

City of Cottonwood
Building Division
2019 Solar Panel Requirements
Per 2017 NEC



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The 2018 International Building Code says:

R105.1 - Required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, **install**, enlarge, alter, repair, **remove**, **convert** or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the building official and obtain the required permit.

Purpose

To assist and encourage private generation of electricity through usage of solar power, while assuring that such generation does not create electrical, structural, fire or life safety hazards.

Scope

This Construction Tip Sheet may only be used for single-family, two-family and townhome buildings, as defined by the International Residential Code.

Definitions

- PV means Photo-Voltaic
- NEC means National Electrical Code

Permit and Installation Requirements

PV panel installations require a building permit unless exempted in this section. All PV installations require an electrical permit. The installation of roof mounted PV solar panels must meet all of the following:

- Total dead load of panels, supports, mountings, raceways and all other appurtenances weigh no more than three pounds per square foot.
- The total PV solar panel system weight will not exceed 1,000 pounds.
- Panels are to be mounted no higher than 18" above the surface of the roofing to which they are affixed. Except for flat roofs, no portion of the system may exceed the highest point of the roof. Panels on flat roofs cannot exceed the maximum height allowed for the building unless approved by the local jurisdiction.
- Supports for solar panels are to be installed to spread the dead load across as many roof-framing members as needed to ensure that no point loads in excess of fifty pounds are created.
- Attachment to the roof will be as specified by the mounting system manufacturer.
- All signage and markings required by NEC 690 shall be a phenolic or metallic plate or other similar material engraved in block letters at least 1/4" high and suitable for the environment and application. The letters and the background shall be in contrasting colors. Screws or rivets shall be used to affix an identification plate to the equipment or enclosure.
- The installation must still comply with all land use and other applicable codes even if a building permit is not required.
- Provide letter stating roof has been inspected and will support the additional load of the PV system.

Additional Signage and marking Requirements

In addition to the signage and markings required in NEC 690 an Identification Plate is needed to provide emergency responders with appropriate warning regarding the solar electric system and must comply with the following:

- Identification Plate text: “WARNING: PHOTOVOLTAIC POWER SOURCE”
- Red background, white lettering
- Minimum 3/8” letter height, all capital letters
- Arial or similar font, non-bold
- Reflective, weather resistant material
- The marking should be placed on the exterior of structure adjacent to the meter and within the main service disconnect. If the main service disconnect is operable with the service panel closed, then the marking should be placed on the outside cover.
- Identify system as rapid shut down compliant.

Electrical Permits and Inspections

Electrical permits and inspection approvals are required for all PV installations that connect to the building’s electrical system. The following information must be provided for plan review:

- A wiring diagram showing all photovoltaic equipment, devices, wire type and size, over-current protection and grounding.
- Electrical calculations used to determine voltage and current within the photovoltaic system.
- Information/specifications for all equipment (array, inverter, modules including operating and maximum voltages/currents/power, etc.).

Firefighter Access

PV systems are a serious concern for the fire service in that they limit access for roof operations and, even when disconnected from the building electrical system, remain energized during daylight hours. The following recommendations are made to help mitigate these concerns.

Access

- A pathway should be constructed along all roof edges, peaks, and valleys for firefighter access.
- The pathway should be not less than 36” wide measured from the edge of the solar array. (See attached figures 1-4 for examples of firefighter pathways).
- When solar arrays are installed on roofs, there should be a minimum of 36” of clearance at the ridgeline to allow for smoke ventilation.
- This guideline does not apply to non-habitable structures without concealed attic/roof spaces. Examples of non-habitable structures include, but are not limited to, parking shade structures, carports, solar trellises, etc.

