

WENDELL CREEK ESTATES HOMEOWNERS ASSOCIATION,
An Illinois Not-for-Profit Corporation

ENERGY POLICY STATEMENT

WHEREAS, Section 20 of the Homeowners' Energy Policy Statement Act (765 ILCS 165/20) (hereinafter referred to as the "Act") provides, in the fourth sentence thereof, that a homeowners' association – within 120 days after receiving a request for a policy statement or an application from one of its members –

“shall adopt an energy policy statement regarding: (i) the location, design, and architectural requirements of solar energy systems; and (ii) whether a wind energy collection, rain water collection, or composting system is allowed, and, if so, the location, design, and architectural requirements of those systems.”;

WHEREAS, the Wendell Creek Estates Homeowners' Association (hereinafter referred to as the "Association") has received a request for an energy policy statement from one of its members;

WHEREAS, Section 10 of the Act (765 ILCS 165/10) contains the following definition:

“Solar energy system” means:

(1) a complete assembly, structure, or design of solar collector, or a solar storage mechanism, which uses solar energy for generating electricity or for heating or cooling gases, solids, liquids, or other materials; and

(2) the design, materials, or elements of a system and its maintenance, operation, and labor components, and the necessary components, if any, of supplemental conventional energy systems designed or constructed to interface with a solar energy system.”

WHEREAS, “a complete assembly, structure, or design of solar collector, or a solar storage mechanism, which uses solar energy for *generating electricity*” (emphasis by italics added) – as described in subparagraph (1) of the Act's definition of “solar energy systems – is generally known in the construction industry as a “**solar photovoltaic system**” or “**photovoltaic system**”;

WHEREAS, “a complete assembly, structure, or design of solar collector, or a solar storage mechanism, which uses solar energy for . . . for *heating or cooling gases, solids, liquids, or other materials*” (emphasis by italics added) – as described in subparagraph (1) of the Act's definition of “solar energy systems – is generally known in the construction industry as a “**solar thermal energy system**”;

WHEREAS, the Board of Directors of the Association finds that the best and most comprehensive standards for installing **solar photovoltaic systems** in, or for, residences such as those in the Wendell Creek Estates subdivisions are set forth in Section 324 “Solar Energy Systems” of the *2018 International Residential Code for One- and Two-Family Dwellings* published by the

International Code Council (a copy of which section is attached hereto as *Exhibit A*) and Section 1204 “Solar Photovoltaic Power Systems” of the *2018 International Fire Code* published by the International Code Council (a copy of which section is attached hereto as *Exhibit B*), including all references contained therein to other parts of the same code or to other codes published either by the International Code Council or another entity generally recognized within the construction industry as being authoritative (such as the reference to “NFPA 70” [published by the National Fire Protection Association] in Section 1204.1 of the *2018 International Fire Code*);

WHEREAS, the Board of Directors of the Association finds that the best and most comprehensive standards for installing **solar thermal energy systems** in, or for, residences such as those in the Wendell Creek Estates subdivisions are set forth in Chapter 23 “Solar Thermal Energy Systems” of the *2018 International Residential Code for One- and Two-Family Dwellings* published by the International Code Council (a copy of which section is attached hereto as *Exhibit C*) including all references contained therein to other parts of the same code or to other codes published either by the International Code Council or another entity generally recognized within the construction industry as being authoritative;

WHEREAS, the Board of Directors of the Association finds that – to establish the Association’s design and architectural requirements for installing **solar photovoltaic systems** in, or for, residences such as those in the Wendell Creek Estates subdivisions – Section 324 “Solar Energy Systems” of the *2018 International Residential Code for One- and Two-Family Dwellings* published by the International Code Council (a copy of which section is attached hereto as *Exhibit A*) and Section 1204 “Solar Photovoltaic Power Systems” of the *2018 International Fire Code* published by the International Code Council (a copy of which section is attached hereto as *Exhibit B*), including all references contained therein to other parts of the same code or to other codes published either by the International Code Council or another entity generally recognized within the construction industry as being authoritative (such as the reference to “NFPA 70” [published by the National Fire Protection Association] in Section 1204.1 of the *2018 International Fire Code*), should be incorporated by reference as part of the Association’s Energy Policy Statement;

