

Photovoltaic Solar Panels – Roof Mounted One- and Two-Family Dwellings

This tip sheet reflects code requirements of the 2021 International Residential Code (IRC) and the 2021 International Fire Code (IFC) with Washington State Amendments, and provides information on the installation of Photovoltaic (PV) systems in single family homes, two-family homes, and townhouses as defined by the IRC.

Building Permit: May be required.

Check with your local jurisdiction for information on if a building permit is required for a solar system installation in your area.

Electrical Permit: Required.

Electrical permits and inspections are required for all PV installations that connect to the building's electrical system. Some jurisdictions may also require an electrical plan review. Check with your local jurisdiction for permit requirements.

Photovoltaic Systems:

Installation, modification, or alteration of a PV system shall comply with IRC Section R324.3 and the IFC Section 1205. Systems connected to the utility grid shall use inverters listed for utility interaction.

Exception: Detached, nonhabitable Group U structures (i.e. accessory buildings like garages and sheds) shall not be subject to the requirements IRC Section R324.3 for structural and fire safety.

Equipment Listings:

Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Inverters shall be listed and labeled in accordance with UL 1741. Mounting systems listed and labeled in accordance with UL 2703 shall be installed in accordance with the manufacturer's installation instructions and their listings.

Rooftop-mounted PV systems shall comply with IRC Section R324.4.

Exception: The roof structure shall be deemed adequate to support the load of the rooftop solar PV system if all of the following requirements are met:

1. The PV panel system shall be designed for wind speed and be installed per the manufacturer's specifications.
2. The ground snow load does not exceed 70 pounds per square foot.
3. The total dead load of modules, supports, mountings, raceways, and all other appurtenances weigh no more than 4 pounds per square foot.
4. PV modules are not mounted higher than 18 inches above the surface of the roofing to which they are affixed.

Supports for solar modules are to be installed to spread the dead load across as many roof-framing members as needed, so that no point load exceeds 50 pounds.

Photovoltaic Shingles shall comply with IRC Section 905.16.

Building-Integrated PV Roof Panels shall comply with IRC Section 905.17.

Roof Access and Pathways:

Roof access, pathways and setback requirements shall be provided to comply with IRC Section R324.6 and IFC Section 1205.2.

Exceptions:

1. Detached, nonhabitable structures, including but not limited to detached garages, parking shade structures, carports, solar trellises and similar structures, shall not be required to provide roof access.
2. Roof access, pathways and setbacks need not be provided where the code official has determined that rooftop operations will not be employed.
3. These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (17-percent slope) or less.

Pathways shall comply with IRC Section R324.6.1 and IFC Section 1205.2.1.1.

Not fewer than two pathways, on separate roof planes from lowest roof edge to ridge and not less than 36 inches wide, shall be provided on all buildings. Not fewer than one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, a pathway not less than 36 inches wide shall be provided from the lowest roof edge to ridge 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.

Setback at ridge shall comply with IRC Section R324.6.2 and IFC Section 1205.2.1.2.

For photovoltaic arrays occupying not more than 33 percent of the plan view total roof area, not less than an 18-inch clear setback 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 clear setback is required on both sides of a horizontal ridge.

Alternative setback at ridge shall comply with IRC Section R324.6.2.1 and IFC Section 1205.2.1.3.

Where an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D or IRC Section P2904, setbacks at ridges shall comply 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 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 clear setback is required on both sides of a horizontal ridge.

Emergency escape and rescue openings shall comply with IRC Section R324.6.3 and IFC Section 1205.2.2.

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 pathway not less than 36 inches wide shall be provided to the emergency escape and rescue opening.