EXAMPLES OF SOLAR ARRAY FIREFIGHTER PATHWAYS

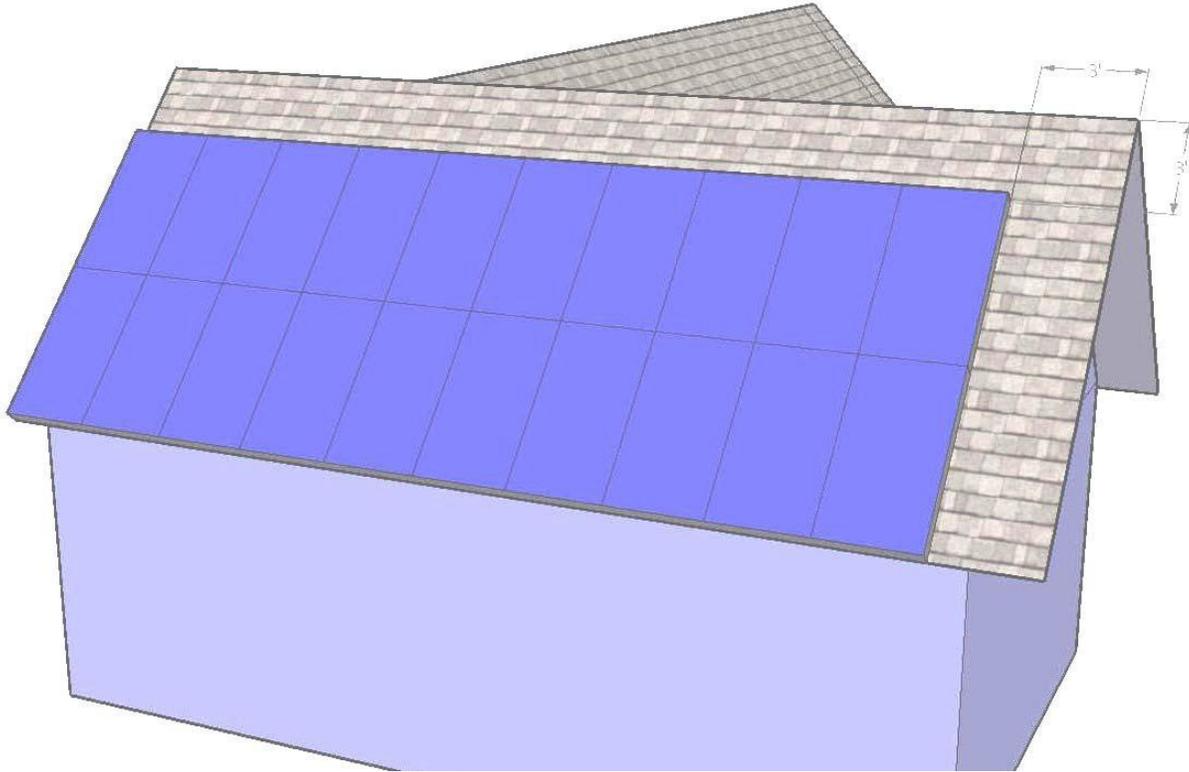


Figure 1 – Cross Gable Roof

