

# **Patrick St. Peter & Sons**

## **Plumbing-Heating-Cooling Contractors**

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### **Electrical Safety Written Safety Plan**

#### **Purpose:**

Due to established hazards related to plumbing and heating, the company requires the use Electrical Safety Regulations to prevent injuries to our workers.

#### **Responsibilities:**

To ensure that the Company's policy for Electrical Safety is fully implemented, responsibility is assigned to the following individuals:

Enforcement: front-line supervisors

Answering questions/coaching: front-line supervisors/safety manager

Authorizing of changes in the written policy: project/safety manager

New-employee and refresher training: safety manager/front-line supervisor

#### **Hazard Identification:**

Because in many cases, hazards related to plumbing and heating cannot be eliminated, the following exposures to potential injury can be anticipated:

##### HAZARD

Contact with overhead and buried power lines at your site

Lack of ground-fault protection

Path to ground missing or discontinuous

Equipment not used in manner prescribed

Improper use of extension and flexible cords

##### INJURY POTENTIAL

Fatal electrocution is the main risk, but burns and falls from elevation are likely

Electrical burns, explosions, fire, or death result from a ground-fault that sends current through the workers' body

Electrical burns or death from fault current traveling through the workers' body

Employee injuries and equipment damages

Risk of contacting electrical current

#### **Company Standards and Procedures:**

Due to reasonably expected electrical hazards associated with plumbing and heating, the following standards and procedures shall be followed by all employees for power tool use:

### Contact with overhead and buried power lines:

Overhead and buried power lines at your site are especially hazardous because they carry extremely high voltage. Fatal electrocution is the main risk, but burns and falls from elevation are also hazards. Using tools and equipment that can contact power lines increase the risk.

1. Examples of equipment that can contact power lines: aluminum paint rollers, backhoes, concrete pumpers, cranes, long handled cement finishing floats, metal building materials, metal ladders, raised dump truck beds, and scaffolds.
2. Methods suggested to avoid contact hazards:
  - a. Look for overhead power lines and buried power line indicators. Post warning signs.
  - b. Contact Dig Safe (1-888-DIGSAFE (344-7233) or <http://www.digsafe.com>) and utilities who aren't members of Dig Safe for buried power line locations.
  - c. Stay at least 10 feet away from overhead power lines.
  - d. Unless you know otherwise, assume that overhead lines are energized.
  - e. De-energize any ground lines when working near them. Other protective measures include guarding or having the lines insulated by utilities.
  - f. Use nonconductive wood or fiberglass ladders when working near power lines.

### Lack of ground-fault protection:

Due to dynamic, rugged nature of construction work, normal use of electrical equipment at your site causes wear and tear that results in insulation breaks, short circuits, and exposed wires. If there is no ground-fault protection, this can cause a ground-fault that sense current through the worker's body resulting in electrical burns, explosions, fire, or death.

1. Methods suggested to avoid such hazards:
  - a. Use ground-fault circuit interrupters (GFCIs) on all 120-volt, single phase, 15- and 20-ampere receptacles.
  - b. Follow manufacturer's recommendations testing procedures to insure GFCI is working correctly.
  - c. Use double-insulated tools and equipment, distinctively marked.
  - d. Use tools and equipment according to the instruction included in their listing, labeling, or certification.
  - e. Visually inspect all electrical equipment before use. Remove from service any equipment with frayed cords, missing ground prongs, cracked tool casings, etc. Apply a warning tag to any defective tool and do not use it until properly repaired.

### Path to ground missing or discontinuous:

If the power supply to the electrical equipment at your site is not grounded or the path has been broken, fault current may travel through the worker's body, causing electrical burns or death. Even when the power system is properly grounded, electrical equipment can instantly change from safe to hazardous because of extreme conditions and rough treatment.

1. Methods suggested to avoid such hazards:
  - a. Use only properly grounded power supply systems, electrical circuits, and electrical equipment.
  - b. Use qualified electrician to install temporary electrical power services as prescribed by the National Electric Code. Or troubleshoot electrical system operational issues.
  - c. Frequently inspect electrical systems to ensure that the path to ground is continuous.

- d. Visually inspect all electrical equipment before use. Take any defective equipment out of service. Apply a warning tag and do not use it until properly repaired.
- e. Do not remove ground prongs from cord- and plug-connected equipment or extension cords.
- f. Use double-insulated tools.
- g. Install, use, maintain and care for electrical power generators according to the manufacturer's suggestions.

Equipment not used in manner prescribed:

If electrical equipment is used in ways for which it is not designed, you can no longer depend on safety features built in by the manufacturer. This may damage your equipment and cause employee injuries.

1. Common examples of misused equipment:
  - a. Using multi-receptacle boxes designed to be *mounted* by fitting them with a power cord and placing them on the floor.
  - b. Fabricating extension cords with ROMEX wire.
  - c. Using equipment outdoors that is labeled for use only in dry, indoor locations.
  - d. Attaching undergrounded, two-prong adapter plugs to three-prong cords and tools.
  - e. Using circuit breakers or fuses with the wrong rating for over-current protection, e.g., using a 30-amp breaker in a system with 15- or 20-amp receptacles. Protection is lost because it will not trip when the system's overload has been exceeded.
  - f. Using modified cords or tools, e.g., removing ground prongs, face plates, insulations, etc.
  - g. Using cords or tools with work insulation or exposed wires.
2. Methods suggested to avoid such hazards:
  - a. Use only equipment that is approved to meet ANSI, NFPA-NEC, and OSHA standards [1926.403(a)].
  - b. Use all equipment according to the manufacturer's instructions.
  - c. Do not modify cords or use them incorrectly.
  - d. Be sure equipment that has been shop-fabricated or altered is in compliance with recognized standards for safe and hazard-free design.

Improper use of extension and flexible cords:

The normal wear and tear on extension and flexible cords at your site can loosen or expose wires, creating hazardous conditions. Cords that are not 3-wire type, not designed for hard usage, or that have been modified increase your risk of contacting electrical current.

1. How do I avoid hazards?
  - a. Use factory-assembled cord sets.
  - b. Use only extension cords that are 3-wire type.
  - c. Use only extension cords that are marked with a designation code for hard or extra-hard usage.
  - d. Use only cords, extension devices, and fittings that are equipped with strain relief.
  - e. Remove cords from receptacles by pulling on the plugs, not the cords.
  - f. Continually audit cords on-site. Any cords found not marked for hard or extra-hard use, or which have been modified, must be taken out of service immediately.

**Training:**

1. Workers will be trained in the Company's safety and health programs designed to address electrical incidents and the variety of ways electricity becomes a hazard.
2. Workers will be educated in the danger of work near any part of an electrical power circuit unless protected by the proper measures.
3. Workers will be educated and trained in identifying and controlling the hazards associated with the use of temporary electrical power on construction sites.
4. Workers will be educated in how electricity works, shocks occur, electrical current affects the human body, and the typical injuries associated with electric shock.

**Enforcement policy:**

When a worker is observed not using appropriate electrical cords or tools when working, the following steps shall be taken by their immediate supervisor:

1. First occurrence – Verbal warning. With coaching on proper procedures to be followed. Note made in supervisor's daily log or job report.
2. Second occurrence – Written warning. Supervisor and employee sign the documented reprimand. A copy of the written warning is placed in the employee file.
3. Third occurrence – Written warning is completed and the employee is given 8 hours, or one full workday, off without pay.
4. Fourth occurrence – When an employee fails to correct and improper work process within 6 months of having been given time off without pay – the employee shall be terminated.