SOLAR – PHOTOVOLTAIC (PV) SYSTEMS

Building Requirements

Required Permit Submittal:

- A building permit is required.
- Survey/Detailed site plan– details shall include survey or other accurately scaled drawing showing:
  - Proposed location of the Solar Panels & Transformers.
  - Roof Mounted Panels – What structure they are mounted on, as well as access and pathways according to Section R324.6 2020 MRC
  - Roof Mount Panel - Plans shall include existing roof structure analysis by a qualified structural engineer or all framing details including spacing and design loads of engineered roof trusses if applicable, or species and grade of rafters, rafter sizes and framing methods used, spacing and spans of rafters
- Specifications – Provide panel and mounting/racking manufacturers specifications.

Rooftop – Residential Dwelling and Accessory Structures:

- Photovoltaic systems shall be designed and installed in accordance with Sections R324.3.1 through R324.7.1, NFPA 70 and the manufacturer's installation instructions
- Structural requirements - Rooftop-mounted photovoltaic panel systems shall be designed to structurally support the system and withstand applicable gravity loads in accordance with Chapter 3 MNRC. The roof on which these systems are installed shall be designed and constructed to support the loads imposed by such systems in accordance with Chapter 8 MNRC.
- Rooftop systems shall support a roof snow load of 35 pounds per square foot and ground mount systems shall support a ground snow load of at least 50 psf as found in Table R301.2(1).
- The total dead load of ALL additional weight must be accounted for in the proposed design in accordance with Section R324.4.1 of the current MNRC.
- Roof and wall penetrations shall be flashed and sealed in accordance with Chapter 9 or the current MNRC.
- Rooftop installed photovoltaic systems that are adhered to or attached to the roof covering or photovoltaic modules/shingles installed as roof coverings shall identify their fire classification.
- Photovoltaic shingles shall be attached in accordance with the manufacturer's installation instructions and Section R905.16 of the MNRC.
- For arrays occupying less than 33 percent of the plan view total roof area, not less than an 18-inch clear setback is required on both sides of a horizontal ridge. For arrays occupying more than 33 percent of the plan view total roof area, not less than a 36-inch clear setback is required on both sides of a horizontal ridge.
- No fewer than two, 36" wide pathways shall be provided, on separate roof planes, from the lowest roof edge to the ridge of all buildings containing rooftop solar arrays. At least one of these pathways shall be provided on the driveway or street side of the roof.
- For each individual roof plane with a solar array, a minimum 36" pathway shall be provided from the lowest roof edge to ridge on the same roof plane as the array, on an adjacent roof plane, or straddling the

same adjacent roof planes.

- Pathways shall be over areas capable of supporting fire fighters accessing the roof.
- Pathways shall be located in areas with minimal obstructions such as vent pipes, conduit, or mechanical equipment.
- Detached, non-habitable accessory structures, including but not limited to detached garages, pole sheds, parking shade structures, carports, and similar structures, shall not be required to provide roof access.

Rooftop – Non-Residential:

- Rooftop arrays shall be designed for all uniform and concentrated live loads, dead loads including panels and components in accordance section 1607.13.5 MNBC.
- Rooftop arrays shall be designed for all applicable wind loads in accordance with section 1609 MNBC.
- Arrays shall be listed and labeled for the fire classification required based on building construction type as found in Section 1505.1 and 1505.9 MNBC.
- Roof access points shall meet all of the following requirements:
    - Roof access points shall be located where fire departments have ground access.
    - Roof access points shall be located in areas that do not require the placement of fire department ground ladders over openings such as windows or doors.
    - Roof access points shall be located at strong points of building construction capable of supporting emergency responders.
    - Roof access points shall be in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.
    - Each roof access point shall be provided with a landing on the roof side not less than 6 feet (1829 mm) in each direction. The landing shall be free and clear of obstructions such as vent pipes, conduit, and mechanical and electrical equipment.
    - Roof access point landings on roofs with slopes greater than two units vertical in 12 units horizontal (2:12) shall be positioned with direct access to a pathway to ridge.
    - Each solar array or grouping of arrays shall have not less than two roof access points spaced not closer than one-third the diagonal dimension of the array or arrays served.
- When solar photovoltaic panels are installed on any building or site, the licensed design professional shall notify the fire code official 3111.1.4 MNBC.
- Pathways and setbacks at ridge are the same as above except:
    - Pathways shall be provided at intervals not greater than 150 feet throughout the length and width of the roof.

