

Euco N.S." Euclid Chemical Co. Masterflow 713; Master Builders Five Star Grout; U.S. Grout Corp. Upcon; Upco Chem. Div., USM Corp. Propak; Protex Industries, Inc.

2. Epoxy or Polyester Resin Grouts may be used, subject to submission of acceptable product information and test data.

### PART 3 EXECUTION

#### A. GENERAL

1. Comply with the manufacturer's recommendations for the use of the grouts.

END OF SECTION

V.

TECHNICAL SPECIFICATIONS

SECTION 04200

UNIT MASONRY

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions (if any) and Division-1 Specification Sections, apply to work of this Section.

1.02 DESCRIPTION OF WORK

- A. Extent of masonry work is indicated on the Drawings.

1.03 SUBMITTALS

- A. Product data: Submit manufacturer's product data for each type of masonry unit and other manufactured products, including certifications that each type complies with specified requirements.

1.04 JOB CONDITIONS

- A. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
- B. Protect sills, ledges and projections from droppings of mortar.
- C. Cold Weather Protection:
  - 1. Do not lay masonry units which are frozen.
  - 2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
  - 3. Remove all masonry determined to be frozen or damaged by freezing conditions.

4. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation.
- 40 degrees F to 32 degrees F:
- Mortar: Heat mixing water to produce mortar temperature between 40 degrees F and 120 degrees F.
- 32 degrees F to 25 degrees F:
- Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F and 120 degrees F; maintain temperature of mortar on boards above freezing.
- 25 degrees F to 20 degrees F:
- Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F and 120 degrees F; maintain temperature of mortar on boards above freezing.
- Heat both sides of walls under construction using portable gas heaters vented to the outside and temporary shelters approved by the Owner.
- Use windbreaks or enclosures when wind is in excess of 15 mph.
- 20 degrees F and below:
- Mortar: Heat mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
- Masonry Units: Heat masonry units so that they are above 20 degrees at time of laying.
- Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 degrees F for 24 hours after laying units.

1.05 DELIVERY AND STORAGE

- A. All materials shall be delivered to the job site and stored until ready for use.
- B. All mortar mix shall be delivered to the job site in unbroken bags, in good condition, and in full weight. Damaged or fractional bags will be rejected. Immediately upon receipt, all mortar mix shall be stored in a watertight and properly ventilated structure. Reinforcement shall be stored off the ground to prevent distortion.

PART 2 PRODUCTS

2.01 MASONRY UNITS, GENERAL

- A. Manufacturer: Obtain masonry units from one manufacturer, properly cured, of uniform texture and color for each kind required, for each continuous area and visually related areas.
- B. Masonry Unit Characteristics: Provide units complying with standards referenced and requirements indicated.

2.02 CONCRETE MASONRY UNITS (CMU)

- A. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" (15-5/8" x 7-5/8" actual), unless otherwise indicated.
- B. Special Shapes: Provide where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.
- C. Hollow Load-Bearing (HL CMU): ASTM C 90 where shown as "HL-CMU" and as follows:
  - Grade N
- D. Weight Classification: Normal weight units unless otherwise indicated. (125 lbs. per cu. ft. or more, oven dry weight of concrete).
- E. Exposed Faces: Provide manufacturer's standard color and texture, unless otherwise indicated.

2.03 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I, except Type III may be used for cold weather construction.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Aggregates: ASTM C 144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.
- D. Water: Clean and potable.

2.04 MASONRY REINFORCEMENT

- A. "Duro-O-Wal" or approved equal, standard duty, with #9 gauge pencil rod and #9 gauge cross rods.
- B. Reinforcing bars shall be ASTM A 615, Grade 60.

2.05 MASONRY INSULATION

- A. Zonolite Masonry Insulation as manufactured by W. R. Grace & Co. or equal.

2.06 MORTAR MIXES

- A. Do not lower the freezing point of mortar by use of admixtures or anti-freeze agents.
  - Do not use calcium chloride in mortar.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specifications, for types of mortar required, unless otherwise indicated.
- C. Use Type N Mortar for exterior, above grade loadbearing and non-load bearing walls; for interior loadbearing walls; and for other applications where another type is not indicated.

2.07 MIXING

- A. All mortars shall be machine mixed.
- B. No mortars that have stood more than one hour after mixing shall be used.

## PART 3 EXECUTION

### 3.01 INSTALLATION, GENERAL

- A. Thickness: Build masonry construction to the full thickness shown, except, build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness shown or specified.
- B. Cut masonry units with motor-driven saw designed to cut masonry with clean sharp unchipped edges. Cut units as required to provide pattern shown and to fit adjoining work neatly. Use full units without cutting wherever possible. Use dry cutting saws to cut concrete masonry units.
- C. Do not wet concrete masonry units.
- D. Match coursing, bonding, color, and texture of new masonry work with existing work, where indicated.
- E. Layout walls in advance for accurate spacing of surface bond patterns, with uniform joint widths and to properly locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half size units at corners, jambs and wherever possible at other locations.
- F. Lay-up walls plumb and with courses level, accurately spaced and coordinated with other work.
- G. Built-In Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.
  - 1. Fill space between hollow metal frames and masonry solidly with mortar.
  - 2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
  - 3. Fill CMU cores with grout 3 courses (24") under bearing plates, beams, lintels, posts and similar conditions unless otherwise indicated.
- H. Reinforcing: Install reinforcing every second course in concrete block walls as shown. Extra wall reinforcing shall be provided over door lintels and other openings. Block walls over the above openings shall be reinforced every block course for a number of courses equal to one half the width of the

opening for wide openings and for four (4) block courses for narrow openings, such as windows. Extra reinforcing shall be extended beyond the face of the openings a distance equal to one half of the opening dimension for wide openings and a distance of 1'-6" for narrow openings.

### 3.02 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells; also bed webs in mortar in starting course on footings and foundation walls and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or to be filled with concrete or grout. For starting courses on footings where cells are not grouted, spread out full mortar bed including areas under cells.
- B. Joints: Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not otherwise indicated, lay walls with 3/8" joints. Cut joints flush for masonry walls, which are to be concealed or to be covered by other materials. Tool exposed joints slightly concave using a jointer larger than joint thickness. Rake out mortar in preparation for application of caulking or sealants where shown.
- C. Joints between existing and new masonry shall be laid out and constructed as shown on the drawings.
- D. Remove masonry units disturbed after laying; clean and relay in fresh mortar. Do not pound corners at jambs to fit stretcher units, which have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.

### 3.03 LINTELS

- A. Install loose lintels of steel and other materials where shown.
- B. Provide masonry lintels where shown and wherever openings of more than 1'-0" are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Thoroughly cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.
  1. For hollow concrete masonry unit walls, use specially formed "U"-shaped lintel units with reinforcing bars placed as shown and filled with grout of consistency required to completely fill space between reinforcing bars and masonry unit.
- C. Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

3.04 REPAIR, PAINTING, AND CLEANING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints at corners, openings and adjacent work to provide a neat, uniform appearance, properly prepared for application of caulking or sealant compounds.
- C. Clean exposed CMU masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings. Comply with recommendations in NCMA TEK Bulletin No. 28.

3.05 WATERPROOFING

- A. Waterproofing of concrete block shall conform to finishes in Section 09000 of the Specification.

END OF SECTION



## TECHNICAL SPECIFICATIONS

### SECTION 16000

#### ELECTRICAL

##### PART 1 GENERAL

###### 1.01 DESCRIPTION OF WORK

- A. The contractor will install all electrical conduit and grounding work as indicated on the contract drawings. The Contractor shall provide all required excavation, backfilling and compaction for the completion of this work.
- B. The Contractor shall coordinate the installation of embedded grounding and conduit materials in foundations with all other embedded foundation materials including piles and concrete reinforcement. Before placement of concrete, the Owner's Project Manager shall conduct inspection and verification for correctly dimensioned placement of all embedded electrical materials.

