SAFETY MANUAL

Rev / 2020

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Definitions

Accident / Incident
An unplanned, unexpected or undesirable event that results in damage, personal injury, or harm to machinery, personnel or property.

Affected Person (LOTO)
An employee whose job requires him or her to operate or use a machine or equipment in which servicing or maintenance is being performed under lockout or tagout, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed.

Attendant
An employee assigned to remain immediately outside the entrance to an Enclosed Space or Confined Space to render assistance as needed to employees inside the space.

Authorized Person
An employee who has permission from the Management or the Person-In-Charge to enter a designated work area and perform specific work tasks.

Authorized Person (LOTO)
An employee who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An Affected Person becomes an Authorized Person when that employee's duties include performing servicing or maintenance.

Bonding
The electrical interconnection of conductive parts designed to maintain a common electrical potential.

Bracket / Master Grounding
A grounding method where temporary Ground Sets are installed on both sides of the work site.

Cable, Conductor or Line
A material usually in the form or a wire, cable or bus bar suitable for carrying an electric current. This cable, conductor or line may contain an outer jacket of insulation or unjacketed bare metallic wire / cable.

Clearance
The unobstructed (clear) distance between two objects measured surface to surface.

Cluster Bar / Cluster Bar Support
A terminal that is temporarily attached to the structure to support (it may serve to establish an equipotential zone) and provide a bar that will accommodate at least two grounding clamps and may have terminals to accommodate grounding cables.

Combustible Liquid
Any liquid having a flash point at or above 140° F and below 200° F.

Competent Person
An employee who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to personnel, and who has the authorization to take prompt corrective measures to eliminate them.

Conductor / Line
A wire or combination of wires stranded together not insulated from one another, suitable for carrying an electric current. However, it may be bare or insulated.

Confined Space
A space that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- Has limited or restricted means for entry or exit (e.g., tanks, vessels, silos, storage bins, vaults, and pits); and
- Is not designed for continuous occupancy.

Customer
An organization or entity that purchases services from the company. Typically, the Customer is a utility services provider, general contractor, construction management company or distributor or utility services.

De-energized
Disconnected from all sources of electrical supply by open switches, disconnecting devices, open taps, removed jumpers, or by other means.

Dielectric
An insulating medium that intervenes between two conductors or metallic surfaces. Typically, a dielectric material is a poor conductor of electric current.

Electrical Transmission and Distribution (ET&D) Partnership Best Practices
A program, procedure or work method developed by or in cooperation with the established industry associations and contracting partners. (e.g., NECA, IBEW, OSHA, EEI)

Enclosed Space
A work space, such as a manhole, vault, tunnel, shaft or other space that has a limited means of egress or entry, that is designed for periodic employee entry under normal operating conditions, and that under normal conditions does not contain a Hazardous Atmosphere but may contain a Hazardous Atmosphere under abnormal conditions.

Energized (Live)
Electrically connected to a source of potential difference, or electrically charged so to have a potential significantly different from that of the earth in the same vicinity.

Energy Source
Any electrical, mechanical, hydraulic, pneumatic, chemical, thermal, nuclear, hydro, gravitational or other energy source that when released could cause injury to an individual.

Entrant
An employee who enters a Confined Space or Enclosed Space to perform work tasks.

Equipotential / Equipotential Work Zone (EPZ)
- An identical state of electrical potential for two or more items. For the purposes of Personal Protective Grounding (PPG), a near- identical state of electrical potential.
- A work zone that is placed at a near-identical state of electrical potential by the installation of Personal Protective Grounding devices.

Excavation
Any man-made cut, cavity, depression or trench in an earth surface that is formed by earth removal.

Excavation, Trench
A narrow excavation in which the depth is greater than the width and the width does not exceed fifteen (15) feet.

Exposed (Electrical)
Any electrical conductor, cable, part or equipment which is accessible to personnel and which is not shielded from contact. Extension cords and power-tool cords are excluded from this definition.

Exposure Limit
An established concentration, which if not exceeded will not generally cause adverse effects to the exposed employee.

Extended Reach
The full reach (extended arm and hand) of an employee in any direction which includes the length of any conductive object(s) in the hand. See also, Minimum Approach Distance.

Fall-Arrest System
Also called Personal Fall-Arrest System (PFAS). A system consisting of a body harness, lanyard, connectors and anchorage, with or without an energy-absorbing device, to limit the forces an employee can experience during a fall.

Fall-Prevention System
- A system which may include a positioning device system intended to prevent an employee from falling from an elevation.
- A system which prevents employees from being exposed to a fall hazard; either by eliminating work at elevation, installing guard rails or utilizing a restraint system consisting of a body harness, lanyard, connectors and anchorage.

Fault Current
A current that flows from one conductor to Ground or to another conductor caused by an abnormal connection (including an arc) between the two.

Flame Resistant (FR)
Any material which prevents, terminates or inhibits combustion following the application of a flaming or non-flaming source of ignition.

Flammable Liquid
Any liquid having a flash point below 140°F (37.8°C) and having a vapor pressure not exceeding absolute pressure of 40 p.s.i. (276 kPa) at 100°F (37.8°C).

Flash Point
The minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

Global Harmonizing System (GHS)
The Hazard Communication Standard (HCS) is now aligned with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). This update to the Hazard Communication Standard (HCS) will provide a common and coherent approach to classifying chemicals and communicating hazard information on labels and safety data sheets.

Ground Set
A system of ground clamps and jacketed cables suitable for carrying fault current.

Grounded
A conducting connection, whether intentional or accidental, by which an electrical circuit or equipment is connected to earth, or to some conductive body of relatively large extent that serves in place of the earth, resulting in the circuit or equipment to be grounded.

Ground Grid (temporary)
Temporarily installed conductive surface mats or grating to establish an equipotential surface.

Hazardous Atmosphere
An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor or mist in excess of 10% of the lower flammable limit.
- Airborne concentration of dust at a concentration that exceeds the LFL, Lower Flammability Limit, or LEL, Lower Explosive Limit.
- Oxygen content less than 19.5% or greater than 23.5%; or
- Any other atmospheric condition that is immediately dangerous to life and health.

Hazardous Materials identification System (HMIS) Label

- A rectangular label to provide substance-specific information. The label contains four colored areas, blue, red, yellow and white. Each colored area will have a number from 0 to 4. Zero (0) identifying no hazard, and four (4) identifying a high hazard.

Hazardous Substance

- Any substance designated or listed in which exposure to the substance results or may result in adverse health or safety effects to personnel.
- Any substance defined under section 101 (14) of CERCLA, Comprehensive Environmental Response, Compensation, and Liability Act.
- Any biologic agent or other disease-causing agent which if ingested, consumed or inhaled may potentially cause death, cancer, genetic mutation, physical deformity, abnormal behavior, or disease.

- Any substance listed by the USDOT, United States Department of Transportation, as a hazardous material.
- A hazardous waste or combination of wastes.

Hot Work
Any operation that produces heat, sparks, or flames such as welding, cutting, brazing, soldering, grinding or other similar activity.

Insulating Protective Equipment (IPE)
Devices such as blankets, line hose, hard plastic covers, insulating covers, hot sticks, mats and other devices that are installed to insulate and isolate energized conductors or parts.

Insulated
Separated from other conducting surfaces by a dielectric (including air space) offering a high resistance to the passage of current. Protection of an Energized component by surrounding it with a material or air that prevents the conduction of electricity.

Isolated
Physically separated, electrically and mechanically, from other conducting surfaces or electrical sources of energy. The act of separating an energized component from other energized or grounded parts. Not readily accessible to persons unless special means for access are used.

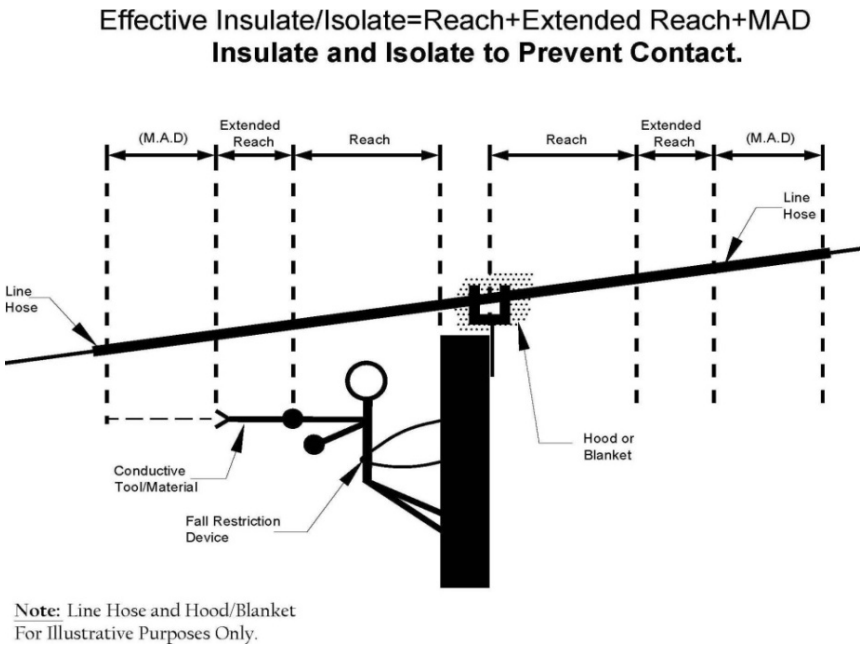
Job Briefing
A meeting conducted at the job site by the Person-in-Charge of the work that focuses on the site-specific hazards and controls associated with the work to be performed. This meeting shall be conducted in accordance with the guidelines provided in the ET&D Partnership Best Practices.

Live-Line Work
Work activities performed on Energized conductors or equipment with a phase-to-phase voltage exceeding 600 volts using the hot-stick technique or exceeding 69kV using bare-hand technique.

Live-Line Work (Bare Hand)
Work activities performed by placing the employee at the same potential as the conductor or equipment while maintaining the required clearances from other/adjacent energized conductor/equipment and Grounded parts.

Management
A business unit, person or group of persons assigned responsibility for a department, business unit or entity. Job titles such as, but not limited to, Project Manager, District Manager, Operations Manager, Vice President, Director and Construction Manager are defined as Management.

Minimum Approach Distance (M.A.D.)
The closest distance an employee is permitted to approach an energized or grounded object. This distance is measured from the end of the employee's reach or from the end of the conductive object being handled by the employee. (See picture below)



Near Miss
An unplanned event that did not result in injury, illness, or damage-but had the potential to do so.

National Fire Protection Association (NFPA) Label
A diamond-shaped diagram that identifies the characteristics of a substance. The label provides four quadrants with a respective color and number that identify the type of hazard and the risk. Numbers range from 0 (least severe hazard) to 4 (most severe hazard) and a white section to denote special firefighting measures/ hazards.

ET&D Strategic Partnership
A formal collaboration of industry stakeholders, working together to improve safety for personnel in the electric line construction industry.

Overhead Ground Wire (OHGW)
Single or multiple Grounded wire(s) placed above phase conductors for the purpose of intercepting lightning strikes in order to protect the phase conductors from direct strikes.

Parallel Grounds
Two single Ground Sets used as one. With both sets having the ground ends attached to the same Ground source, and both sets having the conductor end attached to the conductor source. Parallel Ground Sets shall be identical in length, size and clamp type.

Personal Protective Equipment (PPE)
Equipment such as safety glasses, hard hats and other items donned to protect personnel from a known hazard.

Person-In-Charge
An employee designated, identified or assigned oversight duties. This person is the individual who monitors and regulates employees in their performance of assigned tasks.

Personal Ground
A temporary grounding conductor installed at the same location as the workers. A personal ground is installed for the primary purpose of individual protection and to establish an equipotential zone (EPZ).

Personnel Protective Ground(s) (PPG)
All temporary Ground Sets installed to provide protection against electrical shock that may cause death or injury to personnel while working on de-energized lines or equipment.

Primary Zone
An area identified as the M.A.D. around any Energized or potentially Energized object.

Qualified Observer
A Qualified Observer is defined as is an electrically qualified worker that can identify all hazards present to the crew working energized conductors. The Qualified Observer shall be capable of:

- Distinguishing exposed live parts.
- Identify nominal voltages;
- Determine minimum approach distances;
- Knowing safe work practices for working on, or near, energized lines and equipment;
- Recognize electrical hazards to which workers will be exposed and skills and techniques to control those hazards;
- Rendering immediate assistance in case of an accident

A qualified observer shall not have/conduct any other duties or be distracted unless the crew being observed has stopped work and is outside MAD.

Qualified Person
An employee knowledgeable through training and experience in the construction, operation and associated hazards of the electric power system, equipment or tools.

Rubber Glove Method
A work practice in which the employees don rubber protective insulating gloves and sleeves rated for the exposure of the highest phase-to-phase voltage.

Secondary(ies)

- The conductors originating at the low-voltage secondary winding of a distribution transformer.
- An additional level of protection (e.g., a backup safety device-LOTO).

Site-Specific Task Plan
A written plan created by Management and Safety Management that:

- Identifies and evaluates the hazards.
- Provides control or mitigation strategies for the identified hazards.
- Identifies training prerequisites.
- Identifies the Qualified Person(s).
- Creates a work plan to ensure safe and effective work practices.
- Is a living document that is updated as the site conditions change, or new hazards are introduced; and
- Is reviewed and approved by Safety and Management prior to the start of the work tasks.

Spotter
A spotter is an employee that serves as an extra set of eyes to assist and direct drivers, equipment operators and individual workers. Besides making sure that a piece of equipment or vehicle that's moving doesn't run into anything or anyone, spotters may also pay attention to personnel, cranes and other equipment in tight spots, or when there is poor visibility. A spotter is not to be confused with a qualified observer.

Supervisor
See Person-In-Charge.

Step Potential / Step Voltage
The potential voltage difference between each foot of a person standing near an Energized grounded object. A person can be at risk of injury during a fault simply by standing near the Grounding point.

Touch Potential / Touch Voltage
The potential voltage difference between the energized object and the feet of a person in contact with an object that may be or become potentially energized. Touch potential could be nearly the full voltage across a Grounded object if that object is Grounded at a point remote from the place where the person is in contact with an Energized or potentially Energized object.

Vented Vault
A vault designed and constructed with a ventilation system to provide air changes for airflow which eliminates a Hazardous Atmosphere from developing. This system will have air intakes and exhaust stacks for air circulation.

Working Load Limit (WLL)
Also called Safe Working Limit (SWL). The maximum weight or force that may be applied to a product, designated by the manufacturer, with respect to the center line of the product, or the designated loading area.

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1. General Rules

1.1. Objective and Purpose

This Safety Manual is intended to safeguard the lives of our employees, customers, business partners and the general public with whom contact is made through our daily operations.

An attempt has been made to identify rules covering individual precautions that shall be taken to ensure workplace safety. Employees shall not only abide by the following rules and regulations but should take any additional precautions which may be necessary to protect themselves, fellow employees and the public. If local or customer rules are different, the more stringent of the rules shall be followed.

1.2. Responsibilities

1.2.1. Information Transfer ET&D – Administrative Controls & Information Transfer

As it relates to safety, information from the client shall be attained relating to the work to be performed including but not limited to:

1.2.1.1. Nominal voltage of the line equipment
1.2.1.2. Maximum switching – transient voltages
1.2.1.3. Presence of hazardous induced voltages
1.2.1.4. Condition of protective grounds and equipment grounding conductors
1.2.1.5. Condition of poles
1.2.1.6. Environmental conditions
1.2.1.7. Information regarding Minimum Approach Distances (MAD)
1.2.1.8. Information regarding arc flash protection values
1.2.1.9. Available Fault Current

1.2.2. Management, Operations Manager / District Manager

Management shall support, implement and be accountable for the following:

1.2.2.1. Management shall ensure that its employees and subcontractors are instructed regarding hazardous conditions revealed via the information transfer provided by the client.
1.2.2.2. Accident prevention within the business unit / department.
1.2.2.3. Assigning only Competent and Qualified Person(s)-In-Charge who understand and uphold these rules.
1.2.2.4. Ensuring that each employee receives an Employee Safety Handbook and that the Person-In-Charge has a copy of the Safety Manual.
1.2.2.5. Ensuring that work is completed in compliance with company rules, Customer rules, regulatory requirements and ET&D Partnership Best Practices.
1.2.2.6. Providing safety training, skills training and Person-In-Charge training with adequate time allotted for training.
1.2.2.7. Providing and ensuring the proper use and maintenance of all required protective equipment, tools, and protective devices.

1.2.2.8. Ensuring Safety Committee meetings are performed and actively participate in these meetings.

a. Actively participating and supporting Incident and Near-Miss investigations.
b. Identifying and developing controls to address safety concerns prior to introducing a new process, procedure, equipment or material.
c. Implementing fair and consistent disciplinary action when safety violations are identified.
d. Ensuring periodic inspections of job sites are completed; and
e. Performing periodic inspections of job sites.

1.2.3. Person-In-Charge (Foreman, General Foreman, Superintendent)

The Person-in-Charge shall support, implement and be accountable for the following:

1.2.3.1. Ensuring every employee working under his or her direction is working safely.
1.2.3.2. Stopping work activities when personnel place themselves in a potentially hazardous or life-threatening situation.
1.2.3.3. Ensuring the execution of work in a safe manner and for the job performance of every employee under his or her direction.
1.2.3.4. Ensuring that a detailed Job Briefing is completed prior to the start of work operations and that it is updated if the tasks change significantly or if the work is stopped due to an unsafe situation.
1.2.3.5. Performing documented weekly safety meetings and sending them to the District or Project office for their records.
1.2.3.6. Assigning tasks only to Qualified Persons who are capable of completing the task.
1.2.3.7. Observing job sites daily and correcting unsafe acts or conditions.
1.2.3.8. Instructing every employee on the reporting of Accidents, Injuries, Near Misses and Good Catches.
1.2.3.9. Supporting a culture of “speaking up” and “stop work authority”
1.2.3.10. Review Job Briefs on a periodic basis and mentor persons assigned to conduct them, if needed.
1.2.3.11. Applying a more stringent interpretation of these safety rules, as these rules are a minimum requirement.
1.2.3.12. Ensure that Authorized and Qualified Persons perform inspections of tools and equipment and prohibit the use of tools or equipment judged to be unsafe.
1.2.3.13. Safeguarding the work site, including employees, the public and the environment from identifiable hazards.
1.2.3.14. Oversight of subcontractors on job sites in order to confirm compliance and align safety values.

1.2.4. Safety Manager and Safety Director

The Safety Manager and Safety Director shall support, implement and be accountable for the following:

1.2.4.1. Providing guidance, assistance and interpretation of the rules contained in this Safety Manual.

1.2.4.2. Supervising the Safety Personnel within his or her area of responsibility and providing guidance to the Safety Personnel.

1.2.4.3. Communicating with Management to ensure safety rules are effective and implemented properly.

1.2.4.4. Assisting Management and Person-In-Charge with the safe completion of work tasks.

1.2.4.5. Providing updates on new regulations.

1.2.4.6. Developing, revising and reviewing training programs for regulatory compliance.

1.2.4.7. Assisting Management with the development of safety related plans and other client requirements.

1.2.5. Safety Personnel

The Safety Personnel shall support, implement and be accountable for the following:

1.2.5.1. Auditing work sites within their area of responsibility for compliance with safety rules, company rules, Customer rules and ET&D Partnership Best Practices.

1.2.5.2. Documenting work-site audits and communicating deficiencies to Management.

1.2.5.3. Ensuring corrective measures are implemented and verifying their effectiveness.

1.2.5.4. Providing safety and health support to the Management, Person-In-Charge and employees.

1.2.5.5. Providing safety and health training to employees.

1.2.5.6. Providing support with Incident investigation including follow up and completion of corrective action identified during the investigation.

1.2.5.7. Coordinating, monitoring and providing technical support for safety committees.

1.2.6. Employee

Every employee:

1.2.6.1. Shall be responsible for conforming to the rules contained in the Employee Safety Handbook and rules implemented by the Person-In-Charge.

1.2.6.2. Shall comprehend and implement the rules that apply to the work performed.

1.2.6.3. Shall identify unsafe acts or conditions and report them to the Person-In-Charge.

1.2.6.4. Has the responsibility to stop the work task before or during the task if a safety concerns arises regardless of their job classification or title. If the work site appears unsafe, each employee has the responsibility and authority to discuss this concern with the Person-In-Charge and correct the hazard prior to beginning or restarting the work task.

1.2.6.5. Shall perform a visual inspection of safety devices, tools, machinery and equipment for defects prior to use.

1.2.6.6. Shall use and operate safety devices, tools, machinery and equipment in the proper manner.

1.2.6.7. Shall immediately report any injuries, Near Misses, or damage to the Person-In-Charge.

1.2.6.8. Shall maintain a professional appearance while on duty. Loose hair, jewelry or articles of clothing shall be controlled to prevent accidental contact with exposed

Energized conductors or equipment or with rotating parts. Clothing shall be worn properly and in a professional manner.

1.2.6.9. Shall attend and participate in Job Briefings and safety meetings.

1.2.7. Qualified / Competent Person

The Qualified or Competent Person shall:

1.2.7.1. Ensure compliance with the rules and procedures required for the process or task.

1.2.7.2. Immediately correct any developing, recognized, or created hazard that may endanger employees, the public or property.

1.2.7.3. Maintain up to date credentials/certification and qualifications for the work.

1.2.7.4. Ensure required documentation is properly completed.

1.3. Incident Management

1.3.1. General

1.3.1.1. Every Incident shall be reported immediately and no later than the end of the work shift to the Person-In-Charge.

1.3.1.2. Incidents involving the public or injuries to employees shall be reported to Management and Safety as soon as reasonably possible but no later than 2 hours following the incident.

1.3.1.3. Incidents involving injuries, illnesses, Near Misses, property damage or other serious Incidents shall be investigated by the Management and the Safety Personnel.

1.3.2. Serious Incidents, Contacts or Burns

In the event of a serious or fatal Accident including contacts and burns; the Person-In-Charge shall:

1.3.2.1. Contact EMS.

1.3.2.2. Immediately provide assistance to the injured.

1.3.2.3. Secure the scene and prevent unauthorized personnel from entering.

1.3.2.4. Contact the Safety Personnel and District Manager.

1.3.3. Near Miss

1.3.3.1. Near Misses shall be reported to the Person-In-Charge and the Safety Personnel immediately but no later than the end of the work shift.

1.3.3.2. Near Misses with high severity shall be investigated.

1.3.4. Employee Injury or Illness

1.3.4.1. Qualified Persons may offer / administer first aid and/or CPR.

1.3.4.2. Employees or the Person-In-Charge shall contact Emergency Medical Services (EMS) for emergency services.

1.3.4.3. The Person-In-Charge shall notify the Management and the Safety Personnel.

1.3.4.4. If an injury or illness is serious or potentially serious, Management and Safety Department representatives shall be notified immediately.

1.3.4.5. The Person-In-Charge shall obtain all pertinent facts and the names of every witness.

1.3.4.6. The Person-In-Charge shall complete the Company Personal Injury / Incident Summary Report and forward to the Safety Personnel within 24 hours.

Reference Link: Personal Injury/Incident Summary Report

1.3.5. Motor Vehicle

1.3.5.1. In the event of a motor vehicle Incident, local Management and Safety shall be notified as soon as possible and:

1.3.5.2. Secure the accident area to the extent possible.

1.3.5.3. Qualified Persons may offer first aid and/or CPR.

1.3.5.4. Notify Emergency Medical Services (EMS) or law enforcement to report to scene.

1.3.5.5. DO NOT discuss or argue the cause or results of the Incident.

1.3.5.6. Answer all questions asked by a proper authority, but under no circumstances shall the employee admit fault, liability or negligence.

1.3.5.7. DO NOT sign any statement (except a citation issued by law enforcement) for anyone except Company Management.

1.3.5.8. Gather supporting information such as names of involved parties, insurance companies, names of witnesses along with addresses and phone numbers.

1.3.5.9. Complete the company Vehicle Incident Report and forward it to the local office within 24 hours.

Reference Link: *Vehicle Incident Report*

1.3.6. Property Damage

1.3.6.1. Notify Management and Safety Department representative of any property damage to customer, company or public property.

1.3.6.2. Complete the Company General Liability (GL) Incident Report for any property damage or other potential GL claim and forward to the local office within 24 hours.

Reference Link: *General Liability Incident Report*

1.3.7. Incidents Involving the Public

1.3.7.1. Incidents involving the public shall be immediately reported to the District Manager or the Person-In-Charge. Employees are not authorized to speak with the press. Media inquiries shall be directed to the District Manager or Legal Department.

1.3.8. Potentially Hazardous Conditions

1.3.8.1. Potentially hazardous conditions shall be corrected or reported promptly to the Person-In-Charge.

1.3.8.2. The Person-In-Charge shall attempt to correct the hazardous condition, barricade/demarcate/identify the area or evacuate the immediate area if the condition cannot be corrected.

1.4. Safety Meetings

1.4.1. Job Briefing

1.4.1.1. The Person-In-Charge shall perform Job Briefings with all personnel / crew members prior to the start of any work task.

1.4.1.2. As visitors or other personnel arrive, they shall be included in the Job Briefing.

1.4.1.3. The Job Briefing shall at least cover the following (where applicable):

a. Hazards associated with the job and mitigation.
b. Work procedures involved.
c. Identify roles and responsibilities.
d. Special precautions.
e. Selection of Insulating & Isolating equipment.
f. Energy-source controls.
g. PPE to be used, and
h. Emergency planning.

1.4.1.4. If the work or operations to be performed for that shift are repetitive and similar, one Job Briefing shall be conducted before the start of the first task. Additional Job Briefings shall be conducted if the work tasks change or significant changes to the work process are altered during the course of work.

1.4.1.5. Employees working alone shall document a daily job briefing to ensure that the tasks to be performed are planned and hazards mitigated.

1.4.1.6. Job Briefings shall be documented, and every crew member shall review, acknowledge understanding and sign the Job Briefing form.

1.4.2. Weekly Safety Meeting

1.4.2.1. The Person-In-Charge shall ensure that a documented safety meeting is conducted at least once per week.

1.4.3. Safety Committees

1.4.3.1. Safety committees shall:

a. Establish a charter that identifies roles and responsibilities,
b. Determine frequency of meetings,
c. Review Incidents, Accidents, Near Misses, and Good Catches to identify methods to reduce the frequency and severity of Incidents.
d. Develop a process for periodic inspection of safety and emergency supplies; and
e. Record and distribute minutes.

1.5. Policy Statements

1.5.1. Drug Free Workplace Policy

1.5.1.1. Employees shall comply with the Substance Abuse Policy and applicable local area testing requirements. Reference Drug Free Workplace Policy.

1.5.2. Anti-Harassment

1.5.2.1. The Company shall not permit harassment or retaliation for good faith reporting of a safety concern.

1.5.3. Portable Electronic Devices

1.5.3.1. Company employees are prohibited from any activity that distracts them while operating a motor vehicle or other equipment.

1.5.3.2. The following are expressly prohibited unless pulled over and parked in a safe location:

a. Reading or responding to text messages, instant messages, tweets or emails.
b. Adjusting GPS / navigation system.
c. Accessing the internet or any application installed on the device.
d. Using a mobile phone in a non- "hands free" application.

*Note that these rules apply even when a vehicle is at a stop light.

1.5.3.3. This policy applies to all employees when any of the following five conditions apply:

a. Operating a company vehicle.
b. Operating a personal or rental vehicle on company business.
c. Driving on company property.
d. Using a company cell phone.
e. Using a personal cell phone for company business

1.5.3.4. Employees may, provided such operation is not distracting:

a. Initiate and receive phone calls provided such operation can be accomplished by voice commands or single-touch activation without holding the mobile device.
b. Use GPS provided the operation is hands free and the address is entered while the vehicle is parked and not being operating.

1.5.3.5. Use of personal cell phones is permitted under the following conditions:

a. At company-approved break and lunch intervals.
b. For emergency-response notification; or
c. When designated and approved by the Management.

1.5.3.6. In the event of a client or applicable law providing additional requirements or restrictions, then the more restrictive of policies or applicable law shall apply.

1.5.3.7. Use of Portable Electronic Devices is strictly prohibited when Employees are within the M.A.D. or when acting as a qualified observer or spotter.

1.5.4. My Safe Workplace Program

1.5.4.1. The company recommends that employees attempt to resolve any safety concern with their supervisor.

1.5.4.2. If adequate resolution has not been achieved, employees have additional recourse to correct these situations. Employees may use the reporting system – anonymously if preferred – to report any unsafe condition, at-risk action or safety issue.

1.5.4.3. My Safe Workplace contact # 1 (800) 461-9330.

1.6. Emergency Action Plans / Medical Services

1.6.1. Emergency Planning

1.6.1.1. Management shall develop and implement a site-specific emergency action plan for each job site.

1.6.1.2. Management shall develop and implement an emergency action plan at each facility. The minimum requirements of this plan include:

a. Procedures for reporting a fire or other emergency.
b. Procedures for emergency evacuation, including type of evacuation and exit route identification and assembly locations.
c. Procedures to account for all personnel after evacuation.
d. The name and job title of the employee who can provide more information about the plan or an explanation of employees' duties under the plan.
e. Methods to provide and maintain a clear path of ingress for emergency vehicle access to a facility or work site.
f. Procedures for personnel assigned rescue, medical assistance or emergency response activities.
g. Employee training for safe and orderly evacuation of the work site or facility.
h. Employee training for the procedures of the emergency action plan; and
i. Employee retraining when the plan changes or the employee is assigned new responsibilities.

1.6.1.3. In the event of an emergency, all personnel shall evacuate.

1.6.1.4. The Person-In-Charge and Management shall ensure that EMS is readily available. Coordination and verification of EMS providers shall occur prior to the start of work tasks.

1.6.1.5. Employees trained in first aid and CPR shall be available at the work site.

1.6.1.6. The Person-In-Charge shall periodically inspect and ensure that exit routes are clear and maintained. Exit routes shall be identified and the locations provided to employees and the public.

1.6.1.7. Permanent exit routes in offices, warehouses and buildings shall be legibly identified.

1.6.2. First Aid and Medical Supplies

1.6.2.1. Management shall ensure that adequate first aid and bloodborne pathogen supplies are readily available and maintained at all work sites.

1.6.2.2. First aid supplies shall be inspected and restocked.

1.6.2.3. Eye-wash stations shall be provided in garage areas, shop areas and chemical use/storage locations. Eye-wash equipment shall be inspected monthly.

1.6.3. Bloodborne Pathogens

1.6.3.1. Management shall ensure the development, maintenance and administration of a written bloodborne pathogens program for employees with occupational exposure.

1.7. Housekeeping

1.7.1. General

1.7.1.1. Permanent aisles, walkways and passages shall be kept clean and maintained free of obstructions and tripping hazards.

1.7.1.2. Egress paths shall be legibly marked, kept clean and maintained free of obstructions and tripping hazards.

1.7.1.3. Permanent aisles, walkways and passages in warehouses and shops shall be marked, kept clean and maintained free of obstructions and tripping hazards.

1.7.1.4. Equipment, machinery and tools shall be properly stowed or stored.

1.7.1.5. Stored or stacked material shall not create a hazard from tipping, falling or disruption.

1.7.1.6. Trash, rubbish, wastepaper, rags and debris shall be disposed of properly.

1.7.1.7. Trash with sharp edges shall be discarded in a manner in which it will not create a hazard to other personnel.

1.7.1.8. Spills shall be cleaned up properly.

1.7.1.9. Hazardous areas shall have appropriate floor markings, signage, or be barricaded.

1.7.1.10. Floors shall be maintained in a serviceable condition.

1.7.1.11. Protruding nails and staples shall be removed from lumber material unless the lumber is to be disposed of.

1.7.1.12. Trip hazards shall be controlled or eliminated.

1.7.2. Storage Yards

1.7.2.1. Non-compatible materials shall be segregated in storage.

1.7.2.2. Structural steel, poles, pipe, bar stock and other cylindrical materials shall be blocked unless racked.

1.7.3. Shops and Tool Rooms

1.7.3.1. Tools and materials shall be stored properly.

1.7.3.2. Keep floors free of oil, grease and other slippery substances.

1.7.3.3. Materials in racks shall be stored properly.

1.7.3.4. Flammable and combustible materials shall be stored in approved and labeled container(s).

1.7.3.5. Oily rags shall be disposed of in approved containers.

1.7.3.6. Combustible liquids shall be disposed of in accordance with federal, state and local requirements.

1.7.3.7. Fire extinguishers shall be mounted in appropriate locations near flammable or combustible materials and as required by federal, state and local fire authority.

1.7.4. Field Locations and Vehicles

1.7.4.1. Field offices and vehicles shall be kept clean and neat.

1.7.4.2. Work areas shall be kept clean.

1.7.4.3. Flammable, combustible and toxic materials shall be stored in approved and labeled containers and / or fire cabinets.

1.7.4.4. Vehicles shall be kept neat and orderly. Trailer decks, truck beds, and employee access locations on vehicles shall be kept clean.

1.7.4.5. Tools and materials shall be stored in their proper places.

1.7.5. Offices

1.7.5.1. Desk drawers, cabinet doors, slides and files shall not be unnecessarily left open.

1.7.5.2. Office locations shall be kept clean and neat.

1.7.5.3. Only one drawer in a file cabinet shall be opened at a time.

1.7.5.4. Combustible materials shall be stored in designated locations. These locations shall not be in egress routes or near exit doors.

1.7.5.5. Permanent use of extension cords is not permitted in office areas, walkways or across doorways. Proper electrical outlets shall be installed.

1.7.5.6. Travel paths, hallways and walkways shall be kept free of tripping hazards.

1.7.5.7. Fire extinguishers shall be placed in egress paths.

1.8. Minimum Approach Distances (M.A.D.)

1.8.1. Transmission, Distribution and Substation

1.8.1.1. Every crew member shall ensure that employees do not encroach or take any conductive object closer to Exposed Energized parts than the distances specified in the following tables unless:

a. The employee is effectively Isolated and Insulated; or
b. The employee is performing the Live-Line Bare-Hand methods.

Table 1.8.1 Minimum Approach Distances AC Voltages

Up to 72.5 KV Nominal voltage in kilovolts (kV)	Distance Phase-to-ground exposure		Phase-to-phase exposure	
	(ft-in)	(m)	(ft-in)	(m)
0.005 to 1.0	(1)	(1)	(1)	(1)
1.1 to 15.0	2-2	0.65	2-3	0.67
15.1 to 36.0	2-7	0.77	2-10	0.86
36.1 to 46.0	2-9	0.84	3-2	0.96
46.1 to 72.5	3-3	1.00	3-11	1.20

[1]Avoid Contact

(72.6 KV[1] and Above) Voltage Range Phase to Phase (KV)	Phase to Ground (ft.)	Phase to Phase (ft.)
72.6 to 121.0	3.71	4.66
121.1 to 145.0	4.27	5.38
145.1 to 169.0	4.79	6.36
169.1 to 242.0	6.59	10.10
242.1 to 362.0	11.19	18.11
362.1 to 420.0	13.94	22.34
420.1 to 550.0	16.63	27.03
550.1 to 800.0	22.57	37.34

Note: These distances are to be used when the client has not established the Minimum Approach Distances.

[1]The clear live line tool distance shall equal or exceed the values for the indicated voltage ranges.

1.8.1.2. Work site locations in excess of 3000 feet (900m) above sea level shall have the M.A.D. distance recalculated by multiplying the distances from Table 1.8.1 by the correction factors in Table 1.8.2.

Table 1.8.2 Altitude Correction Factor

Altitude		Correction		Altitude		Correction
(FT)	(M)	Factor		(FT)	(M)	Factor
3000	900	1.0		10000	3000	1.20
4000	1200	1.02		12000	3600	1.25
5000	1500	1.05		14000	4200	1.30
6000	1800	1.08		16000	4800	1.35
7000	2100	1.11		18000	5400	1.39
8000	2400	1.14		20000	6000	1.44
9000	2700	1.17				

1.8.1.3. Every crew member shall ensure that employees do not encroach or take any conductive object closer to Exposed Energized parts than the distances specified in the following tables unless:

a. The employee is effectively Isolated and Insulated; or
b. The employee is performing the Live-Line Bare-Hand Methods.

