

Disconnecting Means

PV System

PV system disconnecting means shall be provided in accordance with the 2017 National Electrical Code® (NEC), NFPA 70®. [690.13]

A Rapid Shutdown switch shall be provided at a readily accessible location outside the building in accordance with the 2017 National Electrical Code® (NEC), NFPA 70® [690.12(C)]

Energy Storage System

A readily accessible disconnect shall be provided within sight of the ESS [NEC 706.7(A)]

Where remote actuation of the disconnecting means is employed the controls are not within sight of the ESS, the disconnecting means shall be capable of being locked in the open position. [NEC 706.7(B); 110.25]

Where ESS input and output terminals are more than 5ft from connected equipment, or where circuits from these terminals pass through a wall or partition;

- A disconnecting means is required at the ESS end of the circuit
- If this disconnect is not within sight of the connected equipment a second disconnecting means is required at the connected equipment. [NEC 706.7(E)(1); 706.7(E)(2)]

The disconnecting means for the ESS shall be legibly marked with the nominal ESS voltage, the maximum available fault current from the ESS and the associated clearing time, and the date the calculation was performed. [NEC 706.7(D)]

Signs, Placards, Directories, and Markings Guidance

General

All labeling shall comply with Section 324 of the 2018 International Residential Code and Articles 690 and 705 of the 2017 National Electrical Code® (NEC), NFPA 70

All labeling shall comply with [NEC 110.21 (B)]

Rapid Shutdown Label

A label shall be installed not greater than 3ft from the electric utility service location that includes the location of all identified Rapid Shutdown switches if not at the same location. [IRC 324]

The label shall indicate which type of Rapid Shutdown system is installed, and include a simple diagram with sections in red designating areas that are not controlled by the rapid shutdown switch. [NEC 690.56(C)(1)]

Buildings with more than one rapid shutdown type:

A detailed plan view diagram showing each PV system and a dotted line around areas that remain energized after the rapid shutdown switch is operated. [NEC 690.56(C)(2)]

Rapid Shutdown (PV Hazard Control) switch:

This switch shall have a label not greater than 3 feet from the switch that states the following:

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM [NEC 690.56(C)(3)]

Energy Storage System

Where the disconnects are not within sight of each other, a placard or directory shall be provided at each disconnecting means showing the location of all other disconnecting means. [NEC 706.7(E)(1); 706.7(E)(2); 706.7(E)(5)]

Roof Access, Egress, and Ventilation

SolarAPP+ Fire Bulletin

General

Access and minimum spacing shall be provided for access to specific areas of the roof, emergency egress from the roof and opportunities for smoke ventilation in accordance with the 2018 International Residential Code [IRC 324.6]

References:

Ridge Setbacks - [IRC R324.6.2]

Sprinklered Occupancies - [IRC R324.6.2.1]

Pathways - [IRC 324.6.1]

Emergency escape and rescue openings - [IRC R324.6.2.2]

Exceptions:

Detached, non-inhabitable structures [IRC R324.6 Ex. 1]

Roof access, pathways and setbacks need not be provided where the code official has determined that rooftop operations will not be employed. [IRC R324.6 Ex. 2]

Low-slope roofs with pitch of less than or equal to 2:12; this exception may not be valid depending on the jurisdiction. [IRC R324.6 Ex. 3]

Carbon Monoxide, Smoke & Heat Detectors

SolarAPP+ Fire Bulletin

Guidance:

Carbon Monoxide and smoke detectors shall be provided in accordance with the code or an Affidavit has been provided by the customer. 2018 International Residential Code. [R314, R315]

Energy Storage System

SolarAPP+ Fire Bulletin

Special Considerations

ESS shall not be installed within the habitable space of a dwelling unit. [IRC R327.3]

When the ESS is installed in a location subject to vehicle damage it shall be protected by approved barriers. [IRC R327.6]

ESS installed indoors that produce hydrogen or other flammable gases during charging shall be provided with either natural or mechanical ventilation in accordance with Section M1307.4.1 or M1307.4.2. [IRC R327.5; M1307.4]

Fire Classification

SolarAPP+ Fire Bulletin

PV System

Rooftop-mounted PV systems shall have the same fire classification as the roof assembly required in 2018 International Residential Code. [R902.4; R324.4.2]

