City of White Bear Lake
Building Department
4701 Highway 61 N.
White Bear Lake, Minnesota 55110
651-429-8518 | www.whitebearlake.org
buildingdepartment@whitebearlake.org

ROOFTOP SOLAR PV INFORMATION

This handout is a summary of the permit & inspection process as well as standard requirements based on State Building Code regarding Rooftop Solar Panels. Information contained herein does not contain all of the specific codes for construction, and shall only be used as a guide.

Permit Submission Requirements:

- Completed Building Permit Application
- Completed Electrical Permit Application or in White Bear Lake, obtain the electrical permit via the ePermit System at www.whitebearlake.org
- Construction detail and site plan (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:
  - 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

Rooftop Solar Panel Building and Electrical Permit Fees: See the White Bear Lake Fee Schedule at www.whitebearlake.org

Licensing Requirements:

Electrical Contracting Company must be licensed in the State of Minnesota.

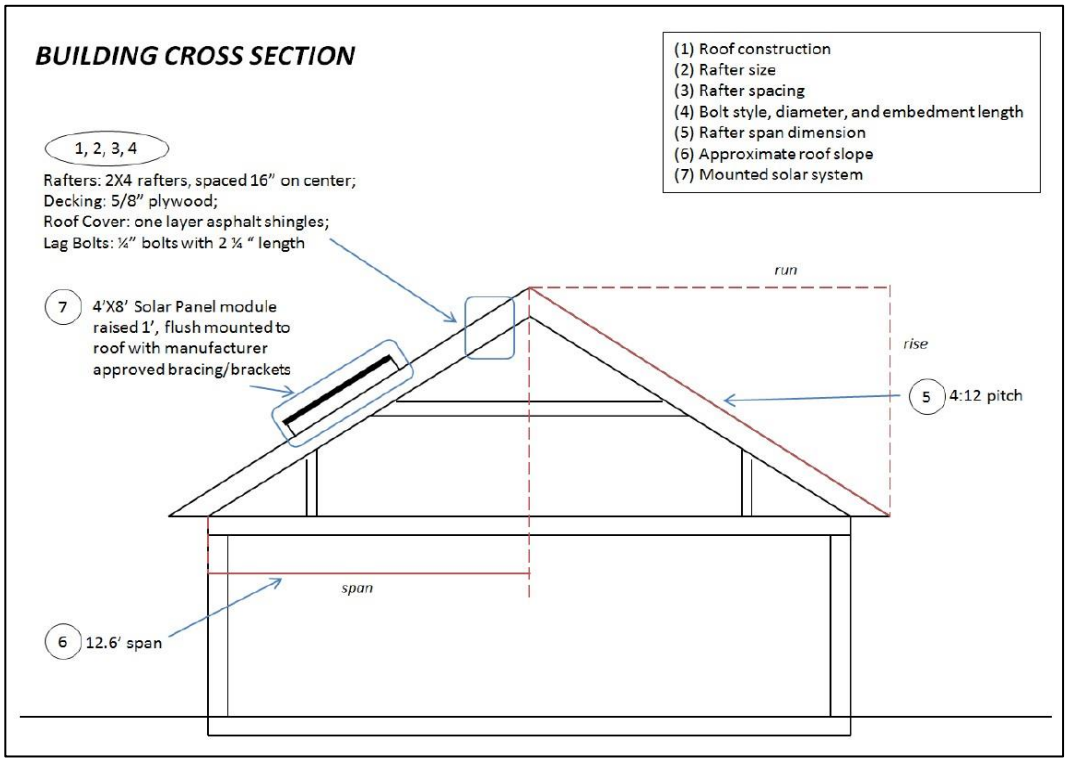
Inspection Requirements:

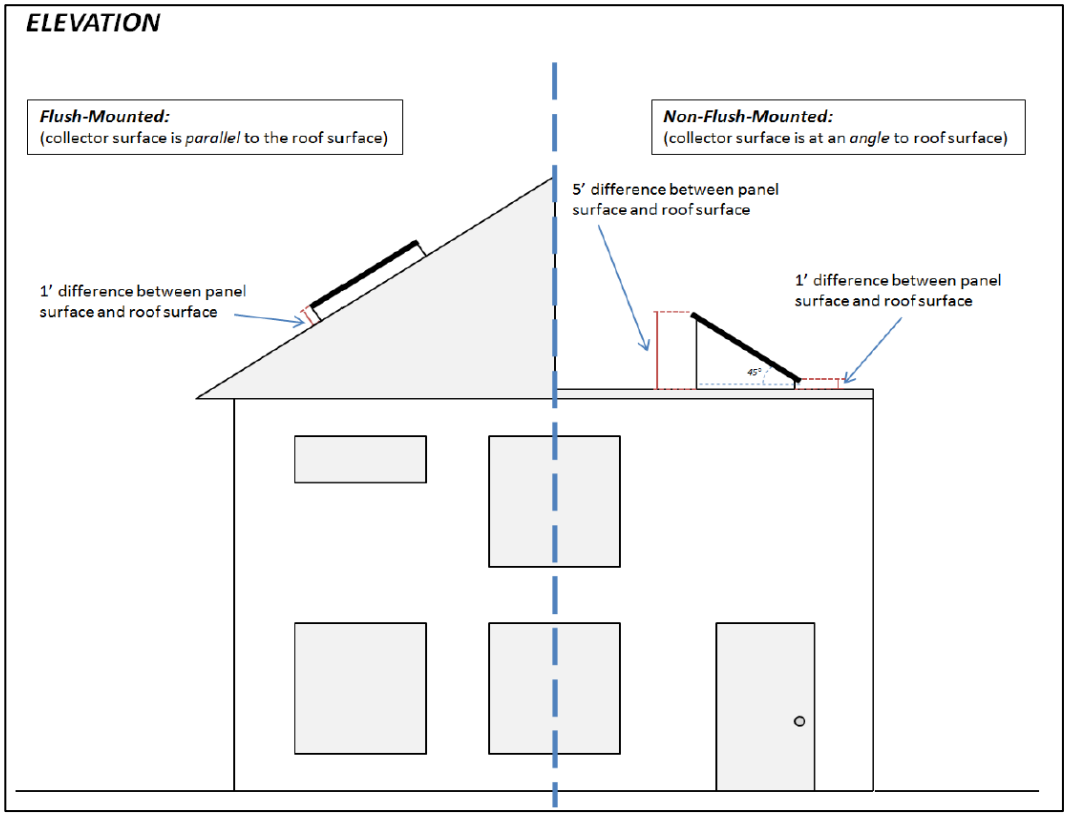
The inspection card and approved plans must be on site upon the start of work until the final inspection has been performed and passed. All construction work shall remain accessible and exposed for inspection until approved by the Building Inspection Department.