Table 1.8.3 Minimum Approach Distances DC Voltages

Maximum Anticipated per-unit transient over voltage	Maximum phase-to-ground voltage in kilovolts (kV)				
	250	400	500	600	750
<1.5	3ft 8 in	5 ft 3 in	6 ft 9 in	8 ft 7 in	11 ft 10 in
1.6	3 ft 10 in	5 ft 7 in	7 ft 4 in	9 ft 5 in	13 ft 1 in
1.7	4 ft 1 in	6 ft 0 in	7 ft 11 in	10 ft 3 in	14 ft 4 in
1.8	4 ft 3 in	6 ft 5 in	8 ft 7 in	11 ft 2 in	15 ft 9 in
Note: The distances specified in this table may be applied only where the maximum anticipated per-unit overvoltage has been determined by engineering analysis and has been supplied by the customer. (Distance listed are the bare-hand and live-line tool). If the factor is not known, a factor of 1.8 shall be assumed.					

1.8.1.4. Every crew member shall ensure that employees do not encroach or cross the boundaries specified below unless they have the proper PPE and approval from the Person-In-Charge.

Table 1.8.4 Minimum Approach Distances Commercial and Industrial

System Voltage VAC	Limited Approach Boundary		Restricted Approach Boundary	Prohibited Approach Boundary
	Movable	Fixed		
< 50 (less than)	Not specified	Not specified	Not specified	Not specified
50 – 300	10 ft	3 ft 6 in	1 ft	0 ft 1 in
301- 750	10 ft	3 ft 6 in	2 ft 2 in	0 ft 7 in
751 – 15 kV	10 ft	5 ft	2ft 7 in	0 ft 10 in
15.1 – 36 kV	10 ft	6 ft	2 ft 9 in	1 ft 5 in
36.1 – 46 kV	10 ft	8 ft	3 ft 3 in	2 ft 2 in

Reference NFPA 70E -2009, Table 130.2C

1.9. Illumination

1.9.1. All offices, shops, tool rooms and storage areas shall have illumination of at least five (5) foot candles.

1.9.2. Work site illumination is referenced in Section 17.2.4.

1.10. Ladders

1.10.1. General

1.10.1.1. Ladders shall only be used for their intended purpose.

1.10.1.2. Ladders shall be inspected prior to use.

1.10.1.3. Employees ascending, or descending ladders shall always face the ladder and use three (3) points of contact while maintaining a grip of the sides or rungs.

1.10.1.4. Employees shall always maintain three (3) points of contact while pulling material of any type through conduit while working from a ladder.

1.10.1.5. Employees shall not carry anything in the hands that prevents a solid grip of the ladder while ascending or descending a ladder.

1.10.1.6. Defective ladders shall be removed from service and an Out Of Service tag affixed.

1.10.1.7. Extension ladders shall be secured to prevent displacement.

1.10.1.8. Never place ladders on or against moveable objects (including vehicles) unless the object has been properly secured to prevent ladder displacement.

1.10.1.9. Portable ladders with metallic side rails are prohibited near electrical equipment except in Energized extra-high voltage (>230kV) areas.

1.10.1.10. Portable extension ladders used to access an upper landing surface shall extend at least three (3) feet above the upper landing surface and be secured to prevent displacement.

1.10.1.11. Ladders shall not be loaded beyond their rated capacity.

1.10.1.12. Ladders shall be secured while in storage in a vertical position.

1.10.1.13. Ladders shall not be spliced.

1.10.1.14. Ladders placed in aisles or near doorways shall be properly guarded by an attendant or the installation of barricades.

1.10.1.15. Ladders in transport shall be fastened securely in the proper transport position.

1.10.1.16. Employees shall not over-reach the stability of the ladder. If the work is beyond safe reach, move the ladder so that the work can be done without over-reaching.

1.10.2. Extension Ladders

1.10.2.1. The base of a straight or extension ladder shall be positioned at ¼ the distance of its working height. (Example: a ladder at 16 feet of elevation, the base shall be 4 feet back from that position.)

1.10.2.2. The ladder shall be placed on a firm and level surface. Ladders that cannot be placed on firm and level surfaces shall utilize ladder-leveling equipment or have the area leveled to constitute a firm, level surface.

1.10.2.3. Extension ladders shall be secured at the top or both ends. Employee securing / holding a ladder is acceptable.

1.10.2.4. Ladders placed against poles shall be secured at the top.

1.10.2.5. Verify that the upper section latches have engaged prior to climbing the ladder.

1.10.2.6. Ladders shall maintain the manufacturer-designed overlap.

1.10.3. Step Ladders

1.10.3.1. Each leg of a step ladder shall be placed on a firm, flat and level surface with all legs bearing on the ground surface. Step ladders that cannot be placed on flat, level surfaces shall have the area leveled to constitute a firm, level surface.

1.10.3.2. The locking bar to secure the legs shall be properly locked while the ladder is in use.

1.10.3.3. Employees shall not stand or sit on the top two (2) steps of the step ladder.

1.10.4. Fixed Ladders

1.10.4.1. Fixed ladders shall be visually inspected for integrity prior to use.

1.10.4.2. Employees ascending or descending fixed ladders with integral fall-restraint systems shall employ the fall protection system for all ascending and descending.

1.10.5. Hook Ladders

1.10.5.1. Ladders shall be used per manufacturer specifications and within the load rating.

1.10.5.2. Employees accessing or working from hook ladders shall employ appropriate ET&D Partnership Best Practice methods.

1.11. Scaffolds

1.11.1. Scaffolds shall only be erected, modified, dismantled or relocated under the supervision of a Competent Person. Scaffold installations shall be designed by a Qualified Person.

1.11.2. Fall protection is required over six feet during erection and dismantling of scaffolds.

1.11.3. Scaffolds shall be inspected prior to use.

1.11.4. Footings, bases or anchorages for scaffolds shall be capable of supporting four times (4X) the maximum intended load without settling or displacement.

1.11.5. Scaffolds shall be level, plumb and square prior to employees accessing or working on the scaffold.

1.11.6. Open sides of a scaffold with fall exposures exceeding six (6) feet shall have guard rails installed.

1.11.7. Toe boards shall be installed on all open edges where feasible. If toe boards are not feasible, a controlled access zone shall be installed at the appropriate safe distance as determined by the Competent Person.

1.11.8. Appropriate access and egress shall be maintained to all working levels.

1.11.9. Overhead protection shall be provided to personnel working at lower levels when exposed to overhead hazards.

1.11.10. Scaffold towers shall be properly secured to prevent tipping when they reach heights of twenty-five (25) feet or four times (4X) the smallest base dimension.

1.11.11. The Competent Person shall determine when employees shall exit the scaffold during periods of high winds, storms or lightning.

1.11.12. Scaffolds shall maintain appropriate clearances from power lines.

Table 1.11 Scaffold Clearance from Electrical Lines

Voltage	Insulated Lines		Uninsulated Lines	
	Minimum Distance	Alternatives	Minimum Distance	Alternatives
≤ 300 VAC	3 feet		10 feet	
300 VAC to 50 kV	10 feet		10 feet	
≥ 50 kV	10 feet plus 0.4 inches for each 1 kV over 50 kV	2 times the length of the line insulator, never less than 10 feet.	10 feet plus 0.4 inches for each 1 kV over 50 kV.	2 times the length of the line insulator, never less than 10 feet.

1.11.13. Mobile Scaffolds

1.11.13.1. A Competent Person shall ensure that caster screw jacks are properly pinned in place.

1.11.13.2. Mobile scaffolds shall only be moved on level floors free of holes or obstructions.

1.11.13.3. Employees shall not be positioned on mobile scaffolds when they are moved.

1.11.13.4. Materials, tools or equipment shall only be raised or lowered by means of a handline. Employees shall not carry anything in their hands while climbing or descending.

1.11.13.5. Tools, materials and equipment shall be secured or contained by toe boards, containers or lashings on elevated surfaces. If these items cannot be secured or contained, they shall be lowered to the ground level.

1.12. Fire Prevention / Fire Protection

1.12.1. Management shall develop, maintain and administer a written Fire Prevention Plan for incipient fires. The plan shall identify:

a. Major fire hazards and control.
b. Procedures for control of fuel source hazards; and
c. Procedures and responsibility for maintenance of equipment for fire suppression.

1.12.2. Fire Extinguishers

1.12.2.1. Fire extinguishers shall be readily available in all vehicles, shops, field offices, warehouses, tool rooms and office locations.

1.12.2.2. Fire extinguishers shall be compatible with the type of materials present in the local environment.

1.12.2.3. Fire extinguishers shall be inspected monthly and tested annually.

1.12.2.4. Fire extinguishers placed in fixed locations in shops, tool rooms and offices shall have appropriate signage installed to identify the location of the equipment.

1.12.2.5. Fire extinguishers and firefighting equipment shall be readily accessible at all times. Obstructions to firefighting equipment are not permitted.

1.12.2.6. Employees shall be familiar with the location of the firefighting equipment and the safe operation of the equipment. Employees shall receive training annually.

1.12.2.7. Firefighting equipment shall only be used for the intended purpose.

1.12.3. Fire Prevention

1.12.3.1. Combustible materials shall not be permitted to accumulate.

1.12.3.2. Signs prohibiting smoking, open flames or sparks shall be displayed where smoking or open flames constitute a fire hazard.

1.12.3.3. Materials that may spontaneously combust such as oily rags shall be contained in approved containers.

1.12.3.4. All flammable and combustible materials shall be stored in designated locations.

1.12.3.5. Hot Work shall only be performed when proper authorization has been received from the Customer representative, designated inspector, prime contractor or the Person-In-Charge.

1.12.3.6. When Hot Work is performed, fire watchers shall be stationed adjacent to Hot Work operations when combustible materials are:

a. Within 35 feet.
b. Within the distance and requirements specified in a Hot Work permit; or
c. Adjacent to the opposite side of a metal partition, walls, ceiling, floor or roof.

1.12.3.7. Fire watchers shall be stationed for the duration of the Hot Work operation and at least thirty (30) minutes after the operation is finished.

1.12.3.8. Fire Watchers shall be trained to:

a. Identify combustible materials and the onset of a fire.
b. Operate a fire extinguisher.
c. Identify the type of fire; and
d. Initiate an alarm in the event of a fire.

1.13. Working over or Near Water

1.13.1. When working over or adjacent to navigable waterways, Management shall ensure a Site-Specific Task Plan is developed, approved and implemented.

1.13.2. Personnel shall comply with the applicable federal, state local, and USCG (US Coast Guard) regulations.

1.14. Manual Material Handling (Back Injury Prevention)

1.14.1. The Person-In-Charge shall ensure employees are trained in proper lifting and carrying methods.

1.14.2. Employees shall never carry a load that exceeds their abilities and obtain help with the object to be lifted. Objects that exceed the physical abilities shall be lifted with the assistance of additional personnel or mechanical methods.

1.14.3. Employees shall never carry a load that obstructs their vision unless assisted by a spotter.

1.14.4. When multiple employees are lifting or pulling together, one employee shall give the signals for the group.

1.14.5. Employees shall use gloves or hand pads on sharp, rough or heavy materials.

1.14.6. Employees shall not carry pipes, ground rods, and other conductive material above the shoulders near Exposed Energized electrical equipment.

1.15. Out of Service Tagging Policy

1.15.1. Any defective tool, vehicle or equipment shall be tagged "Out of Service" and removed from service until repaired.

1.15.2. The damage or defect shall be noted on the tag.

1.15.3. The Person-In-Charge shall ensure that the tagged tools are removed from service and returned to the local shop.

1.16. Signage and Warning Signs

1.16.1. Warning (Caution or Notice) signs or Danger signs shall be posted in areas that may constitute a safety hazard or imminent danger condition.

1.16.2. Signage shall be posted where visible to personnel entering the area.

1.17. Working Areas

1.17.1. The Person-In-Charge shall ensure:

1.17.2. The establishment of designated work zones.

1.17.3. Signage, barricades, delineators or other effective means are installed to delineate the workspace.

1.17.4. The work zones are maintained and controlled; and

1.17.5. Work zone signage, barriers, delineators, etc., are removed when tasks are complete.

1.18. Facilities

1.18.1. Load-bearing limits shall be posted in elevated storage areas.

1.18.2. Overhead clearance limitations in frequently traveled areas shall be posted.

1.18.3. Personnel exposed to falls in excess of four (4) feet on elevated walkways or overhead storage areas shall be protected by guard rail systems.

1.18.4. Stairways and temporary stairways shall have handrails installed when elevation changes exceed thirty (30) inches or four risers.

1.18.5. Facility evacuation plans shall be posted at each office assigning duties for emergency personnel and the identified assembly point.

1.18.6. Openings in floors shall have appropriate covers or barricades.

1.19. Extension Cords, Cables and GFCI

1.19.1. Extension cords, GFCI devices and electrical equipment shall be inspected prior to use.

1.19.2. Extension cords shall be of the heavy-duty type, sized for the load and a minimum of three-wire.

1.19.3. Flat extension cords are not permitted.

1.19.4. Extension cords, cables, welding cables and any other electrical cables shall not constitute a tripping hazard.

1.19.5. Surge-protector type extension cords are permitted for devices that require surge protection.

1.19.6. Extension cords shall be protected from vehicular traffic.

1.19.7. Job-made extension cords shall not be permitted.

1.19.8. GFCI Protection shall be tested prior to use.

1.19.9. GFCI devices shall be available and used in the following situations:

1.19.9.1. Wet or damp locations (bathrooms, kitchens, wash down areas, outdoors, etc.);

1.19.9.2. Generators exceeding five (5) kW;

1.19.9.3. Temporary extension cords; and

1.19.9.4. Tools used in wet environments.

1.20. Electrical Panels

1.20.1. Electrical Panels shall have a minimum of thirty-six (36) inches of clear space in front of the panel and the width of the space shall be a minimum of thirty (30) inches or sufficient to allow doors to open ninety (90) degrees.

1.20.2. Panels shall be labelled with the voltage and arc flash information.

1.20.3. Overcurrent protective devices (disconnects, fuses, circuit breakers, etc.) shall be labeled to identify the equipment or location to which they supply power.

1.20.4. Electrical panels shall remain closed at all times and only opened for servicing and maintenance by Qualified Persons.

1.20.5. Openings for cable, circuit breakers, conduit, knockouts, or other equipment shall be effectively closed when not used.

1.20.6. Damaged electrical panels, outlets, switches, or receptacles shall be repaired immediately.

1.20.7. Panel covers shall be secured at all times when panels are in normal operating condition.

1.21. Machine Guarding

1.21.1. Point of operation guarding is required for exposure to:

1.21.1.1. Rotating parts.
1.21.1.2. Flying chips and sparks.
1.21.1.3. Ingoing nip points.
1.21.1.4. Impact operations.
1.21.1.5. Compression operations including mechanical presses.
1.21.1.6. Cutting, sawing or grinding operations; and
1.21.1.7. Belts, sprockets, chains, chain drives or gears.

1.21.2. Guards shall be affixed and secured to the machine.

1.21.3. Fixed machinery shall be anchored to prevent movement.

1.21.4. Fences, rests, barriers and other guards shall be operational and function properly.

1.21.5. Guards shall not be defeated.

1.22. Employee Safeguards

1.22.1. Employees shall be protected from:

1.22.1.1. Falling into openings in walls, floors, open holes or other openings with fall hazards exceeding six (6) feet. These openings shall be protected by guard rails or secured and labeled covers, or employees shall don Personal Fall-Arrest Systems (PFAS) when positioned within six (6) feet of the opening.
1.22.1.2. Fall hazards, by the erection of barriers placed at a distance at least six (6) feet away from the exposure.
1.22.1.3. Vehicular traffic by properly identified pedestrian areas.
1.22.1.4. Objects falling from elevated walking and working surfaces. (Toe guards on walking and working surfaces are required.)
1.22.1.5. Extreme environmental conditions such as dangerous or poisonous animals, excessive heat or cold.
1.22.1.6. Contact with Hazardous Substances or materials (e.g., Asbestos, lead, PCBs).
1.22.1.7. Being struck by moving or operating equipment.
1.22.1.8. Tripping and falling on stairways by appropriate handrails.

1.22.2. Whenever employees are working in elevated areas and there is a potential for falling objects, the “Drop Zone” shall be identified with signs or barricades.

1.22.3. Employees shall not drop or throw materials or tools from elevated levels, unless a drop zone is established, approved by management or safety and documented on the DJB.

1.22.4. Employees shall not work below other employees unless the task requires employees to be below other employees; when this is required, the following shall be complete:

1.22.4.1. Employees shall communicate the work plan,

1.22.4.2. Communication methods to warn employees of falling objects shall be identified and implemented.

1.23. Pinch Points / Line of Fire / Crushing Zones

1.23.1. Pinch points and crushing zones shall be identified and discussed in the daily Job Briefing.

1.23.2. The Person-In-Charge shall ensure employees are involved in identifying and controlling identified pinch points.

1.23.3. The Person-In-Charge shall ensure employees have a discussion about pinch points, aka "stay out of the bite." Pinch point hazards are present in all work activities; examples of pinch points include the following:

1.23.3.1. Devices which are sleeved; in which one component slides onto another component.

1.23.3.2. Devices that have stored potential energy (e.g., springs or self-closing doors).

1.23.3.3. Devices that have stored gravitational energy (e.g., jacks, elevated items that can drop).

1.23.3.4. Pulleys and sheaves, with and without running lines.

1.23.3.5. Devices that contain pins to secure parts.

1.23.3.6. Hammering-type devices, jack hammers, sledgehammers.

1.23.3.7. Putting your body in between two objects.

1.23.3.8. Loading and unloading equipment, trailers; or

1.23.3.9. Devices with sliding components.

1.24. Concrete Operations

1.24.1. Only Qualified and Authorized Persons shall perform concrete operations.

1.24.2. Dust controls shall be in place to protect employees from silica unless sampling results confirm that employee exposure is below 25 micrograms per cubic meter based on an 8-hour time weighted average. See Table 1.23 (starting on page 166) for additional guidance on addressing Silica exposure.

1.24.3. Exposed rebar that personnel could fall onto shall be protected by appropriate reinforced rebar caps.

1.24.4. Exposed rebar that is protruding horizontally that personnel could incur injury from shall have rebar caps installed.

1.24.5. Employees shall wear the appropriate PPE to ensure concrete does not contact the skin.

1.24.6. Employees placing concrete with a hose from a pumper shall wear a face shield in addition to appropriate PPE.

1.24.7. Employees shall not ride in concrete buckets.

1.24.8. Employees shall not work below concrete buckets while they are being elevated or lowered into position.

1.24.9. Employees applying concrete with pneumatic equipment (shotcrete) shall wear appropriate PPE

1.24.10. Employees shall never place their hands into a mixer while in operation.

1.24.11. When cleaning mixers, if you must place any part of the body into the mixer, LOTO rules shall be followed in Section 11.

1.24.12. Handles on floats or other equipment which may contact an Energized electrical component shall be constructed of nonconductive material.

1.24.13. Rebar shall only be bent with appropriate tools.

1.24.14. Concrete demolition utilizing pneumatic or hydraulic operated tools, such as jack hammers, shall require the following:

1.24.14.1. Appropriate PPE shall be donned.

1.24.14.2. Non-essential personnel shall be kept away from the work area; and

1.24.14.3. Employees clearing debris or working near the tool shall wear appropriate PPE.

1.24.15. Concrete demolition utilizing hydraulic powered attachments shall require the following:

1.24.15.1. Operators shall ensure all other employees are at a safe distance;

1.24.15.2. Operators shall stop operations if employees are too close to the work task; and

1.24.15.3. Personnel are only permitted to enter the work area when equipment operations have ceased.

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2. Personal Protective Equipment

2.1. General Rules

2.1.1. PPE shall be selected and approved by the Company.

2.1.2. Employees shall be trained in the proper selection, use, donning, removing and disposing of PPE.

2.1.3. Employees shall don, and wear PPE designated and approved by the Company.

2.1.4. Management and Safety shall ensure that a hazard assessment is performed to determine that the appropriate PPE is selected.

2.1.5. PPE shall be inspected prior to each use.

2.1.6. PPE shall not be altered or modified without management approval.

2.1.7. PPE shall be replaced when required.

2.1.8. PPE shall be stored appropriately when not in use.

2.1.9. PPE shall be available in multiple sizes or styles for proper fit.

2.1.10. Minimum PPE requirement for field work locations is ANSI-rated safety glasses, ANSI rated work shoes, ANSI rated hard hats and proper hand protection. Additional PPE will be provided if deemed necessary as required per the hazard assessment and local or client requirements.

2.1.11. Minimum PPE requirements for shop employees are ANSI-rated safety glasses.

2.1.11.1. Shop employees working in locations outside of a shop shall wear ANSI-rated hard hats and ANSI-rated safety glasses and work shoes.

2.1.12. Personal conductive objects (e.g., jewelry, keys, coins) worn on the body shall be removed prior to work on or near Energized conductors or equipment.

2.1.13. Sharp or pointed tools and materials shall not be carried inside clothing unless the point or cutting edge is guarded.

2.1.14. Employees shall ensure loose clothing, PPE, hair, jewelry, tools and other personal items are secured prior to approaching or working adjacent to rotating parts or equipment.

2.2. Protective Apparel (Clothing)

2.2.1. Properly rated AR (Arc Rated) / FR (Flame Resistant) apparel shall be properly donned by employees who may be exposed to electrical arc or flash.

2.2.2. Selection of proper rating garments shall be in accordance to the following table:

Table 2.2.2 AR/FR Garment Ratings

Voltage Range (KV)	Fault Current (KA)	Maximum Clearing Cycles			
		4 Cal/cm²	5 Cal/cm²	8 Cal/cm²	12 Cal/cm²
4.0 to 15.0	5 10 15 20	46 18 10 6	58 22 12 8	92 36 20 13	138 54 30 19
15.1 to 25.0	5 10 15 20	28 11 7 4	34 14 8 5	55 23 13 9	83 34 20 13
25.1 to 36.0	5 10 15 20	21 9 5 4	26 11 6 4	42 18 10 7	62 26 16 11
36.1 to 46.0	5 10 15 20	16 7 4 3	20 9 5 4	32 14 8 6	48 21 13 9

2.2.3. AR / FR garments shall be the outermost garment.

2.2.4. AR / FR garments shall have the appropriate rating for the anticipated exposure:

2.2.4.1. Full body FR garments is required

2.2.4.2. Insulated gloves and sleeves with protectors are considered arc rated

2.2.4.3. Heavy-duty work shoes or boots are considered arc rate

2.2.4.4. Hard hats ANSI/SEA 87.1-2009 Type I Class E are also considered arc rated and

2.2.4.5. For aerial distribution work, minimum 8 cal/cm² face-shields is considered arc rated. Client specific requirements must be followed as required.

a. Undergarments shall be made of non-melting material.
b. Protective apparel that has oil, grease, fuel or combustible fluid stains or saturation shall not be worn or used while welding, torch cutting, or when working on or near Energized conductors or equipment. Protective apparel that is torn, ripped, cut or otherwise damaged shall be removed from service.
c. Clothing that becomes contaminated shall be removed as quickly as possible and in locations away from the potential hazards. Contaminated clothing shall be removed from service until properly cleaned.
d. High visibility safety apparel shall be worn when required by the Customer, federal or state requirements, or when the employee is within fifteen (15) feet of a right-of-way.

2.3. Head Protection

2.3.1. Hard hats shall have an E or G electrical rating.

2.3.2. Hard hats shall be replaced when they are worn, cracked or subjected to damage.

2.3.3. Ball caps are not permitted under the hard hat. Skull caps and tight-fitting insulated caps are acceptable under the hard hat.

2.3.4. Chin straps shall be used during periods of high wind.

2.4. Eye and Face Protection

2.4.1. Employees shall wear company-approved eye and face protection equipment.

Note: The Company requires one hundred percent (100%) use of safety glasses within designated areas and work sites.

2.4.2. Eye protection shall be ANSI Z87.1 rated. Side shields, prescription glasses, over the glass equipment, goggles and temporary "slip over" side shields shall meet ANSI Z87.1.

2.4.3. Goggles shall be worn when additional eye protection has been deemed necessary for a given task and at all times when:

2.4.3.1. Using compressed air to clean materials or machinery

2.4.3.2. Transferring or using chemicals, caustics, acids, etc., (face protection may be required)

2.4.3.3. Any other hazard that may potentially injure the eyes; or

2.4.3.4. When required by Safety Data Sheet, or the Person-In-Charge.

2.4.3.5. When accessing or performing work in plenums with pressurized airflow.

2.4.4. Face protection (face shield, arc-rated shield, etc.) also requires the use of eye protection (safety glasses or goggles) under the shield. Work operations that require a face shield in addition to eye protection are:

2.4.4.1. Grinding

2.4.4.2. Powered buffing, polishing or brushing

2.4.4.3. Jackhammering, chipping stone/masonry

2.4.4.4. Powder-actuated tools when fastening into concrete or masonry

2.4.4.5. Exothermic welding (Cad Weld) when within five feet from the ignition source

2.4.4.6. Opening an electrical cabinet or cutout, or switching tasks in which electrical arc flash may occur

2.4.4.7. Transferring liquids when splash protection is required; or

2.4.4.8. Using chain, chop and demolition saws and

2.4.4.9. Where there is potential for falling debris such as during drilling or cutting when performing overhead operations.

2.4.4.10. When exposed to an arc flash.

2.5. Hearing Protection

2.5.1. Employees exposed to sound levels equal or exceeding 85 DBA on an eight-hour time-weighted average (TWA) shall be included in the hearing conservation program. Noise exposure shall be determined by noise dosimetry testing.

2.5.2. Hearing protection shall be worn when identified by the hazard assessment or daily Job Briefing.

2.5.3. Hearing protectors may be the ear canal type or the over the ear (muff) type.

2.6. Respiratory Protection

2.6.1. The Person-In-Charge shall contact the Safety Department prior to issuing a respirator.

2.6.2. When respirators are required, employees shall:

2.6.2.1. Be trained in compliance with the written respiratory protection program including the anticipated hazards, limitations of respirators and proper use of respirators.

2.6.2.2. Have completed the required medical evaluations.

2.6.2.3. Have received a medical clearance from a licensed healthcare professional; and

2.6.2.4. Have completed qualitative or quantitative fit testing to ensure proper fit of a respirator.

2.6.3. Voluntary use of filtering face pieces is permitted when used for nuisance dust purposes. Employees who are issued filtering face pieces for voluntary use shall be trained and receive a copy of OSHA 29 CFR 1910.134 Appendix D.

2.7. Hand Protection

2.7.1. Employees shall wear appropriate work gloves for all work tasks.

2.7.2. Prior to issuing specialty work gloves, skin sensitization shall be considered as part of the hazard assessment.

2.7.3. Cut-resistant gloves are recommended when handling knives, sheet metal and other sharp-edged tools or materials.

2.8. Foot Protection

2.8.1. Proper foot protection (Safety Toe, Steel Toe or Metatarsal Guards) is required in all shops, warehouses, field locations, work sites, and tool rooms to prevent injury caused by falling, dropping, crushing, or rolling objects.

2.8.2. The Person-In-Charge shall ensure that the appropriate type of foot protection required for the specific site conditions and hazards are in use.

2.8.3. Metatarsal foot protection is required when using jack hammers, tampers and other hand-operated compacting type equipment that constitute a hazard to the feet.

2.8.4. Tennis shoes, sandals, or worn-out shoes are not permitted in shops, tool rooms, field locations or work sites.

2.9. Fall Protection

2.9.1. Management shall develop, maintain and implement a written fall protection / safety-at-heights program identifying appropriate fall protection.

2.9.2. Only Qualified and Authorized Persons shall don, use, and connect fall protection equipment.

2.9.3. Employees working at levels greater than six (6) feet above a lower level shall be protected from falling (ET&D Partnership Best Practices "Safety at Heights" shall be adhered to as applicable). Local area regulations may be more stringent.

2.9.4. Employees may be protected from falls by any of the following methods:

2.9.4.1. An engineered system consisting of top rails, mid rails and toe boards.

2.9.4.2. A personal fall-arrest system (PFAS); or

2.9.4.3. A fall-restraint system.

2.9.5. Fall protection equipment shall be inspected by each user prior to each use.

2.9.6. Damaged, defective, deployed or arrested equipment shall be removed from service.

2.9.7. Fall protection equipment shall be manufactured in compliance with ANSI Z359 and have the appropriate labeling affixed. Must meet the arc rated requirements if potentially exposed to an arc.

2.9.8. Equipment without legible labels or inspection tags shall be removed from service.

2.9.9. Equipment shall be inspected by a Competent Person at least annually.

2.10. Work Positioning Equipment (Climbing / Positioning Gear)

2.10.1. Management shall ensure that climbing and positioning equipment is approved for the use and shall be in compliance with ANSI Z359.

2.10.2. Only Qualified and Authorized Persons shall don, use, and connect work-positioning equipment in accordance with the ET&D Partnership Best Practices. While climbing poles 100% fall protection shall be adhered to.

2.10.3. Prior to climbing the employee shall ensure that the climbing and positioning equipment is inspected, adjusted and securely connected.

2.10.4. Employees transitioning around obstructions on structures shall ensure that the secondary belt is positively secured prior to releasing any in-use connections.

2.10.4.1. Prior to disengaging any part of the climbing / positioning equipment, visually verify positive engagement of the snap-hook to the D-ring.

2.10.5. Climbing and positioning equipment shall be stored where it cannot be damaged.

2.10.6. Belt bags shall not be attached closer than four inches to D-rings.

2.10.7. Utility pole climbing gaffs shall be kept properly sharpened and at least one and one quarter inch (1¼") in length.

2.10.8. Utility pole climbing gaffs shall not be used for climbing or working in trees.

2.10.9. Gaff guards shall be in place when not in use.

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3. Electrical Protective Equipment

3.1. General

RULES CONTAINED IN THIS SECTION ARE THE MINIMUM STANDARDS; LOCAL AREA RULES MAY BE MORE STRINGENT.

3.1.1. Electrical protective equipment shall be approved and provided by the Company.

3.1.2. Only Qualified and Authorized Persons may inspect, install, operate, remove, clean or maintain Insulating Protective Equipment.

3.1.3. Electrical protective equipment shall be inspected and/or tested prior to use. The equipment shall be re-inspected and/or retested following any Incident that may have damaged it.

3.1.4. When using the Rubber Glove Method, rubber insulating protective gloves and sleeves shall be donned in accordance with the ET&D Partnership Best Practices.

3.1.5. Electrical protective equipment shall be:

3.1.5.1. Free of damage.

3.1.5.2. Stored properly.

3.1.5.3. Selected based upon the anticipated phase-to-phase voltage exposure; and

3.1.5.4. Maintained free of petroleum-based contaminants, chemicals, acids, chlorinated solvents and other chemicals.

3.1.6. Flat or long flexible rubber materials (e.g. blankets and line hose) shall never be kinked or folded during storage.

3.1.7. Damaged or contaminated equipment shall be taken out of service until inspected, repaired, and tested.

3.1.8. Rubber insulating protective gloves shall be stored in bags with the fingers up to prevent debris from entering the glove.

3.2. Selection and Identification of Rubber Insulating Goods

3.2.1. Rubber insulating protective equipment shall be selected based upon the phase-to-phase voltage.

3.2.2. Rubber insulating protective gloves and sleeves shall be marked legibly with the size, class and test date.

3.2.3. Equipment manufactured to ASTM Classes (specifications) shall be rated according to the below table:

Table 3.2 Rubber Goods Classification

Glove Class (Colored Label)	AC Proof Test Voltage	DC Proof Test Voltage	Maximum Use AC Voltage
Beige (00)	1000	5000	600
Red (0)	5000	20000	1000
White (1)	10000	40000	7500
Yellow (2)	20000	50000	17000
Green (3)	30000	60000	26500
Orange (4)	40000	70000	36000

3.2.4. Rubber insulating blankets shall be marked legibly with the class and test date.

3.2.5. Hard cover made of fiberglass, plastic or other non-conductive materials shall be selected based on the anticipated phase-to-phase voltage.

3.3. Rubber Insulating Gloves and Sleeves

3.3.1. Rubber insulating protective gloves and sleeves shall be donned in accordance with the ET&D Partnership Best Practices and:

3.3.1.1. Visually inspected prior to each day's use and when damage is suspected.

3.3.1.2. Visibly marked with the test date and issue date; and

3.3.1.3. Air-tested prior to each day's use.

3.3.2. Class 1 to Class 4 rubber insulating protective gloves shall not be used on any Energized electrical component without leather protectors.

3.3.3. In addition to following the ET&D Best Practices, rubber insulating protective gloves and sleeves shall be donned prior to entering M.A.D. and remain on at all times while the employee is within the M.A.D.

3.4. Insulating Protective Equipment (IPE) (Blankets, Line Hose, and Cover)

3.4.1. Installation of IPE as secondary protection does not alter the requirement for rubber gloves and sleeves.

3.4.2. IPE shall be inspected by a Qualified Person prior to installation.

3.4.3. IPE shall be installed to adequately cover Exposed Energized parts. (e.g., M.A.D. plus extended reach).

3.4.4. IPE shall be fastened securely when installed. Fasteners shall be of sufficient durability to prevent displacement.

3.4.5. Determination of the size, type and quantity of IPE shall be determined by the Qualified Person and in accordance with the ET&D Partnership Best Practices.

3.4.6. Installation of IPE shall start at the lowest or nearest exposure and proceed upward or away to the next closest exposure.

3.4.7. Employees shall not cross unprotected conductors to install or remove IPE.

3.4.8. Removal of IPE shall be from the highest (or farthest) location to the lowest (or nearest) location (reverse order of installation).

3.4.9. IPE shall only be installed or removed in one of the following manners:

3.4.9.1. Employees wearing rubber insulating protective gloves and sleeves; or

3.4.9.2. Employees who, by using hot sticks, do not enter the M.A.D.

3.5. Testing

3.5.1. Rubber insulating protective equipment shall be tested at regular intervals; the following are the minimum guidelines. Local area rules may have more stringent requirements.

3.5.2. Rubber insulating protective gloves:

3.5.2.1. Visually inspected and air-tested prior to each use.

3.5.2.2. Voltage tested every six (6) months.

3.5.3. Rubber insulating protective sleeves:

3.5.3.1. Visually inspected prior to each use.

3.5.3.2. Voltage tested annually.

3.5.4. Rubber insulating blankets:

3.5.4.1. Visually inspected prior to each use.

3.5.4.2. Voltage tested annually.

3.5.5. Insulating line hose:

3.5.5.1. Visually inspected prior to each use.

3.5.6. Insulated Live Line tools (hot sticks):

3.5.6.1. Visually inspected prior to each use.

3.5.6.2. Voltage tested bi-annually (every two years).

3.5.7. Insulated Jumpers

3.5.7.1. Visually inspected prior to each use

3.5.7.2. Tested Annually

3.6. Removal from Service

3.6.1. Gloves, sleeves and blankets shall be removed from service:

3.6.1.1. When the glove fails an air test.

3.6.1.2. When dirt or stains on gloves, sleeves or blankets cannot be removed.

3.6.1.3. When gloves or sleeves have tears, cuts or deep scratches in the material.

3.6.1.4. When the gloves, sleeves or blankets have damage from petroleum residue.

3.6.1.5. When a component has different colored materials on the inside and the outside, and the interior color is visible on the outside;

3.6.1.6. When an employee determines that the equipment is unsafe for use; or

3.6.1.7. When the equipment has exceeded the testing date interval.

3.7. Storage

3.7.1. Gloves, sleeves and blankets that have passed a voltage test may be stored in a temperature-controlled environment for up to one (1) year prior to issue.

3.7.2. Gloves, sleeves and blankets in storage for more than one (1) year shall be tested prior to issue.

Note: These rules are minimum requirements; local rules may be more stringent.

3.8. Insulated Hand Tools

3.8.1. Insulated hand tools shall:

3.8.1.1. Be selected and properly rated based upon the anticipated voltage.

3.8.1.2. Be inspected and wiped down prior to each use.

3.8.1.3. Be free of grease, dirt, oily residues, other contaminants or damage that makes the tool unsafe for use.

3.8.1.4. Only be used for the intended purpose.

3.8.1.5. Only be used with properly rated rubber insulating protective gloves and outer protectors; and

3.8.1.6. Be stored in protective cases and placed in areas free from contamination during use.

3.9. Live Line Tools (Hot Sticks)

3.9.1. Live line tools shall:

3.9.1.1. Be selected based upon the Working Load Limit (WLL) and the phase-to-phase voltage.

3.9.1.2. Be inspected and wiped down prior to each use.

3.9.1.3. Be free of grease, dirt, oily residues, other contaminants, physical damage.

3.9.1.4. Be removed from service at two-year intervals for inspections, cleaning, waxing and re-tested in accordance with company testing policy.

