

## Photovoltaic (PV) Submittal Requirements

### PERMIT APPLICATION PROCESS:

#### a. Electronic Submittal Requirements:

- ☐ Permit applications may be submitted electronically utilizing our Citizen Access Portal at the following link: <http://www.citrusheights.net/135/Building-Permits>
- ☐ Provide one complete set of plans, details and specs on 11" x 17" paper in (PDF) format. Plans, specs and supporting documents shall be organized, oriented and submitted as a single PDF file.
- ☐ Provide SMUD application confirmation letter

**Solar Energy permit applications will be processed within 3 business days.**

### PERMIT INFORMATION:

- ☐ The installation of a photovoltaic solar electric system requires a permit.
- ☐ **Homeowners Association:** If the property is regulated by a Home Owners Association, any exterior work must have written approval of the association and the written approval must be attached to the permit.
- ☐ A solar permit does not include replacement or upgrading of the existing electrical panel or service (a separate electrical permit must be obtained, or the work may be included with the PV application with an additional permit fee).
- ☐ A building permit may be issued only to a State of California licensed contractor or the home owner.
- ☐ If the work is performed by the homeowner personally or by his/her workers, and an inspection indicates the work cannot be completed satisfactorily, then a licensed contractor must perform the work
- ☐ If the home owner hires workers, State Law requires the home owner to obtain Worker's Compensation Insurance, proof of this insurance is required prior to inspection.

### INSTALLATION REQUIREMENTS

- ☐ **Building Codes:** All work must comply with the 2019 California Building Code (CBC), 2019 California Residential Code (CRC), 2019 California Electrical Code (CEC), 2019 California Mechanical Code (CMC), 2019 California Plumbing Code (CPC), 2019 California Energy Code.
- ☐ Equipment must be installed in accordance with its listing and the manufacturer's installation instructions CEC 110.3(B)
- ☐ All work shall comply with CEC Article 690 *Solar Photovoltaic*.

### PLAN REQUIREMENTS

Plans need to be submitted containing the following items:

- ☐ Plan view showing location of the PV installation and layout of existing roof framing members that support the system, or site plan if panels are not mounted on the roof.
- ☐ Details on mounting of PV modules, type and number of roof coverings, and subsequent weatherproofing of the roof.
- ☐ Electrical single-line diagram clearly identifying all devices installed in the PV system and indicating total kVA rating of the system.

- ☐ Clearly identify the point of interconnection with the utility supplied wiring system and provide details on main breaker, PV breaker and rating of bussing.
- ☐ Indicate type and size of all conduit and conductors throughout the PV system.
- ☐ Provide manufacturer's cut-sheets and installation instructions for all PV modules, mounting systems, combiner boxes (if used), inverters, and disconnects.
- ☐ Provide structural calculations, prepared by a registered California design professional, if the total weight of the photovoltaic system is over five pounds per square foot.
- ☐ The installation of the PV system shall conform to the requirements of CEC Article 690 and any other applicable articles or standards.
- ☐ For Central Inverter Systems for single family dwellings, provide completed solar PV standard electrical plan <https://www.citrusheights.net/155/Building-Permit-Handouts>
- ☐ For Micro-inverter systems for single family dwellings, provide completed solar PV standard electrical plan <https://www.citrusheights.net/155/Building-Permit-Handouts>

#### **FIRE DEPARTMENT REQUIREMENTS**

##### Signage

- ☐ See item #4 below.

##### Roof access for venting:

- ☐ R324.6.1 Pathways. (CFC 605.11.1.2.1)

Not less than two minimum 36-inch-wide (914 mm) 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. For each roof plane with a photovoltaic array, a minimum 36-inch-wide (914 mm) pathway from the lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and adjacent roof planes. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions such as vent pipes, conduit, or mechanical equipment.

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

R324.6.2.1 Alternative set back at ridge. Where an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D setbacks at ridges shall conform to 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.
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.

R324.6.4 Emergency escape and rescue opening. Panels and modules installed on dwellings shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A 36-inch-wide (914 mm) pathway shall be provided to the emergency escape and rescue opening.

R324.7 Ground-mounted photovoltaic systems. Ground mounted photovoltaic systems shall be designed and installed in accordance with Section R301.

R324.7.1 Fire separation distances. Ground-mounted photovoltaic systems shall be subject to the fire separation distance requirements determined by the enforcing agency.

R324.7.2 Ground-mounted photovoltaic arrays.

Ground mounted photovoltaic arrays shall comply with this section and the California Electrical Code. Setback requirements shall not apply to ground-mounted, free-standing

R324.7.3 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 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 within enclosed spaces in a building. Conduit shall run along the bottom of load bearing members.

#### SIGNAGE

- ☐ All warning signs shall be red background with white 3/8" lettering, all capital letters, Arial or similar font. Material used for signage must be weather resistant. It is recommended that Underwriters Laboratories Marking and Labeling System 969 (UL 969) be used as standard to determine weather rating. Labels on raceways and other equipment shall be reflective, weather resistant, and suitable for the environment. (State Fire Marshal)
- ☐ Premises having PV systems shall be identified. The marking (signage) may be placed within the main service disconnect. If the main service disconnect is operable with the service panel closed, the marking should be placed on the outside cover. Marking shall conform to the following: (State Fire Marshal)

**CAUTION!**  
**SOLAR ELECTRIC**  
**SYSTEM CONNECTED**

- ☐ Marking is required on all interior and exterior DC conduit, raceways, enclosures, cable assemblies, and junction boxes to alert the Fire Service to avoid cutting them, every 10 feet, at turns and above and/or below penetrations and all DC combiner and junction boxes. Marking shall conform to the following: (State Fire Marshal)

**CAUTION!**  
**SOLAR CIRCUIT**

- ☐ Appropriate signage shall be provided to identify the main A/C disconnect for the solar system (State Fire Marshal).

