



White Bear Lake Area Department of Inspections
4701 Highway 61, White Bear Lake, MN 55110
Phone: 651-429-8518 / Fax: 651-429-8503
www.whitebearlake.org

Mahtomedi Rooftop Solar PV Application Checklist

Instructions: Submit this fully completed checklist, accompanying information, completed Building Permit Application, and completed Request for Electrical Inspection Permit Application as one application packet. NOTE: additional information may be requested during the review process.

Checklist

- [Building Permit](#)
- Electrical Permit (Check & submit one of the below)
 - [Request for Electrical Inspection Permit \(One & Two Family Dwellings\)](#)
 - [Request for Electrical Inspection Permit \(Non-Dwellings & Multi Family Dwellings\)](#)
- Construction Detail & Site Plans (see Appendix 1 for examples)
- Specification sheets and installation manuals (if available) for all manufactured components including, but not limited to, PV modules, inverter(s), combiner box, disconnects, and mounting system. If there is no installation manual available, fill out appendix 2.
- Proof of Structural Compliance (Optional)
 - If there is a concern based on the documentation submitted that the roof framing is inadequate, additional structural compliance information will be requested by staff during the plan review process. Potential Resources:
 - MN Department of Labor & Industry: "[Standardized Load Tables Characterizing Residential Solar Thermal and Solar Electric Installations For Residential Structures in Minnesota](#)"
 - See Appendix 2 "Structural Review of PV Installation Mounting System & Roof"
 - Structural MN Professional Engineering Study

Application Submittal. Complete and thorough applications for small rooftop solar PV permits will be processed in 7 – 10 business days. The permit application may be submitted for review by way of any of the following methods.

- **In-person/Mail:** 4701 Highway 61, White Bear Lake, MN 55110
- **Fax:** 651-429-8503

Associated Fees. Payment must be made in-person at White Bear Lake Area Department of Inspections. The city accepts payments in the form of Cash / Check / Credit Card.

- **Building Permit Fee:** Flat fee (\$175 Residential, \$275 Commercial).
- **Electrical Permit Fee:** Sliding Scale (\$60-250 for small rooftop solar PV systems; higher for commercial larger systems. See [2019 Fee Schedule](#) for larger PV system fees)
 - (1) 0 watts to and including 5,000 watts, \$90 or
 - (2) 5,001 watts to and including 10,000 watts, \$150 or
 - (3) 10,001 watts to and including 20,000 watts, \$225

Associated Fees Example: Average Residential Solar PV System size in the U.S. is 5.1kW (5,100 watts). In Mahtomedi, permits for this system would cost:

\$175 (Flat Building Permit Fee) + \$150 (Electrical Permit, Sliding Scale Range #2) = **\$325**

Appendix 1: Construction Detail & Site Plan Diagrams

BUILDING CROSS SECTION

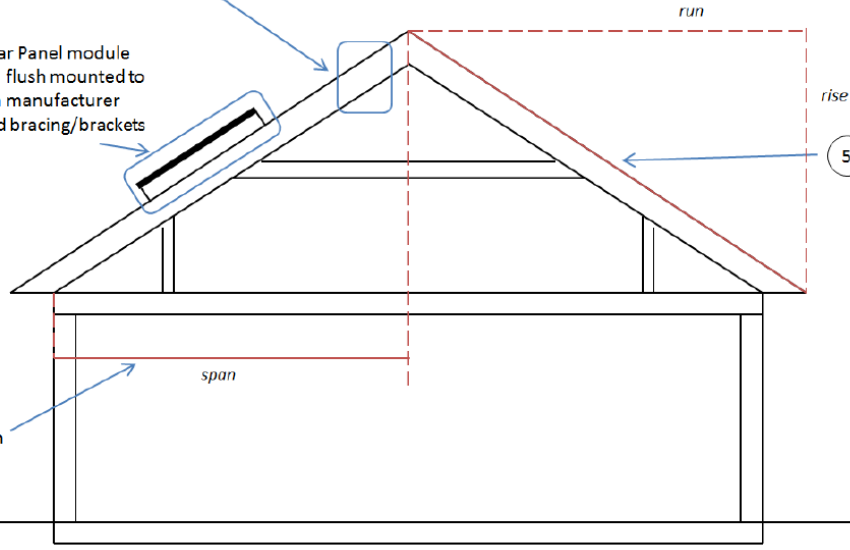
1, 2, 3, 4

Rafters: 2X4 rafters, spaced 16" on center;
 Decking: 5/8" plywood;
 Roof Cover: one layer asphalt shingles;
 Lag Bolts: 3/4" bolts with 2 1/4" length

- (1) Roof construction
- (2) Rafter size
- (3) Rafter spacing
- (4) Bolt style, diameter, and embedment length
- (5) Rafter span dimension
- (6) Approximate roof slope
- (7) Mounted solar system