###### 1.02 RELATED SECTIONS

- A. Section 02200 – Earthwork
- B. Section 03310 - Concrete

###### 1.03 MATERIAL STORAGE

- A. All materials furnished by the Owner shall be delivered to the jobsite by the Owner. The Contractor shall transport all materials from the delivery point to storage and/or installed location. It shall be the Contractor's responsibility for storage and safekeeping. Any shortages or damage of supplied material shall be replaced by the Contractor at no cost to the Owner.

##### PART 2 PRODUCTS

###### 2.01 MATERIALS

- A. All copper ground wire, ground rods, and compression ground connectors for the ground grid and substation fence will be furnished by the Owner.
- B. All Cadweld, exothermic connectors shall be furnished by the Contractor.
- C. The Contractor shall furnish all PVC and galvanized steel conduit with associated fittings.

## 2.02 MATERIAL STANDARDS

- A. Materials, equipment or devices installed without specific approval for the substitution shall be replaced with specified items, at the direction of the Owner, and at no additional cost to the Owner.
- B. Defective equipment, or equipment damaged in the course of installation or testing, shall be replaced or repaired in a manner approved by the Owner, and at no additional cost to the Owner.

## PART 3 EXECUTION

### 3.01 GROUNDING

- A. Excavate for and backfill grounding materials in accordance with the project drawings and CMP Substation Standards.

### 3.02 UNDERGROUND CONDUIT – DIRECT BURY

- A. Excavate for and backfill conduit materials in accordance with the project drawings. Prepare sand beds for conduits at depths and locations indicated on Project Drawings. Provide 4” min. sand cover all around conduits.

### 3.03 CONCRETE ENCASED DUCT BANK

- A. Excavate for duct banks in accordance with the project drawings. Prepare level base in undisturbed bearing soil for concrete. Use caution during concrete placement to prevent conduct displacement. Backfill concrete duct bank with gravel fill.

END OF SECTION



**Central Maine Power Company  
Working Rules for Contractors**

REVISED 01/28/03

**CONTENTS**

- A. Prohibitive Conduct
- B. General Rules
- C. Control of Contractor Tools, Equipment and Materials
- D. Safety Instructions - General
- E. Safety Instructions - Transmission and Distribution
  - 1. Appendix A - Loop Grounding Diagrams
  - 2. Appendix B - Helicopter Wire Stringing Operations
- F. Safety Instructions - Substations
- G. Contractor Sign-Off Sheet

Any questions about these subjects should be directed by the job supervisor to the appropriate CMP Co. management individual.

These rules apply to all contract workers regardless of their gender. Any reference made to he or she, his or hers, him or her in these rules shall include all workers.

The basic working rules for all contractors working at Central Maine Power Company locations are covered by these instructions. They will be expected to be familiar with the rules and to abide by them. Violation of these rules may subject the contractor and/or his workers to be discharged from the premises. The contractor shall keep a copy of these rules on the job site.

These instructions can only be superseded or amended by an official bulletin, properly signed and posted. However, in case of emergency, a superintendent or supervisor having jurisdiction over persons in danger, may modify or suspend any of these instructions as may be considered temporarily necessary to permit proper handling of this specific emergency. In this case it shall be the responsibility of the superintendent or supervisor to see that any work carried out under such suspension of instructions be performed in a safe manner.

**A. PROHIBITIVE CONDUCT**

It is expected that all contractor personnel will comply with all rules set forth by CMP Co. Violation of the following prohibitive conduct rules may result in immediate dismissal from the site.

1. The possession or drinking of alcohol on any CMP Co. properties (this includes parking lots).
2. The suspected use of any substances which alter mental or physical capacity including, but not limited to non-prescription drugs, narcotic, marijuana or other "controlled substance" or "controlled dangerous substance" on the plant or station property.
3. Stealing.
4. Intentional damage including graffiti on CMP Co. property.
5. Possession of firearms on CMP Co. property/private vehicles.
6. Sleeping during work hours.
7. Engaging in fighting or horseplay.
8. Failure to use other than designated sanitary facilities.
9. Gambling.
10. Operating switches, valves, or push buttons unless authorized by CMP Co. personnel.

## **B. GENERAL RULES**

It is required that all contractor personnel will comply with these General Rules.

1. Appropriately worn, approved hard hats (class B), safety glasses and safety footwear are to be worn by all contract personnel at all times inside all facilities and construction locations, unless circumstances are such that the immediate CMP Co. supervisor gives permission not to wear them.
2. Flame retardant clothing shall be worn at all times when doing hot line work if the worker is within the minimum approach distance as specified in CMP's Accident Prevention Manual.
3. When using ATV's, DOT approved helmets shall be required. Hard hats are not to be substituted.
4. CMP Co. telephones are not to be used for personal outgoing calls. Incoming calls will be limited to emergencies.

5. Contractor personnel shall stay in assigned work area unless on an errand. This means no wandering around facilities.
6. Use of smoking materials will only be permitted in areas specifically designated as smoking areas.
7. Lunch breaks and coffee breaks - contractor personnel are to use contractor trailers or pre-established areas.
8. Reading materials which are not project related will not be allowed on site.
9. Contractor personnel are required to furnish their own coveralls, gloves, safety glasses, hard hats, and other clothing and safety equipment for jobs.
10. Any vendor/contractor desiring use of facilities shall request service through the most immediate CMP Co. supervisor.
11. In case of personal injury, property damage or any unusual circumstance, a CMP Co. supervisor shall be contacted immediately.
12. All independent contractors working for CMP shall comply with all Federal, State and Company safety regulations. The Company's authorized representative in charge of contractor's work may order work stopped immediately if the work is not being carried out in accordance with these instructions.

### **C. CONTROL OF CONTRACTOR TOOLS, EQUIPMENT AND MATERIALS**

Contractors must maintain inventory control over their own equipment and tools brought to the job site. CMP Co. will not be responsible for lost or stolen equipment or tools.

"When working near exposed energized conductors or circuit parts, each worker shall use insulated tools or handling equipment if the tools or handling equipment might make contact with such conductors or parts. If the insulating capability of insulated tools or handling equipment is subject to damage, the insulating material shall be protected."

All contractors must have identified their equipment and tools brought to the job site with other than a paint color, i.e., stamped, etched or tagged.

### **D. SAFETY INSTRUCTIONS - GENERAL**

These instructions apply to all workers of outside contractors employed to perform work on Central Maine Power Company property. These instructions are an abridged version of the CMP Co. Accident Prevention Manual and are intended for use at all CMP Co. locations.

These instructions do not relieve the contractor from complying with applicable Federal, State and local laws and regulations.

The contractor shall enforce all State, Federal, and Central Maine Power Company Safety Requirements.

### **Inspection and Maintenance of Equipment and Working Place**

It should be understood that the CMP Co. supervisor has authority, after proper inspection, to prohibit the use of any tools, protective devices and other equipment, regardless of ownership, which are considered unsafe. This includes clothing of flammable material such as acetate, nylon, polyester and rayon.

All broken or defective tools must be removed from service immediately and reported promptly so that they may be repaired or replaced.

All ropes, cables, chains, hoists, blocks, slings and related rigging equipment shall be inspected each day before use and again before returned to storage. All equipment found to be unsafe will be removed from service immediately for repair or replacement.

All slings shall be stored such that damage and/or kinking is prevented. Where practicable slings should be hung from suitable pegs.

Crane, hoist or boom equipment operators shall accept signals only from a previously designated signal person. No response shall be made to unclear signals. All crew members engaged in rigging shall be trained in the use of proper hand signals.

Tools and materials shall not be thrown up to workers on elevated structures and shall not be thrown to the ground by the workers. They shall be raised or lowered by means of hand lines or in material bags.

When tools or materials are being raised or lowered, workers shall stand clear at all times and they shall avoid coming directly under any load until it is properly placed and secured.

