CONSTRUCTION TIP SHEET
Roof Mounted Photo-Voltaic Solar Panels
One-and-Two Family Dwellings

2012 IRC

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:

1. *Electrical Permit* - Some jurisdictions also require electrical plan review.
2. *Building Permit* - The City of North Bend requires a building permit for all Solar System installations.

- Each photovoltaic array is no larger than 150 feet by 150 feet in either array.
- Total dead load of panels, supports, mountings, raceways and all other appurtenances weigh no more than 4 lbs/sq.ft.
- The total PV solar panel system weight will not exceed 1,000 pounds.
- 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 50 lbs are created.
- 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.
- The equipment layout meets the 3 foot roof setback requirements of the 2012 IFC. See sheet 2 for setback requirements and exceptions. Does not apply to roofs with slopes of 2 units vertical in 12 units horizontal (2:12) or less.
- Attachment to the roof will be as specified by the mounting system manufacturer.
- All signage and markings required by NEC 690 and 2012 IFC shall be provided.
- Refer to 2012 IFC section 605.11 for all Fire Code requirements.
- The installation must still comply with all land use and other applicable codes even if a building permit is not required.

GENERAL INFORMATION:

- Obtain an electrical permit before starting construction.
- This tip sheet is intended to provide a policy for MBP jurisdictions.
- Additional information can be found at your local building department.

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 shall be placed adjacent to the main service disconnect in a location clearly visible from the location where the disconnect is operated.
- Marking shall be placed on interior and exterior DC conduit, raceways, enclosures and cable assemblies every 10 ft, within 1 ft of turns or bends and within 1 ft above and below penetrations of roof/ceiling assemblies, walls or barriers.

Electrical Permits and Inspections

Electrical permits and inspection approvals are required for all PV installations that connect to the building's electrical system. Some electrical jurisdictions require an electrical plan review prior to the permit issuance. Be sure to check with your local jurisdiction to determine if electrical plan review is required. If a plan review is not required, the following information must be provided to the electrical inspector at the time of the electrical inspection:

- 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

2012 IFC Access

- Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.
- 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.

Exceptions:

1. Residential dwellings with an approved automatic fire sprinkler system installed.
2. Residential dwellings with an approved mechanical or passive ventilation system.
3. Where the Fire Code Official determines that the slope of the roof is too steep for emergency access.
4. Where the Fire Code Official determines that vertical ventilation tactics will not be utilized.
5. These requirements shall not apply to roofs where the total combined area of the solar array does not exceed 33% as measured in plan view of the total roof area of the structure, where the solar array will measure 1000 sqft or less in area and where a minimum 18" unobstructed pathway shall be maintained along each side of any horizontal ridge.

