

1305.3111 SECTION 3111, SOLAR ENERGY SYSTEMS.

Subpart 1. **IBC section 3111.1.** IBC section 3111.1 and its subsections are amended to read as follows:

3111.1 General. Solar energy systems shall comply with the requirements of this section.

Exception: Buildings regulated by Minnesota Rules, chapter 1309, the Minnesota Residential Code.

3111.1.1 Wind resistance. Rooftop-mounted photovoltaic panels and modules and solar thermal collectors shall be designed in accordance with Section 1609.

3111.1.2 Roof live load. Roof structures that provide support for solar energy systems shall be designed in accordance with Section 1607.13.5.

3111.1.3 Roof access points. Roof access points shall meet all the following criteria:

1. Roof access points shall be located where fire departments have ground access.
2. 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.
3. Roof access points shall be located at strong points of building construction capable of supporting emergency responders.
4. Roof access points shall be in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.
5. Each roof access point shall be provided with a landing on the roof side not less than six feet in each direction. The landing shall be free and clear of obstructions such as vent pipes, conduit, and mechanical and electrical equipment.
6. 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.
7. Each solar array or grouping of arrays shall have not less than two roof access points spaced not closer than 1/3 the diagonal dimension of the array or arrays served.

3111.1.4. When solar photovoltaic panels are installed on any building or site, the licensed design professional shall notify the fire code official.

Subp. 2. **IBC section 3111.3.** IBC section 3111.3 is amended to read as follows:

3111.3 Photovoltaic solar energy systems. Solar photovoltaic energy systems shall be designed and installed in accordance with this section, the Minnesota State Fire Code, the Minnesota Electrical Code, and the manufacturer's instructions.

Exception: Solar photovoltaic power systems installed on detached, nonhabitable Group U structures including parking shade structures, carports, solar trellises, and similar structures

need only comply with the Minnesota Fire Code, the Minnesota Electrical Code, and the manufacturer's instructions.

(Subsections 3111.3.1, 3111.3.2, and 3111.3.3 remain unchanged.)

Subp. 3. **IBC section 3111.3.4.** IBC section 3113.3.4 and its subsections are amended to read as follows:

3111.3.4 Access and pathways. Roof access, pathways, and spacing requirements shall be provided in accordance with Sections 3111.3.4.1 through 3111.3.4.2.3. Pathways shall be over areas capable of supporting firefighters accessing the roof. Pathways shall be located in areas without obstructions such as vent pipes, conduit, and mechanical and electrical equipment.

Exceptions:

1. Detached, nonhabitable Group U structures including but not limited to detached garages serving Group R-3 buildings, parking shade structures, carports, solar trellises, and similar structures.
2. Roof access, pathways, and spacing requirements need not be provided where the fire code official has determined that rooftop operations will not be employed.

3111.3.4.1 Solar photovoltaic systems for roof slopes greater than two units vertical in 12 units horizontal (2:12). Solar photovoltaic systems for buildings with roof slopes greater than two units vertical in 12 units horizontal (2:12) shall comply with Sections 3111.3.4.1.1 through 3111.3.4.1.3.

3111.3.4.1.1 Pathways to ridge. Not fewer than two 36-inch-wide pathways on separate roof planes, from the lowest roof edge to ridge, shall be provided on all buildings. Pathways shall be provided at intervals not greater than 150 feet throughout the length and width of the roof. Not fewer than one pathway shall be provided on the street or driveway side, or fire-department-access side of the roof. For each roof plane with a photovoltaic array, not fewer than one 36-inch-wide pathway from lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and adjacent roof planes.

3111.3.4.1.2 Setbacks at ridge. For photovoltaic arrays occupying 33 percent or less of the plan view total roof area, a setback of not less than 18 inches (457 mm) wide is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, a setback of not less than 36 inches (914 mm) wide is required on both sides of a horizontal ridge.

3111.3.4.1.3 Alternative setbacks at ridge. Where an automatic sprinkler system is installed within the building, setbacks at the ridge shall conform to one of the following criteria:

1. For photovoltaic arrays occupying 66 percent or less of the plan view total roof area, a setback of not less than 18 inches (457 mm) wide is required on both sides of a horizontal ridge.
2. For photovoltaic arrays occupying more than 66 percent of the plan view total roof area, a setback of not less than 36 inches (914 mm) wide is required on both sides of a horizontal ridge.