The smallest possible quantity of oil, gasoline and other flammable liquids shall be kept in buildings other than separate oil houses. In all cases, gasoline and other flammable liquids shall be kept in containers approved by the Underwriters Laboratories. The use of gasoline as a cleaning solvent is prohibited. In determining which solvent to use for cleaning operations, factors such as possible health hazards, personal protective equipment required and permissible exposure limits shall be considered.

Trenching and excavating projects (especially in public ways) shall be properly protected by barriers, warning signs, flags, cones and/or lighting so as to be conspicuous to pedestrians and vehicular traffic by day or by night.

Workers must inspect the general area where welding or flame cutting is to take place prior to the start of the job to ensure that there are no flammable materials present. Fire fighting equipment shall be in a stand-by condition at the site of the welding. Welding or flame cutting operations must be shielded to protect workers in the same area from flash and sparks. An additional worker must inspect the area during work and for one half hour after work for falling sparks and fire.

### **Selection, Observation and Instruction of Workers**

The supervisor shall ensure that the workers are qualified physically, mentally, and by training to perform safely the work assigned to them.

The supervisor shall ensure that workers are trained in and familiar with the safety related work practices, safety procedures, and other safety requirements in this manual that pertain to their respective job assignments. Workers shall also be trained in and familiar with any other safety practices, including applicable emergency procedures (such as pole top and manhole rescue, etc.) that are related to their work and are necessary for their safety. All training shall be documented.

The supervisor shall ensure that workers working on or with energized lines and equipment at 50 volts or more are trained in CPR/first aid within the first 3 months of hire to ensure 4 minute response and maintain certification. The supervisor shall instruct all workers to report accidents and obtain first aid treatment for injuries immediately.

The supervisor shall, on an annual basis, inspect and document the knowledge of safety rules and practices of their workers.

The worker in charge of a project shall thoroughly explain the details of the job and possible hazards to all crew members before work begins. The worker in charge shall conduct at least one job briefing with workers 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. A worker working alone need not conduct a job briefing. However, the employer shall ensure that the tasks to be performed are planned as if a briefing were required.

Employees shall be trained in and familiar with the safety related work practices, safety procedures and other safety requirements that pertain to their respective job respective job assignments. Compliance to safety related work practices shall be ongoing through supervision, inspections, revised safety instructions, and follow-up training on at least an annual basis. All training and annual inspections shall be documented

If any workers are observed not following the safety instructions or the rules as outlined in this document, the observing party shall immediately notify that worker's supervisor, and document the violation of the rule. The workers should be given the proper training to ensure that he/she follows safety rules in the future.



### **Insufficient Safeguards**

In any case where a worker is called upon to do work which the worker considers dangerous and not protected with sufficient safeguards, or if in doubt as to the proper performance of the work, it shall be the workers duty to bring the matter to the attention of his supervisor before proceeding with the work.

### **Hearing Protection**

Approved hearing protection shall be worn when 8 hour time-weighted average noise levels exceed 85 DBA.

Workers shall be warned of the hazard by clearly worded signs located at entrances to or perimeter to high noise areas exceeding 85 Db. Hearing protection is also recommended to be worn by any worker exposed to noise which seems excessive to them.

Approved lapel speakers can be used in conjunction with a two-way portable radio by workers during the performance of their duties when the noise level in or around the work area makes it difficult to hear the transmission from a portable two-way radio. Portable radios and lapel speakers shall not be taken in areas where energized hazards exist.

### **Hand Protection**

Suitable gloves shall be worn at all times by those handling sharp and rough materials, cables, ropes, etc. Appropriate gloves shall be used when handling chemicals.

### **Eye Protection**

All contractors will be responsible for providing their workers with safety glasses. The safety glasses shall be equipped and worn with side shields.

Safety glasses are not intended to take the place of goggles, full face shields or welding helmets. Approved goggles, full face shields or welding helmets shall be used when chipping, chiseling, grinding, welding or doing any other kind of work in which the eyes are exposed to flying objects or particles, splashing liquids or harmful intensities of light. Cracked or broken eyewear shall be replaced as soon as noticed.

### **Respiratory Protection**

Respiratory protection shall be provided and used in accordance with CMP's Respiratory Protection Policy when work requires exposure to harmful concentrations of dust, fog, fumes, mists, gases, sprays, vapors, etc.

### **Portable Ladders/Fixed Ladders**

Only approved wood or fiberglass ladders will be used around electrical equipment. Defective ladders shall be so tagged and removed from service.

Ladders must be equipped with approved safety feet, but; regardless of this, when used on cement, tile or iron floors or other smooth or slippery surfaces, they shall be held by another worker or firmly lashed (this does not necessarily apply to stepladders). Where practicable, the top of the ladder shall be lashed to prevent side slip.

Care shall be taken that stepladders are fully opened out with braces in place before stepping on them. Tools and other materials shall not be left on the steps of ladders.

Workers shall not carry anything on a ladder which will interfere with sufficient use of the hands for holding on to the ladder and they shall grasp the sides rather than the rungs of the ladder. Workers shall not slide down ladders and shall always face the ladder when ascending or descending.

The foot of a ladder should not be placed less than one-quarter of its length nor more than one-third of its length from the wall or vertical surface against which the top is leaned unless lashed or otherwise secured. When on ladders, workers shall avoid leaning or reaching too far to the side.

When the total climb on fixed ladders equals or exceeds 20 feet, the ladder shall be equipped with a fall protection device, except where the use of the same constitutes a special hazard. This device shall be designed and used in such a way so as not to allow the employee to free fall more than 2 feet.

Ladders painted with non-transparent paint or reinforced longitudinally with metal shall not be used. They should be coated with oil, shellac or insulating varnish which does not conceal defects which may develop.

All staging used on the site will comply with applicable OSHA standards (e.g. height of rails, toe boards, securing of lifts, and securing at proper height intervals).

### **Electrical**

Electrical extension lights shall be so constructed and maintained that the user will not be exposed to contact with current carrying parts. Lamp guards, insulated from current carrying parts, shall always be used. There points are of special importance when using lights in boilers, water wheels on or near other grounded objects. In the case of portable or vehicle mounted generators, the non current carrying metal parts shall be bonded to the generator frame or bonded to the vehicle frame.

All portable powered hand tools shall be equipped with a three-wire cord having the ground wire permanently connected to the tool frame and means for grounding the other end; or be of the double insulated type and permanently labeled as "Double Insulated".

The use of matches or open flame lights for illumination is forbidden. Only approved flashlights or extension lights shall be used.

### **Housekeeping/Fire Prevention**

The contractor's supervisor is held responsible for general housekeeping conditions in and around the work of which he is in charge.

Spilled oil or other material, which might cause falls, must be promptly cleaned up and absorptive material applied if needed.

All workers shall be given thorough instructions in the use of fire extinguishers, protective equipment and also fire fighting and prevention procedures that apply to the worker's assignment. Contractors on site shall receive periodic reviews and updates of CMP's policy regarding fire protection.

### **Clothing, Footwear and Metal Articles**

Smooth footwear or slippery soled footwear is not to be worn.

Sneakers, canvas shoes or light weight shoes will not be permitted for construction, production, maintenance or warehouse operations.

Footwear with spark producing surfaces, or with metal cleats, nails or inserts attached to the sole or heel are not to be worn in or around flammable areas.

Footwear with steel toes or equivalent shall be worn by workers while doing ground work, patrolling, climbing or working aloft shall meet the specifications of the ANSI Z41 standard.

Protective footwear shall be worn when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards. The employer shall train each worker who is exposed to the hazards of flames or electric arcs in the hazards involved.

Flame retardant clothing shall be worn by contractors when exposed to electrical hazards such as working on energized lines or equipment. ("Working on" applies to handling, connecting or disconnecting of energized parts without the use of special tools and equipment). ("Exposed to" is defined as being in the work area within reaching distance of where work is being performed). For further explanation, reference OSHA 1910.269 (D)(6)(iii). Workers that perform work within reaching distance of energized parts shall not wear conductive articles such as key or watch chains, rings, wrist bands and necklaces, unless such articles do not increase the hazards associated with energized parts.

