trailer shall be securely fastened every ten feet.
- g. When a load of poles is within working distance of the ground, load binders shall be installed so that they can and will be operated by employees while standing on the ground.
- h. Employees shall not ride pole dollies or trailers.
- I. The wheels of the transporting vehicle shall be chocked or securely braked prior to loading.

32-18 Setting and Removing Poles

- a. If any holes are left unfilled at the end of the work period, they shall be protected with substantial coverings.
- b. All persons not engaged in pole-setting operations shall keep out of the work area.
- c. No one shall be on a gin pole when it is being used to raise another pole.
- d. While setting or removing poles between or near conductors energized above 500 volts:

1. If safe clearance cannot be maintained, the conductors shall be de-energized, covered with protective devices, spread apart, or a pole guard shall be used, to minimize accidental contact.
 2. Workmen handling the butt of the pole shall wear rubber gloves and sleeves whether or not can't hooks, peaveys or slings are used.
 3. Until a pole is positively secured from moving against an energized conductor, no one shall step on or off the truck or pole trailer, nor shall an employee standing on the ground touch any part of the truck or pole trailer without using rubber gloves.
 4. Ground wires shall not be attached to the pole higher than 10 feet from the ground.
- e. When pikes are used to hold poles in place while holes are being backfilled, they shall be firmly secured until the backfill is sufficient to hold. When a pole is being "canted" or "hooked", the pikes shall be held.
- f. Employees shall not stand or pass under a suspended load or adjacent to or over or under a loaded winch line.
- g. Employees engaged in handling or working on poles shall wear suitable gloves and shall wear a shirt or jacket with the sleeves rolled down.
- h. Hoisting equipment operators shall accept signals only from the employee specifically designated. The operator shall obey a stop signal given by anyone.
- i. The operation of setting a pole in an energized line shall require two (2) qualified employees in the group including one (1) journeyman and a qualified apprentice or two (2) journeymen. The number of employees utilized will depend on the work to be done. Additional qualified personnel will be assigned whenever required to perform the work safely.

It should be understood that poles, even within the same class, vary in diameter and hence weight. Also, the moisture content of a pole changes under various conditions. Therefore, the weights given in these tables should be taken as average values only, but they should prove sufficiently reliable.

WESTERN RED CEDAR

Length Class

(ft.)	1	2	3	4	5	6	7	8	9
30	1000	850	730	610	500	420	350	325	250
35	1200	1000	850	750	650	560	470	450	
40	1500	1300	1100	900	800	700			
45	1800	1550	1300	1150	1000				
50	2000	1800	1550	1400	1300				
55	2300	2000	1750	1600	1600				
60	2600	2200	2000	1900					
65	3200	2500	2300	2200					
70	3600	3000	2700	2600					
75	4200	3600	3100	3000					
80	5000	4200	3600	3500					
85	5500	4500	4000						
90	6600	5600	4800						

CREOSOTED YELLOW PINE - 8 lb. Treatment

32-19 Derrick Trucks, Cranes, Etc.

With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized line or equipment than the clearances set forth in Table 3-1, unless:

1. An insulated barrier is installed between the energized part and the mechanical equipment, or
2. The mechanical equipment is grounded, or
3. The mechanical equipment is insulated, or
4. The mechanical equipment is considered as energized.

32-20 Fuses

Rubber gloves and sleeves shall be worn while opening, closing, removing or replacing hot clamps, fuses or fuse doors on cutouts even when using an approved switch stick or hot line tool. Approved eye protection shall also be used during these procedures.

32-21 Rope (Synthetic Fiber-Manila)

- a. A rope shall not be overloaded or dragged over rough or sharp objects.
- b. Short bends over sharp-edged surfaces shall be avoided.
- c. Kinks shall be removed before any strain is put on a rope.

- d. When not in use, rope shall be dried and stored properly and kept free from mechanical damage and excessive heat and dryness.
- e. Rope shall be examined regularly for cuts, worn spots, burns and rot. The rope shall be untwisted at various places and inspected for poor fiber and dry rot.
- f. The outward appearance of rope shall not be accepted as proof of quality or strength.
- g. The safe loads, as specified by the manufacturer, shall not be exceeded.
- h. Handlines shall be a minimum of 1/2-inch diameter and have a strength equivalent to 1/2-inch manila.
- i. Eyes and splices shall be made in accordance with the instructions given by the rope manufacturer.

32-22 Underground Lines and Equipment - Opening and Guarding Holes

Whenever the cover is to be removed from a manhole or a vault, or when any other obstruction to traffic exists, the following precautions shall be taken.

- a. All obstructions to traffic shall be guarded by adequate signs, barricades, lights, flares or flags. Traffic shall be warned in advance through the use of signs, high level standards, flashing lights, traffic cones or flaggers, as may be required by the situation.

- b. Where permissible and practicable, the truck shall be placed to guard the work area against oncoming traffic.
- c. A blow torch or other open flame shall never be used to melt ice around a manhole or vault cover.
- d. Manhole, vault and service-box covers shall always be removed and replaced by means of approved hooks and hoists.

32-23 Underground Lines and Equipment - Entering Underground Structures

- a. Testing of the confined or enclosed space should be listed as a requirement before opening underground structures.
- b. All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas.
- c. Before an employee enters a street opening, such as a manhole or an unvented vault, it shall be promptly protected with a barrier, temporary cover, or other suitable guard.
- d. If, in an emergency, it becomes necessary for an employee to enter a manhole or vault where gas is present, he shall use an approved gas mask and a rescue harness to which there is attached a lifeline attended by another employee stationed at the manhole or vault opening.
- e. A ladder shall always be used in entering or leaving a manhole or vault. Climbing into or out of manholes or vaults by stepping on cables or hangers is forbidden.
- f. While work is being performed in manholes, an employee shall be available in the immediate vicinity to render emergency assistance as may be required. This shall not prevent the employee in the

immediate vicinity from occasionally entering a manhole to provide assistance, other than emergency. This requirement does not preclude an authorized employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, taking readings, or similar work if such work can be performed safely.

g. Before any work is done on a cable, it shall be identified by an approved method. If there is any doubt as to the identification, work shall not be started until it is checked and identified by the proper authority.

h. No workman shall use or be required to use any toxic cleaning fluids in manholes, vaults or excavations.

32-24 Underground Lines and Equipment - Work on Energized Cables

a. All underground cables and apparatus carrying current at voltage above 500 volts shall be de-energized before work is done on the conductor or before the cables are cut into or spliced.

b. Before any work is done on an energized cable, other cables and all grounded equipment with which contact can be made while working on the energized cable shall be covered with rubber blankets or approved insulating shields. (Cables with non-metallic sheaths and those with an insulating jacket over the metallic sheath need not be covered).

c. Because of the characteristics of a low voltage network system, when work is performed on cables or apparatus carrying less than 500 volts, employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearances and in using proper tools in order to prevent short circuits.

d. Employees shall wear rubber gloves with leather protectors, sleeves and stand on rubber mats or use insulated tools while cutting into and removing sheathing or sleeves and while testing an energized cable.

e. After removing a section of lead sheath or sleeve on an energized cable, the lead on each side of the open shall be covered with insulating tape for a distance of at least 9 inches.

f. When cutting an energized multiple conductor cable, a piece of fiber or wood shall be placed between the conductor being cut and the other conductors, and the cut shall be made directly over the shield.

g. Immediately after each conductor of an energized multiple conductor cable is cut in two, the ends shall be insulated before another conductor is cut. During the course of the work, only one uninsulated conductor shall be exposed at any one time.

32-25 Underground Lines and Equipment - Work On De-Energized Cables

a. When cables and apparatus are taken out of service to be worked on, the procedure outlined in Rule 31-6 shall be followed.

b. When grounding de-energized underground cable, a zone of equalized potential shall be created for the employees who are working on it.

c. When a high voltage cable is to be cut, the cable shall be speared at the work location by a remotely operated grounded spear, or a short section of the shielding if any, completely around the cable shall be removed and tests made with two statiscopes or other approved testing devices, to determine whether or not the cable is de-energized. If no indication of a live cable is obtained, the employee may proceed with the work.

d. When opening a joint or splice in a high voltage cable, it shall be speared as in (c) or the sleeve of the joint shall be cut completely around near the wipes and then cut lengthwise and removed from the joint. No effort shall be made to remove the compound. The employee shall then test over each conductor with two statiscopes or other approved testing devices. If no indication of a live cable is obtained, the Employee shall remove the compound. If shielding tape is then encountered, it shall be removed and another test made over each conductor with two statiscopes or other approved testing devices. If no indication of a live cable is then obtained, the Employee shall cut through the joint until the saw touches one of the conductors. Before sawing further, a statiscopes test shall be made on the blade of the saw.

e. When cutting or opening joints on low voltage cables, the same procedure as outlined above for high tension cables shall be followed, except in testing. To determine whether the conductor is energized, the insulation shall be cut away to the conductor and tests made with an approved tester. On multiple conductor cables, only one conductor shall be cut into at a time, and tests shall be made on at least two conductors before proceeding with work.

32-26 Underground Lines and Equipment - Pulling Cables

a. Employees shall not handle pull-wires or pulling-lines within reaching distance of blocks, sheaves, winch drums or take-up reels.

b. Pull-wires, steel pulling-lines or metal rodding shall not be pushed through ducts where energized equipment is present unless another employee is stationed at the other end of the run.

c. Employees shall not remain in a manhole or vault during pulling operations involving heavy pulling strains unless they can take a position clear of the pulling-line.

d. Communications between manholes shall be maintained.

e. When pulling cable into vaults, manholes, or duct, care shall be exercised to protect employees and the public from possible injury. Vehicular and pedestrian traffic at the work location shall be studied long enough to enable the equipment to be set up in the safest manner possible, and with the least inconvenience to the public.

f. An employee or suitable warning sign or barricade, shall be stationed alongside a cable, snake wire, or pulling rope laid out on the sidewalk or street pavement; cables laid across sidewalks temporarily during pulling operations shall be properly guarded, to reduce the hazard to pedestrians.

32-27 Underground Lines and Equipment - Moving Energized Cables

- a. Cables operating at voltages above 15,000 volts shall not be moved under any circumstances.
- b. All cables up to 15,000 volts may be moved at the discretion of the foreman. They shall not, however, be moved where such movement requires changing bends.
- c. All cables energized above 500 volts shall be handled with rubber gloves and sleeves.

32-28 Underground Lines and Equipment - Materials

- a. Metals and insulating compounds shall be heated in such manner as to prevent hazard to the employees working in manholes or vaults and to vehicular or pedestrian traffic.
- b. Gloves shall be worn while heating or working with hot insulating compound.
- c. Furnaces and tanks containing liquefied petroleum gas shall not be placed in a manhole or vault.
- d. Cold solder scraps or ladle shall never be placed in a hot solder pot until the chill and any moisture have been removed from the scraps or ladle.
- e. Heating pots for lead, oil or compound shall be safely positioned so that the contents cannot enter the vault or manhole in the event of spillage.
- f. Lighted furnaces or torches should not be left unattended.
- g. Torches or furnaces must be kept at a safe distance from flammable materials.

