Safety Rules
For the Outside
Electrical Industry

IMPROVING OUR INDUSTRY THROUGH SAFETY AND TRAINING

Version 2018
I certify that I have received the 2018 Green Safety Rules for the Outside Electrical Industry and will familiarize myself with these rules.

Name (print) ________________________________________________________________

Signature ________________________________________________________________

Date ____________________________

Name (print) ________________________________________________________________

Signature ________________________________________________________________

Date ____________________________
FOREWORD

In our type of work, there is no part which is more important than safety, and with this in mind it is the earnest desire of the Contractors, Union, Fund Trustees, Safety Director, and Safety Committee to see that all operations are conducted with the utmost regard for the safety of the employees and members of the public. Safe and sensible work practices help the employee to live and to work another day without physical suffering and financial burden placed upon him and his family by a work accident. They help the employer by conserving equipment, tools, reducing both direct and indirect accidents, and insurance costs.

This book of Safety Rules has been written to guide all those people engaged in the Outside Electrical Industry. Many of these rules were formulated because of accidents that occurred in past years – accidents that could have been avoided. Each employee must comply with these rules, and their rigid enforcement by supervision can do much to prevent future accidents. In some cases the Client’s Safety Regulations may take precedence over our own, but at no time will Safety Requirements be less than those outlined in this manual.

It must be realized that no one book could possibly contain rules for every condition met in our diversified work, so it goes without saying that common sense plays a large part in our daily field activities. By strictly adhering to our Safety Rules, and using good common sense, we can accomplish our goal – an accident free job.

“Company” as used herein shall mean “Contractor”.

YOUR SAFETY COMMITTEE
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INTRODUCTION

Accident Prevention

No aspect of operations is of greater importance than accident prevention. The degree of safety and the results accomplished are directly proportional to the effort expended to control the conditions, practices and human actions that are responsible for accidents. Each contractor will maintain a safety program that each employee will comply with and work to achieve the goals of the program.

Purpose

The purpose of this Manual is to reduce and eliminate accidents by raising employee awareness of behaviors that contribute to accidents.

“Our goal with this manual is zero accidents, incident and injuries” and continue to protect our members and employees as well as improve safety in the workplace.

Effectiveness

A) This Manual shall be effective as of the date of issuance; compliance by all parties is mandatory.

B) Existing governmental codes, statutes, rules and orders shall be considered a part of this Manual and where any conflict exists between the two, governmental statutes shall prevail.

Occupational Safety and Health Requirements

The contractor is responsible for employee compliance with all aspects of Occupational Safety and Health rules (Federal or State) and the contractor is subject to severe penalties for violation of these rules by any employee. As stated in the Occupational Safety and Health Act, “Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.”

Responsibility of Employees

Employees share with the employer the responsibility for safety. Each employee is responsible for their own safety, the safety of their fellow workers and the general public. Employees shall become familiar with and use all the protective devices provided for their safety as well as the public.

Employees shall report to their supervisor all unsafe equipment, unsafe tools and hazardous conditions that come to their attention.

Employees who do not abide by the safety rules of this manual or other contractor safety requirements shall be subject to disciplinary actions.
Knowledge of Safety Rules

Every employee shall become thoroughly familiar with the rules of this Manual as they apply to his or her work activities.

Conditions Not Covered

Although each employee is primarily responsible for his or her own safety, in all instances where conditions are not covered by this Manual, or the job is not completely understood, the employee shall obtain specific instructions from his or her immediate supervisor before proceeding with the work.

Qualifications for Duty

Any trained supervisor or foreman having reasonable grounds to suspect that an employee under their jurisdiction is either Mentally or Physically unfit for the work assigned, shall prohibit that employee from working until satisfactory medical or other evidence indicating their fitness is secured.

Care in Performance of Duties

Each employee shall use reasonable care in the performance of their duties and shall at all times act in a manner as to assure safety to oneself, fellow employees and the public.

Safety Meetings

The employer shall provide at least 1 hour each month for the purpose of conducting a Safety Meeting. All employees shall attend and participate in all written and practical exercises related to their safety training.

Job Briefing

The employee in charge shall conduct a job briefing at the job location with all employees involved before they start each job. The briefing shall cover at least the following subjects: hazards associated with the job, work procedures involved, special precautions, energy source controls, and personal protective equipment requirements.

If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing shall be conducted before the start of the first job of each day or shift. Additional job briefings shall be held if significant changes, which might affect the safety of the employees, occur during the course of the work.

Safety Inspections

An authorized representative of the safety committee may conduct unannounced on-site safety inspections. The results of these inspections will be documented on approved forms with copies to be issued to the contractor, the Union and the Safety Fund.
DEFINITIONS

The following terms and definitions of terms are applicable to these Safety Rules:

**Alive or 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 vicinity.

**ANSI:** American National Standards Institute.

**Approved:** The term “approved” when used in connection with methods, tools, or equipment, refers to methods, tools or equipment that meets or exceeds current industry safety standards approved by the Company.

**Authorized person:** One who has the authority to perform specific duties under certain conditions or who is carrying out orders from a responsible authority.

**Automatic circuit reclosure or reclosure:** A self-controlled device for automatically interrupting and reclosing an alternating current circuit with a predetermined sequence of opening and reclosing followed by resetting, hold closed, or lockout operation.

**Barrier:** A physical obstruction, that prevents contact with energized lines, or equipment or prevents unauthorized access to a work area.

**Barricade:** A physical obstruction, such as tapes, screens, or cones that provides a warning about, and limit access to a hazardous area.

**Bond:** An electrical connection from one conductive element to another for the purpose of minimizing potential differences.

**Cable:** A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable) or a combination of conductors insulated from one another (multiple-conductor cable).

**Circuit:** A conductor or system of conductors through which an electric current is intended to flow.

**Clearance - For Working:** Certification by the proper authority that a specified line or piece of equipment is de-energized, drained, purged, depressurized or whatever is necessary to make equipment safe to work on or in, and that control of the line or equipment is being turned over to the qualified workers.

**Clearance - From Hazard:** Adequate separation or protection by the use of devices to prevent accidental contact by persons or objects on approach to a point of danger.

**Clearance - Hot Line:** An assurance that the automatic reclosing features of a circuit have been made inoperative.

**Clear Hot Stick Distance:** The minimum distance for the use of live-line tools held by lineworkers when performing live-line work.
**Cluster Bar:** A terminal temporarily attached to a structure to support and provide a connection point to accommodate grounding cables. It may also be used to establish an equipotential zone.

**Company:** The employer. The entity having jurisdiction and control over the work being performed. (Could be the Customer/Utility)

**Communication Lines:** The conductors and their supporting or containing structures that are used for public or private-signal or communication service.

Note: Telephone, telegraph, railroad signal, data, clock, fire, police, alarm, community television antenna, and other similar systems are included. Lines used for signaling purposes, but not included under this definition, are considered as electric supply lines of the same voltage.

**Conductor:** A material, usually in the form of a wire, cable, or bus bar used for carrying an electric current.

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

**Dead:** When the word “dead” is used in connection with wires or equipment that are a part of the electrical system, it shall be taken to mean disconnected from any electrical source of supply and properly tagged, shorted and grounded.

**De-energized:**Disconnected from all intentional sources of electrical supply by opening switches, jumpers, taps or other items. De-energized lines and equipment can be electrically charged or energized through various means, such as induction from energized circuits, portable generators or lighting. De-energizing lines and equipment does not allow workers to enter minimum approach distances unless the workers are insulated, isolated, or the lines and equipment have been properly grounded.

**Designated Person:** See Authorized Person.

**Disciplinary Action:** Administrative action taken by the employer against the employee. May vary from verbal reprimand to dismissal.

**Disconnected:** Removed from connection to any electrical source of supply.

**Effectively Grounded:** Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages which may result in undue hazard to connected equipment or to persons.

**Emergency:** An unusual condition that endangers life, property or both.

**Employee:** Any person employed by the Company on either the permanent or temporary payroll.
Employer: See Company.

Enclosed: Surrounded by a case, cage or fence, which will protect the contained equipment and prevent accidental contact of a person with live parts.

Energized (also “alive”, “live”, or “hot”): Electrically connected to a source of potential difference or electrically charged so as to have a potential different from that of the earth.

Equipotential Zone (EPZ): The state of maintaining a near-identical electrical potential between two or more items, as compared to the nominal voltage present.

Equipment: A general term which includes fittings, devices, appliances, fixtures, apparatus, and the like, used as part of, or in connection with, an electrical power transmission and distribution, or communication system.

Excavations: Any opening made in the ground, street or sidewalk in connection with Company work, such as holes, trenches, ditches or tunnels.

Exposed: (a) Exposed circuits or lines are those in such a position that in case of failure of supports or insulation, contact with another circuit or line may result. (b) Exposed equipment is an object or device that can be inadvertently touched or approached nearer than a safe distance by any person. The term is applied to objects not suitably guarded or isolated.

Exposure Voltage: The voltage impressed across a worker’s body, either hand to hand or hand to foot, when the worker comes in contact with objects at the work site that are not at the same potential.

Fall Arrest System: A system that will stop a worker’s fall before the worker hits the surface below.

Fall Prevention System: Those systems and techniques that eliminate the possibility of a fall.

Fall Protection System: Any of the following when used to protect a worker from a fall or minimize the risk from falling: guardrails, safety belt or a full body harness with a lanyard and/or lifeline and an anchor, and their related equipment, safety net, control zone, safety monitor with a control zone, and other acceptable procedures.

Flares: A device used to produce a bright blaze of fire or light as a warning signal. As used in this document, “flares” include flares, torches, fuses, red lanterns, reflectors or any other equipment that is adaptable for use as a visible warning.

Foreman or Supervisor: Used in a general sense to indicate any person, regardless of classification, who is directly in charge of a specific job or jobs.

Governmental: Any type of agency having control over an area. Included are Federal, State, county, township, city, etc.
**Ground**: (noun) A conductive connection, whether intentional or accidental by which an electric circuit or equipment is connected to reference ground.

**Ground**: (reference) that conductive body, usually earth, to which an electric potential is referenced.

**Ground**: (verb) The connecting or establishment of a connection, whether by intent or accident, of an electric circuit or equipment to reference ground.

**Grounding Electrode** (Ground Electrode): A conductor embedded in the earth, used for maintaining ground potential on conductors connected to it, and for dissipating into the earth current conducted to it.

**Grounded System**: A system of conductors in which at least one conductor or point (usually the middle wire, or neutral point of transformer or generator windings) is intentionally grounded, either solidly or through a current-limiting device, (not a current-interrupting device).

**Guarded**: Covered, fenced, or enclosed by means of suitable casings, barrier rails, screens, mats, platforms, or other suitable devices in accordance with standard barricading techniques designed to prevent dangerous approach or contact by persons or objects. (Note: Wires, which are insulated, but not otherwise protected, are not considered as guarded.)

**Hold Cards**: Also called “Hold Tags”. A card or tag-type device, usually having a predominant color of white or red, which warns against the operation of a particular switch, device, valve, circuit, tool or machine. These tags must be respected; equipment or items so tagged must not be activated or used without full and proper authority from a responsible person.

**Hotline Tools and Ropes**: Tools and ropes that are especially designed for work on energized high voltage lines and equipment. Insulated aerial equipment especially designed for work on energized high voltage lines and equipment shall be considered hotline equipment.

**Insulated**: Separated from other conducting surfaces by a dielectric substance (including air space) permanently offering a high resistance to the passage of current and to disruptive discharge through the substance or space.

**Isolated**: Electrically isolated means that there is no chance of accidental energization from any source, or, when considering the worker, that there is no second point of contact between different potentials that establishes a path for current to flow.

**Job Briefing**: A method to make sure each employee knows and understands all the steps, hazards and protective measures necessary to complete a given task safe.

**Load Dispatcher, Power Dispatcher, System Operator**: Person designated by the employer as having authority over switching and clearances of high voltage lines and station equipment.
Manhole: A subsurface enclosure, which personnel may enter. It is used when installing, operating, and maintaining underground equipment or cable.

Manhole/Confined Space Opening: An opening through which personnel may enter into a confined or restricted space.

Pad Mount: Equipment or device, which is surface mounted and normally worked from ground level.

Personal Protective Grounding: The combination of tripping grounds and personal grounds installed in a method that bonds the de-energized lines and equipment with all other conductive objects within the work site – including the structure – limiting the exposure voltage to a safe value.

Primary Compartment: A compartment containing current-carrying devices operating at more than 500 volts.

Primary Voltage: Any electrical circuit that normally operates at more than 500 volts.

Public: Any individual not an employee or representative of the company.

Qualified Person: A person who is familiar with the construction and operation of the lines or equipment with which one works and who is fully aware of the hazards involved; a person who has successfully demonstrated their ability and is recognized by management as qualified to perform the duties to which they have been assigned.

Reduced Visibility: Times when normal visibility is significantly reduced because of adverse weather conditions such as fog, heavy rainfall, snow, dawn or dusk.

Road: The paved or unpaved surface of a roadway upon which vehicles are intended to travel. When the road is paved, the entire surface is included.

Roadway: The road and the areas immediately adjacent, such as the shoulder of the road or parking strip.

Safety Rule: A provision requiring compliance by all members. Deviation from safety rules is not permitted and shall be subject to disciplinary action. Provisions requiring compliance use the word “shall” (See the definitions of “shall” and “should”).

Secondary Compartment: A compartment containing current-carrying devices operating at 500 volts or less.

Secondary Voltage: Any supply voltage 500 volts or less.

Shall: When the word “shall” appears in the wording of a rule, the rule is to be obeyed as written. Such rules are safety rules.

Should: When the word “should” appears in the wording of a rule, the rule is recommended but is not compulsory.
**Step Potential:** The voltage between the feet of a person standing near a high voltage electrical fault to earth.

**Switch:** A device for opening and closing or changing the connection of a circuit. In these rules, a switch is understood to be manually operable, unless otherwise stated.

**Tailboard Discussion:** A short informal discussion of the work to be accomplished and the safety measures to be incorporated. It is normally conducted by the foreman.

**Touch Potential:** Touch potential is the touch voltage between the energized object and the feet of a person in contact with the object. It is equal to the difference in voltage between the object and a point some distance away. The touch potential or touch voltage could be nearly the full voltage across the grounded object if that object is grounded at a point remote from the place where the person is in contact with it. For example, a crane that was grounded to the system neutral and that contacted an energized line would expose any person in contact with the crane or its uninsulated load line to a touch potential nearly equal to the full fault voltage.

**Tripping Grounds:** Temporary protective grounding equipment installed in a manner that bonds the ground source and phase conductor(s) together. Tripping grounds are not used by themselves for worker protection.

**Underground Residential Distribution (URD):** The facilities necessary to furnish underground service, generally to residential and commercial-type customers, usually through directly buried cable.

**Unsafe Conditions:** Dangerous, hazardous, defective, or unusual conditions, that could cause accidents.

**Vault:** An enclosure above or below ground, that personnel may enter. It is used for installing, operating, and maintaining equipment or cable.

**Voltage:** The effective (RMS) potential difference between any two conductors or between a conductor and ground. The voltage specified in this Manual shall mean the maximum effective voltage to which the personnel or protective equipment may be subjected.

Low voltage includes up to and including 500 volts.

High voltage shall mean voltage in excess of 500 volts.

**Voltage of an Effectively Grounded Circuit:** The voltage between any conductor and ground, unless otherwise indicated.

**Warning Signs:** For the purpose of these rules, a warning sign is any sign or similar means of alerting an employee or the public of an actual or possible hazard. Included are “Danger” signs, “Caution” signs, traffic control signs, instructional signs and informational signs.
PART I
GENERAL RULES FOR ALL EMPLOYEES
SECTION 1
APPLICATION AND RESPONSIBILITY

11-1 Application of Safety Rules

a. These safety standards have been compiled for the purpose of making work safe for electrical workers and the compilation of these standards is done in the interest of all members of the I.B.E.W., the employer and the general public. By cooperation in the enforcement of, and obedience to these standards, many accidents will be prevented.

b. Employees required to work on the lines of public utilities shall work under the safety rules as established by the utility on whose lines they are working but in no case are those rules to be less than the minimum standards established in these safety rules for the outside electrical industry.

c. The rules that prescribe methods do so only insofar as they affect safety, and are not intended to be a complete description of the procedure for carrying out the work mentioned.

d. If an employee is called upon to perform work that he or she considers hazardous and without proper protection in place, the employee shall, bring the matter to the attention of his or her supervisor before commencing work. If questions arise, interpretation rests with the supervisor and the Union Steward, with final approval by the Safety Director if required.

e. These rules represent minimum requirements and are only intended to cover average conditions. Since it is impracticable to cover all conditions and emergencies, the earnest cooperation of all employees with their supervisors is requested in meeting conditions not covered in these rules.

f. These rules are written in general performance oriented terms. The details of how to implement the rules are left to the employer. In any event, the practices adopted by the employer shall meet the performance requirements to these rules.

g. Personal use of communication devices (i.e. cell phones) shall be prohibited from the energized work zone. Talking while employees are in the energized zone shall be kept to the job at hand.

11-2 Responsibility of Individuals

It is the responsibility of every Company employee to:
a. Know the rules in this book and abide by them. A reckless, unsafe worker is a menace to oneself, their fellow workers and the general public, and non-compliance with rules can be grounds for disciplinary action or dismissal.

b. Be on time, fit for duty, dressed properly, mentally and physically able to perform tasks and show professionalism.

c. Keep tools, climbers, safety straps and other personal equipment in good shape at all times, and promptly replace any defective articles.

d. Use Company tools and equipment in the proper manner and with care and consideration.

e. Report unsafe equipment, tools and apparatus to their supervisor. If found unsafe remove from service immediately.

f. Report all accidents, incidents and near misses immediately to the person in charge, (i.e. Lead Person, Foreman, General Foreman, Supervisor) immediately. The Local Union Safety Director shall be notified as well.

g. Request assistance (peer check) when in doubt as to how a job is to be done. Discussing any issues during the tailboard discussion will help insure a safe operation.

h. Be alert at all times and do not engage in horseplay or practical jokes.

i. Help maintain a safe work area through good housekeeping at the job site and on the truck.

j. All required personal protective equipment shall be worn at all times.

k. Personal use communication devices (i.e. cell phones, walkie talkies, etc.) shall be prohibited from the energized work zone. Talking while in the energized zone shall be kept to the job at hand.

11-3 Responsibility of Foreman (Supervision in direct control of task)

Each Foreman is responsible for:

a. The employee in charge shall conduct and record the job briefing at job location with all employees involved, before they start each job. The briefing shall cover at least the following subjects: hazards associated with the job, work procedures involved, special precautions, energy source controls, and personal protective equipment requirements.

If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing shall be conducted before the start of the first job of each day or shift. Additional job briefings shall be held if significant changes, which might affect the safety of the employees, occur during the course of the work.
b. Explaining work to his or her workers before and during each operation.

c. Setting a good example for Employees under them by complying with all safety rules and regulations. (Note that compliance is required in any event and noncompliance is subject to disciplinary action as for any other employee).

d. Continuously supervising all work, stressing compliance with all safety rules.

e. Insuring care and consideration for Company tools, equipment and vehicles.

f. Periodic check of climbers, belts, safety straps, other tools and Personal Protective Equipment.

g. Prompt reporting of all compensation and liability accidents to the General Foreman, Employer Representative and the Safety Funds Director.

h. Request additional personnel if necessary to perform the work safely. The number of employees utilized will depend on the work to be done.

i. Being cognizant of employee’s fitness for duty and making sure that all employees under his/her direction are fit for duty.

11-4 Responsibility of General Foreman

Each General Foreman is responsible for:

a. Insuring that all work under his or her jurisdiction is performed in a safe manner.

b. Providing the best and safest possible equipment and tools, including proper and adequate rubber protective goods, to all crews working under his or her direction.

c. Analyzing each job requirement, and planning the job with safety and efficiency incorporated in work procedures.

d. Continuously inspecting all jobs for unsafe work methods and unsafe conditions.

e. Prompt reporting of all accidents to the appropriate parties at his or her employer, in at the Union having jurisdiction and discussing accidents with foreman whose crews involved.

f. Holding Safety Meetings at least an hour each month.

g. Completing and returning Safety Meeting Reports, Accident Reports or “No Accident” Reports to the Safety Director by the tenth (10th) day of the following month.
11-5  **Reporting Employee Injuries**

a. All accidents must be reported by the Supervisor and Employee or Employees involved.

b. All accidents must be reported to the employer on forms supplied by the Company, or its insurance carrier, for this purpose.

c. All accidents must be reported by the General Foreman to the Safety Director on forms supplied for this purpose, by the tenth (10th) day of the following month.

d. In case of serious or fatal accidents to employees, appropriate action shall be taken promptly. The accident shall be reported immediately to the Supervisor, the company Representative, and the Safety Director having jurisdiction.

11-6  **Reporting Company Vehicle Accidents**

a. The driver shall report accurately and immediately every accident involving a vehicle in their possession. Additional reports shall be made to the police or state authority as required.

b. The driver shall not discuss or argue the causes or results of an accident with other parties, but shall secure all pertinent facts and information. The driver shall answer questions when asked by the proper authorities, but under no circumstances shall the driver admit fault or negligence or sign any statement for anyone except proper representatives of the Company.

c. Should the other driver demand immediate action, they shall be referred to the employee’s supervisor.

d. The driver, when involved in an accident, shall stop and give their name and address, and the employer’s name and address. The driver shall also secure the names and addresses of others involved in the accident and of witnesses to the accident, (this is very important). The driver shall also note, and if possible photograph the position of all vehicles after the collision in reference to edge of road, sidewalk line, center of intersection, etc.

e. If any person is injured as the result of a vehicle accident, employees shall see that necessary emergency aid is provided.

11-7  **Practical Jokes**

Employees shall not engage in practical jokes or “horseplay”.
**11-8 Intoxicating Beverages/Controlled Substances**

a. All employees under the bargaining agreement shall not permit any intoxicating beverages or controlled substances on the job, at company headquarters or on company property.

b. Any employee under the bargaining agreement who knowingly permits another employee to go to work while under the influence of any intoxicating beverage or controlled substance shall be subject to disciplinary action, as well as the employee under the influence.

**PART 1**

**SECTION 2**

**GENERAL PRECAUTIONS**

**12-1 Protection in Public Work Areas**

a. When an employee needs additional light while working on the premises of a customer, a battery powered flashlight or lantern, or an approved, properly guarded electrical extension light shall be used. A flame-type light shall not be used.

b. The public shall be kept away from locations where work activity presents hazards.

c. Traffic control shall be implemented in accordance with Part I Section 9.

d. When it is necessary to leave reels, equipment or other obstructions unattended, the following precautions shall be taken:

1. They shall not be left adjacent to fire plugs or directly in front of entrances to private or public property.

2. They shall be locked, blocked or otherwise secured.

e. When chiseling, chipping or welding is done in locations where others are exposed to eye hazards, shields shall be placed around the work or the area shall be barricaded.

**12-2 Taking Chances**

a. Before commencing any work that may be hazardous, care shall be taken to establish a safe procedure. Where more than one employee is engaged in the same job, all employees concerned shall understand the procedures to be followed through a tailboard discussion. Under no circumstances shall safety be sacrificed for speed.
b. Employees shall always place themselves in a safe and secure position. The care exercised by others shall not be relied upon for one’s own protection.

12-3 Reporting Hazardous Conditions

a. When an employee observes a hazardous condition that may cause injury, property damage or interfere with services, regardless of the department in which the condition exists, they shall report it promptly to the proper authority and when necessary guard it.

b. An employee who receives a report of any hazardous emergency condition shall obtain the name of the informant, the exact location and the nature of the trouble. The employee shall immediately refer this information to the person having responsibility for handling the conditions.

12-4 Guards

a. No guard shall be removed from any machine or piece of equipment except to perform required maintenance.

b. Guards removed to perform maintenance operations shall be replaced immediately and the machine shall not be operated while the guards are removed except when procedures to prevent employee exposure are followed for testing for positioning.

12-5 Lockout/Tagout Procedures

a. Employees shall ensure that the following procedures for the application of energy control devices have been followed:

1. Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type, magnitude and the hazards of the energy to be controlled, and the method or means to control the energy. As well as being responsible for determining the exposure status of individual employees under his or her authority and shall ensure that no group lockout or tagout device is removed while any of the other individuals are still exposed.

2. Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

3. Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner to isolate the machine or equipment from the energy source(s).
4. Lockout or tagout device application

   a. Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

      1. Group lockout procedures may be used when several employees need to be afforded the same level of protection.

   b. Lockout devices, where used, shall be affixed in a manner that will hold the energy isolating device in a safe or off position.

   c. Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the off or safe position is prohibited.

   d. Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point the lock would have been attached.

   e. Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

   f. Except for work on electric transmission or distribution lines and equipment each employee shall affix a personal lockout or tag out device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

12-6 Office and Clerical Work

   a. Chairs, wastebaskets, cords and other articles shall not be left in aisles where they constitute a tripping hazard.

   b. Desk drawers, cabinet doors, slides and files shall not be left open while unattended.

   c. Common or sharp-pointed pins shall not be used for fastening paper together. Staples, clips or other approved fasteners shall be used.

   d. Broken glass or other sharp-edged objects shall not be placed in wastebaskets unless properly protected.

   e. Approved ladders or other safe supports shall not be used to reach material on high shelves or at other similar locations. Employees shall not stand on boxes, crates, chairs, etc.
Warnings

Warning signs shall be heeded. Persons seen in a dangerous situation shall be warned without being startled. Employees not required to be near potentially dangerous places shall keep away from them.

PART 1
SECTION 3
HAND AND POWER TOOLS

13-1 General

a. All tools, regardless of ownership, shall be of an approved type and maintained in good condition. (Tools are subject to inspection at any time. A supervisor has the authority and responsibility to condemn unserviceable tools, regardless of ownership.)

b. Defective tools shall be tagged and taken out of service until repaired, if they cannot be repaired, they shall be removed from the job site.

c. Employees shall always use the proper tool for the job to be performed. Makeshift and substitute tools shall not be used.

d. Hammers with metal handles, screwdrivers with metal continuing through the handle and metallic measuring tapes shall not be used on or near energized electric circuits or equipment.

e. Tools shall not be thrown from place to place or from person to person: tools that must be raised or lowered from one elevation to another shall be placed in tool buckets or firmly attached to hand lines.

f. Tools shall never be placed unsecured on elevated places.

g. Impact tools such as chisels, punches and drift pins that become mushroomed or cracked, shall be dressed, repaired or replaced before further use.

h. Chisels, drills, punches, ground rods and pipes shall be held with suitable holders or tongs (not with the hands) while being struck by another employee.

i. Shims shall not be used to make a wrench fit.

j. Wrenches with sprung or damaged jaws are considered as defective and shall not be used. (See Rule 13-1b.)

k. Pipe shall not be used to extend a wrench handle for added leverage unless the wrench was designed for such use.
l. Tools shall be used only for the purposes for which they have been approved.

m. The sharp edges of tools shall be protected while in storage. Sharp tools shall be handled so that they will not cause injury or damage. They shall NOT be carried in pockets.

n. Wooden handles that are loose, cracked or splintered shall be replaced. The handle shall not be taped or lashed with wire.

o. All cutting tools such as saws, wood chisels, drawknives, and axes, shall be kept in suitable guards or in special compartments.

p. Tools shall not be left lying around where they may cause a person to trip or stumble.

q. When working on or above open grating, a canvas or other suitable covering shall be used to cover the grating to prevent tools or parts from dropping to a lower level where others are or maybe present, or the danger area below shall be barricaded or guarded.

r. Plastic, wood, and rubber on the handles of hand tools shall not be depended upon to protect users from shock.

s. All guards shall be installed and maintained in good condition and they shall be adjusted properly.

t. All extension cords shall be kept in good condition, and shall be inspected regularly for cuts and other damage, have ground continuity at all times and protected from damage while in use.