Shirts shall be worn at all times.

At all times where hazards may exist, such as working on or within reaching distance of energized equipment or lines, workers shall wear shirts or garments which extend below the elbow so that no skin is exposed at any time. While climbing poles or structures, workers shall wear long sleeved garments with the sleeves rolled down and shall avoid loose or floppy clothing.

### **Industrial Bottled Gas**

All workers involved in handling and/or using industrial bottled gas shall be instructed in its proper handling, moving, storage, installation and use.

All gas cylinders shall be secured while in storage, in transport and while in use. The valve protective cap shall always be in place except while using gas. Gas cylinders shall be stored and used in a vertical position.

### **Working Near or Over Water**

Workers working over or near water, where the danger of drowning exists, shall wear a U. S. Coast Guard approved life jacket or buoyant work vest and the jacket or vest shall be zipped or securely fastened while in use.

Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

### **Chemical Substances/Labeling**

Central Maine Power Company requires all contractors to submit to the Company facility using their service, the MSDS for all hazardous materials to be used on the job. This must be done prior to the delivery of the hazardous materials to any CMP Co. location. Contractors must follow CMP Co. hazardous chemical labeling procedures.

To provide a safe working environment CMP Co. must supply contractors who are working at CMP Co. locations where a hazardous material is used or stored, copies of the following:

- a) the hazardous chemical labeling procedure.
- b) the location of the Material Safety Data Sheets.
- c) list of hazardous chemicals at the work location.

All contractors must ensure that their workers are trained and in compliance with CMP Co.'s Chemical Substance/Labeling policies and procedures.

### **Hazardous Waste**

All contractors are responsible for the removal and proper disposal of all the hazardous wastes they generate. Disposal shall be in accordance with Federal and State laws and regulations.

### **Confined/Enclosed Space Entry**

All workers required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazard involved, the necessary precautions to be taken and in the use of protection and emergency equipment required.

All contractors will be provided with CMP Co.'s Confined Space Entry Policy and the work location confined space procedure and ensure that their workers are trained and in compliance with these policies.

### **Protecting the Public**

During construction work, reasonable care must be taken to protect people and property. When trucks are parked along streets and highways, appropriate advance warning shall be displayed. Pedestrians and vehicles shall be kept away from locations where wires, street lamps or other equipment are apt to fall.

Vehicles shall utilize wheel chocks when parked on an incline.

In all cases where trenches or holes are left open, they must be properly barricaded and at night must also be provided with a sufficient number of warning lights.

Pole holes and obstructions along highways and other frequented places shall be protected by suitable guards, or danger signs, appropriately lighted at night so located as to be visible to traffic.

When workers are hoisting or lowering materials above places where there is frequent traffic, rope barriers with danger signs shall be so placed that traffic cannot come within the danger zone.

### **Protecting Traffic**

When stringing wires, they must not be allowed to sag in such a manner as to endanger vehicles or pedestrians below unless traffic is intercepted and protected from danger by an observer or other adequate means.

"Utility Work Ahead" signs shall be placed on both sides of a work area along or across all traveled ways. Traffic cones shall be used in conjunction with approved signs to control traffic flow and provide a safe working area for workers. The distance of signs away from the work and the placement of cones shall be governed by the nature and

speed of normal traffic and contour of the road. When work is completed, all signs and devices shall be removed.

### **Rubber Protective Equipment and Devices**

Protective equipment and devices, provided to make the work less hazardous, shall always be used but entire reliance must not be placed on them as any protective equipment or device may become defective. Such equipment or devices shall be examined before use to make sure they are suitable and in good condition.

Workers working on energized conductors shall cover all conductors, exposed ground wires, guys and grounded equipment, with which contact may be made while at work, with rubber line hose, insulator hoods, line guards, line-duc, blankets or other approved protective devices.

### **Safety Belts and Harnesses**

No worker shall work on poles or other elevated structures unless fully qualified. Transferring from an aerial lift to a wooden structure shall not be allowed. Workers shall be secured in position by an approved safety belt except where the use of same constitutes a special hazard.

Before a worker's weight is trusted to the belt, the worker shall make sure that the snaps are properly caught in the "D" rings and that the worker is secure in the belt. Care must be taken to prevent the snaps coming in contact with anything that may open the snap and thus release the safety belt. The tongue of the snap on the safety belt must face away from the body.

Safety straps must not be attached to insulator pins, crossarm braces or around crossarms beyond the outside pin.

Neither end of the belt shall be allowed to hang loose either in ascending or descending a pole or structure. Both ends of the safety belt must be fastened to the "D" ring. An approved body harness and shock absorbing lanyard (maximum 6') and attachment shall be required for any work from an aerial basket.

The use of an approved, small material bag attached to the belt is recommended.

### **Inspection of Climbing Equipment**

Body belts, harnesses, safety straps, climbers and other equipment, including any tools owned by the workers and used on CMP Co. work, must be inspected by the worker before and after each use. The use of defective tools and equipment is prohibited.

Climber gaffs must be at least one and one-eighth inches long (inner surface) and kept sharp. The climbers must fit properly and the straps and pads must be in good condition.

Climbers must not be worn on work for which they are not required nor while workers are traveling to and from work. They shall not be worn while upon the roofs of buildings, when erecting or removing poles or for climbing shade trees.

### **Compressed Air, Use of**

Compressed air used for cleaning purposes shall not exceed 30 PSI when the nozzle end is obstructed or dead ended where blowback can occur, and then only with effective chip guarding and personal protective equipment.

Workers using compressed air for cleaning purposes shall use proper eye, hand, and when necessary, respirator protection.

### **Chain Saws**

Extreme caution must be used when operating any type of chain saw.

Before operating a gasoline powered chain saw, the operator shall ensure that:

- all handles and guards are in place and tight
- all controls function properly
- approved eye protection and leg protection is worn
- hearing protection is worn if operating saws more than a few minutes
- the saw is equipped with an operating chain brake
- muffler is in proper working condition

When operating a gasoline powered chain saw on the ground, leg protection is required. The gasoline powered saw shall be started on the ground or where otherwise firmly supported and when all other workers are clear of the saw.

When working out of aerial lift units, hydraulic chain saws will be used under normal everyday type situations.

In unusual situations and with local supervisory approval, it is permissible to use an approved gasoline powered saw out of an aerial lift unit.

### **Warning Signs and/or Barrier Tape**

Should a worker notice a dangerous work location where there is no warning sign, the worker shall report the condition at once in order that signs may be placed. Danger signs shall be used where necessary but shall not be used promiscuously nor left in place when the danger no longer exists.

Workers shall cultivate the habit of being cautious. Warning signs shall be heeded and persons warned when seen in dangerous situations. Care shall be used to avoid startling them, however.

Workers not required to approach or be near dangerous places must keep away from them. The public shall be warned to keep away from positions of danger near where work is going on.

**Handling Polychlorinated Biphenyl Fluids & Equipment (marked with yellow PCB labels) and PCB-contaminated mineral oil or oil filled equipment (between 50 to 500 ppm)**

The following precautions shall be followed:

Personal Protective Equipment (PPE) including chemically-coated tyvek suit, disposable rubber gloves, disposable rubber boots, hard hat and safety glasses or goggles shall be worn while handling PCB fluids or leaking PCB filled equipment.

**Donning (Putting on) PPE:**

- a) Put on tyvek suit.
- b) Put on disposable rubber boots and duct tape leg cuffs over the tops of the boots.
- c) Put on disposable rubber gloves and duct tape arms of suit over gloves.
- d) Put on safety glasses and hard hat.