**PHOTOVOLTAIC SYSTEM AC DISCONNECT**

MAX. OPERATING CURRENT: \_\_\_\_ VAC  
OPERATING VOLTAGE: \_\_\_\_ AAC

- ☐ Where all terminals of the disconnecting means may be energized in the open position, a warning sign shall be mounted on or adjacent to the disconnecting means (CEC 690.17).

**WARNING**  
**ELECTRIC SHOCK HAZARD.**  
**DO NOT TOUCH TERMINALS.**  
**TERMINALS ON BOTH THE LINE AND**  
**LOAD SIDES MAY BE ENERGIZED**  
**IN THE OPEN POSITION.**

- ☐ Ungrounded photovoltaic power systems shall be labeled with the following warning at each junction box, combiner box, disconnect, and device where energized, ungrounded circuits may be exposed during service: [CEC 690.35(F)]

**WARNING**  
**ELECTRIC SHOCK HAZARD. THE DC**  
**CONDUCTORS OF THIS PHOTOVOLTAIC**  
**SYSTEM ARE UNGROUNDED AND MAY**  
**BE ENERGIZED**

- ☐ The following sign shall be installed at the dc photovoltaic disconnecting means: (CEC 690.53)

PHOTOVOLTAIC SYSTEM DC DISCONNECT  
RATED MAX. POWER-POINT CURRENT: \_\_\_\_ADC  
RATED MAX. POWER-POINT VOLTAGE: \_\_\_\_VDC  
MAXIMUM SYSTEM VOLTAGE: \_\_\_\_VDC  
SHORT-CIRCUIT CURRENT: \_\_\_\_ADC  
CONTROLLER MAX. RATED OUTPUT CURRENT: \_\_\_\_ADC

- ☐ Photovoltaic power systems employing energy storage shall also be marked with the maximum operating voltage, including any equalization voltage and the polarity of the grounded circuit conductor (CEC 690.55).
- ☐ All interactive system(s) points of interconnection with other sources shall be marked at an accessible location at the disconnecting means (CEC 690.54). Equipment containing overcurrent devices in circuits supplying power to a busbar or conductor supplied from multiple sources shall be marked to indicate the presence of all sources [CEC 690.64(8)(4)].

PHOTOVOLTAIC POINT OF INTERCONNECTION  
RATED AC OUTPUT CURRENT: \_\_\_\_AMPS  
NOMINAL OPERATING AC VOLTAGE: \_\_\_\_VOLTS  
THIS PANEL IS FED BY MULTIPLE SOURCES  
(PG&E AND SOLAR)

- ☐ Any structure or building with a photovoltaic power system that is not connected to a utility service source and is a stand-alone system shall have a permanent plaque or directory installed on the exterior of the building or structure at a readily visible location. The plaque or directory shall indicate the location of system disconnecting means and that the structure contains a stand-alone electrical power system. (CEC 690.56(A))
- ☐ Buildings or structures with both utility service and a photovoltaic system shall have a permanent plaque or directory providing the location of the service disconnecting means and the photovoltaic system disconnecting means if not located at the same location [CEC 690.56(8)].
- ☐ Unless the panelboard is rated not less than the sum of the ampere ratings of all overcurrent devices supplying it, a connection in a panelboard shall be positioned at the opposite (load) end from the input feeder location or main circuit location. The bus or conductor rating shall be sized for the loads connected in accordance with CEC Article 220. A permanent warning label shall be applied to the distribution equipment with the following: [CEC 690.64(8)(7)]

WARNING  
INVERTER OUTPUT CONNECTION  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE

#### SMOKE ALARMS, CARBON MONOXIDE ALARMS:

- ☐ In single family and multi-family residences (including townhomes, condominiums and apartments) installation of smoke alarms and, carbon monoxide alarm is required prior to the final inspection as follows:
- **Smoke Alarms** listed in accordance with U.L. 217 and listed and approved by the California State Fire Marshal must be installed if they do not already exist in each sleeping room, outside each separate sleeping area in the immediate vicinity of the bedrooms and on each story of the dwelling. For R-3.1 occupancies, refer to CBC Section 907.2.11.2 for additional requirements. (CRC R314)
  - **Power source:** Smoke alarms shall receive their primary power from the building wiring and shall be

equipped with a battery backup. Smoke alarms shall emit a signal when the batteries are low. Alarm wiring shall be directly connected to the permanent building wiring without a disconnecting switch other than as required for overcurrent protection. Smoke alarms are permitted to be solely battery operated in existing buildings where no construction is taking place and in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic or crawl space available which could provide access for building wiring without the removal of interior finishes.

- **Interconnection:** Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit, except interconnection is not required in buildings that are not undergoing alterations, repairs or construction of any kind and where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic or crawl space available which could provide access for interconnection without the removal of interior finishes. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.
- **Carbon Monoxide Alarms:** An approved carbon monoxide alarm listed as complying with UL 2034, approved and listed by the California State Fire Marshal, installed and maintained in accordance with NFPA 720 and the manufacturer's instructions shall be installed if they do not already exist in existing dwellings or sleeping units having a fossil fuel-burning heater or appliance, fireplace or an attached garage as follows: outside each separate dwelling unit sleeping area in the immediate vicinity of bedroom(s) and on every level of dwelling unit. Carbon monoxide detection systems that include carbon monoxide detectors and audible notification appliances, installed and maintained as required for carbon monoxide alarms and NFPA 720 shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075. (CRC R3 15)
- **Power supply and Interconnection:** Refer to the requirements above for smoke alarms for connection to the building wiring, exceptions allowing battery only alarms and interconnection of the alarms when more than one is installed.