13-2 Portable Electric Tools

a. The non-current-carrying metal parts of portable electric tools, such as drills, saws, and grinders, shall be effectively grounded when connected to a power source unless:

1. The tool is an approved double-insulated type, or,

2. The tool is connected to the power supply by means of an isolating transformer or other isolated power supply, such as a 24V DC system, or,

3. If the tool is powered by a portable generator, the non-current-carrying metal part of the tool shall be bonded to the generator in lieu of grounding.

b. All portable electric tools shall be examined before use to ensure that the tools are in safe condition with all safety features operable.

c. Portable electric tools shall be kept in good repair and shall be disconnected from the power source while repairs are being made.
d. Portable electric tools shall be used only within their design capability and shall be operated in accordance with the instructions of the manufacturer.

e. Portable electric tools shall not be used where there is a hazard of flammable vapors, gases, or dusts.

f. GFCI Protection shall be used were applicable.

13-3 **Pneumatic and Hydraulic Tools**

a. Compressed air and compressed air tools shall be used with care.

b. Pneumatic tools shall never be pointed at another person.

c. Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.

d. Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

e. Compressed air shall not be used to blow dust or dirt from clothing.

f. The manufacturer’s stated safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

g. The use of hoses for hoisting or lowering tools shall not be permitted.

h. All compressed air hoses exceeding ½-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in event of hose failure.

i. Before making adjustments to or changing air tools, not equipped with quick change connectors, the air shall be shut off at the air supply valve ahead of the hose. The hose shall be bled at the tool before breaking the connection.

j. Eye protection, foot protection and other personal protective devices shall be worn where there is a reasonable probability that such equipment can prevent injury.

k. Pneumatic and hydraulic tools shall be operated only by competent persons who have been instructed in their use.

l. A hydraulic or pneumatic tool used where it may contact exposed energized parts shall be designed and maintained for such use. Conductive hoses shall not be used near energized equipment.
13-4 Powder Actuated Tools

a. Only employees who have been trained in their use shall operate powder-actuated tools.

b. Explosive charges shall be carried and transported in approved containers.

c. Operators and assistants using these tools shall wear eye protection (safety goggles or face shields) and head protection (hard hat).

d. Tools shall be maintained in good condition and serviced regularly by qualified persons. The material upon which these tools is to be used shall be examined before work is started to determine its suitability and to eliminate the possibility of hazard to the operator and others.

e. Before using a powder-actuated tool, the operator shall insure that the protective shield is properly attached to the tool.

f. Before using a powder-actuated tool, the operator shall inspect the tool to be sure that it is clean, that moving parts operate freely, and that the barrel is free from obstructions.

g. A defective tool shall be tagged and immediately removed from service.

h. Powder-actuated tools shall not be used in an explosive or flammable atmosphere.

i. Tools shall not be loaded until just before the intended firing.

j. Only cartridges with an explosive charge adequate for the job and with proper penetration shall be used.

k. Fasteners used in tools shall be only those specifically manufactured for use in such tools.

l. Tools and cartridges shall never be left unattended.

m. Tools shall never be pointed at any person.

n. In case of a misfire, the operator shall hold the tool in place for 30 seconds. He shall then try to operate the tool a second time and, if unsuccessful, shall wait another 30 seconds. Misfired cartridges shall be disposed of properly. (Place in metal container and return to supervisor.)
PART 1
SECTION 4
PORTABLE LADDERS AND SCAFFOLDS

14-1 General

a. Only approved ladders owned by the Company shall be used by employees.

b. Ladders shall not be painted. They shall be treated only with a transparent non-conducting material.

c. Only non-conductive ladders shall be used. There are no exceptions.

d. All straight and extension ladders shall be equipped with non-skid safety feet or other means to prevent slipping.

e. Straight and extension ladders shall be set up on a 4:1 ratio. They shall not be used in excess of their listed capacity. Employees shall not ascend or descend while carrying tools or materials.

f. Portable ladders shall be inspected regularly for damage to side rail and rungs. An employee shall not use a ladder that has broken, loose, or cracked rungs, side rails or braces. Defective ladders shall be tagged and removed from service.

g. When ascending or descending ladders, employees shall face the ladder and grip the sides or rungs with both hands. Never slide down ladders.

h. Boxes, crates, chairs, etc. shall not be used in place of a ladder.

i. Only one employee shall work from a ladder (except hook ladders) at one time. If the work requires two employees, a second ladder shall be used.

j. If a ladder is to be placed where the opening of a door may displace it, the door shall be locked or otherwise guarded.

k. When transferring from a ladder to an elevated position, the ladder side rails shall extend at least 36 inches above the landing.

14-2 Straight Ladders

a. An employee shall not stand on either of the top two rungs of a ladder.

b. Ladders shall not be spliced together unless specifically designed for that purpose.

c. A ladder shall never be placed against an unstable support.

d. Ladders shall be placed on a substantial base.
e. Ladders shall not be used as scaffold platforms.

f. Portable ladders in use shall be tied, blocked or otherwise secured to prevent displacement.

g. Employees shall belt off whenever working on a ladder when at a height over four (4) feet.

14-3 Step Ladders

a. Employees shall not use the top step of a step ladder (This rule does not apply to mobile ladder stand platforms.)

b. While an employee is working on a step ladder (except a mobile ladder stand platform) at a point 10 feet or more above ground or floor, the ladder shall be tied, blocked, secured or held in place to prevent its being displaced.

c. Step ladder legs shall be fully spread and locked open when the ladder is in use.

d. Step ladders shall not be used as straight ladders.

14-4 Scaffolds

a. Scaffolds shall be erected in accordance with the requirements stipulated in OSHA 29 CFR 1926.451 and 1926.452.

PART 1
SECTION 5
HANDLING MATERIALS

15-1 By Hand

a. An employee shall obtain assistance to lift heavy objects or shall use power equipment.

b. When two or more persons carry a heavy object that is to be lowered or dropped, there shall be a prearranged signal for releasing the load.

c. When two or more persons are carrying one object, each employee, if possible, shall face the direction in which the object is being carried.

(Avoid strains from lifting objects by being sure of footing, bending the knees and keeping the back almost perpendicular. When ready to lift, straighten the legs slowly, thus taking the strain on the stronger muscles of the body.)
15-2   Industrial Trucks-Fork Lifts

a. Forklift truck drivers are required to be trained before being assigned and be retrained at a maximum of every 3 years. This training shall encompass all aspects of forklift use and address the type of forklift to be used in the safe operating conditions at the worksite.

b. Brakes and controls shall be tested before use. Equipment with faulty brakes or mechanical or electrical defects shall be tagged to indicate it is out of service and shall not be operated. Needed repairs shall be reported immediately.

c. Equipment shall always be operated at a safe speed for existing conditions.

d. Before moving the equipment, the operator shall make sure that no person or object is in the path of the vehicle. Clearances in all directions shall always be checked, particularly overhead clearances.

e. Industrial trucks shall not be fueled while the engine is running.

f. When picking up a load, forks shall be set squarely and placed under the load as far as possible. Loads should not be raised or lowered while traveling. Loaded or empty, forks should be carried as low as possible, but high enough to clear uneven surfaces.

g. Loads shall not be suspended or swung over other persons. No one should be allowed to stand or walk under elevated forks whether loaded or empty.

h. The operator shall always face in the direction of travel.

i. On inclines, all types of loaded lift trucks shall be driven with the load on the upgrade side of the driver whether ascending or descending.

j. Sudden stops that might spill the load shall be avoided.

k. All loads shall be securely fastened or safely positioned to prevent tipping or falling.

l. Lift bars on fork lift trucks that are movable or replaceable shall be held firmly in place by a proper securing pin. Jury-rigged devices, such as using a threaded bolt, shall not be permitted.

m. Only attachments provided by or approved by the manufacturer may be used; all attachments shall be properly secured. Improvised methods shall not be used.

n. No one other than the operator shall be allowed to ride the truck, forklift or other equipment, except when seats are provided for this purpose.

o. When an industrial truck is left unattended (operator is 25 feet away or the vehicle is not in his view), the load engaging means shall be fully lowered,
controls shall be neutralized, power shall be shut off and brakes shall be set. Wheels shall be chocked when the truck is parked on an incline.

p. Equipment with internal combustion engines shall not be operated in enclosed areas for prolonged periods of time so as not to exceed the allowable levels of carbon monoxide.

q. When loading or unloading trucks or railroad cars, approved dockboards, properly secured, shall be used. The wheels of the truck or railroad car shall be blocked.

15-3 Mobile Cranes, Derricks and Hoisting Equipment

a. Only those qualified by certification or other approved means of qualification are allowed to operate hoisting equipment. Crane and derrick operators shall be qualified or certified except for employees who operate digger derricks used for work involving poles for electric or telecommunication lines or when used for other work on electric power transmission and distribution installations.

b. Operators shall be able to meet the physical requirements of a DOT physical.

c. All hoisting equipment shall be equipped with a manufacturer’s load-rating chart that is legible and accessible to the operator from the control station.

d. Load limits as specified by the manufacturer shall not be exceeded under any circumstances.

e. All operational aids shall be checked and verified weights, measured radii, manufacturer’s load rating chart, and instructions take precedents when handling loads.

f. Modifications or additions that effect capacity must be approved by the manufacturer or approved by a registered professional engineer who is a qualified person with respect to the equipment involved. The attachments must also be equipped with all associated operations manuals and load charts.

g. Responsibilities but not Limited to

1. Crane Owner (Rental Company/Manufacturer)
   i. Provide a compliant piece of equipment and all applicable load charts and technical information

2. Crane User (Contractor’s Field Supervision)
   i. Verify equipment compliance
   ii. Operator Qualification
   iii. All Associated personnel to lifting operations

3. Site Supervisor
   i. Ensures intended area for hoisting operations are compliant and sufficient
ii. Permits special operations such as multiple crane lifts or use of special equipment

4. Lift Director
   i. Present during lifting operations
   ii. Controls and manages lifting operations
   iii. Appoints personnel to specific task
   iv. Obtains verification for the operator that load weights do not exceed rated capacity of equipment.

5. It is common for the Site Supervisor and Lift Director to be the same person.

6. Operator
   i. Review requirements with lift director
   ii. Confirm site conditions
   iii. Operate equipment within the confines of the manufacturer's specifications and governing regulations
   iv. Perform Daily inspections on equipment
   v. Stop all crane operations if there are any safety concerns and refuse to continue until all concerns are rectified and agreed upon by the lift director and operator.

h. All Hoisting equipment shall be inspected daily before use, to a minimum of the following:
   1. All control mechanisms
   2. Operational aids
   3. Hydraulic hoses
   4. Pins and retainers
   5. Hooks and latches
   6. Ropes and Reeving
   7. Electrical system function
   8. Hydraulic fluid level
   9. Tires and chassis
   10. Fire extinguisher present 10BC or larger

i. All hoisting equipment shall have a valid annual inspection during use.

j. Operating and Maintenance procedures, as specified by the manufacturer, shall be followed.

k. Wire ropes shall have the anticipated amount of rope to be used for the day inspected before use to the following criteria:
   1. Rotation Resistant Rope
      i. 2 randomly distributed broken wires in 6 rope diameters or 4 randomly distributed broken wires in 30 rope diameters.
      ii. 1 outer wire broken at the point of contact with the core and has worked its way out of the ropes structure (Valley Break).
   2. Running Rope
      i. 6 randomly distributed broken wires in one lay or 3 broken wires in one strand in one lay. A lay length being the distance it takes one strand to make a complete revolution around the rope.
   3. Any reduction greater than 5% from nominal size is also out of service.
4. Standing ropes, more than 2 broken wires in one lay in sections beyond end connections and 1 broken wire at an end connection.

l. A minimum of two full wraps unless otherwise specified by the manufacturer must be kept on any hoist drum at all times.

m. All dead-ending of wire rope shall be done using an approved method that does not damage or pressure the live or load side of the rope.

n. No person shall be allowed to ride the hook, sling or load of any hoisting equipment.

o. For the first lift of each day, the load shall be test-lifted, and the brakes checked (load lifted several inches and then tested).

p. Free wheeling winches are prohibited on Hoisting Equipment. All winches must be locked in position and controlled load lowering used.

q. Side loading shall be avoided and limited only to freely suspended loads; cranes shall not be used for dragging loads.

r. Operation during inclement weather such as lightning and high winds, manufacturer’s recommendations for specific model crane must be adhered to.

s. During operation, all outrigger floats must be properly attached and pinned in position to avoid being dislodged.

t. Outriggers shall be set at equal positions that correspond to the load/capacity charts supplied by the manufacturer for those positions. Only the load chart(s) corresponding to the outrigger positions shall be used for operation.

u. When calculating the necessary amount of blocking to support a crane on normal soil conditions the formula of gross tonnage divided by five can be used unless otherwise stated by the manufacturer (40ton Crane / 5 = 8 sq ft of blocking).

v. Blocking under outrigger floats, when required, shall be of sufficient strength and size to prevent crushing, bending, or shear failure. Also such a thickness, width, and length, as to completely support the float, transmit the load to the supporting surface and prevent shifting, toppling, or excessive settlement under load. Three(3) to one(1) ratio of blocking to float. Outriggers shall be set so that all tires are free of the ground unless otherwise stated by manufacturer.

w. Operators shall not leave their position at the controls of cranes, hoist, derricks, or other lifting devices while the load is suspended.
x. No employee shall be under a suspended load or inside the angle of a winch line. No employee shall stand near a cable, chain, or rope under tension unless the nature of his/her work requires it.

y. Operation of cranes, derricks or similar lifting devices around energized conductors shall be done with extreme caution and employees and public properly protected.

1. Properly grounded, or
2. Insulated, or
3. Isolated, or
4. Considered as energized
5. Barricaded

z. Hoisting equipment performing work under Sub Part V may use minimum approach tables R-6 and R-7.

aa. Hoisting equipment not involving Sub Part V work must use the following:

i. Up to 50 Kv, 10 ft
ii. Over 50 Kv, 10 ft plus 4in. for each 10 kv over 50 kv

bb. All slings and bindings shall be checked and shall be readjusted to insure safety and stability.

cc. When employees are engaged in hooking, unhooking or guiding the load, or in initial connection of a load to a component or structure and are with in the fall zone. The Materials must be rigged by a qualified rigger. All slings and other fittings shall be of sufficient strength, proper type and safe for their intended use.

dd. Signals to the equipment operator shall be given by qualified signalperson designated at the pre lift meeting. All signals, except an emergency stop signal, shall only be given by the signalperson. An emergency stop can be given by anyone and must be obeyed.

ee. Signals shall be given in the operators perspective using one of the standard method signals. See hand signal chart.

ff. During hoisting operations communication between the operator and signalperson shall be maintained during all crane movements.

gg. A hand signal chart must be posted conspicuously in hoisting area.

15-4 Hoisting Personnel

a. Equipment shall be set up with in 1% of level and on stable footing established by a qualified person.
b. Equipment must have outriggers fully extended to hoist personnel unless otherwise stated by manufacturer.

c. Platforms without controls, the equipment operator must remain at the control station.

d. Platforms equipped with controls, the occupant using the controls in the platform must be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation.

e. The total load (platform loaded, hook, load line, and rigging) must not exceed 50% of the rated capacity of the equipment at anticipated radii.

f. Hoisting equipment must be equipped with a boom angle indicator, a boom hoist-limiting device, device to indicate extended boom length, and an anti two-block device.

g. The Platform must include guardrails all the way around with anchorage points for personnel to attach safety lanyards and be capable of supporting without failure its own weight and 5 times the intended load. Platforms must also conform to all applicable standards for manufacturing.

h. All hooks and other detachable devices must of a type that can be closed and locked, eliminating throat opening; and stay closed and locked the entire time personnel are suspended.

i. All rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied. When rotation resistant rope is used, the slings must capable of handling 10 times the maximum intended load.

j. Proof testing must be done at each jobsite prior to hoisting personnel, and after any repair or modification, the platform and rigging must be proof tested to 125% of the platforms rated capacity. The test may be done concurrently with the Trial Lift. The platform must be lowered by controlled load lowering and held suspended for a period of 5 minutes with the test load evenly distributed. After proof testing the platform and rigging shall be inspected by a competent person for deficiencies before personnel can be hoisted.

k. Trial Lift must be performed with the personnel platform loaded to the anticipated weight of personnel and equipment from every location personnel are to be hoisted from. The Trial Lift must follow the route that personnel will be hoisted.

l. Wind Speed, personnel hoisting must be suspended in wind speeds (sustained or gust) above 20mph at the platform operation.
m. Adverse weather and environmental conditions. A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, lifting operations must not begin. If already in progress they must cease.

n. Hoisting Personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited, except for work covered by Subpart V.

15-5 Rigging Safety and Quick Reference Material

a. All rigging equipment shall be inspected to manufacturer’s specifications before each use. Any hardware found deficient shall be taken out of service immediately.

b. Slings shall have suitable characteristics for the type of load, hitch, and environment they will be subject to.

c. The rated load of the sling shall not be exceeded. When using a multiple-leg sling, no leg shall be loaded beyond its single-leg rating.

d. When the choker hitch rating is not identified on the sling, the choker hitch rating for single-leg and bridle slings shall be 75% on metallic slings and 80% on synthetic of the sling’s straight-line hitch rating (70% for cable-laid slings), unless other ratings are provided by the sling manufacturer or a qualified person. Consult the sling manufacturer or a qualified person for choker hitch ratings for grommets and endless slings.

e. Rated loads for angles of choke less than 120 degrees shall be de-rated per manufacturer recommendations.

f. Multiple-leg slings shall be selected according to the sling’s rated load based on the specific angle(s) as stated on the sling’s identification. The rated load for use at other angles shall be provided by the sling manufacturer or a qualified person. It is not recommended to rig below a 30 degree angle as sling tension is double at that point.

g. When D/d ratios smaller than 15/1 for hand-tucked splice type slings and 25/1 for mechanical splice and swaged or poured socket-type slings are used in the body of the sling, the rated load of the sling shall be decreased according to the recommendations of the manufacturer, a qualified person, or the Wire Rope Sling Users Manual.
Angle of Choke, deg | Rated Capacity %
---|---
Over 120 | 100%
90 – 120 | 87%
60 – 89 | 74%
30 – 59 | 62%
0 – 29 | 49%

Care and Use of Rigging Hardware

a. Slings shall be shortened or adjusted only by methods approved by the sling manufacturer or a qualified person.

b. Slings shall not be shortened or lengthened by knotting, twisting, or by wire rope clips.

c. The sling shall be hitched in a manner providing control of the load.

d. Slings in contact with edges, corners, or protrusions should be protected with a material of sufficient strength, thickness, and construction to prevent damage to the sling.
e. Shock loading should be avoided.

f. Loads should not be rested on the sling.

g. Slings should not be pulled from under a load when the load is resting on the sling.

h. Twisting and kinking shall be avoided.

i. During load handling activities, with or without load, personnel shall be alert for possible snagging.

j. When using multiple basket or choker hitches, the load should be rigged to prevent the sling from slipping or sliding along the load.

k. When lifting with a basket hitch, the legs of the sling should contain or support the load from the sides, above the center of gravity, so that the load remains under control.

l. Slings should not be dragged on the floor or over an abrasive surface.

m. In a choker hitch, the choke point should only be on the sling body, not on a splice or fitting.

n. Slings should not be constricted, bunched, or pinched by the load, hook, or any fitting.

o. The load applied to the hook should be centered in the base (bowl) of the hook to prevent point loading on the hook, unless the hook is designed for point loading.

p. An object in the eye of a sling should not be wider than one half the length of the eye, nor less than the nominal sling diameter.

q. When a hand-tucked sling is used, the sling, load, or load handling device shall be prevented from rotating.

r. Slings made with wire rope clips shall not be used as a choker hitch.

s. All portions of the human body shall be kept from between the sling and load, and from between the sling and hook, shackle, or other load handling device.

t. Personnel should not stand in line with or next to the leg(s) of a sling that is under tension.

u. Personnel shall not stand or pass under a suspended load.

v. Personnel shall not ride the sling.
w. Do not inspect a sling by passing bare hands over the wire rope body. Broken wires, if present, may puncture the hands.

Rope Care and Use

a. A rope shall not be overloaded or dragged over rough or sharp objects.

b. Short bends over sharp-edged surfaces shall be avoided.

c. Kinks shall be removed before any strain is put on a rope.

d. When not in use, rope shall be dried and stored properly and kept free from mechanical damage and excessive heat and dryness.

e. Rope shall be examined regularly for cuts, worn spots, burns and rot. The rope shall be untwisted at various places and inspected for poor fiber and dry rot.

f. The outward appearance of rope shall not be accepted as proof of quality or strength.

g. The safe loads, as specified by the manufacturer, shall not be exceeded.

h. Hand lines shall be a minimum of 1/2-inch diameter or have a strength equivalent to 1/2-inch manila.

i. Eyes and splices shall be made in accordance with the instructions given by the rope manufacturer.
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<tr>
<th>Diameter (D)</th>
<th>Polypropylene Core</th>
<th>Polypropylene Cover</th>
<th>Nominal Line Diameter</th>
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SAFETY FACTOR = 5

BRIDGED SYNTHETIC FIBER LINES (LB)

APPROXIMATE SAFE WORKING LOADS OF NEW
## APPROXIMATE SAFE WORKING LOADS OF NEW FIBER LINES — POUNDS

### Three-Strand Line

Safety Factor = 5

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Poles - Average Weights

(When Furnished to A.S.A. Specifications)

It should be understood that poles, even within the same class, vary in diameter and hence weight. Also, the moisture content of a pole changes under various conditions. Therefore, the weights given in these tables should be taken as average values only, but they should prove sufficiently reliable.

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<th>Class 3</th>
<th>Class 4</th>
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CREOSOTED YELLOW PINE - 8 lb. Treatment

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<th>Class 2</th>
<th>Class 3</th>
<th>Class 4</th>
<th>Class 5</th>
<th>Class 6</th>
<th>Class 7</th>
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<td>742</td>
<td>646</td>
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<td>1622</td>
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<td>1219</td>
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<td>921</td>
<td>807</td>
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<td>45</td>
<td>2222</td>
<td>1911</td>
<td>1664</td>
<td>1444</td>
<td>1274</td>
<td>1114</td>
<td>976</td>
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# Lineman Rigger's Reference Card

**Sling Capacities**

<table>
<thead>
<tr>
<th>Size in inches</th>
<th>MECHANICAL SPLICE IN POUNDS</th>
<th>DESIGN FACTOR 5:1</th>
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<tbody>
<tr>
<td></td>
<td>2 - Legs or Basket 90°</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 - Legs 60°</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 - Legs Only if 1/3 each leg</td>
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</tr>
<tr>
<td></td>
<td>Size in mm</td>
<td></td>
</tr>
<tr>
<td>1/4</td>
<td>1,300 960 2,600 2,200 1,820 1,300 3,300 6.4</td>
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<tr>
<td>5/16</td>
<td>2,000 1,480 4,000 3,400 2,800 2,000 5,100 8.0</td>
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</tr>
<tr>
<td>3/8</td>
<td>2,800 2,200 5,600 5,000 4,000 2,800 7,400 9.6</td>
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<td>7/16</td>
<td>3,800 2,800 7,600 6,800 5,400 3,800 10,000 11.0</td>
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</tr>
<tr>
<td>1/2</td>
<td>5,000 3,800 10,000 8,800 7,200 5,000 13,200 13.0</td>
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</tr>
<tr>
<td>9/16</td>
<td>6,400 4,800 12,800 11,000 9,000 6,400 16,500 14.0</td>
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<td>5/8</td>
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<tr>
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<td>11,200 8,200 22,400 19,400 15,800 11,200 29,100 19.0</td>
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<tr>
<td>7/8</td>
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<tr>
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<td>30,000 22,500 60,000 52,000 42,000 30,000 76,000 32.0</td>
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</tr>
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</table>

### Formula to find sling length

Total distance between pick points x Multiplier = Sling Length
Load Factors & Weight Distribution

Tension in A = \( \frac{3}{6} \times 4,000 \) #

How much tension in chain come-a-long A?

Solution: Tension in s = \( \frac{8}{10} \times 5,000 \) #

Given: length s = 10', and length h = 8', what is tension in s?

\[ Tension \ in \ s = \left( \frac{length \ h}{length \ s} \right) \times \frac{length \ h \ x \ Share \ of \ Load \ WI.}{Share \ of \ Load \ WI.} \]
## Sling Capacities

<table>
<thead>
<tr>
<th>Size or Code</th>
<th>Vertical</th>
<th>Choker</th>
<th>2-Legs or Basket</th>
<th>60°</th>
<th>45°</th>
<th>30°</th>
<th>60° Only if 1/3 Each Leg</th>
<th>Diameter or Width</th>
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<td>6,100</td>
<td>4,900</td>
<td>3,500</td>
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<td>7 mm</td>
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<tr>
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<td>7,100</td>
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<td>14,200</td>
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<td>7,100</td>
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<td>16 mm</td>
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<td>Web</td>
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Example

Block & Fairlead Loading

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<th>90 deg</th>
<th>120 deg</th>
<th>150 deg</th>
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<td>BL = 6'000</td>
<td>6'000</td>
<td>6'000</td>
<td>6'000</td>
<td>6'000</td>
</tr>
<tr>
<td>A = 8'460</td>
<td>10'380</td>
<td>120</td>
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<td>B = 12'000</td>
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<td>1.41</td>
<td>1.73</td>
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<td>C = 12'000</td>
<td>6'000</td>
<td>150</td>
<td>90</td>
<td>60</td>
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<tr>
<td>D = 3'120</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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System: Inertialness
Assume

Formula: Block Factor x Line Pull = Block Load

Included Full Angle
### Rigging Hardware Capacities

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<th>Size in inches</th>
<th>Shldr Eye Bolt 5:1 Vertical</th>
<th>45 deg.</th>
<th>Turnbuckle 5:1 Eye or Jaw</th>
<th>Master Link 5:1</th>
<th>Shackle 6:1 SPAnchor</th>
<th>Wire Rope Clip Min. # of clips</th>
<th>Turnback in inches</th>
<th>Torque in ft. lbs.</th>
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<td>------</td>
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<td>------</td>
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<td>3</td>
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<tr>
<td>9/16</td>
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<td>------</td>
<td>------</td>
<td>------</td>
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<td>------</td>
<td>------</td>
<td>------</td>
<td>19,000</td>
<td>6</td>
<td>34.00</td>
<td>225</td>
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### Coefficients of Friction

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<tr>
<td>Metal on concrete</td>
<td>.60</td>
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<tr>
<td>Wood on concrete</td>
<td>.45</td>
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<tr>
<td>Wood on wood</td>
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<tr>
<td>Wood on wood</td>
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<tr>
<td>Lubricated surface</td>
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<tr>
<td>Steel on steel</td>
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</tr>
<tr>
<td>Load on wheels</td>
<td>.05</td>
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### D/d Ratios

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<tr>
<td>20:1</td>
<td>.92</td>
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<tr>
<td>15:1</td>
<td>.89</td>
</tr>
<tr>
<td>10:1</td>
<td>.86</td>
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<td>8:1</td>
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<td>5:1</td>
<td>.77</td>
</tr>
<tr>
<td>2:1</td>
<td>.65</td>
</tr>
<tr>
<td>1:1</td>
<td>.50</td>
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</tbody>
</table>
### Formulas and Information

- **Load Weight (to estimate)**: Volume in cu. ft. x 500 lbs. x density factor. 0.02, 0.05, 0.10, 0.20, 0.30 etc.
- The area of a circle is approx. 80% of its diameter squared (diameter x diameter).
- Area of square or rectangle = HWL
- Volume of cube = HWL
- Area of circle = \( \pi r^2 \)
- Circumference = \( \pi d \)
- \( \pi = 3.14 \) (approx.)
- \( H = \text{Height} \)
- \( W = \text{Width} \)
- \( L = \text{Length} \)
- \( d = \text{diameter} \)
- \( r = \text{radius} \)
- \( \pi = 3.14 \) (approx.)