Underground Residential Distribution

Introduction

Underground Residential Distribution (URD) systems have a number of apparent advantages over overhead systems; however, they also have some disadvantages such as confined working spaces, closer clearances between energized parts and greater exposure to all types of grounds. In most cases, if protective devices are not used, the employee will be in direct contact with the ground or grounded equipment. This contact completes half of an electrical circuit. If these contacts are not avoided, or protection against contact is not used, serious injury can result.

32-29 URD-General

- a. Before a URD transformer enclosure is opened, all unauthorized persons including the public shall be required to leave the work area, and remain clear of all hazards involved in the work.
- b. When underground equipment is being located, previously buried short sections of scrap cable could provide false indications of the actual position of permanent conductors. Therefore, all scrap cable, regardless of length, is to be removed from the job site.

32-30 URD - Opening and Closing Circuit

- a. Company switching procedures, including Hold Carding practices, shall be followed when sectionalizing URD systems.
- b. When a URD circuit has opened, the route of the circuit shall be patrolled for obvious hazards before the circuit is reclosed.
- c. An approved switching tool and rubber gloves with sleeves shall both be used when switches (including secondary breakers) in an energized circuit are opened or closed.

d. Any URD primary circuit shall be de-energized by opening one or more devices. De-energizing shall be done with load break elbow connectors, load break fuse cutout at the riser pole, load break tool or other approved device.

e. Eye or face protection shall be worn when primary switching operation are performed.

32-31 URD - Grounding

Note: A capacitance charge can remain in a URD cable after it has been disconnected from the circuit and a static-type arc can occur when grounds are applied to these cables.

a. All URD cables and equipment, including services, that have been energized or could become energized from any source, shall be considered as energized until the equipment is positively proven to be de-energized and has been grounded.

b. Before doing work on de-energized primary circuits or equipment: (1) a visible open break shall be provided; (2) a voltage test shall be made; and (3) the equipment shall be grounded.

c. When work is to be done on equipment or cables or an underground system, precautions to prevent backfeed shall be taken. This shall include grounding of the secondary conductors where applicable.

d. De-energized cables shall be grounded at a point as close to the work as possible before work is started.

e. All underground cables and apparatus carrying current at voltages above 500 volts shall be de-energized and grounded before cables are cut into or spliced.

32-32 URD - Rubber Glove and Sleeve Use

- a. Rubber gloves and sleeves shall be worn before any URD compartment or enclosure (including a service pedestal) is opened.
- b. Rubber gloves and sleeves shall be worn when removing animals, vines, weeds, grass or vegetation of any kind that has grown into an energized URD installation whether the equipment is opened or closed.
- c. Rubber gloves and sleeves shall be worn when energized primary cables are moved, handled or protected.
- d. Rubber gloves and sleeves shall be worn when work is performed on energized secondary's and services.
- e. Rubber gloves and sleeves shall be worn when working on or contacting a neutral.

32-33 URD - Work On Energized Equipment

- a. When work is performed on cables or apparatus carrying less than 500 volts, employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearances, and in using proper tools in order to prevent short circuits.
- b. When energized pad-mounted transformers are unlocked and opened, they shall be directly attended by an Employee. They shall be kept closed and locked at all other times.
- c. A primary or secondary system neutral on any energized circuit shall not be opened under any circumstances.

d. Elbow connectors provide a great deal of flexibility in switching and system sectionalizing. However, only those connectors designed and approved for load break use shall be used to connect or disconnect an energized circuit.

e. Only tools with insulated handles shall be used for making energized secondary connections or when work is performed within energized service pedestals, pad-mount compartments or submersible transformer enclosures.

f. Only one energized secondary or service conductor shall be worked on at any one time, and protective devices shall be used to insulate or isolate it from all others.

g. Before any attempt is made to replace a damaged or blown cable limiter, the customer's service will be checked for faults by the use of either an ohmmeter or a voltmeter.

h. Appropriate clothing with full-length sleeves, rolled down, shall be worn when work is performed with rubber gloves and sleeves.

32-34 URD - Excavations

a. Mechanical excavating equipment shall be used only in areas where there is no known danger of contacting or damaging buried facilities.

b. Whenever excavating is done in close proximity to buried facilities, it shall be done only by hand digging.

c. Before excavating in any area where any buried facilities are suspected, such facilities shall be located as accurately as possible and other utilities shall be notified of the proposed work.

d. If electric cables are damaged, the following steps shall be taken:

1. If the damaged cable belongs to a power company other than the one performing the work, this company shall be notified at once.
 2. The area shall be barricaded and the public kept out until hazardous conditions can be eliminated.
- e. If gas lines are damaged, the following steps shall be taken as soon as possible:
1. The hole shall be left open to allow the gas to dissipate into the atmosphere. All possible sources of igniting the gas shall be removed or eliminated.
 2. Residents of the area shall be warned when necessary and the public kept out of the area.
 3. The following departments shall be notified immediately:
 - a.) Local fire
 - b.) Gas company
 - c.) Local police
 - d.) If communication cables are damaged, the communication company shall be notified at once.
- g. When trenches are left open, warning devices, barriers, barricades or guardrails shall be placed to adequately protect the public and employees.
- h. At the end of each day's work, as much of the trench as practical shall be closed. No more trench shall be open at one time than is necessary.

I. Suitable gloves shall be worn when using any equipment or tools to excavate, expose or handle secondary cables. They shall also be used when digging with approved hand tools to expose primary cables.

32-35 Live-Line Bare-Hand Work - Working On Energized

a. Only employees who have been instructed and trained in live-line bare-hand work shall use the technique on energized circuits.

b. Live-Line bare-hand work shall not be performed on voltages under 69 kivas unless minimum clearances specified in Table 3-2 can be maintained.

c. Before using the live-line bare-hand technique on energized high-voltage conductors or parts, a check shall be made of:

1. The voltage rating of the circuit on which the work is to be performed;

2. The clearances to ground of the lines and other energized parts on which work is to be performed; and

3. The voltage limitations of the aerial-lift equipment intended to be used.

d. Only equipment designed, tested, and intended for live- line bare-hand work shall be used.

e. The automatic reclosing feature of circuit interrupting devices shall be made inoperative before working on any energized line or equipment.

f. Work shall not be performed during the progress of an electrical storm in the immediate vicinity.

g. A conductive bucket liner or other suitable conductive device shall be provided for bonding the insulated aerial device to the energized line or equipment.

1. The employee shall be connected to the bucket liner by use of conductive shoes, leg clips, or other suitable means.

2. Adequate electrostatic shielding shall be used or conductive clothing suitable for the voltage shall be worn.

h. Only tools and equipment intended for live-line bare-hand work shall be used, and such tools and equipment shall be kept clean and dry.

I. Before the boom is elevated, the outriggers on the aerial truck shall be extended and adjusted to stabilize the truck and the body of the truck shall be bonded to an effective ground or barricaded and considered as energized equipment.

j. Before moving the aerial lift into the work position, all controls (ground level and bucket) shall be checked and tested to determine that they are in proper working condition.

k. Arm current tests shall be made before starting work each day, each time during the day when higher voltage is going to be worked and when changed conditions indicate a need for additional tests.

This test shall consist of placing the bucket in contact with an energized source equal to the voltage to be worked upon for a minimum of three (3) minutes. The leakage current shall not exceed 1 micro-ampere per kilovolt of nominal line-to-line voltage. Work operations shall be suspended immediately upon any indication of a malfunction in the equipment.

l. All aerial lifts to be used for live-line bare-hand work shall have dual controls, lower and upper.

1. The upper controls shall be within easy reach of the employee in the basket. If a dual-bucket-type lift is used, access to the controls shall be within easy reach from either basket.
 2. The lower set of controls shall be located near the base of the boom and must permit over-ride operation of the equipment at any time.
- m. Before the employee contacts the energized part to be worked, the conductive bucket liner shall be bonded to the energized conductor by means of a positive connection which shall remain attached to the energized conductor until the work on the energized circuit is completed.
- n. The minimum clearance distances for live-line bare-hand work shall be as specified in Table 3-2. These minimum clearance distances shall be maintained from all grounded objects and from lines and equipment at a different potential than that to which the insulated aerial device is bonded unless such grounded objects or other lines and equipment are covered by insulated guards. These distances shall be maintained when approaching, leaving, and when bonded to the energized circuit.
- o. The use of hand lines between buckets, booms, and the ground is prohibited.
- p. No conductive materials over 36 inches long shall be placed in the bucket, except for appropriate length jumpers, armor rods, and tools.
- q. Non-conductive-type hand lines may be used from line to ground when not supported from the bucket.
- r. A minimum clearance table (as shown in Table 3-2) shall be printed on a plate of durable non-conductive material, and mounted in the buckets or its vicinity so as to be visible to the operator of the boom.
- s. It is recommended that insulated measuring sticks be used to verify clearance distances.

32-36 Vehicle Operations

- a. Only those employees specifically authorized and who possess a valid commercial driver's license or permit for the equipment being used shall operate motor vehicles on company business. (NOTE: Driver with a Permit only must be accompanied by a driver with a CDL).
- b. Drivers shall know and obey all state and local motor vehicle laws applicable to the operation of their vehicle.
- c. The driver shall drive at safe speeds no greater than that permitted by law. Traffic, road, and weather conditions shall be given consideration in determining the safe speed within the legal limit at which the vehicle shall be operated.
- d. A driver shall not permit unauthorized persons to drive, operate or ride in or on a company vehicle.
- e. Where the manufacturer provides seat belts, they shall be used.
- f. Employees shall not permit anyone to ride on the running boards, fenders or any part of the vehicle except on the seats. Passengers shall not stand in moving vehicles.
- g. Employees shall not ride on trailers.
- h. Employees shall not jump on or off vehicles in motion.
- i. The privilege of operating equipment may be withdrawn if operator abuses this privilege by careless or unlawful practices. (Abuse defined - endanger life, limb, property or damage to equipment.)
- j. Drivers operating equipment in a negligent or unlawful manor shall be subject to disciplinary action.

32-37 Inspection of Equipment

- a. The driver shall conduct a pre-trip inspection of the vehicle to determine if it is in a safe operating condition. Any defects found on the vehicle shall be reported immediately to your supervisor.
- b. The driver shall inspect windshield wipers frequently and see that they are in good operating condition and that the windows and windshield give sufficient visibility for safe operation of the vehicle.
- c. All lights and reflectors of vehicle shall be inspected and if found defective, they shall be repaired immediately.
- d. The driver shall report any defects that may have developed during the day. If the brakes are not working properly, they shall be adjusted or repaired before the vehicle is put in operation. Other items that affect safety shall be repaired prior to continued vehicle operation.
- e. All vehicles must be equipped with a fire extinguisher and three red reflective triangles.
- f. D.O.T. requires that a post trip inspection be done with written documentation. The driver of that vehicle on the next shift shall review that inspection form for any defects, ensure those defects have been repaired, and check it off on the inspection form. The driver is then required to carry that inspection form on the vehicle for the remainder of the shift.

32-38 Operation

- a. The operator of a motor vehicle shall clearly signal their intention of turning, passing or stopping.

b. Upon a signal from a vehicle approaching from the rear, the driver of a company vehicle shall yield the right of way.

c. Drivers shall be prepared to stop and the right of way shall be yielded in all instances where necessary to avoid an accident.

