

● Grounding Electrode Conductor – Protection From Physical Damage

Inspectors have been encountering grounding electrode installations that are subject to physical damage. NEC 250.64(B) has specific requirements for protection of exposed grounding electrode conductors.

Exposed grounding electrode conductors:

- Smaller than 6 AWG must always have physical protection.
- Sized 6 AWG that are free from exposure to physical damage are permitted to run along the surface of the building construction without protection where it is securely fastened to the building surface.
- Sized 4 AWG or larger must be protected where exposed to physical damage. This requirement was changed from “severe” physical damage in the 2005 NEC.

Physical damage is not defined in the NEC. The department’s electrical inspectors will consider the grounding electrode conductor to not be exposed to physical damage when:

- The conductor is buried more than 12” deep in the earth outside the building’s footprint.
- Encased or covered by 2” of concrete or asphalt.
- The conductor is inside the building footprint and protected by the building’s structural elements or when inside and determined, by the inspector, to not be subject to physical damage.
- Enclosed by a metal or nonmetallic raceway or enclosure. The raceway or enclosure must be approved to protect from severe physical damage if it is not protected by appropriate physical barriers from contact with vehicles, lawn mowers, and other equipment that might damage the conductor or enclosure.

If ferrous metal raceways or enclosures are used to protect the conductor, they must be bonded at both ends to the conductor according to the requirements in NEC 250.64(E).

Problems with physical protection may be avoided by using grounding electrodes that do not require supplemental electrodes or where the grounding electrode conductor can be installed solely inside the structure of the building (e.g. concrete-encased electrode, exterior metal underground water pipe with 10’ or more of the pipe in direct contact with the earth, etc.).