RESIDENTIAL ELECTRICAL PANEL REPLACEMENT

BUILDING DIVISION REQUIREMENTS

An electrical permit is required for replacement and upgrade of the main electrical service panel prior to installation of the new panel. The following is a list of the general requirements for electrical panel replacements based on the 2013 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 1-1/4". The minimum size service entrance wire shall be rated 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 head and service drop will have a minimum clearance of 10' vertically above ground and three 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 (CEC Table 310.5[b] [7] and 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 ¼ inch
125 Amps	#2 AWG	#1/0 AWG	1 ¼ inch
150 Amps	#1 AWG	#2/0 AWG	1 ¼ inch
200 Amps	#2/0 AWG	#4/0 AWG	1 ½ 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 headroom 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 piping 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 contract 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.

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 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

- **Important PG& E Requirements**-Only authorized PG&E employees can connect or disconnect PG&E's electric service to the building. Unauthorized persons must not tamper with or break PG&E seals placed on meters and associated service equipment. Only authorized PG&E employees can remove, replace, or interfere with PG&E's meters, seals, connections, padlocks, or other locking devices. Refer to PG&E Electric & Gas Service Requirements at: http://www.pge.com/en/myhome/servicerequests/building/greenbook/index.page?WT.mc_id=Vanity_greenbook

PERMIT PROCESS

1. Prior to submittal for a building permit, contact the Planning Division to determine if a separate permit is required.

Building Permit Review

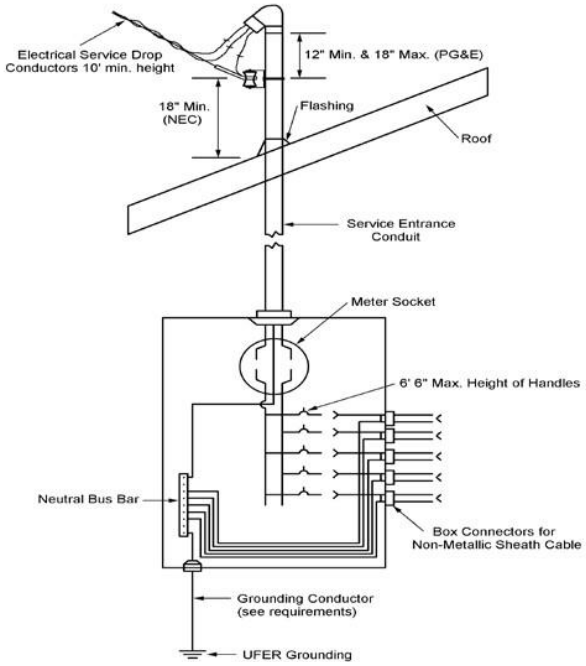
1. Building permits for electrical panel replacements are available at the Building Division counter from 8am-4pm Monday to Friday.

Inspections

1. A minimum of two inspections are required, a utility release and a final. The utility release inspection should be scheduled when the new panel is installed and ready to be hooked up the PG&E supply. The building inspector will provide a utility release form which will need to be provided to PG&E to have the supply hooked up to the new panel. A wire lath inspection is required for stucco repairs. A final inspection should be scheduled after all of the work is complete.
2. All work exceeding $1,000 requires the installation of listed/approved *smoke alarms* in all bedrooms, adjoining hall, and at each level per the CA Residential Code section R314. A *carbon monoxide alarm* is required, when there is an attached garage or fuel burning appliance, in the adjoining hallway(s) of the bedrooms and on every level of a dwelling unit including basement. For additional information please see *City of East Palo Alto Smoke & Carbon Monoxide Alarms Owner Certificate of Compliance* and *Examples of Locations for Smoke & Carbon Monoxide Alarm Handout*.

Building Permit Application Requirements

- ☐ A completed Building Permit Application
- ☐ If panel is to be relocated, a letter of approval from PG&E for the new location.



Important Note: Building plans may be required at the time of the submittal if rewiring, modifying/altering, or adding new branch circuits. Please inquire with staff.