**Doffing (Removing) PPE:**

- a) Remove boots and tape first.
- b) Remove gloves and tape.
- c) Carefully remove suit be touching the inside of the suit.
- d) Remove safety glasses and hard hat.

**Disposal of Clothing:**

- a) Remove protective clothing at the outer boundary of the work site. Do not walk in uncontaminated area wearing PPE.
- b) Remove protective clothing in the following sequence:
  1. Boots
  2. Gloves
  3. Suit
  4. Hard hat and safety glasses
- c) Step out of the work site after you remove each boot.
- d) Uncontaminated equipment can be used again for future work. Place all contaminated PPE into plastic bags and then into a DOT approved 55 gallon drum. Label the drum accordingly.



- e) Thoroughly wash your hands, arms, face, etc. after handling untested electrical equipment, fluids, or debris.

Chemical safety glasses or goggles, a face shield, and a protective apron shall be worn whenever a potential of exposure to splashing PCB fluids exists.

Electrical equipment failures in enclosed areas: Avoid breathing vapor or mist. The odor of PCB fluids and the gasses given off during a transformer or capacitor failure are very unpleasant and irritating. If these odors are detected in an enclosed area, the area shall be thoroughly ventilated before entering. If it is not practical to completely ventilate the area prior to entering, a supplied air respirator with full face piece or an SCBA respirator with full face piece shall be used and other personnel shall stand by as a rescue team in case of an accident. If the odor of PCB's is detected while wearing the respirator, leave the area immediately and proceed to a well ventilated area.

Transformer and capacitor failures occurring outdoors seldom pose respiratory problems and as a general rule do not require the use of respirators.

#### **Handling Non-PCB oil and oil-filled equipment (under 50 ppm of PCB's)**

The following precautions shall be followed at the option of the individual:

- Personal protective clothing may be worn during the containment or clean up of a Non-PCB oil or oil-filled equipment. It is recommended that safety goggles and gloves (inner and outer) be worn during these operations.
- Disposal rubber gloves shall be worn where possible while handling oil or oil soaked materials.
- Chemically-coated tyvek suits, rubber boots, and a hard hat shall be worn where the probability exists for clothing to become oil soaked.
- Safety glasses or goggles, a face shield, and a protective apron shall be worn whenever the eyes or other parts of the body are exposed to splashing oil.

#### **Handling or Removal of Equipment or Materials Containing Asbestos**

No worker shall handle asbestos material or suspected asbestos material or be in the presence of persons working with this material unless they receive training recognized as adequate by State and Federal law and follows the asbestos removal and disposal procedures.

#### **Handling Materials Containing Lead**

Work activities and construction projects that involve products, materials, or waste streams known or suspected to contain lead shall be conducted in compliance with procedures contained in Central Maine Power Company's Lead Policy.

## **E. SAFETY INSTRUCTIONS - Transmission and Distribution**

### **Rubber Gloves**

Rubber gloves shall be air-inflated and visually inspected in the morning and at the start of the afternoon and any other time deemed necessary.

Rubber gloves with leather protectors shall be worn at all times while a worker is ascending, or descending any structure or ladder to access or while working on any energized conductor, service or any street light wire dead or alive, and when opening, closing, or working on any energized padmount transformer.

Authorized persons working with hot line tools on voltages up to and including 38KV shall wear rubber gloves and leather protectors. Rubber gloves shall not be worn while doing hot line tool work on 115KV or higher voltages.

Rubber gloves with leather protectors shall be worn at all times by persons in the basket when an aerial basket truck is being operated in such a location that energized equipment or conductors could be reached by extending, raising, lowering, or rotating the basket in any direction.

Workers occupying the basket may only remove their rubber gloves when they are in such a position that they can either step from the basket onto the truck or from the basket onto the ground.

When it is necessary to make up terminators on energized structures while working out of a bucket truck, workers may remove rubber gloves and leather protectors for that portion of the job of installing the terminator on the conductor. All energized equipment on the structure must be properly covered with approved protective equipment prior to removing rubber gloves. In addition the conductor must be measured and then lowered to a position on the structure where the worker cannot reach any energized primary conductors. The bucket truck engine must be shut off before rubber gloves are removed.

When it is necessary to make up paper and lead joints on energized structures, workers may remove rubber gloves and leather protectors after they have reached their work position. Rubber gloves may be removed for only that portion of the job of applying tape and lead. When using a bucket truck, engine must be shut off before removing rubber gloves. All energized equipment on the structure must be properly covered with approved protective equipment prior to removing rubber gloves. In addition, the cable shall be properly identified on both ends, tested with appropriate equipment and grounded.

When it is necessary to change taps in transformers, it is permissible to remove rubber gloves and protectors, after all exposed energized wires are properly covered with approved rubber protective equipment and the transformer completely disconnected from both the primary and secondary circuits. The primary leads of the transformer must be removed from the cutout boxes. When using a bucket truck, engine must be shut off before removing rubber gloves. Appropriate non-porous disposable gloves must be worn when putting hands into transformer oil to change taps.

Rubber gloves with leather protectors and hard hats shall be worn when operating DISCONNECTING AND AIRBREAK SWITCHES, 600 VOLTS OR GREATER. This applies to both hot line stick and gang-operated disconnects located indoors or outdoors.

When running wire to poles or structures carrying any energized wires, workers tending reels or handling wire shall wear rubber gloves with leather protectors with an experienced person always assigned to this work. A headline must always be attached to the pulling end of the wire and rubber gloves worn by the worker.

In changing street lamps approved eye protection shall be worn, workers shall use rubber gloves with leather protectors unless an approved lamp-changing device is used, shall work from underneath, if practicable, and shall keep the body as far away from the lamp and fixture as possible. They shall protect themselves by parking the vehicle in the direction of traffic, if possible, near the lamp so that their work is done in front of the vehicle.

### **15KV Rubber Gloving**

For nominal phase-to-phase voltages above 5KV, up to and including the 15KV class, work with rubber gloves and sleeves shall be permitted from an approved aerial basket truck or approved insulated platform.

The preferred method for glove work on energized 15KV class circuits shall be from an approved aerial basket truck. However, glove work may be performed from an approved insulated platform. Where necessary, work may be performed with the use of both an aerial basket truck and insulated platform. Where necessary, a combination of hot stick, aerial basket and/or platform operations may also be employed. Conventional hot line tools may be used in conjunction with this procedure providing hot line tool instructions are followed.

No work or installation of rubber protective equipment shall be permitted on energized 15KV conductors from a pole position (lineworker spurred into pole or standing on pole steps or other permanent pole attachments). While preparing to perform rubber glove work from the platform, approved line guards shall first be placed on the energized primary conductors above the platform position with an insulated stick from the pole position. After protective equipment has been installed, the lineworker shall secure the platform to the pole at a suitable working height and shall then mount the platform and cover other energized primary conductors and devices which are within reaching distance

of his working position. Secondary conductors, common neutral conductors, and any other grounded devices below the primary conductors shall also be covered as the lineworker ascends the pole.

Workers working on energized 15KV equipment from an approved insulated polemounted platform shall keep their feet on the platform at all times. The safety strap shall be attached to the platform attachment and not to the pole or other hardware.

When working on energized 15KV circuits, with rubber gloves, all conductors or equipment within reaching distance shall be covered with approved protective equipment except those portions which are actually being worked on. When work is performed on an energized primary conductor all other conductors, neutrals, grounds and potential grounds, including the crossarms and any portion of the pole within reaching distance shall be covered with approved protective equipment so that these cannot be touched with any part of the body.

When an energized primary conductor is placed on the crossarm or against the pole, it shall first be covered with a line hose or line guard when working on energized 15KV circuits with rubber gloves; and in addition, the crossarm or pole shall be covered with a plastic arm or pole guard or a rubber blanket.

When work is being performed on energized 15KV conductors by workers in aerial baskets and/or by workers working from an approved insulated platform on the same pole or structure, the work shall be confined to only one phase of a circuit at a time.