3.9.1.5. Not be placed on the ground or other surface where they may be exposed to contamination or damage.

3.9.1.6. Be stored in approved locations and in a manner to prevent damage to the tool.

3.9.1.7. Be tested prior to issue.

3.9.2. If the tool has been repaired or refinished, the tool shall be tested prior to re-issue.

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4. Tools

4.1. General

4.1.1. Powered tools shall only be operated, repaired or maintained by Qualified and Authorized Persons.

4.1.2. Tools shall be kept in good condition, inspected and maintained.

4.1.3. Tool guards shall be inspected prior to use.

4.1.4. Damaged or faulty tools shall be tagged Out of Service, removed from service until repaired, inspected and tested.

4.1.5. Portable powered tools (air, electric, hydraulic and fuel) shall have a constant pressure switch that turns the tool off when released.

4.1.6. Tool implements (drill bits, dies, saw blades, etc.) shall only be changed or replaced while the tool is disconnected from the power source.

4.1.7. Implements shall be properly rated for the speed (RPM) and type of material to be worked.

4.1.8. Guards shall be in place while the tool is in use.

4.1.9. Tools shall not be issued or operated in a defective condition.

4.1.10. Hoses or electric cords shall not be used to raise or lower tools.

4.1.11. Tools shall be stored in designated locations and per manufacturer guidelines.

4.1.12. Operate tools according to the manufacturers' instructions.

4.1.13. Non-sparking tools shall be provided in areas where flammable atmospheres are present.

4.1.14. Employees shall don all required PPE as identified by the manufacturer or the company prior to tool operation.

4.2. Personal Tools

4.2.1. Personal tools shall be inspected prior to use and maintained per the manufacturer's specification.

4.2.2. Defective personal tools shall be tagged Out of Service and removed from service.

4.2.3. Personal tools shall be subjected to company inspection and safety requirements.

4.3. Fuel (Gas, Diesel) Powered Tools

4.3.1. Fuel-powered tools shall be used in well-ventilated areas.

4.3.2. Fuel-powered tools shall not be operated in basements, inside of buildings, Confined Spaces or Enclosed Spaces without exhausting outside the work area, and adequate ventilation inside the work area.

4.3.3. Employees shall have adequate ventilation while operating fuel powered tools.

4.3.4. Fuel-powered tools shall be shut off during refueling, servicing or maintenance.

4.3.5. Fuel-powered tools shall have fire extinguishing equipment readily available as identified by the Job Briefing.

4.4. Powder Actuated Tools

4.4.1. Only Qualified and Authorized Persons shall use powder-actuated tools.

4.4.2. Appropriate PPE shall be donned prior to operating powder-actuated tools.

4.4.3. Loaded tools shall not be left unattended and only loaded prior to use.

4.4.4. Cartridges used or misfired shall be disposed of properly.

4.4.5. Shells, unused cartridges and power cartridges shall be stored properly in secured areas.

4.4.6. Powder-actuated tools shall not be pointed at anyone.

4.4.7. Powder-actuated tools shall be inspected prior to use and to ensure the tool is in proper operating condition.

4.5. Electric Powered Tools

4.5.1. Electric-powered tools shall not be used if there is damage to the electrical cord, sheathing, insulation, or strain relief.

4.5.2. Electric-powered tools shall be powered by round three-wire cords or be double insulated.

4.5.3. Electric-powered tools shall have the proper supply sources and overcurrent protection.

4.5.4. Electric-powered tools shall have all attachments firmly secured, seated or affixed.

4.5.5. Electric powered tools shall not be altered from their designed configuration and purpose.

4.5.6. Stand-based pipe threading machines shall have foot controls.

4.6. Chop, Demolition and Concrete Saws

4.6.1. Operators shall inspect the machine and attachments prior to use.

4.6.2. Operators of demolition saws shall wear appropriate hearing protection, face protection, eye protection and leg protection.

4.6.3. The RPM rating of the cutting disc or blade shall exceed the rated RPM of the saw.

4.6.4. Blade rotation shall match the rotation of the power unit.

4.6.5. The blade shall be properly installed and secured.

4.6.6. When cutting concrete or masonry, wet methods shall be implemented where feasible. Dry cutting shall require the use of adequate ventilation and appropriate respiratory protection. For wet methods, use table 1.23 Control Methods – Crystalline Silica (starting on page 166).

4.7. Air Compressors and Pneumatic Tools

4.7.1. Compressed air exceeding thirty (30) p.s.i. shall not be used to remove debris from employees or clothing.

4.7.2. Air tanks shall be drained daily of accumulated liquid.

4.7.3. Air pressure shall be cut off from tools prior to disconnection.

4.7.4. Cold climates require proper maintenance to prevent freeze-up.

4.7.5. Hoses shall not be exposed to burning, crushing, solvents or other harmful substances.

4.7.6. Hose couplings shall be secured with an approved pin or whip-check device.

4.7.7. Hoses shall be repaired using a compression crimp method. (Water hose clamps are not permitted).

4.7.8. Hoses shall be inspected prior to use for any cuts, dry-rot or other damage.

4.7.9. Pressure-relief valves (safety valves) shall be checked periodically.

4.7.10. Rated operating pressures shall not be exceeded.

4.8. Hydraulic Powered Tools

4.8.1. Only Qualified and Authorized Persons shall operate hydraulic powered tools.

4.8.2. Hydraulic-powered tools shall have approved fluids per the manufacturer's specifications.

4.8.3. Fluid levels shall be checked to ensure proper operation.

4.8.4. Manufacturer's recommended operating pressures shall not be exceeded.

4.8.5. Hydraulic-powered tools used on Energized equipment shall have non-conductive hoses.

4.8.6. Couplings shall be inspected to ensure they are seated and connected.

4.8.7. Couplings shall have covers (caps) installed when not in use to keep connections clean and free of contaminants or damage.

4.8.8. Hydraulic-powered tools shall be designated for the type of system to which they are designed.

4.8.9. Hydraulic powered tools shall be disconnected from the source for service or repairs. The practice of “feeling” for hydraulic leaks is strictly prohibited due to hydraulic injection hazards.

4.9. Hand Tools

4.9.1. Hand tools shall be used for the intended purpose.

4.9.2. Hand tools shall have proper handles for use.

4.9.3. Impact tools shall be kept free of defects and damage such as mushroomed heads. (e.g., chisels, punches)

4.9.4. Cheaters or extensions shall not be used on hand tools unless the tool is designed for the purpose.

4.9.5. Conduit benders shall only be used for bending conduit.

4.9.6. Operators shall be aware of and avoid pinch points when using hand tools.

4.10. Chain Saws

4.10.1. Only Qualified and Authorized Persons shall operate chain saws.

4.10.2. Operators of chain saws shall wear appropriate PPE to include face, eye, hand, and leg protection.

4.10.3. Leg protection is not required when working from the bucket.

4.10.4. Anti-kickback devices shall be in place and operational.

4.10.5. Employees shall maintain a safe distance from the operator and saw while the tool is in use.

4.10.6. Guards shall be maintained in place and operational during use.

4.10.7. Blade guards shall be installed when not in use, and when stored.

4.11. Arc Welders Electric or Fuel Powered

4.11.1. Only Qualified and Authorized Persons shall use electric arc welders.

4.11.2. Leads, stingers and connectors shall be properly inspected and maintained.

4.11.3. Cables connected to the rod holder end (stinger) shall be free of damage.

4.11.4. Welding operations shall have appropriate barriers to protect personnel from the arc.

4.11.5. Current carrying parts shall be properly insulated.

4.11.6. Grounding cables shall be properly attached as close as possible to the welding location.

4.11.7. When unattended, the electrode shall be removed from the holder (stinger).

4.12. Fixed Machinery

4.12.1. Fixed machinery shall only be operated by Qualified and Authorized Persons.

4.12.2. Machines not designed for continuous operation shall be shut off when unattended or when work is complete.

4.12.3. Exposed rotating parts of machinery shall be guarded.

4.12.4. Point-of-operation guarding shall be installed and operational.

4.12.5. Machinery shall be hard-wired; temporary wiring is not permitted.

4.12.6. Operators shall wear appropriate PPE for the machinery.

4.12.7. Implement (bits, blades, etc.) replacements or machinery repairs shall require proper lockout/tagout procedures.

4.12.8. Fixed machinery shall have preventative maintenance performed per manufacturers recommendations and / or guidelines.

4.13. Jacks and Jack Stands

4.13.1. Jacks and jack stands shall not be loaded beyond their rated capacity.

4.13.2. Jacks shall be centered under the load and blocks or jack stands shall be placed under the load.

4.13.3. Jacks and jack stands shall be inspected prior to each use to ensure safe operation.

4.13.4. Jacks and jack stands shall be supported when placed on uneven or soft ground.

4.13.5. Blocking or jack stands shall be installed when employees work under a load.

4.13.6. Jacks used in freezing weather shall have appropriate fluids.

4.14. Grinders

4.14.1. Face shields with safety glasses or goggles shall be donned when operating grinders.

4.14.2. Grinding discs shall be visually inspected prior to each use.

4.14.3. Handles shall be in place and operational.

4.14.4. Grinding disks that have been dropped, acquired moisture or stored improperly shall not be used.

4.14.5. Manufacturer-supplied guards shall be in place and operational.

4.14.6. The RPM rating of the disc shall not exceed the RPM of the grinder.

4.14.7. Other employees shall not stand in front of a grinder when it is started or operated.

4.14.8. Grinders shall not be used on soft materials (wood, copper, brass).

4.14.9. Personnel shall be kept away from the spark trail.

4.14.10. A ring test shall be performed on all grinding wheels prior to installing on bench grinders.

4.15. Bench Grinders

4.15.1. Work rests shall be kept adjusted closely to the wheel with a maximum opening of one-eighth (⅛) inch.

4.15.2. Tongue-guard openings shall be adjusted to one-quarter (¼) inch.

4.15.3. Spark guards shall be installed and maintained as specified by the manufacturer.

4.15.4. Shields shall be installed and maintained as secondary protection for the face and eyes.

4.15.5. Bench grinders shall be permanently affixed to a stable surface.

4.15.6. Aluminum or other ferrous metals will not be worked on bench grinder wheels. This can result in unbalanced loading of the grinding wheel. Grinding wheels shall be selected for the intended metal to be worked on.

4.16. Hoists and Come-Alongs

4.16.1. Hoists and come-alongs shall be legibly identified with the maximum capacity.

4.16.2. Cables, chains or straps of the hoist or come-along shall not be wrapped around a load. Proper rigging shall be used to secure the load.

4.16.3. Employees shall use hoists and come-alongs in accordance with the manufacturer’s recommendations.

4.16.4. Hoists and come-alongs shall be inspected prior to use.

4.16.5. Hoists and come-alongs shall be attached to anchorages rated at or greater than the rating of the load or hoist.

4.16.6. Hoists with nylon straps designed for support of Energized conductors shall be Isolated from the structure.

4.16.7. Designed hooks shall have operable safety "keeper" latches in place.

4.16.8. Hoists shall be properly stored when not in use to prevent damage and excess corrosion.

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5. Motor Vehicles

5.1. General

5.1.1. Operators shall perform a complete walk-around inspection of the vehicle prior to movement.

5.1.2. Drivers shall have a valid driver's license of the appropriate class, including applicable endorsements for the vehicle being operated. Company vehicles shall only be operated by Company Authorized Persons.

5.1.3. The operator is responsible for the proper safe operation, daily maintenance, and cleanliness of his or her vehicle.

5.1.4. Each operator shall ensure that all occupants of a passenger vehicle wear safety belts at all times prior to placing the vehicle in motion.

5.1.5. The operator shall not permit persons to ride, stand or sit on the running boards, fenders, truck beds, or any other location not designed for passenger occupancy. Seats or stations designed for equipment operation shall not be utilized as a passenger seat.

5.1.6. Operators shall not permit unauthorized persons to drive, operate or ride in or on a company vehicle.

5.1.7. Employees shall not jump on or off vehicles, truck beds or trailer beds at any time.

5.1.8. Employees accessing vehicles with designated access points shall employ three points of contact when accessing or exiting the vehicle.

5.1.9. Operators shall not text, read, write, edit emails, or documents on cell phones, or operate any other portable device while operating any motor vehicle. Such activities shall be performed after the vehicle is safely out of active traffic lanes and all vehicle motion has stopped (parked). (Inclusive of all construction equipment.)

5.1.9.1. Cell phone use shall be in accordance with Federal, State, local area regulations and current Company policies.

5.1.10. Operators shall report any suspension, license restrictions or any violations to Management immediately.

5.1.11. Commercial vehicle operators shall immediately report any violation, citation, suspension, DUI (Driving Under the Influence), DWI (Driving While Impaired), reckless driving or license restriction as required by federal rules.

5.1.12. Hazardous spills or leaks shall be cleaned up and disposed of properly by Qualified and Authorized Persons and reported to Management and Safety.

5.1.13. Operators are responsible for loads transported on their vehicle and compliance with federal, state and local D.O.T. regulations.

5.1.14. Vehicles equipped with fuel tanks for transporting and dispensing shall be properly secured to the vehicle, equipped with a 20-B:C fire extinguisher, labeled and shall comply with motor vehicle regulations.

5.1.15. Motors or engines shall be shut off during refueling operations.

5.1.16. Adequate fire extinguishers shall be readily available on all commercial vehicles and as required by Management.

5.1.17. Vehicles with a GVWR above 10,001 pounds shall have a functioning backup alarm.

5.1.18. Trailer decks, truck beds and personnel access locations on vehicles shall be kept clean.

5.1.19. Non-highway vehicles shall not be operated on public roadways unless an escort is provided, or the vehicle is properly licensed or placarded.

5.1.20. Gross vehicle weight ratings (GVWR), Gross Combined Vehicle Weight ratings (GCVW), load ratings, and axle weight ratings shall not be exceeded.

5.1.21. Rollover Protection Systems (ROPS), if installed on vehicles, shall not be altered.

5.1.22. Equipment without a ROPS or overhead canopy does not require seatbelts.

5.1.23. Disabled vehicles shall be protected by appropriate flagging or triangles.

5.1.24. Wheel chocks shall be installed on all vehicles and trailers when parked unless:

5.1.24.1. Equipped with positive spring-type parking brake that is engaged.

5.1.24.2. An automatic transmission placed in park; or

5.1.24.3. Construction equipment with parking brake engaged.

5.1.25. When wheel chocks are required on parked vehicles, they shall be installed on the front and back of one drive wheel.

5.1.26. When wheel chocks are required on disconnected and parked trailers, they shall be installed on the front and back of one wheel.

5.1.27. Always use a spotter when backing vehicles and equipment. Use spotters front and rear when positioning equipment in confined or congested areas.

5.1.27.1. When additional personnel are not present, the driver shall verify the clearances prior to movement.

5.1.28. Operators shall check the height of the vehicle and the clearance from any overhead obstacles prior to traveling under the obstacle.

5.1.29. Operators shall ensure operator and safety manuals are maintained on the equipment.

5.1.30. Vehicles with outriggers, stabilizers or leveling jacks shall be operated with all devices extended and set per manufacturer specifications.

5.1.31. Operators shall ensure all personnel are clear of the stabilizer, outrigger or jack during raising and lowering, including the initial contact with the pad or ground surface.

5.1.32. Outriggers, stabilizers or leveling jacks shall always have pads to provide solid and secure footing.

5.2. Operation and Inspection

5.2.1. Operators shall comply with federal, state and local motor vehicle rules of the road.

5.2.2. Operators shall operate their vehicle in a safe manner and always employ defensive driving principles.

5.2.3. Operators of commercial vehicles shall perform and complete pre-trip inspections of vehicles prior to use and in compliance with federal, state and local regulations.

5.2.4. Operators shall perform walk-around inspections of the vehicle prior to movement.

5.2.5. Operators shall complete all daily required inspections to comply with D.O.T., federal, state, local, Customer and company regulations.

5.2.6. Department of Transportation (DOT)

5.2.6.1. A Commercial Driver's License (CDL) is required for the following vehicles.

a. Vehicles with a GVWR exceeding twenty-six thousand (26,000) pounds.
b. Vehicles in combination with a GCVW exceeding twenty-six thousand (26,000) pounds.
c. Vehicles in combination with a GCVW exceeding twenty-six thousand (26,000) pounds, and a trailer exceeding ten thousand (10,000) pounds GVWR require a Class A CDL.
d. Any vehicle designed to transport hazardous materials.
e. Any vehicle capable of hauling more than one-hundred nineteen (119) gallons of any liquid.

5.2.6.2. Business units shall maintain accurate and up-to-date driver files for each operator who may operate a vehicle exceeding ten thousand (10,000) pounds.

5.2.6.3. Business units shall maintain all required records of commercial vehicle operation in accordance with D.O.T. regulations.

5.2.6.4. Fleet department shall ensure annual vehicle inspections are current.

5.2.7. Licensing

5.2.7.1. CDL licensed drivers shall maintain a current DOT medical card.

5.2.7.2. Non-CDL operators may drive vehicles exceeding ten thousand (10,000) pounds but not more than twenty-six thousand (26,000) pounds. Operators of these

vehicles shall maintain a current DOT medical card and a valid road test in the driver file while operating a vehicle between 10,000 and 26,000 pounds.

5.3. Load Transport / Load Securement

5.3.1. Load binders shall be secured and checked before transport.

5.3.2. Load binders shall be of the ratchet type.

5.3.3. Chains used to secure loads shall be rated for transport.

5.3.4. Loads shall be properly secured and in compliance with federal, state and local regulations.

5.3.5. Tools, materials, equipment on flat or open-bed trucks or trailers shall be properly secured.

5.3.6. Loads shall be secured to prevent movement in any direction.

5.3.7. Loads shall be positioned so that they do not restrict vehicle movement.

5.3.8. Loads shall be positioned so that they distribute weight evenly over the axles of the trailer and/or truck.

5.3.9. Loads on vehicles or trailers require a minimum of two tie-downs:

5.3.9.1. Loads greater than eleven hundred pounds (1,100 lbs.) regardless of length.

5.3.9.2. Loads longer than five (5) feet in length but less than ten (10) feet in length; and

5.3.9.3. Loads longer than ten (10) feet in length require two (2) tie-downs within the forward ten (10) feet of the load and one additional tie-down for each ten (10) feet of length or fraction thereof beyond the first ten (10) feet.

5.3.10. Cargo within containers or large toolboxes shall be secured.

5.3.11. Inspect the load, straps, ratchets and binders after the first fifty (50) miles or thirty (30) minutes of travel and adjust as necessary.

5.3.12. Loads shall be inspected when the vehicle has been driven for three (3) hours, driven more than one-hundred fifty (150) miles or the driver makes a change-of-duty status; whichever occurs first.

5.3.13. Tie-down Working Load Limits (WLL) shall not be exceeded.

5.3.14. Loose debris shall be removed from vehicles, trailers or loads prior to transport.

5.3.15. Flagging is required when the vehicle or load exceeds the maximum vehicle dimensions specified by federal, state or local regulations.

5.4. Wire Reels, Reel Stands and Round Objects

5.4.1. Reel stands shall be secured to the vehicle to prevent movement while in transport.

5.4.2. Wire reels placed in reel stands shall be secured to prevent side shift.

5.4.3. Wire reels placed in reel stands shall have an additional tie-down to secure the reel to the trailer when transported, placed from the front to the rear of the trailer on each side of the spindle.

5.4.4. Reels not placed in reel stands shall be securely chocked and tied down to the bed of the vehicle.

5.4.5. Spindles shall be secured to the stand or the vehicle bed.

5.5. Power Poles

5.5.1. Vehicles used for pole transport shall be designed for the purpose.

5.5.2. Poles shall be secured by at least one tie-down for each ten (10) feet of length or fraction thereof, except pole handling trailers.

5.5.3. Tractors and trailers used to transport poles shall have a header board or cab protection. These vehicles require a second tie-down to be installed within ten (10) feet of the forward end of the load.

5.5.4. Poles shall be solidly packed, and the upper top of the bunk of poles shall have solid contact with the stakes or standards.

5.5.5. Poles shall not be loaded above the top of the stake or standard.

5.5.6. Poles shall be secured as a bundle in addition to being secured to the trailer.

5.5.7. Large diameter poles and stacked pole loads shall be chocked to prevent lateral movement.

5.5.8. Poles that are not held in place by other poles, stakes or standards shall be secured by tie-downs.

5.5.9. Large diameter poles that rise above bunks shall be secured to the underlying load with at least two additional tie-downs.

5.5.10. Poles or other items extending beyond the truck or trailer shall be flagged and/or lighted per Federal, State and local DOT regulations.

5.6. Aerial Equipment (Mobile Elevating Working Platform)

5.6.1. Only Qualified and Authorized Persons shall operate aerial equipment.

5.6.2. Aerial equipment shall be inspected prior to operation; lift controls shall be tested daily prior to use.

5.6.3. Lower controls and emergency-descent devices shall be checked for proper operation prior to use each day. Aerial lifts shall be positioned such that lower controls are accessible to rescue personnel.

5.6.4. Load limits of the platform capacity shall be posted and not exceeded.

5.6.5. Equipment operated by non-Electrically Qualified Persons shall maintain a minimum clearance of ten (10) feet from Energized parts rated at fifty (50) kV phase-to-phase or less; the minimum clearance for conductors rated over fifty (50) kV phase-to-phase shall be ten (10) feet + four (4) inches for each ten (10) kV over fifty (50) kV.

5.6.6. Annual dielectric tests are required for any equipment approved for use on Energized electrical systems and shall comply with ANSI A92.2. (Local area rules may be more stringent.)

5.6.7. Prior to elevation of the bucket or basket, all required inspections and operational checks shall be completed.

5.6.8. Materials, tools or equipment shall not be placed in a position where the items can potentially engage the controls.

5.6.9. Employees shall always stand firmly on the floor of the basket except when entering or exiting the basket. Employees shall not sit or climb on the rails or edge of the basket.

5.6.10. Side loading shall not be placed on an aerial device.

5.6.11. Climbers shall not be worn by employees in buckets or baskets.

5.6.12. Ladders, planks or other height-increasing objects shall not be used in baskets or buckets to gain additional elevation.

5.6.13. Employees in the basket shall utilize proper Personal Fall-Arrest Systems (PFAS) and securely connect to the approved anchorage locations or boom straps attached to the boom.

5.6.14. Employees shall not belt-off or tie-off to an adjacent structure or equipment while working from an aerial lift.

5.6.15. Employees transferring out of an elevated aerial lift shall use the proper fall protection to ensure one hundred percent (100%) fall protection. This activity is only permitted with a Site-Specific Task Plan approved by the Safety Department and Management.

5.6.16. When booms are positioned over active vehicle lanes, a spotter shall ensure the vehicle remains clear of the traffic lane. Booms shall be kept a minimum of sixteen (16) feet above the roadway elevation.

5.7. Bucket Trucks / Insulated Aerial Equipment

5.7.1. Fall protection equipment (PFAS) shall be donned and connected any time the bucket is out of the cradle position.

5.7.2. Riding in the bucket while the truck is traveling is not permitted.

Exception: Employees may ride in the bucket at the work location for short moves if the bucket is returned and secured in the cradle position for each move, fall protection equipment is used, and a Site-Specific Task Plan is approved by Management and Safety.

5.7.3. Lower or ground controls shall be plainly marked as to their function and shall not be operated unless the employee in the bucket has approved the use or in case of emergency.

5.7.4. Buckets shall have an approved bucket liner.

5.7.5. Booms shall be kept clean.

5.7.6. Holes shall not be drilled in the bucket or the bucket liner.

5.7.7. Hydraulic tool hoses shall be routed where they do not become entangled with the controls.

5.7.8. Outriggers shall always be deployed per manufacturer specifications with outriggers pads on all surfaces, unless for repair and inspection.

5.7.9. Employees on the ground shall be Insulated prior to contacting any part of the bucket truck or Insulated aerial equipment when the boom is positioned within the M.A.D. of Energized parts.

5.8. Material Handling Booms

5.8.1. Material handlers shall not be loaded beyond their rated capacity.

5.8.2. Material handlers shall be positioned so they are not side loaded.

5.8.3. All loads attached to the material handler shall be properly rigged so that the load cannot spin or move and contact the aerial boom.

5.9. Articulating Boom Lifts

5.9.1. Only Qualified and Authorized operators shall operate articulating boom lifts. Operators shall be knowledgeable of the aerial limitations of the equipment.

5.9.2. PFAS shall be donned and connected immediately upon entering the basket.

5.9.3. Equipment with extendable axles shall be deployed when required.

5.9.4. Gates and safety chains shall be secured prior to operating the lift.

5.9.5. Lifts shall be operated on surfaces which can support the machine. Operators shall maintain appropriate distances from holes, barricades and floor coverings.

5.10. Scissor Lifts

5.10.1. Only qualified and Authorized operators shall operate scissor lifts. Operators shall be knowledgeable of the aerial limitations of the equipment.

5.10.2. Gates and safety chains shall be secured prior to operation.

5.10.3. Lifts shall be operated on surfaces that can support the machine. Operators shall maintain appropriate distances from holes, barricades and floor coverings.

5.10.4. Do not elevate the lift on inclined surfaces.

5.10.5. PFAS are required when:

5.10.5.1. The employee's feet leave the platform floor; or

5.10.5.2. The employee is accessing a location outside of the platform.

5.11. Forklifts / Powered Industrial Trucks

5.11.1. Only Qualified and Authorized operators shall operate forklifts.

5.11.2. Operators shall:

5.11.2.1. Inspect the machine prior to the beginning of each shift the machine is used.

5.11.2.2. Don the seat belt prior to operation.

5.11.2.3. The operator shall not permit persons to ride, stand or sit on the running boards, fenders, truck beds, or any other location not designed for passenger occupancy.

5.11.2.4. Always be aware of their surroundings, including visibility, personnel walkways, blind corners, other vehicles, machinery, overhead obstacles, hazardous / classified areas, and uneven ground.

5.11.2.5. Descend and ascend ramps slowly and properly.

5.11.2.6. Place the forks on the ground when the machine is stopped or parked.

5.11.2.7. Never leave the machine running while unattended.

5.11.2.8. Never exceed the capacities of the equipment.

5.11.2.9. Use manufacturer-approved attachments.

5.11.2.10. Ensure all rigging is attached to a rigging attachment.

5.11.2.11. Travel at safe speeds so that loads are not displaced.

5.11.2.12. Ensure refueling / battery charging is performed in authorized locations.

5.11.2.13. Wear appropriate PPE when refueling / changing batteries.

5.11.2.14. Remove from service and affix an Out Of Service tag to any machine that is not operating properly;

5.11.2.15. Ensure loads are stable and secure on the forks; and

5.11.2.16. Secure unstable loads to the mast.

5.11.2.17. Use spotters when needed, or vision is impaired by the load and backing

5.11.3. When not in use, forklifts shall be parked on as level ground as possible with the parking brake set.

5.11.4. Operators shall be trained prior to operating a forklift.

5.11.5. Operators shall be retrained every three (3) years or when the operator is involved in an Incident or demonstrates a need for retraining.

5.12. ATV, UTV and Golf Cart

5.12.1. ATV, UTV and golf carts shall be operated at safe speeds and in the manner the equipment was meant to be operated that will not endanger the operator or any passengers.

5.12.2. ATV, UTV and golf carts shall only be used for their designated purpose; stunt driving, and horseplay shall not be permitted.

5.12.3. Fuel-powered vehicles shall only be refueled while the engine is off and in authorized locations.

5.12.4. Inspect the machine prior to the beginning of each shift the machine is used.

5.12.5. Passengers shall be seated in approved seating locations. If seat belts are provided, they shall be used at all times when the vehicle is in motion.

5.12.6. Operators shall not permit unauthorized persons to drive or operate the vehicle.

5.12.7. ATV, UTV and golf carts without rollover protection shall require employees to don DOT-approved head protection.

5.12.8. Three-wheel ATV vehicles are prohibited.

5.13. Earth-Moving Equipment

This section includes rules for equipment such as dozers, excavators, backhoes, loaders, compactors and skid steer equipment.

5.13.1. Only Qualified and Authorized persons shall operate earth-moving equipment.

5.13.2. Operators shall conduct a documented inspection of the equipment prior to use and each shift that the machine is used.

5.13.3. The limitations of the equipment shall not be exceeded.

5.13.4. Seatbelts shall be worn at all times while traveling.

5.13.5. Employees shall not work under an elevated bucket, boom or earth-moving attachment unless the attachment has been properly secured.

5.13.6. Operators shall ensure other persons are clear of the machine's operating radius, travel path and stabilizer or outrigger travel path.

5.13.7. Operators shall position equipment where it will not cause a cave-in or soil displacement to excavations or undisturbed soils.

5.13.8. Equipment shall not be used as hoisting equipment unless designed for the purpose.

5.14. Digger Derricks

5.14.1. Operators must read and understand the manufacturer owner's manual and load charts for the equipment used.

5.14.2. Only Qualified and Authorized persons shall operate digger derricks.

5.14.3. Employees shall maintain a safe distance when cradling and uncradling the auger. An audible warning must be given by the operator.

5.14.4. The strap to cradle and uncradle the auger shall be inspected prior to stowing the auger.

5.14.5. Employees replacing auger bits or changing auger bits shall be trained on pinch points.

5.14.6. Employees shall maintain a safe distance from the auger during operation.

5.14.7. Prior to stowing the auger, ensure it is clean and free of debris.

5.14.8. If augured holes are going to be left unattended, an appropriate means of covering the hole will be provided.

5.14.9. Employee shall not utilize a digger derrick or pressure digger as an anchor point for fall protection unless a site-specific plan is documented that includes red tagging the equipment.

5.14.10. For holes being dug greater than or equal to 36 inches in diameter and greater than 4 feet in depth, employees shall be protected from falling in the hole.

5.15. Cranes

5.15.1. Only Qualified and Authorized persons shall operate cranes.

5.15.2. Crane Operators shall be certified by a Nationally Accredited Program such as EICA or NCCCO, etc.

5.15.2.1. Operators in training can operate cranes under the direct supervision of a certified operator.

5.15.3. Jibs and pin-on man baskets shall be approved by the manufacturer.

5.15.4. Cranes shall never, under any circumstance, be in override to attempt to exceed crane manufactures recommendations.

5.15.5. All Critical lifts require a developed Critical Lift Plan and a pre-lift meeting to discuss the specifics of the plan.

Reference Link: *Critical Lift Plan*

5.15.6. A “Critical Lift” is defined as one that exceeds 75% of the rated capacity of the crane or derrick; or requires the use of more than one crane; or when lifting personnel.

5.15.7. Employees shall not ride the hook, ball, sling or load.

5.15.8. When the load has the potential to swing or spin, the load shall have at least one tag line.

5.15.9. The operator shall never leave a suspended load unattended.

5.15.10. Employees shall only work under suspended loads when a Site-Specific Task Plan has been approved by Management and Safety.

5.15.11. Warning labels for outriggers, electrical clearances, M.A.D. distance charts and manufacturer-required labels shall be installed where required and visible to the operator.

5.15.12. Before a lift is performed, a lift plan shall be completed by the operator to verify and ensure:

- 5.15.12.1. Operators manual must be read and understand the manufacture owner's manual and load charts.
- 5.15.12.2. Daily inspections are completed and documented prior to use.
- 5.15.12.3. Appropriate load charts are provided and available for each configuration.
- 5.15.12.4. Load chart ratings are not exceeded.
- 5.15.12.5. Functional tests are performed.
- 5.15.12.6. Crane leveled within 1% and approved outrigger pads are placed under each outrigger float.
- 5.15.12.7. The crane has a current annual inspection.
- 5.15.12.8. Loads do not exceed the capacity of the crane.
- 5.15.12.9. The crane maintains a safe distance from power lines.
- 5.15.12.10. The super structure swing radius is properly barricaded.
- 5.15.12.11. Every crew member understands and can identify the stop signal;
- 5.15.12.12. One qualified signal person has been identified for the lift;
- 5.15.12.13. Outrigger pads are placed under each outrigger;
- 5.15.12.14. All factors reducing capacity have been evaluated.

CAUTION:
Load Moment Indicators (LMI) are operational aids, never use the LMI in place of a load chart. Always refer to the load chart prior to each lift to ensure the load is within the capacity of the crane.

5.15.13. The Person-In-Charge shall ensure that only qualified signal persons are providing appropriate hand signals identified in Table 5.10.

5.15.14. The Person-In-Charge shall ensure one Qualified rigger is stationed at each location where loads are connected.

5.15.15. Crane operations performed by Electrically Qualified Persons shall not encroach closer than the M.A.D. (Reference Section 1.8). If work tasks require encroachment, appropriate Insulating, Isolating or Deenergizing techniques shall be implemented.

5.15.15.1. Non-Electrically Qualified crane operators can encroach closer than the twenty (20) feet requirement only when supervised by Electrically Qualified Person(s).

5.15.16. Crane operations performed by Non-Electrically Qualified Persons that are closer than twenty (20) feet to the power line shall require a Site-Specific Task Plan and:

5.15.16.1. The work is not feasible to complete without breaching the distances identified in Table 5.9.

5.15.16.2. The Customer states that the line cannot be Deenergized and Grounded.

5.15.16.3. Spotters shall be provided if any part of the crane may encroach closer than twenty (20) feet; and

5.15.16.4. The distances specified shall not be encroached.

Table 5.9 Minimum Clearance Distances / Non-Electrical Qualified Personnel

Nominal AC Voltage	Minimum Clearance Distance (Feet)
Up to 50 kV	10
Over 50 kV to 200 kV	15
Over 200 kV to 350 kV	20
Over 350 kV to 500 kV	25
Over 500 kV to 750 kV	35
Over 750 kV to 1,000 kV	45
Over 1,000 kV	Established by Customer

5.15.17. Lifting of personnel is permitted with pin-on baskets when:

5.15.17.1. A Critical Lift Plan has been developed.

5.15.17.2. The basket, attachment, pins and connection are inspected, documented and verified prior to each lift by a Qualified Person.

5.15.18. Pin-on baskets used with boom trucks shall not exceed the capacity, rating, or scope recommended by the manufacturer.

5.15.19. Hoisting of personnel with suspended baskets shall be permitted only when boom-attached baskets cannot access the work area and the following are completed:

5.15.19.1. The basket, attachment, bridle, and connections are designed and approved for hoisting operations.

5.15.19.2. The operator remains at the operator station while personnel are elevated.

5.15.19.3. A trial lift has been completed that verifies the location, reach and clearances.

5.15.19.4. A proof test has been completed.

5.15.19.5. The personnel platform is not overloaded.

5.15.19.6. The total weight of the load, (basket, personnel, material and tools) does not exceed fifty percent (50%) of the rated capacity for the radius and configuration.

5.15.19.7. An anti-two-block device is installed, tested and operational.

5.15.19.8. The LMI shall be set in the correct crane configuration with the correct operating code.

5.15.19.9. The load line, if capable of a free fall, has this function disabled.

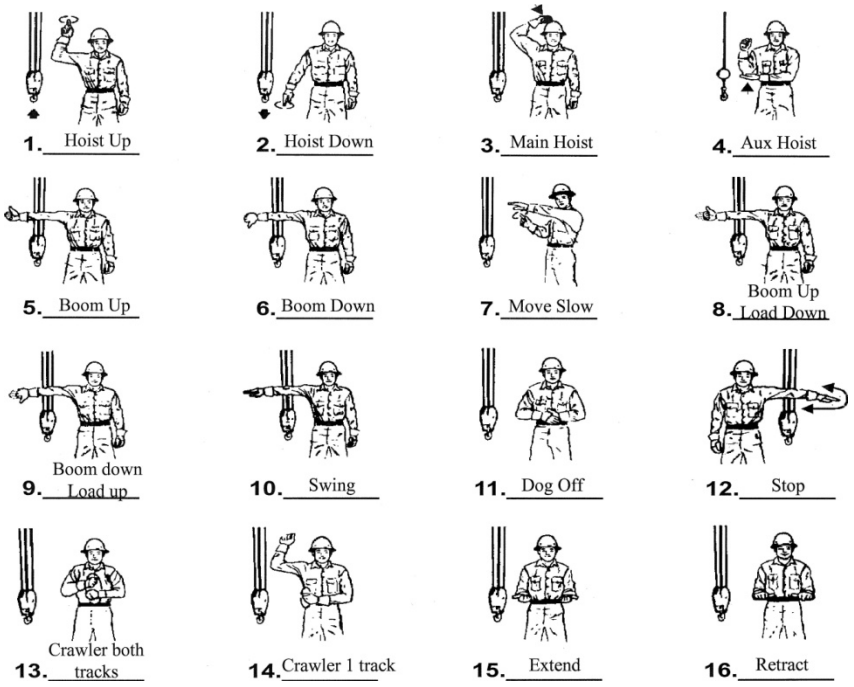
5.15.19.10. Wind speed is less than twenty (20) mph at the personnel platform.

