

Residential Solar Energy Systems

Permits

Building permits are required to install solar energy systems including:

- Roof-top mounted photovoltaic systems
- Building-integrated photovoltaic systems
- Ground-mounted photovoltaic systems

In addition to the building permit, an electrical permit will be required. Electrical permits are issued by the State of Minnesota, Department of Labor and Industry’s Electrical Division. For more information, call (651) 284-5026 or go to http://www.dli.mn.gov/CCLD/etrakit_electrical.asp.

Checklist

The Minneapolis Permit Applicant checklist (pages 4-5) must be completed in full and submitted with the building permit application and plans for roof-top mounted PV systems and ground-mounted PV systems.

Building-integrated photovoltaic systems (where the solar collector replaces or substitutes for an architectural or structural component of a building such as a roof, shingle, or awning) do not require this checklist – but shall provide manufacturer specifications and code evaluation reports for the building-integrated photovoltaic system products being installed.

Plans required for roof-top mounted solar PV systems

Required drawings shall be scaled and dimensioned. See example plans.

1) Site plan indicating the buildings and features of the property. The site plan shall show all the following:

- Property line locations
- Location of all structures on the site
- Driveways and streets
- Setbacks from property lines
- Location of solar energy systems
- Solar panel setback dimension from the peak and all edges of the roof
- Main service location
- Solar easement across adjoining properties (if applicable)

2) Elevation of structure illustrating the appearance of the proposed solar installation and indicating the finished height of the system above the roof surface.

3) Building cross section including the following details:

- Rafter size, spacing, and span dimension
- Roof slope(s)
- Style, diameter, length of embedment of bolts and plan details illustrating method of fastening equipment to the roof

4) Roof plan showing the location of all required roof access locations, pathways, and setbacks. Roof plans must be to scale, fully dimensioned, and include all the following:

- Locations of each array and each panel in each array
- Layout and number of panels
- Locations of obstructions such as vent pipes, conduit, or mechanical equipment

For roof-top mounted systems at dwellings or at detached habitable accessory structures (ADUs), the roof plan must also include:

- Total plan view roof area in square feet
- Total area of the solar panels in square feet
- Locations and dimensions of the required pathways (no fewer than 2, located on separate roof planes) from the lowest roof edge to the ridge
- Show and dimension setbacks at horizontal ridges
- Identify any portions of a roof located below an emergency escape and rescue opening

Note: Roof access is not required at detached, nonhabitable structures, including detached garages, parking shade structures, carports, solar trellises and similar structures. Roof access and pathway requirements do not apply to roofs with slopes of two units vertical in 12 units horizontal (17 percent slope) or less.

Plans required for ground-mounted solar PV installations

For ground-mounted solar energy systems, the installation must meet property line setback standards for solar accessory structures, as identified in the Minneapolis Zoning Code: Title 20, Chapter 535 – Regulations of General Applicability, Article XII – Solar Energy Systems, 535.820-870 (www.municode.com/library/mn/minneapolis/codes/code_of_ordinances).

1) Site plan indicating the buildings and features of the property. The site plan shall show the following:

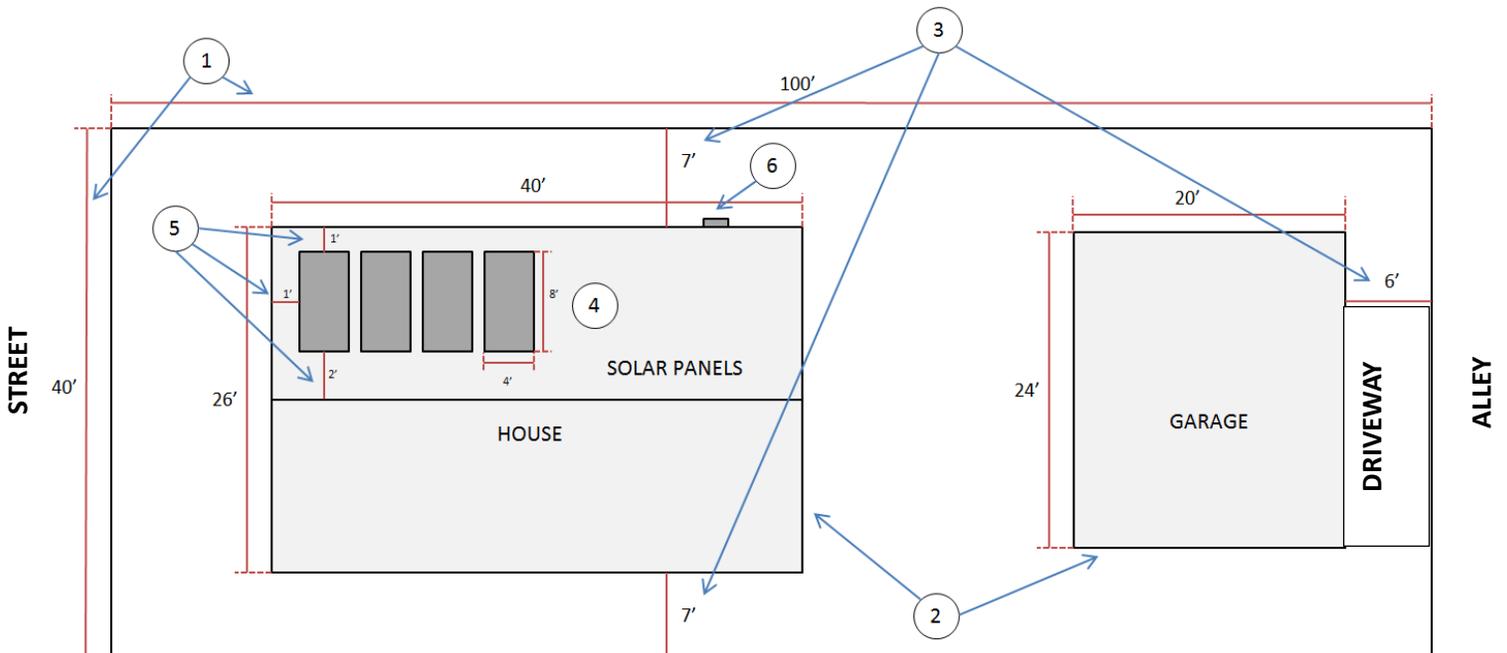
- Property line locations
- Location of all structures on the site
- Setbacks from property lines
- Location of solar energy systems
- Main service location
- Property lines and setbacks are required to be verified. Provide a current survey prepared and signed by a licensed land surveyor - or – Denote locations of the found property pins on the site plan, as located by homeowner or contractor.

2) Elevation of structure illustrating the appearance of the proposed solar installation indicating the finished height of the system above ground.