WHEREAS, the Board of Directors of the Association finds that – to establish the Association’s design and architectural requirements for installing **solar thermal energy systems** in, or for, residences such as those in the Wendell Creek Estates subdivisions – Chapter 23 “Solar Thermal Energy Systems” of the *2018 International Residential Code for One- and Two-Family Dwellings* published by the International Code Council (a copy of which section is attached hereto as *Exhibit C*) including all references contained therein to other parts of the same code or to other codes published either by the International Code Council or another entity generally recognized within the construction industry as being authoritative, should be incorporated by reference as part of the Association’s Energy Policy Statement;

WHEREAS, the Board of Directors of the Association finds that all rooftop-mounted solar photovoltaic systems (which shall be deemed to include photovoltaic systems installed on the roof or on the walls of any building) should be of the rapid shutdown type that shuts down *both* the

array and the conductors leaving the array (rather than shutting down only the conductors leaving the array) described in Sections 1204.5, 1204.5.1, 1204.5.1.1, 1204.5.1.2, 1204.5.2, and 1204.5.3, and should be designed, equipped, located, and labelled as required by those sections;

WHEREAS, the Board of Directors of the Association finds that no part of a solar photovoltaic system and that no part of a solar thermal energy system on a residence should be mounted on the front wall of the residence, the front wall being deemed to be that wall facing the adjacent street, and, in the case of a residence on a corner lot, being deemed to be both walls that face the adjacent streets, so that such a residence will have two front walls;

WHEREAS, the Board of Directors of the Association finds also that “front wall of the residence” should be deemed to include the side walls on any additional gabled part of the residence that extends from the front of the residence toward the adjacent street;

WHEREAS, the Board of Directors of the Association finds that no part of a rooftop-mounted solar photovoltaic system and that no part of a rooftop-mounted solar thermal energy system on a residence should be mounted on the front-facing part of the roof of the residence, the front-facing part of the roof being deemed to be the part of the roof facing the adjacent street, and, in the case of a residence on a corner lot, being deemed to be both parts of the roof that face the adjacent streets, so that the roof of such a residence will have two front-facing parts;

WHEREAS, the Board of Directors of the Association finds also that “front-facing part of the roof” should be deemed to include all portions (including side walls and roof) of any dormer in the front-facing part of the roof and the roof on any additional gabled part of the residence that extends from the front of the residence toward the adjacent street;

WHEREAS, the Board of Directors of the Association finds that no part of a ground-mounted solar photovoltaic system should be installed in the front yard or in a side yard of a residence;

WHEREAS, the Board of Directors of the Association finds that no ground-mounted photovoltaic system should exceed ten feet (10 ') in height;

WHEREAS, finds that – before any solar photovoltaic system or solar thermal energy system is installed on or for any residence – the following should occur: namely, (1) the owners of the residence should submit to the Architectural Control Committee of the Board of Directors of the Association an application for a permit to install a solar photovoltaic system or solar thermal energy system, which application should demonstrate that the system proposed to be installed meets all the requirements of this Energy Policy Statement and that the person or company proposed to do the installation work is experienced, competent, and reputable with respect to such installation work; (2) the Architectural Control Committee should complete its review of, and render its decision in writing on, each application, within thirty days of the owners’ submission of the application to the Architectural Control Committee; (3) the Architectural Control Committee’s

