



INTEROFFICE MEMORANDUM

Date: December 29, 2015

To: Code Services Staff

From: Brad Claussen, Building Official

Subject: Concrete Encased Electrodes

The focus of this memo is on steel in footings/foundations that are used as a grounding electrode. This type of electrode is commonly referred to as a Ufer ground named after Herbert Ufer who invented the concept during World War II. Both the IRC and the NEC have prescriptive requirements for this grounding electrode. There are instances, mainly on commercial projects, where a specific concrete encased electrode is specified by the project engineer in conjunction with the rest of the grounding system but those are designed parts of the electrical system and are installed according to the plan specifications.

The code now requires several items to be part of the grounding electrode system when those items are present. Steel encased in concrete for foundations and footings are one of those. If multiple footings are present for a building, only one Ufer ground is required. There are a couple of ways to accomplish this ground:

- The copper grounding conductor may be clamped to at least 20 feet of ½” minimum horizontal rebar with a clamp listed for direct burial
- A rebar may be extended above the footing or foundation where the grounding conductor can be clamped on in an accessible location

In both cases the 20’ of rebar may be spliced as required for reinforcing steel (typically 20” of lap for ½” rebar). When the second method is used in order to assure an “effective means” of connection, the bar is to be lapped the same 20” and tied with the usual wire ties to at the 20 feet of ½” minimum horizontal bar. The code does not make clear these dimensions but research of the original Ufer ground shows that this is the intent.

It is worth noting that when a Ufer ground is used a driven ground rod is not required by code but may be installed. There are certainly other requirements for this type of grounding electrode but the main reason for this memo is to clarify the connection of the rebar within the footing/foundation. If you have any questions please let me know.