### Materials and Liquids - Pounds / cu. ft.

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<td>75</td>
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<tr>
<td><strong>Rubber</strong></td>
<td>75</td>
</tr>
<tr>
<td><strong>River Sand</strong></td>
<td>95</td>
</tr>
<tr>
<td><strong>Concrete, Rein.</strong></td>
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<tr>
<td><strong>Paper</strong></td>
<td>56</td>
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<tr>
<td><strong>Coal</strong></td>
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<tr>
<td><strong>Bronze</strong></td>
<td>55</td>
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<tr>
<td><strong>Brick</strong></td>
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<tr>
<td><strong>Asphalt</strong></td>
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<tr>
<td><strong>Leads</strong></td>
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</tr>
</tbody>
</table>
Dead-ending Poles & Towers

**FORMULAS**

<table>
<thead>
<tr>
<th>GL = \sqrt{HT^2 + LD^2}</th>
<th>PC = \frac{LT \times HT}{LD}</th>
<th>GT = \frac{LT \times GL}{LD}</th>
<th>LT = \frac{LD \times GT}{GL}</th>
</tr>
</thead>
</table>

**Find**

| PC = ? LD = 90' | GL = ? HT = 60' | GT = ? LT = 5,000 # |

**Given**

<table>
<thead>
<tr>
<th>PC = 5,000 \times 60</th>
<th>90</th>
<th>PC = 3,333#</th>
</tr>
</thead>
<tbody>
<tr>
<td>GL = \sqrt{60^2 - 90^2}</td>
<td>GT = 5,000 \times 108</td>
<td>GL = 108' (approx.)</td>
</tr>
<tr>
<td>GL = 11,700</td>
<td>GT = 6,000#</td>
<td></td>
</tr>
<tr>
<td>Mobile Crane Hand Signals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retract Boom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Boom &amp; Raise Load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extend Boom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swing Boom Slowly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dog Everything</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel (mobile eqpt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Stop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Hoist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary Hoist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoist Load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoist Load Slowly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stop</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Treated Pole Weights

<table>
<thead>
<tr>
<th>Class Length</th>
<th>H1</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>P</td>
<td>C</td>
<td>F</td>
</tr>
<tr>
<td>35</td>
<td>2.0</td>
<td>2.5</td>
<td>1.6</td>
<td>1.4</td>
</tr>
<tr>
<td>40</td>
<td>2.4</td>
<td>2.9</td>
<td>1.9</td>
<td>2.1</td>
</tr>
<tr>
<td>45</td>
<td>2.8</td>
<td>3.2</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>50</td>
<td>3.7</td>
<td>4.8</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>60</td>
<td>3.7</td>
<td>4.8</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>70</td>
<td>4.7</td>
<td>6.1</td>
<td>3.8</td>
<td>3.9</td>
</tr>
<tr>
<td>80</td>
<td>5.8</td>
<td>7.4</td>
<td>4.8</td>
<td>4.9</td>
</tr>
<tr>
<td>90</td>
<td>6.9</td>
<td>8.9</td>
<td>6.0</td>
<td>5.8</td>
</tr>
<tr>
<td>100</td>
<td>8.1</td>
<td>10</td>
<td>7.2</td>
<td>6.9</td>
</tr>
<tr>
<td>110</td>
<td>9.4</td>
<td>-</td>
<td>8.8</td>
<td>8.2</td>
</tr>
<tr>
<td>120</td>
<td>11</td>
<td>-</td>
<td>10.1</td>
<td>9.5</td>
</tr>
</tbody>
</table>

Values above in KIPS • Multiply value x 1000

### Operator's Checklist

- Wind, temperature & visibility
- Line truck & load foundations
- Load weight, height, width & length
- Deductions for extension, jib, block, etc.
- Radius verified for pick, swing & set
- Line truck inspection: controls, hydraulics
- Inspect brakes, outriggers, rotation
- Inspect boom, wire rope, pendant lines
- Inspect blocks, hooks, rigging gear
- Power lines, obstructions, hoisting height
- Load stability, hook centered over load
- Load is free for lift-off, not in a bind
- Tailboard meeting, communications
- Signaller, tag lines, spotters
- Sketch & outline procedure
### A

- $d = \text{diameter} \cdot r = \text{radius} \cdot L = \text{length} \cdot H = \text{height} \cdot W = \text{width} $
- $\infty = \text{infinity}$
- $\pi \text{ or } \text{Pi} = 3.1416 (3.2r^*)$
- Circumference = $\pi d$
- $r^* = \text{rounded}$
- Area of a circle = $\pi r^2$ or $(d^2 \times .8)$
- Volume = $LWH$
- Area of a square = $LW$
- Area of triangle = $LW/2$
- Area of circle, when diameter is doubled it will quadruple the area
- Farhenheit to Centigrade $^\circ C = \frac{5}{9}(^\circ F - 32)$,
  Centigrade to Farhenheit $^\circ F = \frac{9}{5}(^\circ C + 32)$
- Wt. est. = Vol. in cu.ft. x 500 x density factor .02, .05, .10, .20, .30, etc.

<table>
<thead>
<tr>
<th>D/d Ratio</th>
<th>Strength</th>
<th>Efficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>30:1</td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>20:1</td>
<td>.92</td>
<td></td>
</tr>
<tr>
<td>10:1</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td>5:1</td>
<td>.77</td>
<td></td>
</tr>
<tr>
<td>2:1</td>
<td>.65</td>
<td></td>
</tr>
<tr>
<td>1:1</td>
<td>.50</td>
<td></td>
</tr>
</tbody>
</table>

### B

<table>
<thead>
<tr>
<th>Unit Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mile = 5,280 ft., 1,760 yds, 1.61 km / 1 kilometer = .62 mile, 3,281 ft</td>
</tr>
<tr>
<td>1 yard = 3 ft, 36 inches, .91 meter / 1 meter = 1.09 yds, 3.28 ft, 39.37 in.</td>
</tr>
<tr>
<td>1 ton (short) = .891 long ton, .91 metric ton, 2,000 pounds, 907 kms</td>
</tr>
<tr>
<td>1 ton (metric) = 1.1 short ton, .98 long ton, 2204 lbs, 1000 kms</td>
</tr>
<tr>
<td>1 pound = 16 ounces, .45 kg / 1 kg = 1000 grams, 35 ozs, 2.2 lbs</td>
</tr>
<tr>
<td>1 gallon (US liq) = 4 qts, 3.8 liters / 1 liter = .264 gallon (US), 1.06 qts</td>
</tr>
</tbody>
</table>
Pick Points / CC & Sling Leg Loading

| 1 | 2-leg bridge = 1 leg llt |
| 2 | 3-leg bridge = 2 legs llt |
| 3 | 4-leg bridge = 3 legs llt |
| 4 | 4-leg bridge = 3 legs llt |
| 5 | 2-leg bridge = 2 legs llt |
| 6 | 3-leg bridge = 3 legs llt |
| 7 | 4-leg bridge = 3 legs llt |
| 8 | 3-leg bridge = 3 legs llt |
Steel Beam & Rigging Gear Capacities

<table>
<thead>
<tr>
<th>Wide Flange Beams (W&quot;x&quot;F&quot;)</th>
<th>Yield Stress (FY) 36 KSI</th>
<th>10' Span</th>
<th>20' Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>4x4</td>
<td>2,500</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>6x4</td>
<td>1,100</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>8x8</td>
<td>13,700</td>
<td>3,800</td>
<td></td>
</tr>
<tr>
<td>10x4</td>
<td>1,200</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>10x10</td>
<td>20,400</td>
<td>10,200</td>
<td></td>
</tr>
<tr>
<td>12x8</td>
<td>21,100</td>
<td>5,800</td>
<td></td>
</tr>
<tr>
<td>12x12</td>
<td>28,400</td>
<td>17,600</td>
<td></td>
</tr>
<tr>
<td>14x8</td>
<td>25,000</td>
<td>6,300</td>
<td></td>
</tr>
<tr>
<td>14x10</td>
<td>31,300</td>
<td>14,300</td>
<td></td>
</tr>
<tr>
<td>16x10</td>
<td>38,700</td>
<td>16,300</td>
<td></td>
</tr>
</tbody>
</table>

The above capacities are based on a design factor of 4 and for estimation only. Verify with engineer before using in-plant beam for rigging point.

<table>
<thead>
<tr>
<th>Tension in pounds</th>
<th>Wire Rope Slings 6x19 IPS IWRC</th>
<th>Web Slings Flat</th>
<th>Chain Slings Alloy G-8</th>
<th>Shackles Carbon Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000</td>
<td>3/8</td>
<td>1-901</td>
<td>7/32</td>
<td>3/8</td>
</tr>
<tr>
<td>8,000</td>
<td>3/4</td>
<td>1-903</td>
<td>1/2</td>
<td>3/4</td>
</tr>
<tr>
<td>16,000</td>
<td>1</td>
<td>2-903</td>
<td>5/8</td>
<td>1</td>
</tr>
<tr>
<td>24,000</td>
<td>1-1/4</td>
<td>3-903</td>
<td>3/4</td>
<td>1-1/4</td>
</tr>
<tr>
<td>34,000</td>
<td>1-1/2</td>
<td>4-904</td>
<td>7/8</td>
<td>1-1/2</td>
</tr>
<tr>
<td>45,000</td>
<td>1-3/4</td>
<td>3-906</td>
<td>1</td>
<td>1-3/4</td>
</tr>
<tr>
<td>60,000</td>
<td>2</td>
<td>3-908</td>
<td>1-1/4</td>
<td>2</td>
</tr>
<tr>
<td>72,000</td>
<td>2-1/4</td>
<td>3-910</td>
<td>1-1/4</td>
<td>2-1/2</td>
</tr>
<tr>
<td>86,000</td>
<td>2-3/8</td>
<td>4-910</td>
<td>—</td>
<td>2-1/2</td>
</tr>
<tr>
<td>100,000</td>
<td>2-5/8</td>
<td>4-912</td>
<td>—</td>
<td>2-1/2</td>
</tr>
</tbody>
</table>

The above capacities, sling descriptions and choices are for estimating purposes only. Always confirm the actual ratings of rigging equipment prior to making any lift.
Federal Specification FF-C-450 Type I Class 1

Use only USA forged steel clips Crosby G-450 or equivalent to meet

Apply tension

Operation

Step 1: Apply first clip - One base width from dead end of wire rope - U-bolt over dead end and Prop Clip Installation

Tighten nuts evenly to recommended amount - U-bolt over dead end and

Step 2: Apply second clip - Nearest eye as possible.

DO NOT TIGHTEN

U-bolt over dead end - Swing up nuts but

Step 3: All other clips - Space equally between

First two.

Step 4: Tighten all nuts to recommended torque.

Step 5: Recheck nut torque after rope has been in tension.

<table>
<thead>
<tr>
<th>FTS-lbs</th>
<th>0</th>
<th>360</th>
<th>45</th>
<th>65</th>
<th>45</th>
<th>35</th>
<th>25</th>
<th>15</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.360</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8.360</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8.360</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8.360</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8.360</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8.360</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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</tr>
<tr>
<td>8.360</td>
<td>7</td>
<td>3</td>
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</tr>
<tr>
<td>8.360</td>
<td>7</td>
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<td>2</td>
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<td>2</td>
</tr>
<tr>
<td>8.360</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Handling and Storage of Cylinders

a. Care shall be exercised in handling all gas cylinders. They shall not be dropped or jarred.

b. Gas cylinders shall not be hoisted using a sling or electro magnet nor shall they be lifted by the valve protection cap. When a hoisting device is used to handle cylinders, a platform, cage, or cradle that protects cylinders shall be used to support them. Hydraulic tailgates or other approved methods shall be used in lowering cylinders from trucks.

c. Gas cylinders, whether full or empty, shall be secured in an upright position at all times. Valve protection caps shall be kept in place except while the cylinders are in use.

d. Gas cylinders shall be kept away from heat and from welding or cutting operations where sparks could reach them.

e. Oxygen cylinders shall not be stored near highly combustible materials, especially oil and grease. They shall be separated in storage from fuel gas cylinders or combustible materials a minimum distance of 20 feet or by a 5-foot high firewall when in use only. Increased to 50-foot separation when not in use.

f. Welding or cutting of any pipeline, tank, empty container or piece of equipment shall not be performed until it has been tested and found to be free from highly flammable materials or an explosive mixture of gases. Before welding or cutting procedures have started, the hazardous materials shall be removed, or it shall be vented to the atmosphere to prevent an explosion from expansion of trapped gases. Acetylene and oxygen tanks and pipelines shall be purged with oil free air, oil free nitrogen, or oil free carbon dioxide before welding it started.

g. Cylinders containing chlorine, nitrogen, acetylene, propane or hydrogen shall not be stored in a general storeroom. They shall be stored in separate, well-ventilated, fireproof areas.

h. Cylinders shall not be allowed to come in contact with energized conductors, ground wires from electric equipment or welding machines.

i. A full cylinder shall be connected to a header or manifold with other cylinders only when their temperatures are approximately the same.

j. The valves of compressed gas cylinders shall be opened slowly and only with the special wrench provided.
k. Employees shall never tamper with the safety relief devices of cylinders.

l. Employees shall never force connections that do not fit.

m. Oil or grease shall not be used for lubricating valves, gauge connections or other parts of an oxygen system.

n. Before the regulator is removed from a cylinder, the valve shall be closed and all pressure released from the regulator.

o. A leaking cylinder shall not be used. Such cylinders shall be tagged out of service and taken outdoors away from sources of ignition. The supervisor shall be notified.

p. A flame shall never be used to detect gas leaks.

q. The recessed top of cylinders shall not be used as a place for tools.

r. No attempt shall be made to mix gases in a cylinder or to transfer gas from one cylinder to another.

s. A sign “Danger-No Smoking, Matches or Open Lights Area” or equivalent wording shall be conspicuously posted in rooms or at entrances to areas where fuel gas is used or stored.

16-2 Welding and Cutting-General

a. Welding and cutting shall be performed only by experienced and properly instructed persons. All appropriate PPE shall be worn when welding, cutting or brazing. Bystanders and other employees shall be shielded or protected from radiant energy from the arc when arc welding.

b. When welding or cutting in elevated positions, precautions shall be taken to prevent sparks or hot metal from falling onto people or flammable material below.

c. Suitable fire extinguishing equipment shall be immediately available at all locations where welding and cutting equipment is used.

d. Matches shall not be carried by welders or their helpers when engaged in welding or cutting operations.

e. A fire watch shall be maintained wherever welding or cutting is performed in locations where combustible materials present a fire hazard. A fire check shall be made of the area one half hour after completion of welding.

f. Where combustible materials such as paper clippings or wood shavings are present, the floor shall be swept clean for a radius of 35 feet before welding is performed. Combustible floors shall be kept wet or protected by fire-resistant shields. Where floors have been wet down, personnel
operating arc-welding or cutting equipment shall be protected from possible electric shock.

g. Machinery, tanks, equipment, shafts, or pipes that could contain explosive or highly flammable materials shall be thoroughly cleaned and decontaminated before the application of heat.

h. In dusty or gaseous spaces where there is a possibility of an explosion, welding or cutting equipment shall not be used until the space is adequately ventilated as confirmed by test.

i. Adequate ventilation or approved respiratory equipment shall be used while welding in confined spaces or while brazing, cutting or welding zinc, brass, bronze, stainless steel, medals coated with mercury-bearing metals, or galvanized or lead coated material.

j. Cadmium bearing materials.

1. Proper respiratory protection must be used when welding or cutting cadmium bearing metals.

2. Remote Exothermic Welding Ignition System is recommended if available.

3. Indoors or in confined spaces, local exhaust ventilation or air line respirators shall be used.

4. Outdoors, respiratory protection such as approved fume respirators or air line respirators shall be used.

k. Work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

16-3 Electric Welding

a. No electrical welding machine, either AC or DC, shall be operated until the frame or case of the machine is electrically grounded. Grounding connections shall be checked prior to welding is performed to ensure that they are adequate, both mechanically and electrically.

b. Rules and instructions supplied by the manufacturer or affixed to the machine shall be followed.

c. To protect eyes, face and body during electrical welding and cutting, the operator shall wear an approved helmet and proper protective gloves and clothing. Helpers or attendants shall wear proper eye protection. Other employees shall not observe electric welding operations unless they use approved eye protection.

d. Proper eye protection shall be worn to guard against flying particles when the helmet is raised.
e. Welding screens shall be used whenever other persons could be exposed to the arc of the welding operation. Welders shall not strike an arc with an electrode when there are persons nearby who might be affected by the arc.

16-4 Gas Welding

a. Suitable eye protection and protective gloves and clothing shall be worn during welding or cutting operations or while cleaning scale from welds. Helpers or attendants shall wear proper eye protection.

b. Matches shall not be used to light a torch; a torch shall not be lighted on hot work. A friction lighter or stationary pilot light shall be used.

c. Welding hose shall not be repaired with tape.

d. All gauges or valves shall be removed when transporting or storing tanks or cylinders.

e. When welding equipment is not in use, the cylinders valves shall be closed and the pressure in the hose released.

PART 1
SECTION 7
EXPLOSIVES

NOTE: Please review all Employer policies and applicable guidelines before handling explosives.

17-1 General

a. Explosives or explosive materials shall not be used except with specific permission from Supervisors.

b. Only persons authorized by the Company shall use explosives or explosive materials. These persons shall be qualified by training or experience in the handling and use of explosives and shall have a working knowledge of applicable state, and local laws and possess appropriate licensing as required by state and federal law.

c. Because electric blasting caps, when not shielded by a closed metal box, have been detonated by the operation of two-way radios in vehicles, as well as by regular radio transmitter stations, no vehicle equipped with a radio transmitter shall be allowed within 100 feet of blasting operations or exposed electric caps, while the transmitter is in operation.
d. When electric blasting caps are used, adequate signs warning against the use of mobile radio transmitters shall be prominently displayed at 1,000 feet and 500 feet of the blasting area.

17-2 Transportation

a. Explosives shall be carried and transported in approved containers by persons authorized by the Company.

b. Explosives and blasting caps (detonators) shall not be transported on the same vehicle. (Blasting caps may be transported on the same vehicle with unmixed “blasting agents” such as commercial packages of ammonium nitrate and oil. However, these materials should be transported in separate compartments to increase safety.)

c. Smoking and open flames shall not be permitted near any explosive materials. When transporting explosives, persons may not smoke in the cab or near the vehicle.

d. Vehicles transporting explosives or blasting caps shall be placarded on the front, rear and both sides with approved “EXPLOSIVES” signs.

17-3 Preparation and Blasting

a. The blaster, before connecting the charge or initiating the explosives shall insure the protection of both employees and the public through the use of warning signs or personnel stationed around the perimeter of the danger area. Lead wires and firing lines shall be short circuited up to the time they are connected to the firing mechanism.

b. Electrical connections shall be made only after the hole has been charged and the area is clear. Loaded holes shall be properly tamped with earth, using a wood rod.

c. Before an explosive is fired, a loud signal shall be given by the blaster who shall have made certain the area is clear of persons and materials. Blasting signals shall be as follows:

1. Warning Signal – A 1 minute series of long signals given 5 minutes prior to the firing signal.

2. Firing Signal – A short series of signals 1 minute prior to the firing.

3. All Clear Signal – A prolonged signal following inspection of the blast area.

d. Misfires shall not be inspected until a sufficient waiting period has elapsed. For non-electric blasting, the minimum waiting period is 1 hour; for electric blasting, the minimum period is 15 minutes.
NOTE: In addition to the above, all local, state and Federal Laws covering the transportation and use of explosives shall be observed.

PART 1
SECTION 8
VEHICLE OPERATIONS

18-1 General

a. Only employees who are specifically authorized and who possess a valid commercial driver's license or permit for the equipment being used shall operate motor vehicles on Company business. (NOTE: Driver with a Permit only must be accompanied by a driver with a CDL.)

b. Drivers shall know and obey all Federal, State and local motor vehicle laws applicable to the operations of their vehicle.

c. The driver shall drive at safe speeds no greater than that permitted by law. Traffic, road, and weather conditions shall be given consideration in determining the safe speed within the legal limit at which the vehicle shall be operated.

d. A driver shall not permit unauthorized persons to drive, operate or ride in or on a Company vehicle.

e. Where the vehicle has seat belts, they shall be used. If the vehicle does not have seat belts the supervisor should be notified.

f. Employees shall not permit anyone to ride on the running boards, fenders or any part of the vehicle except on the seats. Passengers shall not stand in moving vehicles.

g. Employees shall not ride on trailers.

h. Employees shall not jump on or off vehicles in motion.

i. The privilege of operating equipment may be withdrawn if the operator abuses this privilege by careless or unlawful practices. (Abuse is defined as – endangering life, limb, property or damage to equipment.)

j. Drivers operating equipment in a negligent or unlawful manner shall be subject to disciplinary action.
18-2 Inspection of Equipment

a. The driver shall conduct a pre-trip inspection of the vehicle to determine if it is in a safe operating condition. Any defects found on the vehicle shall be reported immediately per the Contractor’s policy.

b. The driver shall inspect windshield wipers frequently and see that they are in good operating condition and that the windows and windshield give sufficient visibility for safe operation of the vehicle.

c. All lights and reflectors of vehicle shall be inspected and if found defective, they shall be repaired immediately.

d. The driver shall report any defects that may have developed during the day. If the brakes are not working properly, they shall be adjusted or repaired before the vehicle is put in operation. Other items that affect safety shall be repaired prior to continued vehicle operation.

e. All vehicles must be equipped with a fire extinguisher and three, red reflective triangles.

f. Federal and State D.O.T. requires that a post trip inspection be done with written documentation. The driver of that vehicle on the next shift shall review that inspection form for any defects, ensure that those defects have been repaired, and check them off on the inspection form. The vehicle shall not be operated if any of those defects have not been repaired. If all repairs have been made, the driver shall carry that inspection form on the vehicle for the remainder of the shift.

g. It is the driver’s responsibility to make sure all loads will be inspected and properly secured before operating vehicle.

18-3 Operation

a. The operator of a motor vehicle shall clearly signal their intention of turning, passing.

b. Upon a signal from a vehicle approaching from the rear, the driver of a Company vehicle shall yield the right of way.

c. Drivers shall be prepared to stop and the right of way shall be yielded in all instances where necessary to avoid an accident.
<table>
<thead>
<tr>
<th>Speed</th>
<th>Trucks (in Feet)</th>
<th>Automobiles (in Feet)</th>
<th>Average Time (seconds)</th>
<th>Reaction Time (seconds)</th>
<th>Total Stopping Distance (in Feet)</th>
<th>Average Stopping Distance (in Feet)</th>
<th>Miles per Hour</th>
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<td>10</td>
<td>5</td>
<td>10</td>
<td>14.6</td>
<td>10</td>
</tr>
</tbody>
</table>
NOTE: These are the shortest distances in which a vehicle in good condition, driven by an average driver, can stop on a good road surface. Distances will increase with any change in driver, vehicle or road surface.

d. The driver of a vehicle shall be courteous toward other operators and pedestrians. The driver shall operate the vehicle in a safe manner and shall yield the right of way to pedestrians and other vehicles when failure to do so might endanger any person or another vehicle.

e. The driver shall stay a sufficient distance behind when following another vehicle so that they can safely stop the vehicle in the clear distance ahead.

f. Drivers shall exercise added caution when driving through residential and school zones.

g. When entering or leaving any building, enclosure, alley or street where vision is obstructed, a complete stop shall be made and the driver then shall proceed with caution when the way is clear.

h. Before a radio equipped vehicle is driven under or adjacent to energized equipment, especially in substation areas, any external radio antenna shall be lowered and clearance checked to ensure that proper clearance will be maintained between the vehicle and energized equipment.

i. Ignition systems and radio transmitters shall be turned off and no smoking is permitted while a vehicle is being refueled.

j. When the vehicle is proceeding down grade, the clutch shall not be disengaged. Trucks, particularly if heavily loaded, shall be in a lower than normal gear on steep grades.

k. The driver shall not operate the motor in any garage except when driving in or out, and then the motor shall be operated as little as practicable. The motor shall not be warmed up inside a garage, nor shall the driver test motor operations in a garage unless the exhaust gas is carried directly to outside atmosphere or doors and windows are open so that adequate ventilation exists.

18-4 Parking

a. When vehicles must be parked on the roadway, they shall be parked on the right hand side facing in the direction of traffic flow, whenever possible.

b. When parking on a roadway, vehicles shall park off the traveled road surface, whenever possible. When vehicles must park closer than 10 feet to the traveled road surface, appropriate traffic control devices shall be used.

c. Trucks or trailers stopped on any public roadway shall be protected by proper warning lights, reflectors or red flags in accordance with State or local requirements.
d. Vehicles shall not be parked on bridges or over culverts except when necessary for work.

e. When a truck is parked, the driver shall make sure the vehicle is left in a safe position. If the vehicle is not a pickup truck the engine shall be turned off, the transmission shall be placed in the lowest gear, parking brake shall be set, and the wheels chocked. When parked on an incline, the front wheels shall be cut into the curb if present. Rear wheels shall be chocked.