5.15.19.11. If wind speed exceeds twenty (20) mph, the operator must determine if the wind speed creates an unsafe operating condition

5.15.19.12. These rules are completed for each crane setup location; and

5.15.19.13. A pre-lift meeting is completed and documented.

Table 5.15 Approved Hand Signals



5.16. Training

5.16.1. Specific training shall be required for company-owned or leased equipment. Equipment identified below may require operator licensing and/or training; this list is not inclusive:

5.16.1.1. Forklifts.

5.16.1.2. Aerial lifts—boom lifts.

5.16.1.3. Cranes.

5.16.1.4. Scissor lifts.

5.16.1.5. Off-highway vehicles on MSHA-regulated property.

5.16.1.6. Commercial vehicles; and

5.16.1.7. Digger Derricks.

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6. Chemicals / Hazardous Materials

6.1. General

6.1.1. Management shall develop, maintain and administer a written Hazard Communication program.

6.1.2. Hazardous, flammable or combustible materials shall be stored in designated locations.

6.1.3. Hazardous materials shall not be stored in or near egress routes.

6.1.4. Employees shall receive training on the types of chemicals or hazardous materials they may be exposed to in the workplace. Training will include familiarization with Global Harmonizing System (GHS).

6.1.5. Employees who use, transport, dispose of or disturb chemicals or hazardous materials shall be trained in the proper use, disposal, storage and PPE requirements for the substance.

6.1.6. Chemicals or materials shall be kept in the original container. Transfer of chemicals or materials is permitted for quantities limited to one-day use.

6.1.7. All containers shall be labeled. Unlabeled containers are not permitted.

6.1.8. Spills or leaks shall be cleaned up and disposed of properly.

6.1.9. Containers shall be disposed of properly.

6.1.10. Storage tanks shall have secondary containment or be a double-walled tank.

6.1.11. Regulated materials, (explosives, radioactive) shall only be handled, stored or transported by Qualified and Authorized Persons.

6.1.12. In any workplace with a threshold quantity of highly hazardous chemicals, the Management shall establish a Process Safety Management compliance plan. Employees shall not work in a PSM covered process without training and authorization.

6.1.13. In any workplace involved in hazardous waste cleanup or emergency response the Management shall establish a Hazardous Waste Operations and Emergency Response plan. Employees shall not work in a HAZWOPER process without training and authorization.

6.2. Flammable and Combustible Liquids

6.2.1. Flammable and Combustible Liquids shall be stored in approved and properly labeled safety cans.

6.2.2. Portable tanks and containers containing Flammable or Combustible Liquids shall be labeled with the material type and no-smoking signage.

6.2.3. Flammable and Combustible Liquids shall be stored in an approved storage cabinet.

6.2.4. Flammable and Combustible Liquid storage cabinets shall be Grounded or ventilated.

6.2.5. Approved Bonding connections shall be attached during transfer of Flammable Liquids from a container to another container (tankers delivering fuel to site bulk tank).

6.2.6. Motors and engines shall be shut off during refueling.

6.2.7. Indoor storage of Flammable and Combustible Liquids shall not be in or near egress paths.

6.3. Compressed Gases

6.3.1. General

6.3.1.1. If cylinders are equipped with caps, they shall be in place for storage, transport, and handling.

6.3.1.2. Cylinders in use shall be secured and positioned upright.

6.3.1.3. Cylinder valves shall be checked to ensure they are closed.

6.3.1.4. Cylinders shall be “cracked” to ensure the throat is free of debris. Cracked means opening the valve slightly and then closed immediately.

6.3.1.5. Compressed gases shall only be used when supplied with appropriate regulators, valves and hoses for the type of gas.

6.3.1.6. Never interchange regulators and hoses with different gases.

6.3.1.7. Compressed gas cylinders shall never be taken into Confined Spaces or Enclosed Spaces.

6.3.1.8. Gases shall not be transferred from cylinder to cylinder.

6.3.1.9. Cylinder storage shall comply with Rule 6.3.30 to 6.3.37.

6.3.1.10. Cylinders shall not be used as rollers or supports.

6.3.1.11. Cylinders shall have pressure relief devices installed and maintained according to the manufacturer or supplier instructions.

6.3.1.12. If a leak develops at the cylinder, the cylinder shall be removed from the work area.

6.3.2. Oxygen

6.3.2.1. Oxygen shall be stored a minimum of twenty (20) feet from combustible gas cylinders (propane, acetylene, etc.) or separated by a thirty- (30) minute fire-rated wall with a minimum height of five (5) feet.

6.3.2.2. Oxygen gauges, valves and hoses shall be free of oil, grease, dirt and other contaminants.

6.3.2.3. Oxygen hoses, attachments, regulators or valves shall not be lubricated, cleaned or maintained with oil, grease or other petroleum products.

6.3.3. LPG (Propane Gas)

6.3.3.1. LPG storage tanks and equipment used within buildings shall be equipped with a flow shutoff valve.

6.3.3.2. LPG storage tanks less than five hundred (500) gallons shall be placed at least ten (10) feet from an occupied building. Larger storage tanks shall be positioned per OSHA and fire department regulations.

6.3.3.3. LPG shall not be stored inside of buildings.

6.3.3.4. LPG tank valves shall not be cracked in an area where sparks, heat or flames are present. Cracked means opening the valve slightly and then closed immediately.

6.3.4. Acetylene / Hydrogen (Fuel Gas Cylinders)

6.3.4.1. Fuel gas cylinder valves shall not be cracked in an area where sparks, heat or flames are present.

6.3.4.2. Acetylene cylinders shall be stored, transported and operated upright at all times.

6.3.4.3. Acetylene cylinder valves shall only be opened ¼ to 1 turn to facilitate quick closing.

6.3.4.4. Acetylene cylinder valve wrenches shall remain in place on the valve during operation.

6.3.4.5. Acetylene pressure in hoses shall never exceed fifteen (15) p.s.i. at any time.

6.3.5. CO^2 Carbon Dioxide

6.3.5.1. CO^2 gas shall not make contact with exposed portions of the body.

6.3.6. Inert Gases

6.3.6.1. Inert gases such as argon, neon and others shall be stored in areas separate from oxidizers or fuel gas cylinders.

6.3.7. Storage / Transport and Handling

6.3.7.1. Cylinders shall be stored:

a. Away from vehicle and pedestrian passages;
b. In an upright position;
c. Oxygen shall be stored a minimum of twenty (20) feet from combustible gas cylinders (propane, acetylene, etc.) or separated by a thirty- (30) minute fire-rated wall with a minimum height of five (5) feet with valves closed and caps installed; and
d. With similar materials grouped together.

6.3.7.2. Cylinders shall meet DOT regulations.

6.3.7.3. Cylinders shall be secured while in storage, during use and transport to prevent tipping or displacement.

6.3.7.4. Cylinders shall have caps in place during storage, transport and handling. In-use safety caps are recommended for all cylinders.

6.3.7.5. Cylinders transported over public roadways shall be secured per DOT load-securement requirements.

6.3.7.6. All compressed gas cylinders shall be stored in areas where they are not subject to heat or flame or temperatures exceeding 125°F (52°C).

6.3.7.7. Cylinders shall remain upright at all times except for short periods of time during hoisting or lifting.

6.3.7.8. Hand carrying of cylinders exceeding thirty (30) pounds is not permitted.

6.3.7.9. Explosives

6.3.7.10. Explosives shall only be permitted with a Site-Specific Task Plan approved by Management.

6.3.7.11. Explosives includes any operation involving dynamite, blasting caps, implosive sleeves, black powder, detonating cord, 2-part explosives, ignition safety fuses, igniters or igniter cord.

6.3.7.12. Please contact the Safety Department for additional requirements regarding blasting or explosives.

6.3.7.13. Only Qualified and Authorized Persons shall handle, store, transport or use explosives.

6.3.7.14. Employees shall comply with manufacturer specific guidelines and federal, state, and local regulations.

6.3.8. Acids and Caustics

6.3.8.1. Only Qualified and Authorized Persons shall handle acids or caustics.

6.3.8.2. Employees shall wear the appropriate PPE and have available the proper reagent material to inert the chemical. Refer to the material specific SDS for the hazard assessment.

6.3.8.3. Acids and caustics shall be stored in designated areas and in proper containers. Acids and caustics shall not be stored in metallic containers.

6.3.9. Combustible Metals

6.3.9.1. The only combustible metal approved for use is the metallic component of an explosive that is supplied as a manufactured product. (Cad-Weld, Implosive Sleeves, etc.). Contact the Safety Personnel for air sampling requirements / results.

6.3.9.2. Combustible metals such as sodium, potassium, lithium, and magnesium are prohibited.

6.3.10. Chemical or Liquid Transfer

6.3.10.1. Only Qualified and Authorized Persons shall transfer chemicals, liquids or hazardous materials.

6.3.10.2. Transfer shall only be performed in designated areas with adequate ventilation and adequate spill-prevention materials.

6.3.10.3. Transfer of liquids with splash potential shall require the use of face shields, splash-proof goggles, gloves and body protection; refer to material-specific Safety Data Sheet (SDS), formerly known as MSDS.

6.3.10.4. Appropriate first-aid supplies, showers or eye wash stations shall be available in the transfer area.

6.3.10.5. Secondary containers shall be labeled:

6.3.10.6. Labeling shall be easily identifiable and identified by the common trade name of the substance. Labeling options are the trade name, the NFPA diamond or the HMIS label.

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7. Excavations

7.1. General

7.1.1. Competent Person (s) shall be at the work site at all times while employees are working in excavations.

7.1.1.1. Another competent person shall be designated if the original competent person is unable to be present.

7.1.2. Only Qualified and Authorized Persons shall work in or around excavations.

7.1.3. The local utility-locating service shall be notified in accordance with the locating service requirements prior to the start of excavating activities. The Person-In-Charge shall verify that the notification and marking is completed.

7.1.4. Compliance with local area rules shall determine the distance from each side of the utility-locate mark.

7.1.5. Final locations of underground utilities shall be determined by safe means prior to mechanical excavation. If unable to determine location by safe means, stop work and contact Management/Supervision before proceeding.

7.1.6. Exposed utilities and encumbrances shall be adequately supported and protected from damage.

7.1.7. Employees, pedestrians and vehicular traffic shall be protected from excavation hazards to the level determined by the Competent Person.

7.1.8. Excavations shall be barricaded if left open past the end of the work shift to the level determined by the Competent Person. Barricades shall be capable of deterring access to the excavation from expected sources, e.g., pedestrians, vehicular traffic, etc. Warning tape is not considered to be an effective barricade for this application.

7.1.9. Excavations performed within the buffer zone to buried facilities shall be done by non-destructive means.

7.1.10. Water accumulation around and in the excavation shall be prevented. Standing water shall be removed from the excavation.

7.1.11. If the Competent Person suspects the presence of, or the potential for, a Hazardous Atmosphere in excavations in excess of four (4) feet deep, the atmosphere shall be tested. Testing shall determine the work procedures in compliance with Confined Space safety rules.

7.1.12. Employees shall be protected from spoils, materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least two (2) feet from the edge of the excavation, or by the use of retaining devices that are sufficient to

prevent materials or equipment from falling or rolling into excavations, or by a combination of both, if necessary.

7.1.13. The Competent Person shall inspect excavations prior to employees entering the trench and after each change in conditions.

7.1.14. If an unknown material or substance is encountered, Safety and Management must be notified before proceeding. A soil test may be warranted.

7.1.15. Excavations exceeding twenty (20) feet in depth in which employees may enter shall be designed and engineered by a professional engineer.

7.1.16. The Competent Person shall complete the Excavation / Trenching form prior to employees entering the excavation.

7.2. Employee Protection

7.2.1. Employees shall be protected from cave-ins and falling objects in excavations of any depth.

7.2.2. Excavations at or exceeding five (5) feet in depth which employees may enter shall have protective methods installed for employee protection. Methods to provide protection are sloping, benching, shielding or shoring.

7.2.3. Sloping or benching shall comply with the angles specified:

7.2.3.1.	Class A soil;	1/2:1	53°
7.2.3.2.	Class B soil;	1:1	45°
7.2.3.3.	Class C soil;	1½:1	33°

7.2.4. Employees shall be provided with safe means of entry and egress. Ladders or ramps shall be stationed within twenty-five (25) feet of any employee in the excavation. Ramps shall be designed such that an employee can walk upright.

7.2.5. The Competent Person shall determine the appropriate fall protection system for employees working near excavations.

7.2.6. Employees working near traffic shall wear approved retro-reflective clothing.

7.2.7. Employees working near machinery shall wear approved high-visibility clothing.

7.2.8. Equipment shall be positioned to eliminate the potential of cave-ins. If equipment is required to be at the edge of an excavation, the excavation shall be shored or braced to prevent displacement or cave-in.

7.2.9. Employees shall not cross excavations exceeding two (2) feet in width and four (4) feet in depth. Excavations exceeding these dimensions that are to be crossed shall have appropriate walkways with guard rail systems.

7.2.10. Unattended wells, pits, shafts, boreholes, etc. shall be covered.

7.2.11. Employees working near or adjacent to wells, pits, shafts, boreholes, etc. that cannot be covered and are larger than three (3) feet in diameter and four (4) feet in depth shall implement the following:

7.2.11.1. Establish a highly visible zone at a minimum of six (6) feet from each side of the excavation.

7.2.11.2. Employees crossing into the identified zone shall be protected from falls by a personal fall-arrest system or proper fall restraint.

7.2.12. Employees shall not enter wells, pits, shafts, boreholes and other confined excavations without approval from Management and Safety.

NOTE: Wells, pits, shafts in excess of four (4) feet may be classified as a Confined Space.

7.2.13. Electrically Qualified Persons exposing, working on or near, working in close proximity to, or hand excavating near Energized underground electrical conductors shall wear appropriate rubber insulating PPE.

7.2.14. If displacement, cracking, settling or other hazards are present or develop, all employees shall exit the trench and the Competent Person shall evaluate the condition.

7.2.15. Employees shall not re-enter an excavation until the hazard has been corrected to permit safe entry.

7.3. Soil Classification / Soil Testing

7.3.1. The Competent Person shall classify the soil materials.

7.3.1.1. The soil classification shall be based upon a minimum of one visual observation and one manual analysis.

7.3.2. Multiple soil types may be present, and the least stable soil type shall determine the type of protection to be implemented.

7.3.3. The Competent Person shall determine the protective system based upon the soil classification.

7.4. Shoring and Shielding

7.4.1. Shoring and shielding components shall have the manufacturer data at the work site.

7.4.2. Shoring and shielding shall be capable of withstanding the intended loads and installed per manufacturer specifications.

7.4.3. The Competent Person shall inspect the shoring or shielding each day, if conditions change or if the components are altered.

7.4.4. Shoring or shielding with visible damage that compromises the integrity of the system shall not be installed. If components are damaged during use, all employees shall exit the excavation immediately; then the component shall be repaired or replaced.

7.4.5. Installation of the components shall be performed so that employees are protected at all times.

7.4.6. Removal of the components shall be performed so that employees are protected at all times. If employees must enter the excavation for removal, then removal shall occur from the bottom of the trench and proceed upward. Jacks or braces shall be released slowly to prevent collapse.

7.4.7. Protective systems for excavations exceeding twenty (20) feet in depth shall be designed by a professional engineer.

7.5. Damage to Underground Utilities

7.5.1. If underground utilities (electric, water, communications, sewer, gas, storm water, TV) are damaged, the facility owner and Management shall be immediately notified.

7.5.2. The area shall be barricaded, and unauthorized personnel shall be kept at a safe distance.

7.5.3. If a gas facility is damaged:

7.5.3.1. Evacuate non-essential personnel from the area.

7.5.3.2. Eliminate sources of ignition.

7.5.3.3. Secure the damaged area.

7.5.3.4. Contact the operator; and

7.5.3.5. If buildings are in the area, warn and notify the occupants downwind.

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8. Confined / Enclosed Spaces

8.1. General

8.1.1. Only Qualified and Authorized Persons can enter Confined Spaces or Enclosed Spaces.

8.1.2. Employees are prohibited from entering Permit Required Confined Spaces without specific written authorization (e.g., permit or documented reclassification.)

8.1.3. Competent Person(s) shall be present at all times when employees are entering or working in the space.

8.1.4. The Competent Person shall:

8.1.4.1. Identify and inventory Confined Spaces to be entered by the employees.

8.1.4.2. Classify the space in one of the following categories: Permit-Required Confined Space; Re-Classified Confined Space (Non-Permit-Required Confined Space); or Enclosed Space. (Reference Rules 8.1.11, 8.1.12 and8.6.1)

8.1.4.3. Specify acceptable entry conditions and any necessary isolation, purging, inerting and/or ventilation.

8.1.4.4. Develop and implement a rescue plan prior to entry.

8.1.4.5. Identify the Authorized Persons to enter the space (entrants) and the Authorized Persons who shall stay outside the space (attendants).

8.1.4.6. Ensure the entrants and the attendants fulfill their responsibilities.

8.1.4.7. Initiate and control the entry permit.

8.1.4.8. Ensure acceptable entry conditions are achieved.

8.1.4.9. Ensure issuance and cancellation of permits.

8.1.4.10. Document the information on Form # 40.0021; and

8.1.4.11. Ensure compliance with rules contained in this section.

8.1.5. Entrants shall:

8.1.5.1. Be knowledgeable of the space hazards and signs of exposure.

8.1.5.2. Don all appropriate PPE prior to entering.

8.1.5.3. Maintain communication with the attendant at all times.

8.1.5.4. Exit the space when adverse conditions are present (e.g., alarm event occurs, warning signs of overexposure are present or, an evacuation command is announced); and

8.1.5.5. Alert the attendant of adverse conditions.

8.1.6. Attendants shall:

8.1.6.1. Be stationed at the entry location while employees are entering or working in the space.

8.1.6.2. Know the existing and potential hazards.

8.1.6.3. Know the signs of overexposure.
8.1.6.4. Maintain communication with the entrants.
8.1.6.5. Ensure proper operation of ventilation and air-monitoring equipment.
8.1.6.6. Order evacuations when an adverse condition is identified.
8.1.6.7. Perform non-entry rescues when possible.
8.1.6.8. Remain outside the space at all times.
8.1.6.9. Summon rescue or emergency services.
8.1.6.10. Ensure unauthorized persons do not enter the work area or space; and
8.1.6.11. Not perform duties that interfere with these rules.

8.1.7. Guardrails or barriers shall be erected to prevent falls or falling objects into Confined Spaces or Enclosed Spaces.

8.1.8. Employees may not enter the space prior to achieving acceptable entry conditions unless supplied-air respirators are provided for all entrants.

8.1.9. Employees may not enter IDLH (Immediately Dangerous to Life and Health) environments. Contact Safety Personnel for more information.

8.1.10. If a Hazardous Atmosphere or other hazard is introduced, all employees shall immediately exit the space.

8.1.11. Enclosed Space entry shall comply with Sections 8.1 to 8.5 and require:

8.1.11.1. Retrieval equipment to be at the work location; and
8.1.11.2. Attendants to be positioned at the entrance to the space.

8.1.12. An Enclosed Space containing hazards other than electrical components shall be classified as a Permit Required Confined Space and reclassified by Section 8.7.

8.1.13. Spaces may be declassified per Company procedures.

8.1.14. Each district office shall complete an evaluation of the program and forward changes or recommendations to the VP Safety annually.

8.2. Atmospheric Testing / Monitoring

8.2.1. Only Qualified and Authorized employees shall operate test instruments.

8.2.2. Competent Person(s) shall attempt to identify potential toxic chemicals that could affect the space during space evaluation. These potential toxic chemicals shall be monitored.

8.2.3. Testing around the perimeter of the opening shall occur prior to removing the cover.

8.2.4. Testing shall be performed prior to each entry.

8.2.5. Testing shall occur at the top, middle and bottom of the space.

8.2.6. The breathing zone of Entrants working in the space shall be tested.

8.2.7. Testing of the space shall be performed and verified prior to any employee entering the space. Any employee may observe the testing.

8.2.8. Testing shall be continuous for Confined and Enclosed Spaces.

8.2.9. If the testing device fails or sounds an alarm, all employees shall immediately exit the space.

8.3. Ventilation

8.3.1. Purging of the space shall occur prior to employees entering the space.

8.3.2. Spaces shall be continuously ventilated while employees are in the space.

8.3.3. Ventilation equipment shall be positioned so that contaminated atmospheres are not captured by the ventilation fan and blown into the space.

8.4. Rescue

8.4.1. Only Qualified and Authorized persons may enter a space to perform a rescue if properly equipped.

8.4.2. Rescue personnel and equipment shall be readily available at the entry location.

8.4.3. Employees, contractors, or others performing rescues shall be informed of the hazards and don the appropriate retrieval equipment to aid in rescue.

8.4.4. Rescue equipment shall be inspected before employees enter the space.

8.5. Test Instrument Calibration

8.5.1. Only Qualified and Authorized Persons shall calibrate and bump-test instruments.

8.5.2. Instruments shall be calibrated and bump-tested per manufacturer requirements.

8.5.3. Instruments shall have the date of the last calibration or an internal electronic date in the software of the instrument.

8.6. Permit Required Confined Space Reclassification

8.6.1. Non-Permit Entry

8.6.1.1. Spaces may be reclassified as a Non-Permit Confined Space provided that:

8.6.1.2. The space does not contain any potential or actual Hazardous Atmosphere.

8.6.1.3. All other hazards are eliminated without entry; (e.g. a new underground vault without conductors)

8.6.1.4. The space remains reclassified for as long as the hazards remain eliminated.

8.6.1.5. The space has continuous atmospheric monitoring.

8.6.1.6. The proper forms are completed for documentation; and

8.6.1.7. If any hazards are identified or develop, all Entrants shall immediately evacuate the space.

8.6.2. If Entrants are evacuated, the space shall be reevaluated and designated as a Permit-Required Confined Space if hazards cannot be controlled.

8.6.3. Alternate Entry

8.6.3.1. Spaces may be reclassified as an alternate entry provided that:

8.6.3.2. The space only contains an actual or potential Hazardous Atmosphere.

8.6.3.3. All other hazards are eliminated without entry (e.g. a wastewater / sewer vault).

8.6.3.4. The space maintains acceptable entry conditions by forced air ventilation.

8.6.3.5. The space has continuous atmospheric monitoring.

8.6.3.6. The proper forms are completed for documentation; and

8.6.3.7. If a Hazardous Atmosphere is detected, all Entrants shall immediately evacuate the space. The space shall be reevaluated, and the source of the Hazardous Atmosphere shall be identified and mitigated prior to re-entry.

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9. Welding, Cutting and Grinding

9.1. General

9.1.1. Only Qualified and Authorized Persons shall perform welding, cutting or grinding.

9.1.2. Fire-prevention procedures shall be implemented when welding, cutting or grinding.

9.1.3. Oxygen, acetylene and propane tank rules are provided in Section 6.3.

9.1.4. Fire protection equipment rules are provided in Section 1.12.

9.1.5. Welders shall wear an appropriate helmet with the proper shade for the type of weld process. Helpers positioned to hold or support the materials shall wear the same level of protection as the welder.

9.1.6. Face shields shall be worn when chipping slag, removing scale, or any grinding activities.

9.1.7. Welding or cutting on galvanized materials or stainless steel shall require a well-ventilated area, local area ventilation or respiratory protection.

9.1.8. Leather gauntlets and appropriate clothing shall be worn while welding, cutting or grinding.

9.1.9. Sparks, hot embers or fire shall be contained in the work area by installing appropriate barriers such as fire blankets, barriers or flash screens.

9.1.10. Welding shall not be performed in areas containing a Hazardous Atmosphere.

9.1.11. Welding screens shall be positioned to ensure other personnel are protected from the arc.

9.1.12. Employees shall keep their face out of the fume or smoke plume, or respiratory protection shall be donned.

9.1.13. Never hold two electrode holders, or one electrode holder and a torch, at the same time. An employee shall only hold one (1) welding device at a time unless the welding devices are Deenergized.

9.1.14. Welding operations in Confined and Enclosed Spaces shall be in compliance with Section 8.

9.2. Electric Arc Welding

9.2.1. Current carrying cables shall be inspected prior to use and rated for the anticipated current.

9.2.2. Cable connectors shall be adequately secured.

9.2.3. The cable to the electrode holder end (stinger) shall be free of damage.

9.2.4. Electrode holders (stinger) left unattended shall have the electrode (rod) removed and the holder placed away from employees and conductive objects.

9.2.5. Grounding connections shall be placed as close as possible to the work location.

9.2.6. Current-carrying cables shall be routed away from unauthorized personnel.

9.2.7. Cables and rod holders shall be routed away from water and not dipped in water.

9.2.8. Damaged cables shall be repaired prior to use.

9.2.9. Connections shall be inspected prior to each use.

9.2.10. Connections and cable connectors shall have the appropriate rating and insulation.

9.3. Oxyacetylene Torch Welding and Cutting

9.3.1. Hoses, torches and connections shall be inspected prior to each use.

9.3.2. Fuel and oxygen hoses shall be readily distinguishable from each other either by color.

9.3.3. Cylinders shall be “cracked” prior to connection to a regulator. Cracked means opening the valve slightly and then closed immediately.

9.3.4. Oxygen hoses, fittings and couplings shall be free of petroleum products at all times. Proper cleaning methods shall be employed.

9.3.5. Cylinders shall be placed:

9.3.5.1. At a sufficient distance away from the welding operation.

9.3.5.2. Where they will not contact an electric circuit or an electrode; and

9.3.5.3. In locations where they are not exposed to excessive heat.

9.3.6. Torches and torch tips shall be cleaned with appropriate cleaning materials.

9.3.7. Torches shall be lighted by friction lighters or other approved methods; cigarettes, matches or lighters are not permitted.

9.3.8. Hoses and hose connections shall be leak-tested.

9.3.9. One-way check valves shall be installed on each regulator.

9.3.10. Acetylene hose pressure shall not exceed fifteen (15) p.s.i.

9.4. Endothermic and Exothermic Welding (Cad Weld / Terra Weld, Implosive Sleeves, etc.)

9.4.1. Implosive sleeves are classified as an explosive; the Person-In-Charge shall ensure compliance with federal, state and local regulations.

9.4.2. The explosive materials, molds and igniting equipment shall be compatible.

9.4.3. Materials, molds, igniters and filler material shall be visually inspected prior to welding operations.

9.4.4. The thermo-weld charge shall only be ignited by means of a flint gun or manufacturer-approved device. Extension devices are highly recommended.

9.4.5. Employees shall not position any portion of their body directly above the top opening of the mold.

9.4.6. Molds shall:

9.4.6.1. Be properly supported and secured prior to igniting.

9.4.6.2. Not be held in the hands.

9.4.6.3. Be pre-heated in cold weather to remove moisture;

9.4.6.4. Not contain any moisture, snow or water;

9.4.6.5. Not be opened during the welding process; and

9.4.6.6. Be stored in clean and dry areas.

9.4.7. Employees shall wear all required PPE including face and body protection. Manufacturer shall specify required PPE.

9.4.8. Employees shall have the space required to safely exit the area.

9.5. MIG Welding (Gas Metal Arc Welding)

9.5.1. MIG machines shall be properly Grounded through the electrical power cord.

9.5.2. MIG welding shall only be performed in areas with adequate ventilation.

9.5.3. The shielding gas supply shall be shut off when not in use.

9.5.4. Hoses and hose connections shall be checked for leaks.

9.5.5. MIG welding shall not be performed within fifty (50) feet of degreasing, cleaning, parts washing, spraying or chlorinated solvent operations. The vapors can become toxic and potentially ignite.

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10. Work Area Protection

10.1. Traffic Control

10.1.1. Work locations within the boundaries of a right-of-way of highways, roads, or streets shall comply with the local area requirements for temporary traffic control.

10.1.2. Only Qualified and Authorized Persons wearing the proper PPE shall be permitted in traffic control zones.

10.1.3. Employees within fifteen (15) feet of a right-of-way or roadway shall don the properly rated ANSI retro-reflective garment. Garments shall at a minimum be rated at ANSI Class 2.

10.1.4. Work locations encroaching on traffic lanes, closing traffic lanes or shifting traffic lanes shall have written and approved traffic control plans.

10.1.5. Traffic control plans shall at a minimum:

10.1.5.1. Minimize traffic disruption.
10.1.5.2. Ensure proper signage is displayed at proper intervals.
10.1.5.3. Minimize employee exposure to traffic hazards.
10.1.5.4. Ensure safe passage for pedestrians.
10.1.5.5. Provide easy to interpret traffic paths; and
10.1.5.6. Provide access for emergency vehicles.

10.1.6. The Person-In-Charge shall:

10.1.6.1. Be trained in the federal, state and local area requirements.
10.1.6.2. Ensure employees have donned the proper PPE.
10.1.6.3. Ensure employees comply with the traffic-control plan.
10.1.6.4. Ensure signs and devices are removed, covered or taken down when work operations are complete.
10.1.6.5. Ensure employees stay out of active traffic lanes (unless flagging or other controls are in place); and
10.1.6.6. Ensure employees such as flaggers have the proper training prior to performing the operation (check local area rules for training requirements).

10.1.7. Employees in temporary traffic-control zones shall:

10.1.7.1. Comply with traffic-control plans.
10.1.7.2. Stay out of active traffic lanes.
10.1.7.3. Don the proper high-visibility clothing prior to entering the work area.
10.1.7.4. Only cross roadways, streets or highways at designated locations; and
10.1.7.5. Be properly trained when required for flagging of traffic-control set up (Comply with federal, state and local requirements).

10.1.8. Working at night requires the following safeguards:

10.1.8.1. Employees shall wear ANSI Class III retro-reflective garments.

10.1.8.2. Adequate lighting shall be provided to illuminate the work area.

10.1.8.3. Adequate barriers or delineators shall be installed to keep traffic away from work areas; and

10.1.8.4. Employees shall receive training in the hazards of nighttime work.

10.1.9. Traffic-control devices shall be installed in accordance with the local area requirements.

10.1.10. Advance warning signs shall be provided to adequately delineate the work area.

10.1.11. Barriers, barricades, delineators or warning devices placed in or near roadways shall only be installed when required by federal, state or local requirements.

10.1.12. Police assistance should be considered for complicated work zones or in extremely high traffic areas.

10.2. Flaggers

10.2.1. Flaggers shall:

10.2.1.1. Maintain compliance with local area certification or training requirements.

10.2.1.2. Ensure the proper retro-reflective PPE is donned prior to entering the traffic-control zone.

10.2.1.3. Be alert to ALL traffic hazards and traffic flows.

10.2.1.4. Implement an escape route and have the ability to select multiple escape routes.

10.2.1.5. Provide warning to employees of a hazardous condition.

10.2.1.6. Stay behind barriers when feasible.

10.2.1.7. Always stay on the periphery of active traffic lanes and face moving traffic at all times.

10.2.1.8. Only encroach into active traffic lanes when vehicles are stopped.

10.2.1.9. Minimize the stopping and slowing of traffic as much as possible.

10.2.1.10. Ensure traffic is controlled or stopped prior to construction vehicles or personnel crossing active traffic lanes.

10.2.1.11. Not be distracted or have other duties while flagging. (e.g., cell phone, texting, headphone, or other similar devices).

10.2.1.12. Utilize all flagging tools in the intended and proper manner.

10.2.1.13. Provide guidance or direction in a respectful manner to motorists.

10.2.1.14. Be visible to vehicle operators at the following speed and distances.

10.2.1.15. Maintain an effective means of communication between flaggers.

10.2.1.16. Be included in the pre-job briefing.

Table 10.2 Flagger Station Sight Distance

SPEED	DISTANCE
25 MPH	155 FT
30 MPH	200 FT
40 MPH	305 FT
50 MPH	425 FT
60 MPH	570 FT
70 MPH	820 FT

MUTCD 2009 Edition Table 6E-1 Stopping Sight Distance

10.2.2. Stopping and slowing of traffic shall be completed by the use of proper STOP / SLOW techniques. STOP / SLOW paddles are required. Hand signals or flags may be used in an emergency situation or for short term traffic disruptions.

10.2.3. Traffic-control plans (where required) shall be readily available at the work location.

10.3. Traffic Control Templates

10.3.1. With Management approval, the following traffic-control templates are permitted for use until a traffic-control plan is developed.