Note: These are the shortest distances in which a vehicle in good condition, driven by an average driver, can stop on a good road surface. Distances will increase with any change in driver, vehicle or road surface.

d. The driver of a vehicle shall be courteous toward other operators and pedestrians. The driver shall operate the vehicle in a safe manner and shall yield the right of way to pedestrians and other vehicles when failure to do so might endanger any person or another vehicle.

e. The driver shall stay a sufficient distance behind when following another vehicle so that he can safely stop the vehicle in the clear distance ahead.

f. Drivers shall exercise added caution when driving through residential and school zones.

g. When entering or leaving any building, enclosure, alley or street where vision is obstructed, a complete stop shall be made and the driver then shall proceed with caution.

h. Before a radio equipped vehicle is driven under or adjacent to energized equipment, especially in substation areas, the radio antenna shall be lowered and clearance checked in order to insure that proper clearances will be maintained between the vehicle and energized equipment.

i. Ignition systems and radio transmitters shall be turned off and no smoking permitted while refueling.

j. When proceeding down grade, the clutch shall not be disengaged. Trucks, particularly if heavily loaded, shall be in a lower gear on steep grades.

k. The driver shall not operate the motor in any garage except when driving in or out, and then the motor shall be operated as little as practicable. The motor shall not be warmed up inside a garage nor shall the driver test motor operation in a garage unless the exhaust gas is carried directly to outside atmosphere or doors and windows are open so that adequate ventilation exists.

32-39 Parking

a. When vehicles must be parked on the roadway, they shall be parked on the right hand side facing in the direction of traffic flow, whenever possible.

b. When parking on a roadway, vehicles shall park off the traveled road surface, whenever possible. When vehicles must park closer than 10 feet to the traveled road surface, appropriate warning devices shall be used.

c. Trucks or trailers stopped on any public roadway shall be protected by proper warning lights, reflectors or red flags in accordance with state or local requirements.

d. Vehicles shall not be parked on bridges or over culverts except when necessary for work.

e. When a truck (other than a pickup) is parked, the driver shall make sure the vehicle is left in a safe position. The engine shall be turned off, the transmission shall be placed in the lowest gear, parking brake shall be set, and the wheels chocked. When parked on an incline, the front wheels shall be cut into the curb if present. Rear wheels shall be chocked.

32-40 Backing

a. Whenever possible, the vehicle shall be positioned to avoid the necessity of backing later.

b. Extreme caution shall be exercised when backing a vehicle, to avoid injury to persons and to prevent property damage. If another employee is present, the Employee shall be stationed at the rear of the vehicle to assist the driver in backing the vehicle safely.

c. When backing a vehicle which has an obstructed view to the rear:

1. A reverse signal (back-up alarm) audible above the surrounding noise level shall be used,
or

2. An observer shall signal that it is safe to back.

d. During all backing operations, the vehicle operator shall:

1. Keep a constant lookout during the entire time.

2. Carefully check any blind areas.

3. Back slowly.

4. Watch both sides. Do not depend entirely on mirrors.

32-41 Stopping on Highway

- a. Stopping on the highway shall be avoided.
- b. When it is absolutely necessary to stop on the highway, extreme caution shall be used. Warning signals and lights shall be used.
 - 1. Rotating beacon shall be used, if vehicle is so equipped.
 - 2. Tail lights/emergency flashers shall be used.
 - 3. Flares or reflectors shall be placed to give adequate advance warning.
 - 4. If work is in progress, traffic control devices (together with flaggers, where necessary) shall be used.

32-42 Hauling Materials, Poles or Ladders

- a. Ladders, pipe, etc., shall be loaded parallel with the truck length. Such material shall not extend beyond the normal width of the vehicle.
- b. Materials shall be securely fastened to prevent a hazard due to shifting.
- c. Material which extends more than 4 feet beyond the front or back of the truck or trailer shall have warning devices attached. During the day, red flags shall be used; at night and during periods of poor visibility, red lights shall be used.

d. When hauling long poles and the vehicle must enter congested areas or heavy traffic conditions, escort vehicles displaying suitable warning signs should be used.

32-43 Aerial Lifts

a. Only authorized persons who are properly trained shall use or operate this equipment.

b. The operating and maintenance instruction manuals issued by the manufacturer shall be followed.

c. Load limits of the boom and bucket shall not be exceeded. Shock loading (sudden stops or starts) of the equipment shall be avoided.

d. Aerial lifts shall not be “field modified” unless such modification is certified by the manufacturer. The insulated portion shall not be altered in any manner that might reduce its insulating value.

e. Prior to use, the equipment shall be given a warm up period. The hydraulic system and the lift controls shall be checked and tested daily before use to determine that they are in safe working condition. Malfunctions or unsafe operational conditions shall be reported.

Equipment that is not in proper operational condition shall not be used.

f. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in an emergency.

g. The truck shall not be moved unless the boom is lowered, the bucket cradled and secured, and the outriggers retracted.

h. Employees shall not ride in the bucket while the truck is traveling. (Exception: Men may ride in the basket for short moves at the work location if the basket is returned to the cradled position for each

move. Employees riding in the bucket are required to face in the direction of travel while the truck is moving.)

i. When employees are in the bucket of an aerial lift, all parking brakes of the vehicle shall be set and wheel chocks shall be used.

j. When outriggers are provided, they shall be used and they shall be set on pads. The truck should be level when viewed from the rear.

k. When working from an aerial lift a full body harness shall be worn and a lanyard attached to the boom or basket.

l. Employees shall not be permitted to transfer from a bucket to a pole or structure except for specialized transmission jobs and then only when following specific written company procedures.

m. Safety rules governing the use of hot line tools, rubber goods, personal protective equipment and general safe practices shall also apply to work done from aerial baskets. (Exception: Different rules apply when performing “live-line bare-hand” work.)

n. When the boom must be maneuvered over a street or highway, necessary precautions shall be taken to avoid accidents with traffic and pedestrians.

o. The operator shall always face in the direction in which the basket is moving, and shall see that the path of the boom or basket is clear when it is being moved.

p. Employees shall not stand or sit on top of or edge of the bucket. Employee’s feet shall be on the floor of the bucket the entire time he is in it.

- q. When two Employees are in the bucket or buckets, one of them shall be designated to operate the controls. One employee shall give all signals, which shall be thoroughly understood by all persons concerned.
- r. Climbers shall not be worn by employees while in the basket.
- s. When two linemen are working from an aerial lift, extreme care shall be taken to avoid one man contacting poles, cross arms or other grounded or live equipment while the second linemen is working on equipment at a different potential.
- t. No more than one energized conductor or phase shall be worked at one time.
- u. Clearances. The aerial lift, together with the Employees in the bucket and all tools and equipment, shall maintain proper clearances from unprotected energized conductors, unless isolated or insulated. (Exception: Direct contact may be made when performing “live-line bare-hand” work.)
- v. When using pneumatic or hydraulic tools in a bucket, the operator shall be sure that hoses or lines do not become entangled in the operational controls.
- w. The bottom of the bucket shall be kept free of tools, trash, etc.
- x. Electrical retest shall be performed on aerial lifts, used on or near energized lines or equipment at least every twelve (12) months. A copy of the test results shall be kept with the vehicle.
- y. Bucket Trucks shall have liners which must be tested every twelve (12) months.

32-44 Work Area Protection

Introduction

- a. Work area protection is the adequate safeguarding or protecting of pedestrians, motorists, utility workers and equipment by the use of adequate barriers, warning signs, lights, flags, traffic cones, high-level standards, barricade rope or flaggers on approaches to work areas, excavations, open manholes or parked equipment.
- b. Work area protection is accomplished by the use of good informative and protective devices, keeping in mind that a safe installation requires the use of these devices in relation to the location of the workers and the equipment involved. The use of these devices must be coupled with proper planning, design, installation, inspection, maintenance and the use of good common sense. It is of the utmost importance that the work area be properly identified and that warning devices say what they mean, to convey the message to the traveling public well in advance of arrival at the work area.
- c. The public must be warned in advance, then regulated and guided safely through or around the work area. Proper work area protection shall be planned to insure the safety and protection of the public, the workers and the equipment.
- d. The possibility of accidents occurring is greatly minimized by proper planning, design, installation, operation, and maintenance, coupled with the use of common sense.

32-45 Area Protection - Equipment

- a. Only those signs, standards, barricades, flags and cones that conform to state or local codes shall be used.
- b. All state and local traffic codes shall be followed when providing work area protection.

- c. During night operations or in periods of reduced visibility special precautions shall be taken. Adequate warning equipment, which may include flashing lights, flares or area illumination, shall be used.
- d. Warning devices and equipment shall be removed as soon as the hazard is eliminated.
- e. Warning devices and equipment not in use shall be stored in a proper manner or shall be removed from the work area.

32-46 Work Area Protection - Flaggers

- a. Flaggers or other appropriate traffic controls shall be used whenever there is any doubt that effective protection can be provided by signs, signals and barricades.
- b. Flaggers shall wear an approved orange warning vest or other approved garment. Warning garments worn at night shall be of a reflectorized material.
- c. Flaggers using hand signaling equipment shall insure that signals provide sufficient warning to protect themselves and the work site.
 - 1. Signal flags shall be red and at least 24 inches square.
 - 2. Sign paddles (Stop and Slow) shall be on a 6-foot staff.
 - 3. In periods of darkness or reduced visibility, red lights shall be used.
- d. Flaggers shall place themselves in a protected position to reduce possibility of injury from traffic.

- e. Flaggers shall insure they can fully observe the operation and shall guide vehicular traffic in such a manner as to minimize the possibility of accidents or injury.

- f. When flaggers are used at both ends of a job site, reliable communications or prearranged signals shall be used to insure proper traffic flow.

- g. Flaggers shall face traffic when giving signals.

- h. Flaggers shall give positive, direct signals that leave no doubt as to their meaning.

- i. All federal, state and local laws governing traffic control shall be observed.

Section 32

Transmission and Distribution Operations

32-1 General

Electrical equipment and lines shall always be considered as energized unless they are positively proven to be de- energized and properly grounded.

IF IT ISN'T GROUNDED - IT ISN'T DEAD!

- a. Only authorized employees shall work on or near energized lines or equipment.
- b. No employee shall approach any exposed ungrounded line wire or apparatus unless he is insulated from other conducting surfaces or uses adequate protective devices.
- c. Employees shall report immediately to their nearest foreman or supervisor any defective line, or tool or other condition which in their judgment may be dangerous either to persons or property or likely to interrupt or delay service.
- d. Electrical equipment and lines shall always be considered as “live” unless they are positively known to be dead and grounded. Before starting to work, preliminary inspection or test shall be made to determine what conditions exist. Extreme care shall be exercised when handling common neutral conductors as high voltage may be encountered. Any line or circuit to be worked on as de-energized, has to be Identified, Isolated and Tested before grounding can take place.
- e. Secondary windings of current or series transformers shall be short circuited before any instrument or other device connected in the circuit is removed or disconnected.

f. No work shall be performed in inclement weather on high voltage equipment or lines when conditions are such as to materially increase the hazards of the operations being performed, 2excepting emergency work necessary to restore service or demanded by the public interest.

g. Employees working in rain shall be furnished with rain coats and slush boots. This equipment shall not be considered to be protection from energized circuits.