18-5 Backing

a. Whenever possible, the vehicle shall be positioned to avoid the necessity of backing later.

b. Extreme caution shall be exercised when backing a vehicle, to avoid injury to persons and to prevent property damage. If another employee is present, the Employee shall be stationed at the rear of the vehicle to assist the driver in backing the vehicle safely.

c. When backing a vehicle, which has an obstructed view to the rear:

1. A reverse signal (back-up alarm) audible above the surrounding noise level shall be used, or

2. An observer shall signal that it is safe to back.

d. During all backing operations, the vehicle operator shall:

1. Keep a constant lookout during the entire time.

2. Carefully check any blind areas.


4. Watch both sides. Do not depend entirely on mirrors.

18-6 Stopping on Highway

PLEASE FOLLOW ALL FEDERAL, STATE AND LOCAL APPLICABLE LAWS.

a. Stopping on the highway shall be avoided.

b. When it is absolutely necessary to stop on the highway, extreme caution shall be used. Warning signals and lights shall be used.

1. Rotating beacon shall be used, if a vehicle is so equipped.

2. Tail lights and emergency flashers shall be used.
3. Flares or reflectors shall be placed to give adequate advance warning.

4. If work is in progress, traffic control devices (together with flaggers, where necessary) shall be used.

18-7 Hauling Materials, Poles or Ladders

It is the drivers responsibility to make sure all loads will be inspected and properly secured before operating vehicle.

a. Poles, ladders, pipe and all other long materials shall be loaded parallel with the truck length. Such material shall not extend beyond the normal width of the vehicle.

b. Materials shall be securely fastened to prevent a hazard due to shifting.

c. Materials which extends more than 4 feet beyond the front or back of the truck or trailer shall have warning devices attached. Red flags shall be used; at night and during periods of poor visibility, red lights shall be used.

d. When hauling long poles and the vehicle must enter congested areas or heavy traffic conditions, escort vehicles displaying suitable warning signs should be used.

18-8 Aerial Lifts

a. Only authorized persons who are properly trained shall use or operate aerial lifts.

b. The operating and maintenance instruction manuals issued by the manufacturer shall be followed.

c. Load limits of the boom and bucket shall not be exceeded. Shock loading (sudden stops or starts) of the equipment shall be avoided. If a boom is subjected to shock loading, for example, by a load unexpectedly dropping; it shall be inspected for damage before continued operation.

NOTE: Aerial Lifts including Material Handlers shall never be used to pull poles out of the ground or any other undetermined loads.

d. Aerial lifts shall not be modified at the worksite. However, using attachments and reconfiguring the equipment as intended by the manufacturer are permitted. The insulated portion shall not be altered in any manner that might reduce its insulating value.

e. Before use, the equipment shall be given a warm up period. The hydraulic system and the lift controls shall be checked and tested daily before use to determine that they are in safe working condition. Malfunctions or unsafe operational conditions shall be reported, and equipment that is not in proper safe operational condition shall not be used.
f. Lower level controls shall not be operated unless permission had been obtained from the employee in the lift, except in an emergency.

g. The truck shall not be moved unless the boom is lowered, the bucket cradled and secured, and the outriggers retracted.

h. Employees shall not ride in the bucket while the truck is traveling. (Exception: Employees may ride in the bucket for short moves at the work location if the manufacturer’s operating instructions permit such operation, provided that the bucket is returned to the cradled position for each move.) Employees riding in the bucket shall face in the direction of travel while the truck is moving.

i. When employees are in the bucket of an aerial lift, all parking brakes of the vehicle shall be set and wheel chocks shall be used.

j. When outriggers are provided, they shall be used and they shall always be set on pads. All pads should be placed on level ground and if uneven surfaces are present all necessary steps shall be taken to make pads level (Cribbing, Excavating the earth, etc.). The truck should be level when viewed from the rear.

k. When working from an aerial lift a properly rated full body harness and lanyard shall be worn and attached to the provided anchorage point on the boom or basket.

l. Employees shall not be permitted to transfer from a bucket to a pole or structure except for specialized transmission jobs and then only when following specific written company procedures.

m. Safety rules governing the use of hot line tools, rubber goods, personal protective equipment and general safe practices shall also apply to work done from aerial baskets. (Exception: Different rules apply when performing “live-line bare-hand” work.)

n. When the boom must be maneuvered over a street or highway, necessary precautions shall be taken to avoid accidents with traffic and pedestrians. Traffic control measures, such as the use of flaggers, shall be used to ensure that vehicles do not strike the boom or bucket of an aerial lift operating over a roadway.

o. The operator shall always face in the direction in which the basket is moving, and shall see that the path of the boom and bucket is clear when it is being moved.

p. Employees shall not stand or sit on top of or edge of the bucket. Employee’s feet shall be on the floor of the bucket the entire time he or she is in it.

q. When two employees are in the bucket, or buckets on a two-bucket aerial lift, one of them shall be designated to operate the controls. One employee
shall give all signals, which shall be thoroughly understood by all persons concerned.

r. Climbers shall not be worn by employees while in the basket.

s. When two employees are working from an aerial lift, extreme care shall be taken to avoid one employee contacting poles, crossarms or other grounded or live equipment while the second employee is working on equipment at a different potential.

t. No more than one energized conductor or phase shall be worked at one time.

u. Minimum Approach Distances. The aerial lift, together with the employees in the bucket and all tools and equipment, shall maintain proper clearances from energized conductors. (Exception: Direct contact may be made when performing “live-line bare-hand” work.)

v. When using pneumatic or hydraulic tools in a bucket, the operator shall be sure that hoses or lines do not become entangled in the operational controls.

w. The operator shall be sure that jumpers and conductors do not become entangled in the operational controls.

x. The bottom of the bucket shall be kept free of tools, trash, etc.

y. Electrical retest shall be performed on aerial lifts, used on or near energized lines or equipment, at least every twelve (12) months. A copy of the test results shall be kept with the vehicle.

z. Bucket Trucks shall have liners, the liners shall be tested every twelve (12) months.

PART 1
SECTION 9
WORK AREA PROTECTION

Introduction

a. Work area protection is the adequate safeguarding or protecting of pedestrians, motorists, utility workers and equipment through the use of adequate traffic control devices including: barriers, warning signs, lights, flags, traffic cones, high-level standards, barricade rope or flaggers on approaches to work areas, excavations, open manholes or parked equipment.

b. Work area protection is accomplished by the use of informative and protective devices, keeping in mind that a safe installation requires the
use of these devices in relation to the location of the workers and the equipment involved. It is of the utmost importance that the work area be properly identified and that warning devices say what they mean, to convey the message to the traveling public well in advance of arrival at the work area.

c. The public must be warned in advance, then regulated and guided safely through or around the work area. Proper work area protection shall be planned to insure the safety and protection of public, workers and equipment.

d. Hazards such as manholes, pole holes, trenches or excavations shall be protected with warning devices that are lighted at night with lanterns, flares or flashers so located as to be visible to traffic and the public.

e. When it is necessary to warn traffic, flaggers or warning devices shall be stationed far enough on each side of the hazard to give vehicles enough time to stop and comply with state and local regulations. The flaggers should be trained under the standards of the “Manual on Uniform Traffic Control Devices” or the appropriate state and local laws and should be wearing the appropriate ANSI class of vest or garment for the speed rating in the area they are working.

f. All work area protection shall adhere to the “Manual on Uniform Traffic Control Devices” where applicable.

19-1 Equipment

a. Signs, standards, barricades, flags, cones and other traffic control devices shall conform to applicable state and local codes.

b. All state and local traffic codes shall be followed when providing work area protection.

c. During night operations or in periods of reduced visibility special precautions shall be taken. Adequate warning equipment, which may include flashing lights, flares or area illumination, shall be used.

d. Warning devices and equipment shall be removed as soon as the hazard is eliminated.

e. Warning devices and equipment not in use shall be stored in a proper manner or shall be removed from the work area.

19-2 Flaggers

a. Flaggers or other appropriate traffic controls shall be used whenever there is any doubt that effective protection can be provided by signs, signals and barricades.
b. Flaggers shall wear an approved high visibility safety vest or other approved garment. Warning garments worn at night shall be of a reflectorized material and meet all Federal, State and Local Laws.

c. Flaggers using hand-signaling equipment shall insure that signals provide sufficient warning to protect themselves and the work site.

1. Signal flags shall be limited to emergency situations only and shall be red and at least 24 inches square.

2. Sign paddles (Stop and Slow) shall be on a 6-foot staff.

3. In periods of darkness or reduced visibility, red lights shall be used.

d. Flaggers shall place themselves in a protected position to reduce possibility of injury from traffic.

e. Flaggers shall ensure that they can fully observe the operation and shall guide vehicular traffic in such a manner as to minimize the possibility of accidents or injury.

f. When flaggers are used at both ends of a job site, reliable communications or prearranged signals shall be used to ensure proper traffic flow.

g. Flaggers shall face traffic when giving signals.

h. Flaggers shall give positive, direct signals that leave no doubt as to their meaning.

i. All Federal, State and Local laws governing traffic control shall be observed.

PART II
PERSONAL AND ENVIRONMENTAL PROTECTION
SECTION 1
HEALTH AND ENVIRONMENTAL CONTROL

Introduction

This section deals with general health areas and depicts some of the control methods an employee must use for their protection. The general principles outlined in this section are applicable to all work activities. Specific control measures applicable to special types of work are covered in other sections.

Work processes and work locations can present health hazards to the employee. Because most of these health hazards do not pose an immediate danger, they are frequently not given the attention they deserve.
For the employee to be fully protected, they must know as much as possible about potential health hazards. Thorough understanding of the principles of this section is essential.

Identifying labels and applicable precautionary measures are normally printed on all chemical and hazardous material containers. These instructions should be read and understood by the employees using them. Applicable safety and health precautions must be taken.

21-1 Confined or Enclosed Spaces

a. All employees required to enter into confined or enclosed spaces shall be trained per the requirements under the applicable OSHA regulations.

b. Before any employee enters a confined space, the space shall be tested for oxygen deficiency or forced ventilation shall be used. In addition, after the test for oxygen, and ventilation of the space if necessary, the space shall be tested for the presence of flammable gases or vapors. If flammable gases or vapors are detected or if oxygen deficiency is found, forced air ventilation shall be used to maintain a safe atmosphere.

c. When unsafe conditions are detected, the work area shall be ventilated until safety has been assured by additional tests.

d. Employees shall ensure there is an adequate continuous supply of air.

e. Emergency entry may be made into confined spaces when an unsafe atmospheric condition exists (refer to applicable OSHA 1910 or 1926 standard for additional requirements). And requires written procedures as well as an attendant.

21-2 Hearing Conservation

NOTE: Exposure to excessive noise can cause a gradual decay in hearing ability. Efforts are being made to reduce noise in the work area. Until such time when the noise hazard is eliminated, employees shall wear proper ear protection when exposed to excessive noise.

a. Ear protection must be worn when there is a possibility of hearing damage. (This occurs when there is continuous exposure to noise or impulse exposure to loud impact noise.) When exposed to noise of 90 dBA (decibels) for more than 8 hours, 95 dBA for over 4 hours, and 100 dBA for over 2 hours or 105 dBA for over 1 hour, proper ear protection must be worn. Protection must be used against impact noise over 140 dBA.
b. Specific areas where the noise level is above 90 dBA shall be identified with signs posted and time limits stated. Employees shall wear proper protective devices when exposed within the posted areas in the stated time limits.

c. Proper ear protection may consist of any of the following when provided with a noise/reduction rating (NRR): ear muffs, ear plugs or molded ear protectors. Plain cotton is not acceptable. Ear protection devices shall be worn properly to provide the required protection; they shall be maintained in a sanitary condition.

### 21-3 Lighting

Where natural illumination is not sufficient, artificial lighting shall be used. See 29CFR 1926.56 for requirements for minimal levels of illumination.

### 21-4 Asbestos

Asbestos fibers, which are suspended in the air in a significant quantity, can cause bodily harm if the fibers are inhaled. Employees shall not disturb or handle asbestos containing materials (ACM) as a course of their normal work. Work shall be done by a contractor licenced to perform ACM work.

### 21-5 Exhaust Ventilation

a. Exhaust systems, when provided at the work location, shall be used.

b. When an exhaust system does not provide adequate protection, other protective means, such as an approved respirator, shall be used.
RESPIRATORS

Whenever respirators are required to be worn, a written respirator protection program must be developed and implemented in accordance with OSHA’s respirator standard, 29 CFR 1910.134. (Additional program requirements may be found in standards that regulate the hazards to which the employee is exposed.) Because workplaces differ substantially, each program must be tailored to the specific conditions of the workplace. The program must consist of worksite-specific procedures governing the selection, use, and care of respirators. The program must be updated as often as necessary to reflect changes in workplace conditions and respirator use.

NOTE: Where various types of respirators are available, care must be taken in proper selection. The respirator must provide adequate protection against the anticipated hazard. Whenever there is doubt, the more protective device must be used. A respirator with a dust filter is not suitable when working with toxic fumes.

Employees must be medically evaluated and found eligible to wear the respirator selected for their use prior to fit testing or first-time use of the respirator in the workplace. Medical eligibility is to be determined by a physician or other licensed health care professional (referred to as “PLHCP”). A variety of qualified health care providers, besides physicians, including occupational health nurses, nurse practitioners, and physician assistants, can perform the medical evaluations provided they are licensed to do so in the state in which they practice.

SELECTION FACTORS

Many factors must be considered carefully in respirator selection. In choosing the appropriate respirator, one must consider the nature and extent of the hazard, work requirements and conditions, and the characteristics and limitations of the respirators available. The following categories of information must be taken into account:

- Nature of the hazard, and the physical and chemical properties of the air contaminant.
- Concentrations of contaminants.
- Relevant permissible exposure or other occupational exposure limit;
- Nature of the work operation or process;
- Time period the respirator is worn;
- Work activities and physical/psychological stress;
- Fit testing;
- Physical characteristics, functional capabilities and limitations of respirators.

Types of respirators include the following:

- Air purifying respirators
- Powered air purifying respirator
• Continuous flow respirator
• Pressure demand respirator
• Supplied air respirator
• Oxygen breathing apparatus
• Self-contained breathing apparatus
• Hose mask with blower

APPROVED RESPIRATORS SHALL BE WORN WHEN:

• Applying paint or toxic liquids with pressure spray equipment inside buildings, except in shops where special approved rooms or booths are provided for this purpose.
• Buffing creates an abnormal amount of dust.
• Welding (or flame cutting) galvanized iron or when melting zinc.
• Handling lime or other toxic or caustic powered chemicals.
• Exposed to abnormal amounts of coal dust.

MAINTENANCE AND CARE

The OSHA standard requires that employers provide each respirator user with a respirator that is clean, sanitary, and in good working order. These requirements are a vital part of any successful respiratory protection program. To ensure that the respirator remains serviceable and delivers effective protection, a maintenance program must be in place prior to respirator use.

The OSHA respirator standard strongly emphasizes the importance of a good maintenance program, but permits it’s tailoring to the type of facilities, working conditions, and hazard involved. However, all programs are required to include at least: Cleaning and disinfecting procedures; Proper storage; Regular inspections for defects (including leak check); and Repair methods.

INSPECTION

To ensure the continued reliability of respiratory equipment, it must be inspected on a regular basis. The frequency of inspection and the procedures to be followed depend on whether the respirator is intended for non-emergency, emergency, or escape use only.

TRAINING

Employee training is an important part of the respiratory protection program and is essential for correct respirator use. The OSHA respiratory protection standard requires employers to provide training before the employee uses a respirator in the workplace.

For the training to be effective, the training information must be comprehensive and presented in an understandable way.
Employee training must include a discussion of why the use of the respirator is necessary. Such training would address the identification of the hazards involved, the extent of employee exposures to those hazards, and the potential health effects of such exposures.

**NOTE: Protect Yourself Silicosis**

Silicosis is caused by exposure to respirable crystalline silica dust. Crystalline silica is a basic component of soil, sand, granite, and most other types of rock, and it is used as an abrasive blasting agent. Silicosis is a progressive, disabling, and often fatal lung disease. Cigarette smoking adds to the lung damage caused by silica.

**Effects of Silicosis**

- Lung cancer – Silica has been classified as a human lung carcinogen.
- Bronchitis/Chronic Obstructive Pulmonary Disorder.
- Tuberculosis – Silicosis makes an individual more susceptible to TB.
- Scleroderma – a disease affecting skin, blood vessels, joints and skeletal muscles.
- Possible renal disease.

**Symptoms of Silicosis**

- Shortness of breath; possible fever.
- Fatigue; loss of appetite.
- Chest pain; dry, nonproductive cough.
- Respiratory failure, which may eventually lead to death.

**Sources of Exposure**

- Sandblasting for surface preparation.
- Crushing and drilling rock and concrete.
- Masonry and concrete work (e.g., building and road construction and repair).
- Mining/tunneling; demolition work.
- Cement and asphalt pavement manufacturing.

**Preventing Silicosis**

- Use all available engineering controls such as blasting cabinets and local exhaust ventilation. Avoid using compressed air for cleaning surfaces.
- Use water sprays, wet methods for cutting, chipping, drilling, sawing, grinding, etc.
- Substitute non-crystalline silica blasting material.
- Use respirators approved for protection against silica; if sandblasting, use abrasive blasting respirators.
- Do not eat, drink or smoke near crystalline silica dust.
- Wash hands and face before eating, drinking or smoking away from exposure area.
### Table 1: Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica

<table>
<thead>
<tr>
<th>Equipment/Task</th>
<th>Engineering and Work Practice Control Methods</th>
<th>Required Respiratory Protection and Minimum Assigned Protection Factor (APF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handheld power saws (any blade diameter)</td>
<td>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.</td>
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<tr>
<td></td>
<td>• When used outdoors.</td>
<td>≤ 4 hrs/shift</td>
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<td></td>
<td>• When used indoors or in an enclosed area.</td>
<td>&gt; 4 hrs/shift</td>
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<tr>
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<td>None</td>
<td>APF 10</td>
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<td></td>
<td>APF 10</td>
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</tbody>
</table>

Footnote: Refer to OSHA Standard 1926.1153 for further information.

### 21-7 Hazard Communication

All Employees must follow all Federal and State Guidelines

a. Work processes and work locations can present health hazards to the employee. Because most of these health hazards do not pose an immediate danger, they are frequently not given the attention that is necessary.

b. For employees to be fully protected, they must become as knowledgeable as possible of potential health hazards. Thorough understanding of safety data sheets is essential.

c. Employees have a need to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring.
1. Each employer will maintain a program of hazard communication.

2. Employees are to be trained at the time they are assigned to work with a hazardous chemical. The intent of this provision (1910.1200(h)) is to have information prior to exposure to prevent the occurrence of adverse health effects. This purpose cannot be met if training is delayed until a later date. The training provisions of the HCS are not satisfied solely by giving employee the data sheets to read. An employer’s training program is to be a forum for explaining to employees not only the hazards of the chemicals in their work area, but also how to use the information generated in the hazard communication program.

3. The Safety Data Sheet (SDS) is the main vehicle for communicating the hazards, safe handling requirements, and emergency procedures for each hazardous material. Employees shall know the location of SDS for all hazardous materials known to be in their work area.

4. Employees shall not use materials they find in unlabeled containers. Employees shall report unlabeled containers and containers with damaged labels to their supervisor, and those containers shall be removed from the work areas.

5. Employees shall not transfer a hazardous substance from a labeled container to an unlabeled container unless the unlabeled container is a portable container and the container will be under the exclusive control of the employee and used only during the work shift in which transfer occur.

6. Employees shall take special precautions when working on or around unlabeled pipes and shall empty, make safe, or label such pipes upon completion of the job task.

7. Employees shall report all hazardous materials spills to their supervisor. Employees shall not control or clean up spills unless they have been properly trained and have the required personal protective equipment.

8. Employees can obtain an inventory of hazardous materials known to be in their work area from their supervisor.
PART II
SECTION 2
PERSONAL PROTECTIVE DEVICES

22-1 Fall Protection

a. Only approved belts, harness, positioning straps and lanyards shall be used.

b. All work positioning equipment, fall arrest equipment and fall restraint equipment, including body belts, positioning straps, harnesses, lanyard and lifelines shall be inspected daily before use. Defective equipment shall be tagged and removed from service.

c. Personal fall arrest systems shall be rigged so that no employee may free fall more than 6 feet or contact any structure below him or her.

d. Snap hooks may not be connected to loops made in webbing type lanyards, or to other snap hooks.

e. Fall arrest equipment, work positioning equipment, or fall restraint equipment shall be used by employees working at elevated locations more than 4 feet above the ground on poles, towers, and other elevated structures if other fall protection has not been provided. ASTM Rated 100% Fall Protection Equipment is required to be used by a qualified climber while climbing or changing locations on poles, towers, or structures.

1. Work positioning equipment shall only be used on vertical surfaces.

2. A fall restraint system shall be used only on horizontal surfaces to protect against access to unprotected edges.

f. Aerial Devices:

1. ASTM Rated Harnesses and lanyard attached to the bucket or boom must be worn at all times.

2. Lanyards shall always be attached to the approved attachment point.

22-2 Eye Protection

a. Employees are required to wear eye protection at all times when performing work. This eye protection can be safety glasses, goggles and face shields and safety glasses combination that conform to ANSI Standards.

b. Prescription eyeglasses shall conform to ANSI/ISEA Z87.1 or they shall be covered with the appropriate goggles or glasses.
**CHART NO. 2-1**

**SELECTION CHART FOR EYE AND FACE PROTECTION**

The following chart provides general guidance for the proper selection of eye and face protection for hazards associated with the listed hazard “source” operations.

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>TYPE OF HAZARD</th>
<th>PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IMPACT</strong> – Chipping, grinding, machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding.</td>
<td>Flying fragments, objects, large chips, particles, sand, dirt, etc.</td>
<td>Spectacles with side protection, goggles, face shields. For severe exposure use face shield over primary eye protection. See notes (1), (3), (5), (6), (10).</td>
</tr>
<tr>
<td><strong>HEAT</strong> – Furnace operations, pouring, casting, hot dipping, and welding.</td>
<td>Hot sparks</td>
<td>Face shields, goggles, spectacles with side protection. For severe exposure use a face shield. See notes (1), (2), (3).</td>
</tr>
<tr>
<td></td>
<td>Splash from molten metals</td>
<td>Face shields worn over goggles. See notes (1), (2), (3).</td>
</tr>
<tr>
<td></td>
<td>High temperature exposure</td>
<td>Screen face shields, reflective face shields. See notes (1), (2), (3).</td>
</tr>
<tr>
<td><strong>CHEMICALS</strong> – Acid and chemical handling, use of cleaning products, paint use and clean-up products, pesticide and herbicide use.</td>
<td>Splash</td>
<td>Chemical splash goggles, eyecup and cover types. For severe exposure, use face shield. See notes (3), (11).</td>
</tr>
<tr>
<td></td>
<td>Irritating mists</td>
<td>Special-purpose goggles.</td>
</tr>
<tr>
<td><strong>DUST</strong> – Woodworking, buffing, general dusty conditions.</td>
<td>Nuisance dust</td>
<td>Goggles or spectacles with side protection. See note (8).</td>
</tr>
<tr>
<td><strong>LIGHT and/or RADIATION</strong> – Welding: Electric Arc.</td>
<td>Optical radiation</td>
<td>Welding helmets or welding shields. Typical shades: 10-14. See notes (9), (12).</td>
</tr>
<tr>
<td><strong>WELDING: Gas</strong></td>
<td>Optical radiation</td>
<td>Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4. See note (9).</td>
</tr>
<tr>
<td><strong>WELDING: Torch brazing, Torch soldering.</strong></td>
<td>Optical radiation</td>
<td>Spectacles or welding face shield. Typical shades: 1.5-3. See notes (3), (9).</td>
</tr>
<tr>
<td><strong>GLARE</strong></td>
<td>Poor vision</td>
<td>Spectacles or welding face shield. Spectacles with shaded or special-purpose lenses, as suitable. See notes (9), (10).</td>
</tr>
</tbody>
</table>
NOTES TO EYE AND FACE PROTECTION SELECTION CHART

1. Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.

2. Operations involving heat may also involve light radiation. When necessary, protection from other hazards must be provided.

3. Face shields should only be worn over primary eye protection (spectacles or goggles).

4. Filter lenses must meet the requirements for shade designations as outlined in the OSHA regulations and ANSI standards. Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.

5. As required by the standard, persons whose vision requires the use of prescription lenses must wear either protective devices fitted with prescription lenses or protective devices designed to be worn over regular prescription eyewear.

6. Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.

7. Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.

8. Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.

9. Welding helmets or face shields should be used only over primary eye protection (spectacles or goggles).

10. Non-sideshield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for “impact”.

11. Eye and Face Protection must provide adequate ventilation (indirect ventilation holes) and also protect the wearer from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation (indirect ventilation holes) and protects the wearer from splash entry.

12. Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows the task to be performed.
22-3 Face Shields and Hoods

a. Where the danger of an electrical arc exists (including switching, and making and breaking electrical contact) approved eye protection shall be used. Approved face shields or hoods shall be worn when the electric arc may be accompanied by flying debris strike the face directly.

b. Approved face shields or hoods shall be worn when welding, whether hydrogen, heliarc, or electrical arc.

22-4 Life Jackets, Life Lines and Similar Equipment

When working over water, employees shall wear an approved personal flotation device.

22-5 Head Protection

a. Approved safety head protection shall be worn by all employees at all times when on the job. Hard hats should meet ANSI class E.

b. Head Protection and their attaching or supporting mechanism shall not be defaced or altered in any manner.

c. Installing non FR Stickers or decals could jeopardize hardhat integrity and should be avoided.

22-6 Wearing Apparel

a. Each employee shall wear appropriate work gloves and other suitable clothing at all times. Leather protectors for rubber insulating gloves shall not be used as work gloves.

b. Long sleeves are required for all outdoor work including work on poles, structures and in aerial devices.

c. When working on or near live parts, employees shall not wear loose dangling watch chains, key chains or unnecessary metal of any kind.

d. Hand protection shall be worn at all times when there is a chance of hand injury or contamination. In the event of potential chemical contamination the appropriate type glove shall be worn as required by the material safety data sheet.

22-7 FR Apparel

Employees must:

a. Assess the workplace to identify exposure to hazards from flames or from electric arcs.
b. Ensure that the outer layer of clothing worn is flame resistant under all arc or flame exposures.

c. Ensure all undergarments shall be at minimum natural fibers.

d. Ensure that when exposed to hazards from electric arcs or potential exposure to flame wear fire retardant protective clothing and other protective equipment with an arc rating greater than or equal to the estimated heat energy (hazard assessment) provided by the Employer or Host/Utility.

e. Ensure that when exposed to hazards from flames or electric arcs they do not wear clothing that could melt onto their skin or that could ignite and continue to burn when exposed to flames or estimated heat energy.

f. Make sure FR garments that have irreparable damage, are worn out, or are unusable for other safety reasons, are not to be reused and should be discarded.