Table 10.3.1 Sign Spacing

Recommended Advance Warning Sign Minimum Spacing			
Road Type	Distance Between Signs**		
	A	B	C
25 MPH or less	100 feet	100 feet	100 feet
30 – 55 MPH "URBAN"	350 feet	350 feet	350 feet
30 – 55 MPH "RURAL"	500 feet	500 feet	500 feet
Highway / Freeway	1,000 feet	1,500 feet	2,640 feet

Table 10.3.2 Taper Lengths

		* Minimum Desirable Taper Lengths			Suggested maximum Spacing of Channelizing Devices	
Posted Speed	Formula	10' Offset	11' Offset	12' Offset	On a taper	On a tangent
30	$L = \frac{WS}{60}^2$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45		450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'

Table 10.3.3 Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	100 feet per lane

Note: Use Table 10.3.4 to calculate L

Table 10.3.4 Formulas for Determining Taper Length

Speed (S)	Taper Length (L) in feet
40 mph or less	L = WS2 / 60
45 mph or more	L = WS

Where:

L = taper length in feet

W = width of offset in feet

S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

Figure 10.3.1 Component Parts of a Temporary Traffic Control Zone

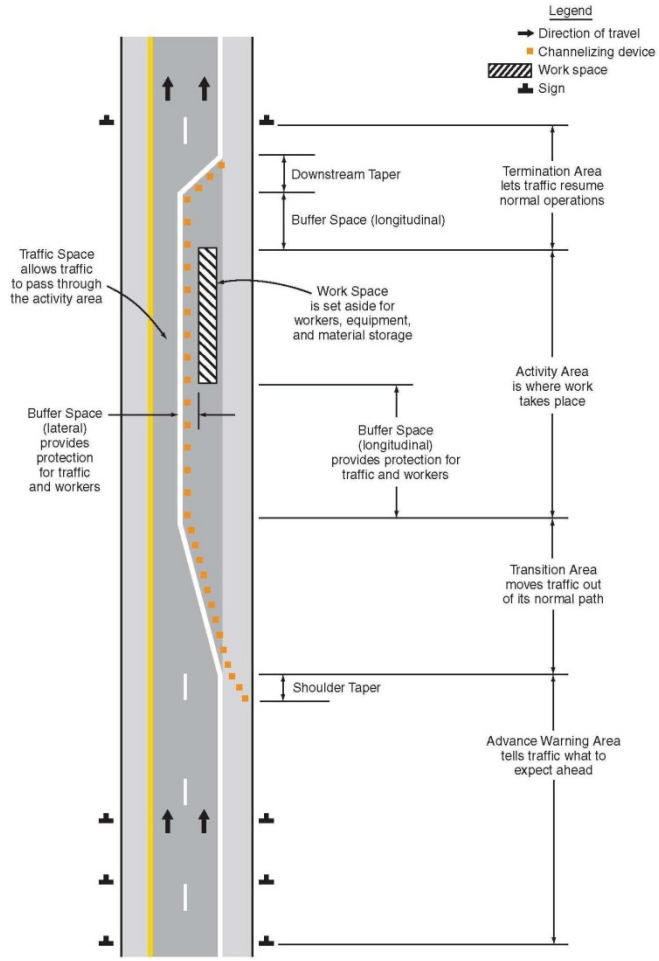
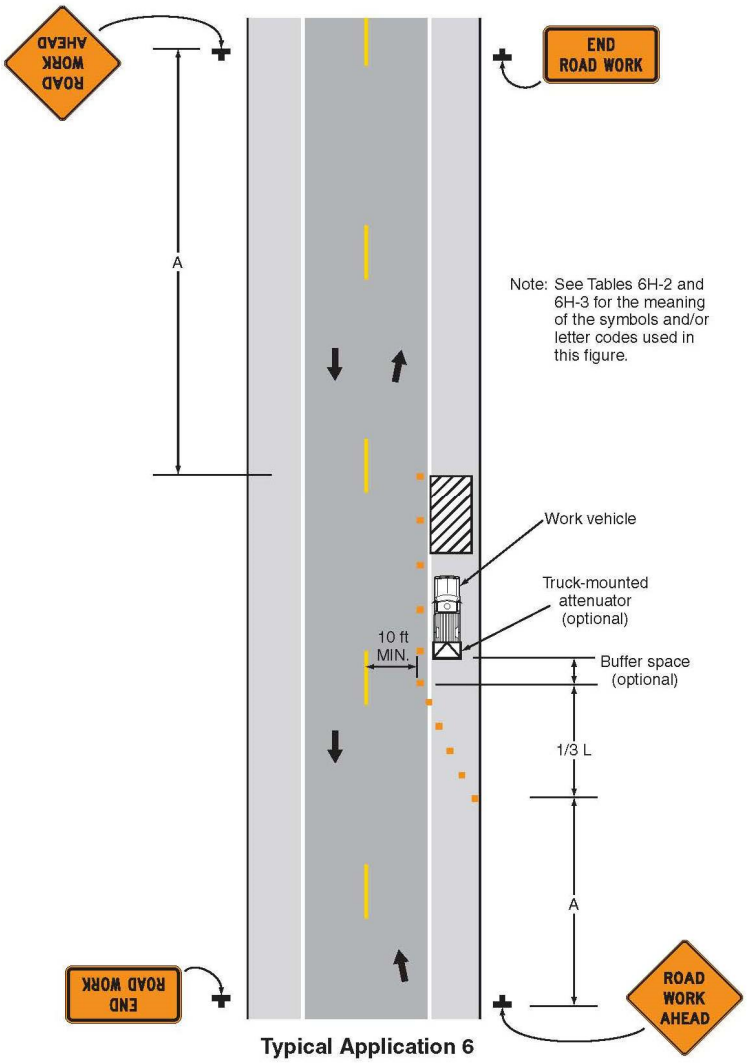


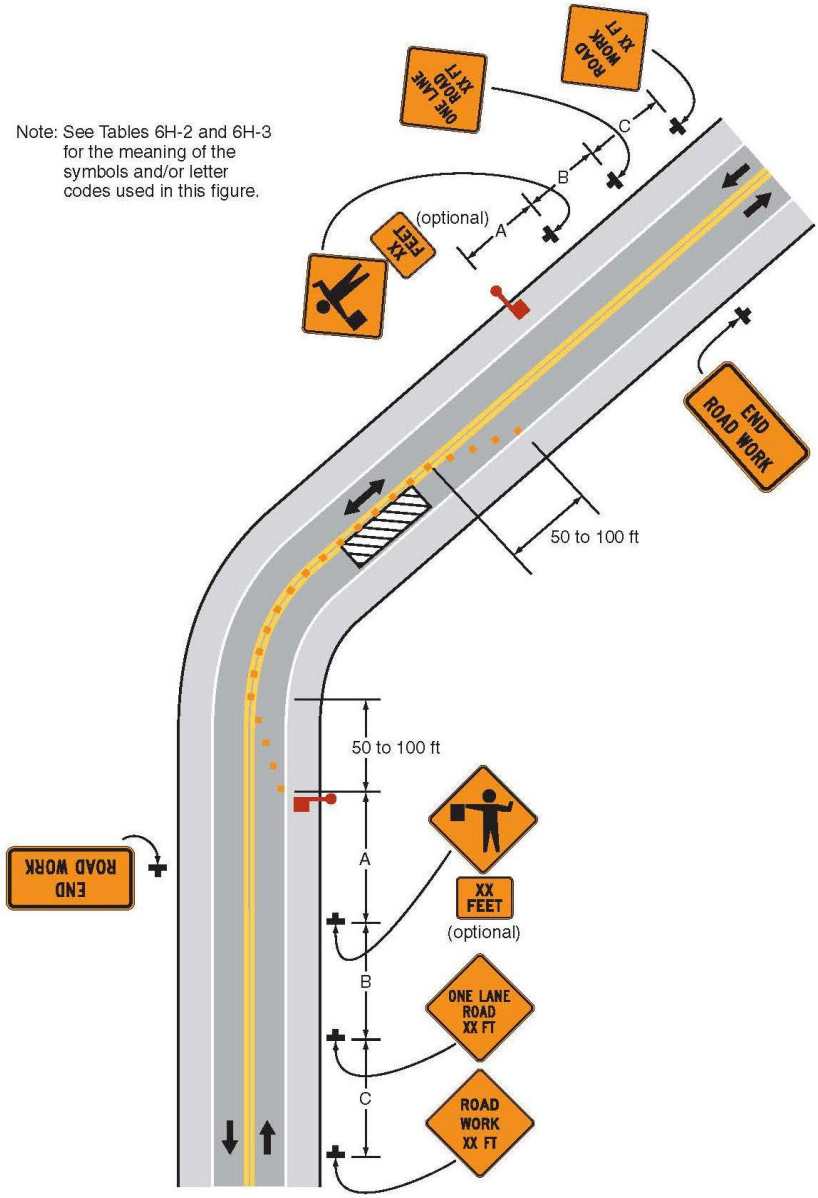
Figure 10.3.2 Shoulder Work with Minor Encroachment

Note: The lane width shall not be less than ten (10) feet. If work operations decrease lane width to less than ten (10) feet, a lane closure may be required.



Typical Application 6

Figure 10.3.3 Lane Closure on a Two-Lane Road Using Flaggers



Typical Application 10

10.4. Railroad Right of Way

10.4.1. Prior to working near the railroad right-of-way, the Management shall ensure the following:

10.4.1.1. Railroad customer is contacted;

10.4.1.2. Railroad customer requirements are received and implemented;

10.4.1.3. Ensure encroachment does not occur without authorization. (Some operators specify fifty (50) feet or twenty-five (25) feet, know your local area rules).

10.4.2. Employees shall not mount, dismount or cross over moving on-rail vehicles or equipment.

10.4.3. Vehicles or equipment on the track and in travel shall require all passengers to be seated in approved locations with safety belts.

10.4.4. Employees shall not walk or place feet on the rails at any time.

10.4.5. Employees, vehicles, equipment and tools shall not “Foul the Track” at any time unless proper clearance has been obtained from the railroad customer. Fouling the track means encroaching closer than the distance specified by the railroad operator.

10.4.6. The Person-In-Charge shall be aware of exclusive-occupancy periods and ensure all tools, materials, equipment and personnel are clear of the tracks when these periods are no longer in effect.

10.4.7. While trains are passing work areas, personnel shall comply with the railroad customer requirements.

10.4.8. On-track equipment shall maintain appropriate spacing while traveling.

10.4.9. On-track equipment shall have effective means of communication with other on-track equipment.

10.4.10. Employees shall not be positioned between on-track vehicles unless the following precautions are taken:

10.4.10.1. The vehicles are stopped and blocked or otherwise rendered immoveable.

10.4.10.2. Safe work zones are established for the equipment per railroad customer requirements; and

10.4.10.3. Prior to moving any vehicle, a spotter shall be positioned to ensure personnel are clear of the front and rear of the vehicle.

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11. Rigging / Lifting Equipment

11.1. General

11.1.1. Rigging operations shall only be performed by Qualified and Authorized Persons.

11.1.2. Rigging components shall be legibly marked such that Working Load Limits (WLL) / Safe Working Load (SWL) can be determined.

11.1.3. Rigging equipment shall always be used within the WLL / SWL limits and the design configurations.

11.1.4. Rigging equipment designed for hoisting without legible WLL / SWL (or tags) shall be removed from service.

11.1.5. Slings shall be hitched in approved methods.

11.1.6. Rigging that has been used to tow or pull equipment shall not be shock loaded and never be used for hoisting.

11.1.7. Field or shop-fabricated rigging equipment shall be certified and stamped by a third party and shall include a load rating.

11.1.8. Loads shall be visually inspected to ensure the rigging will not slip or slide and cause the load to fall.

11.1.9. Taglines shall be used on loads which may spin or become uncontrolled during hoisting.

11.1.10. Knots shall not be placed in wire rope slings, nylon slings or chain slings.

11.1.11. Metallic slings shall not be used around Energized electrical systems unless appropriate Insulate and Isolate techniques are implemented.

11.1.12. Employees shall only work under suspended loads when a Site-Specific Task Plan has been approved by Management.

11.2. Inspection

11.2.1. Daily inspections shall be completed by a Qualified Person.

11.2.2. Annual inspections of rigging equipment shall be completed by Competent Persons.

11.2.3. Additional inspections shall be performed after the pick if damage is suspected.

11.2.4. Any item not passing an inspection shall be immediately removed from service and tagged Out of Service.

11.3. Synthetic Slings, Nylon and Round

11.3.1. Synthetic slings shall be stored in manner to minimize damage due to sharp edges, oils, solvents, gasoline and other contaminants.

11.3.2. Synthetic slings shall be protected against sharp edges.

11.3.3. Synthetic slings shall not be exposed to temperatures in excess of 180° F during storage or use.

11.3.4. Synthetic slings shall be removed from service when they have indication of:

11.3.4.1. Acid or caustic burns.

11.3.4.2. Melting, charring or thermal burns.

11.3.4.3. Snags, punctures, cuts or tears.

11.3.4.4. Broken or worn stitching; or

11.3.4.5. Distortion of eyes or fittings.

11.4. Slings, Wire Rope and Chain

11.4.1. Wire rope and chain equipment shall be stored properly in areas free from standing water, sharp edges, acids and alkali substances.

11.4.2. Slings containing excessive rust or corrosion shall be removed from service and tagged Out of Service.

11.4.3. Wire rope slings configured with D:d ratios less than 25:1 shall be de-rated.

11.4.4. Softeners shall be installed on loads where there are sharp edges to ensure:

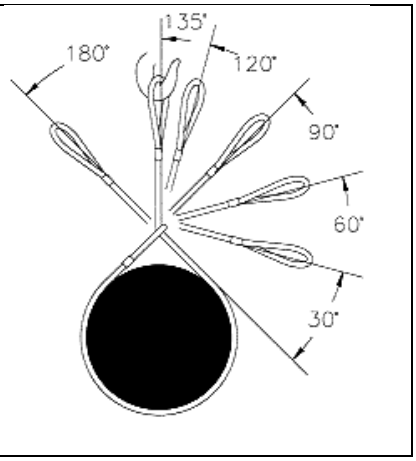
11.4.4.1. The sling is protected from sharp edges and damage; and

11.4.4.2. The sling will conform to a rounded edge and not a right angle.

11.4.5. Wire rope slings installed in a choker hitch shall be de-rated when angles are less than one-hundred twenty (120) degrees:

Table 11.4 Wire Rope Sling Ratings

Angle of Choke	Rated Capacity of Single Leg
120° - 180°	100%
90° - 120°	87%
60° - 89°	74%
30° - 59°	62%
0° - 29°	49%



11.4.6. Chain slings for overhead lifting shall be a minimum of Grade 80.

11.4.7. Chain slings shall have an identification tag attached.

11.4.8. Chain slings shall be removed from service when:

11.4.8.1. Links are bent, worn or deformed.
11.4.8.2. Hooks, latches or end attachments are deformed, cracked, bent or worn; or
11.4.8.3. There is evidence of heat damage or electric arcing.

11.4.9. Wire rope slings shall be removed from service when:

11.4.9.1. Hooks, latches or end attachments are deformed, cracked, bent or damaged.
11.4.9.2. There is evidence of heat damage or electric arcing.
11.4.9.3. Kinking, crushing, strand displacement, bird-caging or any other damage results in wire-rope distortion; and
11.4.9.4. Ten (10) randomly distributed broken wires are present in one lay, or
11.4.9.5. Five (5) broken wires in one strand in one rope lay.

11.5. Shackles and Hooks

11.5.1. Hooks shall have operational self-closing latches.

11.5.2. Material shackles shall not be used as working shackles.

11.5.3. Shackle pins and rigging eyes shall be seated properly in the hook.

11.5.4. Loads shall not be placed against the latch.

11.5.5. Shackle bolts shall seat fully at the shoulder.

11.5.6. Hooks shall be removed from service when:

11.5.6.1. The latch is sprung or missing.
11.5.6.2. The throat is sprung (opened).
11.5.6.3. Hook is twisted or deformed.
11.5.6.4. Significantly damaged or unusually worn; or
11.5.6.5. Damaged by heat, chemicals or electric arcing.

11.5.7. Shackles shall be removed from service when:

11.5.7.1. The body has spread.
11.5.7.2. The shoulder of the pin is not flush with the body.
11.5.7.3. The body is bent or distorted.
11.5.7.4. Significantly damaged or unusually worn; or
11.5.7.5. Damaged by heat, chemicals or electric arcing.

11.6. Blocks

11.6.1. Blocks shall be used within the WLL / SWL.

11.6.2. Blocks shall be appropriately sized for the wire rope. Blocks shall have a D:d ratio of 16:1 or greater with respect to the rope or line.

11.6.3. Snatch blocks used to change wire direction shall be inspected to ensure they are not overloaded.

11.6.4. Blocks shall not be installed:

11.6.4.1. In locations where they are in a bind.

11.6.4.2. Where running lines are not in line with the sheave; or

11.6.4.3. Where significant side loading will be imposed.

11.6.5. Blocks shall be removed from service when:

11.6.5.1. The sheaves are worn or damaged.

11.6.5.2. The hook nut, thrust bearing, latch, trunnion pin, hook or dead-end connection are damaged or defective; or

11.6.5.3. Tie bolts or guide bolts are missing.

11.7. Synthetic Ropes and Handlines

11.7.1. Ropes shall be selected and maintained based upon the intended purpose.

11.7.2. Handlines shall:

11.7.2.1. Be inspected prior to use.

11.7.2.2. Be used within the SWL / WLL; and

11.7.2.3. Be removed from service and tagged Out of Service when they do not pass an inspection.

11.7.3. Special precautions shall be taken with handlines and rope when moisture rich environments exist.

11.7.4. Ropes shall not be overloaded due to knots. Knots installed in ropes shall require the capacity to be de-rated by fifty (50) percent.

11.8. Material Handling

11.8.1. Material storage shall not be located under Energized bus, conductors, lines or equipment except when less hazardous locations are not available.

11.8.2. If material storage is located under Energized parts or equipment or is to be placed near Energized equipment; appropriate M.A.D. shall be maintained at all times.

11.8.3. Qualified observers shall be used when maneuvering large or lengthy objects near Energized parts.

11.8.4. Pole tongs shall be properly rated, sized and approved for the task.

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12. Personal Protective Grounding (PPG)

12.1. General Rules

For the purpose of this section the following definitions of terms commonly used with PPG:

Bonding
The electrical interconnection of conductive parts designed to maintain a common electrical potential.

Bracket / Master Grounds
A grounding method where temporary Ground Sets are installed on both sides of the work site.

Cluster Bar/Support
A terminal that is temporarily attached to the structure to support (it may serve to establish an equipotential zone) and provide a bar that will accommodate at least two grounding clamps and may have terminals to accommodate grounding cables.

Energized (Live)
Electrically connected to a source of potential difference, or electrically charged so as to have a potential significantly different from that of the earth in the same vicinity.

Equipotential / Equipotential Work Zone (EPZ)

- An identical state of electrical potential for two or more items. For the purposes of Personal Protective Grounding (PPG), a near- identical state of electrical potential.
- A work zone that is placed at a near-identical state of electrical potential by the installation of Personal Protective Grounding devices.

Fault Current
A current that flows from one conductor to Ground or to another conductor caused by an abnormal connection (including an arc) between the two.

Ground Set
A system of ground clamps and jacketed cables suitable for carrying fault current.

Grounded
A conducting connection, whether intentional or accidental, by which an electrical circuit or equipment is connected to earth, or to some conductive body of relatively large extent that serves in place of the earth, resulting in the circuit or equipment to be grounded.

Parallel Grounds
Two single Ground Sets used as one. With both sets having the ground ends attached to the same Ground source, and both sets having the conductor end attached to the conductor source. Parallel Ground Sets shall be identical in length, size, clamp type and attached to the cable as close together as possible.

Personal Ground
A temporary grounding conductor installed at the same location as the workers. A personal ground is installed for the primary purpose of individual protection and to establish an equipotential zone (EPZ). This is also an effective grounding solution when working Transmission lines with large distances between conductors.

Personnel Protective Ground(s) (PPG)
All temporary Ground Sets installed to provide protection against electrical shock that may cause death or injury to personnel while working on de-energized lines or equipment.

Qualified Observer
A Qualified Observer is defined as is an electrically qualified worker that can identify all hazards present to the crew working energized conductors. The Qualified Observer shall be capable of:

- Distinguishing exposed live parts.
- Identify nominal voltages;
- Determine minimum approach distances;
- Knowing safe work practices for working on, or near, energized lines and equipment;
- Recognize electrical hazards to which workers will be exposed and skills and techniques to control those hazards;
- Rendering immediate assistance in case of an accident

A qualified observer shall not have/conduct any other duties or be distracted unless the crew being observed has stopped work and is outside MAD.

Single Points Grounds
A grounding method where temporary grounds sets are placed at your work location. Single Point Grounding includes all phases shunted together with a path to earth ground and placed on the "Source Side" of the work location. Single Point Grounding is the best application when single energy source potential exists (can become energized from only one possible direction).

Step Potential / Step Voltage
The potential voltage difference between each foot of a person standing near an Energized grounded object. A person can be at risk of injury during a fault simply by standing near the Grounding point.

Touch Potential / Touch Voltage
The potential voltage difference between the energized object and the feet or other body part of a person in contact with an object that may be or become potentially Energized. Touch potential could be nearly the full voltage across a Grounded object if that object is Grounded at a point remote from the place where the person is in contact with an Energized or potentially Energized object.

12.1.1. Only Qualified and Authorized Persons shall perform PPG operations.

12.1.2. Grounding plans shall be communicated to all employees involved in the work tasks.

12.1.3. The Person-In-Charge shall be responsible for the proper implementation of the grounding plan.

12.1.4. Customer identified grounding procedures shall be incorporated into Company work procedures where required by contractual agreements.

12.1.5. M.A.D. shall be maintained while placing and removing PPG.

12.1.6. Temporary PPG shall be installed and arranged in such a manner as to prevent each employee from being exposed to hazardous differences in electrical potential.

12.1.7. In the event a ground is too short, you may use a piece of ground rod as a common point for clamps. The process of clamping the grounds together or utilizing a bolt is unacceptable.

12.1.8. Grounding equipment shall be visually inspected and deemed fit for service prior to use.

12.1.9. An Equipotential Work Zone (EPZ) shall be established at the work site.

12.1.10. When working one phase of a multi-phase system; Bonding of only one phase for establishing an EPZ is allowable ONLY when working between master grounds and within a single span of that shunt. In Transmission applications when it is possible to maintain M.A.D. to adjacent phases, the single Bond is also allowable.

12.1.11. When using a cluster bar to establish an EPZ on wood poles, the "cluster bar" shall be clamped around the pole below the employee and used to provide a Bonding attachment to establish EPZ. The cluster bar shall be bonded to the pole ground or a piece of copper in contact with a nail, staple or other hardware that penetrates the surface of the wood no less than the depth of a workers climbing gaffs.

12.1.12. Uninsulated work platforms shall be Bonded to the Grounded conductor being worked.

12.1.12.1. Bonding assemblies used for uninsulated aerial baskets or other similar aerial work platforms shall be designed so that they:

a. Readily break away from the conductor for emergency rescue purposes (but not fall off or come loose during routine use).
b. Do not damage the conductor if a breakaway occurs.

12.1.13. When parallel PPG are installed, these cables shall be treated as a single grounding conductor during installation and removal.

12.1.13.1. Both grounds shall be the same length.

12.1.13.2. Both ground conductor ends shall be removed before removing the opposite ground end.

12.1.13.3. Clamps shall be attached as closely as possible at each end.

12.1.13.4. Ground Sets shall be de-rated by 10% if grounding conductor is restrained and 20% if unrestrained of values found in rule 12.10.2.

12.1.14. PPG sets shall have a legible test date not exceeding two years in duration securely attached to the cable assembly or as required by local or client guidelines.

12.1.15. PPG cables shall be restrained - as necessary - so as not to create a hazard in the work area.

12.1.16. PPG clamps shall never be installed on armor rod.

12.1.17. Whipping action of PPG cables shall be assessed and the cables shall be secured if the PPG cables pose a hazard to employees due to whipping action.

12.1.18. Master Grounds shall be capable of conducting, transferring and withstanding the maximum available fault current for the necessary clearing time.

12.1.19. The appropriate clamps shall be used when connecting to bus, conductor, structures, etc., and shall be sized to meet the current carrying capacity of the PPG cable.

12.1.20. PPG assemblies that have been exposed to fault current shall be removed from service and retested prior to being put back into service.

12.1.21. Grounding surfaces shall be clean and free of corrosion, paint or other coatings.

12.1.22. PPG shall not be dropped from aloft.

12.1.23. When multiple vehicles or equipment are present, they shall be grounded or bonded in a manner to eliminate hazardous step potential.

12.1.24. When utilizing pole grounds for PPG, the conductor and clamps must be visually inspected.

12.1.25. Ground Sets may be removed temporarily for the purpose of testing lines and/or equipment. During the test procedure, each employee shall consider the line and/or equipment as Energized and follow the necessary Energized work procedures.

12.1.26. Ground Sets that must be relocated during work tasks shall not be removed until an additional Ground Set has been installed at the point of relocation.

12.2. PPG Installation and Removal

12.2.1. Prior to PPG installation, the Person-In-Charge shall ensure:

12.2.1.1. The phase and/or circuit is Isolated with a Customer approved clearance.

12.2.1.2. Potential sources (e.g., backfeed or closed switches) have been Isolated; and

12.2.1.3. Approved voltage detection devices or voltage testers are used to verify that the circuit is de-energized from its source.

12.2.2. When attaching PPG (using proper PPE):

12.2.2.1. The Ground source connection surfaces shall be clean and tight.

12.2.2.2. Employees shall maintain M.A.D. when installing PPG.

12.2.3. All conductors and equipment shall be considered energized until the circuit or equipment is effectively grounded:

12.2.3.1. The ground source end shall be the first connection. An approved Live Line tool shall be used to make this connection unless such process would create a greater hazard. The use of flat style clamps with "T" handles for lattice towers may be applied by hand when potential hazards are discussed in the pre job briefing.

12.2.3.2. Approved live-line tools shall be used to attach the conductor end.

12.2.3.3. Ground the nearest conductor, bus or apparatus first, and then proceed upward / downward & inward (depending on configuration).

12.2.3.4. Repeat steps A thru C until circuit or equipment is effectively grounded and an EPZ is established.

12.2.4. When removing PPG (using proper PPE):

12.2.4.1. Employees shall maintain MAD from conductors and/or equipment from which grounds are being removed.

12.2.4.2. Remove the line/conductor or equipment connection(s) first with an approved live-line tool.

12.2.4.3. Then remove the opposite end with an approved live-line tool.

12.2.4.4. Repeat until you reach the Ground source and then remove the Ground source connection.

12.3. Ground Rods

12.3.1. Temporary ground rods shall be:

12.3.1.1. Five / eights inch (5/8”) bronze, copper, copper-clad or copper weld at least five (5) feet long.

12.3.1.2. Installed to the maximum depth possible.

12.3.1.3. Protected from interference with the public.

12.3.1.4. Placed as far away as reasonable from the work area.

12.3.1.5. Barricaded to provide a visible safety buffer zone around temporary ground rods driven at the worksite.

12.3.2. Ground sources shall be utilized in the order listed, when to do so will not create an additional safety hazard:

12.3.2.1. Station Ground.

12.3.2.2. Overhead or underground primary neutral.

12.3.2.3. Steel structure with integral grounds.

12.3.2.4. Permanently driven ground rod.

12.3.2.5. Temporarily driven ground rod.

12.3.2.6. Pole ground wire.

12.3.3. Overhead Ground Wire (OHGW) or Shield Wire that is on insulators and not bonded to the structure shall not be used as a Ground source and considered energized until verified to be clear of energized sources, tested and bonded to the structure.

12.4. Transmission Line Grounding

12.4.1. The Person-In-Charge shall develop and implement the company grounding plan. This plan shall be documented.

Reference Link: Transmission Grounding Plan

12.4.2. Management shall review the grounding plan.

12.4.3. The grounding plan shall be maintained with the project documents.

12.4.4. Employees on the ground shall be protected from hazardous Step and Touch Potentials by:

12.4.4.1. An EPZ with an isolated ingress/egress transition walkway.

12.4.4.2. Barricades.

12.4.4.3. Insulated platforms or conductive grounding mats Bonded to the conductor / equipment.

12.4.5. A temporary grounding jumper shall be installed prior to cutting or removing jumpers so as to eliminate any open point in the Grounded circuit.

12.4.6. Ground switches at extra-high voltage (EHV) terminals shall be closed before the line is tested and PPGs are installed and removed.

12.4.7. OHGW Bonded to the structures shall be considered as a primary Ground source.

12.5. Substation Grounding

12.5.1. The Person-In-Charge shall develop and implement the Company grounding plan. This plan shall be documented.

12.5.2. Management shall review and approve the grounding plan for approval.

12.5.3. The grounding plan shall be maintained with the project documents.

12.5.4. The Person-In-Charge shall communicate the grounding plan and ensure employees are aware of the Energized sections of the substation.

12.5.5. Station ground platforms and switch handles in substation and switchyards shall be inspected to ensure de-energized parts are bonded to the station ground grid for an effective equipotential zone (EPZ).

12.5.6. PPG in substations shall be placed as close as practical to the work area.

12.5.7. Work performed on equipment such as transformers, breakers, etc., shall require visible grounds on each bushing.

12.5.8. Neutral reactors shall not be worked on unless De-energized or bypassed with Ground Sets.

12.5.9. Transformer cases, breaker housings, etc. shall be treated as Energized unless an inspection of the ground straps and connections has been performed and it has been determined that these parts are Grounded.

12.5.10. When working on De-energized enclosed switches (OCB's, etc.) PPG shall be installed on both sides of the switch.

12.6. Distribution Grounding

12.6.1. The Person-In-Charge shall develop, communicate and implement the grounding plan:

12.6.1.1. The grounding plan shall identify the boundaries of the line sections covered in the EPZ.

12.6.1.2. Grounding plans shall identify and control electrical sources.

12.6.1.3. Potential back-feed sources shall be identified and controlled.

12.7. Underground Grounding (URD)

12.7.1. Existing installations of underground cables and equipment shall be considered Energized at all times unless properly disconnected from all sources of potential, tested for potential, and then properly Grounded using approved PPG.

12.7.2. Pad mount/submersible transformers may be fed from two directions. For this reason, all transformers shall be considered Energized until tests are made, and PPG installed.

12.7.3. Cables or equipment under clearance shall be tested for voltage and then PPG applied at the first possible Grounding point before work is started.

12.7.4. Cables or equipment not tested and Grounded shall be worked with appropriate rubber insulating PPE and adequate IPE as though it was Energized.

12.7.5. Due to loop characteristics of underground circuits, both top and bottom portions of primary switches shall be considered Energized, even in the open position until tested and Grounded.

12.7.6. Always check to make sure that all Ground Sets have been removed before equipment, which has been Grounded, is placed back into service.

12.7.7. Underground cables maintain a capacitive charge and shall be identified as an Energized conductor until tested and PPG are applied.

12.8. Equipment and Vehicle Grounding (minimum 2/o)

12.8.1. Employees and the public on the ground shall be effectively protected from hazardous differences in potential that could be created if Equipment or Vehicles become Energized during the work process by Barricading and EPZ. For the purposes of this section a “Barricade” is defined as a physical barrier that prevents employees from coming within 6 ft. of the designated piece(s) of equipment. Equipment grounds will be installed when necessary or required.

12.8.2. The preferred method for identifying equipment Ground Sets is a green outer jacket or green markings on the cable.

12.8.3. Isolation methods shall also be applied to keep both personnel and the public away from potential exposure to Step and Touch Potential hazards.

12.8.4. Where an employee is to operate equipment while standing on the earth, a conductive grounding mat shall be Bonded to the equipment for the employee to stand on while operating the equipment. A buffer platform shall be provided for employee ingress and egress to the conductive grounding mat.

12.8.5. Employees and operators on the ground shall be informed of the Step and Touch Potential hazards near vehicle(s) and Grounding electrodes (Ground rod, Ground source connection).

12.8.6. The employee removing the equipment Ground Set shall physically trace the Ground Set from the equipment to the Ground source before removing the Ground Set.

12.8.7. Grounding attachment points on vehicles shall be free of corrosion, paint or other materials which would increase the resistance in the Ground Set.

12.8.8. Mobile equipment shall be securely fastened to a properly installed temporary Ground rod or effectively barricaded.

12.9. Personal Protective Grounding (PPG) Equipment Criteria

12.9.1. Minimum wire size for PPG shall be 2/0 stranded copper. Customer may require larger size Ground Sets.

12.9.2. PPG assemblies (Ground Sets) shall have tags applied that display the most recent test date.

12.9.3. Test dates shall not to exceed two-year intervals.

12.9.4. Grounding cable jackets are designed for physical protection and shall not be considered to have insulating value.

12.9.5. Jackets shall have the AWG size and conductor type stamped or printed repeatedly along the length of the cable.

12.10. Personal Protective Grounding Test Requirements

12.10.1. PPG assemblies are only permitted for use when they are designed and constructed in accordance with ASTM F855-2017. ASTM F855 requires:

12.10.1.1. Cable shall be copper wire.

12.10.1.2. Cables shall be welding cable or ASTM Type I, Type II or Type III.

12.10.1.3. Cable connections shall utilize pressed ferrules.

12.10.1.4. Ground clamps shall meet or exceed the fault current rating of the cable.

12.10.1.5. PPG assemblies shall be tested and inspected for resistance after they have been manufactured and every two years thereafter. Local area rules may be more stringent.

12.10.1.6. PPG shall have tags applied to identify the most recent test. If these tags are missing or are out of date, the Ground Set shall be taken Out Of Service until it has been properly tested, and the test date is applied.

12.10.1.7. Cable to clamp connection shall meet or exceed the specified torque in accordance with ASTM F855-17 standard.

12.10.1.8. Approved Ground testers shall be used to verify that the Ground Set meets the requirements for resistance as required by the ASTM standard.

12.10.2. Ground Sets shall be selected based upon the anticipated fault current. Reference the below table.

Table 12.10 Ground sets selected based upon anticipated fault current

Cable Size	Continuous Current	Withstand Current in Amps		Resistance (milli-ohms /ft) @ 25° C.
		15 Cycle	30 Cycles	
2/0	300	27,000	20,000	0.0811
4/0	400	43,000	30,000	0.0509
2- 2/0 or 250kcm	450	54,000	39,000	0.0811 for each cable
2- 4/0 or 350 kcm	550	74,000	54,000	0.0509 for each cable

12.11. Five Point Grounding Check

12.11.1. Lines shall be Isolated, De-energized and tested with appropriate equipment (not fuzzed) before installing PPG.

12.11.2. Maintain the M.A.D. from an ungrounded conductor as you would an Energized conductor until the conductor is Grounded. This includes working from an un-insulated bucket.

12.11.3. M.A.D. shall be maintained while applying and removing PPG with live-line tools of the proper length.

12.11.4. Install PPG in a “nearest to farthest” sequence.

12.11.5. Remove PPG in a “farthest to nearest” sequence.

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13.Overhead T&D

13.1. General

13.1.1. Only Qualified and Authorized Persons shall perform work on overhead transmission or distribution systems.

13.1.2. Primary overhead lines and electrical equipment shall always be worked as Energized unless disconnected from all sources of electricity (visible open), properly tested, Grounded, and Zone of Equipotential established.

13.1.3. Employees exposed to electrical arcs greater than 2.0 cal/cm² shall wear full body arc rated clothing with the exceptions of:

13.1.3.1. Arc rated protection is not necessary for the employees' hands when the employee is wearing rubber insulated gloves with protectors (below 14 cal/cm²).

13.1.3.2. Arc rated protection is not necessary for the employees' feet when the employee is wearing heavy duty work shoes or boots.

13.1.3.3. Arc rated protection is not necessary for the employees' head when the employee is wearing class E hard hat that is below 9 cal/cm² for single phase arcs in open air and 5 cal/cm² for other exposures.

13.1.3.4. If arc rated face shields are required, the shield shall be at a minimum rating of 8 cal/cm².

13.1.4. Poles and towers shall be inspected, and results documented on the Briefing form prior to climbing.

13.1.5. Work procedures shall be inclusive of ET&D Partnership Best Practices.

13.1.6. When employees are working on energized circuits or equipment using the rubber glove method, insulating rubber gloves and sleeves rated for the exposure of the highest nominal voltage shall be worn cradle-to-cradle when working from an aerial platform.

13.1.7. A Qualified Observer shall be designated to provide timely warning while working on or near energized conductors

13.1.8. Appropriate M.A.D. shall be maintained at all times. When work tasks require M.A.D. to be encroached, appropriate Insulating and Isolating techniques shall be implemented.

13.1.9. When two or more employees are working on Energized circuits or equipment and within reach of each other, only one phase shall be worked on at a time.

13.1.10. Hand lines shall be controlled so they do not blow into traffic lanes or be in the way of employees ascending or descending. Employees operating a hand line shall not stand below the employees or at the base of the pole.

13.1.11. Hand lines, taglines or other lines used or placed within M.A.D. of Energized lines and equipment shall be considered conductive and appropriate Isolating and/or Insulating methods shall be employed.

13.1.12. Hand lines shall be utilized for the hoisting and lowering of tools and materials. Small or loose materials shall be contained in a tool bag.

13.1.13. Whenever employees are working in elevated areas and there is a potential for falling objects, the "Drop Zone" shall be identified with signs or barricades.

13.1.14. Scrap materials are permitted to be dropped to the ground in designated areas and personnel shall be removed from the area.

13.1.15. Employees should not work below other employees unless necessary; when this is required, the following shall be completed:

13.1.15.1. Employees shall communicate the work plan, and.

13.1.15.2. Communication methods to warn employees of falling objects shall be identified and implemented.

13.1.16. If the potential for backfeed is present, precautions shall be evaluated and implemented.

13.1.17. At least two (2) Qualified Persons are required for the following tasks:

13.1.17.1. Installation, removal, or repair of Energized lines that are at or above six hundred (600) volts.

13.1.17.2. Installation, removal or repair of Deenergized lines where employees are exposed to contact (within the M.A.D.) with other parts Energized at more than six hundred (600) volts.

13.1.17.3. Installation, removal or repair of equipment such as transformers, capacitors and regulators if an employee is exposed to contact with parts Energized at more than six hundred (600) volts.

13.1.17.4. Work involving the use of mechanical equipment, other than Insulated aerial lifts, near parts Energized at more than six hundred (600) volts.

13.1.18. A Qualified and Authorized Person may perform the following tasks alone:

13.1.18.1. Routine switching of circuits, if the employee can perform the work safely.

13.1.18.2. Work performed with live-line tools if the employee is positioned so that they are not within the M.A.D. of or otherwise exposed to contact with any Energized parts.

13.1.18.3. Emergency repairs to the extent necessary to safeguard the general public.

13.1.18.4. Employees engaged in troubleshooting of existing problems on a line.

13.1.19. Steel or wood members to be erected, (cross arms, bracing, etc) shall not be released from hoisting lines until secured.

13.1.20. Each employee handling poles being set within the M.A.D. of exposed Energized overhead conductors shall don properly rated rubber insulating protective gloves.

13.1.21. Reserved.

13.2. Climbing Equipment

13.2.1. Climbing equipment shall be inspected by the user prior to each use. The following shall be verified:

13.2.1.1. Utility pole climbing gaffs shall be kept properly sharpened and at least one and one quarter inches (1 ¼") in length.

13.2.1.2. Straps, rings and leg straps shall be functional and without damage.

13.2.1.3. Body belt and fall protection equipment shall be operational and meet testing requirements for Arc Flash exposure.

13.2.1.4. Fall-restraint devices shall be operational.

13.2.2. Utility pole climbing gaffs shall not be used for climbing or working in trees.

13.2.3. Gaff guards shall be in place when not in use.

13.2.4. Climbers shall not be worn when driving a vehicle, climbing ladders, working on the ground, while on floors or roofs, or in aerial work platforms.