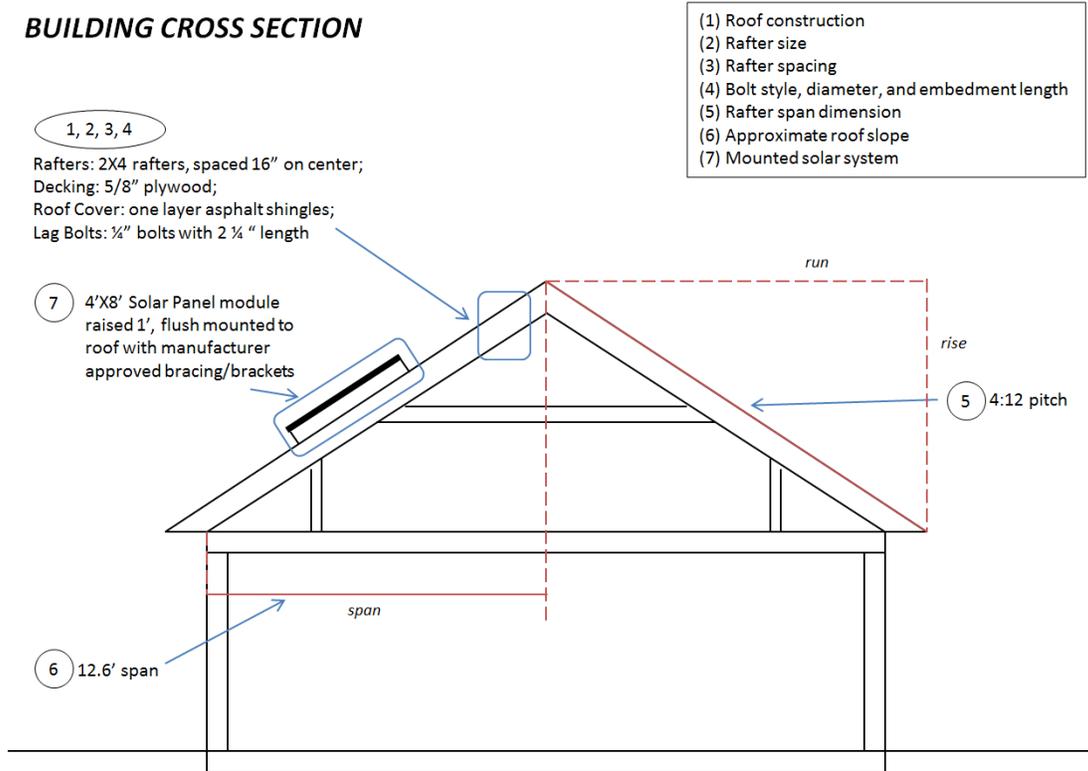
Example Plans

SITE PLAN

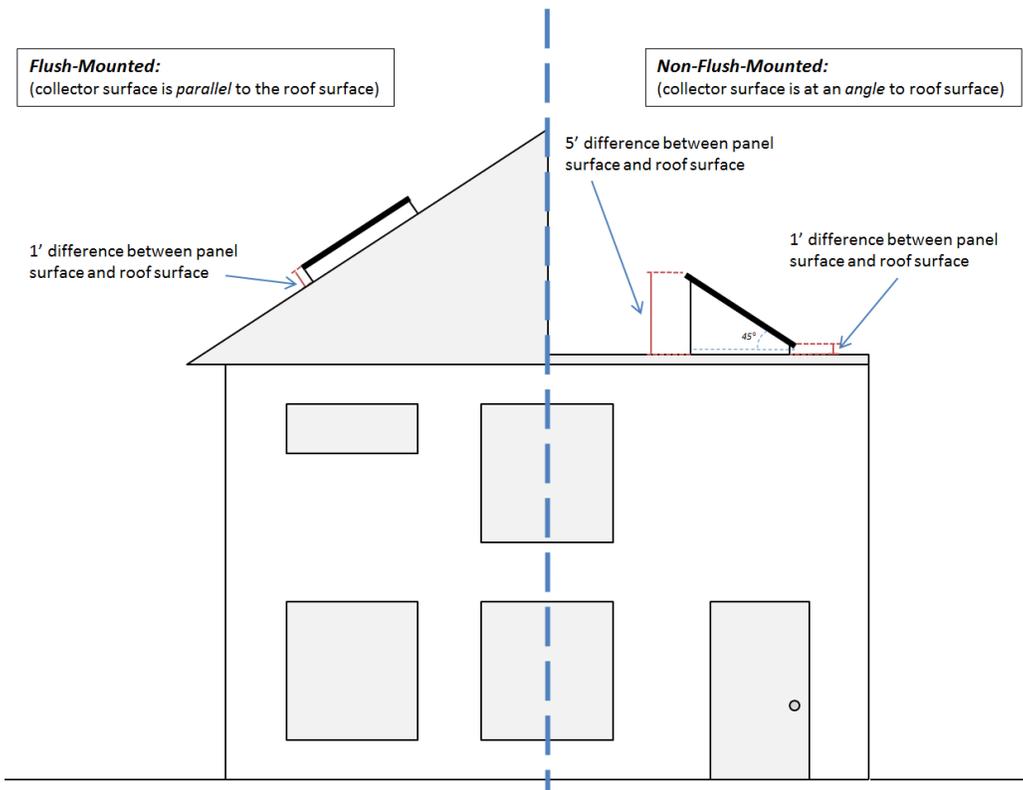
- (1) Property line locations
- (2) Location of all structures
- (3) Setback from property lines
- (4) Location of solar panel installations
- (5) Solar panel setback dimension from roof peak and edges
- (6) Main service location