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Minimum head and face protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None †</td>
</tr>
<tr>
<td>Single-phase, open air</td>
<td>Arc-rated faceshield with a</td>
</tr>
<tr>
<td></td>
<td>minimum rating of 8 cal/cm² *</td>
</tr>
<tr>
<td></td>
<td>Arc-rated hood or faceshield</td>
</tr>
<tr>
<td>Three-phase</td>
<td>2-8 cal/cm²</td>
</tr>
<tr>
<td></td>
<td>9-12 cal/cm²</td>
</tr>
<tr>
<td></td>
<td>13 cal/cm² or higher. †</td>
</tr>
</tbody>
</table>

NOTE: Employers shall obtain from Host/Utility reasonable Estimated Heat Energy Calculations (hazard assessment) when employees are exposed to electric-arc hazards from arc or flame exposures.

22-8 Foot Protection

a. Each employee on an electrical crew shall wear footwear meeting ASTM F2413 with the following minimum classifications:

1. Class 75 impact resistance (I),
2. Class 75 compression resistance (C),
3. Class 50 metatarsal resistance (Mt),
4. Puncture resistant (PR), and
5. Shock resistant (EH) or dielectric insulation (DI).

b. Other workers shall wear foot protection as required by the employer’s hazard assessment for the tasks to be performed.
PART II
SECTION 3
FIRE PREVENTION AND PROTECTION

23-1 Housekeeping

Work locations, vehicles, and the inside and outside of buildings shall be kept clean and orderly at all times.

a. Combustible materials, such as oil-soaked rags, waste and shavings shall be kept in approved metal containers with metal lids. Containers shall be emptied as soon as practicable.

b. Both clean rags and used rags shall be kept in metal or metal lined bins having metal covers.

c. Flammable liquids such as gasoline, benzene, naphtha and lacquer thinner shall not be used for general cleaning purposes.

d. All solvents shall be kept in approved, properly labeled containers. Gasoline, benzene, naphtha, lacquer thinner, and other solvents of this class shall be handled and dispensed only in U.L. approved, properly labeled (yellow letters) red safety cans.

e. Permanent floors and platforms shall be kept free of dangerous projections or obstructions and shall be maintained reasonably free from oil, grease, or water. Where the type of operation produces slippery conditions, mats, grates, cleats or other methods shall be used to reduce the hazard from slipping.

f. Stairways, aisles, permanent roadways, walkways and material storage areas in yards shall be kept reasonably clear and free from obstructions, depressions and debris.

g. Materials and supplies shall be stored in an orderly manner so as to prevent their falling or spreading and to eliminate tripping and stumbling hazards.

h. Paper and other combustible materials shall not be allowed to accumulate.

i. In any building, except one provided for their storage, flammable liquids such as gasoline, benzene, naphtha, and lacquer thinner shall be limited to 5 gallons, in U.L. approved, properly labeled containers.

j. Not more than 1 gallon of kerosene or cleaning agents of the “Stoddard” solvent class shall be kept in any open container. The container shall be provided with a proper cover and be kept securely covered except when in actual use.
k. When gasoline or other flammable liquids is poured or pumped from one container to another, metallic contact shall be maintained between the pouring and receiving containers.

l. Strict adherence shall be paid to “No Smoking” and “Stop Your Motor” signs at fuel dispensing locations.

m. Vehicles shall be maintained with proper load securement and clear of unnecessary clutter.

23-2 Smoking

Smoking and open flames shall not be permitted in areas where dangerous gases might be present; for example, oil rooms, hydrogen areas, acetylene storage, or similar areas. Neither shall smoking be permitted in storerooms, battery rooms, flammable liquid storage and use locations, or in other areas where quantities of combustible materials are kept. Absence of “No Smoking” signs shall not excuse smoking in dangerous places. You shall adhere to all Host/Utility Smoking Policies.

23-3 Fire Protection

a. Fire protection equipment shall be properly located at all times. Except for actual use, employees shall not move or remove such equipment without proper authority.

b. Except for wheeled-type equipment, all fire extinguishers shall be mounted. (Recommended height is 42 inches or less.)

c. Employees shall be familiar with both the location and the operation of all fire protective equipment in the vicinity of their work area.

d. All employees shall know the classes of fire, their burning characteristics and the proper extinguishing agent to be used.

(Class “A” fires involve ordinary combustibles such as wood and paper. Extinguishing agents include water and multipurpose dry chemical.)

(Class “B” fires involve flammable liquids, such as gasoline petroleum oil and paint. Extinguishing agents include Carbon Dioxide and dry chemical). (It is important to use the correct extinguisher for the type of fuel! Using the incorrect agent can allow the fire to reignite after apparently being extinguished successfully.)

(Class “C” fires involve electrical equipment. Extinguishing agents include Carbon Dioxide and dry chemicals.)

(Class “D” fires involves combustible metals such as magnesium, lithium and titanium. Extinguishing agents include dry special powder.)
(Class “K” fires involve cooking media including vegetable or animal oils and fats. Extinguishing agents include wet chemical.)

(Halon 1301 (Freon) and Halon 1211 are gaseous extinguishing agents suitable for combating both Class “B” and Class “C” fires, especially at indoor locations. Both agents are slightly toxic in low concentrations (less than 5 percent) and will cause unconsciousness in a short period of time when the concentration is above 15 percent. When the extinguishing agent is released, precautionary measures similar to those for toxic, confined spaces should be employed.)

e. Employees shall not enter confined spaces after using Carbon Dioxide extinguishers until the area has been thoroughly ventilated and tested.

f. Carbon tetrachloride fire extinguishers should be disposed of properly at a hazardous waste facility.

**PART III ELECTRICAL**

**SECTION 1**

**GENERAL**

31-1 General

Electric equipment and lines shall always be considered as energized unless they are positively proven to be de-energized and properly grounded.

If your not working in a zone of equipotential its not safe!

a. Only Qualified employees shall work on or near energized lines or equipment. Only qualified employees for those under the continuous supervision of an experienced journeyman shall work on lines or equipment, which are energized.

b. No employees shall approach any exposed ungrounded conductor or apparatus unless he is insulated and isolated from other conducting surfaces or uses adequate protective devices. Tables 3-1 and 3-2 list of minimum approach distances for the nominal AC voltage on the system. The utility may set shorter minimum approach distances on systems of more than 72.5 KVA if it controls maximum transient overvoltage is on the system involved.

c. Employees shall report immediately to their nearest foreman or supervisor any defective line, tool or other condition that in their judgment may be dangerous either to persons or property, or likely to interrupt or delay service.

d. Before work is started, preliminary inspection or test shall be made to determine what conditions exist. Extreme care shall be exercised when handling common neutral conductors as high voltage may be encountered.
Any line or circuit to be worked on as de-energized has to be identified, isolated, and tested before grounding takes place.

**e.** After the preliminary inspection, but before work is started, the job shall be planned carefully to provide the maximum clear working space and a tail board discussion of the work procedures shall be conducted. The tail board discussion shall cover at a minimum the following topics:

1. The nominal voltages of lines and equipment;
2. The location of circuits and equipment including electrical supply lines, Communication lines, and fire protective signaling circuits.
3. Conditions of equipment and environmental Conditions relating to safety;
4. Hazards associated with the job,
5. Work procedures involved,
6. Special precautions,
7. Energy source controls, and
8. Personal protective equipment to be used

**f.** Secondary windings of current or series transformers shall be short circuited before any instrument or other device connected in the circuit is removed or disconnected.

**g.** No work shall be performed in inclement weather on high voltage equipment or lines when conditions are such as to materially increase the hazards of the operations being performed, except emergency work necessary to restore service or demanded by the public interest.

**h.** Employees working in rain shall be furnished with raincoats and slush boots. This equipment shall not be considered to be protection from energized circuits.

**i.** Bare communication conductors shall be treated as energized lines and shall be protected accordingly.

**j.** Electric cords and electric power tools shall not be used near or above lines or equipment operating at more than 250 V.
**TABLE 3-1**  
**ALTERNATING CURRENT – MINIMUM DISTANCES**  
Voltage range (phase to ground voltage) Kilovolt

<table>
<thead>
<tr>
<th>Voltage Range Kv</th>
<th>Phase to Ground</th>
<th>Phase to Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>.50 to .300</td>
<td>Avoid Contact</td>
<td>Avoid Contact</td>
</tr>
<tr>
<td>.301 to 750</td>
<td>1'1&quot;</td>
<td>1'1&quot;</td>
</tr>
<tr>
<td>.751 to 5.0</td>
<td>2'1&quot;</td>
<td>2'1&quot;</td>
</tr>
<tr>
<td>5.1 to 15</td>
<td>2'2&quot;</td>
<td>2'3&quot;</td>
</tr>
<tr>
<td>15.1 to 36</td>
<td>2'7&quot;</td>
<td>3'</td>
</tr>
<tr>
<td>36.1 to 46</td>
<td>2'10&quot;</td>
<td>3'3&quot;</td>
</tr>
<tr>
<td>46.1 to 72.5</td>
<td>3'4&quot;</td>
<td>4'</td>
</tr>
<tr>
<td>72.6 to 121</td>
<td>3'9&quot;</td>
<td>4'8&quot;</td>
</tr>
<tr>
<td>121.1 to 145</td>
<td>4'4&quot;</td>
<td>5'5&quot;</td>
</tr>
<tr>
<td>145.1 to 169</td>
<td>4'10&quot;</td>
<td>6'5&quot;</td>
</tr>
<tr>
<td>169.1 to 242</td>
<td>6'8&quot;</td>
<td>10'2&quot;</td>
</tr>
<tr>
<td>242.1 to 362</td>
<td>11'3&quot;</td>
<td>18'2&quot;</td>
</tr>
<tr>
<td>362.1 to 420</td>
<td>14'</td>
<td>22'5&quot;</td>
</tr>
<tr>
<td>420.1 to 550</td>
<td>16'8&quot;</td>
<td>27'1&quot;</td>
</tr>
<tr>
<td>550.1 to 880</td>
<td>22'7&quot;</td>
<td>37'5&quot;</td>
</tr>
</tbody>
</table>

**TABLE 3-1 NOTE**: All employees shall observe the most recent approach distances required by OSHA or the State OSHA where they are working.

All crews must follow these minimum approach distances. In order to vary from these distances the employer must obtain and calculate all the necessary information from the host employer(utility). Maximum phase to phase system voltage, Maximum transient over voltage (TOV) resulting from an engineering analysis, elevation of the work site, etc. The new minimum approach distances and all necessary information must be documented at the job site where new minimum approach distances are being employed.

### 31-2 Insulated Protective Equipment

a. Employees shall not touch or work on any exposed energized lines or apparatus except when wearing rubber-insulating equipment approved for the maximum voltage available to be contacted.

b. When work is to be done on or near energized lines or equipment, all energized and grounded conductors, guys or equipment within minimum approach distance listed in 3-1 or within reach of any part of the body shall be covered with insulating equipment, except that part of the conductor on which the employee is working.
c. When working on energized lines or apparatus, including the installation of protective devices, work should be done from below, if possible.

d. In applying insulating equipment, an employee shall always protect the nearest and lowest wires first, protecting as he or she progresses. In removing rubber insulating equipment, the reverse order shall be maintained.

e. Rubber insulating blankets shall not be used on the ground without protecting them from physical damage and moisture by means of a tarpaulin, canvas, or protective mat.

f. Insulating Equipment shall be put on before entering the work area within which energized lines or apparatus may be reached, and the insulating equipment shall not be removed until the employee is completely out of reach of this area.

g. To avoid corona and ozone damage, rubber insulating equipment shall not be allowed to remain in place on energized lines or apparatus overnight or for more than one 8 hour period, unless approved by the supervisor in charge.

h. Rubber insulating line hose, hoods, blankets, plastic line guards and other insulating equipment shall be visually inspected before use. Damaged equipment shall be removed from service.

i. Rubber insulating line hose and hoods shall be visually inspected and electrically retested upon indication that insulating value is suspect. Rubber blankets shall be electrically retested every six (6) months or when physical inspection reveals defects. Where visual inspection indicates that there may be reason to suspect the electrical integrity of insulating equipment, an electrical test shall be performed before reissuing the equipment for service.

j. Insulating Equipment shall be stored in special compartments on trucks and elsewhere where it will not be subjected to damage from tools, other equipment, or materials.

31-3 Use and Care of Rubber Gloves and Sleeves

When rubber glove work is authorized to be performed, use the following chart.
Leather protectors should have minimum one inch of exposed rubber per every 10,000-volt rating and Rubber insulating sleeves shall be worn inside of rubber gloves at all times.

a. Employees shall wear rubber gloves with leather protectors ground to ground when working on lines or equipment energized at voltages below 500 volts.

b. Employees shall wear rubber gloves with leather protectors and rubber sleeves ground to ground when working on lines and equipment energized at voltages over 500 volts unless approved live line tools are used.

c. Rubber gloves with leather protectors and rubber sleeves shall also be worn by employees on the ground when:

1. Working on or within reaching distance of any electrical equipment and/or conductor which are not effectively grounded and which may become energized (For Example URD, Substations, Traffic Signals).

2. While a pole or other conductive structure is being set or removed near energized primary lines. The gloves and sleeves shall be put on

<table>
<thead>
<tr>
<th>CLASS</th>
<th>TEST AC VOLTS</th>
<th>USE AC VOLTS</th>
<th>USE DC VOLTS</th>
<th>LABEL COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>2,500</td>
<td>500</td>
<td>750</td>
<td>Beige</td>
</tr>
<tr>
<td>0</td>
<td>5,000</td>
<td>1,000</td>
<td>1,500</td>
<td>Red</td>
</tr>
<tr>
<td>1</td>
<td>10,000</td>
<td>7,500</td>
<td>11,250</td>
<td>White</td>
</tr>
<tr>
<td>2</td>
<td>20,000</td>
<td>17,000</td>
<td>25,500</td>
<td>Yellow</td>
</tr>
<tr>
<td>3</td>
<td>30,000</td>
<td>26,500</td>
<td>39,750</td>
<td>Green</td>
</tr>
<tr>
<td>4</td>
<td>40,000</td>
<td>36,000</td>
<td>54,000</td>
<td>Orange</td>
</tr>
</tbody>
</table>
before the pole is raised and worn until pole is set and secured. Also, see Rule 32-12.

3. Required by supervision.

4. Opening and closing manually operated oil circuit breakers, air break switches, fuses, or fuse doors on cutouts.

5. Making tests to determine if lines are de-energized, and applying and removing grounds.

d. When working with rubber protective equipment on energized circuits or apparatus the following minimum conditions shall be met, in addition to all other rules governing the use of protective equipment.

1. Employees shall not make physical contact with energized conductors or grounds, with other than their rubber gloves.

2. If the voltage exceeds 5000 volts between a single phase and ground employees shall be isolated from all grounds (wooden poles shall be considered as grounds in this case) by using approved supplementary insulation such as aerial baskets, a lineman’s platform, or other approved insulated devices. All equipment used for lineworkers protection shall be tested.

e. Rubber gloves shall never be worn inside out or without leather protectors. They shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of them. Leather protectors or overgloves shall not be worn except when in use over rubber gloves.

f. Rubber gloves and sleeves shall be inspected for corona cracks or other damage and the gloves shall be given an air test before each days use, at the beginning of the work period and at any other time when their condition is in doubt. They shall be given a visual inspection before each use.

g. Rubber gloves and sleeves when not in use shall be kept in canvas bags or other approved containers and stored where they will not become damaged from sharp objects or exposed to direct sunlight. They shall never be folded while stored nor shall other objects be placed upon them.

h. Rubber gloves shall be stored in the glove bag with the cuffs down to permit drainage for better ventilation and to reduce the possibility of damage.

i. Suitably sized gloves and sleeves shall be provided by the employer.

j. Inner liners may be worn if desired.

k. Rubber gloves shall be laboratory tested after thirty (30) days of being issued to the employee.
l. Rubber sleeves shall be laboratory tested after sixty (60) days of being issued to the employee.

m. An efficient method of numbering and stamping shall be used showing the date of the last laboratory test on gloves and sleeves.

n. Gloves that have been electrically tested and sealed in plastic bags but not issued for service shall not be placed into service unless they have been tested within the previous 12 months. Gloves that have been electrically tested and sealed in plastic bags but not reissued for service shall not be placed into service unless they have been tested within the previous 6 months. Sleeves that have been electrically tested and sealed in plastic bags but not issued or re-issued first service shall not be placed into service unless they have been tested within the previous 12 months. Date of Issuance (or reissuance) shall be stamped on the glove when distributed.

31-4 Use and Care of other Rubber Insulating Equipment

a. Line hose and hoods shall be visually inspected and electrically retested upon indication that insulating value is suspect.

b. Rubber blankets shall be electrically retested every six (6) months or when physical inspection reveals damage or defects. An efficient method of numbering and stamping shall be used showing the date of the last laboratory test on rubber blankets.

c. Line hose may be folded back over itself but only for inspection purposes.

d. Rubber blankets should be rolled or stored flat, never folded for storage.

e. Rubber goods shall not be thrown from poles or structures but should be raised and lowered by handline with a suitable canvas bag or container.

f. Damaged or defective rubber goods shall not be used.

g. Oil shall not be allowed to contact the rubber; if it does, it shall be wiped off at once.

31-5 Dispatching, Tags and Clearances

This section applies to the de-energized of transmission and distribution lines and equipment for the purpose of protecting employees. Conductors and parts of electric equipment that have been de-energized under procedures other than those required by this section shall be treated as energized.

a. All oral communications about dispatching and clearances shall be documented by the person receiving them and read back to the person giving them.
b. Under no circumstances shall clearances be granted or released on a
predetermined time basis.

c. When two or more crews are working on the same line or apparatus
and are not under the supervision of the same general foreman or other
supervisor, each crew foreman shall request and release his or her own
clearance independently in accordance with these rules.

d. A Tag shall be attached to each switch that is providing clearance on a
cleared line or apparatus.

e. The handles of switches providing clearances for working on lines or
apparatus shall be locked or blocked open or closed in addition to being
Tagged.

f. Under no circumstances shall Tags be removed or the line or apparatus be
put in service until so ordered by the dispatcher.

g. Before ordering Tags removed and line or equipment returned to service,
the load dispatcher shall require that the same person who received the
clearance shall report that the line or equipment may be re-energized.

EXCEPTION: If the person who received the clearance must leave the work
before it is completed, he or she shall so inform the dispatcher, giving
the name of the man who will take his or her place. In such cases, the
dispatcher shall communicate with both employees, releasing the one
who is leaving and accepting the other as authorized to report for him or
her. Clear entries of all such authorized changes shall be made on the
dispatcher’s records, and Hold Cards or Tags.

h. If no system operator is in charge of the lines or equipment and their
means of disconnection, the employer shall designate one employee in
the crew to be in charge of the clearance and to perform the functions that
the system operator would otherwise perform.

i. After de-energizing the line or apparatus and attaching Tags to each switch
providing clearance on the line or apparatus, the employee shall report
back to the person making the request that the line or apparatus is out
of service and that work may begin after adequate grounds have been
installed.

j. A line or apparatus shall not be put back in service, nor the Tags removed
until the person to whom clearance was given releases their clearance.

EXCEPTION: If the person who received the clearance must leave the work
before it is completed, the Employee shall so inform the person having
jurisdiction, giving the name of the person who is to take his place. In
such cases, the person having jurisdiction shall communicate with both
employees, releasing him or her who is leaving and accepting the other
as authorized to report for him or her. Clear entries of all such authorized
changes shall be made on hold cards or tags.
k. When the work is completed, the grounds removed and all employees are clear, the employee who received the clearance, or his or her properly authorized substitute, shall report to the person having jurisdiction that the line or apparatus is ready for service.

31-6 Grounding

a. Personal protective grounds shall be applied so as to create a zone of equalized potential for those working on de-energized lines or equipment and for those working on the ground in the vicinity of the work.

b. De-energized conductors and equipment that are to be grounded shall first be tested for the absence of voltage. If nominal voltage is present, the conductors and equipment shall not be grounded until the conductors and equipment are de-energized.

c. Adequate capacity cables and clamps shall be provided for grounding, with a minimum conductance equivalent to that of No. 2 AWG copper.

d. Grounding equipment shall be of sufficient current-carrying capacity to actuate protective devices, such as oil circuit breakers and relays, without destroying the grounding equipment.

e. Grounding cables and clamps shall be inspected for damage and defects before use. If a clamp or cable is damaged or defective, it shall be tagged and removed from service.

f. Grounds (personal) shall be installed at each worksite. A grounding bracket shall be attached to the pole or structure at a point below the work area.

g. Attaching grounds.

1. When attaching grounds, the ground end shall be attached first, and the other end shall be attached and removed by means of hot-line tools and rubber gloves and sleeves.

2. When removing grounds, the grounding device shall first be removed from the line or equipment using hot-line tools and rubber gloves and sleeves.

h. Where the making of a ground is impracticable, or the conditions resulting there from would be more hazardous than working on the lines or equipment without grounding, the grounds may be omitted and the line or equipment worked as energized.

i. Grounds may be temporarily removed only when necessary for test purposes and extreme caution shall be exercised during the test procedures.
PART III
SECTION 2
OVERHEAD DISTRIBUTION AND TRANSMISSION

32-1 Climbing and Working on Poles

a. Before ascending any pole, individual climber shall inspect and test each poles to assure that the pole is in safe condition for the work to be performed and that it is capable of sustaining the additional or unbalanced stresses to which it will be subjected.

b. Where poles or structures may be unsafe for climbing, they shall not be climbed until made safe by guying, bracing or by other adequate means. If the pole to be climbed is being replaced and the new pole is set adjacent to it, the old pole must be lashed to the new one in lieu of guying.

c. Wires and equipment shall not be attached to or removed from a pole or structure until it is certain the pole or structure will withstand the altered strain.

d. When poles are encountered that are unsafe to climb (for example ice, badly chewed pole condition, wide cracks or shell rot) the use of an aerial bucket shall be considered.

e. Employees shall not wear climbers while driving or riding in vehicles or when doing work on the ground, on ladders (except hook ladders) in aerial lifts or on platforms on which the wearing of climbers creates a hazard.

f. Gaffs on climbers shall be kept within safe length limits (per manufacturer spec), properly shaped, and sharpened.

g. Employees shall not work on or climb an elevated pole or structure without the use of 100% Fall Protection. (BuckSqueeze, Jelco, etc.)

h. Metal hooks, chains, etc., for holding tools or tape shall not be attached to body belts. Approved tool loops of leather or other non-conducting material shall be used for this purpose.

i. A positioning strap shall not be put around a pole above the uppermost pole attachment position, except where pole top or attachment is above eye level. It shall not be attached to pole steps, crossarm braces, insulators, insulator pins, conductors, rotten or otherwise weak crossarms or on attachments. When it is necessary to safety off to a cross arm, the strap should never be placed beyond the outside crossarm attachment. It shall be so placed that it will not be cut by line equipment or twisted or fouled by material that may give way under strain.

j. Employees weight shall be supported by main structural members, such as vertical poles and horizontal arms of adequate strength. Employees
shall not trust their weight to guy wires, pins, braces, conductors, or other such equipment that might prove unstable.

k. When two or more employees are to work on the same pole at the same time, one shall reach the working position before the next leaves the ground. They shall descend the pole one at a time.

l. When climbers are stored in the truck or tool room, they shall be placed where the sharp points will not damage other equipment or cause personal injury if the gaff guards come off.

m. Gaff guards shall be used on climbers when not on the pole.

n. The sliding of guy wires to descend poles or structures is forbidden.

o. Another Properly Trained Qualified Climber shall be available at the worksite with proper equipment (Climbing Gear, Handline, PPE, Etc.) at the structure before work proceeds.

p. A properly rated handline shall be utilized at all Wood Pole Structures.

32-2 Working On Energized Lines With Live-Line Tools

a. All live-line tools to be removed from service and inspected every 2 years. If, during that inspection, any defects are found that could compromise the dielectric properties of the tool, then it shall be repaired, refinished, and tested before the tool to service.

b. Lines of #6 copper, #6 ACSR, and #8A Copperweld or smaller shall not be worked on with live-line tools except when special authorization is given.

c. Planned work with live-line tools shall not be started during unfavorable weather, such as rain or snow.

d. Before work with live-line tools is begun, the dispatcher or person having jurisdiction shall be notified. If during live-line tools work, an interruption of service occurs, the dispatcher or other person having jurisdiction shall be notified immediately.

e. Only tools approved by the Company shall be used.

f. A careful check shall be made to see that the condition of the structure and lines at the point of the work is such that the job may be performed safely. In addition, the adjacent spans and structures shall be carefully checked for defects in conductors, tie wires, insulators, and other equipment.

g. Under no circumstances shall a lineworker depend on another worker to hold a live conductor clear of him.

h. Positive control shall be maintained during the movement of any conductor.
i. While live-line tool work is in progress, no other work of any nature shall be performed on the same pole or structure.

j. All live-line tools, when not in use, shall be kept in canvas bags or weatherproof boxes provided for the purpose; stored in dry and, if possible, a warm place.

k. Live-line tools shall never be laid directly on the ground or against sharp objects such as barbed wire fences. Special tool holders or tarpaulins shall be used for this purpose.

l. All live-line tools shall be visually inspected before use each day. Tools to be used shall be wiped clean, and if any hazardous defects are indicated, these tools shall be tagged and removed from service.

m. When practical, the automatic reclosing feature of circuit interrupting devices shall be made inoperative before work begins.

n. Careful attention shall be given to avoid mechanical overloading of live-line tools.

o. When installing or removing jumpers, only one connection shall be made at a time. Unconnected jumper ends shall be secured in such a manner as to prevent unintended contacts.

p. Employee shall guard against contact with conductors other than the one being worked on.

q. Approved protection devices shall be placed in position on all conductors energized above 5000 volts when such conductors are within reach of any part of the Employee’s body when live line tools are being used. Such protective devices shall be installed by means of appropriate live line tools. (Note that live line tools insulate the worker only from the conductor being handled and the required minimum approach distance in section 31 – 1b apply to on protecting conductors.)

r. Only clean and dry Live line rope meeting ASTM F1701 shall be used on energized conductors above 5000 V. Link sticks shall be used between the rope and energized conductor on all voltages.

s. Care shall be exercised to prevent the ends of the tie wires, armor rods, or other conductive material from contacting the structure or attached hardware during installation on, or energized conductors.

