



Building and Safety Permit Service Center

All plans must be submitted as an unsecured, flattened PDF with embedded fonts. Minimum 11"x17" sheet size.

For small solar PV rooftop systems (up to 10kW AC). The equipment, system, associated wiring and connections shall be installed by a qualified person.

All solar PV installations require an electrical permit. Permit application submittal documents can be submitted electronically using [Permits Online](#) (login and select "Create an Application"), by email to solar@cityofberkeley.info or in person at the [Permit Service Center](#). For standardized solar permitting guidelines, visit <https://www.cityofberkeley.info/solarpvpermitguide/>.

Numbers in parenthesis refer to code sections of the 2022 edition of the California Residential Code (CRC), California Electrical Code (CEC), California Mechanical Code (CMC), California Plumbing Code (CPC), California Energy Code (CEnc) and California Green Building Standards Code (CGBSC).

Building and Safety
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Code Compliance Checklist SOLAR PHOTOVOLTAIC

Project Information

Project Address:

Permit Number:

Permit Submittal Requirements

Schematic Site Plan showing: (a) building footprint with distances to property lines; (b) location of the solar PV system(s); (c) location of the main electrical service panel; (d) subpanel(s) (if any); (e) exterior and interior locations of all equipment and disconnects with working space clearances; (f) clear access pathways from roof eaves to ridges as indicates in the Code Requirements below. The site plan shall also contain project information (i.e., project address, owner's information, scope of work statement) and legend of symbols used on the drawings. See Code Requirements below for any additional guidance.

Structural Plan showing: (a) types, sizes, spacing and span of the existing roof framing members; (b) number and location of the solar panel supports; (c) construction details for the attachment of the solar arrays to the supporting roof framing; (d) type, size and length of fastener to be used. Panels that are not flush mounted (10 inches or more) require a licensed engineer to provide a structural analysis and details of connection adequate to resist wind uplift.

Electrical Plan showing: (a) complete single line diagram of the PV and utility interconnect; (b) existing service size and number of meters; (c) size, type, and insulation ratings (voltage, temperature, etc.) of all conductors and associated wiring components on the direct current (DC) and alternating (AC) side of the PV system; (d) type, size and material of raceway(s); (e) markings and labeling. Manufacturer's specifications sheets shall be provided for all proposed components. See Code Requirements below for any additional guidance.

Electrical Code Requirements

Qualifications of Installer: The equipment, system, associated wiring and interconnections shall be installed by a qualified person trained per NFPA 70E 2018. [CEC 690.4(C)]

Listing of Existing Equipment: The installer shall ensure that any alterations or additions to the existing system(s) shall not cause existing equipment or components to lose their listings. [CEC 110.3]

Grounding: Interconnected electric power production sources shall be grounded in accordance with Article 250. [CEC 705.50]

Ground-Fault Protection: Ground-Fault Protection for DC PV arrays shall meet the requirements of CEC 690.5 to reduce fire hazards. Ungrounded DC PV arrays shall comply with 690.35. Provide grounding instructions for module and mounting rails at time of inspection.

Arc-Fault Circuit Protection: PV systems operating at a maximum system voltage of 80 volts or greater, shall be protected as specified in CEC 690.11.

Disconnecting Means: Shall be provided to disconnect the PV system from all wiring systems including power systems, energy storage systems, and utilization equipment and its associated premises wiring. The PV system disconnecting means shall be

installed at a readily accessible location. [CEC 690.13 and 690.15]

AC and DC Disconnect: Isolating devices or equipment disconnecting means shall be installed in circuits connected to equipment at a location within the equipment, or within sight and within 10 feet of the equipment. [CEC 690.15(A)]

DC Disconnect Markings: A permanent readily visible label indicating the highest maximum DC voltage in a PV system, per CEC 690.7, shall be provided by the installer at one of the following locations: (1) DC PV system disconnecting means; (2) PV system electronic power conversion equipment; or (3) Distribution equipment associated with the PV system. [CEC 690.53]

DC PV Source & Output Circuits Inside a Building: Where PV system DC circuits run inside a building, they shall be contained in metal race-ways, type MC metal-clad cable that complies with CEC 250.118(10), or metal enclosures. The wiring methods shall comply with the additional installation requirements listed in CEC 690.31(G).

Rapid Shutdown: PV system circuits installed on or in buildings shall include a rapid shutdown function that controls specific conductors as follows: [CEC 690.12]

- Requirements for controlled conductors shall apply only to PV circuits supplied by the PV system.
- Controlled conductors located outside the boundary or more than 1 m (3 ft) from the point of entry inside a building shall be limited to not more than 30 volts within 30 seconds of rapid shutdown initiation.
- Controlled conductors located inside the boundary shall be limited to not more than 80 volts within 30 seconds of rapid shutdown initiation.
- Voltage and power shall be measured between any two conductors and between any conductor and ground.
- An initiation device(s) shall be located at a readily accessible location outside the building. The rapid shutdown initiation device(s) shall consist of at least one of the following: (1) Service disconnecting means; (2) PV system disconnecting means; (3) Readily accessible switch that plainly indicates whether it is in the "off" or "on" position.
- Equipment that performs the rapid shutdown functions, other than initiation devices such as listed disconnect switches, circuit breakers, or control switches, shall be listed for providing rapid shutdown protection.