13.2.5. Employees shall ensure positioning equipment is properly adjusted and operational prior to climbing.

13.2.6. Employees transitioning around obstructions on structures shall ensure that the secondary belt is positively secured prior to releasing any in-use connections.

13.2.7. Prior to disengaging any part of the climbing or positioning equipment, employees shall visually verify positive engagement of the snap-hook to the D-ring.

13.2.8. Climbing or positioning equipment shall be stored where it cannot be damaged.

13.3. Switching Procedures

13.3.1. The Person-In-Charge shall ensure Customer-switching procedures shall be adhered to.

13.3.2. Prior to re-closing any circuits, the Person-In-Charge shall ensure the following occurs:

13.3.2.1. Patrol and inspect the circuit to ensure it is clear from any faulted conditions.

13.3.2.2. All grounds have been removed and.

13.3.2.3. Personnel and public are clear of the circuit.

13.3.3. Prior to opening circuits, the Person-In-Charge shall ensure the following occurs:

13.3.3.1. Non-load-rated switches require the use of an appropriately rated load-break tool.

13.3.3.2. Opening of jumpers requires an amperage measurement to verify the absence of hazardous electrical current.

13.3.4. Live-line tools shall be used for switching operations.

13.3.5. LOTO and PPE requirements shall be followed when operating hand-operated switching controls.

13.3.6. Appropriately rated load pickup and load-break tools shall be used during switching operations.

13.4. Distribution Work Rules

13.4.1. De-energized Rules

13.4.1.1. Prior to working on De-energized equipment, the Person-In-Charge shall ensure:
a. Customer switching, tagging, and line-clearance rules are implemented.
b. The line or circuit has been tested and Grounded.

13.4.1.2. Conductors or equipment to be worked on by hand (without gloves or sleeves) shall have an equipotential zone (EPZ) established prior to any employee touching the conductor or equipment.

13.4.1.3. Always maintain appropriate M.A.D. while equipment is being De-energized and Grounded.

13.4.1.4. If work tasks cause employees or equipment to encroach on the M.A.D., the work tasks shall conform to the rules in 13.4.2 through 13.4.4.3.

13.4.1.5. Newly constructed lines may be installed without rubber insulating protective gloves, sleeves and personal grounds only when a Site-Specific Task Plan has been developed and approved by Management and Safety Management.

13.4.2. Energized Work Rules (Distribution)

13.4.2.1. Appropriate rubber insulating protective gloves shall be worn when employees are exposed to voltages greater than fifty (50) volts. Sleeves shall be worn when upper-arm exposure is present. Full Body Arc rated clothing shall be worn anytime the potential for arc flash is present. Rubber insulating protective equipment shall be worn in accordance with the ET&D Partnership Best Practices.
a. Employees and the public on the ground shall be effectively protected from hazardous differences in potential that could be created if Equipment or Vehicles become Energized during the work process by Barricading and EPZ. For the purposes of this section a “Barricade” is defined as a physical barrier that prevents employees from coming within 6 ft. of the designated piece(s) of equipment. Equipment Grounds will be installed when necessary or required.

13.4.2.2. Live-line tool work shall be performed in compliance with the ET&D Partnership Live-Line Tool Best Practice.

13.4.2.3. Energized and potentially Energized circuits, parts, equipment, etc. shall be properly Insulated and Isolated in accordance with the ET&D Partnership Best Practices.

13.4.2.4. To work on Energized lines and equipment, the voltage shall be determined prior to working on or near the Energized parts.

13.4.2.5. Only one phase shall be worked on at any time at each location and each employee shall ensure they are Insulated and Isolated from other potentials.

13.4.2.6. When two or more employees are working on Energized circuits or equipment and within M.A.D. of each other, only one phase shall be worked on at a time.

13.4.2.7. Employees working on the Energized lines and equipment shall not exchange tools or materials with other employees who are not properly Insulated or wearing rubber insulating PPE.

13.4.2.8. Energized conductors supported by hoisting equipment shall have appropriately rated live-line tools installed between the conductor and the winch line of the hoisting equipment. M.A.D. shall be maintained by all un-insulated parts of the hoisting equipment.

13.4.2.9. Energized conductors supported by synthetic strap hoists shall be insulated from the structure.

13.4.2.10. Mechanical jumpers shall be Insulated and Isolated from differences in potential. When installing jumpers ensure they are controlled and properly sized for the load.

13.4.2.11. Only approved devices shall be used to make or break a load.

13.4.2.12. When changing out poles the following shall be completed:

a. Pole stress shall not be changed by the addition or removal of guys, conductors, cross arms, etc. unless a determination has been made that the pole can withstand the altered stress.
b. Employees shall work from new poles whenever possible.
c. Damaged or rotten poles/structures shall be made safe before climbing.

13.4.2.13. The Person-In-Charge shall determine when work activities shall be stopped during adverse weather conditions. The Person-In-Charge is permitted to complete necessary work operations to ensure the safety of the public provided that employees can perform the work safely. The Person-In-Charge shall monitor lightning strikes and adverse weather conditions through the use of a lightning strike app. When lightning has been recorded to strike at a distance of six miles from the work site the Person-In-Charge will direct workers to take shelter inside vehicles with the windows rolled up or in a designated shelter for 30 minutes after the last sound of thunder.

13.4.2.14. To protect from back feed, primary leads of a transformer shall be considered Energized at primary voltage until the secondary leads have been disconnected. Disconnected leads shall be physically separated and isolated to prevent accidental contact with Energized lines or equipment.

13.4.3. 5kV Circuits and Below

13.4.3.1. The Rubber Glove Method performed from the pole is permitted on voltages up to 5 kV.

13.4.4. 5 kV Circuits up to 35kV

13.4.4.1. The Rubber Glove Method performed from the pole is not permitted on circuits greater than 5kV.

13.4.4.2. The Rubber Glove Method shall be performed from Insulated platforms or Insulated aerial equipment.

13.4.4.3. The Rubber Glove Method performed from Insulated aerial lifts shall be in accordance with the ET&D Partnership Best Practices. Local or Client requirements shall be adhered too.

13.5. Transmission Work Rules

13.5.1. De-energized Rules

13.5.1.1. Prior to working on De-energized equipment, the Person-In-Charge shall ensure:
a. Customer switching, tagging and line-clearance rules are implemented.
b. A grounding plan is developed and implemented in accordance with Rule 12.4.1.
c. The line or circuit has been tested, grounded and EPZ established.

13.5.1.2. Newly constructed lines may be worked without conventional grounding schemes provided that a Site-Specific Grounding Plan has been developed by the Person-In-Charge reviewed and approved by Management and Safety.

13.5.2. Energized Work Rules

13.5.2.1. Employees and the public on the ground shall be effectively protected from hazardous differences in potential that could be created if Equipment or Vehicles become Energized during the work process by Barricading and EPZ. For the purposes of this section a “Barricade” is defined as a physical barrier that prevents employees from coming within 6 ft. of the designated piece(s) of equipment. Equipment Grounds will be installed when necessary or required.

13.5.2.2. Live-Line Work shall only be performed when a Site-Specific Task Plan has been developed, implemented and approved by Management and Safety Management.

13.5.2.3. Work on Energized lines shall only be performed by Qualified and Authorized Persons with properly rated live-line tools unless the work is to be performed with bare-hand techniques.

13.5.2.4. Only one phase shall be worked on at any time at each location, and each employee shall ensure they are Insulated and/or Isolated from other potentials.

13.5.2.5. Cranes, derricks and boom trucks supporting Energized conductors shall have appropriately rated insulating link sticks installed between the conductor and the hoisting equipment.
a. Cranes, derricks and boom trucks shall maintain M.A.D. from Energized parts or equipment.
b. Hoists supporting Energized conductors shall have appropriately rated live-line tools installed between the conductor and the hoist.

13.5.2.6. Insulated ladders used to access working locations shall comply with the following:

13.5.2.7. Insulated ladders shall be secured and positioned to provide at least the M.A.D. plus a worker envelope that allows for the total length of the employee.
a. Insulated ladders shall be made of non-conductive fiberglass reinforced plastic (FRP).

b. When employees are in contact with the conductor, while working from Insulated ladders, the employees shall Bond their conductive clothing together and to the line to be worked upon; and
c. Ladders shall be rigged with Insulated sticks and clean, dry non-conductive rope.

13.5.3. Bare Hand / Live Line Work Rules

13.5.3.1. Employees performing Live-Line Bare-Hand work shall be Qualified and Authorized through a Company approved LLBH program.

13.5.3.2. Employees shall be re-qualified if they have not performed Live-Line Bare-Hand work in the past twelve (12) months by the subsidiary LLBH Committee.

13.5.3.3. Live-Line Bare-Hand work shall only be performed with proper Customer notification. If the Customer requires a permit or work authorization form, the Person-In-Charge shall ensure the work authorization is completed and approved prior to the start of work.

13.5.3.4. Employees performing Live-Line Bare-Hand work shall don the proper conductive apparel prior to entering the M.A.D.

13.5.3.5. Live-Line Bare-Hand work shall be discontinued when the presence of inclement weather or lightning is in the surrounding area. Live-Line Bare-Hand work shall be discontinued when the presence of inclement weather or lightning is in the surrounding area. The Person-In-Charge shall monitor lightning strikes and adverse weather conditions through the use of a weather app. If lightning strikes within 15 miles the Person-In-Charge will direct workers to take shelter inside vehicles with the windows rolled up for 30 minutes after the last strike.

13.5.3.6. Prior to starting work, the Person-In-Charge shall verify the circuit voltage.

13.5.3.7. The Person-In-Charge shall:
a. Be positioned on the ground at all times.
b. Maintain communication with employees aloft; and
c. Ensure all boom segments below the Insulated portion do not encroach on the M.A.D.

13.5.3.8. A Qualified and Authorized person shall be stationed on the truck and monitoring the leakage current readings while employees are elevated. This person shall have knowledge of the lower controls and how to remove the bucket or basket from contact with the line.

13.5.3.9. Live-Line Bare-Hand aerial device rules:
a. Only company-approved aerial devices with a Class A dielectric rating shall be used.
b. Aerial devices shall be inspected prior to each use.
c. Insulated portions of the aerial device shall be wiped clean prior to each use.
d. Employees using Insulated aerial devices shall always work from a conductive basket or conductive liner in the Insulated bucket.
e. The upper metal parts of the upper end of the boom shall be Bonded together.
f. Aerial devices shall be properly Grounded.

g. Aerial devices shall be barricaded, or appropriate controls implemented to ensure ground personnel are prevented from accidentally contacting the vehicle.
h. Aerial devices shall have a metallic Bonding device for the purpose of Bonding the employee to the conductor being worked; and
i. Lower controls shall be operated before use each day.

13.5.3.10. Leakage current measurement shall be performed daily at each work location and after each time the aerial lift is cradled. Leakage current measurement shall conform to the following:
a. This verification shall be performed with no one in the bucket.
b. Contact shall be held for at least three minutes.
c. During this time leakage current readings shall be observed and documented.
d. Leakage currents shall not exceed one microampere per kilovolt of phase-to-ground voltage, or the values identified by Customer rules and
e. If leakage current exceeds acceptable values, all work shall be stopped immediately and the boom shall be wiped down, then another boom-leakage test will be performed.

13.5.3.11. Bonding leads shall not be used as jumpers, load-pickup or load-break tools.

13.5.3.12. Hand lines shall not be used from Insulated equipment during live-line bare-hand work. Employees shall not place anything on the Insulating component that may decrease its insulating value.

13.5.3.13. Safe Working Load (SWL) shall not be exceeded when using Insulated ladders, Insulated sticks, rope and other associated rigging equipment.

13.6. Conductor Stringing

13.6.1. Management shall ensure that an approved stringing plan is completed for all stringing operations and may also require an approved Grounding Plan.

Reference Link: Wire Stringing Plan

13.6.2. The Person-in-Charge shall implement the requirements specified in the stringing plan.

13.6.3. The “Pre-Pull Wire Stringing Checklist” shall be completed prior to each pull.

13.6.4. All pulling and tensioning equipment shall be Isolated, Insulated or effectively Grounded with EPZ established. Employees and the public on the ground shall be effectively protected from hazardous differences in potential that could be created if Equipment or Vehicles become Energized during the work process by Barricading and EPZ. For the purposes of this section a “Barricade” is defined as a physical barrier that prevents employees from coming within 6 ft. of the designated piece(s) of equipment. Equipment Grounds will be installed when necessary or required.

13.6.5. Employees shall perform visual inspections of all equipment prior to performing work tasks.

13.6.6. Reliable and effective communication shall be maintained between the tensioner, puller, spotters and the person watching the lead/sock.

13.6.7. Required guard structures or “Bat Wing” protection shall be in place and noted on the wire stringing plan.

13.6.8. The puller and tensioner shall be leveled.

13.6.9. Lead distance ratio less than 3:1 shall be reviewed and approved by Management.

13.6.10. The Person-In-Charge shall ensure that EPZs are established for wire-stringing operations. Employees shall ensure that the established EPZ is maintained and shall notify the Person-In-Charge of any deficiencies during wire-stringing operations.

13.6.11. Employees shall ensure that the established EPZ is maintained and shall notify the Person-In-Charge of any deficiencies during wire-stringing operations.

13.6.12. When the pull is in motion, employees shall maintain safe distances from all moving parts.

13.6.13. Running grounds shall be installed between the tensioner and the first structure and Bonded to the common Ground source.

13.6.14. Wire grips, socks and catch-off devices shall be of the proper size and type for the conductor/wire/cable being caught and inspected prior to use.

13.6.15. PPG shall be installed at snubs and catch-off point locations.

13.6.16. Snub sites, splicing sites, etc., left unattended shall be guarded, barricaded or visually identified.

13.6.17. Splicing operations shall require the following:

13.6.17.1. Grounds shall be installed on each side of the work area.

13.6.17.2. The two ends to be spliced shall be Bonded to each other; and

13.6.17.3. Employees working on the ground shall stand on a splicing rig or a conductive mat that is Bonded to the conductor being spliced to maintain an EPZ.

13.6.18. Clipping operations shall require:

13.6.18.1. The establishment of an EPZ for employee protection.

13.6.18.2. The employees to be aware of pinch points and in- the-bite hazards created by the stringing blocks, pulling line and the conductor; and

13.6.18.3. Newly constructed lines may be worked without conventional grounding schemes provided that a Site-Specific Grounding Plan has been developed by the Person-In-Charge reviewed and approved by Management and Safety.

13.6.18.4. PPG shall not be removed until conductor installation is complete.

13.6.19. Stringing Parallel to Energized Lines

13.6.19.1. Stringing operations adjacent to Energized parallel lines shall include these additional requirements:

a. The tension-stringing method shall be used so that there will not be contact between the Energized conductors and the conductors being installed or removed.
b. Pulling and tensioning equipment shall be Isolated, Insulated or effectively Grounded with EPZ established for each piece of equipment.
c. Ground Sets shall be installed to effectively Ground each bare conductor, sub-conductor or overhead ground conductor.
d. Except for moving-type grounds, the PPG shall be installed and removed with an approved hot stick.
e. If the design of the circuit-interrupting devices protecting the line so permits, the automated reclosing feature of those devices shall be made inoperative.

13.7. Overhead Line Equipment

13.7.1. Transformer oil samples shall only be taken when transformers are De-energized.

13.7.1.1. Capacitors

a. Capacitors shall be De-energized, and employees shall wait five minutes, then the terminals shall be Bonded to the frame with an approved live-line tool.
b. Capacitor shall be effectively shunted and remain shunted in transport and storage to eliminate hazardous potential.

13.7.1.2. Load Break Devices

a. Load shall be determined (amperage) and the properly rated load-break device shall be utilized.
b. Load-break tools shall be used and operated in accordance with manufacturer instructions.

13.7.1.3. Regulators

a. Regulators shall be brought on and off line per Customer procedures.

13.7.1.4. Automatic Reclosing Devices

a. When the reclosing device has a non-reclosing feature, the employees performing work shall request that the auto feature be disabled for the duration of their task(s) or shift.

13.7.1.5. Lightning Arrestors

a. Lightning arrestors shall be De-energized / Energized with a hot stick.

13.8. Setting Poles and Lattice Structures

13.8.1. Employees should stay out of the swing area of the pole or tower and also stay out of the fall zone.

13.8.2. All components shall be inspected prior to hoisting to ensure they are fully assembled, and all required fastening has been completed.

13.8.3. Employees positioned in connecting locations during setting operations shall not transfer onto the member being connected until it is securely attached to the structure.

13.8.4. When induced voltages may be a hazard, the hoisted structure shall be Bonded to the foundation or existing structure during the setting work activity.

13.9. Material Handling

13.9.1. Material storage shall not be located under Energized bus, conductors, lines or equipment except when less hazardous locations are not available.

13.9.2. If material is located under Energized parts or equipment or is to be placed near Energized equipment for installation purposes; appropriate M.A.D. shall always be maintained unless insulate and isolate best practices are used.

13.9.3. Qualified observers shall be used when maneuvering large or lengthy objects near Energized parts.

13.9.4. Pole tongs shall be properly rated, sized and approved for the task. Ice tongs are not acceptable and forbidden from use.

13.10. Helicopter Rules

13.10.1. All personnel associated with helicopter operations shall be trained and briefed daily to the level necessary as deemed appropriate by the helicopter company representative.

13.10.2. Daily tailboards shall include the following:

13.10.2.1. Identification of signal person.

13.10.2.2. Communication methods between ground crew, flight crew, signal person and identification of all applicable hand signals.

13.10.2.3. Landing zones, pick zones, travel paths.

13.10.2.4. Rigging and lifting procedures.

13.10.2.5. Safe approach zones to the helicopter.

13.10.2.6. Never approach a helicopter from the rear of the aircraft.

13.10.2.7. Stay as low as possible when approaching aircraft. Keep tools, materials, clothing and arms below your head at all times.

13.10.2.8. Always allow the steel load-line cable to contact the ground, tower or otherwise be Bonded to a Grounded object before grasping or handling the cable.

13.10.2.9. Visual inspection for FOD (foreign/flying-object debris); and

13.10.2.10. Appropriate PPE, goggles, chin straps, secure clothing.

13.10.3. All on-board tools and supplies shall be stowed in secure containers prior to lift off and during flight.

13.10.4. When long-lining personnel, grapple hooks and lifting equipment shall not be attached to the aircraft.

13.10.5. Never throw any items into, out of or while inside the aircraft.

13.11. Working from the Skid

13.11.1. Working from the skid shall only be performed when a Site-Specific Task Plan is developed and approved by Management and the helicopter company representative.

13.12. Transfer Procedures

13.12.1. Transferring from a helicopter shall only be performed when a Site-Specific Task Plan is developed and approved by the Management and the helicopter company representative.

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14. Underground T&D

14.1. General

14.1.1. Only Qualified and Authorized Persons will perform work on underground transmission or distribution systems.

14.1.2. Cables shall be treated as Energized until identified and proven to be De-energized, tested and Grounded.

14.1.3. Work procedures shall be inclusive of ET&D Partnership Best Practices.

14.1.4. When employees are working on energized circuits or equipment, rubber protective-insulating gloves and sleeves rated for the exposure of the highest nominal voltage shall be worn “lock to lock” when employees are working on underground electrical equipment. This includes when the employee manipulates the enclosure’s door.

14.1.5. Management shall develop and implement a Site-Specific Task Plan for work tasks involving cables containing lead or asbestos.

14.1.6. Employees shall receive the proper training and certification prior to working on asbestos or lead-sheathed cable.

14.1.7. Exposed Energized cables in excavations or vaults that are not to be worked on shall be covered (Insulated) and protected to prevent accidental contact or damage. Blast- suppression blankets may be necessary in certain environments.

14.1.8. Barriers, barricades or Isolating materials shall be installed to prevent employees from encroaching on the M.A.D. to Exposed Energized equipment.

14.1.9. Employees carrying, moving or transporting materials shall always maintain appropriate clearances from Energized parts.

14.1.10. When two or more employees are working on Energized circuits or equipment on the same circuit, only one phase shall be worked at a time.

14.1.11. When removing animals, weeds, vines, grass, vegetation or other materials from any underground equipment, the employee shall:

14.1.11.1. Don rubber insulating protective gloves and sleeves and Arc rated Face Shields; or

14.1.11.2. Use approved live-line tools.

14.1.12. Arc rated face protection and rubber insulating protective gloves and sleeves shall be worn when opening and closing the doors of Energized equipment.

14.1.13. Visible door hinges of each enclosure shall be checked for damage prior to opening. Both hands shall be used to keep positive control of the enclosure. Doors with blocking devices incorporated shall be blocked to prevent the door from closing.

14.1.14. All required PPE shall be donned prior to the start of work.

14.1.15. FR garments shall have the appropriate arc rating for the anticipated exposure:

14.1.15.1. Full body FR garment(s) is required.

14.1.15.2. Insulated gloves and sleeves with protectors are considered arc rated.

14.1.15.3. Heavy-duty work shoes or boots are considered arc rate and.

14.1.15.4. Hard hats ANSI/SEA 87.1-2009 Type I Class E are also considered arc rated.

14.1.15.5. 8 cal/cm² rated face shields are considered arc rated.

14.1.16. Equipotential zones (EPZ) will be established for the protection of employees where possible.

14.1.17. The Job Briefing shall identify any back-feed potential.

14.1.18. Prior to opening equipment, if windows are present, check the position of the switch blades.

14.2. Switching Procedures

14.2.1. Customer switching procedures shall be adhered to.

14.2.2. Prior to re-closing any circuits, the Person-In-Charge shall ensure the following occurs:

14.2.2.1. Inspect the circuit.

14.2.2.2. All grounds removed and.

14.2.2.3. Personnel and public are clear of the circuit.

14.2.3. Prior to opening circuits, the Person-in-Charge shall ensure the following occurs:

14.2.3.1. Non-load rated switches shall require the use of an appropriately rated load-break tool.

14.2.3.2. Opening of jumpers shall require an amperage measurement and safeguards to prevent an arc flash.

14.2.4. Live-line tools shall be used for switching operations.

14.2.5. LOTO and PPE requirements shall be followed when operating hand-operated switching controls.

14.2.6. Employees shall maintain a safe distance from view ports, hinged doors, and blast chutes during switching operations.

14.3. De-energized Work Rules

14.3.1. Prior to working on De-energized equipment, the Person-In-Charge shall ensure:

14.3.1.1. Customer switching, tagging and line-clearance rules are implemented.

14.3.1.2. The line or circuit has been tested, Grounded and EPZ has been established.

14.3.2. Before working on a primary cable in a trench or a pull box containing more than one primary circuit:

14.3.2.1. Positively identify the cable to be worked on by utilizing a phase-pulse indicator or similar tool.

14.3.2.2. Appropriate PPE shall be worn if contact could be made with Energized cable.

14.3.2.3. After the cable to be worked has been identified, the cables not being worked may be re-energized after safeguards are provided to protect the employees and the Energized cables from inadvertent damage (e.g., Insulate or Isolate the cables).

14.3.3. Cables to be worked on shall be Grounded at points as close to the work area as possible.

14.3.3.1. Concentric cables shall have the neutral/shield Bonded to the Grounded conductor prior to working on the conductor to dissipate the capacitive charge.

14.3.4. Prior to performing work on a Grounded cable, the cable shall be tested and then spiked to ensure it is De-energized.

14.3.5. Employees shall be removed from the spiking location. Employees shall not remain in vaults, trenches, or underground locations during spiking operations.

14.3.6. Spiking operations shall only be performed with the appropriate live-line spiking tool and the cable shall be Grounded on each side of the work location prior to spiking.

14.3.7. Spiking devices shall be connected with a hot stick and shall be operated remotely by a hot stick or hydraulic-powered means. Spiking devices shall never be applied or operated without the proper live-line tools.

14.3.8. When cutting underground cables properly rated gloves shall be worn.

14.4. Energized Work Rules

14.4.1. All employees must maintain a minimum of five (5) feet of clearance from all open cabinets. Employees encroaching within the five (5) feet clearance limitation shall have all appropriate PPE donned.

NOTE: The five-foot distance is an administrative demarcation arc around open cabinets or enclosures required by the ET&D Best Practices.

14.4.2. Employees shall only be in contact with one phase at any time.

14.4.3. Energized underground conductors or equipment shall never be handled by hand without appropriate PPE.

14.4.4. Elbows shall only be moved with hot sticks and with extreme caution. Switch cabinets, pad-mount transformers and other Energized equipment that are open shall have a qualified attendant at all times.

14.5. URD Circuits

14.5.1. Prior to performing work on a Grounded cable, the cable shall be tested, a phase pulse indicator or other positive identification means shall be used to verify the correct conductor has been selected and then spiked to ensure it is De-energized and Grounded.

14.5.2. Employees shall be removed from the spiking location. Employees shall not remain in vaults, trenches, or underground locations during spiking operations.

14.5.3. Spiking operations shall only be performed with the appropriate live-line spiking tool and the cable shall be Grounded on each side of the work location prior to spiking.

14.5.4. Spiking devices shall be connected with a hot stick and shall be operated remotely by a hot stick or hydraulic-powered means. Spiking devices shall never be applied or operated without the proper live-line tools.

14.6. Pulling Cables

14.6.1. Employees shall perform visual inspections of all equipment to ensure equipment is properly rated (WLL) for the pull.

14.6.2. Employees shall be positioned in locations “out of the bite” and at safe distances from rigging and pulling equipment in anticipation of failure of any component.

14.6.3. Conductive pulling equipment shall not be pushed, blown or pulled by vacuum into ducts or Energized areas where contact with Energized lines or equipment may occur unless all Energized parts are securely covered by proper IPE.

14.6.4. Employees shall not remain in vaults or enclosures on the pulling end during the pulling operation.

14.7. Directional Boring

14.7.1. Prior to directional drilling, Management and Safety shall develop and implement a Site-Specific Task Plan.

14.7.2. Operators, tenders and other employees shall be Qualified and Authorized for the specific equipment.

14.8. Pot Holing

14.8.1. Prior to hydro pot-holing, Management and Safety shall develop and implement a Site-Specific Task Plan.

14.8.2. All pot-holing activities will be performed by Qualified and Authorized Persons.

14.8.3. Pot-holing for utilities is required when excavating under, over, near or adjacent to existing utilities.

14.8.4. All utility-locate procedures shall comply with local area rules. (Reference state or local mandates.)

14.8.5. Electrical Qualified employees pot-holing near Energized electrical cables shall maintained MAD. If MAD may be encroached, the line shall be covered, rubber insulating protective gloves and dielectric boots rated for the phase-to-phase voltage is required. For non-qualified electrical worker, at a minimum 10 feet clearance from the Energized line shall be maintained. If this clearance cannot be maintained, a mitigation plan shall be developed and approved by Management.

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15.Substations

15.1. General

15.1.1. Only Qualified and Authorized Persons shall perform work in substations.

15.1.2. The Person-In-Charge shall ensure personnel entering or leaving a supervisory-controlled substation notify the Customer representative. Customer requirements for FR clothing must be adhered to.

15.1.3. Work procedures shall be inclusive of ET&D Partnership Best Practices.

15.1.4. Employees shall maintain appropriate M.A.D. from Energized bays and equipment.

15.1.5. Management or the Person-In-Charge shall obtain permission from the Customer representative prior to parking or driving into substation yards.

15.1.6. Gates shall be locked when substations are unattended.

15.1.7. Conductive fencing and temporary conductive fencing shall be bonded to the Grounding grid. Equipment parked inside energized substations overnight should be bonded to a ground source.

15.1.8. Temporary perimeter fencing shall have the same warning signs as a permanent perimeter fence.

15.1.9. Employees shall not work below other employees unless the task requires employees to be below other employees. When this is required, the following shall be completed:

15.1.9.1. Employees shall communicate the work plan, and

15.1.9.2. Communication methods to warn employees of falling objects shall be identified and implemented.

15.1.10. Bussing, lines, conductors and equipment shall be considered as Energized unless tested, Grounded and EPZ is established.

15.1.11. Employees carrying or moving materials in an Energized yard shall ensure:

15.1.11.1. M.A.D. is not encroached.

15.1.11.2. Safe travel paths are identified; and

15.1.11.3. Lengthy objects shall either be handled below the shoulders or handled by a person on each end.

15.1.12. Employees shall only climb on structures or equipment that is stable, secured and capable of supporting the total weight of the employee, tools and material.

15.1.13. Storage trailers, support equipment and material shall be stored in areas that do not interfere with ingress, egress, bussing or the structures.

15.1.14. Storage trailers placed in Energized yards shall be Bonded to the Grounding grid.

15.1.15. Spotters are required for any vehicle traveling in an Energized section of a substation.

15.1.16. Flammable liquids shall be stored in an NFPA approved storage container or cabinet in areas away from Energized equipment.

15.1.17. Management shall develop and implement a Site-Specific Task Plan when working on hydrogen or nitrogen filled equipment.

15.1.18. Employees shall not intentionally drop items to the ground or throw items to elevated employees.

15.1.18.1. Hand lines shall be utilized for the hoisting and lowering of tools and materials. Small or loose materials shall be contained in a tool bag.

15.1.18.2. Scrap materials are permitted to be dropped to the ground in designated area and personnel shall be removed from the area.

15.1.19. Breakers shall be Grounded on both sides.

15.1.19.1. If one side is not part of the clearance, that side shall be identified as Energized and properly barricaded or Isolated.

15.1.20. Back-feed potential shall be ascertained for all work tasks.

15.1.21. Newly installed substation equipment shall be Isolated from the existing substation equipment and not connected until the final phase of construction.

15.1.22. Newly installed ground grid shall be Isolated from the existing grid and not connected until the final phase of construction.

15.1.23. Motor-operated devices within the clearance shall be disabled and rendered inoperative.

15.1.24. The Person-in-Charge shall ensure the crew members are aware of the grounding plan, Energized sections, locations of PPG and identifying the breakers or switches that shutdown or Isolate the work area.

15.1.25. Bonds are required prior to making any modifications to the ground grid which could create a difference in potential.

15.2. Working Clearances

15.2.1. Vehicles with radio antennae shall have each antenna secured so as not to encroach on the M.A.D.

15.2.2. Energized sections of a substation shall be demarcated with ropes, caution tape or barricades to ensure personnel do not encroach upon Energized equipment.

15.2.3. Metallic devices (tape measures or duct rodding) shall only be used when each end is under the control of a Qualified Person to ensure metallic devices do not contact Energized parts.

15.2.4. To prevent damage to substation and company equipment, MAD and clearances shall be maintained during vehicle, equipment and material movement. Spotters are required for all vehicle, equipment or material movement when potential contact with equipment exists.

15.3. De-energized Work Rules

15.3.1. Prior to working on De-energized equipment, the Person-In-Charge shall ensure:

15.3.1.1. Customer switching, tagging, and line-clearance rules are implemented.

15.3.1.2. The line or circuit has been tested and grounded.

15.3.2. Conductors or equipment to be worked on by hand (without gloves or sleeves) shall have an EPZ established prior to any employee touching the conductor or equipment.

15.4. Energized Work Rules

15.4.1. Employees and the public on the ground shall be effectively protected from hazardous differences in potential that could be created if Equipment or Vehicles become Energized during the work process by Barricading and EPZ. For the purposes of this section a “Barricade” is defined as a physical barrier that prevents employees from coming within 6 ft. of the designated piece(s) of equipment. Equipment Grounds will be installed when necessary or required.

15.4.2. Energized locations shall be identified and barricaded to prevent unauthorized access.

15.4.3. Energized panels adjacent to work operations shall be covered or isolated.

15.4.4. De-energizing transformers that are equipped with a neutral transformer, resistor or reactor in the neutral bus shall require the neutral to be disconnected when the phase conductors are disconnected. If this is not possible, the transformer shall not be grounded and shall be identified as Energized equipment.

15.4.5. Switching

15.4.5.1. The Person-In-Charge shall ensure Customer switching procedures shall be adhered to.

15.4.5.2. Employees shall be positioned at a safe distance when operating air-break switches

15.4.5.3. Employees operating disconnect switches shall stand firmly on the equipotential grid (ground mat) and touch only the switch handle or control panel.

a. Disconnect switches for distribution voltages that do not have an equipotential mat shall require the employee to don the appropriate rubber insulating protective gloves.

15.4.5.4. Employees shall maintain a safe distance from view ports, hinged doors and blast chutes during switching operations.

15.4.5.5. Switch sticks, hot sticks, or shotgun sticks shall be selected based upon the voltage.

15.4.5.6. Employees shall don the proper PPE for switching operations.

15.5. Substation Equipment

15.5.1. Employees shall perform visual inspections of all equipment prior to performing work tasks.

15.5.2. Employees entering tanks, vessels or other confined locations shall comply with Confined Space rules.

15.5.3. Equipment shall be evaluated for the presence of polychlorinated biphenyl (PCB) compounds. If PCB- contaminated materials are present; contact the Safety Department for guidance.

15.5.4. Equipment shall not be used as an anchorage point for a personal fall-arrest system unless evaluated and approved by a Site-Specific Task Plan.

15.6. Gas Insulated Switchgear and Circuit Breakers

15.6.1. Prior to employees working in or entering switch cabinets the differential pressure across the switch barrier insulator shall be eliminated in the adjacent cabinet.

15.6.2. Spring-loaded switching mechanisms shall be isolated, discharged and LOTO applied.

15.6.3. Air-blast circuit breakers require special grounding procedures. Refer to Customer procedures.

15.6.4. Tanks, bushings, pumps and filter apparatus shall be electrically bonded to a common Ground before oil is transferred into De-energized circuit breakers.

15.6.5. Prior to moving the Grounding strap from the ground switch /test probe, a temporary Ground Set shall be connected to the probe before connecting test leads. This temporary Ground Set may be removed for tests.

15.6.6. Circuit breakers and switches on distribution circuits shall only be opened or closed with approved live-line tools.

15.7. SF6 Circuit Breakers

15.7.1. Tank pressure shall be reduced to zero prior to opening breaker tanks.

15.7.2. Breaker tanks shall not be entered until proper Confined Space procedures have been implemented.

15.7.3. Proper respiratory and skin-protection equipment (PPE) shall be donned during exposure to SF6 or the byproducts of SF6 decomposition. (Sulfur Hexafluoride).

15.8. Lightning Arrestors

15.8.1. M.A.D. distances shall not be encroached upon until the lightning arrestors have been De-energized.

15.8.2. Lightning arrestors shall not be connected to an Energized circuit unless there is a switching shield between the arrestor and the exposed employees.

15.8.3. Lightning arrestors are not to be climbed upon.

15.9. Capacitor Banks

15.9.1. Insulated frames of capacitor banks shall be considered Energized until they are De-energized, Grounded and shunted.

15.9.2. When capacitor banks are De-energized, employees shall wait five (5) minutes before connecting Ground Sets.

15.9.3. Capacitor banks containing floating neutrals (wye- connected systems) shall have the floating neutral Grounded in addition to the phase conductors prior to employees working on the equipment.

15.10. Transformers

15.10.1. Insulators, bushings, cooling fins and capacitor stacks shall not be climbed on.

15.10.2. When removing or installing oil, all windings, tanks, pumps, filters, and equipment frames shall be Bonded together and to the system ground.

15.10.3. Working inside a transformer requires compliance with Confined Space procedures.

15.10.4. Transformers equipped with a neutral bus require specific procedures for Grounding. Customer or manufacturer procedures shall be followed at all times.

15.10.5. Employees shall not short-circuit or Ground any Energized component of an Energized transformer.

15.10.6. Voltage shall not be applied to a De-energized secondary circuit without ensuring the primary circuit is disconnected and guarded or barricaded.

15.10.7. The secondary circuit of a current transformer shall not be opened while the current transformer is energized.

15.10.8. If the primary of the current transformer cannot be De-energized before work is performed on an instrument, a relay or other protective device; the secondary circuit of the current transformer shall be Isolated.

15.10.9. Oil samples shall not be taken from Energized power transformers.

15.11. Batteries

15.11.1. Flames, sparks, torches and other high-heat devices shall be kept away from battery systems due to hydrogen gas release during battery charging.

15.11.2. Metallic tools and equipment shall not contact more than one battery terminal at a time.

15.11.3. Long metallic objects shall not be taken into battery rooms until the battery terminals are covered with Insulating barriers.

15.11.4. Batteries shall not be opened (chemical exposure) in areas exceeding 125° F. Temperature shall be reduced prior to opening.