Rooftop – Non-Residential With Slope of 2:12 or Less:

- Access to systems for buildings with roofs with slopes of two units vertical in 12 units horizontal (2:12) or less, shall be provided in accordance with Sections 3111.3.4.2.1 through 3111.3.4.2.3 MNBC.
- There shall be a minimum 6-foot-wide clear perimeter around the edges of the roof.
- Interior pathways shall meet the following requirements:
    - Pathways shall be provided at intervals not greater than 150 feet throughout the length and width of the roof.
    - A pathway of not less than 4 feet wide in a straight line to roof standpipes or ventilation hatches
    - A pathway not less than 4 feet wide around roof access hatches, with no fewer than one such pathway to a parapet or roof edge.
    - A pathway not less than 4 feet wide from the perimeter pathway to an emergency escape and rescue opening located above the roof.
- Smoke ventilation options between array sections shall be one of the following:
    - A pathway 8’ or greater in width
    - A 4’ or greater in width pathway and bordering roof skylights or smoke and heat vents.
    - A 4’ or greater in width pathway and bordering 4’ by 8’ “venting cutouts” every 20’ on alternating

sides of the pathway.

Ground-Mounted Panels:

- Ground Mounted Panels are not allowed in The City of New Prague

Rapid Shutdown Type Systems:

- Buildings with rapid-shutdown solar photovoltaic systems shall have permanent labels in accordance with Sections 3111.3.6.1 through 3111.3.6.3 MNBC.
- For solar photovoltaic systems that shut down the array and the conductors leaving the array, a label shall be provided. The first two lines of the label shall be uppercase characters with a minimum height of 3/8 inch in black on a yellow background. The remaining characters shall be uppercase with a minimum height of 3/16 inch in black on a white background. The label shall be in accordance with Figure 3111.3.6.1(1) and state the following: **SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN. TURN RAPID SHUTDOWN SWITCH TO THE "OFF"POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZZARD IN ARRAY.**