Work on 15KV class circuits shall be permitted from an approved aerial basket or approved insulated platform by first class and second class line workers who have been trained and qualified. A second class line worker shall be accompanied on the structure by a higher rated, fully qualified line worker for a period of not less than three (3) months or for a longer period of time until fully qualified. A trained and qualified second class line worker will always be accompanied by a higher rated, fully qualified line worker in the work area while performing 15KV gloving. When a first class line worker is performing the 15KV gloving method alone, at least one other qualified line worker of third class rating or higher shall be in the work area. In the work area means on the ground having visual and verbal contact.

15KV gloving work will not be performed when weather conditions are such that the principle of insulate and isolate cannot be maintained. Rubber gloving work should not be done while it is damp, foggy or raining unless emergency conditions require it and it can be done safely.

On 15KV class circuits, installing and removing rubber protective equipment will be restricted to only those first class and second class line workers who have been trained and qualified in 15KV gloving with at least a third class line worker who is totally familiar with the truck operation in the work area. In the case of the second class line worker, a first class line worker must be present.

15KV gloving will not normally be performed after dark. If circumstances indicate gloving to be the best method to complete a job after dark, adequate lighting shall be made available as needed to perform the work safely.

### **Line Worker Working Alone**

A line worker alone shall not attempt to put back an energized street light or primary wire which is down on the ground, but shall guard it and request help.

A line worker alone finding an energized primary or street light wire on the ground and being unable to get assistance without leaving the scene, may cut the wire on adjacent poles and then summon help.

A line worker or qualified trouble shooter may, while working alone, perform routine switching of circuits. live line tool work (if the employee is positioned so that he or she is neither within reach of nor otherwise exposed to contact with energized parts) and emergency repairs to safeguard the public.

It is CMP Co.'s policy that a person, working alone, shall request assistance if, in their judgment, the trouble is beyond their ability to repair safely and adequately alone.

Two (2) qualified line workers are required when an employee is positioned so that he or she is within reach or otherwise able to contact exposed parts energized at more than 600 volts. Primary voltage cover up does not eliminate the need for the second qualified line worker.

Two (2) qualified line workers are required when installing or removing any primary tapped equipment on structures energized at more than 600 volts. Examples:

1. Transformers
2. Disconnect switches
3. Lightning arrestors
4. Fused switches
5. Underground terminators

Note: (Not a limited list)

A single (1) qualified line worker positioned on a pole for the purpose of opening or closing fused or solid blade disconnect switches must use a hot line tool of at least twelve (12) feet in length.

### **Pole Holes**

Pole holes shall never be left unguarded. When it is necessary to keep holes open overnight, the opening shall be protected by an adequate covering, reflectors or an approved light, or both.

Care shall be taken always to dispose properly of excess earth or stones after setting poles.

Holes backfilled following pole erection, replacement or removal shall be checked for settling and the surface maintained not less than level with the adjacent ground.

### Handling Poles

When loading, unloading or handling poles, make sure ropes, tackle and chains are in good condition and of adequate size and strength.

Don't stand under poles or in front of them when they are being loaded on or off trailers, carts or trucks. Remember that poles are not straight and roll in large circles. Keep clear of the ends.

When piking poles do not pike from your belt or shoulder or lock fingers or both hands together. (If a pole fell sideways, a worker would not be able to get away from it.)

When poles are being set, a worker shall stand at butt with two cantdogs to prevent pole from rolling off pikes.

All pole butts and anchor rods shall be removed from the ground or cut off below ground level. Pole butts must be properly disposed of and the hole properly filled.

### Handling Poles Near Energized Circuits

Rubber gloves with leather protectors shall be worn at all times by all workers while handling poles when they might come in contact with energized wires.

While handling poles near energized primary lines where adequate clearance is not available, pole setting guards must be used in addition to rubber gloves. The automatic feature of the recloser/circuit breaker may be put on "Do Not Reclose" and tagged if the person in charge deems necessary.

Pole guards are to be installed from the top of the pole to the balance point or lowest area on the pole that might come in contact with an energized primary conductor at or above 600 volts. The table below shows the recommended number of 6' sections of pole guards to be installed to provide adequate protection.

Pole being replaced same height	Pole being installed same height	# of 6ft. sections needed
30	35	2
30	40	3
35	40	4
35	45	3
	45	4

Pole being replaced	Pole being installed	# of 6ft. sections needed
40	45	3
40	50	4
40	55	5
45	50	3
45	55	4
45	60	5
50	55	3
50	60	4
55	60	3

If circumstances warrant further protection, additional cover shall be used.

Pole grounds can only be pre-installed while setting poles on de-energized work. At no time shall pre-installed grounds be installed on energized work.

Installation of line cover on energized primary conductors is at the discretion of the crew when setting poles on energized circuits.

If the use of cant hook is necessary, on a distribution set, the handle of the device shall be of the insulated type.

### **Climbing and Inspection of Poles and Structures**

Before climbing poles, ladders or elevated structures, workers must first check the following conditions: position and condition of ladder, soundness of the pole or structure, depth and condition of setting, undue strains that may exist or that will be produced by the proposed work, and the condition of all fixtures and attachments.

Whenever any of the above conditions are found unsafe or cannot be properly determined, the instructions for temporary guying of poles and structures must be followed.

All supervisors, or workers in charge of work, must insist on their line workers using temporary supports for protection when removing wires from old poles or working on poles where the earth has been partially removed, jacked up by frost, burned, broken or otherwise damaged.

Strains on any poles or structures shall not be changed by adding or removing conductors, transformers, guy wires or other attachment until the person in charge of the work is assured that the pole or structure will stand the altered strains.

Unqualified workers must use fall arrest equipment, work positioning equipment, or travel restricting equipment when working at elevated locations more than 4 feet above the ground on poles, towers, or similar structures.

The use of fall protection equipment is not required to be used by a qualified worker climbing or changing location on poles, towers, or similar structures unless conditions dictate the use of it. Examples of these conditions are ice, high winds, the design of the structure (unable to hold on with hands), etc.

### **Temporary Guying of Poles and Structures**

Poles and structures that are found unsuitable or unsafe for climbing must not be climbed until necessary temporary supports are installed for the safety of the workers.

Poles and structures may be secured by the following: lashing the pole or structure to a truck derrick, lashing to a new and sound pole or structure, or by the use of temporary guys. (Rope smaller than one-half inch may not be used for this purpose, and where heavy strains are present larger ropes must be used).

To install temporary guys, workers must first brace poles with pike poles and then install temporary guys. Pikes that cannot be properly grounded must be attended. Whenever the butt condition of the pole presents an additional hazard, it must be reinforced in addition to the temporary guying to secure the pole. Pike poles must be removed after the pole is properly guyed and before other work starts.

Any unsafe pole or any pole of questionable safety must be reported to the supervisor and replaced as soon as the supervisor deems necessary.

### **Qualification of Workers Working On or Near Energized Circuits**

No line helper or apprentice line worker shall be allowed to do work on any structure in a position that will expose the worker to voltage in excess of 750 volts between phases except an apprentice line worker may, for the purpose of learning, work on voltages from 750 to 5000 volts between phases, provided he is accompanied on the structure by a second class line worker or higher.

All line workers above the rating of apprentice line worker may work on voltages up to 5000 volts between phases, provided, in the case of the third class line worker, his work is done under supervision.

Operations on simple structures such as opening and closing cutouts, changing taps in transformers, installing and removing hot line clamps, etc., and installing and removing rubber protective equipment are not to be considered as actually working on energized circuits.

Working on energized circuits is to be interpreted as actually contacting energized circuits by hand and doing such operations as tying and untying wires, pulling up slack, splicing, making up deadends, making taps, etc.



### **Opening and Closing Any Line Device Under Load**

A regulation Hot Line Stick shall be used when opening and closing all line devices. When handling cutout doors, the Telescopic Stick shall have an attachment to safely remove and install the door, and close the cutout.

