



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 the California Fire Code which includes standards for the installation of photovoltaic systems. These standards relate to life safety requirements for the safety of firefighters during fire suppression activities.

CFC Section 605, CEC Section 690,705 & ECMC
Solar Photovoltaic Installations

605.11 General. Solar photovoltaic power systems shall be installed in accordance with sections 605.11.1 through 605.11.3. The installation shall also comply with the California Building & Residential Code, California Electrical Code and NFPA 70.

Exception: *Detached, nonhabitable Group U structures including, but not limited to, parking shade structures, carports, solar trellises and similar structures shall not be subject to the requirements of this section.*

Roof access, pathways, and spacing requirements need not be provided where the fire code official has determined rooftop operations will not be employed.

690.14(C)(2) Marking. Each photovoltaic system disconnecting means shall be permanently marked to identify it as a photovoltaic system disconnect.

690.31(E)(3) Marking or Labeling Required. Wiring methods and enclosures that contain PV power source conductors to include conduit bodies, covers or enclosures of pull boxes and junction boxes shall be marked with the wording “**PHOTOVOLTAIC POWER SOURCE**”.

690.31(E)(4) Location of marking. Labels or markings shall be visible. Power circuit labels shall be placed not more than every 10 feet and within 1 foot above and below penetrations of roof/ceiling assemblies, walls or barriers. Labels shall be suitable for the environment where they are installed.

690.56 Identification of Power Sources. A plaque identifying the location of all customer self-generation equipment, the service point and DC disconnects must be installed on the enclosure for the service disconnect. The plaque shall be attached to the exterior of the enclosure with pop-rivets, machine screws, or other fasteners acceptable to the AHJ. Epoxy or other adhesive is not acceptable. (San Diego Area Electrical Newsletter 2014)

Note: A disconnecting means shall be provided on the roof within sight for systems using micro inverters.

690.31(E) Location 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 the 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. DC wiring shall be installed in metallic conduit or raceways when located inside a building or structure. Conduit shall run along the bottom of load bearing members. Wiring beneath roofs shall not be within 10 inches of roof decking unless directly below modules or equipment.

605.11.1 Access and pathways. Roof access, pathways, and spacing requirements shall be provided in accordance with Sections 605.11.1.1 through 605.11.1.3.3

Exception: Panels/modules may be permitted to be located in approved access pathways where an alternative ventilation method approved by the fire code official has been provided or when the fire code official has determined vertical ventilation techniques will not be employed.

605.11.1.1 Roof access points. Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of buildings construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.

605.11.1.2.2 Residential buildings with hip roof layouts. Panels/modules installed on residential buildings with hip roof layouts shall be located in a manner that provides a 3-foot-wide clear access pathway from the eave to the ridge on each roof slope where panels and modules are located. The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof. *These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal or less.*

605.11.1.2.3 Residential buildings with a single ridge. Panels/modules installed on residential buildings with a single ridge shall be located in a manner that provides two, 3-foot-wide access pathways from the eave to the ridge on each roof slope where panels and modules are located. *This requirement shall not apply to roofs with slopes of two units vertical in 12 units horizontal or less.*

605.11.1.2.4 Residential buildings with roof hips and valleys. Panels/modules installed on residential buildings with roof hips and valleys shall be located no closer than 18 inches to a hip or a valley where panels/modules are to be placed on both sides of a hip or valley. Where panels are to be located on only one side of a hip or valley that is of equal length, the panels shall be permitted to be placed directly adjacent to the hip or valley. *These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal or less.*

605.11.1.2.5 Residential building smoke ventilation. Panels/modules installed on residential buildings shall be located no less than 3 feet below the ridge in order to allow for fire department smoke ventilation operations.

605.11.1.3 Other than residential buildings. Access to systems for occupancies other than one- and two-family dwellings and group R-3 shall be provided in accordance with Sections 605.11.1.3.1 through 605.11.1.3.3

Exception: Where it is determined by the fire code official that the roof configuration is similar to that of a one- or two-family dwelling, the residential access and ventilation requirements in Sections 605.11.1 through 605.11.1.2.5 shall be permitted to be used.

605.11.1.3.1 Access. There shall be a minimum 6-foot-wide clear perimeter around the edges of the roof.

Exception: Where either axis of the building is 250 feet or less, there shall be a minimum 4-foot-wide clear perimeter around the edges of the roof.

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

1. The pathway shall be over areas capable of supporting the live load of fire fighters accessing the roof.
2. The centerline axis pathways shall be provided in both axes of the roof. Centerline axis pathways shall run where the roof structure is capable of supporting the live load of fire fighters accessing the roof.
3. Shall be a straight line not less than 4 feet clear to roof standpipes or ventilation hatches.
4. 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.

605.11.1.3.3 Smoke ventilation. The solar installation shall be designed to meet the following requirements:

1. Arrays shall be no greater than 50 feet by 50 feet in distance in either axis in order to create opportunities for fire department smoke ventilation operations. ECMC 15.56.190
2. Smoke ventilation options between array sections shall be one of the following:
 - 2.1. A pathway 8 feet or greater in width.
 - 2.2. A 4-foot or greater in width pathway and bordering roof skylights or smoke and heat vents.
 - 2.3 A 4-foot or greater in width pathway and bordering all sides of non-gravity operated dropout smoke and heat vents on not less than one side.
 - 2.3. A 4-foot or greater in width pathway and bordering 4-foot by 8-foot “venting cutouts” every 20 feet on alternating sides of the pathway.

605.11.2 Ground-mounted photovoltaic arrays. Ground-mounted photovoltaic arrays shall comply with Section 605 of the CFC and the CEC. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays. A clear, brush-free area of 10 feet shall be required for ground mounded photovoltaic arrays.