Identification of Power Sources: Buildings or structures with both utility service and a PV system shall have permanent labels as described in CEC 690.56(C)

Point of Connection Rating: The output of an interconnected electric power source shall be connected as specified in CEC 705. Note that the sum of the ratings of all overcurrent devices connected to power production sources shall not exceed the rating of the service.

Supply Side Connection: Pursuant to CEC 230.82(6), an electric power production source shall be permitted to be connected to the supply side of the service disconnecting means. The sum of the ratings of all overcurrent devices connected to power production sources shall not exceed the rating of the service. Unless the existing panel is designed for a supply side connection, the installer must demonstrate that the installed supply side connection will not void or violate the panel manufacturer's listing. [CEC 705.11]

Load Side Connection: The output of a utility-interactive inverter shall be permitted to be connected to the load side of the service disconnecting means of the other source(s) at any distribution equipment on the premises. The interconnecting provisions for the utility-interactive inverter(s) shall comply with CEC 705.12(A) through (E).

Bus or Conductor Ampere Rating: 125 percent of the inverter output circuit current shall be used in ampacity calculations for the following: (1) Feeders, (2) Taps, and (3) Busbars. [CEC 705.12(B)]

Identification & Grouping: PV system conductors shall be identified and grouped as required by CEC 690.31(B).

Point of Interconnection Markings: All interactive system(s) points of interconnection with other sources shall be marked at an accessible location at the disconnecting means as a power source and with the rated AC output current and the nominal operating AC voltage. (CEC 690.54)

Marking and Labeling Required: The following wiring methods and enclosures that contain PV power source conductors shall be marked with the wording "WARNING: PHOTOVOLTAIC POWER SOURCE" by means of permanently affixed labels or other approved permanent marking: [CEC 690.31(G)(3)]

- Exposed raceways, cable trays and other wiring methods;
- Covers or enclosures of pull boxes and junction boxes; and

- Conduit bodies in which any of the available conduit openings are unused.

Marking Locations: The labels or marking shall be visible after installation. The labels shall be reflective, and all letters shall be capitalized and shall be a minimum height of 3/8 inch in white on a red background. PV power circuit labels shall appear on every section of the wiring system that is separated by enclosures, walls, partitions, ceiling or floors. Spacing between labels or markings, or between a label and a marking, shall not be more than 10 feet. Labels required by this section shall be suitable for the environment where they are installed. [CEC 690.31(D) (2)]

Structural Code Requirements

Rafter Span: The rafter's spans shall be measured horizontally from ridge board to supporting wall top plates. Installation of purlins and braces to reduce the span of rafters is limited to a slope not less than 45 degrees from the horizontal. [CRC R802.5]

Roof Framing: In lieu of providing a project specific engineered design, the roof rafter framing supporting the added PV system shall meet the conventional framing standards of CRC R802.5 and Tables R802.5.1(1) through (8).

Module Attachment: Module attachments shall be in accordance with the manufacturer's specifications.

Fire Department Requirements

Fire Classification: Rooftop mounted PV panels and modules shall have a combined fire classification listing in accordance with UL1703 and comply with CBC Table 1505.1. Installations within Fire Zones 2 or 3 shall have a listed Class A fire classification; for additional information, reference the State Fire Marshall guidelines. [CRC R902.4]

Building Integrated Photovoltaic Systems: Products installed as the roof covering shall be tested, listed and labeled for fire classification in accordance with CRC R902. and installed in accordance with CRC R905.

Clear Access Paths: Not less than two minimum 36-inchwide pathways on separate roof planes, from lowest roof edge to ridge, shall be provided on all buildings. At least one pathway shall be provided on the street or driveway side of the roof. [CRC R324.6.1]

- For photovoltaic arrays occupying not more than 33 percent of the plan view total roof area, not less than an 18-inch clear set back is required on both sides of a horizontal ridge. [CRC R324.6.2]
- For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, not less than a 36-inch clear set back is required on both sides of a horizontal ridge. [CRC R324.6.2]

Emergency Escape and Rescue Options: Panels and modules installed on dwellings shall not be placed on a portion of a roof that is below an emergency escape and rescue opening. A 36-inch wide pathway shall be provided to the emergency escape and rescue opening. [CRC R324.6.3]

Additional:

I certify that I have read and acknowledged all of the Code Requirements noted above. I accept full responsibility for complying with all of the above requirements, as applicable to my project. I further agree that if I fail to comply with the code requirements, due to error or omission, I will correct all deficiencies prior to final inspection.

Name

Signature

Date

Check One:

Contractor

Owner

Owner's Agent