32-2 Flexible Protective Equipment (Rubber, Synthetics, Etc.)

a. Employees shall not touch or work on any exposed energized lines or apparatus except when wearing Protective equipment approved for the voltage to be contacted.

b. When work is to be done on or near energized lines or equipment, all energized and grounded conductors, guy wires or equipment within reach of any part of the body shall be covered with protective equipment, except that part of the conductor on which the employee is working.

c. When working on energized lines or apparatus, including the installation of protective devices, work should be done from below, if possible.

d. In applying flexible protective equipment, an employee shall always protect the nearest and lowest wires first, protecting himself as he progresses. In removing rubber protective equipment, the reverse order shall be maintained.

e. Flexible blankets shall not be used on the ground without protecting them from physical damage and moisture by means of a tarpaulin, canvas, or protective mat.

f. Protective equipment shall be put on before entering the work area within which energized lines or apparatus may be reached, and the protective equipment shall not be removed until the employee is completely out of reach of this area.

g. To avoid corona and ozone damage, rubber protective equipment shall not be allowed to remain in place on energized lines or apparatus overnight or for more than one eight-hour period, unless approved by the supervisor in charge.

h. Line hose, hoods, blankets, line guards, etc., shall be visually inspected before each job.

i. Line hose and hoods shall be visually inspected and electrically retested upon indication that insulating value is suspect and rubber blankets electrically retested every six (6) months or as required when physical inspection reveals defects.

Where visual inspection indicates that there may be reason to suspect the electrical integrity of flexible protective equipment, an electrical test shall be performed before reissuing the equipment for service.

j. Flexible protective devices shall be stored in special compartments on trucks and elsewhere where they will not be subjected to damage from tools or other equipment.

k. Bare communications conductors shall be treated as energized lines and shall be protected accordingly.

l. Electrical cords or electric power tools shall not be used near or above lines or equipment exceeding 250 volts.

32-3 Use and Care of Rubber Gloves and Sleeves

a. Only qualified employees or those under the continuous supervision of an experienced journeyman shall work on lines or equipment which are energized.

- b. When rubber glove work is authorized to be performed, use the following chart.

Classes of rubber gloves manufactured, proof- test voltage and maximum use voltages as specified by ANSI.

	AC Proof-Test	DC Proof Test	Maximum Use
<u>Class of Glove</u>	<u>Voltage rms</u>	<u>Voltage avg</u>	<u>Voltage AC rms</u>
1	10,000	40,000	7,500
2	20,000	50,000	17,000
3	30,000	60,000	26,500
4	40,000	70,000	36,000

- c. Employees shall wear rubber gloves, with leather protectors ground to ground when working on lines or equipment energized at voltages below 500 volts.

- d. Employees shall wear rubber gloves and sleeves ground to ground when working on lines and equipment energized at voltages over 500 volts unless approved live line tools are used.

- e. Rubber gloves with leather protectors and sleeves shall also be worn by employees on the ground when:

1. Working on or within reaching distance of any electrical equipment and/or conductor which are not effectively grounded and which may become energized (I.E. URD, Sub-Stations, Traffic Signals).

2. While a pole or other conductive structure is being set or removed from proximity of energized primary lines. They shall be put on before pole is raised and worn until pole is set and secured. Also, see Rule 31-18.

3. Required by supervision.

4. Opening and closing manually operated oil circuit breakers, air break switches, fuses, or fuse doors on cutouts.

5. Making tests to determine if lines are de-energized, and applying and removing grounds.

f. When working with rubber protective equipment on energized circuits or apparatus the following minimum conditions shall be met, in addition to all other rules governing the use of protective equipment.

1. Employees shall not make physical contact with energized conductors or grounds, with other than his rubber gloves.

2. Where the voltage exceeds 5000 volts between a single phase and ground employees shall be isolated from all grounds (wooden poles shall be considered as grounds in this case) by using approved supplementary insulation such as aerial baskets, a lineman's platform, or other approved insulated devices. All equipment used for lineman protection shall be tested.

g. Rubber gloves shall never be worn inside out or without leather protectors. They shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of them. Leather protectors or over gloves shall not be worn except when in use over rubber gloves.

h. Rubber gloves and sleeves shall be inspected for corona cracks or other damage and the gloves shall be given an air test each day while in use, at the beginning of the work period and at any other time when their condition is in doubt. They shall be given a visual inspection before each use.

- i. Rubber gloves and sleeves when not in use shall be kept in canvas bags or other approved containers and stored where they will not become damaged from sharp objects or exposed to direct sunlight. They shall never be folded while stored nor shall other objects be placed upon them.
- j. Rubber gloves shall be stored in the glove bag with the cuffs down to permit drainage, better ventilation and reduce the possibility of damage.
- k. Suitable size gloves and sleeves shall be provided by the employer.
- l. Inner liners may be worn if desired.
- m. Rubber gloves shall be laboratory tested after thirty
(30) days of being issued to the employee.
- n. Rubber sleeves shall be laboratory tested after sixty
(60) days of being issued to the employee.
- o. An efficient method of numbering and stamping shall be used showing the date of the last laboratory test on sleeves, blankets and gloves.
- p. Gloves or sleeves that have been electrically tested and sealed in plastic bags but not issued for service shall not be placed into service unless they have been tested within the previous twelve (12) months. Date of issuance shall be stamped on the glove when distributed.

32-4 Protective Equipment

- a. Line hose and hoods shall be visually inspected and electrically retested upon indication that insulating value is suspect and rubber blankets electrically retested every six (6) months or as required when physical inspection reveals defects.
- b. Line hose may be folded back over itself for inspection purposes.
- c. Rubber blankets should be rolled or stored flat, never folded.
- d. Rubber goods should not be thrown from poles or structures but should be raised and lowered by hand line with a suitable canvas bag or container.
- e. Defective rubber goods shall not be used.
- f. Oil shall not be allowed to contact the rubber; if it does, it shall be wiped off at once.

32-5 Climbing and Working on Poles

- a. Before ascending, individual climber shall inspect and test all poles to assure all poles are in safe condition for the work to be performed and that they are capable of sustaining the additional or unbalanced stresses to which they will be subjected.
- b. Where poles or structures may be unsafe for climbing, they shall not be climbed until made safe by guying, bracing or by other adequate means.
- c. Wires shall not be attached to or removed from a pole or structure until it is certain the pole or structure will withstand the altered strain.

d. Poles shall be thoroughly tested before they are climbed. If a pole is not strong enough to sustain a lineman's weight by reason of its condition or its placement (such as in soft ground), it shall be guyed or otherwise secured throughout the time any work is being performed on it. If the pole to be climbed is being replaced and the new pole is set adjacent to it, the old pole may be lashed to the new one in lieu of guying.

e. When poles are encountered which are unsafe to climb (ice, badly chewed, wide cracks, shell rot, etc.), an alternate means of climbing shall be used (use belt around pole while climbing) or the use of an aerial bucket shall be considered.

f. Employees shall not wear their climbers while driving or riding in vehicles or when doing work on the ground, on ladders (except hook ladders), in aerial lifts or on platforms in which the wearing of climbers creates a hazard.

g. Gaffs on climbers shall be kept within safe length limits (1-1/4 inches min.), properly shaped, and sharp.

h. Employees shall not work on an elevated pole or structure without first securing themselves with a safety strap.

i. Only approved belts and straps shall be used.

j. Metal hooks, chains, etc., for holding tools or tape shall not be attached to body belts. Leather or other non- conducting material shall be used for this purpose.

k. The safety strap shall not be put around a pole above the uppermost pole attachment position, except where pole top or attachment is above eye level. It shall not be used on pole steps, cross arm braces, insulators, insulator pins, conductors, rotten or otherwise weak cross arms or on attachments that are being moved. When it is necessary to safety off to a cross arm, the safety strap shall never be placed beyond the outside cross arm attachment. It shall be so placed that it will not be cut by line equipment or twisted or fouled by material that may give way under strain.

- l. Employees shall not trust their weight to guy wires, pins, braces, conductors, or other such equipment that might prove unstable.
- m. When two or more employees are to work on the same pole at the same time, one shall reach the working position before the next leaves the ground. They shall descend the pole one at a time.
- n. When climbers are stored in the truck or tool room, they shall be placed where the sharp points will not damage other equipment or cause personal injury.
- o. Gaff guards shall be used on climbers when not on the pole.
- p. The sliding of guy wires to descend poles or structures is strictly forbidden.

32-6 Working On Energized Lines with Live-Line Tools

- a. All live-line tools to be removed from service and inspected every two (2) years. If, during that inspection, any defects are found that could compromise the dielectric properties of the tool, then it shall be removed from service, repaired and refinished, and tested before returning the tool to service.
- b. Lines of #6 copper, #6 ACSR, and #8A copper weld or smaller shall not be worked on with live-line tools except in specific instances where continuity of service is vital and then only upon special authorization.
- c. Planned work with live-line tools shall not be started during unfavorable weather.
- d. Before work with live-line maintenance tools is begun, the dispatcher or person having jurisdiction shall be notified. If during live-line tools work, an interruption of service occurs, the dispatcher or other person having jurisdiction shall be notified immediately.

- e. Only tools approved by the Company shall be used in live-line maintenance work.
- f. A careful check shall be made to see that the condition of the structure and lines at the point of the work is such that the job may be performed safely. In addition, the adjacent spans and structures shall be carefully checked for defects in conductors, tie wires, insulators, and other equipment.
- g. Under no circumstances shall a lineman depend on another workman to hold a live conductor clear of him.
- h. Positive control shall be maintained during the movement of any conductor.
- i. While live-line work is in progress, no other work of any nature shall be performed on the same pole or structure.
- j. All live-line tools, when not in use, shall be kept in canvas bags or weatherproof boxes provided for that purpose; these containers shall be stored in dry and, if possible, a warm place.
- k. Live-line tools shall never be laid directly on the ground or against sharp objects such as barb wire fences. Special tool holders or tarpaulins shall be used for this purpose.
- l. All live-line tools shall be visually inspected before use each day. Tools to be used shall be wiped clean, and if any hazardous defects are indicated, these tools shall be removed from service.
- m. When practical, the automatic reclosing feature of circuit interrupting devices shall be made inoperative before work begins.
- n. Careful attention shall be given to avoid mechanical overloading of live-line tools.

- o. When installing or removing jumpers, only one connection shall be made at a time. Jumper ends not connected shall be secured in such a manner as to prevent unintended contacts.
- p. Plan each job carefully to provide the maximum clear working space. Guard against contact with conductors other than the one being worked on.
- q. Approved protection devices shall be placed in position on any and all conductors energized above 5000 volts when such conductors are within reach of any part of the Employee's body when live line tools are being used. Such conductor guards shall be installed by means of appropriate live line tools.
- r. Only clean and dry synthetic rope shall be used on energized conductors above 5KV. Link sticks shall be used between the rope and energized conductor on all voltages.
- s. Care shall be exercised to prevent the ends of the tie wires, armor rods, or other conductive material from contacting the structure or attached hardware during removal from or installation on energized conductors.