15.11.5. Batteries shall be protected during installation with Insulating barriers.

15.11.6. Employees working on batteries when exposure to the liquids or vapor is present shall don chemical-protective gloves, aprons, face shield and goggles at a minimum. Full-body protection and chemical-protective boots may be required.

15.11.7. Live parts of battery strings are considered Energized equipment and require the appropriate PPE and rubber insulating PPE.

15.11.8. Appropriate eye-wash facilities shall be within twenty-five (25) feet and readily accessible from the battery area. Shower facilities may be required for lead-acid battery installations.

15.11.9. Lead-acid batteries shall not be opened around Energized equipment.

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16. Lockout Tagout (LOTO)

16.1. Facilities

16.1.1. Only Qualified and Authorized persons shall perform LOTO operations.

16.1.2. Management shall develop, maintain and administer a written LOTO program. For multiemployer worksites, the written program shall be project specific and incorporated requirements by the General Contractor and / or Owner Facility team (Host).

16.1.3. Management shall develop written procedures for machinery that is powered by two sources of energy or by a remotely located power source.

16.1.4. LOTO operations shall be implemented on all equipment, machinery, Energized systems, and potentially Energized systems in which employees may be exposed to potential energy or the release of energy.

16.1.5. Routine maintenance or servicing requiring the removal of a guard, removal of a safety device, or placing a body part into a point of operation or danger zone requires LOTO.

16.1.6. Every employee implementing LOTO shall be provided with individual locks.

16.1.7. Multiple crews working on systems shall independently comply with these rules:

16.1.7.1. Multiple crews can develop group lockout tagout procedures.

16.1.7.2. One Person-In-Charge shall be designated the Authorized Person and retain responsibility for all employees involved.

16.1.8. Authorized Persons shall be identified at each facility.

16.1.9. Authorized Persons shall notify Affected Persons of the LOTO operation.

16.1.10. Only the Authorized Person placing the lock or tag shall have the authority to remove their respective lock or tag.

16.1.11. If an Authorized Person is not present to remove their lock and tag, all reasonable attempts shall be made to contact the employee. The Person-In-Charge shall ensure that all local area procedures for the unavailable Authorized Person are completed. The employee shall be notified of the removal immediately upon their return.

16.1.12. The Authorized Person or the Person-In-Charge shall operate the system controls to ensure the LOTO devices are adequately secured. The system or equipment shall not be capable of restarting. Verify system end point for no back feed (Test or Tryout Rule).

16.1.13. Shift work or personnel changes require the Person-In-Charge to ensure compliance with these rules. The Person(s)-In-Charges shall coordinate a shift change or the addition of personnel to a LOTO process.

16.1.14. Lockout Tagout is NOT the following:

16.1.14.1. Removal of fuses.

16.1.14.2. Isolating an emergency stop (E-Stop), control circuit or a hand-off-auto (HOA) switch; or

16.1.14.3. Isolating an interlock.

16.1.15. Annual reviews of the LOTO program shall be completed by the Safety Personnel and forwarded to the VP Safety.

16.2. Locks and Tags

16.2.1. Locks shall be of a uniform type and consistent in color, size or shape.

16.2.2. Only one key shall be provided for each lock.

16.2.3. Tags shall always be affixed to locks.

16.2.4. Tags and tag attachments shall have a minimum breaking strength of fifty (50) pounds.

16.2.5. Locks and tags shall be securely affixed to equipment.

16.2.6. Tags shall have the following legible information at a minimum:

16.2.6.1. Company Name;

16.2.6.2. Employee Name,

16.2.6.3. Date; and

16.2.6.4. System Name.

16.2.7. Tags may contain additional information such as Person-In-Charge's name, phone numbers of Authorized Persons, start date, completion date or other identification as specified by Customer requirements.

16.2.8. When locks cannot be affixed to a system and a tag is the only means of isolation, the following "Tag Only Procedure" shall be implemented:

16.2.8.1. A supplemental physical safety measure equivalent to the placement of a lock shall be installed to prevent the release of energy. This may be the removal of conductors or piping, removing conductors from the source (de-terminate), opening an additional disconnecting device or installing a blind.

16.2.8.2. Every employee on the system shall be informed of the "Tag Only Procedure" and the reduced level of protection.

16.2.9. "Tag Only Procedures" require the visual verification of the tags and a verification of a zero-energy state prior to the start of work each day.

16.3. Electricians Lockout / Tagout Rules

16.3.1. The Authorized Person or the Person-In-Charge shall always verify the system is De-energized and that other personnel are not working on the system.

16.3.2. The Person-In-Charge shall be responsible for the system identification and ensuring isolation points are identified.

16.3.3. The Authorized Person and/or the Person-In-Charge shall notify all Affected Persons of the procedure.

16.3.4. Each Authorized Person working on the system shall apply their own lock and tag unless covered under a “group leader” LOTO situation for new construction.

16.3.5. Each employee shall verify the effectiveness of the LOTO procedure and ensure all energy sources are Isolated and all energy is released. Verify system end point for no back feed (Test and Try-out).

16.3.6. Each employee shall only remove their own lock and tag when:

16.3.6.1. Their portion of the work is completed; and

16.3.6.2. Exposed Energized parts are Isolated or covered; and

16.3.6.3. The work area is inspected to ensure all tools, materials and equipment are removed from the work area.

16.3.7. The Person-In-Charge shall notify all Affected Persons of the completion of the work.

16.3.8. Personnel shall move to a safe distance prior to re-energizing the system.

16.3.9. Devices, locks and tags shall be removed by the Authorized Person and the system returned to service.

16.4. T&D Line Clearance

16.4.1. T&D Line Clearance Procedures shall be implemented for work performed on Transmission, Distribution or Substation equipment.

16.4.2. The Person-In-Charge shall be responsible for the line-clearance request and notification to the system operator or Customer representative.

16.4.3. T&D tagging requirements shall conform to Customer line-clearance requirements.

16.4.4. If system operators or Customer representatives are not available, the Person-In-Charge shall be responsible for a level of safety equal to a line clearance.

16.4.5. Switching devices shall be rendered inoperable while those devices are protecting employees or included in the boundary of the clearance.

16.4.6. Employees performing line-clearance operations shall be Qualified and Authorized Persons.

16.5. Line Clearance Procedure

16.5.1. The Person-In-Charge shall comply with system operator requirements.

16.5.2. If system operator procedures are not available, the Person-In-Charge or designated employee shall implement this line-clearance procedure:

16.5.2.1. Initiate the line or section isolation request (clearance).

16.5.2.2. Visually verify that the isolation points have been physically opened and tagged per Customer line-clearance requirements.

16.5.2.3. Ensure personnel have signed on to the line clearance and are aware of the limitations of the clearance.

16.5.2.4. Ensure testing has been performed with approved voltage testing equipment to verify that the line is De-energized.

16.5.2.5. Ensure PPG are installed.

16.5.3. Release of a clearance shall be completed per system operator requirements. The Person-In-Charge shall:

16.5.3.1. Notify all employees.

16.5.3.2. Ensure employees are clear of the system.

16.5.3.3. Ensure PPG are removed; and

16.5.3.4. After Ground Sets are removed, the same individual who requested the clearance shall initiate the release of the clearance request.

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17.Commercial and Industrial (C&I)

17.1. General

17.1.1. Commercial and Industrial work is defined as systems on the Customer side of the utility interface and shall be done in accordance with the National Electrical Code.

17.1.2. Only Qualified and Authorized Persons shall perform work on electrical systems.

17.1.3. Electrical work on systems exceeding 600 volts shall comply with the rules in Section 15, 16 or 17.

17.1.4. Electrical systems, parts or equipment operating at or above fifty (50) volts shall be guarded or covered.

17.1.5. Employees who may work on or near Energized circuits shall comply with the M.A.D. and the NFPA 70E Energized Work procedures. (Reference Section 1.8.4 and 17.5)

17.1.6. Employees shall wear appropriate PPE for the hazard.

- 17.1.6.1. De-energized circuits: Minimum PPE requirements are hard hat, safety glasses, safety shoes and gloves.
- 17.1.6.2. Energized Circuits: Appropriate PPE as determined by the hazard analysis rules in Section 17.5.

17.1.7. Electrical equipment shall:

- 17.1.7.1. Have proper over current protection.
- 17.1.7.2. Have proper Grounding and Bonding connections.
- 17.1.7.3. Be designed and approved for the specific use (e.g. damp or wet locations, explosion proof, proper amperage and voltage rating).
- 17.1.7.4. Have proper supports.
- 17.1.7.5. Comply with installation requirements provided in the National Electrical Code (NEC).

17.1.8. Cables and conductors shall have appropriate connectors for strain relief.

17.1.9. Cabinets, boxes, and fittings shall have every opening effectively closed.

17.1.10. Splices, taps, devices, switches, receptacles and connections shall be contained in a box with a cover.

17.2. Temporary Lighting

17.2.1. Temporary lighting circuits and lighting fixtures shall comply with the following:

- 17.2.1.1. Installed in compliance with the National Electrical Code (NEC).
- 17.2.1.2. Not be used for temporary power.
- 17.2.1.3. Lamps shall be protected from accidental damage by suitable guards.

17.2.1.4. Fixtures exceeding 6 pounds shall be supported.

17.2.1.5. Cables and cords feeding lighting fixtures shall be adequately supported with non-conductive material. Cable and cords shall be kept at least seven (7) feet above the floor.

17.2.1.6. Circuits shall originate from over current protective devices that do not supply temporary power.

17.2.2. Damaged or broken lamps shall be replaced.

17.2.3. Unused lighting sockets shall be properly protected.

17.2.4. Temporary lighting shall comply with the below chart:

Table 17.2.4 Temporary Lighting Foot Candles

Foot Candles	Area of Operation
3	General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	General construction area lighting.
5	Indoors, warehouses, corridors, hallways and exit ways.
5	Tunnels, shafts and general underground work areas. (Exception: minimum of 10-ft. candles are required at tunnel and shaft heading during drilling, mucking, and scaling. Approved cap lights shall be acceptable.)
10	General construction plant and shops (e.g. batch plants, screening plants, mechanical and electrical rooms, carpenter shops, rigging lofts and active store rooms, barracks, living quarters, locker or dressing rooms, mess halls, and indoor toilets and work rooms.)
30	First aid stations, infirmaries and offices.

17.3. Temporary Power

17.3.1. Disconnects, circuit breakers, load centers, switchboards, control panels and panel boards shall be legibly marked to identify the load or loads they supply.

17.3.2. Current-carrying feeder cables shall be routed away from ingress / egress paths or break areas, meeting areas or other personnel areas. Temporary systems shall be supported with non-conductive material.

17.3.3. Temporary electrical equipment shall be properly covered, barricaded or protected.

17.3.4. Extension cords:

17.3.4.1. Shall be inspected prior to each use and when exposed to potential damage.
17.3.4.2. Shall be elevated above seven (7) feet where necessary.
17.3.4.3. Shall be three-wire round cords.
17.3.4.4. Shall not be placed in areas where water has accumulated.
17.3.4.5. Shall be designed for hard usage or extra-hard usage. (SO, S, SOW, SJO, SJTO)
17.3.4.6. Shall be repaired by Qualified Persons.
17.3.4.7. Repairs to electrical cords shall maintain the original characteristics of the cord.
17.3.4.8. Repair or replacement of cord caps shall have the appropriate ratings and not exceed the amperage rating of the cord
17.3.4.9. Cord caps shall be mated (matched).
17.3.4.10. Electrical tape is not permitted for repairs.
17.3.4.11. Shall be appropriately sized for the loads. (Twelve gauge (12AWG) is the recommended minimum size.)
17.3.4.12. Shall not be installed where equipment or vehicles travel over the cord.

17.3.5. Flat cords of any type are not permitted.

17.3.6. Ground Fault Circuit Interrupter (GFCI) protection is required:

17.3.6.1. For all one-hundred twenty (120)-volt single phase fifteen (15), twenty (20) and thirty (30)-ampere receptacle outlets that are not part of the permanent wiring of a building or structure.
17.3.6.2. For all existing receptacles that are provided for temporary construction, remodeling, demolition, maintenance or repair activities.
17.3.6.3. On portable generators exceeding five thousand watts (5kW).

Guidance: Systems operating at more than one-hundred twenty-five (125)-VAC or more than thirty (30)-Amps may be GFCI protected. If GFCI protection is not feasible, an Assured Equipment Grounding Conductor Program shall be implemented. (Reference Section 17.3.9.)

17.3.7. GFCI devices shall be tested at the following intervals:

17.3.7.1. Portable plug-in type devices: Each Use
17.3.7.2. Receptacle devices with push-to-test: Monthly
17.3.7.3. Circuit Breaker devices with push-to-test: Monthly

17.3.8. The Assured Equipment Grounding Conductor Program shall be implemented on cables or conductors not specified in the GFCI program in Section 17.3.6.

17.3.9. The Assured Grounding Program, when implemented, shall be documented and maintained by the Person-In-Charge or a Competent Person.

17.3.10. Grounding conductor continuity tests shall be performed:

17.3.10.1. Prior to first use.
17.3.10.2. Prior to return to service after repairs are made.
17.3.10.3. When there is evidence of damage; and

17.3.10.4. Every ninety (90) days.

17.3.11. Cables passing these tests shall be color-coded according to the below table:

Table 17.3.11 Color Code for Assured Equipment Grounding Conductor Program

Month	Tape Color		Month	Tape Color		Month	Tape Color		Month	Tape Color
Jan	White		Apr	Green		July	Red		Oct	Orange
Feb	White with Yellow		May	Green with Yellow		Aug	Red with Yellow		Nov	Orange with Yellow
Mar	White with Yellow and Blue		June	Green with Yellow and Blue		Sept	Red with Yellow and Blue		Dec	Orange with Yellow and Blue

17.3.12. Repairs shall be designated by a brown marking.

17.4. Working Clearances

17.4.1. Electrical equipment such as load centers, switchboards, control panels, panel boards, disconnects, motor controllers, etc., shall maintain the minimum clear working space identified on table 17.4.1. below. (Employees exposed to live parts must demonstrate competency in electrical work practice as defined by NFPA 70E).

Table 17.4.1 Working Clearances

Nominal Voltage to Ground	Minimum Clear Distance for Conditions					
	Condition A[1]		Condition B[1]		Condition C[1]	
	Feet	Meter	Feet	Meter	Feet	Meter
0 to 150	3	0.91	3	0.91	3	0.91
151- 600	3	0.91	3½	1.07	4	1.22

17.4.1.1. Conditions described above are identified as follows: (Note: Employee is between exposures described below.)

a. Exposed live parts on one side and no live or Grounded parts on the opposite side of the working space; or exposed live parts on both sides effectively guarded by Insulating material.
b. Exposed live parts on one side and Grounded parts on the opposite side.
c. Exposed live parts on both sides of the work space (not guarded as described in Condition A1).

Note: Work on electrical systems greater than 600 volts is covered in Sections 15, 16 and 17. Employees who work on systems at or above 600 volts shall be Qualified and Authorized for the work tasks.

17.4.2. At least one entrance and egress path shall be kept clear at all times.

17.4.3. The minimum vertical clearance shall be seventy-eight (78) inches.

17.5. Energized Work

**Note: Electrical work should be performed under de-energized conditions whenever possible. The below definition only applies to scenarios where electrical work cannot be de-energized.*

Energized Work Definition: Performance of any electrical work which will result in exposure of bare energized conductors or circuit parts with voltages above 50VAC or 24VDC

17.5.1. Only Qualified and Authorized Persons shall perform Energized work. Minimum Requirements include:

17.5.1.1. Demonstrated competency in Electrical and Safe Work Practices per NFPA70E (e.g. Lock-out/tag-out, rescue, PPE, etc.)

17.5.1.2. Licensed Journeyman Electrician (except as defined in 17.5.9 or as excepted by local or state requirements)

17.5.1.3. Possession of a signed Energized Work Permit

17.5.2. Management shall develop, implement and maintain an Energized Electrical Safety Program.

17.5.3. If work activity falls under the definition of Energized Work above, an Energized Work Permit must be completed and approved prior to executing work.

17.5.4. Work tasks performed on systems above 250 volts shall require two Qualified and Authorized Persons.

17.5.5. When the Energized Work Permit requires an observer, the observer shall know the location of the isolation device(s) and be trained in first aid and CPR.

17.5.6. PPE shall be selected based upon an exposure assessment or tables provided in NFPA-70E and shall be inspected prior to use.

17.5.7. Prior to working on Energized circuits, the following shall be verified by each employee performing Energized work:

17.5.7.1. Removal of conductive clothing, jewelry, rings, watches, etc.

17.5.7.2. Undergarment materials are cotton, wool or arc-rated per NFPA 70E;

17.5.7.3. Appropriate arc-rated clothing per NFPA 70E rated for the exposure shall be donned.

17.5.7.4. The arc-rated garments per NFPA 70E are the outer most clothing; and

17.5.7.5. Appropriate rubber insulating PPE rated for the anticipated voltage shall be donned.

17.5.7.6. Rubber insulating PPE must be field-verified to have been tested within ASTM D120 standard, and/or company requirements.

17.5.8. Minimum Tool/Equipment requirements:

17.5.8.1. Fire extinguisher.

17.5.8.2. Insulated tools; and

17.5.8.3. Appropriately rated voltage testing equipment.

17.5.9. Apprentices may work on Energized circuits in compliance with Local area rules. Below are minimum requirements:

17.5.9.1. Apprentices and CE/CW class employees with less than 6,000 hours of work experience may not work on or near Energized Circuits.

17.5.9.2. Authorized apprentices and CE/CW class employees with at least 6,000 hours of work experience may work on or near Energized circuits at the discretion of the Qualified Person. The Person-In-Charge shall ensure systems are less than 250 volts phase-to-ground.

17.5.9.3. For Traffic Signal / Highway Lighting / Intelligent Transportation Systems work, Traffic Signal and Traffic Technician apprentice employees with less than 4,000 hours of work experience may not work on or near Energized Circuits.

17.5.9.4. Authorized Traffic Signal Apprentices and Traffic Technicians with at least 4,000 hours of work experience may work on or near Energized circuits at the discretion of the Qualified Person. The Person-In-Charge shall ensure systems are less than 120 volts phase-to-ground or less than 240 volts phase to phase. The prentice or technician shall be under the direct supervision of the person- in- charge.

17.5.10. Energized work on systems above 600 volts shall comply with Sections 15, 16 or 17.

17.6. Storage Batteries

17.6.1. Flames, sparks, torches and other high-heat devices shall be kept away from battery systems due to hydrogen gas release during battery charging.

17.6.2. Metallic tools and equipment shall not contact more than one battery terminal at a time. Long metallic objects shall be handled by two (2) employees.

17.6.3. Batteries shall not be opened or filled in areas exceeding 125° F. Temperature shall be reduced prior to opening.

17.6.4. Protect batteries during installation with Insulating barriers.

17.6.5. Live parts of battery strings are considered Energized equipment. Work on battery strings at or above fifty (50) volts shall comply with Section 17.5.

17.6.6. Appropriate eye-wash facilities shall be within twenty-five (25) feet of the battery area. Shower facilities may be required for lead-acid battery installations.

17.7. Floor and Wall Openings

17.7.1. Covers, barricades and/or guardrails shall be placed to prevent:

17.7.1.1. Employees from falling into or through floor or wall openings;

17.7.1.2. Accidental contact with Energized parts; and

17.7.1.3. Unauthorized personnel from entering work areas.

17.7.2. Floor covers shall be labeled “HOLE” or other appropriate marking to identify the potential hazard they are guarding.

17.8. Guard Rail Systems

17.8.1. Wire rope used for guard rail systems shall only be spliced as described below:

Figure 17.8 Splicing of wire rope for guard rail systems

Correct method – U-bolts of clips on short end of rope. (No distortion on live end of rope.) Thimble in eye splice.

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18.Traffic Signal

18.1. General

18.1.1. Only Qualified and Authorized Persons shall perform work on traffic-control signal devices and street-lighting systems.

18.1.2. Approval to work over active traffic lanes shall require a Site-Specific Task Plan approved by the Management prior to beginning work.

18.1.3. All traffic shall be stopped while loads are hoisted, suspended or traveling over active traffic lanes, pedestrian walkways or other public areas.

18.1.4. Equipment, tag lines, signal arms, span wire, etc., shall be controlled and kept clear of traffic lanes. Traffic shall be stopped until the device is clear of the traffic lanes.

18.1.5. Work areas in public locations shall be adequately barricaded and appropriate signage shall be displayed.

18.1.6. Disabled traffic-control devices (lack of power, replacement, or partial operation) shall have an alternative means of traffic control (Traffic Control Personnel, Flaggers, or alternate devices).

18.1.7. Employees shall not work below other employees unless the task requires employees to be below other employees; when this is required, the following shall be completed:

18.1.7.1. Employees shall communicate the work plan, and

18.1.7.2. Communication methods to warn employees of falling objects shall be identified and implemented.

18.2. Pole, Signage and Mast Arm Installation

18.2.1. Poles shall be inspected prior to the installation of a mast arm or other signaling equipment to ensure it is free of damage or corrosion.

18.2.2. Rigging shall be positioned so that damage will not occur to signals, signage, or other equipment.

18.2.3. Tension on the mast arms shall not be released until all bolts are firmly secured.

18.2.4. Rigging shall be secured on steel poles prior to hoisting.

18.2.5. Unauthorized personnel shall be positioned at a safe distance.

18.2.6. Lift plans shall be developed and communicated to all affected employees for lifts over active traffic lanes, pedestrian walkways or other public areas.

18.3. Load Transport

18.3.1. Pole and mast-arm transport shall conform to state and local requirements.

18.3.2. Flagging is required when the vehicle or load exceeds the maximum vehicle dimensions specified by federal, state and local regulations.

18.3.3. Loads on trailers shall be properly secured according to federal, state and local rules.

18.3.4. Loads shall be visually inspected to ensure they are secure prior to traveling.

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19. Communications/Non-Ionizing Radiation

Non-Ionizing Radiation (NIR) is a term used to describe various low-level radiation such as microwave radiation, ground-penetrating radar, microwave communications, transmitting antennae, microwave radiation, electromagnetic radiation, and visible light.

19.1. NIR, Microwave or Radio Frequency (RF)

19.1.1. Only Qualified and Authorized Persons shall work near or around NIR equipment.

19.1.2. Employees shall be provided appropriate PPE for work locations with exposure to RF burns.

19.1.3. Employees shall receive training prior to working on or near high-level NIR systems.

19.1.4. Employees shall not work on or near ionizing radiation equipment unless the equipment is Isolated through a lockout/tagout procedure. Examples are X-ray equipment, gamma-ray equipment, radio-luminescence equipment, and high-frequency ultraviolet radiation.

19.2. Laser Protection

19.2.1. Only Qualified and Authorized Persons shall work with laser systems.

19.2.2. Laser equipment shall be labeled with the type of laser and maximum output.

19.2.3. Employees who work in, around or near laser beams exceeding 5 mW shall be provided with the appropriate PPE (laser safety goggles) specific to the wavelength and optical density of the laser equipment.

19.2.4. Class 1, 2, and 3 equipment (as identified on the equipment) shall be operated per manufacturer recommendations.

19.2.5. Qualified Persons operating laser equipment shall maintain proof of qualification in their possession.

19.2.6. Areas with active lasers shall have appropriate signage.

19.2.7. Class 4 lasers shall be approved by the Safety Department.

19.3. Fiber Optics

19.3.1. Only Qualified and Authorized Persons shall work with fiber optic systems.

19.3.2. Employees who work with fiber optic cables shall be provided the appropriate PPE, (long sleeve shirts and laser safety goggles).

19.3.3. Inspection of fiber optic cables shall only be performed while the system is dark or protective goggles are donned.

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20. Emergency Tree-Trimming Operations

20.1. General

20.1.1. Only Qualified and Authorized Persons can perform tree-trimming operations.

20.1.2. Employees are not permitted to climb trees.

20.1.3. Tools, equipment and PPE shall be inspected prior to use.

20.1.4. Additional PPE precautions:

20.1.4.1. Goggles and face shields shall be worn when performing tree-trimming operations, including operation of chain saws or other power-cutting equipment

20.1.4.2. Leg protectors shall be worn when operating a chain saw on the ground or when outside of the bucket.

20.1.4.3. Hearing protectors are mandatory when operating fuel-powered equipment.

20.1.5. Employees shall be trained in bucket truck rescue and appropriate rescue procedures shall be identified prior to work.

20.1.6. Tree limbs, trees, branches and other vegetation shall be removed in such a manner that materials when cut will not contact any Energized or potentially Energized parts.

20.1.7. Hand lines or hoisting equipment shall be employed to assist in the removal of branches, limbs or other vegetation.

20.2. Working Near Energized Parts

20.2.1. Inspections shall be performed by the Person-In-Charge or a Qualified Person to determine the potential Energized electrical hazards prior to the start of work.

20.2.2. Non-electrically Qualified Persons shall maintain a minimum clearance of ten (10) feet from Energized conductors and equipment rated at fifty (50) kV phase-to-phase or less; the minimum clearance for conductors rated over fifty (50) kV phase-to-phase shall be ten (10) feet + four (4) inches for each ten (10) kV over fifty (50) kV.

20.2.3. Electrically Qualified Persons may approach closer than ten (10) feet to Energized parts, and the Person-In-Charge shall:

20.2.3.1. Only assign these duties to Qualified Persons.

20.2.3.2. Ensure a Qualified Observer is present at all times.

20.2.3.3. Ensure the Qualified Observer meets the requirements identified in ET&D Partnership Best Practices.

20.2.3.4. The Qualified Observer must prevent employees from encroaching upon the M.A.D.

20.2.4. Employees shall implement every necessary precaution to prevent trees, tree limbs and branches from contacting Energized parts.

20.2.5. Personnel on the ground shall not be in contact with the aerial device when the boom is elevated near Energized conductors or equipment.

20.3. Specialized Equipment

20.3.1. Aerial devices shall maintain appropriate clearances:

20.3.1.1. Insulated aerial equipment shall comply with M.A.D. in Table 1.8.1. and 1.8.2.

20.3.1.2. Un-insulated aerial equipment shall comply with Section 20.2.2.

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21.Gas Operations

Natural gas is largely a mixture of gaseous hydrocarbons occurring naturally in the earth. Wells are drilled and the gas is extracted from the well to be used as a fuel. Natural gas consists of 75% methane, 15% nitrogen, 5% ethane and 5% miscellaneous hydrocarbons. Natural gas is lighter than air and can easily drift or be carried by air currents. Natural gas has the following characteristics:

a. Combustion limits:
    i. Natural gas in its raw state is not explosive, but when mixed with air it becomes explosive. Gas is combustible and explosive in mixtures of approximately 5% to 15% concentration of gas in air.
a. Gas hazards:
    i. Fire – due to burning gas.
    ii. Explosion—due to igniting gas when mixed in air.
    iii. Asphyxiation or suffocation—Due to an excess of gas or lack of oxygen.
    iv. Poisoning—due to fumes containing monoxide.
a. Toxicity:
    i. Natural gas, even odorized gas, is not poisonous. However, it contains 0% oxygen and if present in sufficient quantities to displace the air, can cause suffocation due to lack of oxygen.
a. Odorant:
    i. Natural gas is odorless and colorless.
    ii. Odorant is vaporized into the gas so that a person with a normal sense of smell can detect a natural gas leak before the concentration exceeds 1% gas in air by volume.
    iii. Odorant is flammable.
    iv. Odorant is toxic in heavy concentrations; however, in the small amounts used to odorize gas, it is not considered toxic.
a. Pressure:
    i. Natural gas is pressurized in piping systems. The pressure is usually categorized as low, intermediate or high.

21.1. General

21.1.1. Only Qualified and Authorized Persons are permitted to work on gas operator property.

21.1.2. Personnel shall be required to comply with operator requirements identified in the Pipeline and Hazardous Materials Safety Administration (PHMSA); a division of the Department of Transportation (DOT).

21.1.3. Personnel shall comply with operator-specific requirements.

21.1.4. Drug and Alcohol Testing for Gas Operations shall comply with 49 CFR Part 199. Also reference 40 CFR Part 40 (DOT).

21.1.5. Effective controls and safe work practices shall be employed to protect employees from the following hazards:

21.1.5.1. Fire.

21.1.5.2. Explosion, when natural gas mixes with air it may become explosive.

21.1.5.3. Asphyxiation or suffocation, due to oxygen displacement by gas.

21.1.5.4. Poisoning, due to fumes and vapors lacking oxygen content.

21.1.5.5. Odorant, flammable and toxic.

21.1.6. Appropriate PPE shall be identified and readily available at the work site. Minimum PPE requirements are identified in Section 2.1.10. Specialized PPE may be required when performing Operator Qualification (OQ) qualified tasks, this PPE may include any or all of the following: FR shirt, FR coveralls or SCBA.

21.1.7. Prior to working on any facility, an inspection shall be performed to ensure the system is safe to work on, including but not limited to, pressure is reduced to acceptable levels, ignition sources have been isolated, and the public is maintained at safe distances. Testing of the area is required if the area is enclosed (e.g., Confined Space, excavation, etc.)

21.1.8. Leak detectors shall be approved for gas operations. Leak detectors shall be calibrated and tested at manufacturer or Customer-required intervals.

21.1.9. Leak detectors shall only be operated by Qualified and Authorized Persons.

21.1.10. Removal of any device, plug, meter or other item requires blanking off the opening.

21.1.11. Tools utilized on live gas lines shall be rated for the work task. (e.g., pneumatic powered tools, etc.).

21.1.12. Tools, meters, testers and equipment shall be inspected prior to use.

21.1.13. Entry into underground vaults or Confined Spaces shall be in compliance with Section 8 of this manual.

21.2. Pipe

21.2.1. Materials shall be inspected prior to installation.

21.2.2. Installations shall minimize the strain placed upon fittings, meters and piping.

21.2.3. Be cautious on old systems; the piping can be brittle, and components may break or snap off.

21.2.4. Pipe threading and cutting shall be performed with leather gloves in addition to standard PPE. Die handles shall be blocked or secured to prevent movement if possible.

21.2.5. Air shall be purged from new or repaired lines.

21.2.6. Piping joints and connections shall be leak-tested using a pressure test or leak-detection test.

21.2.7. Static electricity sparking is present during any line breaking, tapping, or other entry into piping. Appropriate controls, such as grounding the gas line, shall be implemented to reduce static charges prior to work operations. If the work breaks the continuity of piping, suitable Bonding jumpers shall be installed.

21.2.8. Employees shall be alert to the hazard of Energized piping due to improper Grounding of electrical circuits or faulty electrical circuits.

21.2.9. Employees shall notify the Person-In-Charge, operator or Customer of any abnormal operating condition prior to performing work.

21.2.10. Damaged or corroded piping shall have the damaged or corroded portion replaced or rendered safe.

21.3. Cutting / Tying in Lines

21.3.1. When potential exposure to escaping gas exists (bagging, tapping, exposing leaks or broken pipes, purging lines, or using pressure-control equipment) or when employees perform 'tie-ins' (activities such as unplugging, uncapping, uncoupling, or opening a live main), the Person-In-Charge shall ensure:

21.3.1.1. A thorough investigation of the distribution area, anticipated pressures, feed direction, bypass requirements and Customer notification is completed.

21.3.1.2. Open flames and sparks are eliminated.

21.3.1.3. The area is barricaded and only Authorized Persons may enter the work area.

21.3.1.4. A spotter is stationed to "stand by" with an appropriate fire extinguisher. This employee shall remain outside the danger area watching for hazards and ready to assist the employees in case of an emergency. The work area shall only be entered to extinguish a fire or assist employees out of the area, not to assist in performing the work task. Sources of ignition, personnel and equipment shall not be downwind of the exposure.

21.3.1.5. Flashback protection is implemented during cutting operations.

21.3.1.6. Work operations are performed per gas operator procedures.

21.4. Purging and Cleaning

21.4.1. When all connections to live lines are completed and prior to new lines or repaired lines being placed into service, the new or repaired line shall be purged of air and inert gas.

21.4.2. Lines shall not be purged inside a building, Confined Space or other enclosure.

21.4.3. If blowing lines with natural gas, a cushion of inert gases shall be used. Such blowing/purging of lines shall only be done under close supervision and with appropriate protection for employees and the public. Notification to the operator, local police and fire services may be required.

21.4.3.1. Where blow risers are installed with compression couplings, such couplings shall be Bonded in accordance with gas operator requirements and the riser is adequately braced to prevent whipping or slippage during the blow.

21.5. Welding

21.5.1. Employees performing welding operations shall be constantly alert to the hazards of escaping gas.

21.5.2. Gas fillet welding of two (2) inch and smaller fittings to live intermediate pressure mains is permitted with the below requirements:

21.5.2.1. The arc-welding process is not immediately available.

21.5.2.2. Approval is obtained from the gas operator.

21.5.2.3. Only Qualified and Authorized Persons shall perform the welding.

21.5.2.4. Line pressure can be reduced where the potential of a blowout is minimal.

21.5.3. Corroded and old piping shall be thoroughly inspected to ensure the wall thickness can withstand the welding operation.

21.5.4. When welding near a bagged line, sparks or hot metal shall be prevented from striking the bag.

21.5.5. Flashback precautions shall be implemented for cutting or welding.

21.5.6. Weld fumes shall be avoided, or proper respiratory protection shall be used. (Reference Section 2.6)

21.5.7. CadWeld (Thermo welding) equipment shall comply with the following:

21.5.7.1. Employees shall be trained in the proper use.

21.5.7.2. The thermo-weld charge shall only be ignited by the means of a flint gun or remote electronic trigger.

21.5.7.3. Gloves, eye protection and a face shield shall be worn when igniting the thermo weld charge.

21.5.7.4. The body, feet, clothing, other personnel, combustible materials/ liquids and flammables are moved away from the area in case molten metal runs out of the mold.

21.5.7.5. Never attempt to thermo-weld wires to magnesium anodes; doing so might cause an explosion.

21.5.7.6. Old pipe shall be inspected carefully for pitting to ensure the thermo-weld can be made without penetrating the pipe; and

21.5.7.7. Thermo-weld materials shall be stored in designated and appropriate locations away from moisture and heat.

21.6. High-Pressure Lines

21.6.1. Only Qualified and Authorized Persons can work on high-pressure gas lines. These lines are typically located at gas compressor stations, wellhead installations or gas transmission pipelines.

21.6.2. Fittings, valves, flexible tubing, piping and flanges shall be inspected prior to use or installation.

21.6.3. Never place your body near any part of the stream or near pressure-relief devices.

21.6.4. "Hot-stabbing" fittings into pipelines are only permitted during emergency situations. Appropriate PPE shall be available and donned prior to any "hot-stabbing" operations.

21.6.5. Valves, relief vents, tubing, fittings, piping, blow-down lines, and blow-down valves shall be adequately supported to withstand the anticipated pressure and forces.

21.6.6. Valves shall be opened at a rate that will not overload or overpressure the system.

21.6.7. Flexible lines shall be secured to prevent whipping.

21.6.8. Components shall be rated for the maximum system pressure.

21.6.9. Storage of high-pressure fittings shall be separated from low pressure and other utility parts.

21.6.10. High-pressure hoses exceeding one-half (½) inch diameter shall be hydrostatic tested annually and tagged with the maximum operating pressure (½ of the test pressure).

21.6.11. High-pressure hoses used for hydrocarbons or oils shall not be used on oxygen systems. Markings or tape shall identify hoses to be used on oxygen systems.

21.6.12. High-pressure sample cylinders shall:

- 21.6.12.1. Be rated at or greater than the system pressure.
- 21.6.12.2. Be hydrostatic and elongation tested every five (5) years. Each cylinder will by tagged with the pressure rating and date of last test.
- 21.6.12.3. Contain burst plugs as required.
- 21.6.12.4. For further detail, refer to compressed-gas cylinders in Section 6.

21.6.13. Metal tubing and fittings are recommended for most high-pressure systems. The following rules are provided for compliance.

- 21.6.13.1. Appropriate tools and cutting equipment shall be used on metal tubing.
- 21.6.13.2. Do not use dull cutters, which harden the tubing and make it brittle.
- 21.6.13.3. Use tubing benders for all tubing bends.
- 21.6.13.4. Do not stretch tubing, force tubing or install tubing in a bind.

21.6.13.5. Do not interchange ferrules, nuts, or bodies on different types of fittings.

21.6.13.6. Always check connections by removing the nut and inspecting the alignment, the threads, ferrule or flare. Reassemble, and then check for leaks.