approval of the application should serve as a permit for the installation of the system in question, which permit shall expire one year after its issuance if the installation work has not been done; (4) if the Architectural Control Committee should deny the application, it shall state clearly how the system proposed by the application fails to meet the requirements of this Energy Policy Statement, and it shall give the applicant an opportunity to revise its application to remedy the defects described in the Architectural Control Committee's written decision; (5) no installation of a solar photovoltaic system or solar thermal energy system should be made without a permit from the Architectural Control Committee; (6) the Architectural Control Committee should retain one or more inspectors to inspect the installation work both while it is being done and when it has been completed; (7) the owners of the residence and the installer of the system should cooperate with the inspector to give him access to every part of the system and installation work for the purpose of making his inspection; (8) if an inspector should determine that a system is being installed in a manner substantially different from the proposed system and installation described in the application, or in violation of a requirement of this Energy Policy Statement – or if the owners or installer refuse to allow the inspector to inspect the system and installation – the inspector should issue a *notice of failed inspection* which should require the correction of the defects in the work within a reasonable time, or, if the owners or installer refused to permit an inspection, a *stop work order*; (9) if the owners of the residence or installer of the system should refuse to correct the work or should fail to correct the work within a reasonable time, the inspector should issue a *stop work order* to the owners and installer; (10) if the owners of the residence or the installer should proceed with installation work without a permit or in disregard of a *stop work order*, the Board of Directors of the Association should be able, in its discretion, to authorize the filing, in a court having jurisdiction over the matter, of an action seeking an injunction against the owners of the residence and the installer to halt the work and for other equitable relief as may be appropriate; and (11) the prevailing party in such an action should be deemed to be entitled to recover, from the losing party, the reasonable attorneys' fees, expert witnesses' fees, and court costs incurred by the prevailing party in the action;

WHEREAS, if the owners of a residence are unable to comply with a requirement of this Energy Policy Statement that concerns aesthetics (such as the location of a proposed solar photovoltaic system or proposed solar thermal energy system on a residence or within a yard) rather than safety, either because of physical impossibility or because of a substantial financial hardship that the owners would have to incur in order to comply, the owners of the residence should be allowed to include in their application to the Architectural Control Committee a request for variance which states the particular requirement of this Energy Policy Statement from which variance is sought, the nature and extent of the variance requested, and the reason for requesting the variance; the Architectural Control Committee, should be able, in its discretion, to grant such variance in a written decision that describes the variance and the reason for granting the variance;

WHEREAS, the Board of Directors of the Association finds that no wind energy collection, rain water collection, or composting system should be allowed in any of the Wendell Creek Estates subdivisions;

WHEREAS, Board of Directors of the Association finds that one copy of the *2018 International Residential Code for One- and Two-Family Dwellings* published by the International Code Council and one copy of the *2018 International Fire Code* published by the International Code Council should be kept in the Association's office, for reference purposes *in the office only*, and that those copies should be non-circulating;

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Wendell Creek Estates Homeowners' Association, as follows:

Section 1. The foregoing recitals are incorporated herein as findings of the Wendell Creek Estates Homeowners' Association.

Section 2. To establish the Association's design and architectural requirements for installing **solar photovoltaic systems** in, or for, residences such as those in the Wendell Creek Estates subdivisions – Section 324 “Solar Energy Systems” of the *2018 International Residential Code for One- and Two-Family Dwellings* published by the International Code Council (a copy of which section is attached hereto as *Exhibit A*) and Section 1204 “Solar Photovoltaic Power Systems” of the *2018 International Fire Code* published by the International Code Council (a copy of which section is attached hereto as *Exhibit B*), including all references contained therein to other parts of the same code or to other codes published either by the International Code Council or another entity generally recognized within the construction industry as being authoritative (such as the reference to “NFPA 70” [published by the National Fire Protection Association] in Section 1204.1 of the *2018 International Fire Code*), are hereby incorporated by reference as part of the Association's Energy Policy Statement.

Section 3. To establish the Association's design and architectural requirements for installing **solar thermal energy systems** in, or for, residences such as those in the Wendell Creek Estates subdivisions – Chapter 23 “Solar Thermal Energy Systems” of the *2018 International Residential Code for One- and Two-Family Dwellings* published by the International Code Council (a copy of which section is attached hereto as *Exhibit C*) including all references contained therein to other parts of the same code or to other codes published either by the International Code Council or another entity generally recognized within the construction industry as being authoritative, is hereby incorporated by reference as part of the Association's Energy Policy Statement.

Section 4. All rooftop-mounted solar photovoltaic systems (which shall be deemed to include solar photovoltaic systems installed on the roof or on the walls of any building) shall be of the rapid shutdown type that shuts down *both* the array and the conductors leaving the array (rather than shutting down only the conductors leaving the array) described in Sections 1204.5, 1204.5.1, 1204.5.1.1, 1204.5.1.2, 1204.5.2, and 1204.5.3, and shall be designed, equipped, located, and labelled as required by those sections.

