



# **Solar PV Requirements in the 2016 California Fire, Electrical & Residential Codes**

## **Wiring/Circuit Installations:**

1. Direct current (DC) conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes and disconnects shall be labeled per the following:
  - Labels shall be reflective, water resistant and can withstand the environment; lettering shall be a minimum 3/8" in height with white on red background.
  - Labels shall state, "WARNING: PHOTOVOLTAIC POWER SOURCE".
  - Labels shall be placed at every service disconnect; also on every DC conduit, raceways, enclosures, etc at 10ft o.c. and within 1ft of turns, bends and penetrations.
2. Conduit, raceways and wiring systems shall be run as close as possible to ridges, hips, valleys, etc; they shall also be installed in such a manner to limit trip hazards and maximize ventilation opportunities. DC wiring in enclosed spaces shall be installed in metallic conduit; conduit shall be run along the bottom of load bearing members.
3. PV source and output circuits inside a building shall be routed along building structural members where the members can be observed (accessible attics, etc). If circuits are embedded in areas (not accessible) that are not covered by PV modules, those areas shall be clearly marked indicating their locations.
4. DC circuits ran inside a building 80 volts or greater shall be protected by a listed arc-fault circuit interrupter.
5. Where multiple inverters are installed and not grouped a clear location directory shall be provided at each AC & DC disconnect location.
6. FMC 3/4" or smaller, MC conduit 1" or smaller or exposed wiring installed across ceiling joists or floor joists shall be protected by guard strips.
7. Rapid shutdown device required for DC system circuits of more than 5ft inside buildings or more than 10ft from the array.
8. Roof mounted DC system manually operated load break disconnect required at combiner boxes or within 6ft of combiner boxes.
9. Disconnects required for energy storage devices where more than 5ft from connected equipment or where circuits pass through a wall/partition.
10. Size of supply side connections comply with CEC 705.12(D)(2).
11. Supply side connections require overcurrent protection within 10ft from the service conductor connection.

## **Roof Access & Pathways (effective July 1, 2018):**

- Not less than two minimum 36" wide pathways on separate roof planes from the lowest edge of the roof to the ridge with one pathway on the street or driveway side of the roof.
- 36" wide pathways shall be maintained to access emergency escape and rescue openings.
- Buildings without fire sprinklers installed:
  - ≤ 33% of solar array roof coverage: 18" clear from panels on both sides of roof ridge
  - > 33% of solar array roof coverage: 36" clear from panels on both sides of ridge
- Buildings with fire sprinklers installed:
  - ≤ 66% of solar array roof coverage: 18" clear from panels on both sides of roof ridge
  - > 66% of solar array roof coverage: 36" clear from panels on both sides of roof ridge

### **Exceptions:**

- *Roofs with a slope of less than or equal to 2:12 or when the Fire Chief approves alternative ventilation methods or determines vertical ventilation techniques will not be used.*
- *Detached non-habitable garages, barns, shade structures, and carports.*

1. Roof access shall be available that doesn't require placement of ladders over windows, doors, etc and located at strong points of the building construction that allow unobstructed access.
2. Ground Mount Arrays: A minimum 10ft clear "brush-free" area around the array shall be provided.