21.6.13.7. Installation of long lengths of tubing requires allowance for expansion and contraction and proper support to prevent sagging, vibration, and fitting separation (pull-out from fitting).

21.6.14. If plastic materials such as pressure bowls and plastic tubing are used on high-pressure systems. The following rules shall apply:

21.6.14.1. Plastic materials shall not be pressurized greater than their respective rating.

21.6.14.2. Plastic materials shall be inspected visually to ensure there are not any cracks, leaks or deformities and to ensure compatibility; and

21.6.14.3. Appropriate tools and cutting equipment shall be used.

21.7. Damage to Underground Facilities

21.7.1. If facilities become damaged, contact the operator immediately.

21.7.2. If gas is escaping:

21.7.2.1. Evacuate non-essential personnel from the area.

21.7.2.2. Eliminate sources of ignition.

21.7.2.3. Secure the damaged area.

21.7.2.4. Contact the operator; and

21.7.2.5. If buildings are in the area, warn and notify the occupants downwind.

21.7.3. If properly Qualified and Authorized, and if safe to do so, secure the line to stop the flow. PPE such as a fire suit, environmental testing equipment and respiratory equipment may be required.

21.7.4. Employees shall not work alone during emergency work tasks.

21.7.5. Leak detectors and piping locators used during gas leaks shall be intrinsically safe and approved for the exposure.

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22.Garage

22.1. General

22.1.1. Only Qualified and Authorized Persons shall be permitted to:

22.1.1.1. Repair or maintain equipment or vehicles.

22.1.1.2. Perform welding and cutting operations.

22.1.1.3. Perform dielectric testing of vehicle insulation; and

22.1.1.4. Perform DOT-mandated inspections.

22.1.2. Internal-combustion engines shall have adequate ventilation available or an extended exhaust hose to prevent accumulation of exhaust gases in garages.

22.1.3. Cutting, welding and grinding shall be done in well- ventilated areas and in compliance with rules in Section 9.

22.1.4. Ladder usage shall comply with Section 1.11.

22.1.5. Eye-wash stations shall be readily available in garage areas.

22.1.6. Equipment with moving parts, rotating parts, power transmission equipment, belts, chains, and other such devices shall have all exposures adequately guarded.

22.1.7. Ensure the atmosphere is free of hazards prior to using any electric tools, starting a vehicle or other spark- producing work activities.

22.1.8. Power tools shall have the appropriate tool guards installed and in proper working condition.

22.1.9. Employees who use, transport, dispose of or disturb chemicals or hazardous materials shall be trained in the proper use, disposal, storage and PPE requirements for the substance.

22.1.10. Liquids, chemicals or hazardous materials shall be kept in the original container.

22.1.11. Transfer of chemicals or materials is permitted for limited quantities using a properly labeled container. Employees who transfer chemicals or hazardous materials shall don the appropriate PPE. (Reference Section 6.7)

22.1.12. Transfer of liquids or hazardous materials shall only be performed in designated areas. Transfer of liquids includes draining of fluids from vehicles or tanks.

22.1.13. Containers shall be labeled.

22.1.14. Spills or leaks shall be cleaned up and disposed of properly.

22.1.15. Ensure that secondary containment is provided for bulk liquids, oils, or fuels when required.

22.2. Flammable and Combustible Liquids

22.2.1. Section 6 contains applicable rules for flammable and combustible liquids.

22.2.2. Flammable and Combustible Liquids shall be stored in approved and properly labeled safety cans.

22.2.3. Approved safety cans and manufacturer-supplied containers shall be stored in an approved cabinet.

22.2.4. Enclosed storage areas shall be adequately ventilated.

22.2.5. Rags and other combustible items shall be disposed of in approved containers.

22.2.6. Compressed gas cylinders shall be stored properly, secured at all times, and used properly. (Reference Section 6)

22.3. Spray Painting

22.3.1. Indoor spray painting (spray cans only) shall be done in well-ventilated locations.

22.3.2. Painting may require the use of respiratory equipment. Contact the Safety Personnel.

22.4. Equipment

22.4.1. Equipment Rules are provided in Section 5.

22.4.2. Equipment shall be inspected prior to use.

22.4.3. Appropriate PPE shall be donned when operating equipment.

22.4.4. Face shields are required for bench grinders, hand grinders and parts washing, and where required by a hazard analysis.

22.4.5. Equipment requiring documented inspections shall be performed at the specified interval.

22.4.6. Monthly documented inspection:

22.4.6.1. Fire extinguishers; and

22.4.6.2. Eye-wash stations.

22.4.7. Annual documented inspection:

22.4.7.1. Cranes

22.4.7.2. Rigging

22.4.7.3. Hazardous liquid storage tanks; and

22.4.7.4. Secondary containment.

22.5. Bridge / Overhead Cranes and Hoists

22.5.1. Only Qualified and Authorized Persons shall operate cranes and hoists.

22.5.2. Hoists, cranes and associated rigging shall not be loaded beyond their rated capacities.

22.5.3. Cranes, hoists and rigging shall have the capacities legibly marked.

22.5.4. Operating controls shall be legibly marked. Pendant controls shall have legible operating controls. Chain hoists do not need legible controls unless they are remotely operated.

22.5.5. Annual inspection documentation shall be maintained at the respective location.

22.5.6. Loads shall only be moved when visible by the operator. If loads cannot be observed, a Qualified and Certified signal person shall provide the proper signals to the operator.

22.5.7. Additional crane rules are provided in Section 5.9.

22.6. Parts Washers

22.6.1. Parts-washing equipment equipped with a fusible link (fire link) shall be properly maintained and working.

22.6.2. Cleaning fluid disposal shall be in compliance with local area regulations (company-approved 3rd party reclamation vendor).

22.6.3. Parts washers containing fluids that may burn, irritate or otherwise harm the skin require an emergency shower AND eye-wash station.

22.6.4. Employees shall wear appropriate PPE for splash protection when required.

22.6.5. Cleaned parts shall drain before being removed.

22.7. Pressure Washers

22.7.1. Inspect hoses prior to use for cuts, frays, leaky fittings, worn coverings and other damage.

22.7.2. Always maintain a firm grip on the gun jet (wand) when starting the machine.

22.7.3. Shut off the machine when leaving the area or when finished with the task.

22.7.4. Proper PPE shall be worn while equipment is in operation.

22.7.5. Always point the nozzle away from yourself and other personnel. The operator shall stop washing when personnel approach.

22.8. Hydraulic Systems

22.8.1. Only Qualified Persons are permitted to repair or maintain hydraulic systems.

22.8.2. Tool-circuit systems are available in two types; “open systems” and “closed systems.” Ensure the tools are matched to the system.

22.8.3. Tool quick disconnects shall not be altered.

22.8.4. Ensure hoses, tools, couplers and fittings are rated for the pump pressure. Do not interchange parts with different p.s.i. ratings.

22.8.5. NEVER use any part of your body to stop or locate a hydraulic fluid leak.

22.9. Jacks and Jack Stands

22.9.1. Jacks and jack stands shall not be loaded beyond their rated capacity.

22.9.2. Jacks shall be centered under the load and appropriate support shall be placed under the load.

22.9.3. Jacks and jack stands shall be inspected prior to each use and when subjected to shock or impact.

22.9.4. Jacks and jack stands shall be supported when placed on uneven or soft ground.

22.9.5. Blocking or jack stands shall be installed when employees work under a load.

22.9.6. Jacks used in freezing weather shall have appropriate fluids.

22.10. Vehicle Isolation (Disabling)

22.10.1. Only Qualified and Authorized Persons shall isolate or disable a vehicle or equipment for maintenance or repair.

22.10.2. Prior to jacking, vehicle movement shall be disabled by utilizing wheel chocks, blocks, hoists and other means to prevent movement.

22.10.3. Prior to any repair work being performed:

22.10.3.1. Wheel chocks shall be positioned.

22.10.3.2. Keys shall be removed from ignitions.

22.10.3.3. In field work areas, Out Of Service tags shall be installed at the operating controls; and

22.10.3.4. Vehicle shall be inspected for anticipated movement prior to starting work.

22.10.4. Service, maintenance and repair shall be performed in non-hazardous areas. Equipment in “danger zones” shall not be trouble-shot, maintained or repaired unless the unit has broken down and a hazard analysis has been performed.

22.11. Roadside Service

22.11.1. Roadside service shall not be performed near or in traffic lanes whenever possible.

22.11.2. Personnel shall comply with traffic control regulations.

22.11.3. Roadside service shall be limited to basic repairs. Repairs requiring extensive work shall require the vehicle or equipment to be transported to an area away from traffic and roadside hazards.

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23. Mine Safety & Health Administration (MSHA)

23.1. General

23.1.1. Only Qualified and Authorized Persons shall work on mine property.

23.1.2. Employees shall comply with all rules in this manual, MSHA rules and the mine (Customer) property rules.

23.1.3. Mine safety standards are available from the Safety Department. Mine safety standards are published as follows:

23.1.3.1. Training; 30 CFR Parts 46, 47, and 48.

23.1.3.2. Notification, investigation and reporting; 30 CFR Part 50.

23.1.3.3. Metal and Non-Metal Safety Regulations; 30 CFR Parts 56, 57, and 58.

23.1.3.4. Noise exposure; 30 CFR Part 62.

23.1.3.5. Coal mining; 30 CFR Parts 70, 71, 72, 73, 74, 75, 77, and 80.

23.1.4. All employees working on mine property shall carry Form #5000-23 “Certificate of Training” at all times. This form is the employee training record of specific task training and equipment certification. All types of climbing (pole, tower, structure and building) are a type of task training.

23.1.5. Personnel working on mine property for fewer than five (5) days per year require eight (8) hours of training.

23.1.6. Personnel working on mine property more than five (5) days per year require twenty-four (24) hours of training.

23.1.7. Personnel working in underground mines require forty (40) hours of training.

23.1.8. Personnel are required to complete an eight (8) hour refresher annually prior to expiration date.

23.1.9. Coal mines require specific licensure for all electrical work. Refer to local area requirements.

23.1.10. All other site-specific safety and health policies shall refer to the applicable rules contained in that section of this manual or the site-specific operator rules (whichever is more stringent).

23.1.11. MSHA requires documented daily workplace examinations performed by the designated competent person prior to beginning work and shall conduct frequent and regular inspections of the work area as necessary to note changing conditions.

23.1.11.1. Deficiencies shall be immediately identified and corrected.

23.1.11.2. Deficiencies beyond the control of the company shall be reported and documented to the operator.

23.1.11.3. Mobile equipment pre-operation inspections shall be performed and documented by the operator daily.

23.1.11.4. Tools and equipment with a noted deficiency shall be Red- Tagged and removed from service immediately until necessary repairs are made

23.1.12. All training plans shall be approved by the MSHA and revised as required for Customer or MSHA requirements.

23.1.13. All employees on mine sites shall be trained under the guidelines of an MSHA-approved training plan. The training plan shall require site-specific training to be provided by the mine operator.

23.2. Jurisdiction

23.2.1. MSHA governs the mining areas above and below ground including the transport of mined materials on mine property. Coal mines, precious metal mines, rock quarries and gravel pits are examples. OSHA may be responsible for plant production areas such as a smelter, acid plant, or production area.

23.2.2. Management shall report all MSHA production hours on a quarterly interval per MSHA requirements.

23.3. Accidents and Accident Reporting

23.3.1. Accidents on MSHA property are reported to MSHA ONLY. Use the proper MSHA forms (#7000-1) and reporting procedures obtained from the Safety Department.

23.3.2. The Person-In-Charge shall immediately report all Accidents to the Management and the mine operator.

23.3.3. Management shall report to MSHA (800) 746-1553 any of the following incidents within fifteen (15) minutes of the occurrence:

23.3.3.1. A death;

23.3.3.2. An injury which has reasonable potential to cause death;

23.3.3.3. An entrapment of an employee for more than thirty (30) minutes;

23.3.3.4. An unplanned:

a. Inundation of a liquid or gas;
b. Ignition or explosion of dust, gas, explosive or a blasting agent;
c. Roof fall in active areas or roof fall that impairs access or ventilation;
d. Fire not extinguished within ten (10) minutes (underground);
e. Fire not extinguished within thirty (30) minutes (surface areas);
f. Coal or rock outburst that disrupts regular mine activity and results in withdrawal of miners for more than one hour;
g. An unstable condition which requires emergency action to prevent failure, or which causes miners to evacuate an area; or
h. Any serious injury which may pose the threat or potential of death

Note: Accidents on MSHA Property are NOT reported on the OSHA 300 log.

23.4. Evacuation, Escape and Rescue

23.4.1. The Person-In-Charge shall establish a site-specific escape and evacuation plan for each work site that is compatible with the mine property rules.

23.4.2. Every Person-In-Charge shall have first aid and CPR training on an annual interval.

23.4.3. The Person-In-Charge shall ensure all employees comprehend the rescue plans, evacuation routes and escape passage locations.

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24.Industrial Hygiene

24.1. General

24.1.1. If employees encounter or expect to encounter any of the below-listed Hazardous Substances, the employee shall notify the Person-In-Charge:

24.1.1.1. Arsenic
24.1.1.2. Asbestos
24.1.1.3. Acids
24.1.1.4. Benzene
24.1.1.5. Beryllium
24.1.1.6. Cadmium
24.1.1.7. Caustics
24.1.1.8. Corrosives
24.1.1.9. Hexavalent Chromium
24.1.1.10. Hydrogen Sulfide
24.1.1.11. Lead
24.1.1.12. Molybdenum
24.1.1.13. Nickel
24.1.1.14. PCBs
24.1.1.15. Silica
24.1.1.16. Sulfur Dioxide
24.1.1.17. Chemical processes with potentially harmful health effects due to employee exposure
24.1.1.18. High concentrations of fugitive emissions / fumes / dust (particulates not otherwise specified--PNOS) generated during work operations or being performed indoors. (High concentrations are defined as the inability to visually recognize objects less than 10 feet away when looking straight ahead); or
24.1.1.19. Biological hazards such as mold, mildew, viruses, poisonous plant or toxins that can affect human health.

24.1.2. Management or the Person-In-Charge shall notify the Safety Personnel of the presence of a Hazardous Substance.

24.1.3. The Safety Personnel shall utilize the necessary resources to develop and implement a Site-Specific Task Plan which shall include at a minimum:

24.1.3.1. Substance identification, evaluation, testing, PPE and exposure controls.
24.1.3.2. The protective measures to manage, control or eliminate the Hazardous Substances; and
24.1.3.3. Periodic inspections and audits of the identified control measures.

24.1.4. Management and Safety shall notify employees of the approved protective measures.

24.1.5. Chemical product hazards shall be evaluated before use by employees.

24.1.5.1. Safety shall be contacted if a chemical has a National Fire Protection Association (NFPA) or Hazardous Material Identification System (HMIS) health rating (blue section) of 3 or 4.

24.1.5.2. Chemicals with a high health hazard (NFPA or HMIS rating of 3 or 4 or GHS 1-2), if possible, should be substituted with another chemical product or eliminated from use.

24.1.5.3. High health hazard chemicals shall have engineering controls such as ventilation instituted when appropriate (indoors).

24.1.6. Indoor exposure controls shall be put in place for employees working indoors where sanding or cutting of drywall and joint compound to prevent exposure to high concentrations of dusts and, in some cases, respirable silica.

24.1.7. Physical hazards in the form of noise, heat, non-ionizing radiation (e.g., welding, microwaves, radio frequency, etc), shall be evaluated by the Safety Personnel and then proper controls instituted.

24.1.7.1. Employees working in hot environments where heat stress is a concern shall take appropriate measures (consume fluids, take breaks, etc.) to prevent heat exhaustion, heat stroke and severe injury.

24.1.7.2. The Safety Personnel shall be contacted before any work occurs on or near any live or energized microwave and/or radio frequency sources.

24.1.7.3. Welding fumes shall be controlled through direct ventilation or general dilution ventilation.

24.1.8. If task performance could result in potential overexposure to chemicals and / or physical hazards to employees based on sampling or testing results, the following hierarchy of controls shall be followed:

24.1.8.1. Elimination of the hazard.

24.1.8.2. Substitute a less hazardous or non-hazardous chemical.

24.1.8.3. Engineering controls such as ventilation.

24.1.8.4. Administrative and work practice controls (e.g., job rotation, to limit the amount of time in the work environment, etc.).

24.1.8.5. Personal Protective Equipment (PPE).

24.1.9. Sampling plans shall be developed to determine the employees' exposure level in a work environment where exposures may exceed established exposure limits.

24.1.10. Employees shall be monitored according to the sampling plan to determine their quantitative exposures to harmful agents.

24.1.11. Personal exposure monitoring results shall be provided to each employee in the work area.

24.1.12. Personal monitoring results are medical records and shall be kept on file for the duration of employment + 30 years.

24.1.13. Employees may access their personal medical and exposure records through a request to Human Resources or the Safety Department.

24.2. Hazard Communication

24.2.1. Management and Safety Personnel shall work together to maintain a list of hazardous chemicals known to be present in the workplace. Each chemical shall have a Safety Data Sheet (SDS) readily accessible in the workplace.

24.2.2. Employees shall be trained prior to use and be knowledgeable of the health and safety hazards associated with use or exposure to Hazardous Substances in their workplace.

24.2.3. Employees shall be provided with the location of the SDS and the methods to access the SDS.

24.2.4. Containers of hazardous materials shall be labeled with the type of material.

24.2.5. Labeling shall be easily identifiable and identified by the common trade name of the substance. Labeling options are the trade name, the NFPA diamond or the HMIS label.

24.2.6. Employees shall use the proper PPE for the type of Hazardous Substance.

24.2.7. All transfer containers, secondary containers and one-days use containers shall be appropriately labeled.

24.2.8. SDS shall be obtained, categorized and filed for quick reference at each work site.

24.2.9. SDS shall be readily available to all employees upon request. SDS can be retrieved from the following:

24.2.9.1. www.3eonline.com 1 (888) 274-3572

24.3. Training

24.3.1. Management shall ensure that employees receive training prior to exposure to Hazardous Substances in the environment.

24.3.2. Substances that require training are the following:

24.3.2.1. Chemicals with an OSHA-specific standard (lead, asbestos, cadmium, Hexavalent chromium, benzene, etc.)

24.3.2.2. Chemicals with a high health-hazard rating of 3 or 4 or (GHS 1-2).

24.3.2.3. Substances identified as carcinogens by federal or state regulation.

24.3.2.4. Substances identified as a biological contaminant, (tuberculosis, bloodborne pathogens, etc.)

24.3.3. Training shall be documented by employee training roster and uploaded on the LMS system.

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25.Sub-Contractor Safety Requirements

25.1. General

25.1.1. Subcontractors working for the Company are responsible for providing and overseeing safety programs that comply with applicable statutes, regulations, codes, ordinances, rules, and project requirements dealing with or related to the safety of persons and/or property as such pertain to the subcontractor's work. Subcontractors shall at all times remain in control and responsible for their own safety compliance.

25.1.2. Management shall communicate any unique hazardous conditions and / or information provided by the customer to all subcontractors that is relevant to the safety of the subcontractors' work.

25.1.3. Management shall ensure subcontractors meet the Guidelines for Subcontractor Safety Performance Qualification.

25.1.4. Subcontractors shall be prequalified and approved by Management.

25.1.5. All Subcontractors are required to do a documented hazard assessment (tailboard) of their work and communicate the hazards and mitigations to their employees.

25.1.6. All Subcontractors are required to employ qualified workers and Supervision at all times.

25.1.7. Subcontractors shall submit their health and safety plan for review by Management. Such review shall be for verification only.

25.1.8. The Person-In-Charge and / or site safety personnel shall periodically observe the work tasks of subcontractors.

25.1.8.1. In the event of an unsafe work or other non-compliant activity is defined, the Person-In-Charge shall stop the activities and notify the subcontractor's management for corrective action.

a. The Person-In-Charge and / or site safety personnel shall also document and notify company Management.
b. Management shall verify that the identified unsafe or non-compliant activities have been corrected.

25.2. Qualified and Authorized Persons

25.2.1. Only Qualified and Authorized Persons shall be permitted to work on company work sites.

25.2.2. Management and the Person-In-Charge shall verify that the Subcontractor has Qualified Persons for the tasks to be performed.

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26.ET&D PARTNERSHIP - Best Practices

BP.1. Administrative Controls

PRACTICE STATEMENT:
Injuries to personnel from improper job planning and risk assessment.

PRACTICE DESCRIPTION:
Identify type and quantity of Insulate and Isolate components.

A. Pre-planning to begin at the pre-bid meeting.
B. Preliminary job site analysis.
C. Contractor shall request information from the host employer so that the Contractor may be able to conduct adequate risk assessments prior to beginning operations.
D. Line work on conductors or equipment shall be performed when they are de-energized or a portion is de-energized and grounded when possible.

BENEFITS:
Eliminate injuries resulting from improper planning by ensuring key job hazards are identified and controlled and provide support to contractors in obtaining needed information for effective risk assessments.

BP.2. Job Briefings

PRACTICE STATEMENT:
Provides a uniform methodology and outlines key components of job briefings.

PRACTICE DESCRIPTION:
Document job sequence, hazards to be encountered, and steps taken to control/eliminate hazards by doing the following:

A. Define routine and critical tasks.
B. Identify roles and responsibilities.
C. Identify hazards.
D. Determine risk mitigation.
E. Documentation shall include Insulate and Isolate to be used.
F. Personal Protective Equipment to be used.
G. Emergency response information.
H. Number of briefings to be held.

NOTE: Job briefing need to be conducted when work changes significantly.

BENEFITS:
A. Provides for essential job safety planning guidelines and lists key elements.
B. Enhances compliance with OSHA regulatory requirements.
C. Incorporates use of a specific hazard identification process in the job planning process that will provide for enhanced controls for risks.

D. Proper pre-planning reduces the risk of injury.
E. The process and required documentation enhance inclusion and participation of job team members in the safety planning processes associated with the job.

BP.3. Pre-Use Inspection of Rubber Protective Equipment

PRACTICE STATEMENT:
Protocols related to the effective inspection of insulating protective equipment.

PRACTICE DESCRIPTION:
All rubber protective equipment shall be inspected prior to each use. All rubber/plastic insulating equipment shall be inspected for any damage, wear or contamination that would compromise its ability to Insulate or Isolate the linemen from different potentials. Applicable service dates shall be observed. If upon inspection insulating protective equipment is found to be defective the equipment shall be identified and removed from service.

BENEFITS:
Provides for uniform inspection guidelines that can be applied industry wide.

BP.4. Qualified Observer

PRACTICE STATEMENT:
Identify and utilize qualified observer for critical tasks.

PRACTICE DESCRIPTION:
A member of the crew shall be identified to act as an observer to ensure clearances are maintained, PPE, and effective cover-up is installed. The observer shall be capable of the identifying nominal voltages, energized components, minimum approach distances, and proper safe work practices while crewmembers are working on energized lines.

NOTE: This section is not intended to mandate staffing requirements.

A. The term “effective cover up” is used to describe the installation of phase-to-phase rated insulating protective cover on energized conductors and/or equipment of different potentials when the lineman is within reaching distance or in areas extended by handling conductive objects.
B. The term “extended reach” is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.

BENEFITS:
A. Eliminate injuries from unrecognized hazards or changes in conditions.
B. Clarify duties and provides guidance as to when observers are beneficial.
C. Provides guidance on observer qualifications.

BP.5. Insulate and Isolate Safety Performance Check

PRACTICE STATEMENT:
Review of qualification, and/or performance criteria to ensure compliance with Isolate and Insulate procedures.

PRACTICE DESCRIPTION:
A safety review process shall be in place that will be performed by a Competent Person. Included in the review process will be assurances that the Company safety rules and proper cover up procedures are being followed. Additionally, documentation such as Job Briefing forms and Job Safety Analysis forms shall be reviewed.

BENEFITS:

A. Routine auditing provides for performance and regulatory assurance for critical control techniques
B. Effective auditing will enable enhanced and consistent performance

BP.6. Cradle-To-Cradle Use of Insulating Rubber Gloves and Sleeves

PRACTICE STATEMENT:
Protocols related to effective use of insulating rubber gloves and sleeves.

PRACTICE DESCRIPTION:
When employees are working on energized circuits or equipment using the rubber glove method, rubber protective-insulating gloves and sleeves rated for the exposure of the highest nominal voltage shall be worn cradle-to-cradle when working from an aerial platform.

A. Rubber protective insulating sleeves are not required when employees are working circuits with a potential of 600 volts or less if there is no upper arm exposure and the worker will not encroach the 5-foot primary zone.
B. The term “effective cover up” is used to describe the installation of phase-to-phase rated insulating protective cover on energized conductors and/or equipment of different potentials when the lineman is within reaching distance or in areas extended by handling conductive objects.
C. The term “extended reach” is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.
    i. Electrical class rating of the insulating rubber sleeves shall meet or exceed the electrical class rating of the insulating rubber gloves when working on primary conductors.
    ii. Company policies shall apply when the above conditions cannot be met. Alternative work methods ensuring worker safety shall be identified, communicated to all affected workers, implemented and documented as part of the Job Briefing process.

BENEFITS:

A. Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
B. Provides for uniform use guidelines that can be applied industry wide.

BP.7. Lock-To-Lock Use of Insulating Rubber Gloves and Sleeves

PRACTICE STATEMENT:
Protocols related to effective use of insulating rubber gloves and sleeves.

PRACTICE DESCRIPTION:
When employees are working on energized circuits or equipment using the rubber glove method, rubber protective-insulating gloves and sleeves rated for the exposure of the highest nominal voltage shall be worn "lock to lock" when employees are working energized URD equipment.

A. The term "Lock-to-Lock" is used to describe the utilization of rubber gloves and sleeves, when required, prior to the time the pad mounted equipment is unlocked until work is complete and the pad mounted equipment is relocked. Additionally, rubber gloves and e reach of the conductor or piece of equipment. The term "extended reach" is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.
B. Electrical class rating of the insulating rubber sleeves shall meet or exceed the electrical class rating of the insulating rubber gloves.
C. Company policies shall apply when the above conditions cannot be met. Alternative work methods ensuring worker safety shall be identified, communicated to all affected workers, implemented and documented as part of the Job Briefing process.

BENEFITS:
A. Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
B. Provides for uniform use guidelines that can be applied industry wide.

BP.8. Rubber Insulating PPE for the Live Line Tool Method on Distribution Lines

PRACTICE STATEMENT:
Use of rubber insulating gloves and sleeves while performing distribution power line tasks via the live line tool method.

PRACTICE DESCRIPTION:
When working primary voltages aloft:

A. For the purpose of this document M.A.D. is defined as the Minimum Approach Distance defined by applicable Federal, State or Local regulation. M.A.D. may also be known as "Primary Contact Zone", "Minimum Working Distance, "Within Reach", "Extended Reach", etc.
B. This Best Practice only applies to those applications where power-line workers are utilizing the "live line tool work method" aka – "hot sticking." Workers using the "live line tool work method" ("hot sticking") use insulating tools designed and intended for use while working on energized equipment and/or conductors. Workers using the "live line tool work method" are not permitted to make direct contact with energized equipment and/or conductors with their hands and are not permitted to be in a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. as prescribed in applicable Federal, State and Local Regulatory Standards.

C. It is not intended nor required that the Strategic Partnership Cradle-to-Cradle Rubber Glove Work Method Best Practice be applicable when power-line workers are using the "live line tool work method". The Cradle-to-Cradle Rubber Glove Work Method Best Practice applies only when work is to be done utilizing the "rubber glove work method". When a task requires the worker to reach into, extend any conductive object into, or extend any other part of the body into M.A.D. while using the "live line tool work method," the use of rubber insulating gloves and/or rubber insulating gloves and sleeves rated the voltage are required to be used as described in this Best Practice".
D. Donning of such PPE shall be done in a safe location so that M.A.D. requirements are not violated. This may include repositioning of the aerial lift to its cradled position. It should be noted however, Incident investigations have revealed M.A.D. violations have occurred during
E. "live line tool work method" operations. The intent of this Best Practice is to eliminate both M.A.D. encroachment violations and subsequent injuries.

Live Line Tool Method

A. Rubber insulating gloves and sleeves are not required when working from a position where the worker cannot reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. while using fiberglass insulating live line tools ("hot stick" method).
B. Before getting into a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D., approved protective equipment shall be used to Insulate and/or Isolate energized conductors and/or parts.
C. Rubber insulating gloves shall be worn when tasks require the worker to reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. when there is no upper arm exposure, even when proper cover is utilized.
D. Insulating rubber gloves and sleeves shall be worn when tasks require the worker be in a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. when all the above precautions have been taken and upper arm exposure still exists.

BENEFITS:

A. Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
B. Provides for uniform use guidelines that can be applied industry wide.

BP.9. Safety at Heights- Fall Protection when Performing Work on Wood Poles

PRACTICE STATEMENT:

Fall Protection Equipment (FPE) shall be used when ascending, descending, changing position and when in the working position while on a wood pole.

PRACTICE DESCRIPTION:

Wood Pole Fall Restriction Device shall be "engaged" ground-to-ground when ascending, descending, changing position and when in the working position.

A. When in the working position, Work Positioning Equipment may be used when rigged such that an employee cannot fall more than two feet.

B. When climbing wood poles that have pole steps or other obstructions the hitch hike climbing method, utilizing the Work Positioning Equipment, may be used to ascend or descend when rigged such that an employee cannot fall more than two feet.
C. Wood pole climbers shall be trained and competent in the care, use and inspection of components used to conform to this Best Practice. Employers should obtain comprehensive training from the manufacturer as to the equipment's proper use (to include "train the trainer"). Employees must be trained in the selection and safe use of the equipment/system. This should include the following: Application limits; techniques used for proper adjusting of the equipment, methods of use, inspection, storage of the device and a demonstration of competency of device usage. Training shall only be conducted by qualified trainers. Refresher training shall be provided that will maintain employee's competency in the use of required equipment.
D. Prior to climbing any wood pole, an inspection of the pole shall be conducted. All components of the Fall Protection Equipment shall be inspected by the climber (per manufacturers' specifications) to ensure the device is fit for use.
E. This Best Practice applies to all climbers including those that perform pole top rescue on wood poles. Rescue application should be pre-determined (as early as possible, but no later than during the pre-job briefing) based on rescue needs such as timeliness and consideration given to the characteristics of the structure that rescue is being performed on. Employers shall address rescue considerations and develop appropriate procedures that will allow successful performance of a given rescue technique for varied field conditions. Climbers shall be qualified in the methods identified to be used for rescue.
F. Company policies shall apply when the conditions of this Best Practice cannot be met. Alternative work methods ensuring worker safety shall be identified, communicated to all affected workers, implemented and documented as part of the job briefing process.

BENEFITS:
To eliminate injuries and fatalities associated with falls from Wood Poles.

Definitions:
Fall Protection Equipment (FPE) — any equipment, device or system that prevents an accidental fall from elevations or that mitigates the effect of such fall.

Wood Pole Fall Restriction Device — A device that, when properly adjusted and combined with other subcomponents and elements, allows the climber to remain at his or her work position with both hands free and that performs a fall restriction function if the climber loses contact between his or her gaffs and the pole.

Work Positioning Equipment (WPE) — Equipment used to support a worker on the pole so that the worker's hands are free when he or she reaches the work position. A pole strap, a lineman's body belt, and/or a lineman's harness and hooks/gaffs constitute Work Positioning Equipment.

BP.10. Fall Protection when Performing Work on Lattice Structures

PRACTICE STATEMENT:
Fall Protection Equipment (FPE) shall be used continuously when ascending, descending, changing position and when in the working position while on a lattice structure.

PRACTICE DESCRIPTION:
Fall hazards associated with aerial work performed on lattice structures shall be assessed, and fall hazard mitigation plans developed. Personnel shall be competent in the application of all necessary fall protection methods used for the fall hazard mitigation of the tasks that will be performed on a given lattice structure. A Fall Hazard Analysis (FHA) shall be completed for workers to use when ascending, descending, maneuvering, while in the working position and performing rescue operations while on a lattice structure.

A. Climbers shall be competent in the application of all necessary fall protection methods used for the fall hazard mitigation of the tasks that will be performed on a given lattice structure.
    i. A Fall Hazard Analysis FHA) shall be completed. As a function of the planning/job site analysis, the following information should be obtained and included with the FHA:
    ii. Identify tasks to be performed on given lattice structures.
    iii. Customer Fall Protection policies, procedures and hazard analysis documentation as applicable.
    iv. Identify suitable anchorage points that are going to be used for the task to be performed on any given lattice structure.
    v. Employers shall address rescue considerations and develop appropriate procedures that will allow successful performance of a given rescue technique for varied field conditions.
    vi. Determine/Identify necessary FPE and/or Work Positioning Equipment (WPE).
    vii. Determine climber qualification in the use of FPE and/or WPE.
B. FPE/WPE shall be inspected and used in accordance with the manufacturer's instructions and guidelines.
C. Company policies shall apply when the conditions of this Best Practice cannot be met. Alternative work methods ensuring climber safety shall be identified, communicated to all affected workers, implemented and documented as part of the job briefing process.
D. Lattice structure climbers shall be trained and competent in the care, use and inspection of the equipment used to conform to this Best Practice. Climbers must be trained in the selection and safe use of the equipment/system. Training shall only be conducted by qualified trainers.
E. Visual inspections shall be performed prior to, and during climbing, to ensure that the structure is in acceptable condition for the safe execution of the tasks to be performed.
F. This Best Practice applies to all climbers including those that perform rescue on lattice structures. Rescue application should be predetermined as early as possible, but no later than during the pre-job briefing, based on rescue needs such as timeliness and consideration given to the characteristics of the structure that rescue is being performed on.

BENEFITS:
To eliminate injuries and fatalities associated with falls from lattice structures.

Definitions:
Anchorage — a secure point of attachment on the lattice structure to which the fall protection system is connected.

Fall Protection Equipment (FPE) — any equipment, device or system that prevents accidental falls from elevations or that mitigates the effect of such fall.

Personal Fall Arrest System (PFAS) – a system used to arrest a fall from a working level. It consists of an anchorage point, connectors, body harness and may include a lanyard, deceleration device, life line, or suitable combinations of these.

Work Positioning Equipment (WPE) - Equipment used to support a worker on the lattice structure so that the worker's hands are free when he or she reaches the work position. A safety strap, a lineman's body belt, and/or a lineman's harness constitute Work Positioning Equipment.

Fall Hazard Analysis (FHA) – Analysis conducted to identify the integrity of the structure. Identify the fall hazards based the type of structure and tasks to be performed on given structure. Equipment and procedures necessary to control the fall hazards.

Table BP.10 Control Methods – Crystalline Silica Table

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
1	Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
2a	Handheld power saws (any blade diameter) when used outdoors	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask
2b	Handheld power saws (any blade diameter) when used indoors or in an enclosed area	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask
3	Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less) for tasks performed outdoors only	Use saw equipped with commercially available dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
4a	Walk-behind saws when used outdoors	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
4b	Walk-behind saws when used indoors or in an enclosed area	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask
5	Drivable saws for tasks performed outdoors only	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
6	Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
7	Handheld and stand-mounted drills (including impact and rotary hammer drills)	Use drill equipped with commercially available shroud or cowling with dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
8	Dowel drilling rigs for concrete for tasks performed outdoors only	Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask
9a	Vehicle-mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.	None	None
9b	Vehicle-mounted drilling rigs for rock and concrete	Operate from within an enclosed cab and use water for dust suppression on drill bit.	None	None
10a	Jackhammers and handheld powered chipping tools when used outdoors	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	None	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask
10b	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask
10c	Jackhammers and handheld powered chipping tools when used outdoors	Use tool equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	None	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
10d	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	Use tool equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask
11	Handheld grinders for mortar removal (i.e., tuckpointing)	Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask	APF 25
12a	Handheld grinders for uses other than mortar removal for tasks performed outdoors only	Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
12b	Handheld grinders for uses other than mortar removal when used outdoors	Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
12c	Handheld grinders for uses other than mortar removal when used indoors or in an enclosed area	Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	APF 10 (or Greater Efficiency) Filtering Facepiece or Half Mask
13a	Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
13b	Walk-behind milling machines and floor grinders	Use machine equipped with dust collection system recommended by the manufacturer. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	None	None
14	Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
15a	Large drivable milling machines (half-lane and larger) for cuts of any depth on asphalt only	Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions.	None	None
15b	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions.	None	None
15c	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None	None
16	Crushing machines	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.	None	None
17a	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
17b	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18a	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18b	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	None	None

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