BUILDING CROSS SECTION



ELEVATION



Permit Applicant Checklist for residential solar energy installations

General Information

Project Address: _____

Property owner Name: _____ Phone number: _____

Address: _____

Contractor company Name: _____ License number: _____

Address: _____

Installation company Name: _____ License number: _____

Address: _____

Describe the proposed work, including both solar equipment installation and all associated construction: _____

System Information for electric (photovoltaic) systems

System kW rating (DC): _____ System designation: _____ Inter-tie or _____ Stand alone

Does the system include backup power? _____ Yes* _____ No

*If yes, complete all the following:

- 1) Is it an uninterruptible power supply (UPS) or an energy storage system (ESS)? _____
- 2) Battery manufacturer & model: _____
- 3) Number, size and installation location of the batteries: _____
- 4) Upload a floor plan showing the battery location (unfinished basement, closet, detached garage, etc.)
- 5) Upload the manufacturer's installation instructions and a current code evaluation report.

See MN Residential Code R327 for a summary of code requirements for electrical energy storage systems (ESS) utilizing stationary storage batteries.

Roof-top Installations

Roof decking and structural supports should all be in good condition without visible roof sag/deflection.

- 6) What is the roof type?
 Flat roof (nominal pitch 2:12 or less)
 Sloped - identify pitch: _____
- 7) Is the edge of the roof less than three feet from a lot line? Yes No
- 8) What is the existing roofing type?
 (shingles, tile, metal, ballasted, membrane, etc.):

- 9) How many roofing layers will be under the panels?
 (no more than 2 layers of roof shingles are allowed):

- 10) What is the age and condition of the roofing material?

- 11) Has the homeowner been made aware of the lifespans of the existing roof and a new solar installation?
 Yes No
- 12) Is the system to be mounted according to panel and rack manufacturer's instructions? Yes No**
 12a. If No, explain: _____

- 13) Is the equipment to be *flush mounted* to the roof (the collector surface is parallel to the roof)?
 Yes No**
 13a. If Yes (flush mounted), does the roof structure use 2x4 or larger rafters, spaced no more than 24 inches on center? Yes No**
 13b. If No (non-flush-mounted), is the finished pitch of the collector at or less than a 12/12 pitch? Yes No**
 Is the collector or racking system fastened to the roof within one foot of the roof peak?
 Yes No**
 Is the collector or racking system fastened to each rafter passing under the collector?
 Yes No**

Is the horizontal span (roof span dimension) of the rafter less than 7.75 feet for 2X4 rafters or 11.5 feet for 2X6 rafters? Yes No**

- 14) Is the roof structure in good condition, having no visible sag, cracking or splintering of rafters, or other potential structural defects? Yes No**
 - Provide photos showing the condition of the roof structure (rafters in the attic space), if accessible.
 - or -
 - Provide exterior photos, showing a side view of the roof, if accessible.

**If the answer is "No" for any parts of questions 12, 13, or 14:

- Provide a study or statement regarding the proposed solar installation and all proposed structural modifications as required and approved (stamped) by a Minnesota licensed structural engineer
AND
- Provide construction plans denoting the roof structure and any modifications to the structure if required, as well as the method of installation of solar collector on the subject property
OR
- Provide a letter from the engineer, specifically addressing the subject property, explaining its roof structure, any required modifications, as well as method of installation of the solar collector on subject property

Heritage Preservation

Exterior work, including installation of solar systems, within city designation heritage preservation sites and districts is subject to additional review and approval by administrative staff or the Heritage Preservation Commission prior to the issuance of city permits. For a city map showing individual sites and district boundaries go to the city website [minneapolismn.gov Landmarks and Historic Districts](http://minneapolismn.gov/Landmarks%20and%20Historic%20Districts). You may also search a specific address by using "property look-up" at [minneapolismn.gov Property Information Search](http://minneapolismn.gov/Property%20Information%20Search)

- 15) Is the installation address within a heritage preservation district, or on a landmark property or building?
 Yes No