a single or multiple concrete-encased electrode(s), as described in 250.52(A)(3), does not extend on to other types of electrodes that require a larger size of conductor, the grounding electrode conductor shall not be required to be larger than 4 AWG copper wire.

(C) Connections to Ground Rings. If the grounding electrode conductor or bonding jumper connected to a ground ring, as described in 250.52(A)(4), does not extend on to other types of electrodes that require a larger size of conductor, the grounding electrode conductor shall not be required to be larger than the conductor used for the ground ring.

Exhibit 250.29 illustrates a GEC installed from service equipment or from a separately derived system to a water pipe grounding electrode. The GEC is required by 250.66 to be sized based on the size of the ungrounded supply conductors. The supply conductors could be service conductors or, in the case of separately derived systems, feeder conductors from a generator or other power source or transformer secondary conductors. The bonding jumpers that connect the other grounding electrodes together are sized using 250.53(C), which refers to 250.66. GECs and bonding jumpers are permitted to be sized based on the electrodes to which they connect, as specified in 250.66(A), (B), or (C). However, if the GEC or bonding jumper extends from this connection to an electrode that is not specified in 250.66(A), (B), or (C), it must be sized per Table 250.66.

In Exhibit 250.29, the size of the GEC and the bonding jumpers is dependent on the electrode to which they are connected. The illustration is not intended to show a mandatory physical routing and connection order of the bonding jumpers and the GEC, since the *NEC* does not specify an order or hierarchy for these connections. The sizes for the bonding jumpers to the ground rod and the concrete-encased electrode shown in Exhibit 250.29 are the maximum sizes required by the *NEC* based on 250.66(A) and (B). If the GEC from the service equipment is run to the ground rod first and then to the water pipe, the GEC to the ground rod is required to be sized based on Table 250.66 as if it were run to the water pipe electrode. The use of bonding jumpers or GECs larger than required by 250.66 is not prohibited.

250.68 Grounding Electrode Conductor and Bonding Jumper Connection to Grounding Electrodes. The connection of a grounding electrode conductor at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at a separately derived system and associated bonding jumper(s) shall be made as specified 250.68(A) through (C).

(A) Accessibility. All mechanical elements used to terminate a grounding electrode conductor or bonding jumper to a grounding electrode shall be accessible.

Exception No. 1: An encased or buried connection to a concrete-encased, driven, or buried grounding electrode shall not be required to be accessible.

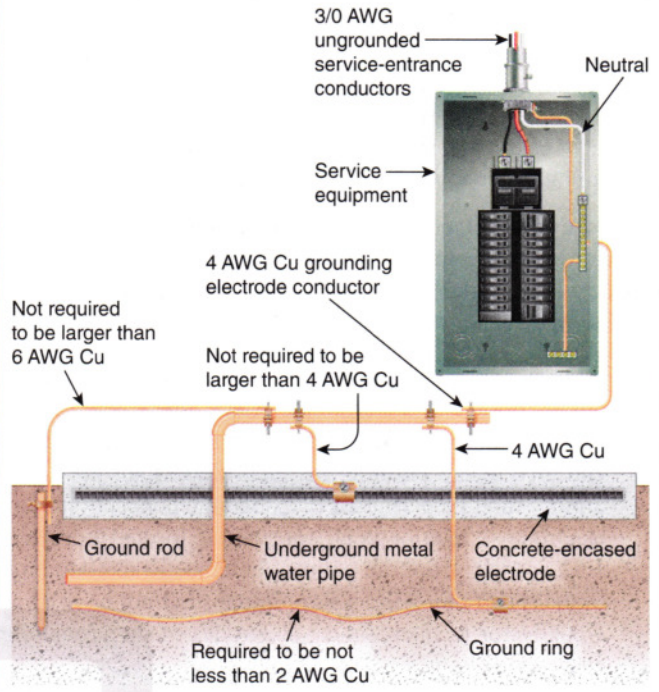

EXHIBIT 250.29 GEC and bonding jumpers sized in accordance with 250.66 for a service supplied by 3/0 AWG copper ungrounded conductors.

Exception No. 2: Exothermic or irreversible compression connections used at terminations, together with the mechanical means used to attach such terminations to fireproofed structural metal whether or not the mechanical means is reversible, shall not be required to be accessible.

Ground clamps and other connectors suitable for use where buried in earth or embedded in concrete must be listed for such use per 250.70. Indication of this listing is either by a marking on the connector or by a tag attached to the connector. See Exhibits 250.22 and 250.25 for illustrations of encased and buried electrodes.

Connections, including the mechanical attachment of a compression lug to structural steel, are permitted to be encapsulated by fireproofing material and are not required to be accessible. This allowance recognizes the importance of maintaining the integrity of the structural fireproofing.

(B) Effective Grounding Path. The connection of a grounding electrode conductor or bonding jumper to a grounding electrode shall be made in a manner that will ensure an effective grounding path. Where necessary to ensure the grounding path for a metal piping system used as a grounding electrode, bonding shall be provided around insulated joints and around any equipment likely to be disconnected for repairs or replacement. Bonding jumpers shall be of sufficient length to permit removal of such equipment while retaining the integrity of the grounding path.