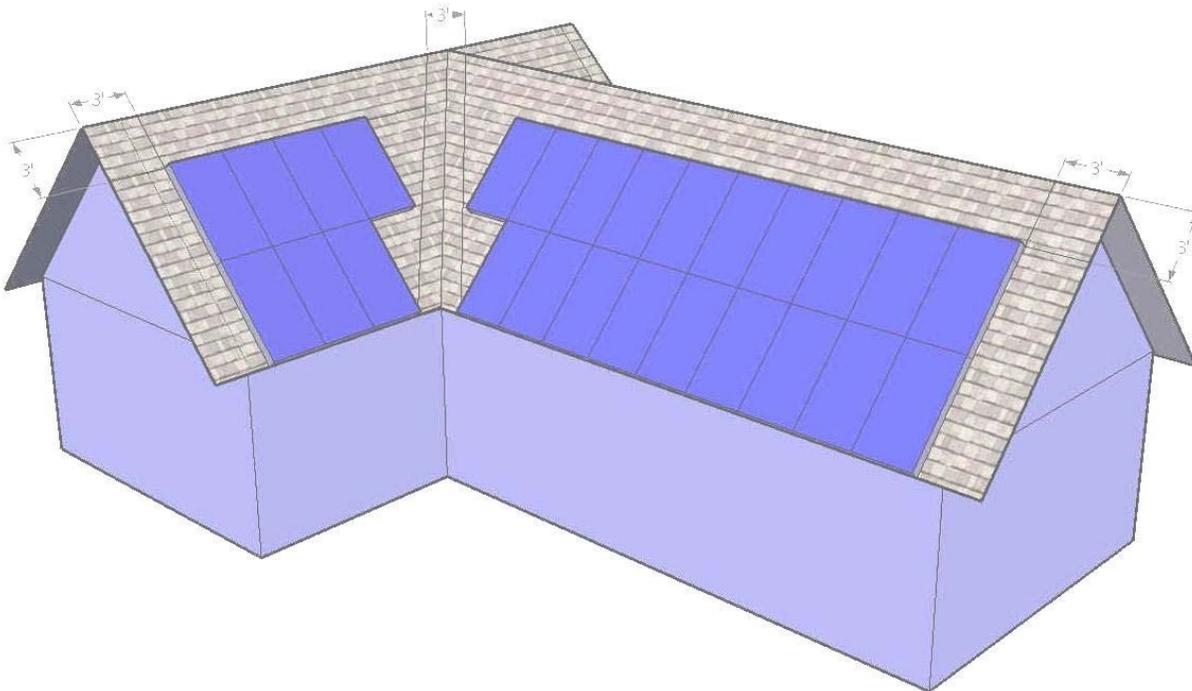


Figure 2 – Cross Gable with Valley

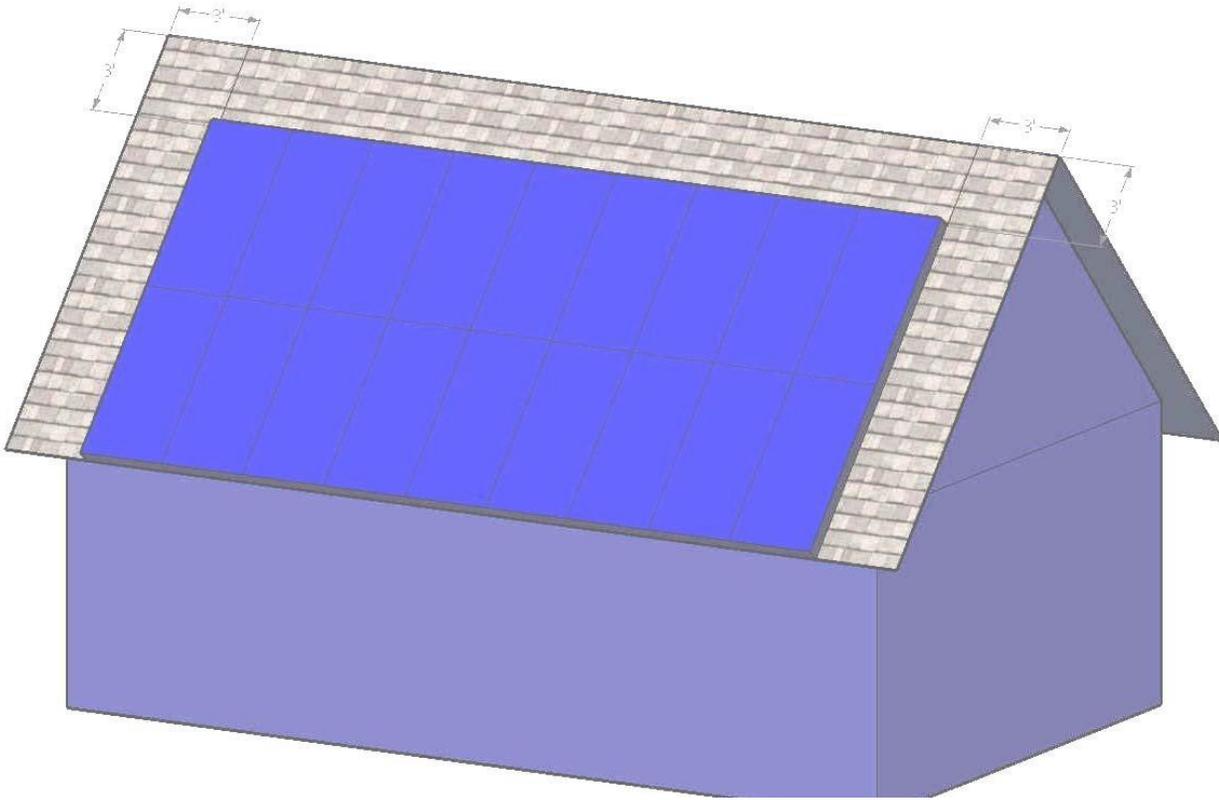