- ☐ If access to the interior of the dwelling by the Building Inspector cannot be scheduled for inspection of the smoke and carbon monoxide alarms and the work being performed is exterior only (such as re-roofing, re-siding, patio covers, swimming pools and the like), a "Smoke Alarm, Carbon Monoxide Alarm installation Certificate" can be signed by each property owner and provided to the inspector prior to final inspection. ([Link Form](#))

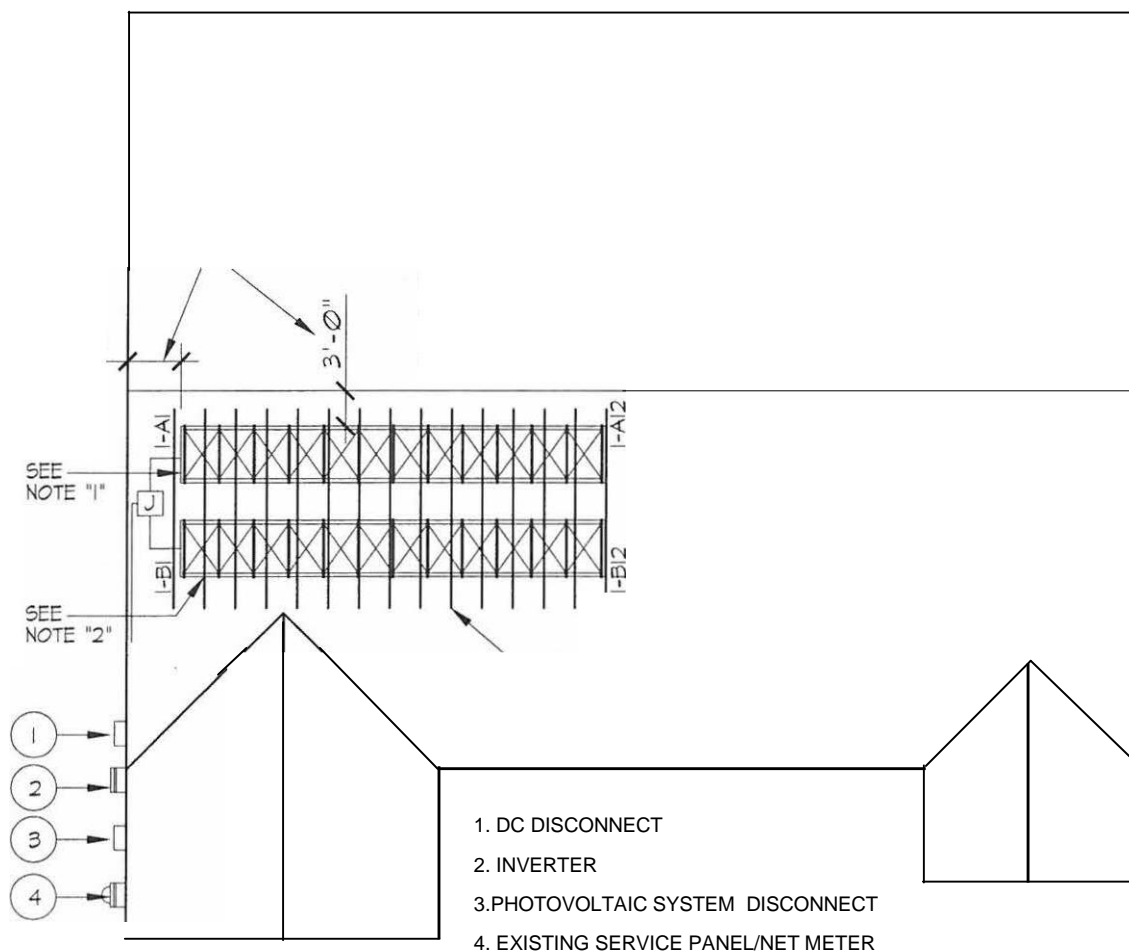
#### INSPECTION PROCEDURES

- ☐ A rough inspection shall be scheduled if any work is inside walls or ceilings and will be covered with finish materials. A final inspection should be scheduled after all work is complete. For each inspection, the Permit Card and the approved job copy of the drawings must be presented to the inspector. Permits expire 180 days after the last passed inspection.
- ☐ All commercial projects require a final inspection and approval from the Fire Department prior to the final inspection being performed by the Building Department. Call 916-725-4760 to schedule.
- ☐ The contractor or owner must provide roof access (ladder to roof) for all required inspections. Ladders must be OSHA approved, minimum Type I with a 250lb rating, in good condition and designed for its intended use.