Section 5. No part of a rooftop-mounted solar photovoltaic system on a residence shall be mounted on the front wall of the residence, the front wall being deemed to be that wall facing

the adjacent street, and, in the case of a residence on a corner lot, being deemed to be both walls that face the adjacent streets, so that such a residence will have two front walls.

Section 6. No part of a ground-mounted solar photovoltaic system should be installed in the front yard or in a side yard of a residence.

Section 7. No ground-mounted solar photovoltaic system shall exceed ten feet (10 ') in height.

Section 8. Before any solar photovoltaic system or solar thermal energy system is installed on or for any residence – the following shall occur: namely,

(1) the owners of the residence shall submit to the Architectural Control Committee of the Board of Directors of the Association an application for a permit to install a solar photovoltaic system or solar thermal energy system, which application shall demonstrate that the system proposed to be installed meets all the requirements of this Energy Policy Statement and that the person or company proposed to do the installation work is experienced, competent, and reputable with respect to such installation work;

(2) the Architectural Control Committee shall complete its review of, and render its decision in writing on, each application, within thirty days of the owners' submission of the application to the Architectural Control Committee;

(3) the Architectural Control Committee's approval of the application shall serve as a permit for the installation of the system in question, which permit shall expire one year after its issuance if the installation work has not been done;

(4) if the Architectural Control Committee denies the application, it shall state clearly how the system proposed by the application fails to meet the requirements of this Energy Policy Statement, and it shall give the applicant an opportunity to revise its application to remedy the defects described in the Architectural Control Committee's written decision;

(5) no installation of a solar photovoltaic system or solar thermal energy system shall be made without a permit from the Architectural Control Committee;

(6) the Architectural Control Committee shall retain one or more inspectors to inspect the installation work both while it is being done and when it has been completed;

(7) the owners of the residence and the installer of the system shall cooperate with the inspector to give him access to every part of the system and installation work for the purpose of making his inspection;

(8) if an inspector determines that a system is being installed in a manner substantially different from the proposed system and installation described in the application, or in violation of a requirement of this Energy Policy Statement – or if the owners or installer refuse to allow the inspector to inspect the system and installation – the inspector shall issue a *notice of failed inspection* which shall require the correction of the defects in the work within a reasonable time, or, if the owners or installer refused to permit an inspection, a *stop work order*;

(9) if the owners of the residence or installer of the system refuses to correct the work or fails to correct the work within a reasonable time, the inspector shall issue a *stop work order* to the owners and installer;

(10) if the owners of the residence or the installer proceed with installation work without a permit or in disregard of a *stop work order*, the Board of Directors of the Association shall be able, in its discretion, to authorize the filing, in a court having jurisdiction over the matter, of an action seeking an injunction against the owners of the residence and the installer to halt the work and for other equitable relief as may be appropriate; and

(11) the prevailing party in such an action shall be deemed to be entitled to recover, from the losing party, the reasonable attorneys' fees, expert witnesses' fees, and court costs incurred by the prevailing party in the action.

Section 9. If the owners of a residence are unable to comply with a requirement of this Energy Policy Statement that concerns aesthetics (such as the location of a proposed solar photovoltaic system or proposed solar thermal energy system on a residence or within a yard) rather than safety, either because of physical impossibility or because of a substantial financial hardship that the owners would have to incur in order to comply, the owners of the residence may include in their application to the Architectural Control Committee a request for variance which states the particular requirement of this Energy Policy Statement from which variance is sought, the nature and extent of the variance requested, and the reason for requesting the variance. The Architectural Control Committee, shall be able, in its discretion to grant such a variance in a written decision that describes the variance and the reason for granting the variance.

Section 10. No wind energy collection, rain water collection, or composting system shall be allowed in any of the Wendell Creek Estates subdivisions.

Section 11. One copy of the *2018 International Residential Code for One- and Two-Family Dwellings* published by the International Code Council and one copy of the *2018*

International Fire Code published by the International Code Council shall be kept in the Association's office, for reference purposes *in the office only*, and those copies shall be non-circulating.

Section 12. This Resolution shall be known as Resolution No. _____ and shall be effective upon its passage and approval.