Figure 3 – Full Gable

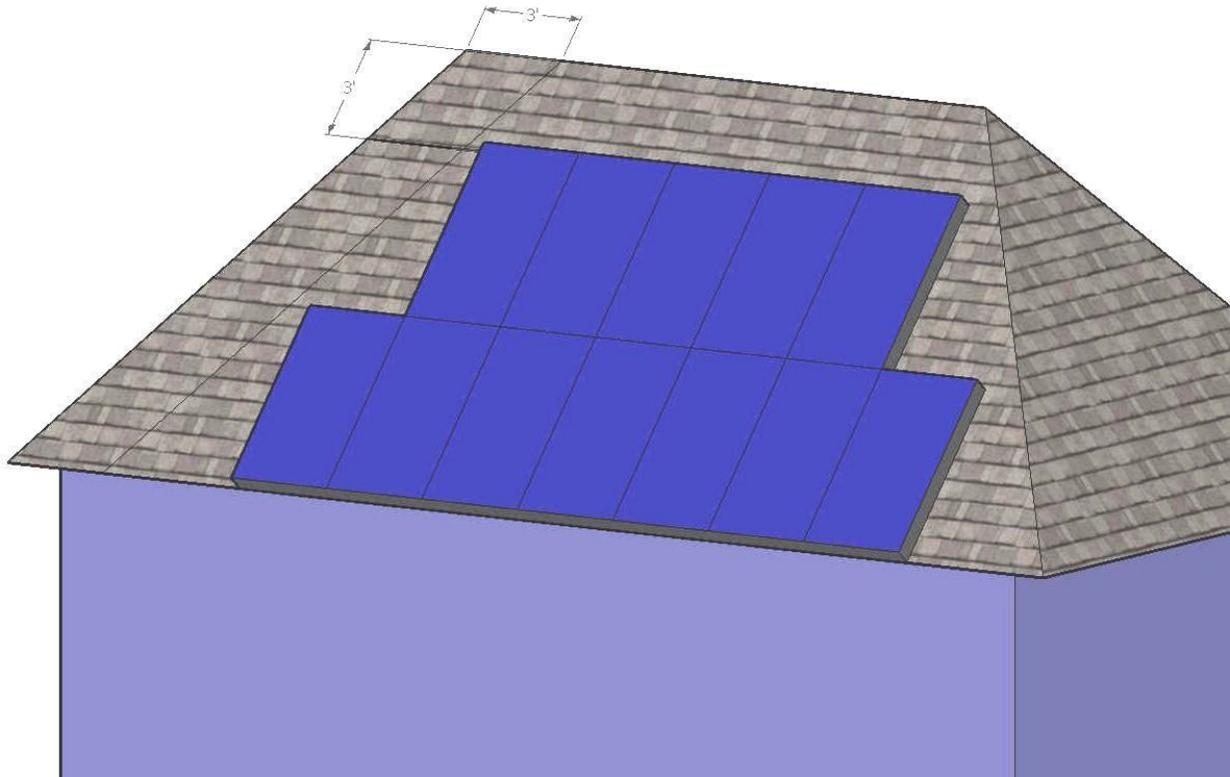


Figure 4 – Full Hip Roof