#### QUESTIONS:

**If you have any questions regarding your project contact the Building & Safety Department at (916) 727-4760.**





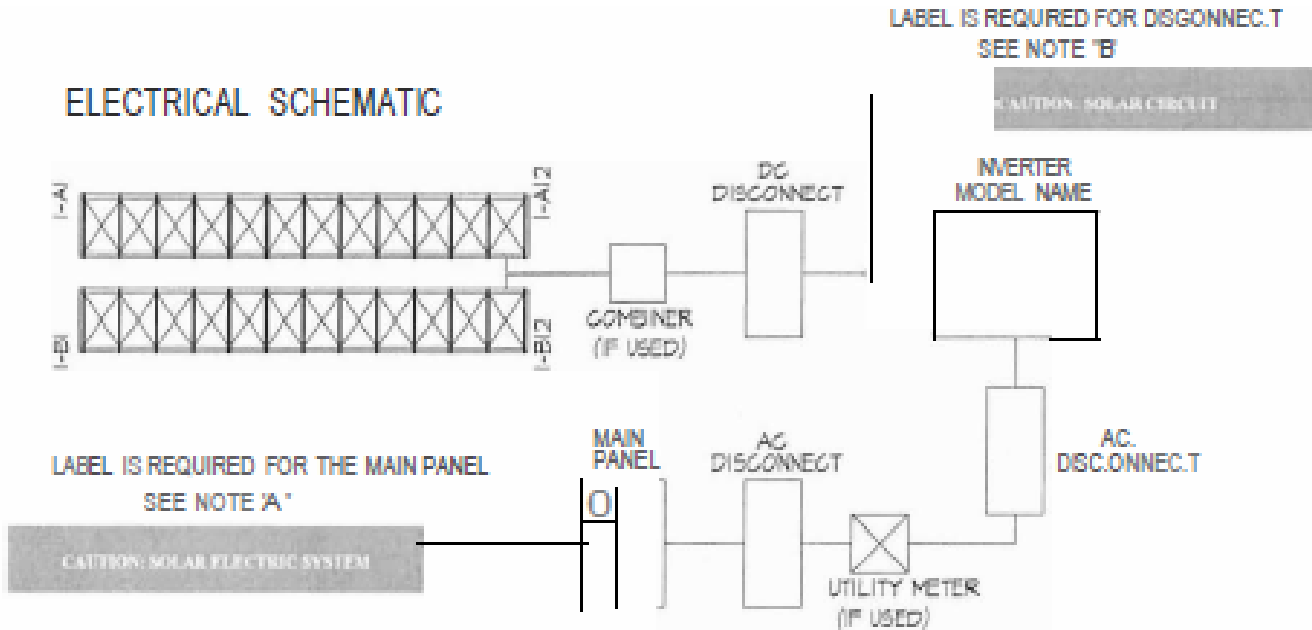
#### **MOUNTING NOTES:**

1. PANELS MOUNTED ON ALUMINIM RACKING
2. PV ARRAY MOUNTS TO ROOF STRUCTURES WITH 5/16" LAGS EMBEDDED 2 1/2" INTO RAFTERS OR SEE NOTE 5 BELOW
3. PV PANELS ARE ANCHORED @ 48" O.C.  
TRUSSES/RAFTERS ARE 24" O.C. OR SEE NOTE 5 BELOW
4. WEIGHT OF PV MODULES AND ASSEMBLY SHOULD BE LESS THAN 5 LBS PER SQUARE FOOT.
5. ALL INSTALLATION MUST COMPLY WITH MANUFACTURER'S INSTALLATION INSTRUCTION.

#### **ARRAY CONDUIT & WIRING ARRANGEMENT**

1. FREE-AIR/ 1/2" CONDUIT SLEEVE\*\*  
(2) #12 AWG; R, W
2. TO DC DISCONNECT  
1/2" CONDUIT  
(4) # 12 AWG; (2) R, (2) W  
(1) #8 GND

\*\*SLEEVE PROVIDES PROTECTION FROM PHYSICAL DAMAGE PER NEC 300.13 & 300.18



**NOTE "A"**  
**MAIN SERVICE DISCONNECT**  
 FOR RESIDENTIAL APPLICATIONS, THE MARKING MAY BE PLACED WITHIN THE MAIN SERVICE DISCONNECT. IF THE MAIN SERVICE DISCONNECT IS OPERABLE WITH THE SERVICE PANEL CLOSED, THE MARKING SHOULD BE PLACED ON THE OUTSIDE COVER.

**MARKING CONTENT AND FORMAT**  
 MARKING CONTENT: CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED  
 BACKGROUND: RED BACKGROUND:  
 LETTER: WHITE LETTERING, MINIMUM 3/8" LETTER HEIGHT, ALL CAPITAL LETTERS, ARIAL OR SIMILAR FONT, NON-BOLD  
 MATERIAL: REFLECTIVE, WEATHER RESISTANT NMATERIAL SUITABLE FOR ENVIRONMENT (DURABLE ADHESIVE MATERIALS MAY MEET THIS REQUIREMENT)

**NOTE "B"**  
**MARKING FOR DIRECT CURRENT CONDUIT, RACEWAYS ENCLOSURES**  
 CABLE ASSEMBLIES AND JUCTION BOXES  
 MARKING IS REQUIRED ON ALL INTERIOR AND EXTERIOR DC CONDUITM RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, AND JUCTION BOXES TO ALERT THE FIRE SERVICE TO AVOID CUTTING THEM. MARKING SHOULD BE PLACED ON ALL INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, BELOW PENETRATIONS AND ALL DC COMBINER AND JUCTION BOXES.