Passed by the Board of Directors of Wendell Creek Estates Homeowners' Association and deposited and filed in the Office of the Wendell Creek Estates Homeowners' Association, on the _____ day of _____, 2019, the vote being taken by ayes and noes, and entered upon the legislative records as follows:

AYES: _____

NOES: _____

APPROVED:

Chairman of the Board of Directors of the
Wendell Creek Estates Homeowners' Association

ATTEST:

Secretary of the
Wendell Creek Estates Homeowners' Association

Exhibit A

Section 324 “Solar Energy Systems”
of the *2018 International Residential Code for One- and Two-Family Dwellings*
published by the International Code Council

Section 324
Solar Energy Systems

R324.1 General.

Solar energy systems shall comply with the provisions of this section.

R324.2 Solar thermal systems.

Solar thermal systems should be designed and installed in accordance with Chapter 23 and the International Fire Code.

R324.3 Photovoltaic systems.

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.

R324.3.1 Equipment listings.

Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

R324.4 Rooftop-mounted photovoltaic systems.

Rooftop mounted photovoltaic panel systems installed on or above the roof covering shall be designed and installed in accordance with this section.

R324.4.1 Structural requirements.

Rooftop-mounted photovoltaic systems shall be designed to structurally support the system and withstand applicable gravity loads in accordance with Chapter 3. 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.

R324.4.1.1 Roof load.

Portions of roof structures not covered with photovoltaic panel systems shall be designed for dead loads and roof loads in accordance with Section R301.4 and R301.6. Portions of roof structures covered with photovoltaic panel systems shall be designed for the following load cases:

1. Dead load (including photovoltaic panel weight) plus snow load in accordance with Table R301.2(1).
2. Dead load (including photovoltaic panel weight) plus roof live load or snow load, whichever is greater, in accordance with Table R301.6.

R324.4.1.2 Wind load.

Rooftop-mounted photovoltaic panel or module systems and their supports shall be designed and installed to resist the component and cladding loads specified in table R301.2(2) adjusted for height and exposure in accordance with R301.2(3).

R324.4.2 Fire classification.

Rooftop-mounted photovoltaic panel systems shall have the same fire classification as the roof assembly required in Section R902.

R324.4.3 Roof penetrations.

Roof penetrations shall be flashed and sealed in accordance with Chapter 8.

R324.5 Building-Integrated photovoltaic systems.

Building-integrated photovoltaic systems that serve as roof-coverings shall be designed and installed in accordance with Section R905

R324.5.1 Photovoltaic shingles.

Photovoltaic shingles shall comply with Section 905.16.

R324.5.2 Fire classification.

Building-integrated photovoltaic systems shall have a fire classification in accordance with Section 902.3.

R324.6 Roof access and pathways.

Roof access, pathways and setback requirements shall be provided in accordance with Sections R324.6.1 through R324.6.2.1. Access and minimum spacing shall be required to provide emergency access to the roof, to provide pathways to specific areas of the roof, provide for smoke ventilation opportunity areas, and to provide emergency egress from the roof.

Exceptions:

1. Detached, nonhabitable structures, including but not limited to detached garages, parking shade structures, carports, solar trellises and similar structures, shall not be required to provide roof access.
2. Roof access, pathways and setbacks need not be provided where the code official has determined that rooftop operations will not be employed.
3. These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (17-percent slope) or less.

R324.6.1 Pathways.

Not fewer than two pathways, on separate roof planes from lowest roof edge to ridge and not less than 36 inches (914 mm) wide, shall be provided on all buildings. 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, a pathway not less than 36 inches wide (914 mm) shall be provided from the lowest roof edge to the ridge on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and 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.

R324.6.2 Setback at ridge.

For photovoltaic arrays occupying not more than 33 percent of the plan view roof area, not less than an 18-inch (457 mm) clear setback is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, not less than a 36-inch (914 mm) cleat setback is required on both sides of a horizontal ridge.

R324.6.2.1 Alternative setback at ridge.

When an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D or Section P2904, setbacks at ridges shall comply with one of the following:

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

R324.6.2.2 Emergency escape and rescue opening.

Panels and modules installed on dwellings shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A pathway not less than 36 inches (914 mm) wide shall be provide to the emergency escape and rescue opening.

R324.7 Ground-mounted photovoltaic systems.