32-7 Working On Energized Lines

- a. All journeymen working on energized conductors and/ or electrical equipment over 500 volts shall be assisted by a journeyman, or a qualified apprentice, on the same pole, structure or location. (Two separate poles or structures may be considered one for the purpose of this rule if both linemen can step to the other pole or structure without descending to the ground to do so.)
- b. In no case, when working together in pairs, shall linemen work simultaneously on energized wires or equipment of different phases or polarities.
- c. Before starting work the lineman shall get himself in such a position that the presence of the second man does not increase the hazard.

d. Qualified apprentices may, under the supervision of a Journeyman, work on energized conductors and/or equipment. Qualified apprentices shall be determined by the Joint Apprenticeship and Training Committee.

e. Energized conductors and/or equipment shall be handled in accord with the Safety rules, regulations and safe working procedures of the Utility on whose property the work is performed, provided a copy of such procedures, is made available.

f. Crew Compliment for Live Line Work. A crew of two (2) qualified employees can handle single phase primary conductors and routine 3 phase primary conductors. The more complex projects, such as sleeving primary, heavy corner and junction poles, etc., should be handled by a minimum of three (3) or more qualified employees, depending upon field conditions determined by the immediate supervisor.

32-8 Working On De-Energized Lines and Equipment

a. General. All conductors and equipment shall be treated as energized until tested to be de-energized and grounded.

b. New construction. New lines or equipment may be considered de-energized and worked as such where:

1. The lines or equipment are grounded, or

2. The hazard of induced voltages is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.

- c. Communication conductors. Bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating materials.
- d. Workmen working on de-energized lines shall work under the tagging orders on whose property the work is performed.
- e. Testing equipment of adequate capacity shall be used to determine whether or not a line and/or equipment is de-energized.
- f. Grounding equipment shall be used when working on all de-energized circuits and/or equipment.
- g. Rubber gloves and sleeves must be worn when sticks are used to test, switch, phase-out, or ground circuits and/or equipment.
- h. Men working in de-energized areas must use barricades, signs, tags, and/or other safety means to designate energized lines and/or equipment.
- i. All tools shall be kept in good working condition, properly stored, and must be restricted to the use for which they are intended.
- j. See Rule No. 31-16 for Grounding Procedures and Requirements.

32-9 Dispatching and Clearances

- a. All oral communications about dispatching and clearances shall be recorded by the person receiving them and read back to the person giving them.
- b. Under no circumstances shall clearances be granted or released on a predetermined time basis.

c. When two or more crews are working on the same line or apparatus and are not under the supervision of the same general foreman or other supervisor, each crew foreman shall request and release his own clearance independently in accordance with these rules.

d. A Hold Card shall be attached to each switch that is providing clearance on a cleared line or apparatus.

e. The handles of switches providing clearances for working on lines or apparatus shall be locked or blocked open or closed in addition to being Hold Carded.

f. Under no circumstances shall Hold Cards be removed or the line or apparatus be put in service until so ordered by the dispatcher.

g. Before ordering Hold Cards removed and line or equipment returned to service, the load dispatcher shall require that the same person who received the clearance shall report that the line or equipment may be re-energized.

EXCEPTION: If the person who received the clearance must leave the work before it is completed, he shall so inform the dispatcher, giving the name of the man who will take his place. In such cases, the dispatcher shall communicate with both men, releasing the one who is leaving and accepting the other as authorized to report for him. Clear entries of all such authorized changes shall be made on the dispatcher's records, and Hold Cards or Tags.

h. When it is necessary to obtain a working clearance on any line or apparatus not under the jurisdiction of a dispatcher, the request shall be made directly to the person having jurisdiction.

i. After de-energizing the line or apparatus and attaching Hold Cards to each switch providing clearance on the line or apparatus, the employee shall report back to the person making the request that the line or apparatus is out of service and that work may be begun after adequate grounds have been installed.

j. A line or apparatus shall not be put back in service, nor the Hold Cards removed until the person to whom clearance was given releases their clearance.

EXCEPTION: If the person who received the clearance must leave the work before it is completed, the Employee shall so inform the person having jurisdiction, giving the name of the person who is to take his place. In such cases, the person having jurisdiction shall communicate with both men, releasing the man who is leaving and accepting the other as authorized to report for him.

k. When the work is completed, the grounds removed and all men are clear, the employee who received the clearance, or his properly authorized substitute, shall report to the person having jurisdiction that the line or apparatus is ready for service.

32-10 Series Street Lighting Circuits

a. Before a series street lighting circuit is opened and work is started, one of the following procedures shall be followed:

1. Circuit shall be visibly disconnected from the source of supply by opening disconnecting switches or other absolute cutouts, and Hold Cards shall be attached to such disconnects or cutouts. Dependence shall not be placed on time switches or other automatic devices.

2. Circuit shall be properly jumpered to avoid an open-circuit condition.

b. All series street lighting circuits shall be considered as energized, and worked on in accordance with Rules Nos. 31-2 and 31-3.

32-11 Working on Transformers

- a. The primary leads of a distribution transformer shall be considered energized at full voltage until both the primary and the secondary leads have been disconnected, or it has been determined that the secondary circuit to which it is attached is not energized from other transformers.
- b. The cases of all transformers connected to a source of supply shall be considered as being energized at the full primary voltage unless they are adequately grounded.
- c. Employees shall not stand on or otherwise contact transformer cases while working on or near energized circuits.

32-12 Hoisting Cables-Conductive Material

- a. Wire rope or other conductive material shall not be used to raise transformers, poles, or any other equipment or materials near energized lines, except:
 - 1. When the wire rope is rigged a sufficient distance below all energized wires to prevent the possibility of electrical contact between the energized wires and the wire rope or conductive material being raised; or
 - 2. When the wire rope and any conductive material being raised are adequately protected; or
 - 3. When energized lines and equipment are adequately protected.

CHART NO. 3-1

APPROXIMATE TRANSFORMER WEIGHTS (WEIGHT IN POUNDS)

50	1230	2225
75	1505	2545
100	1720	2635

NOTE: Old-type transformers with cast iron cases may weigh about 50% more than the weights listed above and will require correspondingly larger rope and blocks. The weights given are for standard distribution transformers.

- b. Use of wire rope as a hoist line shall be discontinued when it becomes worn, deteriorated or damaged to a degree that is unsafe.
- c. Metallic slings (chain or cable) shall not be used near energized equipment.
- d. Whenever possible, chain slings shall not be used for hoisting purposes.
- e. Positive control of wire rope shall be maintained at all times.
- f. Synthetic hoisting and pulling lines and ropes shall not be considered as non-conductive, unless properly maintained to preserve their insulating qualities.

32-13 Working On Capacitors

- a. Line capacitors shall be considered at full voltage until they have been disconnected from the line, and the terminals short-circuited and discharged to ground by an approved method.

The terminals shall not be short-circuited until the capacitors have been de-energized for at least five minutes.

- b. Employee shall wear rubber gloves and use a hot stick while shorting and grounding terminals.
- c. Employees shall not come in contact with an ungrounded capacitor case until the capacitor has been disconnected from the circuit and the terminals shorted.
- d. The exposed terminals of line capacitors in storage shall be shorted.

32-14 Stringing or Removing De-Energized Conductors

- a. Prior to stringing operations, a briefing shall be held setting forth the plan of operation and specifying the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed, and the clearance authorization required.
- b. Where there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced voltage buildup, to further protect the employee from the hazards of the conductor, the conductor being installed or removed shall be grounded or provisions made to insulate or isolate the employee.

c. If the existing line is de-energized, proper clearance authorization shall be secured and the line grounded on both sides of the crossover or, the line being strung or removed shall be considered and worked as energized.

d. When crossing over energized conductors in excess of 500 volts, rope nets or guard structures shall be installed unless provision is made to isolate or insulate the employee or the energized conductor. Where practical the automatic reclosing feature of the circuit interrupting device shall be made inoperative. In addition, the line being strung shall be grounded on either side of the crossover or considered and worked as energized.

e. Conductors being strung in or removed shall be kept under positive control by the use of adequate tension reels, guard structures, tielines, or other means to prevent accidental contact with energized circuits.

f. A transmission clipping crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged. When working on bare conductors, clipping and tying crews shall work between grounds at all times. The grounds shall remain intact until the conductors are clipped in, except on deadend structures.

32-15 Stringing Adjacent to Energized Lines

a. Prior to stringing parallel to an existing energized transmission line, a competent determination shall be made to ascertain whether dangerous induced voltage buildups will occur, particularly during switching and ground fault conditions. When there is a possibility that dangerous induced voltage may exist, the provisions of subparagraphs (b) through (j) shall be followed.

b. When stringing adjacent to energized lines, the tension stringing method or other methods that preclude unintentional contact between the lines being pulled and any employee shall be used.

c. All pulling and tensioning equipment shall be isolated, insulated or effectively grounded.

- d. A ground shall be installed between the tensioning reel setup and the first structure in order to ground each bare conductor and overhead ground conductor during stringing operations.
- e. During stringing operations, each bare conductor and overhead ground conductor shall be grounded at the first tower adjacent to both the tensioning and pulling setup and in increments so that no point is more than
2 miles from a ground.
- f. The grounds shall be left in place until conductor installation is completed.
- g. Such grounds shall be removed as the last phase of aerial cleanup.
- h. Except for moving type grounds, the grounds shall be placed and removed with a hot stick.
- i. Conductors and overhead ground conductors shall be grounded at all deadend or catch-off points.
- j. A ground shall be located at each side and within 10 feet of working areas where conductors or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.
- k. All conductors and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.
- l. Work on deadend towers shall require grounding on all de-energized lines.
- m. Grounds may be removed as soon as the work is completed, provided that the line is not left open circuited at the isolated tower at which work is being completed.

n. When performing work from the structures, clipping crews and all others working on conductors or overhead ground conductors shall be protected by individual grounds installed at every work location.

32-16 Grounding

a. Personal protective grounds shall be applied so as to create a zone of equalized potential for those working on de-energized lines or equipment.

b. New lines or equipment may be considered de-energized and worked as such where:

1. The lines or equipment are grounded, or

2. The hazard of induced voltages is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.

c. Bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating materials.

d. De-energized conductors and equipment that are to be grounded shall first be tested for the presence of voltage.

e. Adequate capacity cables and clamps shall be provided for grounding. They shall be inspected for defects prior to being used.

f. Grounds (personal) shall be installed at each worksite.

A grounding bracket shall be attached to the pole at a point below the work area.

g. Attaching grounds.

1. When attaching grounds, the ground end shall be attached first, and the other end shall be attached and removed by means of insulated tools and rubber gloves.

2. When removing grounds, the grounding device shall first be removed from the line or equipment using insulated tools and rubber gloves.

h. Where the making of a ground is impracticable, or the conditions resulting there from would be more hazardous than working on the lines or equipment without grounding, the grounds may be omitted and the line or equipment worked as energized.

i. Grounds may be temporarily removed only when necessary for test purposes and extreme caution shall be exercised during the test procedures.

j. Grounding to tower shall be made with a tower clamp capable of conducting the anticipated fault current.

k. A ground lead, to be attached to either a tower ground or driven ground, shall be capable of conducting the anticipated fault current and shall have a minimum conductance of No. 2 AWG copper.

l. Grounding equipment shall be of sufficient carrying capacity to actuate protective devices such as oil circuit breakers, relays, etc., without destroying the grounding equipment.