All required inspections will be listed on the permit card. A final inspection is required upon completion of project and approvals for all other inspections have been complete; please call 651-429-8518 to schedule an inspection. A 24-hour notice is required for all inspections (period is subject change during busy times).

Information and Guidelines:

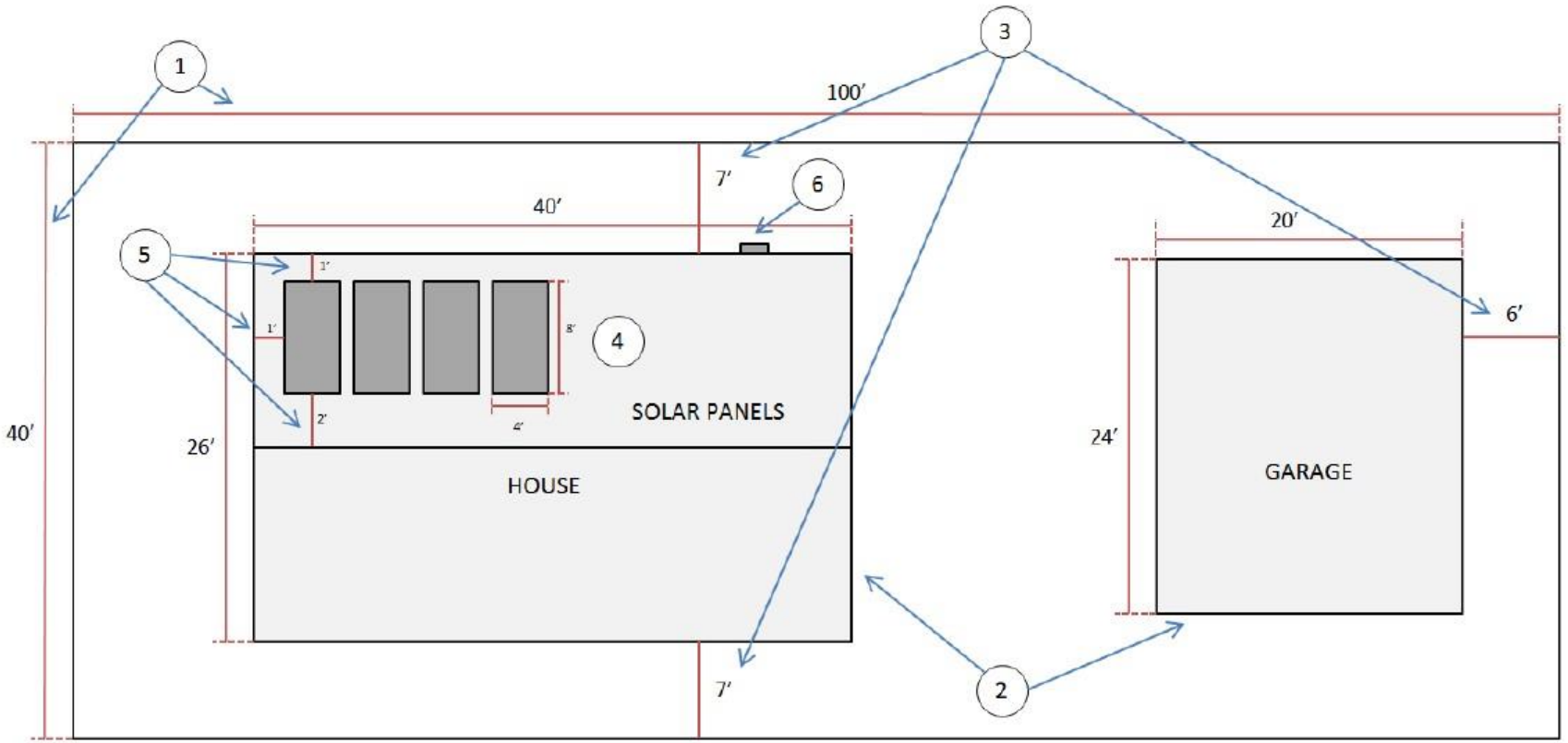
Appendix 1: Construction Detail & Site Plan Diagrams





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
(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**

**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.*

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):

   _____
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
      - *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.