32-3 Working on Energized Lines

a. All journeymen working on energized conductors or electrical equipment over 500 volts shall be assisted by another journeyman, or a qualified apprentice, on the same pole, structure or location. (Two separate poles or structures may be considered one for the purpose of this rule if both
lineworkers can step to the other pole or structure without descending to the ground to do so.)

b. In no case, when working together in pairs, shall linemen work simultaneously on energized wires or equipment of different phases, potential or polarities.

c. Before starting work, the line worker shall be in such a position that the presence of the second employee does not increase the hazard.

d. Qualified apprentices shall work on energized conductors or equipment only under the supervision of a journeyman. Whether an apprentice is considered a qualified apprentices shall be determined by the Joint Apprenticeship and Training Committee.

e. Energized conductors or equipment shall be handled in accord with the safety rules, regulations and safe working procedures of the Utility on whose property the work is performed, provided a copy of such procedures, is made available.

f. Rubber gloves, sleeves and approved switch stick or hot line tool shall be used while opening or closing cutouts, and any non handle operated switches. Approved eye protection shall also be used during these procedures.

g. A properly rated handline shall be utilized in the basket while aloft while doing energized distribution.

h. Crew Compliment for Live Line Work. A crew of Two qualified employees can handle single-phase primary conductors and routine three phase primary conductors. The more complex projects, such as splicing primary, and work on heavy corner and junction poles, should be handled by a minimum of three or more qualified employees, depending upon field conditions determined by the immediate supervisor.

32-4 Working On De-energized Lines and Equipment

a. General. Except as provided in section 32-4b all conductors and equipment shall be treated as energized until tested to be de-energized and properly grounded.

b. New construction. New lines or equipment may be considered de-energized and worked as such where:

1. The lines or equipment are properly grounded (EPZ), and

2. If the installation of the ground is impractical or would create a greater hazard. The hazard of induced voltage is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.
c. Communication conductors. Bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating materials.

d. Employees working on de-energized lines shall work under the tagging orders on whose property the work is performed.

e. Testing equipment of adequate capacity shall be used to determine whether or not a line and/or equipment is de-energized.

f. Rubber gloves and sleeves must be worn when sticks are used to test, switch, phase-out, or ground circuits or equipment.

g. Employees working in de-energized areas must use barricades, signs, tags, or other safety means to designate energized lines or equipment.

h. All tools shall be kept in good working condition, shall be properly stored, and must be restricted to the use for which they are intended.

i. A properly rated handline shall be in basket while aloft while doing de-energized distribution.

j. See Rule No. 31-6 for Grounding Procedures and Requirements.

32-5 Series Street Lighting Circuits

a. Before a series street lighting circuit is opened and work is started, one of following procedures shall be followed:

   1. Circuit shall be visibly disconnected from the source of supply by opening disconnecting switches or other absolute cutouts, and Hold Cards shall be attached to such disconnects or cutouts. Dependence shall not be placed on time switches or other automatic devices.

   2. Circuit shall be properly jumpered to avoid an open circuit condition.

b. All series street lighting circuits shall be considered as energized, and worked on in accordance with Rules No. 31-1 to 31-6 Electrical General.

32-6 Working on Transformers

a. The primary leads of a distribution transformer shall be considered energized at full voltage until both the primary and the secondary leads have been disconnected, or it has been determined that the secondary circuit to which it is attached is not energized from other transformers or backfeed from other sources.

b. The cases of all transformers connected to a source of supply shall be considered as being energized at the full primary voltage unless they are adequately grounded.
c. Employees shall not stand on or otherwise contact transformer cases while working on or near energized circuits.

32-7 Hoisting Cables-Conductive Material

a. Wire rope or other conductive material shall not be used to raise transformers, poles, or any other equipment or materials near energized lines, except:

1. When the wire rope is rigged a sufficient distance below all energized conductors to prevent the possibility that the wire rope or the conductive material being raised could approach the energized more closely than the distance in Table 3-1 or

2. When the wire rope and any conductive material being raised are adequately protected; or

3. When energized lines and equipment are adequately protected.

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NOTE: Old-type transformers with cast iron cases may weigh about 50% more than the weights listed above and will require correspondingly larger rope and blocks. The weights given are for standard distribution transformers.

b. Use of wire rope as a hoist line shall be discontinued when it becomes worn, deteriorated or damaged to a degree that is unsafe.

c. Metallic slings (chain or cable) shall not be used near energized equipment.

d. Whenever possible, chain slings shall not be used for hoisting purposes.
e. Positive control of wire rope shall be maintained at all times.

f. Synthetic hoisting and pulling lines and ropes shall not be considered as non-conductive, unless properly maintained to preserve their insulating qualities.

32-8 Working On Capacitors

a. Line capacitors shall be considered at full voltage until they have been disconnected from the line, and the terminals short-circuited and discharged to ground by an approved method. The terminals shall not be short-circuited until the capacitors have been de-energized for at least five minutes.

b. Employee shall wear rubber gloves and sleeves and use a hot stick while shorting and grounding terminals.

c. Employees shall not come in contact with an ungrounded capacitor case until the capacitor has been disconnected from the circuit and the terminals shorted.

d. The exposed terminals of line capacitors in storage shall be shorted.

32-9 Stringing or Removing De-energized Conductors

a. The required tailboard discussion shall include the plan of operation and specifying the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed, and the clearance authorization required.

b. Where there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced voltage buildup, to further protect the employee from hazards of the conductor, the conductor being installed or removed shall be effectively grounded or provisions made to insulate or isolate the employee or it shall be considered and worked as energized.

c. When crossing over energized conductors in excess of 500 volts, rope nets or guard structures shall be installed unless provision is made to isolate or insulate the employee or the energized conductor. Where practical the automatic reclosing feature of the circuit-interrupting device shall be made inoperative. In addition, the line being strung shall be effectively grounded (example: on either side of the crossing) or considered and worked as energized.

d. Conductors being strung in or removed shall be kept under positive control by the use of adequate tension reels, guard structures, tielines, or other means to prevent accidental contact with energized circuits.
e. A transmission clipping crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged.

f. Grounds shall be so placed and arranged as to protect employees from hazardous differences in electrical potential (EPZ). Grounds shall remain intact until the conductors are clipped in and all employees are out of the zone.

32-10 Stringing Adjacent to or Over Energized Lines

a. Before a line is strung parallel to an existing energized transmission line, a competent determination shall be made to ascertain whether dangerous induced voltage will occur, particularly during switching and ground fault conditions. When there is a possibility that dangerous induced voltage may exist, the provisions of paragraphs (b) through (j) shall be followed.

b. All pulling and tensioning equipment shall be isolated, insulated or effectively grounded.

c. A ground shall be installed between the tensioning reel setup and the first structure in order to ground each bare conductor and overhead ground conductor during stringing operations. Grounds shall be located and arranged as to offer the best protection for each employee from hazardous differences in electrical potential.

d. During stringing operations, each bare conductor and overhead ground conductor shall be grounded at the first tower adjacent to both the tensioning and pulling setup and in increments so that no point is more than 2 miles from a ground.

e. Grounds shall be left in place until conductor installation is completed and shall be removed as the last phase of aerial cleanup.

f. Grounds shall be placed and removed with a hot stick.

g. Conductors and Overhead ground conductors shall be grounded at all dead-end or catch-off points.

h. A ground shall be located at each side and within 10 feet of working areas where conductors or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.

i. All conductors and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.

j. Work on de-energized lines on dead-end towers shall require proper grounding.
k. Grounds may be removed as soon as the work is completed, provided that the line is not left open circuited at the isolated tower at which work is being completed.

l. When performing work from structures, clipping crews and all others working on conductors or overhead ground conductors shall be protected by proper grounding (EPZ) installed at every work location.

### 32-11 Pole Hauling and Temporary Storage

a. The trailing end of a load of poles shall be marked by a red flag during the day and a red light at night. As an additional precaution, warning flags or lights may be placed in the center of long loads. An employee shall be used for flagging when necessary.

b. If it becomes necessary to store poles at the location where they are to be set, they shall be so placed that they will not interfere with traffic.

c. If poles left on or near streets, highways or walkways, overnight create a hazard, they shall be safeguarded by red lights or well-lighted warning signs.

d. Poles shall be placed or blocked so that they will not roll.

e. Employees shall not remain on a pole pile while poles are being hoisted.

f. Poles loaded on a truck or trailer shall be securely fastened.

g. When a load of poles is within working distance of the ground, load binders shall be installed so that they can and will be operated by employees while standing on the ground.

h. Employees shall not ride pole dollies or trailers.

i. The wheels of the transporting vehicle shall be chocked or securely braked prior to loading.

All applicable Federal and State laws shall be followed.

### 32-12 Setting and Removing Poles

a. If any holes are left unfilled at the end of the work period, they shall be protected with substantial coverings.

b. Persons not engaged in pole-setting operations shall keep out of the work area.

c. No one shall be on a gin pole when it is being used to raise any load.
While setting or removing poles near conductors energized above 500 volts:

1. If safe clearance cannot be maintained, the conductors shall be de-energized, covered with protective devices, or spread apart, or a pole guard shall be used, to minimize the possibility of accidental contact.

2. Workers handling the butt of the pole shall wear rubber gloves and sleeves whether or not can’t hooks, peaveys or slings are used.

3. Until a pole is positively secured from moving against an energized conductor, no one shall step on or off the truck or pole trailer, nor shall an employee standing on the ground touch any part of the truck or pole trailer without using rubber gloves.

4. Ground wires shall not be attached to the pole higher than 10 feet from the ground when setting in energized zone.

e. When pikes are used to hold poles in place while holes are being backfilled, pike shall be firmly secured until the backfill is sufficient to hold. When a pole is being “canted” or “hooked”, the pikes shall be held.

f. Employees shall not stand or pass under a suspended load or adjacent to or over or under a loaded winch line.

g. Employees engaged in handling or working on poles shall wear suitable gloves and shall wear a shirt or jacket with the sleeves rolled down.

h. Hoisting equipment operators shall accept signals only from the employee specifically designated, except that the operator shall obey a stop signal given by anyone.

i. The operation of setting a pole in an energized line shall require at least two qualified employees in the group (examples: one journeyman and a qualified apprentice or two journeymen). The number of employees utilized will depend on the work to be done. Additional qualified personnel will be assigned whenever required to perform the work safely.

PART III
SECTION 3
UNDERGROUND LINES AND EQUIPMENT

33-1 Opening and Guarding Holes

Whenever the cover is to be removed from a manhole or a vault, or when any other obstruction to traffic exists, the following precautions shall be taken.

a. Traffic control shall be placed as required by Part I Section 9, “Work Area Protection”.
b. Where permissible and practical, a truck shall be placed to guard the work area against oncoming traffic.

c. A blow torch or other open flame shall never be used to melt ice around a manhole or vault cover.

d. Manhole, vault and service-box covers shall only be removed and replaced by means of approved hooks and hoists.

33-2 Entering Underground Structures

a. All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. Any specific regulations that apply to work in dangerous or potentially dangerous areas shall be complied with.

b. Where a cable in a manhole or vault has one or more abnormalities that could lead to a fault or be an indication of an impending fault, the employer shall de-energize the cable with the abnormality before any employee may work in the manhole or vault, except when service-load conditions and a lack of feasible alternatives require that the cable remain energized. In that case, employees may enter the manhole or vault provided the employer protects them from the possible effects of a failure using shields or other devices that are capable of containing the adverse effects of a fault.

c. Before an employee enters a street opening, such as a manhole or an unvented vault, it shall be promptly protected with a barrier, temporary cover, or other suitable guard. Once entry has started proper continuous monitoring shall be conducted until all entrants have exited the space.

d. Air Monitor Testing of the confined or enclosed space shall be a requirement before opening underground structures.

e. A ladder shall always be used in entering or leaving a manhole or vault. Climbing into or out of manholes or vaults by stepping on cables or hangers is forbidden.

f. While work is being performed in manholes, an employee shall be available in the immediate vicinity to render emergency assistance as may be required. This shall not prevent the employee in the immediate vicinity from occasionally entering a manhole to provide assistance, other than emergency.

g. Before any work is done on a cable, it shall be identified by an approved method. If there is any doubt as to the identification, work shall not be started until it is checked and identified by the proper authority.
h. No workman shall use or be required to use any toxic cleaning fluids in manholes, vaults or other underground structures.

33-3 Work on Energized Cables

a. All Underground cables and apparatus carrying current at voltage above 500 volts shall be de-energized before work is done on the conductor or before the cables are cut into or spliced.

b. Before any work is done on an energized cable, other cables and all grounded equipment with which contact can be made while working on the energized cable shall be covered with rubber blankets or approved insulating shields. (Cables with an insulating jacket over a grounded metallic sheath need not be covered).

c. Because of the characteristics of a low voltage network system, when work is performed on cables or apparatus carrying less than 500 volts, employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearances and in using proper tools to prevent short circuits and resulting electrical arcs.

d. Employees shall wear rubber gloves with leather protectors and sleeves and shall stand on rubber mats or use insulated tools while cutting into or removing sheathing or sleeves and while testing an energized cable.

e. After an employee removes a section of lead sheath or sleeve on an energized cable, the lead on each side of the open shall be covered with insulating tape for a distance of at least 9 inches.

f. When cutting an energized multiple conductor cable, a proper spreader tool shall be placed between the conductor being cut and the other conductor, and the cut shall be made directly over the shield.

g. Immediately after each conductor of an energized multiple conductor cable is cut in two, the ends shall be insulated before another conductor is cut. During the course of the work, only one uninsulated conductor shall be exposed at any one time.

h. If the work to be performed in a manhole vault could cause a fault on any cable, the cable shall be de-energized before any employee works in the manhole vault, except when load conditions and a lack of feasible alternatives require that the cable remain energized. In such cases, employees shall be protected from the possible effects of a failure using shields or other devices that are capable of containing the adverse effects of a fault.

33-4 Work On De-Energized Cables

a. When cables and apparatus are taken out of service to be worked on, the procedure outlined in Rule 31-5 shall be followed.
b. When grounding de-energized underground cable, a zone of equalized potential shall be created for the employees who are working on it.

c. Sheath continuity. When employees perform work on buried cable or on cable in a manhole or vault, the employer shall maintain metallic-sheath continuity, or the cable sheath shall be treated as energized.

d. When a high voltage cable is to be cut, the cable shall be speared at the work location by a remotely operated grounded spear, or a short section of the shielding if any, shall be removed completely around and tests made with two statiscopes or other approved testing devices, to determine whether or not the cable is de-energized. If no indication of a live cable is obtained, the employee may proceed with the work.

e. When opening a joint or splice in a high voltage cable, it shall be speared as in (d) or the sleeve of the joint shall be cut completely around near the wipes and then cut lengthwise and removed from the joint. No effort shall be made to remove the compound. The employee shall then test over each conductor with two statiscopes or other approved testing devices. If no indication of a live cable is obtained, the employee shall remove the compound. If shielding tape is then encountered, it shall be removed and another test made over each conductor with approved testing devices. If no indications of a live cable is then obtained, the employee shall cut through the joint until the saw touches one of the conductors. Before sawing further a statiscope test shall be made on the blade of the saw.

f. When cutting or opening joints on low voltage cables, the same procedure as outlined above for high voltage cables shall be followed, except in testing. To determine whether the conductor is energized, the insulation shall be cut away to the conductor and tests made with an approved tester. On multiple conductor cables, only one conductor shall be cut into at a time, and tests shall be made on at least two conductors before proceeding with work.

### 33-5 Pulling Cables

a. Employees shall not handle pull-wires or pulling-lines within reaching distance of blocks, sheaves, winch drums or take-up reels.

b. Pull-wires, steel pulling-lines or metal rodding shall not be pushed through ducts where energized equipment is present unless another employee is stationed at the other end of the run to signal a stop.

c. Employees shall not remain in a manhole or vault during pulling operations involving heavy pulling strains unless they can take a position clear of the pulling-line.

d. Employees shall maintain reliable communications, through two-way radios or other equivalent means, among all employees involved in the job.
e. When pulling cable into vaults, manholes, or duct, care shall be exercised
to protect employees and the public from possible injury. Vehicular and
pedestrian traffic at the work location shall be studied long enough to
enable the equipment to be set up in the safest manner possible, and with
the least inconvenience to the public.

f. An employee or suitable warning sign or barricade, shall be stationed
alongside a cable, snake wire or pulling rope laid out on the sidewalk or
street pavement; cables laid across sidewalks temporarily during pulling
operations shall be properly guarded, to reduce the hazard to pedestrians.

33-6 Moving Energized Cables

a. Cables operating at voltages above 15,000 volts shall not be moved under
any circumstances.

b. All cables up to 15,000 volts may be moved after a hazard assessment has
been made by a Competent Person and cables are inspected and found
free of abnormalities with written documentation. They shall not, however,
be moved where such movement requires changing bends. Cables with
Elbows or Splices shall take all other possible means to de-energize prior
to moving.

c. All cables energized above 500 volts shall be handled with rubber gloves
and sleeves.

33-7 Heating Materials

a. Metals and insulating compounds shall be heated in such a manner as
to prevent hazard to the employees working in manholes or vaults and to
vehicular or pedestrian traffic.

b. Appropriate Gloves shall be worn while heating or working with hot
insulating compound.

c. Furnaces and tanks containing liquefied petroleum gas shall not be placed
in a manhole or vault.

d. Cold solder scraps or ladle shall never be placed in a hot solder pot until
the chill and any moisture have been removed from the scraps or ladle.

e. Heating pots for lead, oil or compound shall be safely positioned so that
the contents cannot enter the vault or manhole in the event of spillage.

f. Lighted furnaces or torches should not be left unattended.

g. Torches or furnaces must be kept at a safe distance from flammable
materials.
Introduction

Underground Residential Distribution (URD) systems have a number of apparent advantages over overhead systems; However, they also have some disadvantages such as confined working spaces, closer clearances between energized parts and greater exposure to all types of grounds. In most cases, if protective devices are not used, the employee will be in direct contact with the ground or grounded equipment. This contact completes half of an electrical circuit. If these contacts are not avoided, or protection against contact is not used, serious injury can result.

34-1 URD-General

a. Before a URD transformer enclosure is opened, all unauthorized persons including the public shall be required to leave the work area, and remain clear of all hazards involved in the work. Appropriate barricades shall be utilized.

b. When underground equipment is being located, previously buried short sections of scrap cable could provide false indications of the actual position of permanent conductors. Therefore, all scrap cable, regardless of length, is to be removed from the job site.

34-2 Opening and Closing Circuits-URD

a. Company switching procedures, including Hold Carding practices, shall be followed when sectionalizing URD systems.

b. When a URD circuit has opened, the route of the circuit shall be patrolled for obvious hazards before the circuit is reclosed.

c. An approved switching tool and rubber gloves with sleeves shall both be used when switches (including secondary breakers) in an energized circuit are opened or closed.

d. Any URD primary circuit shall be de-energized by opening one or more devices. De-energizing shall be done with load break elbow connectors, load break fuse cutout at the riser pole, load break tool or other approved device.

e. Eye or face protection shall be worn when primary switching operations are performed.
34-3  Grounding-URD

NOTE: A capacitive charge can remain in a URD cable after it has been disconnected from the circuit and a static-type arc can occur when grounds are applied to these cables).

a. All URD cables and equipment, including services, that have been energized or could become energized from any source, shall be considered as energized until the equipment is positively proven to be de-energized and has been grounded.

b. Before work is performed on de-energized primary circuits or equipment:

1. A visible open break shall be provided;
2. A voltage test shall be made; and
3. The equipment shall be grounded.

c. When work is to be performed on equipment or cables of an underground system, precautions to prevent backfeed shall be taken. This shall include grounding of the secondary conductors where applicable.

d. De-energized cables shall be grounded at a point as close to the work as possible before work is started.

e. All underground cables and apparatus carrying current at voltages above 500 volts shall be de-energized and grounded before cables are cut into or spliced.

34-4  Rubber Glove and Sleeve Use-URD

a. Rubber gloves and sleeves shall be worn before any URD compartment or enclosure (including a service pedestal) is opened.

b. Rubber gloves and sleeves shall be worn when removing animals, vines, weeds, grass or vegetation of any kind that has grown into an energized URD installation whether the equipment is opened or closed.

c. Rubber gloves and sleeves shall be worn when energized primary cables are moved, handled or protected.

d. Rubber gloves and sleeves shall be worn when work is performed on energized secondaries and services.

e. Rubber gloves and sleeves shall be worn when working on or contacting a neutral.

34-5  Work On Energized Equipment-URD

a. When work is performed on cables or apparatus carrying less than 500 volts, employees shall take extra precautions in the use of necessary
rubber protective equipment, in observing adequate clearances, and in using proper tools in order to prevent short circuits and resulting electric arcs.

b. When energized pad-mounted transformers are unlocked and opened, appropriate barricades shall be utilized, and shall be directly attended by an Employee. They shall be kept closed and locked at all other times.

c. A primary or secondary system neutral on any energized circuit shall not be opened under any circumstances.

d. Elbow connectors provide a great deal of flexibility in switching and system sectionalizing. However, only connectors designed and approved for load break use shall be used to connect or disconnect an energized circuit.

e. Only tools with insulated handles shall be used for making energized secondary connections or when work is performed within energized service pedestals, pad-mount compartments or submersible transformer enclosures.

f. Only one energized secondary or service conductor shall be worked on at any one time, and protective devices shall be used to insulate or isolate it from all others.

g. Before any attempt is made to replace a damaged or blown cable limiter, the customer’s service will be checked for faults by the use either an ohmmeter or a voltmeter.

h. Appropriate FR clothing with full-length sleeves, rolled down, shall be worn when work is performed with rubber gloves and sleeves.

34-6 Excavations-URD

a. Before excavating in any area where any buried facilities are suspected, such facilities shall be located as accurately as possible and other utilities shall be notified of the proposed work.

b. Mechanical excavating equipment shall be used only in areas where there is no known danger of contacting or damaging buried facilities.

c. Whenever excavating is done in close proximity to buried facilities, it shall be done only by hand digging.

d. If electric cables are damaged, the following steps shall be taken:

1. If the damaged cable belongs to a power company other than the one performing the work, this company shall be notified at once.

2. The area shall be barricaded and the public kept out until hazardous conditions can be eliminated.
If gas lines are damaged, the following steps shall be taken as soon as possible:

1. The hole shall be left open to allow the gas to dissipate into the atmosphere. All possible sources of igniting the gas shall be removed or eliminated.

2. Residents of the area shall be warned when necessary and the public kept out of the area.

3. The following departments shall be notified immediately:
   a.) Local Fire
   b.) Gas Company
   c.) Local Police

If communication cables are damaged, the communication company shall be notified at once.

When trenches are left open, warning devices, barriers, barricades or guardrails shall be placed to adequately protect the public and employees. Traffic controls shall be in place as required by Part I Section 9.

At the end of each day’s work, as much of the trench as practical shall be closed. No more trench shall be open at one time than is necessary.

Rubber Gloves with Protectors shall be worn when using any equipment or tools to excavate, expose or handle secondary cables. They shall also be used when digging with approved hand tools to expose primary cables.

PART III
SECTION 5
LIVE-LINE BARE-HAND WORK

35-1 Working On Energized Lines Bare-Handed

a. Only employees who have been instructed and trained in live-line bare hand-work shall use the technique on energized circuits.

b. Live-Line bare-hand work shall not be performed on voltages under 69kv unless minimum clearances specified in Table 3-2 can be maintained.

c. Before using the live-line bare-hand technique on energized high-voltage conductors or parts, a check shall be made of the following:

1. The voltage rating of the circuit on which the work is to be performed;
2. The clearances of any potential difference from energized lines and other energized parts on which work is to be performed; and

3. The voltage limitations of the aerial-lift equipment intended to be used.

d. Only tools and equipment designed, tested, and intended for live-line bare-hand work shall be used. Such tools and equipment shall be kept clean and dry.

e. The automatic reclosing feature of circuit interrupting devices shall be made inoperative before working on any energized line or equipment.

f. Work shall not be performed during the progress of an electrical storm in the immediate vicinity or in other weather conditions, including high winds, snow storms, and ice storms, making the work unduly hazardous.

g. A conductive bucket liner or other suitable conductive device shall be provided for bonding the insulated aerial device to the energized line or equipment.

1. The employee shall be connected to the bucket liner or other conductive device by use of conductive shoes, leg clips, or other suitable means.

2. Adequate electrostatic shielding shall be used or conductive clothing suitable for the voltage shall be worn.

h. Before the boom is elevated, the outriggers on the aerial truck shall be extended and adjusted to stabilize the truck and the body of the truck shall be bonded to an effective ground or barricaded and considered as energized equipment.

i. Before moving the aerial lift into work position, all controls (ground level and bucket) shall be checked and tested to determine that they are in proper working condition.

j. Arm current tests shall be made before starting work each day, each time during the day when higher voltage is going to be worked and when changed conditions indicate a need for additional tests.

This test shall consist of placing the bucket in contact with an energized source equal to the voltage to be worked upon for a minimum of 3 minutes. The leakage current shall not exceed 1 micro-ampere per kilovolt of nominal line-to-line voltage. Work operations shall be suspended immediately upon any indication of a malfunction in the equipment.

k. All aerial lifts to be used for live-line bare-hand work shall have dual controls, lower and upper.
1. The upper controls shall be within easy reach of the employee in the bucket. If a dual-bucket-type lift is used, access to the controls shall be within easy reach from either bucket.

2. The lower set of controls shall be located near the base of the boom and must permit over-ride operations of the equipment at any time.

l. Before the employee contacts the energized part to be worked, the conductive bucket liner shall be bonded to the energized conductor by means of a positive connection, which shall remain attached to the energized conductor until the work on the energized circuit is completed.

m. The minimum clearance distance for live-line bare-hand work shall be as specified in Table 3-2 unless otherwise specified by the utility. These minimum clearance distances shall be maintained from all grounded objects and from lines and equipment at a different potential than that to which the insulated aerial device is bonded unless such grounded objects or other lines and equipment are covered by insulated guards. These distances shall be maintained when approaching, leaving, and when bonded to the energized circuit.

n. The use of handlines between buckets, booms, and the ground is prohibited. However Non-Conductive-type handlines may be used from line to ground when not supported from the bucket. Ropes used for live-line barehand work shall not be used for other purposes.

o. No conductive materials over 36 inches long shall be placed in the bucket, except for appropriate length jumpers, armor rods, and tools.

p. It is recommended that insulated measuring sticks be used to verify clearance distances.
Table 3-2

<table>
<thead>
<tr>
<th>Voltage Range Kv</th>
<th>Phase to Ground</th>
<th>Phase to Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>.50 to .300</td>
<td>Avoid Contact</td>
<td>Avoid Contact</td>
</tr>
<tr>
<td>.301 to 750</td>
<td>1'1&quot;</td>
<td>1'1&quot;</td>
</tr>
<tr>
<td>.751 to 5.0</td>
<td>2'1&quot;</td>
<td>2'1&quot;</td>
</tr>
<tr>
<td>5.1 to 15</td>
<td>2'2&quot;</td>
<td>2'3&quot;</td>
</tr>
<tr>
<td>15.1 to 36</td>
<td>2'7&quot;</td>
<td>3’</td>
</tr>
<tr>
<td>36.1 to 46</td>
<td>2'10&quot;</td>
<td>3’3”</td>
</tr>
<tr>
<td>46.1 to 72.5</td>
<td>3’4”</td>
<td>4’</td>
</tr>
<tr>
<td>72.6 to 121</td>
<td>3’9”</td>
<td>4’8”</td>
</tr>
<tr>
<td>121.1 to 145</td>
<td>4’4”</td>
<td>5’5”</td>
</tr>
<tr>
<td>145.1 to 169</td>
<td>4’10”</td>
<td>6’5”</td>
</tr>
<tr>
<td>169.1 to 242</td>
<td>6’8”</td>
<td>10’2”</td>
</tr>
<tr>
<td>242.1 to 362</td>
<td>11’3”</td>
<td>18’2”</td>
</tr>
<tr>
<td>362.1 to 420</td>
<td>14’</td>
<td>22’5”</td>
</tr>
<tr>
<td>420.1 to 550</td>
<td>16’8”</td>
<td>27’1”</td>
</tr>
<tr>
<td>550.1 to 880</td>
<td>22’7”</td>
<td>37’5”</td>
</tr>
</tbody>
</table>

NOTE: All employees shall observe the most recent approach distances required by OSHA or the State OSHA where they are working.

