

# RESIDENTIAL ELECTRICAL SERVICE PANEL



**BUILDING & SAFETY DIVISION  
110 E. LA HABRA BLVD.  
LA HABRA, CA 90631  
562-383-4116  
[www.lahabracity.com](http://www.lahabracity.com)**

**Building Division Requirements**

Rev.06/17

**DIGALERT**  
  
**800-227-2600**  
Call 2 Full Working Days In Advance

An electrical permit is required for replacement and upgrade of the main electrical service panel prior to the installation of the new panel. The following is a list of the general requirements for electrical panel replacements based on the 2016 California Electrical Code (CEC). For additional information, contact the Building Division.

## General Requirements

The main electrical service shall be installed with rigid conduit. Electrical metallic tubing may be used where the service drop is attached to the building. The service entrance cable may be used, provided the approved fittings are used with the cable, such as a rain-tight service head or forming the cable goose-neck, taped or painted, and held securely in place by a fitting approved for the purpose (CEC, article 230).

The minimum size service conduit shall be 1 ¼". The minimum size service entrance wire shall be rate 100 amperes minimum if the load is 10 kW or more, or has more than 6 two-wire branch circuits. A larger service may be required for new homes or additions to existing homes.

## Service Entrance Conductors (Wires)

Conductors shall have a vertical clearance of not less than 8' above the roof surfaces. The service head shall be so located that the service drops together with the open wires between the service drop will have a minimum clearance of 10' vertically above ground and tree feet radius from doors and windows (CEC 230.24)

Conductors and cables exposed to direct sunlight, including overhead service conductors, shall be listed and marked as "sunlight resistant." Service entrance conductors and conduit shall be sized according to the following table (Chapter 9 Table 1):

SERVICE ENTRANCE CONDUCTORS SIZE AND RATING			
Service or Feeder Rating	Copper Conductors	Aluminum or Copper-Clad Aluminum	Minimum Conduit Size
100 Amps	#4 AWG	#2 AWG	1-1/4 inch
125 Amps	#2 AWG	#1/ 0 AWG	1-1/4 inch
150 Amps	#1 AWG	#2/ 0 AWG	1-1/4 inch
200 Amps	#2/ 0 AWG	#4/ 0 AWG	1-1/2 inch

*The grounding conductors must be identified by white or grey tape at both ends (CEC, 200.6).*

**Meter Location** – The height of the meter shall be between 48" and 66" above the ground.

**Working Space** – The clear working space in front of the panel shall be 30" wide by 36" deep with a minimum head room clearance of 6'-6" (CEC 110.26)

**Grounding of Services** – Grounding shall consist of a continuous grounding electrode conductor run from the panel to a ground rod (grounding electrode) and to the cold water pipe. Grounding of the electrical service at the main water line must be within the first 5' of water

pipng into the building. The underground water service shall not be used as the grounding electrode without supplemental electrode (CEC 250.53 [d]).

For existing structures and additions not affecting the main electrical service panel location, the grounding electrode shall be nonferrous (copper), listed, and not be less than ½” 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 ground electrode conductor attachment is protected against physical damage.

The required grounding electrode conductor (from electrode to panel) size is listed in the following table:

GROUNDING ELECTRODE CONDUCTOR SIZING (Table CEC 250.66)		
Size of Main Panel	Copper Conductors	Aluminum or Copper-Clad Aluminum
100 Amps	#8 AWG	#6 AWG
125 Amps	#8 AWG	#6 AWG
150 Amps	#6 AWG	#4 AWG
200 Amps	#4 AWG	#2 AWG

**Bonding** – Bonding of the hot, cold, and gas lines 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 and is recommended to be installed at the water heater between the hot, cold, and gas lines. The bonding jumper shall be sized based on the following table:

BONDING JUMPER SIZING (Table CEC 250.122)		
Size of Main Panel	Copper Conductors	Aluminum or Copper-Clad Aluminum
100 Amps	#8 AWG	#6 AWG
125 Amps	#6 AWG	#4 AWG
150 Amps	#6 AWG	#4 AWG
200 Amps	#6 AWG	#4 AWG

**An installer will also need to be familiar with all other sections of the Code which are applicable including:**

1. Annex C Table C.8- Maximum Number of Conductors or Fixture Wires in Rigid Metal Conduit (RMC).
2. Methods of Grounding and Bonding Conductor Connection to Electrodes- CEC 250.70
3. Installation of a ground rod at the panel and subpanel (if located at a detached garage) if some other means for grounding the system does not exist- CEC 250.24(A)(1) - (A)(5). **Note: The ground rod must be driven eight feet into the ground.**
4. Bonding to the water piping and gas piping at accessible locations- CEC 250.104(A)(B)
5. Protection of the grounding electrode conductor if smaller than 6AWG by means of rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, electrical metallic tubing, or cable armor- CEC 250.64(B)
6. Continuity of metal enclosures for grounding electrode conductors- CEC 250.64 (E)
7. Installation of the grounding electrode conductor without a splice or joint- CEC 250.64 (C)(1)(2)
8. The vertical clearance above the roof level shall be maintained for a distance of not less than 3 feet in all directions from the edge of the roof- CEC 230.24(A)

## Building Permit Application Requirements

Building permits for electrical panel replacements are available at the Building and Safety Division counter from 7:30am-1:00pm Monday – Thursday and Alternate Fridays.

## TYPICAL SERVICE METER INSTALLATION

### Service Meter