When connecting or disconnecting hot line clamps on circuits to be energized a regulation hot line stick shall be used.

Before removing or installing primary taps using the 15KV gloving method, all taps shall first be jumpered out.

NOTE: In the case where primary taps are to be installed using bolted connectors, and the line is to be energized, a hot line jumper must first be installed using an appropriate regulation hot line stick.

### **Protective Grounding of Transmission and Distribution Lines and Apparatus**

No system component will be considered de-energized until appropriately tested.

All phases of the circuit worked on shall be grounded. The grounding devices used shall first be connected to ground before any connection whatever is made to the conductor. When removing the grounding devices they shall be disconnected from the conductors before the ground connection is removed.

When working on transmission line H frame or other multiple pole structures with standard 34.5KV, 115KV, or 345KV phase spacing, equal potential single point grounding at the job site may be limited to only those conductors adjacent to the pole from which the work is being performed.

This method of job site grounding may only be used in conjunction with complete three phase equal potential single point grounding of the circuit on both sides of the work site, either at the job site or other appropriate locations which may include a line grounding switch.

When the conductor is being opened or closed as in splicing or tapping, loop grounds shall be applied on both sides of the opening at the job site. Any break in the line, such as a splice location, requires three phase single point grounding on each side of the break and a jumper should be installed.

Workers should stand well below the parts to be grounded in order to keep the body away from any arc that may occur when ground device is applied. All conductors should be treated as alive until they have been tested and properly grounded.

Approved grounds, utilizing the loop ground method (where required), shall be placed between work locations and all known sources of energy and as close as practical to the

work area. When equipment or lines are de-energized for workers, a visual opening shall be obtained at the disconnecting location if possible. The line or equipment shall then be tested for voltage and grounded on both sides of the location where the work is to be done regardless of whether there is more than one source of supply.

On all overhead lines (wood poles) that are not equipped with a neutral, equal potential single point grounding is required. This will assist in providing an equal potential work area.

Three phase grounding shall be installed so that all phases of the circuit are electrically interconnected to an existing anchor rod or installed ground rod, a guy wire (that is bonded to the anchor) or the static wires. If work is to be done at this location a grounding cluster bar must be installed within the distances in Appendix A.

Equal potential single point grounding requires a grounding cluster bar installed at the work location below the line workers' feet. The cluster bar shall be connected to at least one phase wire.

All poles to be worked on must have a grounding cluster bar (see Appendix A).

Note: Whenever the conductor(s) is broken, complete equal potential single point grounding on both sides of the work area must be accomplished with the use of a cluster bar.

When tree contractors are utilized to assist in restoration efforts the following shall apply.

When working out of buckets, grounds are not required as long as the line is treated as energized and proper clearances are maintained. Otherwise, proper grounding methods shall be utilized (employed).

When working in "Right of Ways" and the work is done from the ground, a CMP employee will make sure the line is open. The line worker will test, tag and ground the line at the take off. The ground crew (tree contractor) can then work to the first break in the line and then contact CMP before continuing work.

When switching or grounding in enclosed vaults and metal clad switchgear, approved head and face protection and switch jacket shall be worn.

### **Wire Stringing Operations**

Prior to stringing operations a briefing shall be held setting forth the plan of operation and specifying the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed, and the clearance authorization required.

Where there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced voltage buildup the conductor being installed or

removed shall be grounded or provisions made to insulate or isolate the worker from the hazard.

If the existing line is de-energized, proper clearance authorization shall be secured and the line tested and grounded on both sides of the crossover or, the line being strung or removed shall be considered and worked as energized.

Running grounds shall be installed on all conductors being pulled from a wire tension trailer and on the pulling end if using a hard line.

When crossing over energized conductors, rope nets or guard structures shall be installed. Where equipped, put the recloser/breaker on "Do Not Reclose" and tag.

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.

Where needed, grounding running blocks should be installed to drain induction buildup.

When running wire to poles or structures carrying any energized wires, workers tending reels on the tension trailer and rope trailer or handling wire shall wear rubber gloves with leather protectors with an experienced person always assigned to this work. A headline must always be attached to the pulling end of the wire and rubber gloves worn by the workers. Tension trailers and rope trailers must be grounded when running on energized poles and shall be grounded to the system neutral if available.

When working in substations, all bucket trucks, pulling or tensioning equipment, shall be grounded to the station grid.

When wire stringing operations utilize helicopter operations, refer to Appendix B - *Helicopter Association International, Utilities Patrol and Construction Committee Safety Guide*.

### **Grounding of Aerial Lift and Derrick Trucks**

Aerial lift and derrick trucks which are not electrically tested for the work being performed shall be effectively grounded. Acceptable grounding methods are: system neutral, pole ground, anchor rod or temporary ground. In addition, cones shall be used to protect the public from the work area. Equipment shall be considered as energized whenever the unit is being operated in areas where the derrick or materials being handled could contact lines or apparatus energized at or above 600 volts.

Rubber gloves shall be worn by all workers involved in the work while the derrick is in operation -- in addition to wearing rubber gloves, the workers operating the aerial lift controls shall stand on the operator's platform.

## **Hot Line Tools and Hot Line Work**

The following rules are intended to govern those operations associated with hot line work which involve personnel assigned to such work. They do not supersede or invalidate any other existing operating instructions, but are designed to supplement them. All safety and other operating rules must be observed at all times.

Before working on high voltage distribution circuits, the supervisor shall lay out preliminary plans to follow in doing the actual job and shall discuss these plans with the crew.

All orders and instructions between supervisor, line workers and other crew members must be repeated back to avoid any misunderstanding when such orders and instructions are in direct relation to changing or moving the position of energized circuits and equipment by blocks, ropes or hot line tools.

If you do not thoroughly understand your instructions, do not hesitate to ask for more information before proceeding with the work.

Haste or short cuts inconsistent with safety must not be permitted.

Special attention must be given to the condition of poles and fixtures being worked on and also the adjacent poles and fixtures. Make a thorough test of poles. If at all in doubt use four rope guys or other suitable support before starting work.

The spans on each side of the pole on which hot line work is to be done must be checked for safe clearance of trees, buildings, etc., before untying and changing the position of any conductors.

Choose a safe position from which to work. Do not change that position without first sizing up the new position for possible hazards.

When two or more line workers are working on a structure or pole they must keep clear of each other and work on only one conductor at a time. Maintain a safe distance from all energized conductors and equipment at all times.

Unnecessary conversation or distraction of attention of workers performing hot line work must not be permitted.

Common ground and neutral conductors carried horizontally on the side of the pole, below live conductors, must be removed from the pole or covered with rubber protective devices before work on line conductors is begun. They shall be worked and handled as though they were live conductors.

All other low voltage conductors, telephone circuits and other wires, when within reaching distance, must be removed from the pole or properly covered with rubber protective devices.

All live line tools must be wiped clean and inspected for defects before use each day. Each live line tool shall be inspected annually and tested using the Hot Stick Tester. The tests shall be documented. Blocks, ropes, and other equipment must be kept in good condition and thoroughly inspected for any defects before using. Defective tools shall be tagged and removed from service.

When transporting hot line tools to and from a job, they shall be stored in the proper tool bags or trailers.

While hot line tools are in actual use on a job, they shall be spread out on a waterproof tarpaulin or tool racks to protect them from dirt and moisture.

Hot line tools should not be used while it is damp, foggy or raining unless emergency conditions require the use of such tools and such tools can be safely used.

When conductors are being untied from the insulator, keep tie wires cut short so they cannot contact insulator pins, crossarms or top of pole.

Care must be exercised to select only those tools which have the proper voltage rating, mechanical strength and length for the job. When in doubt as to the strength of a piece of hot line equipment, two pieces shall be used.

When work is to be done on a pole or structure carrying an angle in the line, caution must be used in selecting tools having adequate strength to take care of additional strain.

