



City of El Cajon
Building and Fire Safety Division
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Installation Standards for Photovoltaic Systems

Please be advised that the City has adopted new fire code standards for the installation of photovoltaic systems. These standards relate to life safety requirements for the safety of firefighters during fire suppression activities.

Section 511 Solar Photovoltaic Installations

511.1 General. The installation of solar photovoltaic installations shall comply with Table 601 and Chapter 16 of the California Building Code. The installation shall also comply with Sections 511.2 through 511.11 and NFPA 70.

511.2 Circuit marking. To facilitate identifying energized electrical lines that connect the solar panels to the inverter, to prevent these conduits from being cut when venting for smoke removal, markings shall be provided to give emergency responders appropriate warning that a solar electric system is present.

511.3 Materials. The materials used for marking shall be reflective, weather resistant and suitable for the environment.

511.4 Main service disconnect. For residential occupancies, the marking shall be placed within the main service disconnect. If the main service disconnect is operable with the service panel closed, then the marking shall be placed on the outside cover. For commercial occupancies, the marking shall be placed adjacent to the main service disconnect in a location clearly visible from the location where the lever is operated.

511.4.1. Marking content and format. The marking shall contain the words "CAUTION: SOLAR ELECTRIC CONNECTED" in capital letters a minimum of 3/8 inches in height with white letters on a red background.

511.5 DC conduit, raceways, enclosures, cable assemblies, and junction boxes. Marking shall be provided on all interior and exterior dc conduit, raceways, enclosures, cable assemblies, and junction boxes to alert the fire service to their presence. The marking shall be placed every 10 feet or fraction thereof, at turns and above and below penetrations, and on all dc combiner and junction boxes.

511.5.1 Marking content and format. The marking shall contain the words "CAUTION: SOLAR ELECTRIC CONNECTED" in capital letters a minimum of 3/8 inches in height with white letters on a red background.

511.5.2 Locations of DC conductors. Conduit, wiring systems, and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities. Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes total amount of

conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays.

511.6 Power disconnects. A solar disconnect may be required within 3 feet of the photovoltaic array to provide for de-energizing the DC circuit(s) from the array to the inverter. If required, the disconnect shall be labeled with reflective lettering.

511.7 Access, pathways for smoke ventilation. Roof access and spacing requirements shall be observed in order to ensure access to the roof, provide pathways to specific areas of the roof, and provide for smoke ventilation operations; and to provide emergency egress from the roof.

511.8 Roof access points. Roof access points shall be defined as an area that does not place ground ladders over openings such as windows or doors, and are located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.

511.9. Residential systems-One- and two-family residential dwellings. Access shall be provided in accordance with Sections 511.9.1 through 511.9.3

511.9.1 Residential buildings with hip roof layouts. Panels shall be located in a manner that provides one (1) three-foot (3') wide clear access pathway from the eave to the ridge on each roof slope where panels are located. The access pathway shall be located at a structurally strong location on the building such as along a underlying bearing wall.

511.9.2 Residential buildings with a single ridge. Panels shall be located in a manner that provides two (2) three-foot (3') wide access pathways from the eave to the ridge on each roof slope where panels are located.

511.9.3 Hips and Valleys: Panels shall be located no closer than one and one half (1.5) feet to a hip or a valley if panels are to be placed on both sides of a hip or valley. If the panels are to be located on only one side of a hip or valley that is of equal length then the panels shall be permitted to be placed directly adjacent to the hip or valley.

511.9.4 Ventilation. Panels shall be located no higher than three feet (3) below the ridge.

Exception: The fire department is authorized to allow panels to be located two (2) feet below the ridge if a product or method acceptable to the fire department has been provided for ventilation.

511.10 All other occupancies. Access shall be provided in accordance with Sections 511.10.1 through 511.10.3 511.10.1

511.10.1 Access. There shall be a minimum six (6) foot wide clear perimeter around the edges of the roof.

Exception: If either axis of the building is 250 feet or less, there shall be a minimum four feet (4') wide clear perimeter around the edges of the roof.

511.10.2 Pathways. The solar installation shall be designed to provide designated pathways. The pathways shall meet the following requirements:

1. The pathway shall be over structural members.
2. The center line axis pathways shall be provided in both axis of the roof. Center line axis pathways shall run on structural members or over the next closest structural member nearest to the center lines of the roof.
3. Shall be straight line not less than 4 feet clear to skylights and/or ventilation hatches.
4. Shall be straight line not less than 4 feet clear to roof standpipes.
5. Shall provide not less than 4 feet clear around roof access hatch with at least one not less than 4 feet clear pathway to parapet or roof edge

511.10.3 Ventilation. The solar installation shall be designed to meet the following requirements.

1. Arrays shall be no greater than 50 by 50 feet in distance in either axis
2. Ventilation options between array sections shall be either a pathway 8 feet or greater in width; a 4 feet or greater in width pathway and bordering on existing roof skylights or ventilation hatches-, or a 4 feet or greater in width pathway and bordering 4' x 8' "venting cutouts" every 20 feet on alternating sides of the pathway

511.11 Ground mounted photovoltaic arrays. Ground mounted photovoltaic arrays shall comply with Sections 511.1 through 511.6 and this section. Setback requirements do not apply to ground-mounted, free standing photovoltaic arrays. A clear brush area of 10' is required for ground mounted photovoltaic arrays.