

Application of E3608.1.2 Virginia Residential Code/Article 250.52 N.E.C

## CONCRETE ENCASED ELECTRODE

Effective Date May 1, 2009 starting with the Virginia Statewide Building Code 2009 Edition mandates that all qualifying concrete-encased electrodes are to be used as part of the grounding electrode system for a building or other structure's electrical system unless the building or other structure are existing. The requirement doesn't mandate that a concrete-encased electrode be installed, but that if it is present, it shall be meet the provisions of this code.

As described in E3608.1.2 a qualifying electrode:

1. Is encased by at least 2" of concrete and located within and near the bottom of a concrete foundation or footing that is in direct contact with the earth.
2. Consists of at least 20' of bare or zinc galvanized or other electrically conductive coated steel reinforcing bars or rods that are not less than ½" in diameter.
  - In our interpretation, multiple rods or bars that total at least 20' in length are included.
  - The bars or rods shall be permitted to be bonded together by the usual tie wires or other effective means.

Additionally:

3. No encapsulating non-conductive coatings, such as epoxy, are used for corrosion protection.
4. No vapor barriers or insulating material that effectively isolate the concrete footing or foundation from the earth have been used.

This requirement is for new construction of buildings or other structures that have been designed to the 2005 National Electrical Code or are "design/build" and permitted after July 1, 2005. The requirement does not apply to buildings or other structures that were approved to the 2002 or previous National Electrical Codes or to existing buildings or other structures where just the service or other supply system is being upgraded. It would, however, apply to an existing building or other structure where the construction of an addition, etc. involves a qualifying electrode and the service or other supply system is being upgraded as part of the construction.

Where the above described electrode exists, the connection of a 4 AWG or larger copper grounding

electrode conductor to the steel electrode must be made using a device that is listed by an approved testing agency with respect to its suitability for concrete encasement, if installed within the foundation or footing, for direct burial where applicable and for connection to a steel reinforcing rod or bar.

There are several ways of making a connection to the electrode itself and the method of choice will be a matter of design and coordination. The following illustrations and explanations are intended to aid in understanding some common methods of connection and are not intended to be all inclusive.

