Solar Installation Checklist

This checklist has been developed to make solar installations as simple and affordable as possible.

For prescriptive residential solar installations, the following applies:

1. The system is installed on a roof of metal, single layer wood shingle or shake, or not more than two layers of composition roofing.

2. The combined weight of the PV modules and racking does not exceed 4.5 pounds per square foot, and the maximum module height does not exceed 18” from the top of the module to the roof surface, and does not extend above the highest ridgeline of the building.

3. The roof support is either:
   - Manufactured trusses; maximum 24” on center spacing.
   - Wood rafters complying with Table 305.4.1 or 305.4.2 of the OSISC: Material Span Size Spacing [24” max.]

4. The method of attachment meets the requirements of Section 305.4 [Item 3].

5. The installation is not on a building currently listed in the City’s Historic Resources Properties List. A sketch clearly showing the size and location of the installation, roof slope and Fire Fighter Access and Escape provisions [OSISC Section 304.9]. The plan should also show existing mechanical vents/intakes and existing plumbing vents. Solar panels, racking and associated equipment are not allowed to cover or conceal or cover plumbing or mechanical terminations.

Permits are reviewed and approved in 2-3 days.

Total Cost for Building and Electrical Permit is approximately $275.

A form has been developed to make prescriptive residential solar installations as simple and affordable as possible. This form may only be used for residential roof-mounted solar PV installations meeting the prescriptive requirements of the Oregon Solar Installation Specialty Code (OSISC). This form can be found at the following link.

https://www.milwaukieoregon.gov/building/residential-solar-installation-form

FOR OTHER SOLAR INSTALLATIONS THE FOLLOWING APPLIES.

Incomplete information may result in a delay in the approval of your project.

- Completed Residential or Commercial Permit Application Form (1 copy).
- Electrical Permit Application for Photovoltaic System Mechanical – Electrical permits are approved over the counter.
Include Building Permit Application and include the name of the State of Oregon licensed general contractor if framing or structural changes are required.

An electronic version of construction documents includes but are not limited to:

A site plan and/or floor plans showing proposed equipment locations

<table>
<thead>
<tr>
<th>Site Plan – Equipment Outside the Building</th>
<th>Floor Plan – Equipment Inside the building</th>
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<tbody>
<tr>
<td>• Show location of all disconnects</td>
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<tr>
<td>• Show the location of all modules</td>
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<td>• Show the location of inverters</td>
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<td>• Provide dimensions of clearances around all equipment</td>
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<tr>
<td>• Provide dimensions between equipment and structures</td>
<td>• Show the location of the equipment within the structure</td>
</tr>
<tr>
<td>• Provide dimensions from equipment to property lines</td>
<td>• Label the room in which the equipment is located</td>
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</table>

Elevation drawings indicating relationship of the array to the plane of the roof. Tilt-up arrays may require a separate administrative review (Minor Modification), supplemental engineering, and a Solar Shadow Analysis if the shadow of the array leaves the roof or goes over a parapet wall. For an over-the-counter permit, plans need to indicate in plan view and elevation, that the edges of the panels stay within the confines of the rake edge, and are above the eave and below the ridge of the roof.

Manufacturer’s cut sheets and listing information on PV equipment: inverter, panels, and disconnect including weight of equipment.

Electrical plans and a one-line diagrams that indicate:

- Plans bearing the seal and signature of an Oregon-licensed engineer are required for a photovoltaic solar energy system 10 kW or greater in size, or installed to an electrical service sized 400 amps or greater.
- The number of, and wattage of modules, detail conductor sizes, wire lengths, insulation types, conduit sizes, fuses, circuit breaker ratings, inverter ratings, AC & DC disconnect rating and ground fault protection device(s).
- Provide existing and new panel amperage ratings (Buss ratings) and detail over-current protection in compliance with NEC 690.9(A).
- Specify the PV module’s nameplate short-circuit current and open-circuit voltage relative to the work performed, and module series fuse ratings, inverter output current rating.
Provide calculations used to determine wire sizes, fuse and breaker type and sizing; include temperature deration factors per the NEC Table 690.31(C). Roof-mounted systems should use the worst case scenario for ambient temperature of 56-60 degrees C. See NEC Tables 310.15 (B)(2)(a); (B)(3)(a) & (B)(3)(c).

Provide calculations to show that the PV system voltage does not exceed the maximum rated DC inverter input voltage or that of the connected equipment.

Plans shall include all grounding on the one-line diagram. Show the grounding electrode system per NEC 690.47. Show calculations used to size equipment grounding conductor per NEC 690.43 & 690.45.

Plans shall show location of all disconnecting means, equipment and panels with reference to house and service equipment. Clearly identify where the wiring is on the interior or the exterior of the building. PV system disconnecting means shall be grouped together per NEC 690.14(C)(5).

Provide UL Standard 1703 manufacturer's specifications for the module installation and grounding requirements.

A letter bearing the seal and signature of a Oregon licensed engineer from the rack manufacturer confirming that the racking system meets/exceeds requirements of the Building Code (relating to uplift, snow loads, dead & live loads, etc.) and specifically how the rack will be attached to the house, including, but not limited to: the location, number, and type of attachment points, the number of fasteners per attachment point, and the specific type(s) of fasteners (size, diameter, length, minimum embedment into structural framing, etc.).

An Oregon licensed structural engineer’s evaluation regarding the capacity of the existing roof structure to support the additional loads imposed by the solar photovoltaic system. The engineer must reference the required wind and snow loads for the site. If the panels project above the ridge line of the roof, this must also be part of engineer’s evaluation. If the engineer determines that structural modifications are required; the plans shall include details showing how the existing structure will be altered to support the additional loads imposed by the system. If the engineer determines that the existing structure will support the additional imposed loads with no structural modifications, a letter bearing the engineer’s seal and signature shall be submitted with the application stating this conclusion. In all cases, the plans, evaluations, and letters shall bear the seal and signature of the structural engineer licensed by the State of Oregon. If framing modifications are required, a General Contractor licensed in the City of Milwaukie with the appropriate class of license is required to perform the work.

A sketch clearly showing the size and location of the installation, roof slope and Fire Fighter Access and Escape provisions [OSISC Section 304.9]. Th plan should also show existing mechanical vents/intakes and existing plumbing vents. Solar panels, racking and associated equipment are not allowed to cover or conceal or cover plumbing or mechanical terminations.