**MARKING CONTENT AND FORMAT**  
 MARKING CONTENT: CAUTION SOLAR CIRCUIT  
 BACKGROUND: RED BACKGROUND  
 LETTERS: WHITE LETTERING, MINIMUM 3/8" LETTER HEIGHT, ALL CAPITAL LETTERS, ARIAL OR SIMILAR FONT, NON-BOLD  
 MATERIAL: REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (DURABLE ADHESIVE MATERIALS MAY MEET THIS REQUIREMENT)

**GENERAL NOTE:**

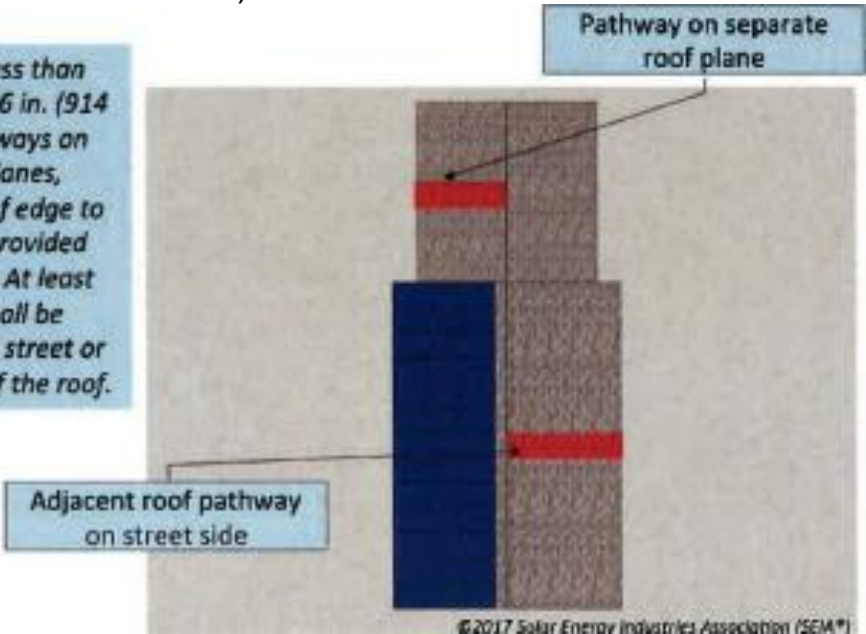
1. BOND PV SUSTEM AND PV RAIL ASSEMBLY TO SERIVCE ELECTRODE
2. CONNECT AC TO CUSTOMER SERVICE VIA 1 DP GE 15 AMP BREAKER
3. ELECTRICAL INSTALLATION IN ACCORDANCE WITH 2013 CALIFORNIA ELECTRICAL CODE

CONDITION	ALLOWABLE CONDUCTOR TYPE(S)
FREE=AIR	USE-S/RHH/RHW-2
RACEWAY ROOF-TOP	THWN-2 OR XHHW-2 OR RHH/RHW-2
RACEWAY OR CABLE INDOORS OR SHADED	THHN OR THWN OR XHHW*
RACEWAY UNDERGROUND	THHN OR THWN OR XHHW*
*MAY SUBSTITUE "-2" RATED CONDUCTORS	



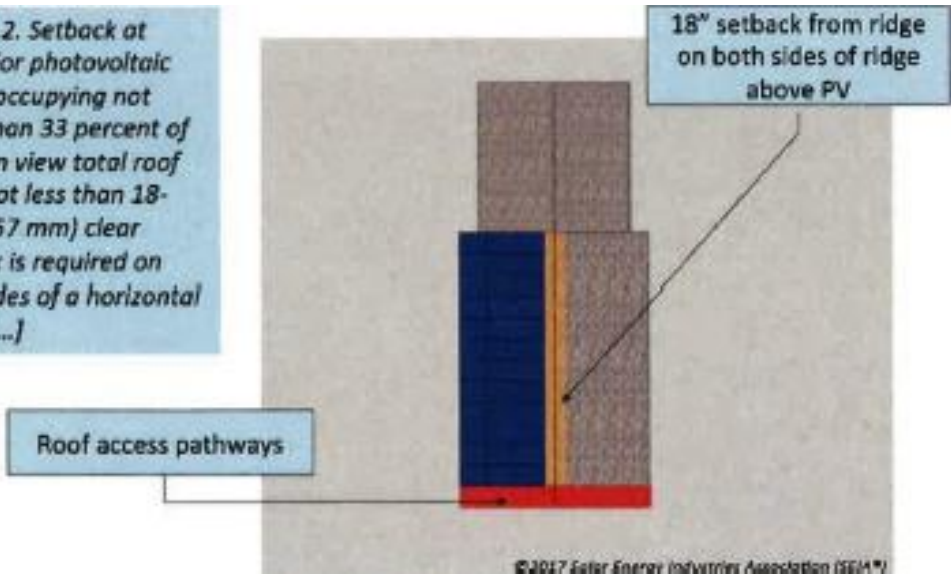
Pathways to Ridge - Street Access 2016 CA Intervening Code Cycle (Supplement) Related CFC Section: (CFC 605.11.1.2.1)