All Crews must follow these Minimum Approach Distances. In order to vary from these distances the employer must obtain and calculate all the necessary information from the host employer(utility). Maximum phase to phase system voltage, Maximum transient over voltage(TOV) resulting from an engineering analysis, elevation of the work site, etc. The new minimum approach distances and all necessary information must be documented at the job site where new minimum approach distances are being employed.
36-1 Tree Trimming-General

a. When tree trimming, tree felling, brush loading or brush disposal operations are under way on street, highway or any other area accessible to the public, traffic-control measures shall conform to Part 1, Section 9.

b. Climbers shall not be used in tree trimming work. (Except for certain types of trees).

c. Dead or rotted limbs, regardless of size, shall not be used by employees for support.

d. No work shall be done in a tree until employee is securely tied in or belted to the tree.

e. Climbing rope shall be crotched in such a manner as to prevent working its way out on a lateral limb.

f. When working in a multiple-trunk tree, the climbing rope shall preferably be crotched around a main trunk other than the one on which the employee is working.

g. Employees shall crotch their climbing rope in two places if a single crotch does not adequately protect them from falling into energized lines or falling back into trunk of the tree.

h. The climbing rope shall not be used as a pull-rope or as a hand-line to lower limbs or branches.

i. The ground end of a climbing rope shall not be allowed to dangle over roadways and shall be kept free from obstructions, passing vehicles, other objects that could cause the climbing rope to move unexpectedly.

j. The taut-line hitch shall not be released until the climber is on the ground.

k. Branches or other material shall not be dropped unless the immediate area has been cleared so that there is no possibility of injury to persons or damage to property. If such a possibility exists, a rope shall be used to lower branches or other materials.

l. When lowering heavy tree members, employees shall not tie fall lines around hands or bodies.

m. Ground personnel shall not attempt to clear limbs or brush from under the side of a tree where the climber is working.
n. Employees shall obtain assistance or use power equipment when lifting logs or other heavy loads.

o. When loading brush on a truck, employees shall not stand on or straddle the loaded brush.

p. Brush shall be hauled away promptly or otherwise disposed of to avoid presenting “an attractive nuisance” to children and to prevent injury to persons or damage to passing vehicles.

q. When hauling brush, care shall be taken that it doesn’t extend over the sides of the truck.

r. When it is necessary to work in the vicinity of poison ivy, poison oak or poison sumac, employees shall keep sleeves rolled down and wear gloves.

36-2 Working Near Energized Conductors

a. Wires in proximity to tree trimming shall be considered as energized unless de-energized in accordance with Rule 31-5 and grounded in accordance with Rule 31-6.

b. Parts of trees, in contact with or likely to contact conductors energized above 300 volts, shall be cut with insulated tools or employee shall wear rubber gloves and sleeves when making cut. Limbs being removed from contact with wires are to be handled with the same precaution as the wires themselves. Care shall be taken to prevent limbs being removed from coming in contact with employee’s body.

c. Employees shall never pass between or contact energized wires unless such wires are covered with protective devices.

d. Employees shall not remove tree limbs or branches from above energized conductors while other employees are working in trees below the conductors in the same span.

e. Broken or fallen wires shall not be handled except by Employees Trained and experienced in such work.

f. When working near wires the employee shall have his climbing rope so secured that in the event he slips or a limb breaks, he will swing free and clear of the wires.

g. Tree limbs shall not be dropped on conductors.

h. Ropes shall not be thrown over conductors or crossarms.

i. Dry ropes shall be used in trees through which energized conductors pass.

j. If electric powered tools are used in trees, the supply cord shall be kept a minimum of 6 feet from energized conductors or the minimum approach
distances specified in Rule 31-1b whichever is greater. Rubber gloves and sleeves shall be worn when using such equipment in proximity to energized conductors or when cutting limbs that may contact the conductors.

k. When using aerial bucket equipment, employee shall take care not to bring himself or the equipment in contact with energized lines.

36-3 Tree Felling

a. Trees to be felled shall be inspected for dead limbs that may break, or broken limbs lodged in the tree that might fall into the working area as the job progresses.

b. Before felling is started, a clear retreat path shall be identified.

c. No one shall be allowed to work in a tree located near a tree that is being felled if there is any danger of its being struck by any part of the falling tree or by any tree that may be dislodged by the falling tree.

d. All persons not engaged in the felling operation shall be kept clear of guide ropes and other rigging.

e. Clear warning shall be given to all employees in the area when trees are to be felled or heavy tree members are to be dropped.

f. Once the felling of a tree has been started, it shall be completed before employees leave the job.

g. When trees or heavy tree members are felled, all exposed walks, roadways and lawns shall be protected if necessary with a cribbing of branches to avoid property damage.

36-4 Care and Use of Tools and Rope

a. Ropes shall be inspected periodically. Damaged sections shall be cut out and destroyed or the rope removed from service.

b. Ropes shall be kept away from acids, oil, chemicals and fire and all sources of excessive heat.

c. Dragging ropes over rough surfaces and sharp objects, such as rocks, shall be avoided. Ropes shall be stored separately from sharp edged cutting tools.

d. The cutting edge of tools shall be suitably sheathed or guarded except while in actual use.

e. When not in actual use, each trimmer’s saw shall be returned to its scabbard.
f. Axes shall not be used in trees or carried on the shoulder.

g. Tools shall not be thrown into or dropped from a tree; they shall be raised or lowered by a suitable rope line.

h. A pruner shall not be laid on a limb, in a crotch or hooked on a wire or rope. It shall be hooked over a limb strong enough to hold its weight.

i. Ladders, when not in use, shall be removed from the base of a tree.

36-5 Powered Trimming Equipment

a. Employees operating powered trimming equipment shall wear suitable PPE.

b. For hearing protection requirements, refer to rule 21-2.

c. When a chain saw is started, it shall be placed on or against a solid support.

d. The operator shall grip the chain saw with both hands during the entire cutting operation.

e. The saw bumper shall be against tree or limb before a cut is started.

f. Chain saw operators shall, when necessary, clear the immediate area around their work to make certain that brush will not interfere with either saw or operator.

g. All chain saws shall be equipped with “dead-man” controls (control that cannot lock in “on” position).

h. The chain saw engine or motor shall be stopped;
   1. When an employee is working on any part of the chain or cutting bar.
   2. While the saw is being moved from one location to another; and,
   3. While unit is unattended.

i. Gasoline driven chain saw engine shall be stopped when being refueled. If gas is spilled on the chain saw during refueling, it shall be wiped off before engine is started.

j. A gasoline driven chain saw shall not be used above shoulder level.

k. Employees shall not approach the chain saw operator within the reach of the saw while the saw is in operation.

l. Employee shall never hand a pneumatic or hydraulic pruner or saw to another employee unless it is disconnected from air hose.
m. Powered tools shall not be left unattended if connected to a power source.

n. Powered tools shall not be adjusted or repaired while connected to a power source.

36-6 Chippers

a. Chippers shall never be parked directly under tree being trimmed.

b. Employees shall not permit spectators to stand near the machine while employees are feeding brush into chipper.

c. Proper PPE (full cover goggles, face shield, etc.) shall be worn by an employee when feeding brush into chipper.

d. For hearing protection requirements, refer to Rule 21-2. In any event. Hearing protection shall be used at all times when attending or working with chippers.

e. Employees shall never place hands or any other part of their bodies into a brush hopper while the chipper is in operation.

f. Tools and other metallic objects shall not be used to push brush into a chipper. Sweepings, which may contain foreign objects such as stones and nails, shall be loaded on the truck and not fed into the chipper.

g. The ignition key shall be removed when a chipper is left unattended.

36-7 Right-of-Way Clearing and Maintenance

a. Where two or more employees are cutting brush, they shall be separated by at least 10 feet.

b. Under no circumstances shall anyone except the operator ride on a bulldozer, or any other heavy equipment used in land clearing.

c. Bulldozer operators shall wear seat belts.

d. Employees shall not anchor equipment to railroad tracks, fences or structures belonging to others.

e. When emerging from right-of-way, prior to road travel, employees shall test brakes.

36-8 Use of Herbicides and Other Chemicals

a. Review of the Safety Data Sheet (SDS) is required.

b. Employees shall avoid skin contact or breathing mist of spray material to the extent possible.
c. Spray equipment shall be cleansed daily when oil solutions are used.

d. Spraying shall not be done when wind exceeds 15 mph unless Chemical instructions dictate otherwise.

e. Brush shall not be sprayed at a distance greater than 15 feet from the power spray nozzle.

f. Foliage and basal sprays shall not be used on wild cherry trees in areas where livestock may graze because of the poisonous acid that is generated.

g. Oil and other liquids, spilled on power spray equipment, shall be removed as soon as possible to prevent falls from slippery surfaces.

h. Hose connections on hydraulic sprayers shall be checked for leaks before use.

i. Employees shall not smoke on or around mist spray equipment when oil solutions are being mixed or used.

j. Herbicides and other chemicals shall never be left where they would create a hazard to persons or property.

k. Empty containers shall be disposed of in a safe manner. They shall never be thrown into ponds, lakes or streams.

l. Spray wastes shall be disposed of in a safe manner.

PART III
SECTION 7
RAILWAY WORKER SAFETY FOR EMPLOYEES WORKING ON RAILROAD PROPERTY

Introduction

The following safety rules are intended to assist Employees in understanding the safety needs of the railroad Environment. Failure to follow these safety instructions could result in equipment or property damage, serious injury, or death.

NOTE: In addition, all contract personnel working on Railroad property must comply with all regulatory standards and mandates.

37-1 Protection Against Moving Trains

a. Prior to performing any task requiring the coordination of two or more employees, those employees involved must hold a documented tailboard
meeting to insure that all have a clear understanding of the task to be performed and their individual responsibilities.

b. Meetings shall be held at the start of each job or whenever the situation changes.

1. Meetings should be formal. Stop everything and focus on safety.
2. Everyone should be encouraged to participate.
3. Employees should share previous similar work experiences.
4. Identify potential the job hazards.
5. Reach consensus on how job needs to be done to be injury free.

37-2 Walking

a. When going to or from work locations employees must walk, not run, keeping hands out of pockets and using established paths or routes. They must be alert to avoid tripping and slipping hazards and must walk around, not jump across, excavations, holes, and open pits. If practicable, remove tripping and slipping hazard from path, walkway, platform, or work area; otherwise, promptly inform immediate supervisor of its nature and location of such hazards.

b. Employees must use designated route, path, or cross-walk to or from yard office, parking lot, station, shop, and other work location.

c. While walking or working in poorly lit area (such as a tunnel), Employees shall have sufficient light to permit moving about and performing work safely.

d. Always look ahead. Stop walking before looking in any other direction.

37-3 On or About Track

a. Employees must not enter track unless it is necessary in performance of their duty.

b. Keep clear of standing trains, self-propelled vehicles and machinery, and other wheeled equipment.

c. Never pass under or, over a standing train or standing self-propelled equipment or pass between standing trains or self-propelled equipment.

d. Employees are prohibited from sitting, stepping, standing, or walking on rail, frog, switch, interlocking machinery, third rail, or other such parts of track structure unless specifically required to do so in the performance of their duties.

e. Keep as far as practicable from passing trains. If in a confined place, employees shall secure loose clothing, large or long coat, and, if possible, maintain handhold until the train has passed.
f. Do not rest any object on your shoulder while close to moving train.

g. Expect equipment to move on any track, in either direction, at any time. Employees must look in both directions and have permission from the appropriate authority before:

1. Fouling the track.
2. Crossing the track.
3. Going between or around the end of equipment or structure.
4. Moving out from between or under equipment or structure.
5. Getting on or off equipment or,
6. Performing any other operation that could pose a hazard from moving trains.

h. When crossing tracks always use approved walkway when available; otherwise take the shortest safe route after looking in both directions. If more than one track is to be crossed, stop and look before crossing each track.

i. Jumping from a truck, car platform, or other elevated location is prohibited. If necessary to descend without the use of ladder or steps:

1. Observe ground or floor conditions.
2. Avoid holes, slippery spots, and obstructions and,
3. When possible, maintain a handhold.

NOTE: REMEMBER: WHEN IT CAN BE AVOIDED, EMPLOYEES MUST NOT RELY ON THE WATCHFULNESS OF OTHERS; THEY MUST PROVIDE FOR THEIR OWN SAFETY.

j. When required by a conductor or flagman or any other qualified railroad employee to vacate tracks compliance must be immediate.

37-4 Third Rail Electric Systems

a. The third rail is divided into sections and the power supply is controlled by circuit breakers and sectionalizing switches. The third rail is normally energized.

b. Avoid stepping, sitting or walking upon or brushing against the third rail. While the energized rail is protected by a cover, there is always a chance of electric shocks because of the presence of water, brake shoe dust, derangement or imperfections in the cover.

37-5 Catenary Electric Systems

a. All overhead wires must be considered energized at all times except when it is known they have been de-energized and properly grounded in accordance with Rules and Regulations.
Other Requirements

a. Prior to the completion of work, the employer shall ensure that his construction site is left in a safe condition. This shall include the use of barricades, good housekeeping and adequate lighting.

b. The employer shall provide first aid kits and fire extinguishers at all work locations.

c. The employer shall post emergency phone numbers, medical police, etc., in locations accessible to all workers.

d. Additional PPE requirements by the railroad authority shall be adhered to by contract personnel.

PART III
SECTION 8
SUBSTATION OPERATION, MAINTENANCE & CONSTRUCTION

Construction in Energized Substations

a. Work near energized Facilities
   • Authorization shall be obtained from the designated, authorized person before entering or performing any work in an energized substation.
   • When work is to be performed in an energized substation, the following shall be determined:
     ▪ What facilities are energized.
     ▪ What protective equipment and precautions are necessary.
   • Mechanized Equipment
     ▪ Use of vehicles, cranes, gin poles, and other equipment in hazardous areas shall at all times be controlled by a designated and qualified employee.
     ▪ All cranes and derricks shall be effectively grounded within close proximity to a Substation, and the equipment shall be considered energized or barricaded. Rubber gloves and sleeves shall be worn while the boom is uncradled unless proper grounding techniques and a zone of EPZ (Equal Potential Zone) is established.
   ▪ Fences
     ▪ When a substation fence must be expanded or removed, a temporary fence affording similar protection shall be provided. Fence Sections shall be isolated, grounded or bonded as necessary to protect employees from hazardous differences in potential.
     ▪ All gates to all unattended substations shall be locked, except when work is in progress.
1. Warning signs should be placed on the gate when work is being performed inside a substation that will affect other authorized entrants.

38-2 Substation Entry

a. Only Authorized employees or escorted visitors may enter a substation.

b. Upon entering a substation where other workers are present, report your presence to the person in charge in order to exchange information on special system conditions affecting employee safety.

c. All Employees shall attend a Job Briefing that covers information on all special system conditions that will affect employee safety, including the location of energized equipment in or adjacent to the work area or to the limits of any de-energized work area.

d. New employees and those not familiar with the hazards in a substation shall be given special instructions prior to entry.

e. Those entering or working in a substation shall not carry anything on their shoulders.

f. When driving into and within a substation, employees shall check clearances between the vehicle and substation equipment.

g. Vehicles should not be driven over wire troughs unless designed or engineered.

h. Upon leaving a substation, employees shall lock all doors, control houses and outside gates.

i. Barriers shall be used to warn others of the hazards adjacent to the work area.

38-3 Working in Energized Substations

a. When work is to be done in an energized substation, the person in charge shall determine:

   1. That people who enter are qualified
   2. Energized zones of the substation
   3. Proper PPE, and equipment that will be needed
   4. The extraordinary caution that should be exercised in energized zones of the substation
   5. All equipment, rigging, and work procedures are in good working order

b. Climbing above exposed energized equipment and conductors is prohibited.
c. All equipment shall be considered energized unless de-energized, tested for voltage and proper grounding techniques and a zone of EPZ.(Equal Potential Zone) is established. In a substation special precautions shall be taken to guard against induced voltage.

d. No employee shall approach or take a conductive object any closer to energized parts closer than specified in the Minimum Approach Distance Table (MAD). Unless:
   1. The employee is insulated from the energized part
   2. The energized part is isolated or guarded from the employee

38-4 Barricades and Barriers

a. When work is to be done in a de-energized bay adjacent to an energized bay, barricades shall be installed to warn against accidental entry into the energized bay.

b. When open trenching inside a substation, an open trench sign shall be placed on the entry gate and the trench itself shall be barricaded.

c. When working in close proximity to energized conductors or equipment, temporary barriers shall be installed to protect employees.

d. When an addition is being constructed, barricades shall be installed around the existing substation until the new substation is completed.

e. All Barricades shall be Non-Conductive and secured properly to prevent accidental damage.

38-5 Working on Overhead Structures

a. When working on elevated structures, employees shall utilize 100% Fall Protection. Employees shall ensure the safety snap is engaged into the appropriate attachment and whatever method used should provide protection from contacting a lower level.

b. Before climbing ladders, scaffolds, steel structures, or other elevated structures, a thorough inspection shall be made to determine if they are safe. 100% fall protection devices shall be used.

c. Tools and materials shall not be thrown up to or down from structures.

d. Employees on the ground shall stay clear of the overhead work (drop zone) to prevent being struck.

e. No one shall be permitted under a structure, which is being erected or assembled unless all other precautionary measures have been taken and it is necessary as part of assembly.

f. Tag lines shall be used any time it is deemed necessary to control the load.
38-6 Fall Protection in Substations

a. 100% Fall Protection shall be used whenever an employee climbs towers or structures. Fall arrest equipment, positioning devices, or travel restricting devices shall be used by employees working at elevated locations above four feet.

b. If vertical lifelines or droplines are used, not more than one employee may be attached to any one lifeline.

38-7 High Voltage or High Power Testing Procedures

a. Test areas shall be guarded by walls, fences or barriers with the intention to keep employees out of the test site.

b. At a test site where permanent fences and gates are not provided, one of the following methods shall be utilized to prevent unauthorized entry:

1. The use of safety tape approximately waist high with safety signs attached.
2. A barrier or barricade that limits access to the test area that limits entry to paragraph (1) above.
3. Having a test site observer stationed that the entire test site can be monitored.

c. Everyone shall stand clear when making the test.

d. Safe grounding and EPZ practices shall be followed in any test area.

e. Only approved equipment shall be used.

38-8 Circuit Breaker Maintenance

a. Proper clearance shall be obtained to test or make repairs to circuit breakers.

b. All workers shall be instructed as to the work procedure.

c. When switching a breaker out for service, if the circuit breaker control switch is remote from the breaker, the person in charge shall place a danger tag on the control switch.

d. A check shall be made to determine that all disconnects or air-break switches are in the open position. The blades of an air-break switch shall rest in the open position.

e. On breakers where the energized side of the disconnects are close to the Oil Circuit Breaker (OCB) bushings, employees shall not climb on top to connect the leads used for testing. This work shall be done from a ladder below the energized zone.
f. Test equipment and vehicles shall be grounded to the substation ground when testing an OCB.

g. The case of all transformers shall be grounded when in use.

h. When an OCB is operated electrically or by spring, employees shall keep hands clear of the closing mechanism.

i. The secondary side of a current transformer shall not be opened.

j. Before entering the tank of an OCB to make repairs or adjustments, the following shall be followed:

1. All AC control power shall be disconnected
2. All DC control power shall be disconnected
3. The main control valve shall be off
4. The operating mechanism shall be in the relaxed position or blocked to prevent movement.
5. Entry shall be in accordance with approved procedures for enclosed or confined spaces.

k. If it becomes necessary to climb on top of an OCB during oil filtering operations, the terminals shall be grounded and proper fall protection shall be utilized.

38-9 Transformers

a. Test to assure no voltage is present at the transformer terminals. Visually assure that the transformer is isolated.

b. Apply grounds as required, and remove the grounds after work is completed.

c. Inspect transformer labeling for PCB’s.

d. Units containing PCB’s will require following State and Federal guidelines for handling and disposal.

e. When filling transformers, appropriate PPE for the type of fluid shall be worn to prevent contact from spillage or discharge. Locate eye wash stations before starting the procedure. Oil hoses shall be grounded to the transformer and oil processing equipment.

f. Entry into a transformer shall be in accordance with approved procedures for enclosed or confined spaces. When working inside transformer tanks, all tools and materials shall be clear of the opening and tied off to prevent them from dropping into the tank.

g. When work is completed, remove all tools and grounds.
38-10 Cable

a. Employees shall verify the routing of cables to be tested and any other cables in the vicinity.

b. The ends of cables and splices to be tested should be made inaccessible by using barriers or another suitable means. Suitable communication may be necessary to prevent unauthorized access.

c. Test to ensure cables are de-energized and that any switches have been opened, locked out, and tagged.

d. Ground any nearby de-energized cables that are not under test.

e. After completing a cable high-potential test (Hi-Pot), ground the conductors. The discharge time should be at least the same time as the high-potential test.

f. If a direct buried cable is to be cut mid run, an approved device such as a low voltage tracer should be used to verify that it is indeed the cable to be worked on.

38-11 Current Transformers

a. Take precautions to assure that the energized current transformers are not open-circuited.

b. When monitoring current transformers circuits, assure the test equipment is of the non-fused type.

38-12 Capacitors

a. Disconnect from energy source and shunt (short circuit) before performing work on capacitors.
   1. Employees must wait at least five minutes from time of disconnection before applying shunt.
   2. Units shall be shunted between all terminals and capacitor case or rack, if cases are ungrounded substation racks the employer shall bond the racks to ground.

38-13 Load Break and Non-Load break Disconnects

a. Test to determine that all circuits have been de-energized.

b. Use grounding cables on both the line side and load side of the switch.

c. Verify that no one is working on any portion of the circuits which are to be switched.
d. Use lockout tagout procedures to assure that no one can energize the circuit while it is under maintenance.

1. Discharge stored energy mechanisms, which may present a mechanical hazard.

38-14 Automatic Transfer Equipment

a. Obtain written approval from the customer prior to performing maintenance on any portion of this type of equipment.

b. Before beginning testing or maintenance on any portion of this type of equipment, verify that both normal and emergency sources have been de-energized and locked out and tagged out.

PART IV EXCAVATION AND STEEL TOWERS

SECTION 1

GENERAL EXCAVATION AND SHORING

Introduction

Before any excavation or trenching operations are started, the area to be worked should be checked carefully for conditions, which may require additional precautionary measures to be taken. These would be: type of soil, possibility of there being underground utility lines if in developed areas, or underground pipe or cable lines in wide-open areas, water table level, percolation qualities, etc.

41-1 Excavations

a. Excavating by machines:

1. No machine shall be oiled, greased, or refueled while the motor is running. The fuel tank shall be filled from approved safety-type cans or pumps.

2. Operators shall keep employees and bystanders a safe distance from the machine while the machine is in operation.

3. An employee shall not attempt to clear buckets, blades, scoops, chutes, etc., while the machine is in operation.

b. Trees, boulders, and other surface encumbrances, located so as to create a hazard to employees involved in excavation work, shall be secured or removed.

c. Employees exposed to vehicular traffic shall wear warning vests marked with, or made of, reflectorized or high visibility material.
d. No employee shall be permitted under loads handled by power shovels, derricks, or hoists. To avoid being struck by any spillage, employees shall be required to stand away from any vehicle being loaded.

e. Daily inspections of excavations shall be made by a competent person. If evidence of possible cave-ins or slides is apparent, all work in the excavation shall cease until the necessary precautions have been taken to safeguard the employees. After a rainstorm or other hazard-increasing occurrences, additional inspections of the excavation shall be made and protection increased if necessary.

f. Special precautions shall be taken in sloping or shoring the sides of excavation adjacent to a previously backfilled excavation or a fill, particularly when the separation is less than the depth of the excavation. Particular attention also shall be paid to joints and seams of material comprising a face and the slope of such seams and joints.

g. Diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. Excess amounts of water shall not be allowed to accumulate in the trenches.

h. If it is necessary to place and to operate power shovels, derricks, trucks, materials, or other heavy objects on a level above and near an excavation, the side of the excavation shall be braced as necessary to resist the extra pressure due to such superimposed loads. If employees are occupying the excavation that is braced or shored, a registered professional engineer shall design it.

i. When mobile equipment is utilized or allowed adjacent to excavations, substantial stop logs or barricades shall be installed. If possible, the grade should be away from the excavation.

j. Adequate physical barrier protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration or similar operations, temporary wells, pits, shafts, etc., shall be backfilled.