3111.3.4.1.4 Emergency escape and rescue openings. Panels and modules installed on Group R buildings shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A pathway of not less than 36 inches (914 mm) wide shall be provided from the roof edge to the emergency escape and rescue opening.

3111.3.4.2 Solar photovoltaic systems for roofs with slopes of two units vertical in 12 units horizontal 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.

3111.3.4.2.1 Perimeter pathways. There shall be a minimum six-foot-wide (1,829 mm) clear perimeter around the edges of the roof.

Exception: Where either axis of the building is 250 feet (76,200 mm) or less, the clear perimeter around the edges of the roof shall be permitted to be reduced to a minimum width of four feet (1219 mm).

3111.3.4.2.2 Interior pathways. Interior pathways shall be provided between array sections to meet the following requirements:

1. Pathways shall be provided at intervals not greater than 150 feet (45,720 mm) throughout the length and width of the roof.
2. A pathway of not less than four feet (1219 mm) wide in a straight line to roof standpipes or ventilation hatches.
3. A pathway not less than four feet (1219 mm) wide around roof access hatches, with not fewer than one such pathway to a parapet or roof edge.
4. A pathway not less than four feet (1219 mm) wide from the perimeter pathway to an emergency escape and rescue opening located above the roof.

3111.3.4.2.3 Smoke ventilation. The solar installation shall be designed to meet the following requirements:

1. Where non-gravity-operated smoke and heat vents occur, a pathway not less than four feet (1219 mm) wide shall be provided bordering all sides.
2. Smoke ventilation options between array sections shall be one of the following:
 - 2.1 A pathway not less than eight feet (2438 mm) wide.

2.2 Where gravity-operated dropout smoke and heat vents occur, a pathway not less than four feet (1219 mm) wide on at least one side.

2.3 A pathway not less than four feet (1219 mm) wide bordering four-foot by eight-foot (1,219 mm by 2438 mm) venting cutouts every 20 feet (6096 mm) on alternating sides of the pathway.

Subp. 4. **IBC section 3111.3.5.** IBC section 3111.3.5 is amended to read as follows:

3111.3.5 Ground-mounted photovoltaic panel systems. Ground-mounted photovoltaic panel systems shall comply with this section and Section 3111.1. Setback requirements shall not apply to ground-mounted, freestanding photovoltaic arrays. A clear, brush-free area of ten feet (3048 mm) shall be required for ground-mounted photovoltaic arrays.

Subp. 5. **IBC section 3111.3.6.** IBC section 3111.3 is amended by adding subsection 3111.3.6 with subsections, and Figures 3111.3.6.1(1) and 3111.3.6.1(2), to read as follows:

3111.3.6 Buildings with rapid shutdown. Buildings with rapid shutdown solar photovoltaic systems shall have permanent labels in accordance with Sections 3111.3.6.1 through 3111.3.6.3.

3111.3.6.1 Rapid shutdown type. The type of solar photovoltaic system rapid shutdown shall be labeled with one of the following:

1. 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 (10 mm) in black on a yellow background. The remaining characters shall be uppercase with a minimum height of 3/16-inch (5 mm) 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 HAZARD IN ARRAY.

2. 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 3/8-inch (10 mm) in white on a red background. The remaining characters shall be capitalized with a minimum height of 3/16-inch (5 mm) 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

Figure 1204.5.1(1) of the 2018 IFC is incorporated by reference and renumbered Figure 3111.3.6.1(1).

Figure 1204.5.1(2) of the 2018 IFC is incorporated by reference and renumbered Figure 3111.3.6.1(2).

3111.3.6.1.1 Diagram. 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.

3111.3.6.1.2 Location. 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.

3111.3.6.2 Buildings with more than one rapid shutdown type. 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.

3111.3.6.3 Rapid shutdown switch. 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

Statutory Authority: *MS s 326B.02; 326B.101; 326B.106*

History: *39 SR 1605; 44 SR 609*

Published Electronically: *March 31, 2020*