*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.*

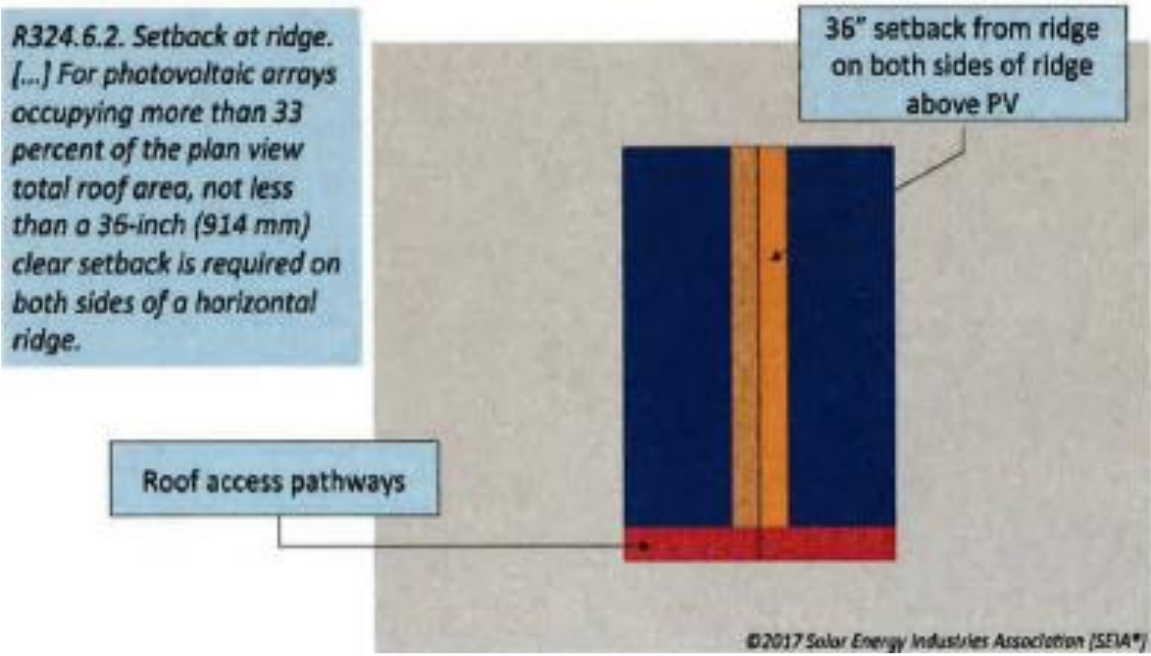


Ridge Setbacks - **Not Sprinkled**, less than (<33%) Total Roof Area 2016 CA Intervening Code Cycle (Supplement) Related CFC Section: (CFC 605.11.1.2.2)

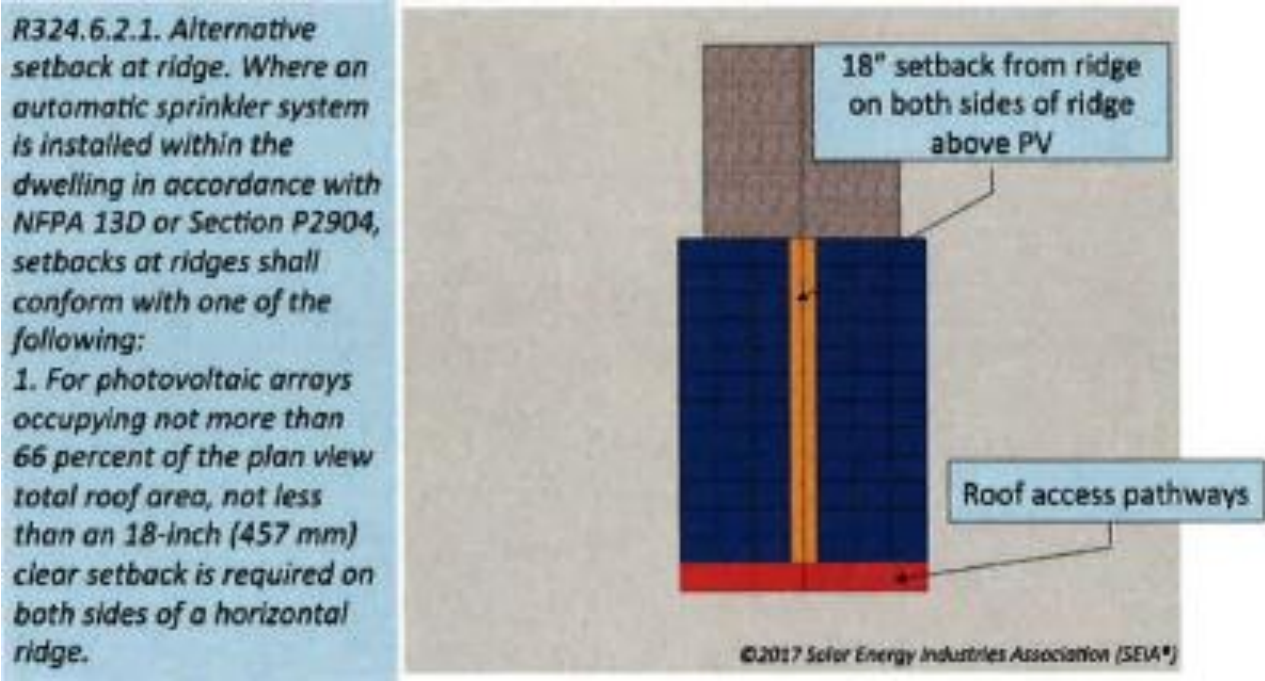
*R324.6.2. Setback at ridge. For photovoltaic arrays occupying not more than 33 percent of the plan view total roof area, not less than 18-inch (457 mm) clear setback is required on both sides of a horizontal ridge. [...]*



