

The following explains the 2020 MNBC requirements for access, pathways and ventilation.

Section 3111 Solar Energy Systems

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

Exception: Buildings regulated by the Minnesota Residential Code



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 fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit or mechanical equipment.

Exceptions:

1. Detached, non-habitable 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.

3111.1.3 Roof Access Points

1. Access to roof landing areas that the fire department has ground access are free and clear of trees, power lines, signs, etc., and not located over doors or windows.
2. Access points shall be located at strong points that are capable of supporting emergency personnel.
3. Not less than 2 roof access points are provided with one roof access point on the street/ fire department access point side.

4. Access points are separated by not less than 1/3 of the diagonal dimension of the roof providing access to the array.
5. Roof access has a 6' x 6' minimum clear landing on the roof.
6. For landings on roofs with over a 2:12 pitch, landings shall be positioned with direct access to a pathway to the ridge.

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 Group R-3 buildings shall comply with Sections 3111.3.4.1.1 through 3111.3.4.1.3.

Exceptions:

1. These requirements shall not apply to structures designed and constructed in accordance with the Minnesota State Residential Code.
2. These requirements shall not apply to roof with slopes of 2 units vertical in 12 units horizontal or less.

3111.3.4.1.1 Pathway to Ridge. Not fewer than two 36-inch -wide (914mm) pathways on separate roof planes, from 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 of the roof. For each roof plane with a photovoltaic array, not fewer that 36-inch-wide (914mm) pathway from lowest roof edge to ridge shall be provided on the same roof plan as the photovoltaic array, on an adjacent roof plane or straddling the same adjacent roof planes.

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

3111.3.4.1.3 Alternate setback at ridge. Where an automatic sprinkler system is installed within the dwelling in accordance with Section 903.3.1.3, setbacks at the ridge shall conform to one of the following:

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.

- For photovoltaics arrays occupying more than 66 percent of the plan view total roof area a setback of not less than 36 inches (914mm) 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 (914mm) wide shall be provided to the emergency escape rescue opening.

3111.3.4.2 Solar photovoltaic systems for roofs with slopes of two units vertical in 12 units horizontal (2:12) or less. Access to systems for buildings with slopes of 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 6-foot-wide (1829 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 4 feet (1219 mm).

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

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

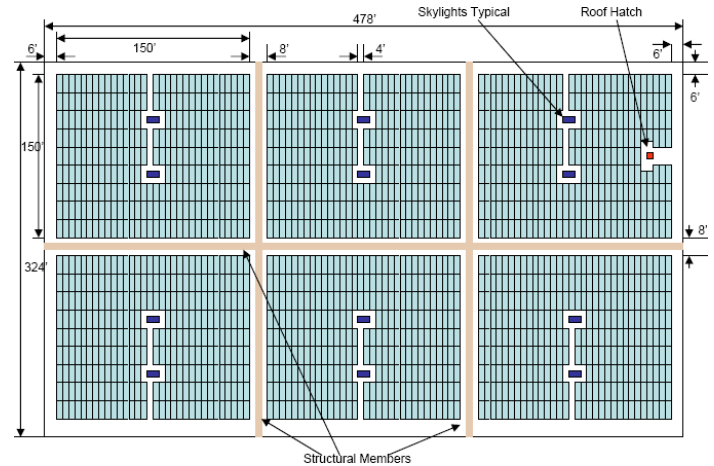
3111.3.4.2.3 Smoke ventilation. The solar installation shall be designed to meet the following requirements:

- Where non-gravity-operated smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) wide shall be provided bordering all sides.
- Smoke ventilation options between array sections shall be one of the following:
 - A pathway not less than 8 feet (2438 mm) wide.
 - Where gravity-operated dropout smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) wide on not fewer than one side.
 - A pathway not less than 4 feet (1219 mm) wide bordering 4-foot by 8-foot (1219 mm by 2438 mm) venting cutouts every 20 feet (6096 mm) on alternating sides of the pathway.