Building-integrated photovoltaic products installed as the roof covering shall be tested, listed, and labeled for fire classification. [IRC R902.3, R324.5.2]

Building-integrated photovoltaic products installed as the roof covering shall comply with the minimum requirements for fire classification set by the jurisdiction. [IRC 902.1]

Product Certifications

SolarAPP+ Fire Bulletin

PV System

PV panels and modules shall be listed and labeled to UL 1703 and/or both UL 61730-1 and UL 61730-2 [NEC 690.4(B)][IRC R324.3.1]

Inverters shall be listed and labeled to UL 1741 [NEC 690.4(B)][IRC R324.3.1]

Hazard Control System

Hazard control system shall be listed and labeled to UL 3741 [NEC 90.7; 110.3(C); 690.4(B) 690.12(D)]

Energy Storage System

The ESS inverter, for AC Coupled systems, shall be listed and labeled to UL 1741 [IRC R327.4]

The ESS shall be listed and labeled to UL 9540 [IRC R327.2]

The ESS Microgrid Interconnection Device shall be listed and labeled to UL 1741 [IRC R327.4]

Service Disconnect

SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN	
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS IN ARRAY REMAIN ENERGIZED IN SUNLIGHT.	Simple Diagram Here

Location: No more than 1 m (3 ft) away from the service disconnecting means.

Code: [NEC 690.56(C)(1)(a)]

RSD Initiation Device

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

Location: Rapid shutdown initiation device.

Code: [NEC 690.56(C)(3)]

Point of Interconnection

WARNING:
EQUIPMENT FED BY MULTIPLE SOURCES LOCATION OF DISCONNECTING MEANS

(LAYOUT OR DESCRIPTION)

Location: At each service equipment location and at the location(s) of the system disconnect(s) for all electric power production sources capable of being interconnected.

Code: [NEC 705.10]

WARNING:
TRI POWER SOURCE
SECOND SOURCE IS PV SYSTEM
THIRD SOURCE IS ENERGY STORAGE SYSTEM

Location: Electrical Equipment containing overcurrent devices in circuits supplying power to a busbar or conductor supplied from multiple sources

Code: [NEC 705.12(B)(3)]

WARNING:
POWER SOURCE OUTPUT CONNECTION -
DO NOT RELOCATE THIS OVERCURRENT DEVICE

Location: At back-feed breaker if using 120% rule (if applicable)

Code: [NEC 705.12(B)(2)(3)(b)]

WARNING:
THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL
RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN
SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED
AMPACITY OF BUSBAR

Location: At distribution equipment adjacent to the back-fed
breaker from the power source when using this "sum of breakers"
code compliance rule.

Code: [NEC 705.12(B)(2)(3)(c)]

PHOTOVOLTAIC POINT OF INTERCONNECTION

MAXIMUM AC OPERATING CURRENT:

MAXIMUM AC OPERATING VOLTAGE:

Location: All interactive system(s) points of interconnection.

Code: [NEC 690.54]

DC Circuit Raceways and Enclosures

PHOTOVOLTAIC POWER SOURCE

Location: DC Circuit Raceways and Enclosures, conduit, and
combiner/junction boxes.

Code: [NEC 690.31(G)(3)]

PV System Disconnect

WARNING:
ELECTRIC SHOCK HAZARD TERMINALS ON LINE AND LOAD
SIDES MAY BE ENERGIZED IN THE OPEN POSITION

Location: DC Disconnecting Means where terminals on both line
and load side may remain energized. Example language or
equivalent.

Code: [NEC 690.13(B)]

PV SYSTEM DISCONNECT

Location: Each PV System Disconnect (May be AC or DC)

Code: [NEC 690.13(B)]

DC String Inverters Equipment Disconnects

WARNING:
ELECTRIC SHOCK HAZARD
TERMINALS ON THE LINE AND LOAD
SIDES MAY BE
ENERGIZED IN THE OPEN POSITION

Location: Each PV system disconnecting means where line and load may be energized in the open position

Code: [NEC 690.13(B)]

PHOTOVOLTAIC DC DISCONNECT

Location: Each PV system disconnecting means.

