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Township Building Officials
Contract Building Inspectors
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Since the adoption of the 2005 National Electrical Code [NEC] on 11-23-2007 and the 2006 Michigan Residential Code [MRC] on 8-1-2008, there have been a number of questions and concerns regarding the requirement in both Codes for a Grounding Electrode Conductor [GEC] to be installed and connected to a Concrete Encased Electrode [CEE] and terminated at the neutral terminal at the Service Disconnect location.

Some of the questions and concerns I have encountered are;

1 Do reinforcing bars [rebar] have to be installed in footings to meet the requirements of the Codes if the building specifications do not call for rebar in the footings? No. They are to be used for grounding purposes only if available. NEC 2005 Art 250.50 and MRC 2006 E3508.1

2 If there is rebar in the footings, must a GEC be connected to the Grounding Electrode System? Yes. NEC 2005 Art 250.50 and MRC 2006 E3508.1

3 Is this required installation part of the Building Code or Electrical Code? Electrical Code. This will require an Electrical Permit to be issued for the GEC to be installed by a licensed electrical contractor prior to the footings being poured. NEC 2005 Art 90.2 and MRC 2006 E3301.2

4 Does the CEE have to be inspected before the footings are poured? Yes. Michigan DLEG Part 8 Electrical Code Rules Art 80.19 and MRC 2006 E3303.2

5 Who Inspects the GEC and the CEE? Inspection to be done by the Electrical Inspector before concrete is poured at the CEE location. DLEG Part 8 Electrical Code Rules Art 80.19 & 80.22.2 and MRC 2006 E3303.2

6 Does the rebar have to be in the footing, or can it be in the wall or the basement floor? Both Codes require the CEE to be "at least 20 feet of ½ inch minimum diameter rebar encased in at least 2 inches of concrete located within and near the bottom of a concrete footing that is in direct contact with the earth". NEC 2005 Art 250.52 [A] {3} and MRC 2006 E3508 .1.2

7 What size conductor is required to be installed for The GEC and connected to the CEE? # 4 awg copper NEC 2005 Art 250.66 [B] and MRC 2006 Tables E3503.1 Note [d]

8 How is the GEC connected to the CEE? Exothermic welding or any lug pressure connector or clamp that is listed and labeled for this purpose. NEC Art 2005.70 and MRC 2006 E3511.1

There are probably many more questions that people have or will have about this requirement. Some of you have heard this referred to as a Ufer Grounding System. Ufer was the name of the gentleman who researched this grounding method in the western deserts of the United States many years ago and found it to be a very effective method of grounding. Neither Code refers to the Ufer ground, but instead uses the terms used in trying to explain these answers.

If you have any questions about this requirement, please contact me and I will try to answer or find an answer for you.

Gord Bosch

Electrical Inspection Service LLC

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