Possible Scenarios for Rooftop Access & Nonresidential PV Installations

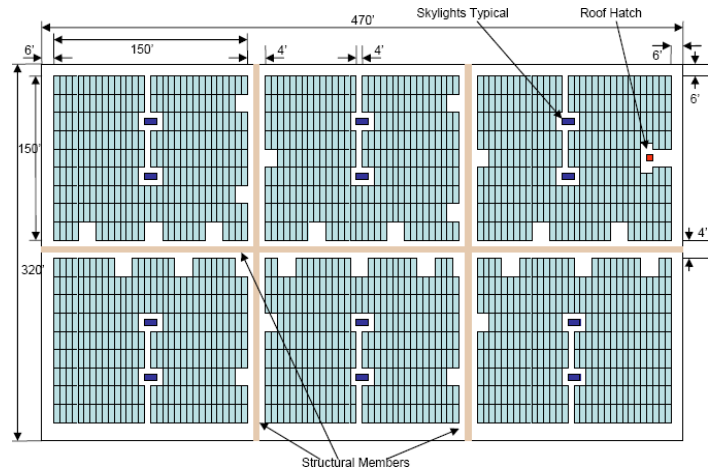
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Typical Nonresidential roof access greater than 250 feet (Figure 1)



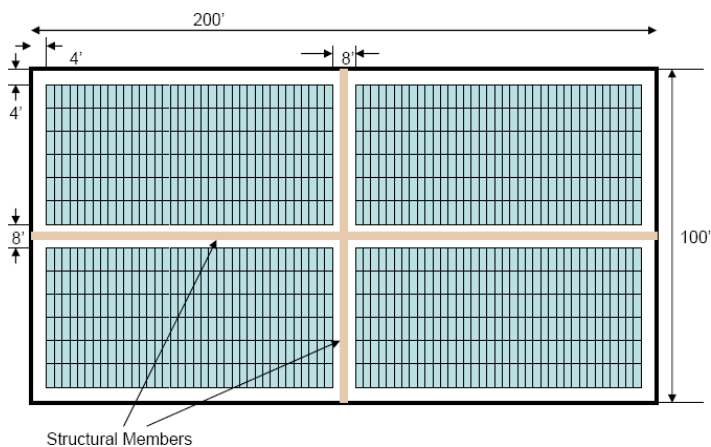
Nonresidential building with either axis greater than 250 feet, minimum perimeter pathway of 6 feet. Interior pathway not less than 8 feet, arrays of 150 feet maximum spacing with a 4-foot walkway to ventilation skylights. (not drawn to scale)

Typical Nonresidential roof access greater than 250 feet with 4 foot by 8-foot ventilation skylight space (Figure 2)



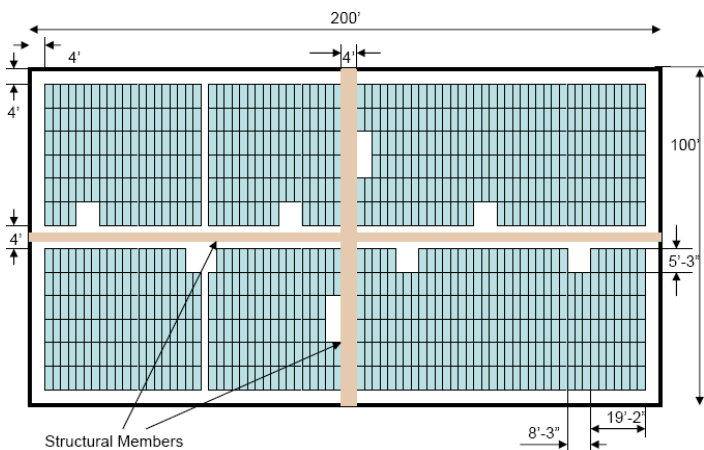
Nonresidential building with either axis greater than 250 feet, minimum perimeter pathway of 6 feet. Interior pathway not less than 8 feet, array of 150 feet maximum spacing between pathways, with a 4-foot by 8-foot walkway to ventilation space. (not drawn to scale)

Typical Nonresidential roof access less than 250 feet
(Figure 3)



Nonresidential building with either axis less than 250 feet, minimum perimeter pathway of 4 feet. Interior pathway not less than 8 feet, array of 150 feet maximum spacing between pathways. (not drawn to scale)

Typical Nonresidential roof access less than 250 feet, with 4 foot by 8-foot ventilation space (Figure 4)



Nonresidential building with either axis less than 250 feet, minimum perimeter pathway of 4 feet. Interior pathway not less than 4 feet, array of 150 feet maximum spacing between walkways with 4 foot by 8-foot ventilation space. (not drawn to scale)