EXAMPLES OF SOLAR ARRAY FIREFIGHTER PATHWAYS

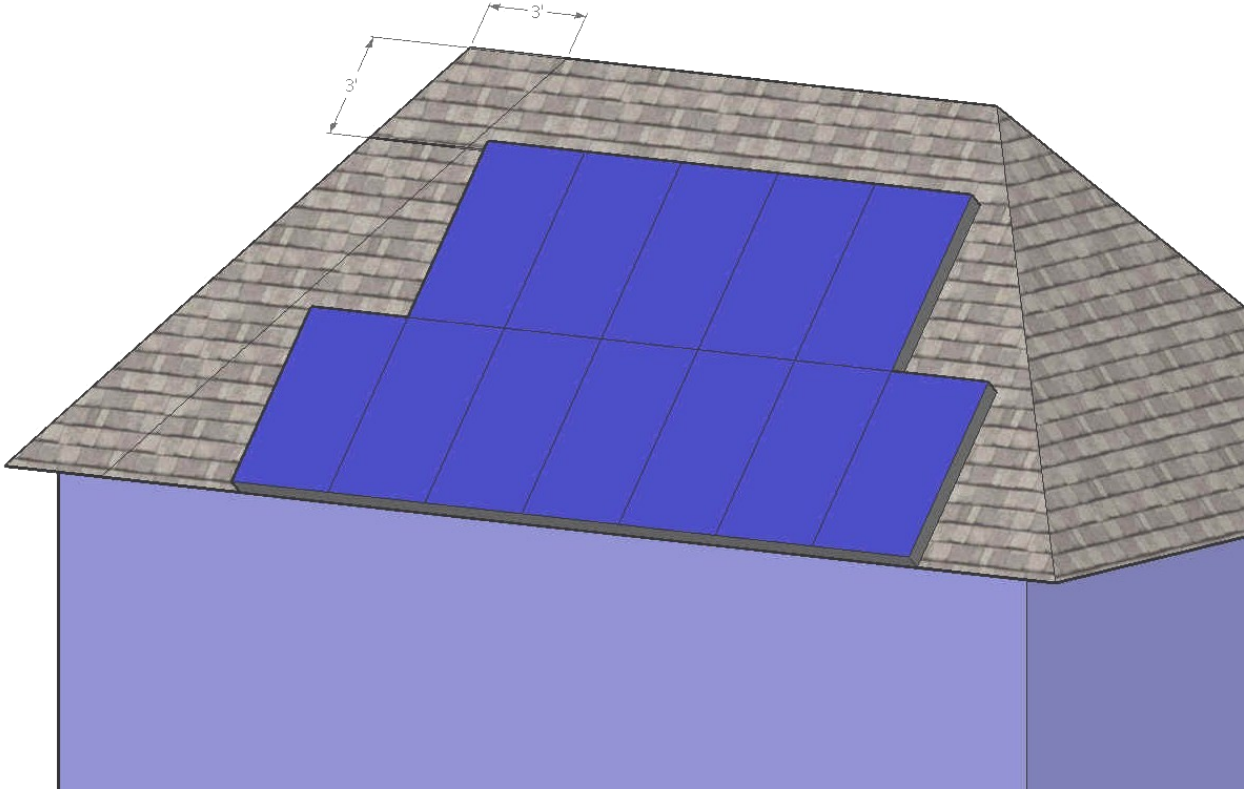

Figure 1 –Hip Roof (IFC 605.11.3.2.1)