32-17 Pole Hauling and Temporary Storage

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- a. The trailing end of a load of poles shall be marked by a red flag during the day and a red light at night. As an additional precaution, warning flags or lights may be placed in the center of long loads. An employee shall be used for flagging when necessary.
- b. If it becomes necessary to store poles at the location where they are to be set, they shall be so placed that they will not interfere with traffic.
- c. If poles left on or near streets, highways or walkways overnight create a hazard, they shall be safeguarded by red lights or well-lighted warning signs.
- d. Poles shall be placed or blocked so that they will not roll.
- e. Employees shall not remain on a pole pile while poles are being hoisted.
- f. Poles loaded on a truck or trailer shall be securely fastened every ten feet.
- g. When a load of poles is within working distance of the ground, load binders shall be installed so that they can and will be operated by employees while standing on the ground.
- h. Employees shall not ride pole dollies or trailers.
- I. The wheels of the transporting vehicle shall be chocked or securely braked prior to loading.

32-18 Setting and Removing Poles

- a. If any holes are left unfilled at the end of the work period, they shall be protected with substantial coverings.

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- b. All persons not engaged in pole-setting operations shall keep out of the work area.
- c. No one shall be on a gin pole when it is being used to raise another pole.
- d. While setting or removing poles between or near conductors energized above 500 volts:
 - 1. If safe clearance cannot be maintained, the conductors shall be de-energized, covered with protective devices, spread apart, or a pole guard shall be used, to minimize accidental contact.
 - 2. Workmen handling the butt of the pole shall wear rubber gloves and sleeves whether or not can't hooks, peaveys or slings are used.
 - 3. Until a pole is positively secured from moving against an energized conductor, no one shall step on or off the truck or pole trailer, nor shall an employee standing on the ground touch any part of the truck or pole trailer without using rubber gloves.
 - 4. Ground wires shall not be attached to the pole higher than 10 feet from the ground.
- e. When pikes are used to hold poles in place while holes are being backfilled, they shall be firmly secured until the backfill is sufficient to hold. When a pole is being "canted" or "hooked", the pikes shall be held.
- f. Employees shall not stand or pass under a suspended load or adjacent to or over or under a loaded winch line.
- g. Employees engaged in handling or working on poles shall wear suitable gloves and shall wear a shirt or jacket with the sleeves rolled down.

h. Hoisting equipment operators shall accept signals only from the employee specifically designated. The operator shall obey a stop signal given by anyone.

i. The operation of setting a pole in an energized line shall require two (2) qualified employees in the group including one (1) journeyman and a qualified apprentice or two (2) journeymen. The number of employees utilized will depend on the work to be done. Additional qualified personnel will be assigned whenever required to perform the work safely.

It should be understood that poles, even within the same class, vary in diameter and hence weight. Also, the moisture content of a pole changes under various conditions. Therefore, the weights given in these tables should be taken as average values only, but they should prove sufficiently reliable.

WESTERN RED CEDAR

Length Class

(ft.)	1	2	3	4	5	6	7	8	9
30	1000	850	730	610	500	420	350	325	250
35	1200	1000	850	750	650	560	470	450	
40	1500	1300	1100	900	800	700			
45	1800	1550	1300	1150	1000				
50	2000	1800	1550	1400	1300				
55	2300	2000	1750	1600	1600				
60	2600	2200	2000	1900					
65	3200	2500	2300	2200					
70	3600	3000	2700	2600					

75	4200	3600	3100	3000
80	5000	4200	3600	3500
85	5500	4500	4000	
90	6600	5600	4800	

CREOSOTED YELLOW PINE - 8 lb. Treatment

32-19 Derrick Trucks, Cranes, Etc.

With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized line or equipment than the clearances set forth in Table 3-1, unless:

1. An insulated barrier is installed between the energized part and the mechanical equipment, or
2. The mechanical equipment is grounded, or
3. The mechanical equipment is insulated, or
4. The mechanical equipment is considered as energized.

32-20 Fuses

Rubber gloves and sleeves shall be worn while opening, closing, removing or replacing hot clamps, fuses or fuse doors on cutouts even when using an approved switch stick or hot line tool. Approved eye protection shall also be used during these procedures.

32-21 Rope (Synthetic Fiber-Manila)

- a. A rope shall not be overloaded or dragged over rough or sharp objects.
- b. Short bends over sharp-edged surfaces shall be avoided.
- c. Kinks shall be removed before any strain is put on a rope.
- d. When not in use, rope shall be dried and stored properly and kept free from mechanical damage and excessive heat and dryness.
- e. Rope shall be examined regularly for cuts, worn spots, burns and rot. The rope shall be untwisted at various places and inspected for poor fiber and dry rot.
- f. The outward appearance of rope shall not be accepted as proof of quality or strength.
- g. The safe loads, as specified by the manufacturer, shall not be exceeded.
- h. Handlines shall be a minimum of 1/2-inch diameter and have a strength equivalent to 1/2-inch manila.
- i. Eyes and splices shall be made in accordance with the instructions given by the rope manufacturer.

32-22 Underground Lines and Equipment - Opening and Guarding Holes

Whenever the cover is to be removed from a manhole or a vault, or when any other obstruction to traffic exists, the following precautions shall be taken.

- a. All obstructions to traffic shall be guarded by adequate signs, barricades, lights, flares or flags. Traffic shall be warned in advance through the use of signs, high level standards, flashing lights, traffic cones or flaggers, as may be required by the situation.
- b. Where permissible and practicable, the truck shall be placed to guard the work area against oncoming traffic.
- c. A blow torch or other open flame shall never be used to melt ice around a manhole or vault cover.
- d. Manhole, vault and service-box covers shall always be removed and replaced by means of approved hooks and hoists.

32-23 Underground Lines and Equipment - Entering Underground Structures

- a. Testing of the confined or enclosed space should be listed as a requirement before opening underground structures.
- b. All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas.
- c. Before an employee enters a street opening, such as a manhole or an unvented vault, it shall be promptly protected with a barrier, temporary cover, or other suitable guard.

d. If, in an emergency, it becomes necessary for an employee to enter a manhole or vault where gas is present, he shall use an approved gas mask and a rescue harness to which there is attached a lifeline attended by another employee stationed at the manhole or vault opening.

e. A ladder shall always be used in entering or leaving a manhole or vault. Climbing into or out of manholes or vaults by stepping on cables or hangers is forbidden.

f. While work is being performed in manholes, an employee shall be available in the immediate vicinity to render emergency assistance as may be required. This shall not prevent the employee in the immediate vicinity from occasionally entering a manhole to provide assistance, other than emergency. This requirement does not preclude an authorized employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, taking readings, or similar work if such work can be performed safely.

g. Before any work is done on a cable, it shall be identified by an approved method. If there is any doubt as to the identification, work shall not be started until it is checked and identified by the proper authority.

h. No workman shall use or be required to use any toxic cleaning fluids in manholes, vaults or excavations.

32-24 Underground Lines and Equipment - Work on Energized Cables

a. All underground cables and apparatus carrying current at voltage above 500 volts shall be de-energized before work is done on the conductor or before the cables are cut into or spliced.

b. Before any work is done on an energized cable, other cables and all grounded equipment with which contact can be made while working on the energized cable shall be covered with rubber blankets or approved insulating shields. (Cables with non-metallic sheaths and those with an insulating jacket over the metallic sheath need not be covered).

- c. Because of the characteristics of a low voltage network system, when work is performed on cables or apparatus carrying less than 500 volts, employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearances and in using proper tools in order to prevent short circuits.
- d. Employees shall wear rubber gloves with leather protectors, sleeves and stand on rubber mats or use insulated tools while cutting into and removing sheathing or sleeves and while testing an energized cable.
- e. After removing a section of lead sheath or sleeve on an energized cable, the lead on each side of the open shall be covered with insulating tape for a distance of at least 9 inches.
- f. When cutting an energized multiple conductor cable, a piece of fiber or wood shall be placed between the conductor being cut and the other conductors, and the cut shall be made directly over the shield.
- g. Immediately after each conductor of an energized multiple conductor cable is cut in two, the ends shall be insulated before another conductor is cut. During the course of the work, only one uninsulated conductor shall be exposed at any one time.

32-25 Underground Lines and Equipment - Work On De-Energized Cables

- a. When cables and apparatus are taken out of service to be worked on, the procedure outlined in Rule 31-6 shall be followed.
- b. When grounding de-energized underground cable, a zone of equalized potential shall be created for the employees who are working on it.
- c. When a high voltage cable is to be cut, the cable shall be speared at the work location by a remotely operated grounded spear, or a short section of the shielding if any, completely around the cable shall be removed and tests made with two statiscopes or other approved testing devices, to determine

whether or not the cable is de-energized. If no indication of a live cable is obtained, the employee may proceed with the work.

d. When opening a joint or splice in a high voltage cable, it shall be speared as in (c) or the sleeve of the joint shall be cut completely around near the wipes and then cut lengthwise and removed from the joint. No effort shall be made to remove the compound. The employee shall then test over each conductor with two statiscopes or other approved testing devices. If no indication of a live cable is obtained, the Employee shall remove the compound. If shielding tape is then encountered, it shall be removed and another test made over each conductor with two statiscopes or other approved testing devices. If no indication of a live cable is then obtained, the Employee shall cut through the joint until the saw touches one of the conductors. Before sawing further, a statiscopes test shall be made on the blade of the saw.

e. When cutting or opening joints on low voltage cables, the same procedure as outlined above for high tension cables shall be followed, except in testing. To determine whether the conductor is energized, the insulation shall be cut away to the conductor and tests made with an approved tester. On multiple conductor cables, only one conductor shall be cut into at a time, and tests shall be made on at least two conductors before proceeding with work.

32-26 Underground Lines and Equipment - Pulling Cables

a. Employees shall not handle pull-wires or pulling-lines within reaching distance of blocks, sheaves, winch drums or take-up reels.

b. Pull-wires, steel pulling-lines or metal rodding shall not be pushed through ducts where energized equipment is present unless another employee is stationed at the other end of the run.

c. Employees shall not remain in a manhole or vault during pulling operations involving heavy pulling strains unless they can take a position clear of the pulling-line.

d. Communications between manholes shall be maintained.

e. When pulling cable into vaults, manholes, or duct, care shall be exercised to protect employees and the public from possible injury. Vehicular and pedestrian traffic at the work location shall be studied long enough to enable the equipment to be set up in the safest manner possible, and with the least inconvenience to the public.

f. An employee or suitable warning sign or barricade, shall be stationed alongside a cable, snake wire, or pulling rope laid out on the sidewalk or street pavement; cables laid across sidewalks temporarily during pulling operations shall be properly guarded, to reduce the hazard to pedestrians.