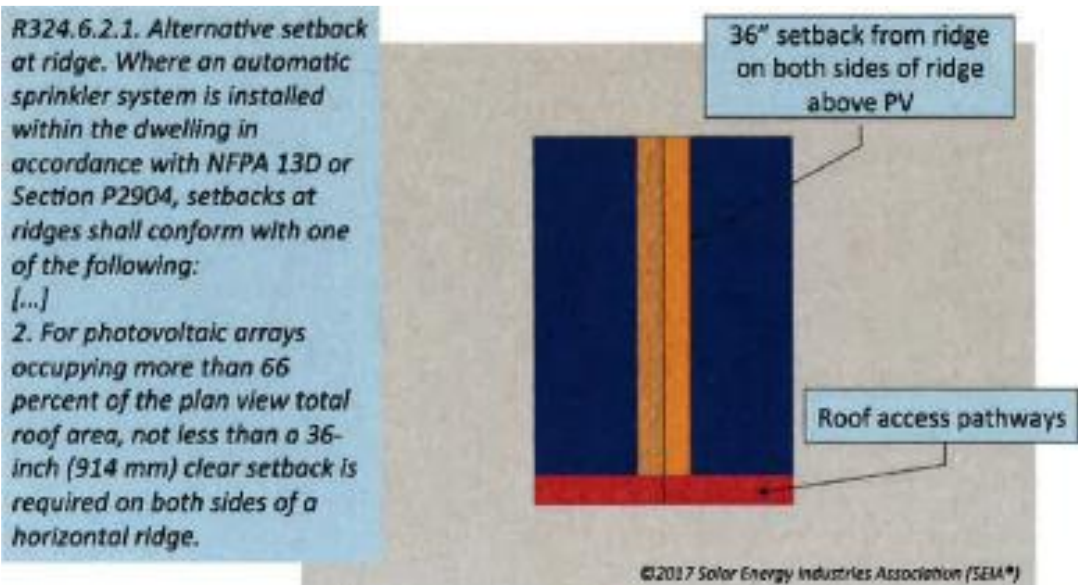
Ridge Setbacks - **Not Sprinkled**, greater than (>33%) Total Roof Area 2016 CA Intervening Code Cycle (Supplement) Related CFC Section: (CFC 605.11.1.2.2)



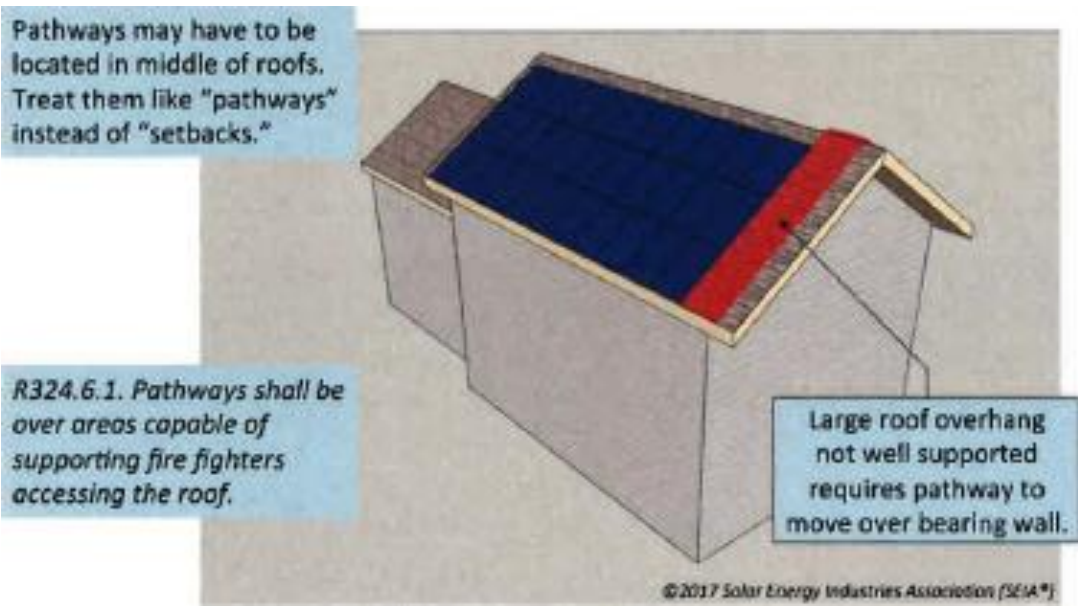
Ridge Setbacks - **Sprinkled**, less than (<66%) Total Roof Area 2016 CA Intervening Code Cycle (Supplement) Related CFC Section: (CFC 605.11.1.2.2.1)



Ridge Setbacks - **Sprinkled**, greater than (>66%) Total Roof Area 2016 CA Intervening Code Cycle (Supplement) Related CFC Section: (CFC 605.11.1.2.2.1)