LABEL FOR SOLAR PV SYSTEMS THAT REDUCE SHOCK HAZARD WITHIN ARRAY AND SHUTS DOWN CONDUCTORS LEAVING THE ARRAY

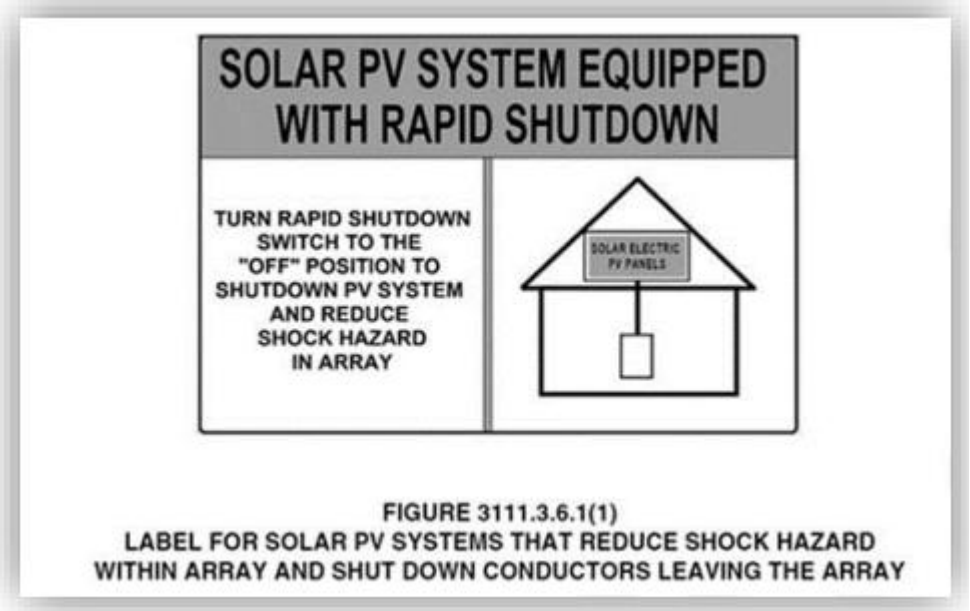

FIGURE 3111.3.6.1(1)
LABEL FOR SOLAR PV SYSTEMS THAT REDUCE SHOCK HAZARD WITHIN ARRAY AND SHUT DOWN CONDUCTORS LEAVING THE ARRAY

- For photovoltaic systems that only shut down conductors leaving the array, a label shall be provided. The first two lines of the label shall be uppercase characters with a minimum height of 3/8inch in white on a red background. The remaining characters shall be capitalized with a minimum height of 3/16-inch in black on a white background. The label shall be in accordance with Figure 3111.3.6.1(2) and state the following: **THIS SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN. TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS WITHIN ARRAY REMAIN ENERGIZED IN SUNLIGHT.**

LABEL FOR SOLAR PV SYSTEMS THAT ONLY SHUTS DOWN CONDUCTORS LEAVING THE ARRAY

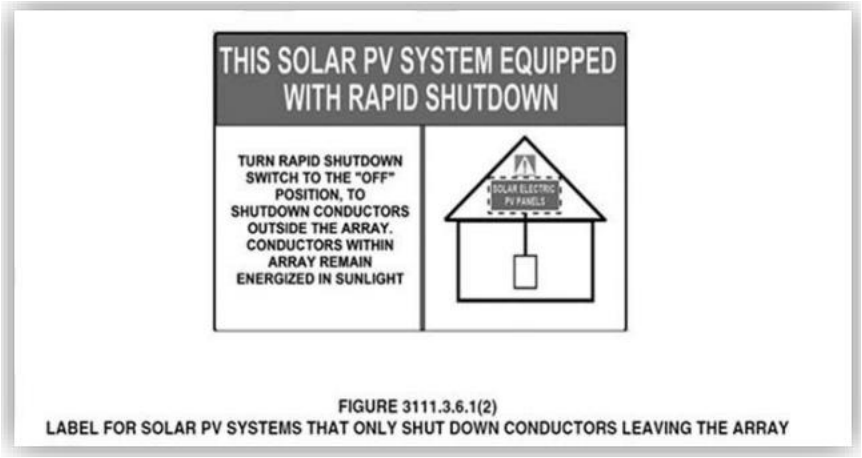

FIGURE 3111.3.6.1(2)
LABEL FOR SOLAR PV SYSTEMS THAT ONLY SHUT DOWN CONDUCTORS LEAVING THE ARRAY

- The labels in Section 3111.3.6.1 shall include a simple diagram of a building with a roof. Diagram sections in red signify sections of the solar photovoltaic system that are not shut down when the rapid shutdown switch is turned off.
- The rapid shutdown label in Section 3111.3.6.1 shall be located not greater than 3 feet (914 mm) from the service disconnecting means to which the photovoltaic systems are connected and shall indicate the location of all identified rapid shutdown switches if not at the same location.
- Solar photovoltaic systems that contain rapid shutdown in accordance with Section 3111.3.6.1, Items 1 and 2, or solar photovoltaic systems where only portions of the systems on the building contain rapid shutdown, shall provide a detailed plan view diagram of the roof showing each different photovoltaic system and a dotted line around areas that remain energized after the rapid shutdown switch is operated.
- A rapid shutdown switch shall have a label located not greater than 3 feet (914 mm) from the switch that states the following: **RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

Required Inspections:

- The Inspection Record card shall be visible from the street and shall remain posted until the final inspection has been made. Cards should be protected from the weather.
- State Electrical Inspection
- New Prague Utilities Inspection
- New Prague Building Department Final Inspection

Call 952-758-1138 between 8:00 A.M. and 4:30 P.M. to schedule an inspection. Provide at least 24-hour advance notice and permit number at time of scheduling.