41-2 Shoring

a. Before any soils can be considered anything but Class “C” required sloping of 1 ½ feet horizontal for every vertical, OSHA requires that the soil be analyzed by a trained “competent person”.

b. Banks more than 5 feet high shall be shored or laid back to a stable slope, or some other equivalent means of protection shall be provided where employees may be exposed to moving ground or cave-ins. Refer to Chart No. 4-1 as a guide in sloping of banks. Trenches less than 5 feet in depth shall also be effectively protected when examination of the ground
by a competent person indicates hazardous ground movement may be expected.

c. Sides of trenches in unstable or soft material, 5 feet or more in depth, shall be shored, sheeted, braced, sloped, or otherwise supported by means of sufficient strength to protect the employees working within them.

d. Sides of trenches in hard or compact soil, including embankments, shall be shored or otherwise supported when the trench is more than 5 feet in depth and 8 feet or more in length. In lieu of shoring, the sides of the trench above the 5-foot level may be sloped to preclude collapse, but shall not be steeper than a 1-foot rise to each 1/2-foot horizontal.

e. Materials used for sheeting and sheet piling, bracing, shoring, and underpinning, shall be in good serviceable condition, and timbers used shall be sound and free from large or loose knots, and shall be designed and installed so as to be effective to the bottom of the excavation.

f. Additional precautions by way of shoring and bracing shall be taken to prevent slides or cave-ins when excavations or trenches are made in locations adjacent to backfilled excavations, or where excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, or any other source.

g. Employees entering pier holes, including bell-bottomed holes, shall be protected by the installation of a casing of sufficient strength to resist shifting of the surrounding earth. Such protection shall be provided for the full depth of that part of each pier hole, that is above the bell. A lifeline, suitable for instant rescue and securely fastened to a shoulder harness. This lifeline shall be individually manned and separate from any other line.
CHART NO. 4-1
APPROXIMATE ANGLE OF REPOSE
FOR SLOPING SIDES OF EXCAVATION

Note: Clays, Silts, Loams or Non-Homogenous Soils Require Special Treatment
The Presence of Ground Water Require Special Treatment

Original Ground Line

Solid Rock, Shale or Cemented Sand and Gravels (90 deg.)
Compacted Angular Gravels
¾ to 1 (63 deg 26 min)
Recommended Slope for Average Soils 1 to 1 (45 deg)
Compacted Sharp Sand 1 ½ to 1 (33.5 deg)
Well Rounded Loose Sand 2 to 1 (26 deg 34 min)
h. The angle of repose shall be flattened when an excavation has water conditions, silty materials, loose boulders, and areas where erosion, deep frost action, and slide planes appear.

i. When employees are required to be in trenches 4 feet or more in depth, an adequate means of exit, such as a ladder or steps, shall be provided and located so as to require no more than 25 ft. of lateral travel to be reached.

j. Bracing or shoring of trenches shall be carried along with the excavation.

k. Cross braces or trench jacks shall be placed in true horizontal position, be spaced vertically, and be secured to prevent sliding, falling, and kick outs.

l. Portable trench boxes or sliding trench shields may be used for the protection of personnel in lieu of a shoring system or sloping. Where such trench boxes or shields are used, they shall be designed, constructed, and maintained in a manner, which will provide protection equal to or greater than the sheeting or shoring required for the trench.

m. Backfilling and removal of trench supports shall progress together from the bottom of the trench. Jacks or braces shall be released slowly and, in unstable soil, ropes shall be used to pull out the jacks or braces from above after employees have cleared the trench.

41-3 Working Around Heavy Equipment

a. When an end-loader is being loaded by hand the loader operator shall keep his hands and feet free of all controls.

b. Ditching machines shall not be used on slopes or inclines without first preparing the right-of-way to prevent overturning.

c. Employees (other than the operator) shall not stand with hands or feet resting on a machine while it is running and shall keep clear of conveyor or discharge side.

d. Trenching machines, that are parked or operating on streets or highways, shall be protected by proper warning devices in accordance with Rule 12-1.

e. When it is necessary to leave excavating equipment unattended, the blade, bucket or scoop shall be lowered to the ground, and the ignition system locked.

41-4 Other Utilities

a. Other companies having underground facilities in the area shall be notified before excavations are started.

b. All underground cables and pipelines shall be located and staked, or marked, when possible. When digging near such facilities hand excavations shall be used to avoid damage.
41-5 Trenching By Hand

a. All soils removed from trenches and other excavations, and tools or other material, shall be piled at least 2 feet from the edge of the excavation.

b. Employees shall not work under pipe, which is only supported on skids over a trench.

c. Pressure on air tools shall be released before the equipment is left unattended.

d. All connections to air tools shall be made secure before turning on air pressure. Before making any adjustments, the air valve should be closed.

e. Air at the tool shall not be turned on until the tool is solidly against the work.

PART IV

SECTION 2

STEEL TOWER LINES AND STRUCTURES

Introduction

It is not the intent of this manual to specify how to run a job, but all employees should be aware of the dangers that can be encountered in steel work, and must follow certain safe practices to insure that they are not injured, crippled or killed.

It is very important that all employees, before the job begins, be told just what operations will be done during construction of the line, and any unusual or unfamiliar work that may occur. This information, together with knowledge of certain safety rules and construction data, will aid greatly in completing an accident free operation.

42-1 General

a. Before a job is started, the Supervisor or General Forman should obtain the addresses and telephone numbers of hospitals and rescue squads near the work area and supply this data to all foremen.

b. A tailboard discussion shall be conducted as required by Rule 31-1e.

c. When climbing or erecting towers, appropriate footwear shall meet ASTM standard 2413.05.

d. Hard hats shall be worn at all times while on the job. ANSI approved; Class E electrically rated.
e. Appropriate hand protection shall be utilized when handling steel, taglines, winch lines, etc. Gloves with four fingers and a thumb are recommended over mittens because of their “gripping” value.

f. Any employee performing drilling, welding or burning on steel or reinforcing steel must wear appropriate PPE.

g. Communication devices shall be used, if necessary, to assure safety in the performance of work.

h. Frayed or worn ropes or slings shall not be used.

i. Metal or metal reinforced measuring tapes shall not be used while an employee is on a tower near energized lines.

j. No person shall ride on steel being hoisted, nor ride on the hooks, cables or slings, nor slide down ropes or cables.

k. When steel is being hoisted, a tag line shall be attached to guide the load until it reaches the level where it is to be erected.

l. Tools and tower materials shall be raised and lowered by means of hand lines, bull lines, winch lines, or other suitable methods.

m. Workers shall not stand under suspended or moving loads or within the “bight” or “hospital side” of a rope or winch line.

n. 100% Fall Protection shall be used when in the air. If necessary for an Employee to be on an arm when a conductor is being pulled in, brought up to sag, or being clipped, the Employee shall anchor into the tower cage with appropriate fall protection.

o. In lacing steel, each member shall be bolted before supporting slings or cables are released, and temporary bolting shall be completed before erectors leave the member.

p. Equipotential zones and work methods shall be utilized when working on new or de-energized tower conductors, installing conductor splices, making dead-ends on the ground, and when utilizing pullers and tensioning equipment. See Rule 31-6.

q. When wire is strung make sure that every tower can be seen by the workers to prevent children from “riding” the conductors. If this is not possible, have spotters at critical areas.

r. Workers shall stand in the clear when ropes, wires and winch lines are moving through sheaves and when the ropes wires and lines are under tension.

s. Ropes and wires shall not be cut under tension. However, if such cutting is absolutely necessary, the parts that will become ends when cut shall
first be secured before the cut is made. Workers shall stand in the clear to prevent injury from whipping or backlash.

t. Additional come-alongs and safety slings shall be used when wires are unclamped or freed from suspension or dead-end tension clamps over energized conductors, railroads or highways.

42-2 Special Safety Slings For Tower Work

a. Safety slings shall be run from the tower cage to the arm when doing deadending work, sagging, loose deadending, temporary catch-off on a tangent tower, and when running to a temporary anchor used for temporary dead-end (catching off) due to reel running out, etc.

b. Slings from cage to arm shall also be used when there is not adequate distance to make a safe-angle pull.

PART V EMERGENCY TREATMENT

SECTION 1

FIRST AID

Introduction

The material in this section is intended to act as an overall guide to first aid activities. It is not designed as a self-teaching course, but merely reviews some aspects of first aid techniques for those who have received training in first aid.

The information given is general. Specific action to be taken at the scene of an emergency cannot be predetermined and will necessarily be modified by the situation. It is important that employees be familiar with the contents of this section and local emergency procedures so as to be better prepared to assist fellow employees in the event of an accident. Details for first aid treatment may be found in the American Red Cross Standard First Aid Book and the U.S. Bureau of Mines First Aid Manual.

51-1 General

a. Employees shall be familiar with the basic techniques for first aid so that they may provide emergency treatment to fellow employees. Personnel should be knowledgeable of the treatment for traumatic shock, means of giving artificial respiration and control of bleeding. Preplanning for a potential emergency situation is most valuable. All employees should be aware of the medical services available and how to obtain them.

b. Personnel engaged in overhead line work shall know the essential elements of pole top rescue. They should also be familiar with resuscitation techniques and how to apply these techniques in an elevated position.
c. First aid kits are to be supplied; employees shall be familiar with the location, the contents and the instructions given with the first aid kit. Each employee shall learn to use this equipment so he can render treatment when needed. Except for minor injuries, the service of a physician shall be obtained.

d. The contents of the first aid kits shall be inspected each week and expended items replaced.

51-2 Wounds and Controls of Bleeding

a. A person can bleed to death in a very short time less than one minute. Therefore, in the event of an injury that results in significant bleeding, immediate steps must be taken to prevent the loss of blood.

b. Bleeding may be controlled by the following methods:

1. Direct pressure. Application of pressure directly on the wound. Use of a sterile dressing is preferred. In an emergency, use any dressing or even the bare hand.

2. Indirect pressure or pressure points—Application of pressure on the arterial pressure points in the arm or leg. Pressure points may be combined with direct pressure to restrict severe bleeding.

3. Elevation—Loss of blood can be slowed by raising the wound above the level of the heart.

c. Shock is present in all cases of serious bleeding. Attention must be given to the prompt treatment for shock.

51-3 Shock

a. Shock usually occurs following a severe loss of blood or some type of serious injury. It can occur from a minor injury or even from anxiety or emotional stress. Regardless of the cause, the symptoms are the same and similar treatment is required.

b. Shock is easier to prevent than to cure. Every injured person is potentially a shock victim and should be treated as such, whether symptoms of shock are present or not.

c. Symptoms of shock are:

- Chalk-like appearance
- Dull or anxious expression
- Shallow breathing
- Weak, rapid pulse
- Cold, moist skin
d. Recommended treatment for shock is:

1. The patient should be kept warm and comfortable but not hot. In many cases, the only first aid measure necessary and possible is to cover the patient underneath as well as on top to prevent loss of body heat.

2. Keep the patient’s body horizontal or, if possible, position the patient so that their feet are at least 12 to 15 inches higher than their head. Always keep the patient’s head low. The single exception to this positioning is the case of a patient who obviously has an injury to the chest, and who has difficulty breathing. The patient should be kept horizontal with head slightly raised to make breathing easier.

3. Clear the patient’s mouth of all foreign bodies and make sure the patient is breathing properly.

4. Loosen tight clothing at the neck, the chest and the waist.

5. Proper transportation practice is never more imperative than in the case of a person who may develop shock. It constitutes the most important single measure in the prevention and treatment of shock. Use an ambulance, if possible. If other means must be used, follow the above instructions as closely as possible.

51-4  Eye Injuries

a. Foreign Bodies

1. When a small foreign body, such as dust or a wood flake, is on the eye or eyelid, moderate efforts may be made to remove it. The edge of a clean handkerchief or similar device may be used.

2. Objects imbedded in the eye must not be removed except by a physician. Both eyes of the injured should be bandaged loosely and the employee taken to the hospital immediately. The injured employee should be told to relax and try not to move their eyes.

b. Chemical burns—acid or caustic. Immediate irrigation of the eye with large quantities of clean water is mandatory whenever a chemical substance enters the eye. Flushing of the eye with running water should continue for 15 minutes.

c. All eye injury cases, regardless of first aid measures taken, should be taken to a physician to be checked and treated.

51-5  Burns and Scalds

Burns are usually the result of contact with dry heat, electricity, and chemicals; whereas scalds are usually the result of contact with hot solutions, hot vapors,
or steams. Electricity may cause burns either by current passing through the body or by an electric arc or flash.

a. Classification of Burns and Scalds

1. **First Degree** - Reddening of the skin.

2. **Second Degree** - The formation of blisters.

3. **Third and Fourth Degree** - Deeper destruction of tissue and possible involvement of bone.

b. Treatment - The first aider’s duties in the treatment of burns and scalds are to prevent infection and treat for shock, which should be done without delay.

1. Minor Burns - A burn in which the degree and size of the burned area is such that it does not require the immediate services of a doctor.
   
   a. Apply approved burn ointment to a sterile dressing and place directly over burn.
   
   b. Bandage in place, firmly but not too tightly.

2. Major Burns - A burn in which the degree and size of the burned area is such that it requires the immediate service of a physician.

   a. Apply a sterile dressing to the burn and cover the injured person with a blanket or other suitable material. Do not apply any ointment or medication.
   
   b. Treat for shock.
   
   c. Do not attempt to remove charred particles of clothing from the burned area.

3. Chemical Burns

   a. Wash immediately with large amounts of water to flush chemicals off clothing and body. For chemicals in the eyes refer to 51-4-b.
   
   b. Remove contaminated clothing.
   
   c. Treat burned area as directed in paragraph (b)(1) or (b)(2) above.
   
   d. Call for assistance when necessary.

51-6 **Heat Stroke or Heat Exhaustion**

   a. Heat stroke is a response to heat characterized by extremely high body temperature and disturbance of the sweating mechanism.
1. Symptoms- Headache, dizziness, nausea, and vomiting sometimes precede actual collapse. If at these signs the victim is withdrawn to a cooler location, the following more severe symptoms may never appear.

   a. Hot, dry skin; flushed face.
   b. Fast, strong pulse.
   c. Unconscious in severe cases.
   d. High body temperature.
   e. Pupils enlarged, but of equal size.

2. Treatment.

   a. Move the injured person to a cool, shady place.
   b. Elevate the head and shoulders slightly.
   c. Loosen or remove excess clothing.
   d. Apply cold pack to head.
   e. Cool the body by wrapping in wet sheet.
   f. Under no circumstances should a stimulant be given.
   g. Obtain medical attention.

b. Heat exhaustion is a result of over-exposure to excessive amounts of heat over a prolonged period of time resulting in loss of body salts.

1. Symptoms - Headache, dizziness, nausea and vomiting sometimes precede actual collapse. If at these signs the injured person is withdrawn to a cooler location, the following more severe symptoms may never appear.

   a. Pale face, cool, clammy skin, usually with perspiration around nose, mouth, and forehead.
   b. Rapid and weak pulse.
   c. Temperature about normal.
   d. Muscular weakness, sometimes producing cramps in the legs, arms, or abdomen.
   e. Breathing is shallow.
2. Treatment
   a. Remove injured person to circulating air.
   b. Keep injured person lying down, elevate feet. If conscious, give a liquid with electrolytes included.
   c. If the victim vomits, do not give any more fluids.
   d. Obtain medical attention.

51-7 Frostbite

Frostbite is the result of over-exposure to freezing temperatures.

1. Symptoms
   a. Skin feels intensely cold and numb.
   b. Skin is pale and glossy and white or grayish-yellow in appearance.
   c. Blisters may appear later.
   d. As time passes:
      1. Mental confusion, victim staggers.
      2. Eyesight fails.
      3. May become unconscious.
      4. Shock develops.
      5. Breathing may cease.

2. Treatment
   a. Cover frozen part.
   b. Bring victim indoors as soon as possible.
   c. Give victim a warm drink.
   d. Rewarm the part quickly in water at body temperature or by wrapping gently in blankets.

   CAUTION: Do not rub the part, apply heat lamps, hot water bottles, or place the part near a hot stove, or break blister.
   e. Obtain medical attention.

51-8 Bites and Stings

   a. Animal Bites (Including conditions in which human teeth may break the skin). In addition to the effects common to other wounds, some animal bites may cause rabies.
1. Treatment

   a. Wash the wound and surrounding tissue with soapy water to remove saliva.

   b. Apply an antiseptic to the wound and surrounding area.

   c. Apply a sterile dressing directly over the wound and bandage in place.

   d. Obtain medical attention.

b. Snake Bites – Poisonous

   1. Symptoms

      a. Rapid swelling.

      b. Rapid pulse, nausea and vomiting.

      c. Shortness of breath.

      d. Very painful.

   2. Treatment

      a. Keep the victim calm as possible, while keeping the injured part lower than the heart level.

      b. Get medical attention immediately.

      c. If a suction device is available, apply to the wound for approximately three minutes (do not make incisions) repeat as necessary.

      d. If professional medical care is delayed, wrap and elastic bandage’s snugly over the bitten area extending the bandage up the limb to the trunk. Immobilize the limb with a splint.

   3. Other Considerations

      a. If the bite is on the hand or arm, remove all jewelry from the affected area.

      b. Identifying the snake: If the snake can be killed without risk or delay, it should be brought, with care, to the hospital for identification.

      c. Do not apply ice or cold compresses.

      d. Do not give alcohol, sedatives, aspirin, or other medications.
e. Snakebite kit should be made available when working in snake-infested or primitive areas.

c. Black Widow Spider Bites. The adult female is glossy black to dark reddish-brown in color. On the underside of the abdomen is a crimson marking often resembling an hourglass. The adult male is grayish-black in color; and, in addition to the hourglass marking of the female; he is marked with grayish stripes across his back. He is much smaller than the female, is timid in nature, and is harmless.

a. Symptoms

1. Sharp pain at location of bite.
2. Burning sensation.
3. Swelling and redness at the point of bite.
4. Pain may develop in back, shoulders, chest and limbs.
5. Nausea, prostration and sweating may occur.
6. Painful cramps in abdominal muscles.
7. Difficulty in breathing and speaking.
8. Shock may develop.

b. Treatment

1. Keep injured person quiet, treat for shock.
2. Apply medicated insect swab contained in first aid kit and/or antiseptic.
3. Apply cold water or ice immediately, if obtainable.
4. Obtain medical attention.

d. Insects other than black widow spiders. There are a variety of insects that have biting or stinging mouth parts which may inject toxic materials into the skin. These conditions are usually of minor medical importance, causing temporary pain, irritation, and general discomfort. Infection may develop if the wound is not properly cared for.

a. Treatment

1. If stinger remains in wound, remove it.
2. Swab affected parts of the skin with medicated insect swab and gently rub into the skin, or apply antiseptic to the wound.
3. Do not scratch the wound.

4. Cover the wound with a Band-Aid.

5. Employees known to be particularly allergic to any insect venom should be seen by a physician without delay.

51-9 Transportation

a. Serious Injury

1. The improper handling of an injured person may cause additional injury or the complication of an existing injury. A person with serious injuries should be moved only if in danger of being further injured. The necessary first aid treatment should be rendered to the injured person at the scene of the accident until help is summoned. If help is delayed, transport by best method available.

2. Seriously injured persons should be moved on a stretcher or in lying-down position.

b. All persons with fractures or suspected fractures should be handled very carefully, fractures to the skull, neck, chest, spine, or other extremities require special care, request the services of a physician or emergency medical technician at the scene of the accident if available.

51-10 Poison Ivy

a. Prevention

1. If working in areas where poison ivy may be found, shirts with full-length sleeves should be worn, with sleeves rolled down and buttoned. Trouser cuffs should be fastened around the ankles. All exposed areas of the skin should have a film of approved protective ointment applied as a preventive measure.

2. An oral preventive is available and recommended for use by those working in areas where they can contact poison ivy. It should not be used for the treatment of poison ivy skin irritation. Also, it should not be taken while the skin is irritated due to poison ivy. To be effective, it must be taken in advance of exposure in accordance with instructions of the manufacturer.

3. Avoid breathing or contacting smoke of burning brush that may contain poison ivy.

4. Immediately after exposure, remove contaminated clothing and wash the affected areas thoroughly with soap and water, and apply approved medicated ointment. Care should be used in cleaning contaminated clothing to avoid reinfection.
b. Symptoms- Symptoms are most common within 12 to 24 hours after contact, although they may appear within a few hours or be delayed several days.

1. Red rash, inflammation and swelling.
2. Appearance of blisters.

c. Treatment

1. Wash affected skin area with soap and water.
2. Apply approved medicated ointment to area to reduce discomfort.
3. Avoid scratching affected area.
4. In severe cases, obtain medical attention.

51-11 Pole Top Rescue

Electric contacts may occur at elevated locations. When such a contact does happen, immediate rescue efforts are necessary.

Rescue operations will vary, depending upon the situation. The information in this section is intended to serve only as a guide.

Preplanning for a possible emergency is important. Prompt action by fellow employees is essential in effecting rescue operations.

a. Size up the situation. The rescue effort will be far more effective if a few seconds are devoted to full identification of the situation.

b. Prepare the equipment you will need.

c. Protect yourself. Apply necessary protective equipment. Use necessary personal protective devices. Then clear the victim from the hazards.

d. Position yourself for rescue.

e. Proceed with rescue or resuscitation as dictated by the conditions.

1. If victim is conscious:
   a. Reassure the injured.
   b. Be watchful for shock.
   c. Help injured descend the pole.
   d. Administer first aid.
2. If victim is unconscious and breathing:
   a. Watch breathing closely.
   b. Lower injured to ground.
   c. Give first aid.
   d. Summon medical assistance.

3. If victim is unconscious and not breathing,
   a. Get the victim to the ground as quickly as possible so proper CPR can be administered. In addition all rescue procedures are required to be practiced or trained on annually.
   b. Lower the victim as quickly and safely as possible.
   f. Lowering victim from the pole.

1. For field expediency, the following method is suggested.
   a. Place handline on crossarm, preferably 2 or 3 feet from pole.
   b. Make one wrap of line. Do not cross load line over fall line.
   c. Pass handline under armpits.
   d. Tie three (3) half hitches or a bowline knot.
   e. Cinch line tightly around victim.
   f. Remove slack in line.
   g. Cut victims safety.
   h. Lower victim.

2. Depending upon the situation, alternate hitching or lowering methods might be more desirable.
PART V
SECTION 2
ARTIFICIAL RESUSCITATION

Introduction

The information given in this section is not intended as instruction for the administration of artificial resuscitation. Such treatment should be given only by persons who are properly trained and qualified. The following is a reminder to those persons of the points to be followed. If not administrated properly, external heart compressions may result in other serious injuries.

52-1 General

a. When a person stops breathing – quick actions are needed. Start at once to give artificial respiration. First remove any foreign matter from the mouth, and then maintain an open airway by tilting the head backwards and lifting the jaw upward.

The most effective method of artificial respiration is mouth-to-mouth, mouth-to-nose, or mouth-to-stoma.

52-2 Mouth-To-Mouth (Nose) Method

a. Place victim on his back. Open airway by tilting the head back maintaining this position with one hand on the forehead. Use the other hand to lift the jaw. This position must be maintained throughout resuscitation period to prevent the tongue from blocking air passage. Pinch victims nose shut with thumb and forefinger.

NOTE: If unable to perform Mouth-to-Mouth breathing, the Mouth-to-Nose technique should be used. To do so, keep the patient’s head tilted back with one hand on the forehead. Use the other hand to lift the jaw and close the mouth. Take a deep breath, seal our lips around the patient’s nose, and blow into the nostrils. Remove your mouth so that the patient may exhale. It may be necessary to open the patient’s mouth so that he can exhale.

Mouth-to-Stoma breathing must be used on a patient who has had his larynx removed. In this instance, ventilation is performed through the stoma, which is an opening at the front base of the neck. The rescuer’s mouth is sealed around the stoma and air is blown in until the patient’s chest rises. Remove your mouth and allow the patient to exhale. The head should be kept straight, with the neck level. Extending the neck may change the shape of the stoma and block the opening.

b. Give two (2) slow breaths. One and a half (1-1/2) to two (2) seconds each allowing the victim to exhale.
NOTE: If air cannot be blown in, check position of victim’s head and jaw and re-check mouth for obstructions, then try again to ventilate.

52-3  **External Heart Compression**

The information given in this section is not intended as instruction for the administration of external heart compression. Only persons who are properly trained and qualified should give such treatment. The following is a reminder to those persons of the points to be followed. If not administered properly, external heart compression may result in other serious injuries.

NOTE: PERFORM HEART COMPRESSIONS ONLY WHEN THE VICTIM HAS NO PULSE. Heart compression is always accompanied by rescue breathing.

a. Place the victim on their back on a firm surface.

b. To find the proper hand placement on the patient’s lower sternum. Trace the margin of the victim’s rib cage to the notch where the ribs meet the lower sternum. Place the heel of one hand on the lower half of the sternum and the other hand is placed on top.

c. Press downward. Apply pressure until breastbone moves a minimum of 2 inches for an Adult.

d. Lift hands and permit chest to return to normal.

e. Give thirty (30) compressions to two (2) breaths (this is one (1) cycle). Chest compressions must be given at the rate of 80 to 100 per minute. Check for pulse and breathing every five (5) cycles.

f. Continue giving heart compressions until medical personnel arrives or until victim shows signs of life.

g. If AED and a trained person is available it should be utilized.
ADDENDUM II
HANDLING LEAD CABLE

Working with lead is regulated by Federal OSHA procedures. These safe-working practices must be adhered to.

1. Work gloves and coveralls are required when handling the lead sheathed cable. Keep gloves away from face and mouth. DO NOT handle food, beverages or smoking material with gloves on. DO NOT wipe face with gloves or sleeves. DO NOT use handkerchief with gloves on.

2. Before eating, drinking or smoking, remove gloves and coveralls, then clean hands thoroughly with waterless hand cleaner. Wipe off hand cleaner and deposit rags in specially labeled waste container. Store gloves and coveralls in specially designated containers when not in use. Clean hands at the end of the workday.

3. DO NOT create lead dust. DO NOT saw, file or strip lead jacket. Cut lead only using a shear. Apply a 6” strip of tape over area to be cut. Position shear in the middle of tape. Immediately install heat shrink end caps to each end after cutting. When pulling lead cable make sure jacket does not become snagged. Line edge of manhole cover with carpet. Protect any other edges as well. Try to limit cutting the cable to inside a manhole.

4. Prior to entering manhole, allow cover to be off for five minutes. Test oxygen level in manhole before entry. Set up and activate ventilation system prior to and throughout any operation in a manhole.

5. Before beginning any work in any manhole, cover entire floor with plastic sheet. Anchor in place with heavy objects such as sandbags. DO NOT remove this protection until all work is completed. When floor covering is to be removed take care to leave any droppings contained in plastic. DO NOT spill. Deposit plastic in lead scrap container. If cutting cable outside a manhole, place a ground cover underneath the cable at the point of cutting. Dispose of cover in the lead scrap container.

6. The employer shall institute a medical surveillance program for all employees who are or may be exposed to lead to comply with the requirements of 1910.1025 or 1926.62 OSHA Standards.

7. From time to time you may be fitted with a personal air monitor to record the lead content in the atmosphere around you. DO NOT attempt to bypass it. DO NOT handle it. DO NOT bring your gloves, coveralls, rags or any other item that has contacted the cable in proximity to it. If it is attached to your coveralls, leave monitor exposed to the air when removing coveralls. DO NOT ball up coveralls with monitor inside it.

8. Once lead cable has been removed from the duct, pulling lubricant will be used when the new cable is being installed in these ducts. Treat this lubricant as if it were lead cable. Wipe all excess lubricant from cables.
with rags. Be sure you are wearing gloves, coveralls and the manhole floor is covered. DO NOT allow gloves, coveralls or rags to come in contact with face or skin. Deposit all rags in the special waste container.

9. When the new cable has been installed and wiped clean it may then be handled in a conventional manner. At this time the plastic manhole floor protection can be removed and disposed of properly. All subsequent work in the manhole requires that use of the ventilation blower and air testing prior to entering.
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Northeastern Line - Constructors Chapter, N.E.C.A.
and
IBEW-LOCAL UNION #42
IBEW-LOCAL UNION #104
IBEW-LOCAL UNION #126
IBEW-LOCAL UNION #351/456
IBEW-LOCAL UNION #1049
IBEW-LOCAL UNION #1249
IBEW-LOCAL UNION #1319

Penn - Del - Jersey Chapter N.E.C.A.
and
IBEW Local Union #126