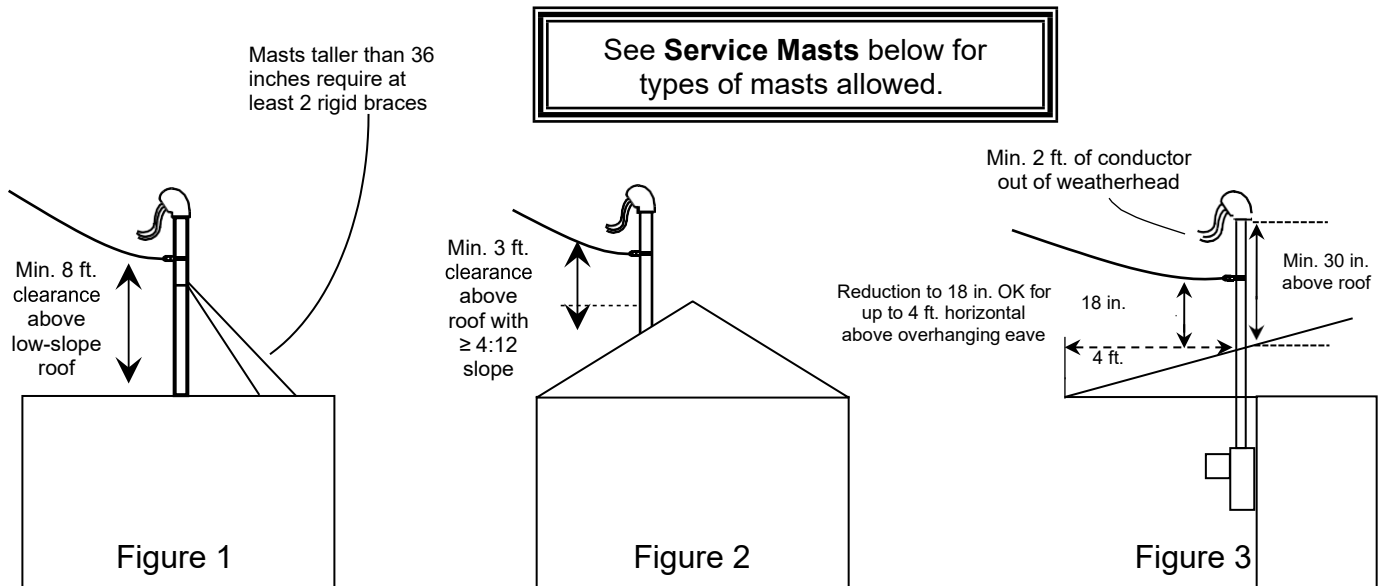




## CALIFORNIA ELECTRICAL CODE / SILICON VALLEY POWER RESIDENTIAL ELECTRICAL SERVICE UPGRADES



### Service Masts:

- Service mast types are limited to the following: Rigid Metal Conduit (RMC-Galvanized Steel, Stainless Steel, Aluminum) or Intermediate Metal Conduit (IMC). [CEC 342, CEC 344]
- 2 secure points of support are required between the threaded enclosure at the top of the panel and the weatherhead. If couplings are used, there must be 2 points of support between the last coupling and the weatherhead.
- The minimum height of the service mast, from bottom of weatherhead to the roof, is 30 inches.
- The minimum trade size of the mast is 1¼ inches (good for up to 125 Amp services).
- Masts over 36 inches in height above the roof require rigid bracing.
- Only power conductors are allowed on the mast – cable TV or phone wires are not allowed.
- The mast must provide the following minimum height of the service drop wires above roofs:
  - 8 feet above a roof with slope less than 4:12 (figure 1)
  - 3 feet above a roof with slopes 4:12 and greater (figure 2)
  - 18 inches above overhanging eaves for a maximum of 4 feet horizontal (figure 3)
- The clear vertical heights above apply for 3 feet past the edge of the roof, and to any outbuildings over which the service drop passes.
- Service drop conductors must have a minimum height of 12 feet above ground, except that areas accessible only to pedestrians may be 10 feet. Clearance above swimming pools shall be 22½ feet in any direction to the water. Clearance above driveways on other than residential property is 18 feet.
- A minimum of 2 feet of conductor must extend from the weatherhead. The neutral must be identified (white tape encircling the conductor is acceptable).
- Conductors must be sunlight-resistant and sized in accordance with the table on the following page.
- The penetration through the roof must have a watertight flashing