32-27 Underground Lines and Equipment - Moving Energized Cables

a. Cables operating at voltages above 15,000 volts shall not be moved under any circumstances.

b. All cables up to 15,000 volts may be moved at the discretion of the foreman. They shall not, however, be moved where such movement requires changing bends.

c. All cables energized above 500 volts shall be handled with rubber gloves and sleeves.

32-28 Underground Lines and Equipment - Materials

a. Metals and insulating compounds shall be heated in such manner as to prevent hazard to the employees working in manholes or vaults and to vehicular or pedestrian traffic.

b. Gloves shall be worn while heating or working with hot insulating compound.

c. Furnaces and tanks containing liquefied petroleum gas shall not be placed in a manhole or vault.

- d. Cold solder scraps or ladle shall never be placed in a hot solder pot until the chill and any moisture have been removed from the scraps or ladle.
- e. Heating pots for lead, oil or compound shall be safely positioned so that the contents cannot enter the vault or manhole in the event of spillage.
- f. Lighted furnaces or torches should not be left unattended.
- g. Torches or furnaces must be kept at a safe distance from flammable materials.

Underground Residential Distribution

Introduction

Underground Residential Distribution (URD) systems have a number of apparent advantages over overhead systems; however, they also have some disadvantages such as confined working spaces, closer clearances between energized parts and greater exposure to all types of grounds. In most cases, if protective devices are not used, the employee will be in direct contact with the ground or grounded equipment. This contact completes half of an electrical circuit. If these contacts are not avoided, or protection against contact is not used, serious injury can result.

32-29 URD-General

- a. Before a URD transformer enclosure is opened, all unauthorized persons including the public shall be required to leave the work area, and remain clear of all hazards involved in the work.

b. When underground equipment is being located, previously buried short sections of scrap cable could provide false indications of the actual position of permanent conductors. Therefore, all scrap cable, regardless of length, is to be removed from the job site.

32-30 URD - Opening and Closing Circuit

a. Company switching procedures, including Hold Carding practices, shall be followed when sectionalizing URD systems.

b. When a URD circuit has opened, the route of the circuit shall be patrolled for obvious hazards before the circuit is reclosed.

c. An approved switching tool and rubber gloves with sleeves shall both be used when switches (including secondary breakers) in an energized circuit are opened or closed.

d. Any URD primary circuit shall be de-energized by opening one or more devices. De-energizing shall be done with load break elbow connectors, load break fuse cutout at the riser pole, load break tool or other approved device.

e. Eye or face protection shall be worn when primary switching operation are performed.

32-31 URD - Grounding

Note: A capacitance charge can remain in a URD cable after it has been disconnected from the circuit and a static-type arc can occur when grounds are applied to these cables.

a. All URD cables and equipment, including services, that have been energized or could become energized from any source, shall be considered as energized until the equipment is positively proven to be de-energized and has been grounded.

- b. Before doing work on de-energized primary circuits or equipment: (1) a visible open break shall be provided; (2) a voltage test shall be made; and (3) the equipment shall be grounded.
- c. When work is to be done on equipment or cables or an underground system, precautions to prevent backfeed shall be taken. This shall include grounding of the secondary conductors where applicable.
- d. De-energized cables shall be grounded at a point as close to the work as possible before work is started.
- e. All underground cables and apparatus carrying current at voltages above 500 volts shall be de-energized and grounded before cables are cut into or spliced.

32-32 URD - Rubber Glove and Sleeve Use

- a. Rubber gloves and sleeves shall be worn before any URD compartment or enclosure (including a service pedestal) is opened.
- b. Rubber gloves and sleeves shall be worn when removing animals, vines, weeds, grass or vegetation of any kind that has grown into an energized URD installation whether the equipment is opened or closed.
- c. Rubber gloves and sleeves shall be worn when energized primary cables are moved, handled or protected.
- d. Rubber gloves and sleeves shall be worn when work is performed on energized secondary's and services.
- e. Rubber gloves and sleeves shall be worn when working on or contacting a neutral.

32-33 URD - Work On Energized Equipment

- a. When work is performed on cables or apparatus carrying less than 500 volts, employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearances, and in using proper tools in order to prevent short circuits.
- b. When energized pad-mounted transformers are unlocked and opened, they shall be directly attended by an Employee. They shall be kept closed and locked at all other times.
- c. A primary or secondary system neutral on any energized circuit shall not be opened under any circumstances.
- d. Elbow connectors provide a great deal of flexibility in switching and system sectionalizing. However, only those connectors designed and approved for load break use shall be used to connect or disconnect an energized circuit.
- e. Only tools with insulated handles shall be used for making energized secondary connections or when work is performed within energized service pedestals, pad-mount compartments or submersible transformer enclosures.
- f. Only one energized secondary or service conductor shall be worked on at any one time, and protective devices shall be used to insulate or isolate it from all others.
- g. Before any attempt is made to replace a damaged or blown cable limiter, the customer's service will be checked for faults by the use of either an ohmmeter or a voltmeter.
- h. Appropriate clothing with full-length sleeves, rolled down, shall be worn when work is performed with rubber gloves and sleeves.

32-34 URD - Excavations

- a. Mechanical excavating equipment shall be used only in areas where there is no known danger of contacting or damaging buried facilities.
- b. Whenever excavating is done in close proximity to buried facilities, it shall be done only by hand digging.
- c. Before excavating in any area where any buried facilities are suspected, such facilities shall be located as accurately as possible and other utilities shall be notified of the proposed work.
- d. If electric cables are damaged, the following steps shall be taken:
 - 1. If the damaged cable belongs to a power company other than the one performing the work, this company shall be notified at once.
 - 2. The area shall be barricaded and the public kept out until hazardous conditions can be eliminated.
- e. If gas lines are damaged, the following steps shall be taken as soon as possible:
 - 1. The hole shall be left open to allow the gas to dissipate into the atmosphere. All possible sources of igniting the gas shall be removed or eliminated.
 - 2. Residents of the area shall be warned when necessary and the public kept out of the area.
 - 3. The following departments shall be notified immediately:

- a.) Local fire
- b.) Gas company
- c.) Local police
- d.) If communication cables are damaged, the communication company shall be notified at once.

g. When trenches are left open, warning devices, barriers, barricades or guardrails shall be placed to adequately protect the public and employees.

h. At the end of each day's work, as much of the trench as practical shall be closed. No more trench shall be open at one time than is necessary.

I. Suitable gloves shall be worn when using any equipment or tools to excavate, expose or handle secondary cables. They shall also be used when digging with approved hand tools to expose primary cables.

32-35 Live-Line Bare-Hand Work - Working On Energized

a. Only employees who have been instructed and trained in live-line bare-hand work shall use the technique on energized circuits.

b. Live-Line bare-hand work shall not be performed on voltages under 69 kivas unless minimum clearances specified in Table 3-2 can be maintained.

c. Before using the live-line bare-hand technique on energized high-voltage conductors or parts, a check shall be made of:

1. The voltage rating of the circuit on which the work is to be performed;
 2. The clearances to ground of the lines and other energized parts on which work is to be performed; and
 3. The voltage limitations of the aerial-lift equipment intended to be used.
- d. Only equipment designed, tested, and intended for live- line bare-hand work shall be used.
- e. The automatic reclosing feature of circuit interrupting devices shall be made inoperative before working on any energized line or equipment.
- f. Work shall not be performed during the progress of an electrical storm in the immediate vicinity.
- g. A conductive bucket liner or other suitable conductive device shall be provided for bonding the insulated aerial device to the energized line or equipment.
1. The employee shall be connected to the bucket liner by use of conductive shoes, leg clips, or other suitable means.
 2. Adequate electrostatic shielding shall be used or conductive clothing suitable for the voltage shall be worn.
- h. Only tools and equipment intended for live-line bare- hand work shall be used, and such tools and equipment shall be kept clean and dry.

I. Before the boom is elevated, the outriggers on the aerial truck shall be extended and adjusted to stabilize the truck and the body of the truck shall be bonded to an effective ground or barricaded and considered as energized equipment.

j. Before moving the aerial lift into the work position, all controls (ground level and bucket) shall be checked and tested to determine that they are in proper working condition.

k. Arm current tests shall be made before starting work each day, each time during the day when higher voltage is going to be worked and when changed conditions indicate a need for additional tests.

This test shall consist of placing the bucket in contact with an energized source equal to the voltage to be worked upon for a minimum of three (3) minutes. The leakage current shall not exceed 1 micro-ampere per kilovolt of nominal line-to-line voltage. Work operations shall be suspended immediately upon any indication of a malfunction in the equipment.

l. All aerial lifts to be used for live-line bare-hand work shall have dual controls, lower and upper.

1. The upper controls shall be within easy reach of the employee in the basket. If a dual-bucket-type lift is used, access to the controls shall be within easy reach from either basket.

2. The lower set of controls shall be located near the base of the boom and must permit over-ride operation of the equipment at any time.

m. Before the employee contacts the energized part to be worked, the conductive bucket liner shall be bonded to the energized conductor by means of a positive connection which shall remain attached to the energized conductor until the work on the energized circuit is completed.

n. The minimum clearance distances for live-line bare-hand work shall be as specified in Table 3-2. These minimum clearance distances shall be maintained from all grounded objects and from lines and equipment at a different potential than that to which the insulated aerial device is bonded unless

such grounded objects or other lines and equipment are covered by insulated guards. These distances shall be maintained when approaching, leaving, and when bonded to the energized circuit.

- o. The use of hand lines between buckets, booms, and the ground is prohibited.
- p. No conductive materials over 36 inches long shall be placed in the bucket, except for appropriate length jumpers, armor rods, and tools.
- q. Non-conductive-type hand lines may be used from line to ground when not supported from the bucket.
- r. A minimum clearance table (as shown in Table 3-2) shall be printed on a plate of durable non-conductive material, and mounted in the buckets or its vicinity so as to be visible to the operator of the boom.
- s. It is recommended that insulated measuring sticks be used to verify clearance distances.

32-36 Vehicle Operations

- a. Only those employees specifically authorized and who possess a valid commercial driver's license or permit for the equipment being used shall operate motor vehicles on company business. (NOTE: Driver with a Permit only must be accompanied by a driver with a CDL).
- b. Drivers shall know and obey all state and local motor vehicle laws applicable to the operation of their vehicle.
- c. The driver shall drive at safe speeds no greater than that permitted by law. Traffic, road, and weather conditions shall be given consideration in determining the safe speed within the legal limit at which the vehicle shall be operated.

- d. A driver shall not permit unauthorized persons to drive, operate or ride in or on a company vehicle.
- e. Where the manufacturer provides seat belts, they shall be used.
- f. Employees shall not permit anyone to ride on the running boards, fenders or any part of the vehicle except on the seats. Passengers shall not stand in moving vehicles.
- g. Employees shall not ride on trailers.
- h. Employees shall not jump on or off vehicles in motion.
- i. The privilege of operating equipment may be withdrawn if operator abuses this privilege by careless or unlawful practices. (Abuse defined - endanger life, limb, property or damage to equipment.)
- j. Drivers operating equipment in a negligent or unlawful manor shall be subject to disciplinary action.