7

4'X8' Solar Panel module raised 1', flush mounted to roof with manufacturer approved bracing/brackets



5 4:12 pitch

6

12.6' span

ELEVATION

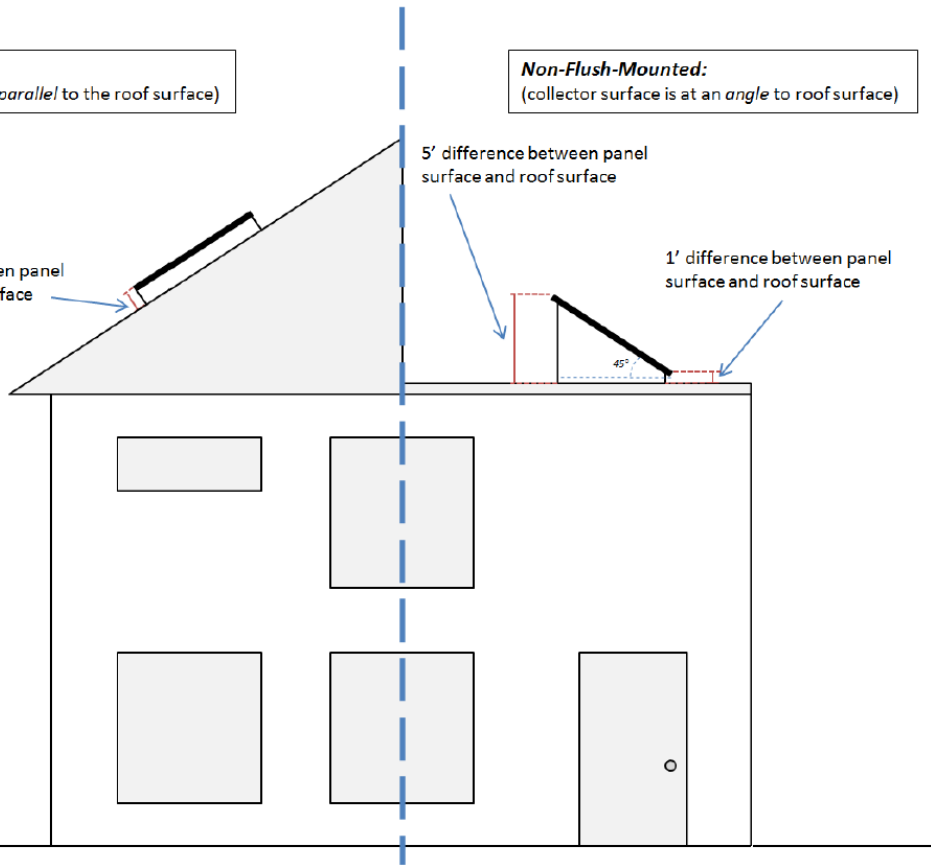
Flush-Mounted:
 (collector surface is *parallel* to the roof surface)

Non-Flush-Mounted:
 (collector surface is at an *angle* to roof surface)

