



Municipality of Anchorage



Handout E.05

Guidelines for Concrete Encased Electrodes in the Municipal Building Safety Service Area

All of the Anchorage-area electrical power companies have had requirements for ground rods in their service standards. Ground rods have also been the standard solution to meet the NEC requirement for a supplemental electrode when a water pipe is the only electrode. Unfortunately, the ground rod installations have not been a good answer in terms of grounding effectiveness, especially in cold weather. They are also subject to physical damage by digging equipment, difficult to install in frozen ground, and often require an extra trip by the contractor to drive down below ground level.

Chugach Electric and Municipal Light and Power have agreed to accept and encourage the use of concrete encased electrodes as a preferred alternative to ground rods in new structures, when Building Safety has inspected the installation.

Other than One- and Two-Family Structures

Building Safety has required the installation of concrete encased electrodes on these buildings for several years. These are installed by an electrical contractor as designed by an electrical engineer and inspected by an electrical inspector. Building Safety will inspect these commercial projects before an electrical permit has been obtained, as the foundations are often put in before an electrical contract is let.

Note: Ground rods would no longer be required when services are mounted on the building served by the service, however remote services would still require an electrode in the immediate area.

Residential Structures

Concrete encased electrodes are required on residential structures when steel reinforcing bars or rods are being installed in a foundation, in a new building or an addition to an existing building.

In order to facilitate the use of the concrete encased electrode, Building Safety has put together a drawing as a guideline that would enable the concrete encased electrode to be installed without requiring an extra inspection or an early site visit by the electrical contractor. Please note that installation of the concrete encased electrode may be done using materials/methods other than shown on the drawing but will require inspection by an electrical inspector. The electrical inspector will accept installations meeting the requirements of the 2005 NEC, Section 250.52.

In general, the guideline drawing requires an extra rebar connected to the reinforcing rods usually installed in the footer of a residential foundation. This rebar is a minimum of ten feet in length and is securely tie-wired to the structurally required footer rebar at two-foot intervals. This added rebar should be stubbed six inches out on the interior side of the exterior wall footer in an accessible location (i.e. crawl space) or the rebar shall extend to an accessible location inside the structure. The structural inspector, as part of his footer rebar inspection, will verify the installation of the electrode.

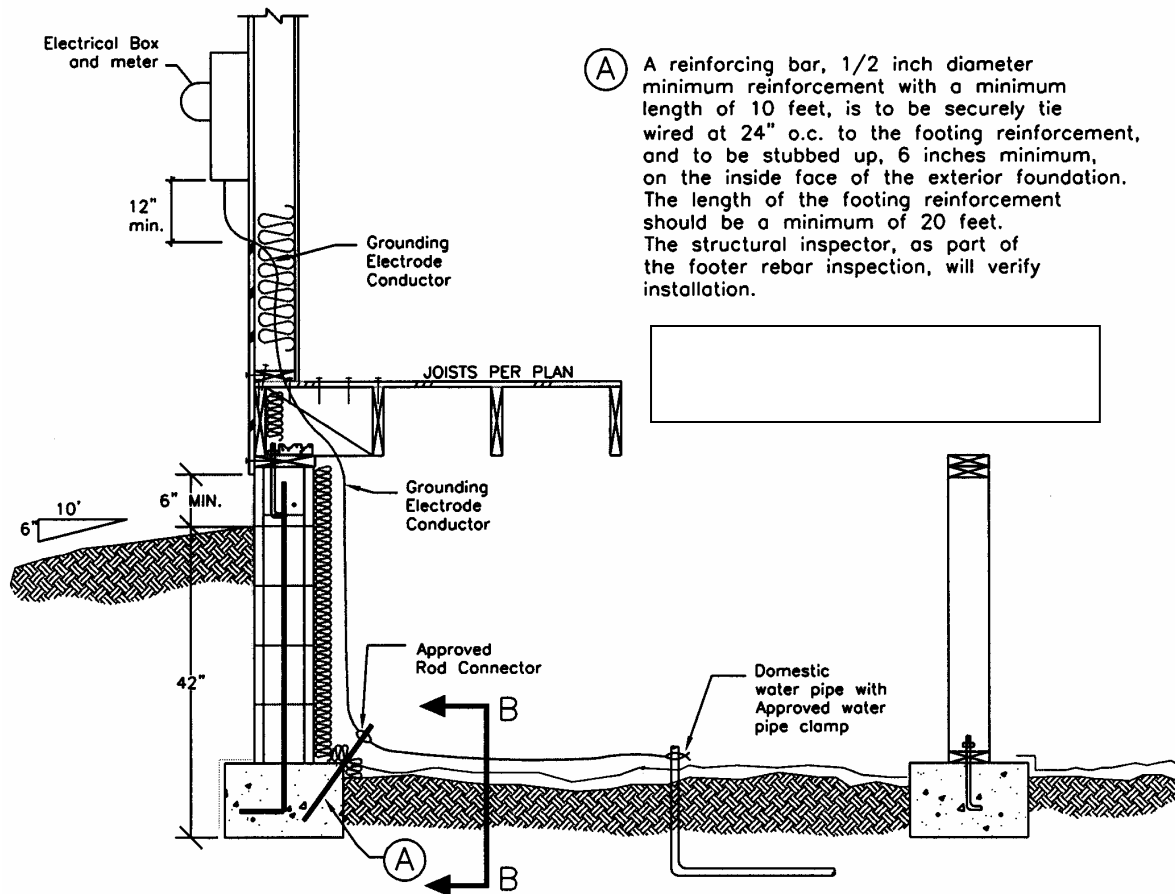
The grounding electrode conductor will be connected to the stub-out by the electrical contractor at the rough-in. The connection to the rebar must be made with an appropriate connector.

In order to provide a connection point for communications utility grounding, the grounding electrode conductor must exit the exterior wall no less than 12 inches below the service enclosure. The grounding electrode conductor is sized by Table 250-66 of the NEC, #6 copper for a 100 amp, and #4 copper for a 200 amp service.

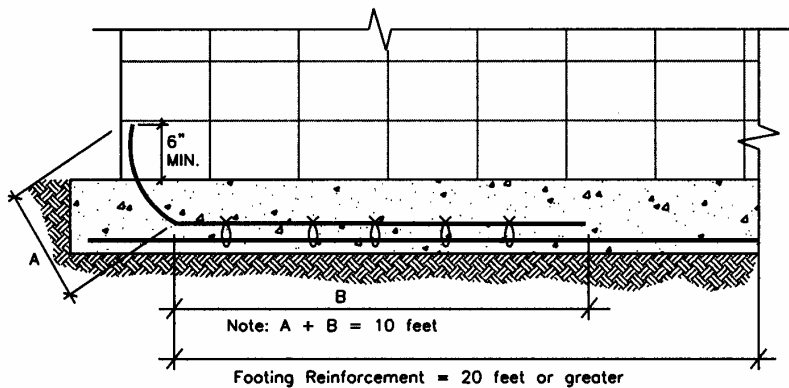
Ron Thompson, Building Official

DATE: May 16, 2006

(ref: 03-05; 03-08; 06-02)



(A) A reinforcing bar, 1/2 inch diameter minimum reinforcement with a minimum length of 10 feet, is to be securely tie wired at 24" o.c. to the footing reinforcement, and to be stubbed up, 6 inches minimum, on the inside face of the exterior foundation. The length of the footing reinforcement should be a minimum of 20 feet. The structural inspector, as part of the footer rebar inspection, will verify installation.



STRIP FOOTING SECTION B-B