Ground-mounted photovoltaic systems shall be designed and installed in accordance with Section R301.

R324.7.1 Fire separation distances.

Ground-mounted photovoltaic systems shall be subject to the fire separation distance requirements determined by the local jurisdiction.

Exhibit B

Section 1204 “Solar Photovoltaic Power Systems”
of the *2018 International Fire Code*
published by the International Code Council

2018 – International Fire Code

Section 1204

Solar Photovoltaic Power Systems

1204.1 General,

Solar photovoltaic systems shall be installed in accordance with Sections 1204.2 through 1204.5 and the International Building Code or International Residential Code. The electrical portion of solar PV systems shall be installed in accordance with NFPA 70.

1204.2 Access and pathways.

Roof access, pathways, and spacing requirements shall be provided in accordance with Sections 1204.2.1 through 1204.3.3, Pathways shall be over areas 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, 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 setbacks need not be provided where the fire code official has determined that rooftop operations will not be employed.

1204.2.1 Solar photovoltaic systems for Group R-3 buildings.

Solar photovoltaic systems for Group R-3 buildings shall comply with Sections 1204.2.1.1 through 1204.2.1.3/

Exceptions:

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

1204.2.1.1 Pathways to ridge.

Not fewer than two 36-inch-wide (914 mm) pathways on separate roof planes, from lowest roof edge to ridge, shall be provided on all buildings. 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 than one 36-inch-wide (914 mm) pathway shall be provided from the lowest roof edge to the ridge on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and 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.

1204.2.1.2 Setbacks at ridge.

For photovoltaic arrays occupying 33 percent or less of the plan view 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.

1204.2.1.3 Alternative setbacks at ridge.

When an automatic sprinkler system is installed within the dwelling in accordance with Section 903.3.1.3, setbacks at the ridge shall comply with 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.
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.

1202.2.2 Emergency escape and rescue openings.

Panels and modules installed on Group R-3 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 to the emergency escape and rescue opening.

1204.3 Other than Group R-3 buildings.

Access to systems for buildings, other than those containing Group R-3 occupancies, shall be provided in accordance with Sections 1204.3.1 through 1204.3.3.

Exceptions: Where it is determined by the fire code official that the roof configuration is similar to that of a Group R-3 occupancy, the residential access and ventilation requirements in Sections 1204.2.1.1 through 1204.2.1.3 are a suitable alternative.

1204.3.1 Perimeter pathways.

There shall be a minimum 6-foot-wide (1829 mm) clear perimeter around the edges of the roof.

Exceptions: 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).

1203.3.2 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) throughout the length and width of the roof.
2. A pathway not less than 4 feet (1219 mm) wide in a straight line to roof standpipes or ventilation hatches.
3. 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.

1203.3.3 Smoke ventilation.

The solar installation shall be designed to meet the following requirements.

1. Where nongravity-operated smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) shall be provided ordering all sides.
2. Smoke ventilation options between array sections shall be one of the following:
 - 2.1 A pathway not less than 8 feet (2438 mm) wide.
 - 2.2 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.
 - 2.3 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.

1204.4 Ground-mounted photovoltaic systems.

Ground-mounted voltaic panel systems shall comply with Section 1204.1 and this section. Setback requirements shall not apply to ground-mounted free-standing photovoltaic arrays. A clear, brush-free area of 10 foot (3048 mm) shall be required for ground-mounted photovoltaic arrays.

1204.5 Buildings with rapid shutdown.

Buildings with rapid shutdown photovoltaic systems shall have permanent labels in accordance with Sections 1204.5.1 through 1204.5.3.

1204.5.1 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 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 1204.5 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 solar 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 with a minimum height of 3/8 inch (10 mm) in white on a red 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 1204.5 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

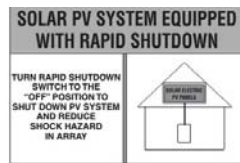


FIGURE 1204.5.1(1)

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

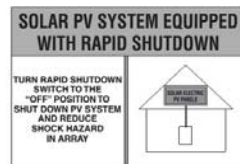


FIGURE 1204.5.1(1)

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

1204.5.1.1 Diagram.

The labels in Section 1204.5.1 shall include a single 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.