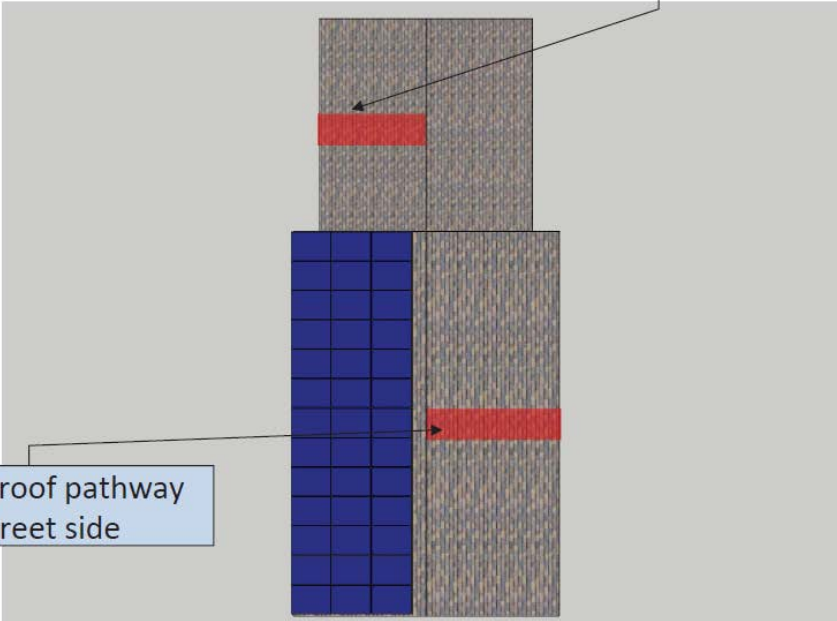
## **Fire Rating:**

1. Modules shall be tested, listed and identified with the fire classification based on the specific type of building construction. (See California Building Code (CBC) Table 1505.1 for specific classification requirements)

R324.6.1. Not less than two minimum 36 in. (914 mm) wide 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.

Adjacent roof pathway on street side

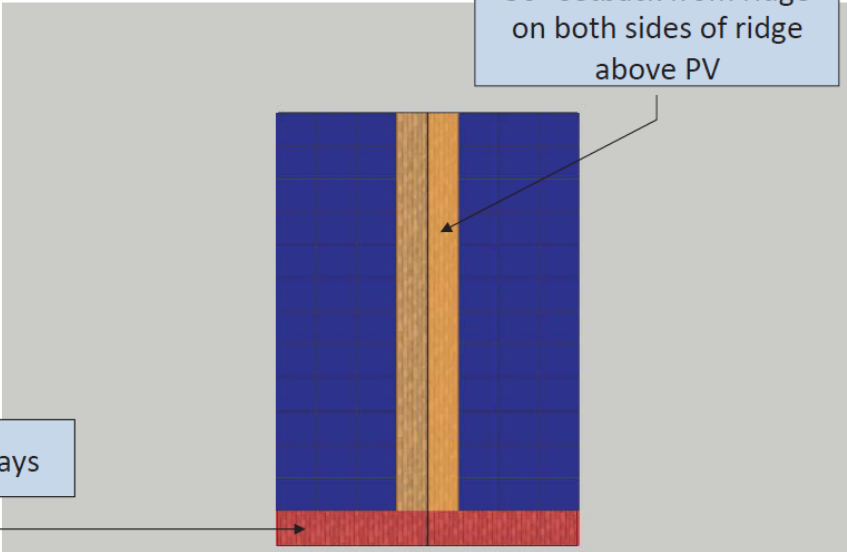
Pathway on separate roof plane



R324.6.2. Setback at ridge. [...] For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, not less than a 36-inch (914 mm) clear setback is required on both sides of a horizontal ridge.

Roof access pathways

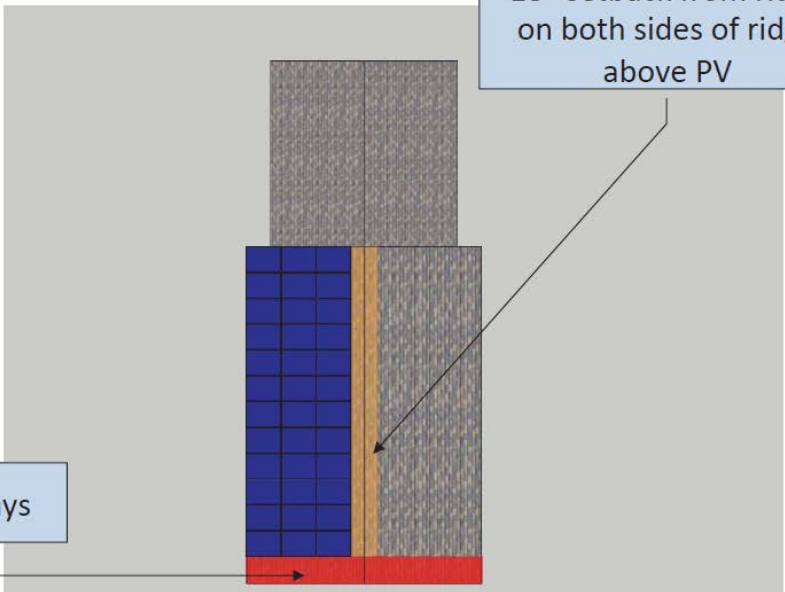
36" setback from ridge on both sides of ridge above PV



R324.6.2. Setback at ridge. For photovoltaic arrays occupying not more than 33 percent of the plan view total roof area, not less than 18-inch (457 mm) clear setback is required on both sides of a horizontal ridge. [...]

