

**DEVELOPMENT SERVICES – BUILDING INSPECTION****INSPECTION GUIDELINES:  
ELECTRICAL SUB PANEL****INSPECTION CODE:** 405, 406**SCOPE:** RESIDENTIAL AND COMMERCIAL**APPLICABLE CODES:** 2016 CBC, CRC, CPC, CMC, CEC, CALGreen, CEnC, and PAMC

*The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.*

**IMPORTANT**

Meter removal and service disconnect/reconnect are to be performed by City of Palo Alto Utilities (CPAU) personnel only. Contractors who tamper with CPAU equipment will be issued a citation. Citations will be assessed at \$500.00 per incident. (PAMC 12.20.01.0)

Failure to complete the items below prior to inspection may result in a re-inspection fee.

**INSPECTION****OVERALL PANEL REQUIREMENTS**

- ☐ Equipment shall be de-energized for inspection.
- ☐ Provide the following working clearances: 36" in depth, 30" in width, and 6'-6" in height. (CEC 110.26)
- ☐ Disconnects for switches and breakers shall be installed so that the center of the operating handle, at its highest position, is not more than 6'-7" above the floor or working platform; it shall be located in a location that is readily accessible. (CEC 404.8(A)(1), CEC 230.70(A)(1))
- ☐ Over current devices shall not be installed over stairs. (CEC 240.24(F))
- ☐ Panelboards at separate structures require a main disconnect. (CEC 250.32 (D))
- ☐ Raceways for underground conduits are required to be sealed. (CEC 225.27)
- ☐ Conduits shall be sealed at the entry for underground-fed panels. (CEC 230.8)
- ☐ Only one feeder of branch circuit can supply power from one building to another. (CEC 225.30)

- ☐ The enclosure shall be free of debris. The internal parts of the electrical equipment (including: bus bars, wiring, terminals, and other surfaces) shall not be damaged or contaminated by foreign materials (such as: paint, plaster, cleaners, abrasives, or corrosive residues). (CEC 110.12 (C))
- ☐ Label service disconnect and all circuits. (CEC 110.22, CEC 230.70 (B))
- ☐ Any unused knock outs and opening must be sealed with listed plugs. (CEC 110.12 (A))
- ☐ All unused circuit breaker openings must be closed. (CEC 408.7)
- ☐ Provide a separate circuit for any forced air units (FAU). (CEC 422.12)
- ☐ Provide an approved handle tie at the garbage disposal and dishwasher for a single yoke. (CEC 210.4(B))
- ☐ Verify that the roof flashing at the riser is sealed and watertight.
- ☐ Supports for EMT, IMC, and RMC used for the riser shall be securely fastened in place at least every 10' and within 3' of each: outlet box, junction box, device box, cabinet, conduit body, or other termination. (CEC 342.30(A), CEC 344.30(A), CEC 358.30(A))
- ☐ Bollards shall be installed when electric equipment is subject to physical damage. See CPAU drawing DT-SS-C-1005.

**EQUIPMENT RATING**

- ☐ Where the available short circuit current exceeds 10,000A, the equipment shall be series rated by the manufacturer; if it is not, the breakers shall be rated at the available short circuit current rating. (CEC 110.9, CEC 110.22)
  - ☐ Provide a label as required that clearly reads: "CAUTION – Series Combination System Rated \_\_\_\_\_ Amperes. Identified Replacement Components Required."
- ☐ The over current protection device (OCPD) shall not be located over a stairway. (CEC 240.24(F))

**TORQUE REQUIREMENTS, LISTED USES, AND CONDUCTORS**

- ☐ Torque the feeder conductor lugs according to the manufacturer's listing. (The electrical contractor shall be on site with a torque wrench and torque screw driver for the inspection.)
- ☐ Circuit breakers shall be listed to be used with the panel used (usually the same manufacturer).
- ☐ Terminals for fine-stranded conductors must be listed for that use. (CEC 110.14)
- ☐ Verify that the panel is listed for the use that it is installed for.
- ☐ No double-lugging is allowed unless the terminal is listed for more than one conductor. (CEC 110.14(A))

- ☐ Check that the wire sizes comply with CEC 310 and CEC Table 310.15 (B).
- ☐ All connections must be tightened to the manufacturer's listing.

### GROUNDING AND BONDING

- ☐ An intersystem bonding termination is required. Provide a listed terminal at the meter enclosure or a bonding bar that is either located near the service equipment enclosure or near the grounding electrode conductor (GEC). The bonding bar connection must have a minimum wire size of 6AWG. The termination is required to have a minimum of three positions and shall remain accessible. (CEC 250.94)
- ☐ Provide grounding electrodes and grounding electrode conductors per CEC Table 250.66, CEC Article 250.64, CEC Article 250.70.
- ☐ The ground rod connection to the conductor shall be accessible. (CEC 250.68(A))
- ☐ Where more than one branch circuit supplies a separate structure, a separate grounding electrode system (i.e. ground rods) is required at each structure. (CEC 250.32(A))
- ☐ When the ground conductor (neutral) is a 6 AWG or smaller, it shall be marked in its entire length. Ground conductors that are larger than 6 AWG are allowed to only be marked at each termination. (CEC 200.6)
- ☐ For multi wire branch circuits, provide: an approved handle tie (CEC 210 (B)), verify the proper phasing (CEC 210.4(C)), and check that grounded/ungrounded conductor are grouped together (with tie wires) for easy identification (CEC 210.4(D)).
- ☐ Verify that the main panel grounds and neutrals are terminated on the same bus bar. (CEC 250.24(B))
- ☐ Grounds and neutrals located at the sub panel and panel at separate structures shall be on separate bus bars. (CEC 250.6, CEC 250.32 (D)(1))

### RECEPTACLES AND OTHER REQUIREMENTS

- ☐ An arc fault circuit interrupter (AFCI) receptacle is required at the following locations:
  - Family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sun rooms, closets, hallways, or similar rooms/areas.
  - Exception: Remodels using existing panels are not required to install AFCI breakers, unless the panel is compatible for AFCI breakers. (CEC 210.12 (B))
- ☐ A ground fault circuit interrupted (GFCI) receptacle is required at the following locations:
  - Kitchen counter tops, bathrooms, garage, unfinished basements, and exterior receptacles. (CEC 210.8)
- ☐ Tempered Resistant (TR) receptacles are required on all 15A and 20A receptacles where located less than 5.5' from the floor. (CEC 406.11)