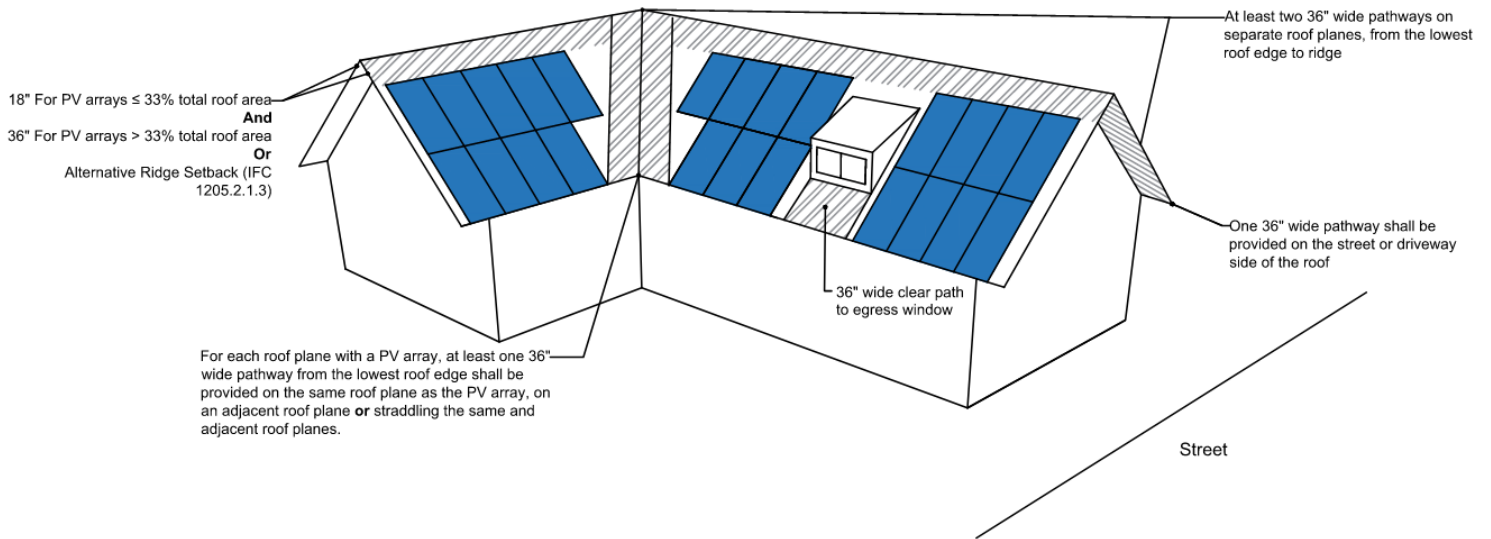


Figure 1

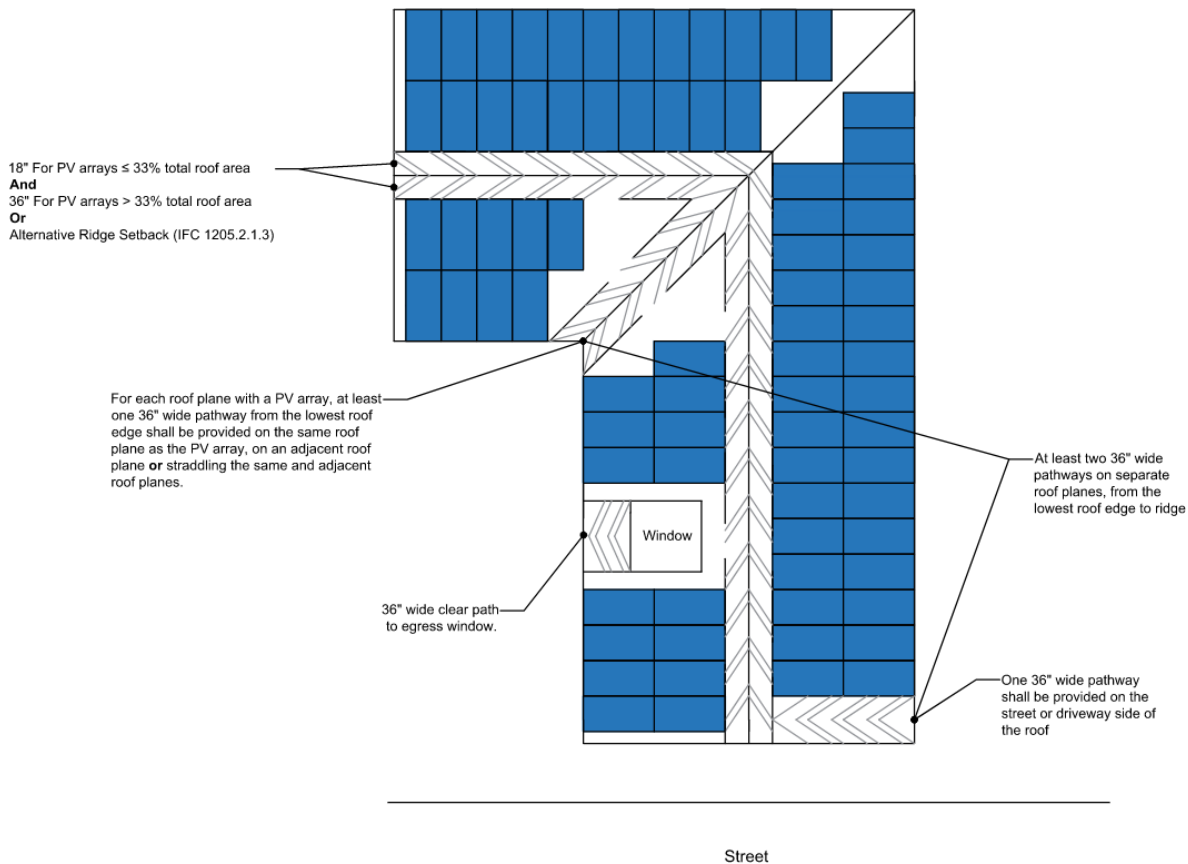


Figure 2