Code: [NEC 690.13(B)]

Maximum Voltage:

Maximum Circuit Current:

Maximum rated output current of the charge controller or dc-to-dc converter (if installed):

Location: At each DC PV system disconnecting means.

Code: [NEC 690.53]

FIRE SAFETY CODE REQUIREMENTS

Does the home have sprinkler systems?

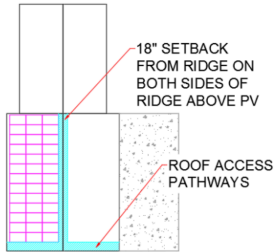
Percentage of Roof Area covered with PV
Total Array Area / Total Roof Area

Roof Access and Ventilation Diagrams

Fire Safety

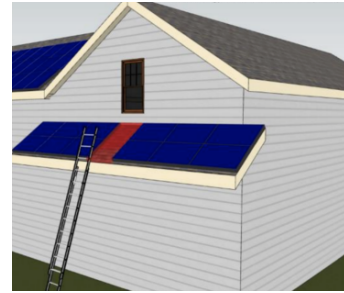
Ridge Setbacks

PV Less Than 33% Roof Area (66% for homes with sprinkler systems)



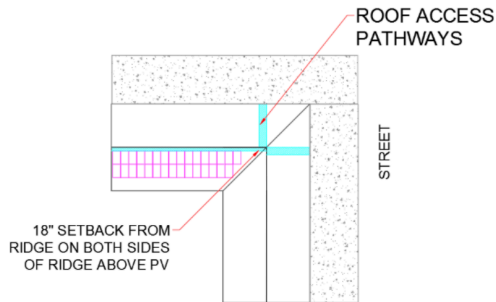
Emergency Escape & Rescue Opening

Minimum 3' Emergency Escape Pathway

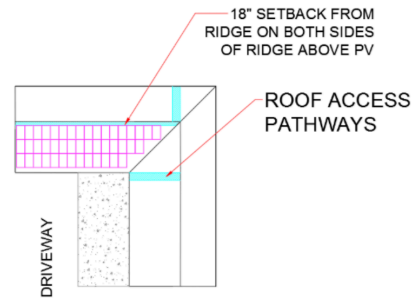


Hips and Valley Setbacks

PV Less Than 33% Roof Area - Street Access (66% for homes with sprinkler systems)



PV Less Than 33% Roof Area - Driveway Access (66% for homes with sprinkler systems)



FIRE SAFETY CODE REQUIREMENTS

Does the home have sprinkler systems?

Percentage of Roof Area covered with PV

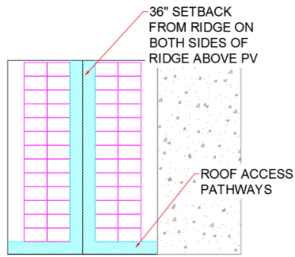
Total Array Area / Total Roof Area

Roof Access and Ventilation Diagrams

Fire Safety

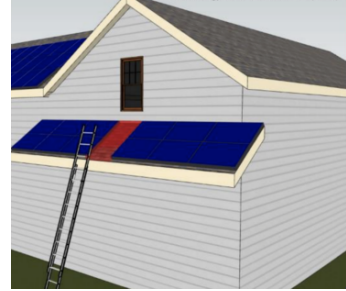
Ridge Setbacks

PV More Than 33% Roof Area (66% for homes with sprinkler systems)



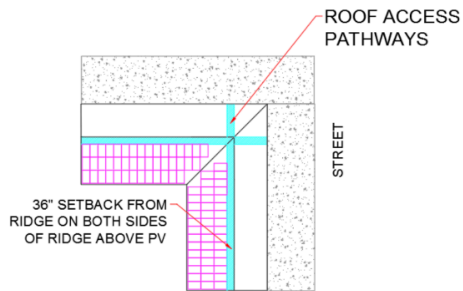
Emergency Escape & Rescue Opening

Minimum 3' Emergency Escape Pathway



Hips and Valley Setbacks

PV More Than 33% Roof Area - Street Access (66% for homes with sprinkler systems)



PV More Than 33% Roof Area - Driveway Access (66% for homes with sprinkler systems)