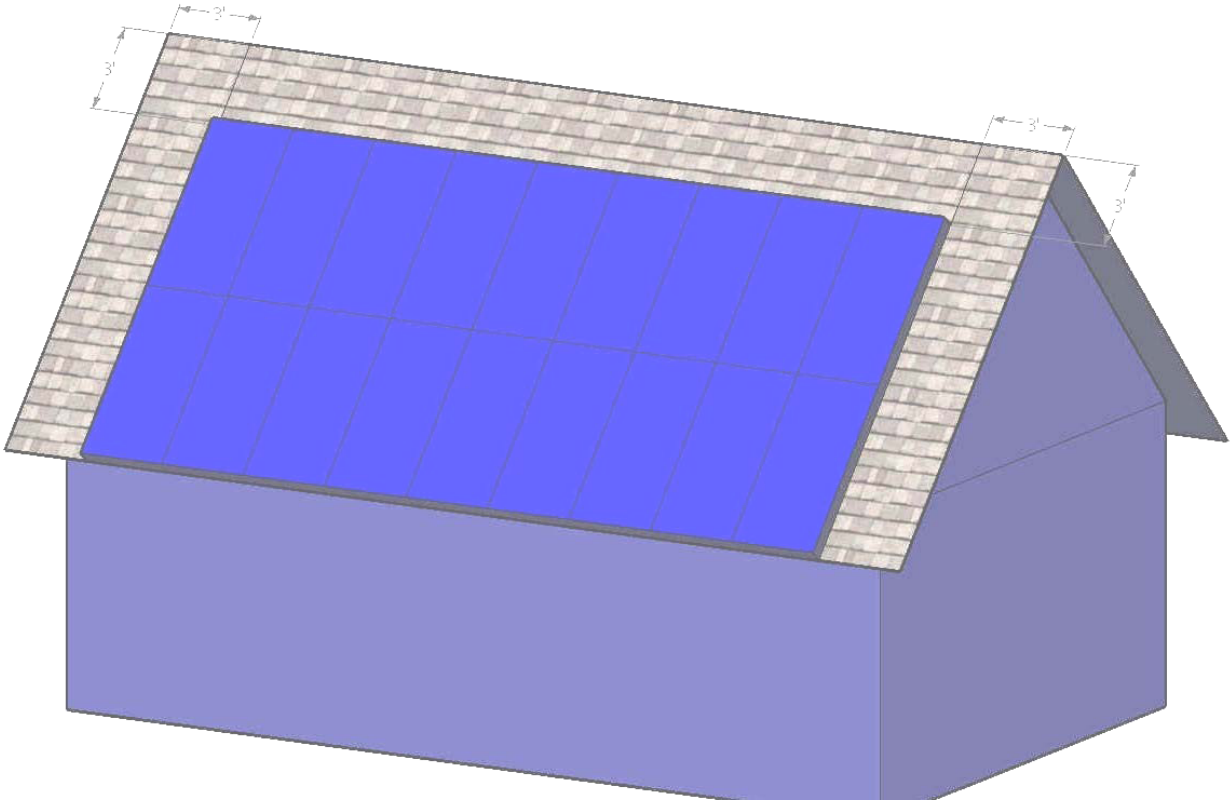

Figure 2 – Single Ridge (IFC 605.11.3.2.2)

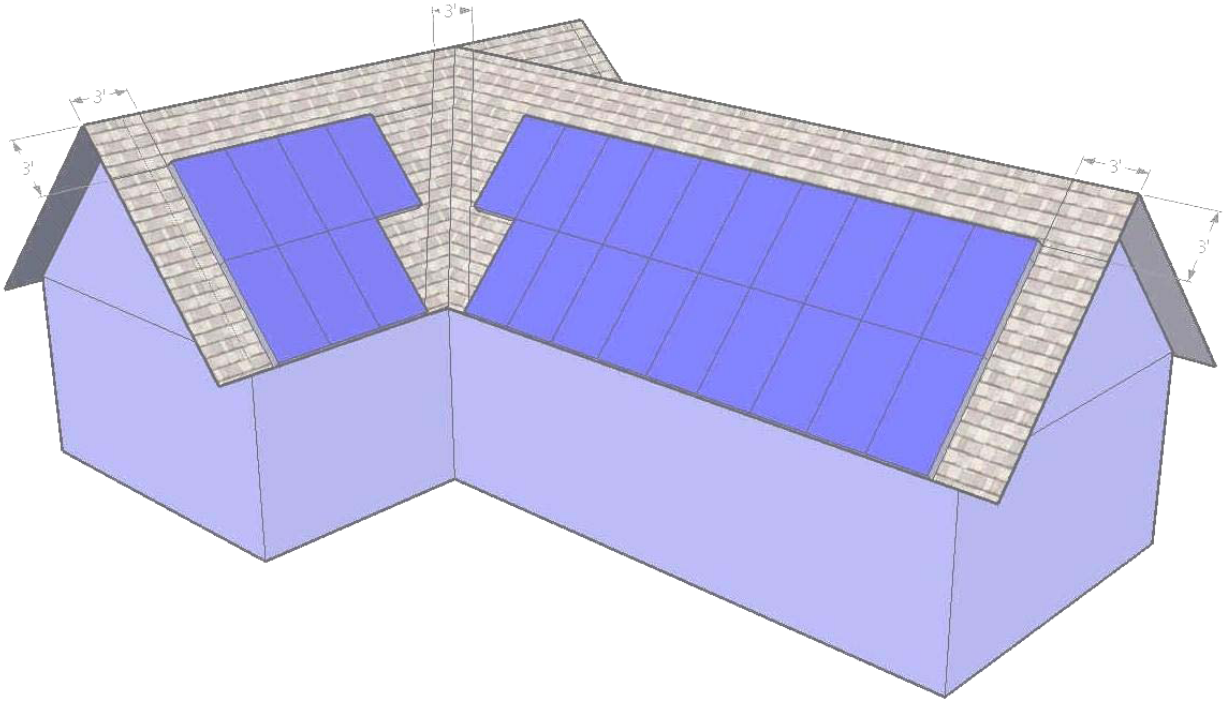

Figure 3 – Roof Hips and Valleys (IFC 605.11.3.2.3)