Lines and blocks that are used to tie off conductors and ladders shall not be tied off to trucks, tractors or other movable equipment unless they have been made inoperative or they shall be tied off to double bull points, poles, trees etc. that have adequate holding strength. Do not use rope on conductors unless insulated from the conductors with link sticks.

Special ladders and platforms shall meet the following requirements: Secured to prevent accidental dislodging; Loaded in accordance with their design; Used only in designed applications; Capable of supporting without failure at least 2.5 times maximum intended load.

### **Contractors**

Transmission and distribution line contractors working for CMP Co. will be issued CMP's Accident Prevention Manual and will be required to work in accordance with those instructions.

Tree contractors working for CMP Co. will be required to work in accordance with the latest American National Standard Institute (ANSI) safety requirements for tree care operations involving pruning, trimming, repairing, maintaining and removing trees and cutting brush.

**Transmission and Distribution Working and Hot Stick Clearances**

The following is a list of working clearances that shall be maintained when practical:

2KV	2 feet
12KV	3 feet
34.5KV	4 feet
115KV	5 feet
345KV	9 feet

Listed below are OSHA's - AC Live-Line Work Minimum Approach Distances:

Nominal voltage in kilovolts phase to phase	Phase to ground Exposure (ft-in) DISTANCE (fn 4)	Phase to phase exposure (ft-in) DISTANCE (fn 4)
0.05 to 1.0		
1.1 to 15.0	2-1	2-2
15.1 to 36.0	2-4	2-7
36.1 to 46.0	2-7	2-10
46.1 to 72.5	3-0	3-6
72.6 to 121	3-2	4-3
138 to 145	3-7	4-11
161 to 169	4-0	5-8
230 to 242	5-3	7-6
345 to 362	8-6*	12-6*
500 to 550	11-3	18-1
765 to 800	14-11	26-0

\*OSHA allows the minimum approach distance from energized parts to be reduced to the distances calculated and provided by engineering transient overvoltage study.

**F. SAFETY INSTRUCTIONS - Substations**

**Entry into Energized Substations**

Non-company personnel shall not be allowed in an energized substation unless accompanied by a qualified CMP employee authorized by the appropriate CMP supervisor.

All non-company personnel while in an energized substation shall be required to comply with all CMP safety instructions, and it shall be the responsibility of the authorized worker to insure compliance.

### **Minimum Working and Hot Stick Clearances**

Work in substations shall be performed to maintain maximum working and hot stick clearances. In no case shall work be performed closer than the following minimum working and hot stick clearances unless a physical barrier has been put in place and rubber gloves are worn to prevent accidental contact with energized equipment or the barrier.

Work shall not be performed from a position which could allow the worker to fall onto any energized conductor or exposed live part.

Rubber gloves shall be worn on voltages from 300V to 2.1KV. Rubber gloves and the proper length hot stick shall be used above 2.1KV.

#### **Minimum Working System Clearance for Voltage \*\* Contractors**

2.1 KV to 15 KV	10 feet
34.5 KV	10 feet
115.0 KV	12.6 feet
345.0 KV	20 feet

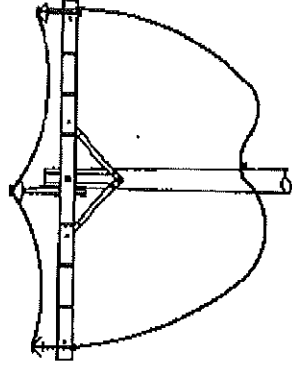
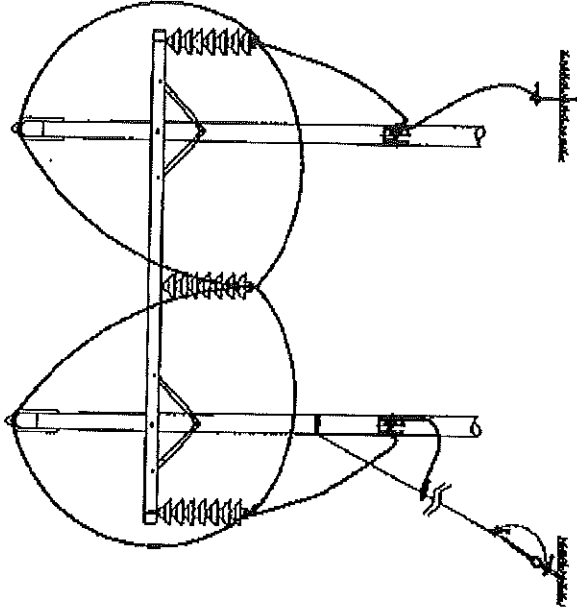
\*\*Any reduction to any of the above clearances, in order to allow any equipment in to do a specific job, must be authorized by the appropriate CMP supervisor and must be closely and continually monitored by an authorized CMP employee assigned by the appropriate CMP supervisor.





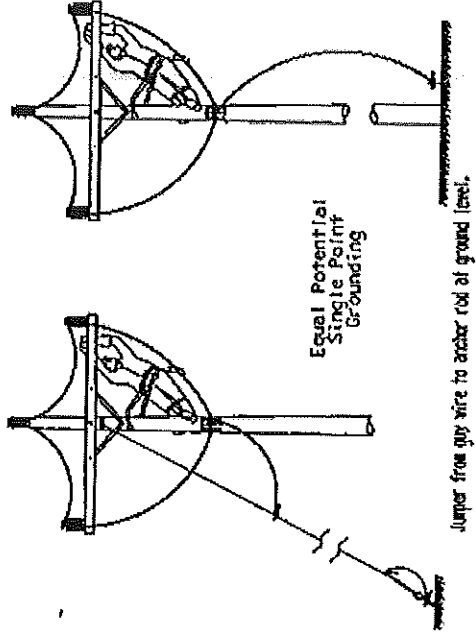
APPENDIX "A"

LOOP GROUNDING

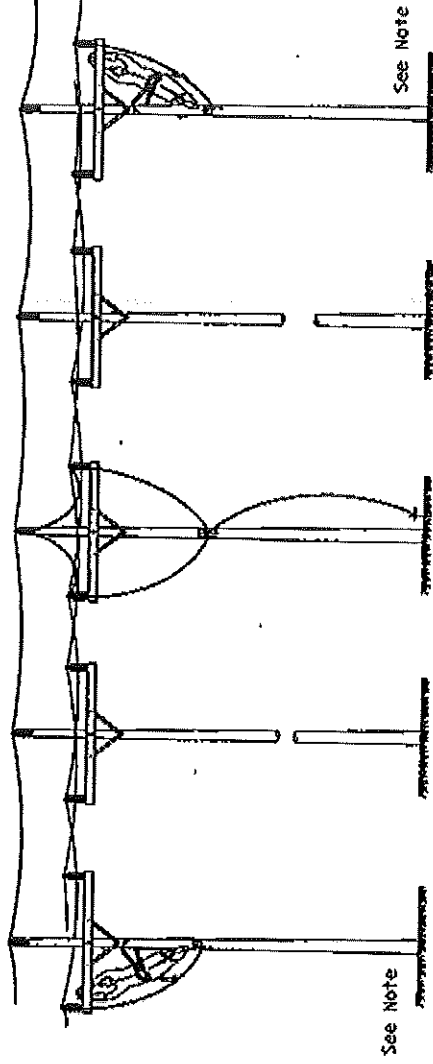


NOTE: ON SINGLE PHASE, ONLY ONE GROUND JUMPER NEEDS TO BE USED ON EACH SIDE OF THE WORK AREA IF THE PRIMARY CONDUCTOR IS SMALLER THAN THE JUMPER. (1/2 AL. AND BELOW)

OVER



Equal Potential Single Point Grounding for Multiple Structures



NOTE:

Must be within 1/4 mile or 7 poles - 34.5kV, 4 structures - 115kV,  
 2 structures - 345kV of Three Phase Equal Potential Single Point  
 Grounding.