



# RESIDENTIAL GROUNDING AND BONDING

## BUILDING INSPECTION MINIMUM REQUIREMENTS

Any work involving adding sub-panels, upgrade of electrical service, change of water service (if using a less conductive material than is existing), re-piping of a structure, or adding circuits (if no grounding system exists) will require upgrading of the grounding and bonding of the electrical service. A permit is required for each of these upgrades/remodels. Following are general grounding and bonding requirements based on the 2016 California Electrical Code. Please contact the Building Inspection Division for any questions or additional information.

### Grounding

Grounding shall consist of a continuous grounding electrode conductor run from the panel to a grounding electrode. Grounding of the electrical service at the main water line must be within the first 5' of water piping into the building. The underground water service shall not be used as the grounding electrode without a supplemental electrode. 2 grounding rods may be used as a grounding electrode system. (CEC 250.52 (A) (1) and 250.53, 250.68)

For new structures and additions to existing structures, a concrete encased ground electrode shall be installed. This shall consist of 20' of ½" bare or zinc-coated rebar or bare copper wire in the portion of the footing in contact with earth. (CEC 250.52)

For existing structures, the grounding electrode shall be nonferrous (copper), listed, and not be less than 5/8" in diameter. The electrode shall be installed such that at least 8' of length is in contact with the soil. The upper end of the electrode shall be flush with or below ground level unless the above-ground end and the grounding electrode conductor attachment is protected against physical damage. (CEC 250.52 (A)(5), 250.64(B))

### Bonding

Bonding of all metal pipes in the building is required when the electrical panel is replaced. Bonding of the hot, cold, and gas lines is required with water service replacements (if using a less conductive material than is existing) and for all re-pipes. Bonding shall consist of a continuous bond jumper installed at the water heater between the hot, cold, and gas lines.