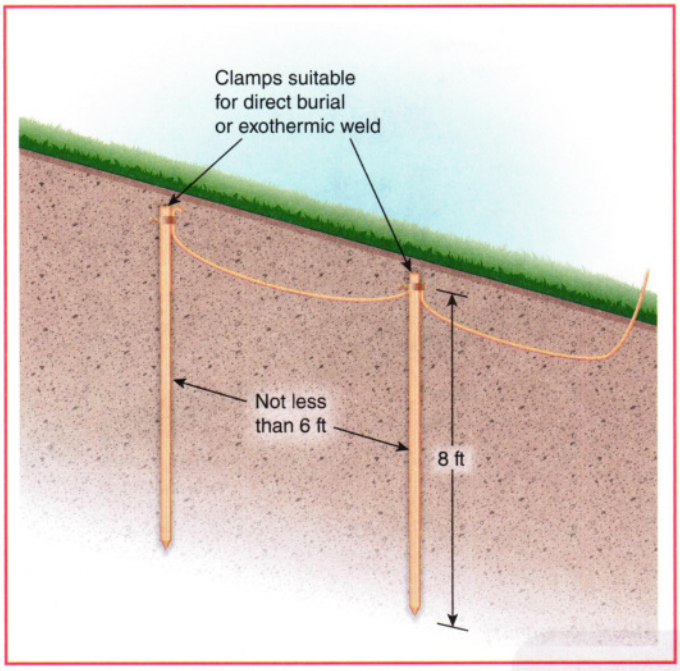

EXHIBIT 250.24 The 6-foot spacing required between multiple rod-type electrodes.

2½-foot-deep trench. Driving the rod at an angle is permitted only if it is impossible to drive the rod vertically to obtain at least 8 feet of earth contact. Burying the ground rod is permitted only if driving the rod vertically or at an angle is not possible. Exhibit 250.25 illustrates these requirements.

Section 250.70 requires ground clamps used on buried electrodes to be listed for direct earth burial. Section 250.10 requires ground clamps installed above ground to be protected where subject to physical damage.

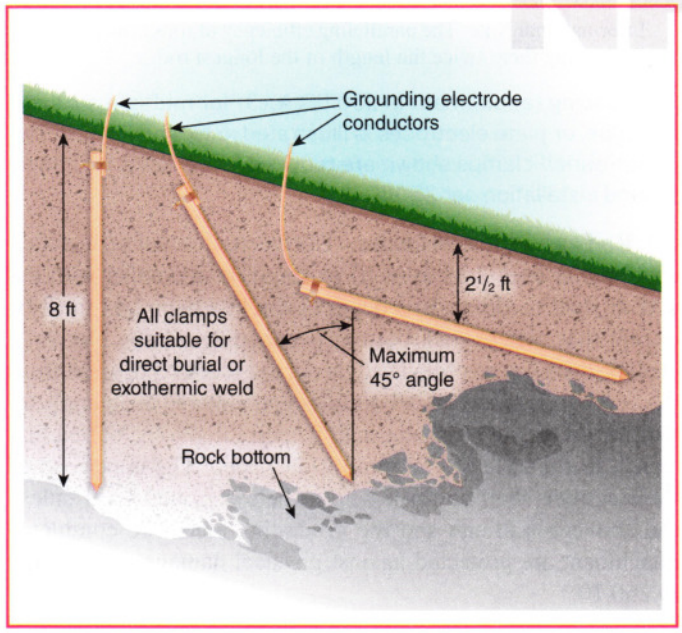

EXHIBIT 250.25 Installation requirements for rod and pipe electrodes shown in specified order of installation from left to right.

(5) Plate Electrode. Plate electrodes shall be installed not less than 750 mm (30 in.) below the surface of the earth.

Δ **(B) Electrode Spacing.** If more than one of the electrodes of the type specified in 250.52(A)(5) or (A)(7) are used, each electrode of one grounding system (including that used for strike termination devices) shall not be less than 1.83 m (6 ft) from any other electrode of another grounding system.

(C) Bonding Jumper. The bonding jumper(s) used to connect the grounding electrodes together to form the grounding electrode system shall be installed in accordance with 250.64(A), (B), and (E), shall be sized in accordance with 250.66, and shall be connected in the manner specified in 250.70. Rebar shall not be used as a conductor to interconnect the electrodes of grounding electrode systems.

See also

250.68(C)(3) and its commentary for more information on the use of rebar as a conductor in the grounding electrode system

(D) Metal Underground Water Pipe. If used as a grounding electrode, metal underground water pipe shall meet the requirements of 250.53(D)(1) and (D)(2).

(1) Continuity. Continuity of the grounding path or the bonding connection to interior piping shall not rely on water meters or filtering devices and similar equipment.

(2) Supplemental Electrode Required. A metal underground water pipe shall be supplemented by an additional electrode of a type specified in 250.52(A)(2) through (A)(8). If the supplemental electrode is of the rod, pipe, or plate type, it shall comply with 250.53(A). The supplemental electrode shall be bonded to one of the following:

(1) Grounding electrode conductor
(2) Grounded service-entrance conductor
(3) Nonflexible grounded service raceway
(4) Any grounded service enclosure
(5) As provided by 250.32(B)

Exception: The supplemental electrode shall be permitted to be bonded to the interior metal water piping as specified in 250.68(C)(1).

This requirement clarifies that the supplemental electrode system must be installed as if it were the sole grounding electrode for the system. As specified in the exception to 250.53(A)(2), if a single rod, pipe, or plate electrode has a resistance to earth of 25 ohms or less, it is not necessary to supplement that electrode with one of the types from 250.52(A)(2) through (A)(8). In other words, a single rod, pipe, or plate electrode being used to supplement a metal underground water pipe-type electrode is itself required to be provided with a supplemental electrode unless the