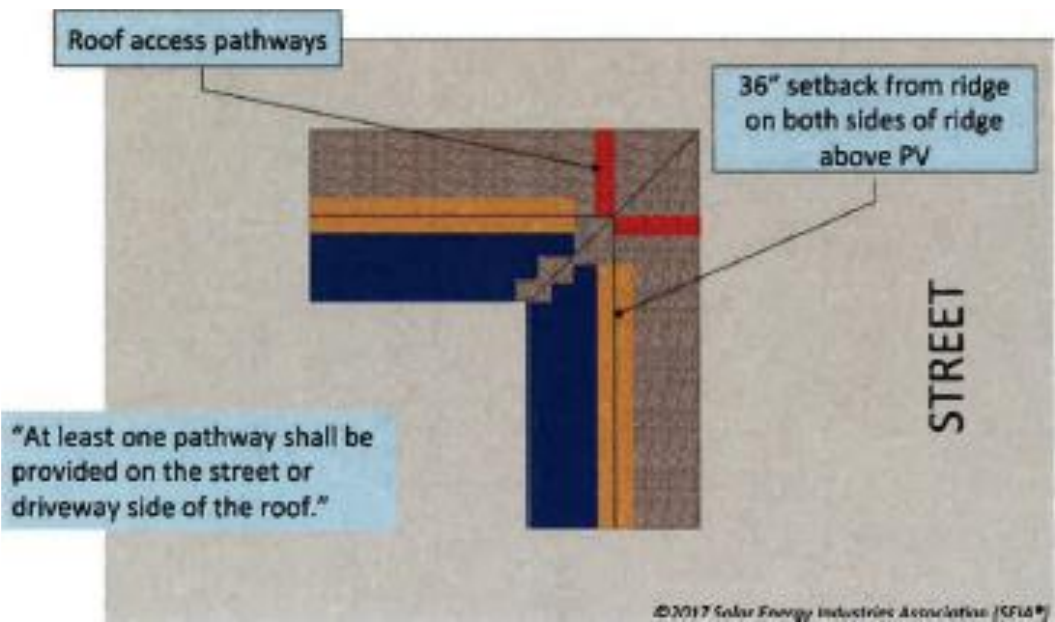


Structural Support of Pathways 2016 CA Intervening Code Cycle (Supplement)

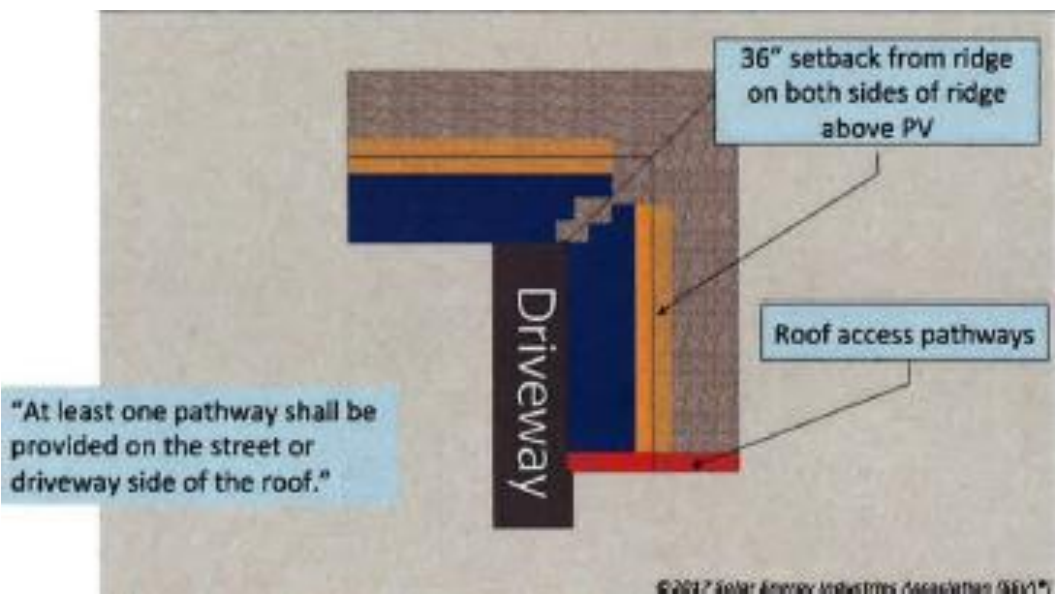




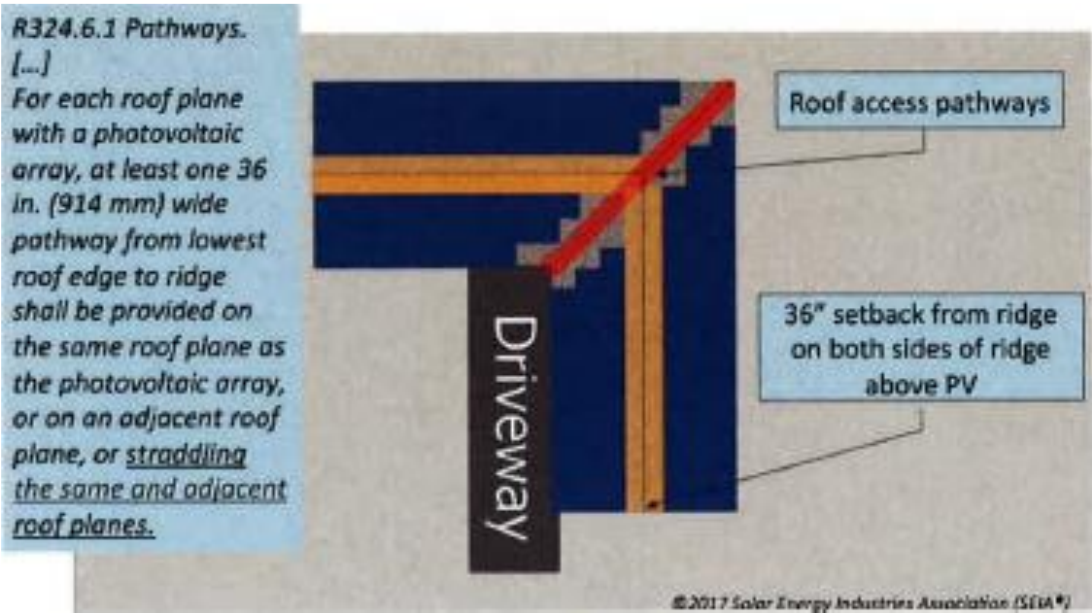
Setbacks & Pathways Involving Hips & Valleys 2016 Intervening Code Cycle (Supplement)



Setbacks & Pathways Involving Driveways 2016 CA Intervening Code Cycle (Supplement)



Setbacks & Pathways with Hips, Valleys & Driveways 2016 Intervening Code Cycle



Emergency Escape & Rescue Opening 2016 CA Intervening Code Cycle (Supplement)

