



## Residential Electrical Grounding & Bonding 2007 California Electrical Codes

### INFORMATION GUIDELINE

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### Electrical - Upgrading the Main Electrical Panel

The following items pertain to upgrading the main electrical panel in a *single family dwelling* :

- ◆ An **electrical permit is required** to upgrade the main panel.
- ◆ The owner or a State licensed contractor may obtain a permit.
- ◆ Load calculations are generally not required for a service upgrade unless additional load is being added **and** the inspector determines that calculations are necessary.

**Meter Height:** Shall be between 42" to 72" above the ground.

**Clear Working Space:** 30" wide by 36" in front of panel .

#### Circuit Breakers

Circuit breakers must be **listed** and **approved** types for panels (The brand of breakers must be specifically approved for use within the panel as stated on the panel's label).

- ◆ A multi-wire circuit (3-wire, 240 volt circuit) to a single duplex receptacle requires a **handle-tie** on the circuit breakers

#### Grounding

- ◆ Any work involving adding sub-panels, upgrade of electrical service, change of water service, or re-piping of a structure will require upgrading of the grounding and bonding of the electrical service.
- ◆ Grounding shall be per the 2001 California Electrical Code
- ◆ Water pipe grounding electrode shall have a supplementary grounding system installed (2 Ground Rods).
- ◆ A supplemental electrode (usually a ground rod) must be installed if the water piping system is the only source of grounding.
- ◆ 2 ground rods must be at least 8 feet buried in the ground with minimum of 6 feet apart. When made of iron or steel, the ground rod must be a minimum 5/8" diameter. Listed stainless steel or non-ferrous rods may be 1/2" in diameter.
- ◆ Grounding electrode conductor shall be connected within 5 ft. from the point of entrance to a cold water pipe grounding electrode. (2007 CEC Section 250-30 Item 3)
- ◆ **Bonding** shall be per 2007 California Electrical Code.

#### The water piping system must be bonded

- ◆ If the main water service piping to the house is metallic, the bonding must occur within five feet of water piping into the building.
- ◆ If the main water service piping is non-metallic (e.g. - PVC), the cold water piping system may be bonded at any accessible location.
- ◆ Bond where water and gas pipes are convenient. Bond clamps shall be accessible.

#### The gas piping system must be bonded

- ◆ The gas piping is bonded via the grounding conductor in the branch circuit to the gas appliances (*if available*).
- ◆ If the electrical system does not contain equipment grounds, then the gas piping system must be bonded externally with a bonding jumper (*same as water pipe*).

Gas bonding shall only be connected to the house side of the meter.