## Service Panels:

- Equipment must be listed and labeled as suitable for use as service equipment.
- The new and/or replaced service equipment must be provided with a surge-protective device. [CEC 230.67]
- A single main disconnect is required (SVP policy). 400-amp services may have two disconnects by special permission and require an approved electrical plan.
- Many older services are NEMA Type I panels rated for indoor use only, and are contained in a small wooden enclosure, or “doghouse.” New “doghouses” are not allowed. All exterior panels, including those installed in existing doghouses, must be rated for outdoors NEMA Type 3 or 3R.
- Surface-mounted panels require a ¼ inch air space between them and the wall. Do not caulk the edges of the panel to the wall.
- Semi-flush panels require a listed and approved flange kit that is integrated with the water-resistive barrier (WRB) in the wall. When the wall is stucco, the stucco must be broken back at least 6 inches around the panel. New paper must be lapped in shingle fashion a minimum of 3 inches at sides, top and bottom to the existing paper, and lap over the flashing flange. New wire lath must be secured to studs. The required lath inspection shall occur at the same time as the service upgrade inspection.
- Do not apply any stucco until the lath inspection has been approved. Stucco requires application in 3 coats with an interval between coats. Each coat must develop sufficient rigidity to resist cracking before the next coat is applied. The standard recommendation is 7 days after the scratch coat and 3 days after the brown coat. Other intervals are possible depending on weather and job conditions.
- The grounding electrode system must comply with current CEC standards. If metal underground water piping is present, the grounding electrode conductor must connect to it no further than 5 feet from the point of entrance of the piping to the building. In most upgrades, this requires running the grounding electrode conductor to the location of the main water shutoff. Water pipe electrodes must be supplemented by a ground rod, which can be adjacent to the water shutoff or the service. See the handout on Grounding Electrode Systems.
- A #6AWG copper bond wire must extend from the panel to an intersystem bonding termination kit on the wall outside the panel. This is used to interconnect phone and CATV grounding.

Minimum Size (AWG) of Service Conductors, Conduit, and Grounding Electrode Conductor (GEC)				
Service Rating (Main Disconnect) (based on service conductor size)	Copper Conductors	Compact Stranded Aluminum Conductors	Minimum Size Rigid Conduit (based on service conductor size)	Minimum GEC <sup>1</sup> (based on service conductor size)
100	4	2	1¼ in. <sup>2</sup>	8 AWG
125	2	1/0	1¼ in. <sup>2</sup>	8 AWG
150	1	2/0	1½ in. <sup>2</sup>	6 AWG
200	2/0	4/0	1½ in. <sup>2</sup>	4 AWG
400 <sup>3</sup>	400kcmil	600kcmil	3 in.	1/0 AWG
1. GECs ending at a ground rod do not need to be larger than 6 AWG (4 AWG if ending at a Ufer)				
2. Larger sizes are preferable – number shown is code minimum				
3. Requires electrical plan review from building department and SVP permission				

## Procedures:

- Do NOT disconnect the SVP service conductors – only SVP can work on those. Do not make a “hot cutover” of the SVP service drop to the new service entrance. The inspector will fail the installation if this is done.
- The building department inspector will need to view the conductors that are landed in the meter section of the service.
- If the inspection passes, the building department inspector will authorize a reconnect of the service.
- The finance department will charge a fee for the reconnection and new meter.