

**WAC 296-45-345 Grounding for the protection of employees. (1)**

Application. This section applies to the grounding of transmission and distribution lines and equipment for the purpose of protecting employees. Subsection (4) of this section also applies to the protective grounding of other equipment as required elsewhere in this section.

(2) General. For the employee to work lines or equipment as deenergized, the lines or equipment must be deenergized under the provisions of WAC 296-45-335 and must be grounded as specified in subsections (3) through (9) of this section. However, if the employer can demonstrate that installation of a ground is impracticable or that the conditions resulting from the installation of a ground would present greater hazards than working without grounds, the lines and equipment may be treated as deenergized provided all of the following conditions are met:

(a) The lines and equipment have been deenergized under the provisions of WAC 296-45-335.

(b) There is no possibility of contact with another energized source.

(c) The hazard of induced voltage is not present.

(3) Equipotential zone. Temporary protective grounds and bonding jumpers must be placed at such locations and arranged in such a manner as to prevent each employee from being exposed to hazardous differences in electrical potential.

Note: This may require bonding equipment together.

(4) Protective grounding equipment.

(a) Protective grounding equipment must be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault. This equipment must have an ampacity greater than or equal to that of No. 2 AWG copper.

(b) Grounding jumpers must have approved ferrules and grounding clamps that provide mechanical support for jumper cables independent of the electrical connection.

Note: Guidelines for protective grounding equipment are contained in American Society for Testing and Materials Standard Specifications for Temporary Grounding Systems to be Used on Deenergized Electric Power Lines and Equipment, ASTM F855-2015.

(c) Protective grounds must have an impedance low enough to cause immediate operation of protective devices in case of accidental energizing of the lines or equipment.

(5) Testing. Before any ground is installed, lines and equipment must be tested and found absent of nominal voltage, unless a previously installed ground is present.

(a) Inspection before use: Grounding equipment must be given a visual inspection and all mechanical connections must be checked for tightness before each use.

(b) Ground surface cleaning: The surface to which the ground is to be attached must be clean before the grounding clamp is installed; otherwise, a self-cleaning clamp must be used.

(6) Order of connection. The employer must ensure that, when an employee attaches a ground to a line or to equipment, the employee attaches the ground-end connection first and then attaches the other end by means of a live-line tool. For lines or equipment operating at 600 volts or less, the employer may permit the employee to use insulating equipment other than a live-line tool if the employer ensures that the line or equipment is not energized at the time the ground is connected or if the employer can demonstrate that each employee is protected from hazards that may develop if the line or equipment is energized.

(7) Order of removal. When a ground is to be removed, the grounding device must be removed from the line or equipment using a live-line tool before the ground-end connection is removed.

(8) Additional precautions. When work is performed on a cable at a location remote from the cable terminal, the cable cannot be grounded at the cable terminal if there is a possibility of hazardous transfer of potential should a fault occur.

(9) Removal of grounds for test. Grounds may be removed temporarily during tests. During the test procedure, the employer must ensure that each employee uses insulating equipment and is isolated from any hazards involved, and the employer must institute any additional measures as may be necessary to protect each exposed employee in case the previously grounded lines and equipment become energized.

(10) Conductor separation: In cases where the conductor separation at any pole or structure is so great as to make it impractical to apply shorts on all conductors, and where only one conductor is to be worked on, only that conductor which is to be worked on needs to be grounded.

(11) Ground personnel: In cases where ground rods or pole grounds are utilized for personal protective grounding, personnel working on the ground should maintain sufficient distance from such equipment or utilize other approved procedures designed to prevent "touch-and step potential" hazards.

Note: See Appendix B of this chapter for protection from step and touch potentials.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060 and chapter 49.17 RCW. WSR 19-13-083, § 296-45-345, filed 6/18/19, effective 8/1/19; WSR 16-10-082, § 296-45-345, filed 5/3/16, effective 7/1/16. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. WSR 98-07-009, § 296-45-345, filed 3/6/98, effective 5/6/98.]