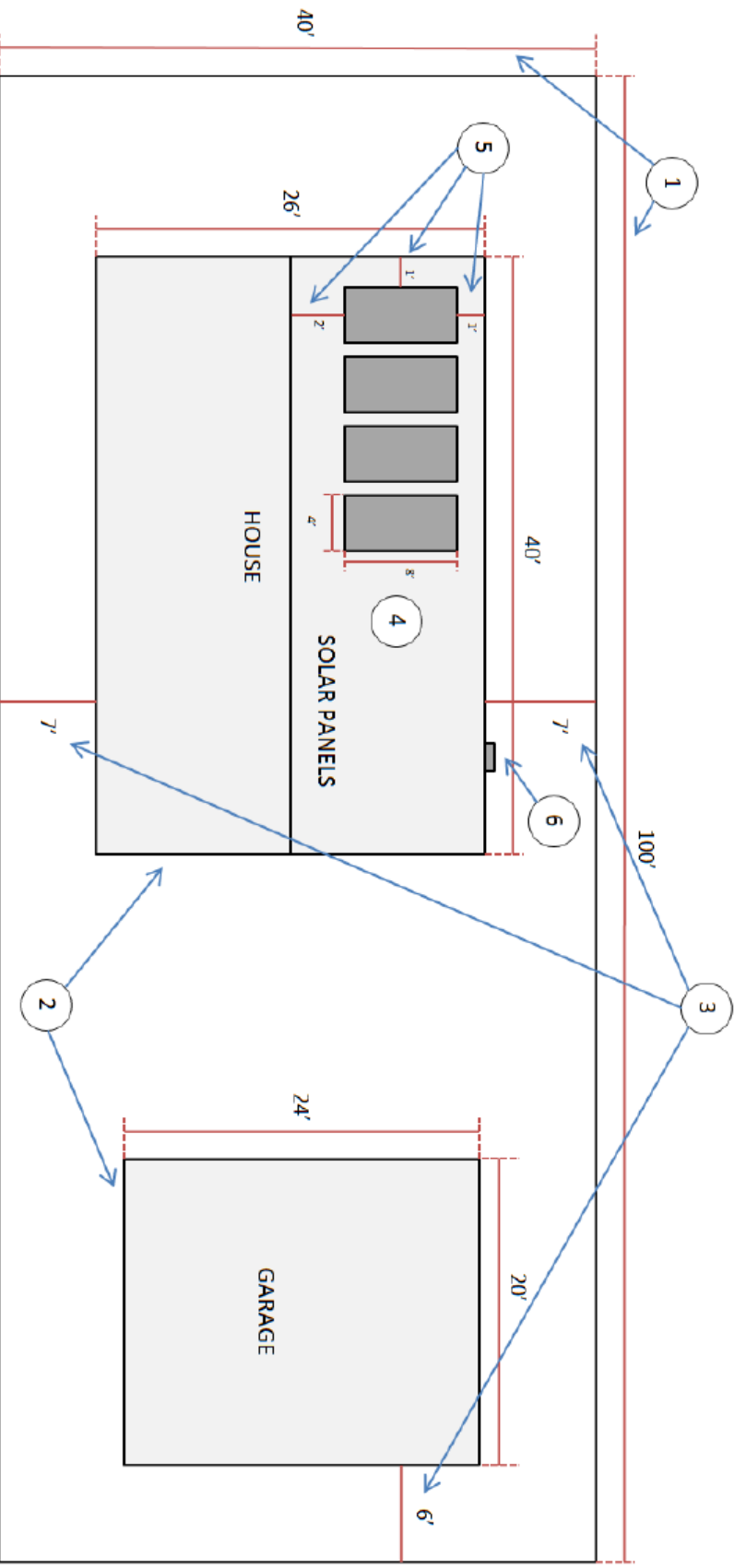
1' difference between panel surface and roof surface

5' difference between panel surface and roof surface

1' difference between panel surface and roof surface



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

Appendix 2

Structural Review of PV Installation Mounting System & Roof

(MN DoLI - Great Plains Institute's "Solar Permitting Toolkit for MN Municipalities")

1. Is the roof supporting the installation a pitched roof in good condition, without visible sag or deflection, no cracking or splintering of support, or other potential structural defect? YES NO
2. Is the roof a rafter system*? YES NO
3. Is the equipment to be flush-mounted to the roof such that the collector surface is parallel to the roof?
 YES NO
4. Is the roofing type lightweight? YES (composition, lightweight masonry, metal, etc...) NO
5. Does the roof have a single layer roof covering? Yes No
- If "No" to any of questions 1 -4 above, additional documentation may be required. Documentation may need to demonstrate the structural integrity of the roof and all necessary structural modifications needed to maintain integrity. A statement stamped by a Minnesota licensed/certified structural engineer certifying integrity may be needed. Contact the building official to determine submittal requirements.
6. Identify method and types of weatherproofing for roof penetrations (e.g. flashing, caulk):

**For truss systems, additional information may be needed to establish the truss' design loads. The SolarStruc Tool (<https://www.growsolar.org/wp-content/uploads/2012/06/Solarstruc-2.2.xls>) allows contractors to calculate truss capacity for solar installations. Contact building official for standards on when structural analysis will be needed.*

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7. Is the mounting structure an engineered product designed to mount PV modules with no more than an 18" gap beneath the module frames? YES NO
- If No, provide details of structural attachment certified by a design professional. Manufacturer's engineering specifications are sufficient to meet this requirement.
 8. For manufactured mounting systems, fill information on the mounting system below**:
 - a. Mounting System Manufacturer _____
 - b. Product Name and Model # _____
 - c. Total Weight of PV Modules and Rails _____ lbs
 - d. Total Number of Attachment Points _____ (attachment points must be equally distributed across the array)
 - e. Weight per Attachment Point (c÷d) _____ lbs
 - f. Maximum Spacing between Attachment Points on a Rail _____ inches (see product manual for maximum spacing allowed based on maximum design wind speed).
 - g. Total Surface Area of PV Modules (square feet) _____ ft²
 - h. Distributed Weight of PV Module on Roof (c÷g) _____ lbs/ft²
 - o If the outcome of e. is greater than 45 lbs or h. is greater than 5 lbs/ft², a study or statement demonstrating the structural integrity of the installation, or a statement stamped by a Minnesota licensed/certified structural engineer, may be required. Contact the building official to determine requirements

**Attaching the rail to each rafter or truss that passes under the array, or to blocking installed between each support, may serve to mitigate for any structural uncertainties on older roofs or wind loading concerns. This approach was used by Minneapolis and Saint Paul based upon engineering studies conducted with their building stock. Contact the building official to determine requirements.