32-37 Inspection of Equipment

- a. The driver shall conduct a pre-trip inspection of the vehicle to determine if it is in a safe operating condition. Any defects found on the vehicle shall be reported immediately to your supervisor.
- b. The driver shall inspect windshield wipers frequently and see that they are in good operating condition and that the windows and windshield give sufficient visibility for safe operation of the vehicle.
- c. All lights and reflectors of vehicle shall be inspected and if found defective, they shall be repaired immediately.

d. The driver shall report any defects that may have developed during the day. If the brakes are not working properly, they shall be adjusted or repaired before the

vehicle is put in operation. Other items that affect safety shall be repaired prior to continued vehicle operation.

e. All vehicles must be equipped with a fire extinguisher and three red reflective triangles.

f. D.O.T. requires that a post trip inspection be done with written documentation. The driver of that vehicle on the next shift shall review that inspection form for any defects, ensure those defects have been repaired, and check it off on the inspection form. The driver is then required to carry that inspection form on the vehicle for the remainder of the shift.

32-38 Operation

a. The operator of a motor vehicle shall clearly signal their intention of turning, passing or stopping.

b. Upon a signal from a vehicle approaching from the rear, the driver of a company vehicle shall yield the right of way.

c. Drivers shall be prepared to stop and the right of way shall be yielded in all instances where necessary to avoid an accident.

Note: These are the shortest distances in which a vehicle in good condition, driven by an average driver, can stop on a good road surface. Distances will increase with any change in driver, vehicle or road surface.

d. The driver of a vehicle shall be courteous toward other operators and pedestrians. The driver shall operate the vehicle in a safe manner and shall yield the right of way to pedestrians and other vehicles when failure to do so might endanger any person or another vehicle.

e. The driver shall stay a sufficient distance behind when following another vehicle so that he can safely stop the vehicle in the clear distance ahead.

f. Drivers shall exercise added caution when driving through residential and school zones.

g. When entering or leaving any building, enclosure, alley or street where vision is obstructed, a complete stop shall be made and the driver then shall proceed with caution.

h. Before a radio equipped vehicle is driven under or adjacent to energized equipment, especially in substation areas, the radio antenna shall be lowered and clearance checked in order to insure that proper clearances will be maintained between the vehicle and energized equipment.

i. Ignition systems and radio transmitters shall be turned off and no smoking permitted while refueling.

j. When proceeding down grade, the clutch shall not be disengaged. Trucks, particularly if heavily loaded, shall be in a lower gear on steep grades.

k. The driver shall not operate the motor in any garage except when driving in or out, and then the motor shall be operated as little as practicable. The motor shall not be warmed up inside a garage nor shall the driver test motor operation in a garage unless the exhaust gas is carried directly to outside atmosphere or doors and windows are open so that adequate ventilation exists.

32-39 Parking

a. When vehicles must be parked on the roadway, they shall be parked on the right hand side facing in the direction of traffic flow, whenever possible.

- b. When parking on a roadway, vehicles shall park off the traveled road surface, whenever possible. When vehicles must park closer than 10 feet to the traveled road surface, appropriate warning devices shall be used.
- c. Trucks or trailers stopped on any public roadway shall be protected by proper warning lights, reflectors or red flags in accordance with state or local requirements.
- d. Vehicles shall not be parked on bridges or over culverts except when necessary for work.
- e. When a truck (other than a pickup) is parked, the driver shall make sure the vehicle is left in a safe position. The engine shall be turned off, the transmission shall be placed in the lowest gear, parking brake shall be set, and the wheels chocked. When parked on an incline, the front wheels shall be cut into the curb if present. Rear wheels shall be chocked.

32-40 Backing

- a. Whenever possible, the vehicle shall be positioned to avoid the necessity of backing later.
- b. Extreme caution shall be exercised when backing a vehicle, to avoid injury to persons and to prevent property damage. If another employee is present, the Employee shall be stationed at the rear of the vehicle to assist the driver in backing the vehicle safely.
- c. When backing a vehicle which has an obstructed view to the rear:
 - 1. A reverse signal (back-up alarm) audible above the surrounding noise level shall be used, or
 - 2. An observer shall signal that it is safe to back.

- d. During all backing operations, the vehicle operator shall:
 - 1. Keep a constant lookout during the entire time.
 - 2. Carefully check any blind areas.
 - 3. Back slowly.
 - 4. Watch both sides. Do not depend entirely on mirrors.

32-41 Stopping on Highway

- a. Stopping on the highway shall be avoided.
- b. When it is absolutely necessary to stop on the highway, extreme caution shall be used. Warning signals and lights shall be used.
 - 1. Rotating beacon shall be used, if vehicle is so equipped.
 - 2. Tail lights/emergency flashers shall be used.
 - 3. Flares or reflectors shall be placed to give adequate advance warning.
 - 4. If work is in progress, traffic control devices (together with flaggers, where necessary) shall be used.

32-42 Hauling Materials, Poles or Ladders

- a. Ladders, pipe, etc., shall be loaded parallel with the truck length. Such material shall not extend beyond the normal width of the vehicle.
- b. Materials shall be securely fastened to prevent a hazard due to shifting.
- c. Material which extends more than 4 feet beyond the front or back of the truck or trailer shall have warning devices attached. During the day, red flags shall be used; at night and during periods of poor visibility, red lights shall be used.
- d. When hauling long poles and the vehicle must enter congested areas or heavy traffic conditions, escort vehicles displaying suitable warning signs should be used.

32-43 Aerial Lifts

- a. Only authorized persons who are properly trained shall use or operate this equipment.
- b. The operating and maintenance instruction manuals issued by the manufacturer shall be followed.
- c. Load limits of the boom and bucket shall not be exceeded. Shock loading (sudden stops or starts) of the equipment shall be avoided.
- d. Aerial lifts shall not be “field modified” unless such modification is certified by the manufacturer. The insulated portion shall not be altered in any manner that might reduce its insulating value.

e. Prior to use, the equipment shall be given a warm up period. The hydraulic system and the lift controls shall be checked and tested daily before use to determine that they are in safe working condition. Malfunctions or unsafe operational conditions shall be reported.

Equipment that is not in proper operational condition shall not be used.

f. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in an emergency.

g. The truck shall not be moved unless the boom is lowered, the bucket cradled and secured, and the outriggers retracted.

h. Employees shall not ride in the bucket while the truck is traveling. (Exception: Men may ride in the basket for short moves at the work location if the basket is returned to the cradled position for each move. Employees riding in the bucket are required to face in the direction of travel while the truck is moving.)

i. When employees are in the bucket of an aerial lift, all parking brakes of the vehicle shall be set and wheel chocks shall be used.

j. When outriggers are provided, they shall be used and they shall be set on pads. The truck should be level when viewed from the rear.

k. When working from an aerial lift a full body harness shall be worn and a lanyard attached to the boom or basket.

l. Employees shall not be permitted to transfer from a bucket to a pole or structure except for specialized transmission jobs and then only when following specific written company procedures.

m. Safety rules governing the use of hot line tools, rubber goods, personal protective equipment and general safe practices shall also apply to work done from aerial baskets. (Exception: Different rules apply when performing "live-line bare-hand" work.)

- n. When the boom must be maneuvered over a street or highway, necessary precautions shall be taken to avoid accidents with traffic and pedestrians.
- o. The operator shall always face in the direction in which the basket is moving, and shall see that the path of the boom or basket is clear when it is being moved.
- p. Employees shall not stand or sit on top of or edge of the bucket. Employee's feet shall be on the floor of the bucket the entire time he is in it.
- q. When two Employees are in the bucket or buckets, one of them shall be designated to operate the controls. One employee shall give all signals, which shall be thoroughly understood by all persons concerned.
- r. Climbers shall not be worn by employees while in the basket.
- s. When two linemen are working from an aerial lift, extreme care shall be taken to avoid one man contacting poles, cross arms or other grounded or live equipment while the second linemen is working on equipment at a different potential.
- t. No more than one energized conductor or phase shall be worked at one time.
- u. Clearances. The aerial lift, together with the Employees in the bucket and all tools and equipment, shall maintain proper clearances from unprotected energized conductors, unless isolated or insulated. (Exception: Direct contact may be made when performing "live-line bare-hand" work.)
- v. When using pneumatic or hydraulic tools in a bucket, the operator shall be sure that hoses or lines do not become entangled in the operational controls.

- w. The bottom of the bucket shall be kept free of tools, trash, etc.
- x. Electrical retest shall be performed on aerial lifts, used on or near energized lines or equipment at least every twelve (12) months. A copy of the test results shall be kept with the vehicle.
- y. Bucket Trucks shall have liners which must be tested every twelve (12) months.

32-44 Work Area Protection

Introduction

- a. Work area protection is the adequate safeguarding or protecting of pedestrians, motorists, utility workers and equipment by the use of adequate barriers, warning signs, lights, flags, traffic cones, high-level standards, barricade rope or flaggers on approaches to work areas, excavations, open manholes or parked equipment.
- b. Work area protection is accomplished by the use of good informative and protective devices, keeping in mind that a safe installation requires the use of these devices in relation to the location of the workers and the equipment involved. The use of these devices must be coupled with proper planning, design, installation, inspection, maintenance and the use of good common sense. It is of the utmost importance that the work area be properly identified and that warning devices say what they mean, to convey the message to the traveling public well in advance of arrival at the work area.
- c. The public must be warned in advance, then regulated and guided safely through or around the work area. Proper work area protection shall be planned to insure the safety and protection of the public, the workers and the equipment.
- d. The possibility of accidents occurring is greatly minimized by proper planning, design, installation, operation, and maintenance, coupled with the use of common sense.

32-45 Area Protection - Equipment

- a. Only those signs, standards, barricades, flags and cones that conform to state or local codes shall be used.
- b. All state and local traffic codes shall be followed when providing work area protection.
- c. During night operations or in periods of reduced visibility special precautions shall be taken. Adequate warning equipment, which may include flashing lights, flares or area illumination, shall be used.
- d. Warning devices and equipment shall be removed as soon as the hazard is eliminated.
- e. Warning devices and equipment not in use shall be stored in a proper manner or shall be removed from the work area.

32-46 Work Area Protection - Flaggers

- a. Flaggers or other appropriate traffic controls shall be used whenever there is any doubt that effective protection can be provided by signs, signals and barricades.
 - b. Flaggers shall wear an approved orange warning vest or other approved garment. Warning garments worn at night shall be of a reflectorized material.
 - c. Flaggers using hand signaling equipment shall insure that signals provide sufficient warning to protect themselves and the work site.
- 1. Signal flags shall be red and at least 24 inches square.

2. Sign paddles (Stop and Slow) shall be on a 6-foot staff.
3. In periods of darkness or reduced visibility, red lights shall be used.
- d. Flaggers shall place themselves in a protected position to reduce possibility of injury from traffic.
- e. Flaggers shall insure they can fully observe the operation and shall guide vehicular traffic in such a manner as to minimize the possibility of accidents or injury.
- f. When flaggers are used at both ends of a job site, reliable communications or prearranged signals shall be used to insure proper traffic flow.
- g. Flaggers shall face traffic when giving signals.
- h. Flaggers shall give positive, direct signals that leave no doubt as to their meaning.
- i. All federal, state and local laws governing traffic control shall be observed.