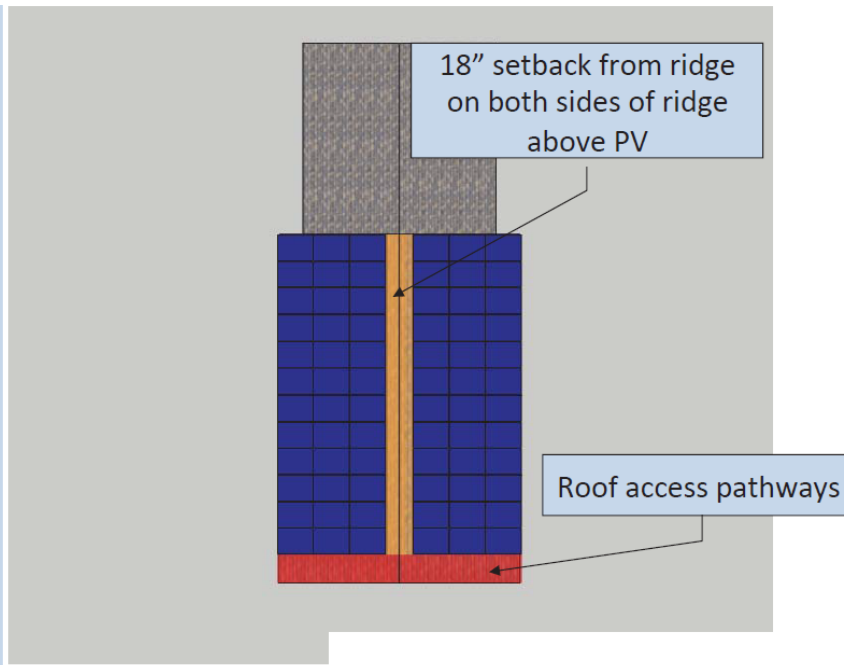
Roof access pathways

18" setback from ridge on both sides of ridge above PV



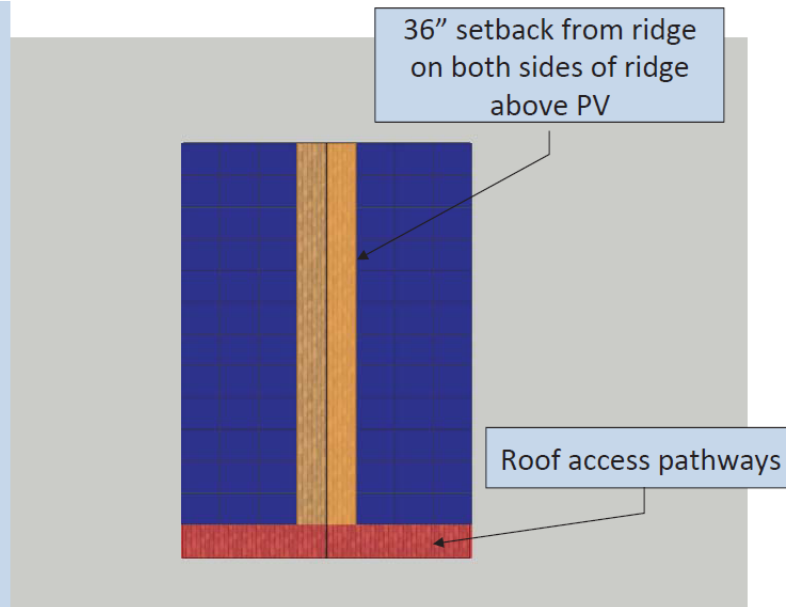
R324.6.2.1. *Alternative setback at ridge. Where an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D or Section P2904, setbacks at ridges shall conform with one of the following:*

1. *For photovoltaic arrays occupying not more than 66 percent of the plan view total roof area, not less than an 18-inch (457 mm) clear setback is required on both sides of a horizontal ridge.*



R324.6.2.1. *Alternative setback at ridge. Where an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D or Section P2904, setbacks at ridges shall conform with one of the following:*

[...]  
2. *For photovoltaic arrays occupying more than 66 percent of the plan view total roof area, not less than a 36-inch (914 mm) clear setback is required on both sides of a horizontal ridge.*



R324.6.1 Pathways.  
[...]

*For each roof plane with a photovoltaic array, at least one 36 in. (914 mm) wide pathway from lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, or on an adjacent roof plane, or straddling the same and adjacent roof planes.*