1204.5.1.2 Location.

The rapid shutdown label in Section 1204.5.1 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.

1204.5.2 Buildings with more than one rapid shutdown type.

Solar photovoltaic systems that contain rapid shutdown in accordance with both Items 1 and 2 of Section 1204 5.1 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 the areas that remain energized after the rapid shutdown switch is operated.

1204.5.3 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

Exhibit C

Chapter 23 “Solar Thermal Energy Systems”
of the *2018 International Residential Code for One- and Two-Family Dwellings*
published by the International Code Council

Chapter 23
Solar Thermal Energy Systems

User notes:

***About this chapter:** Chapter 23 is specific to thermal solar systems and equipment. Solar voltaic systems are not addressed in this chapter. This chapter covers solar collectors, system design, safety devices, relief valves, freeze protection, expansion tanks, signage, labeling, heat transfer fluids, protection of potable water and potable water hearing.*

***Code development reminder:** Code change proposals to this chapter will be considered by the IRC—Plumbing/Mechanical Code Development Committee during the 2018 (Group A) Code Development Cycle. See explanation on page iv.*

CHAPTER 23

SOLAR THERMAL ENERGY SYSTEMS

M2301.1 General.

This section provides for the design, construction, installation, alteration and repair of equipment and systems using solar thermal energy to provide space heating or cooling, hot water heating and swimming pool heating.

M2301.2 Design and installation.

The design and installation of solar thermal energy systems shall comply with Sections M2301.2.1 through M2301.2.13.

M2301.2.1 Access.

Access shall be provided to solar energy equipment for maintenance. Solar systems and appurtenances shall not obstruct or interfere with the operation of any doors, windows or other building components requiring operation or access. Roof-mounted solar thermal equipment shall not obstruct or interfere with the operation of roof-mounted equipment, appliances, chimneys, plumbing vents, roof hatches, smoke events, skylights and other roof penetrations and openings.

M2301.2.2 Collectors and panels.

The roof shall be constructed to support the loads imposed by roof-mounted solar collectors. Roof-mounted solar collectors that serve as a roof covering shall conform to the requirements for roof coverings in Chapter 9 of this code. Where mounted on or above the roof coverings, the collectors and supporting structure shall be constructed of noncombustible materials or fire-retardant-treated wood equivalent to that required for the roof construction.

M2301.2.3 Pressure and temperature relief valves and system components.

System components containing fluids shall be protected with temperature and pressure relief valves or pressure relief valves. Relief devices shall be installed in sections of the system so that a section cannot be valved off or isolated from a relief device. Direct systems and the potable water portion of indirect systems shall be equipped with a relief valve in accordance with Section P2804. For indirect systems, pressure relief valves in solar loops shall comply with ICC 900/SRCC 300. System components shall have a working pressure rating of not less than the setting of the pressure relief device.

M2301.2.4 Vacuum relief.

System components that might be subjected to a vacuum during operation or shutdown shall be designed to withstand such a vacuum or shall be protected with vacuum relief valves.

M2301.2.5 Piping insulation.

Piping shall be insulated in accordance with the requirements of Chapter 11. Exterior insulation shall be protected from ultraviolet degradation. The entire solar loop shall be insulated. Where split-style insulation is used, the seam shall be sealed. Fittings shall be fully insulated.

Exceptions:

1. Those portions of the piping that are used to help prevent the system from overheating shall not be required to be insulated.
2. Those portions of piping that are exposed to solar radiation, made of the same material as the solar collector absorber plate and are covered in the same manner as solar collector absorber, or that are used to collect additional solar energy, shall not be required to be insulated.
3. Piping in thermal solar systems using unglazed solar collectors to heat a swimming pool shall not be required to be insulated.

M2301.2.6 Protection from freezing.

System components shall be protected from damage resulting from freezing or heat-transfer liquids at the winter design temperature provided in Table R301.2(1). Freeze protection shall be provided in accordance with ICC900/SRCC 300. Drain-back systems shall be installed in compliance with Section M2301.2.6.1. Systems utilizing freeze-protection valves shall comply with Section M2301.2.6.2.

Exceptions: Where the 97.5-percent winter design temperature is greater than or equal to 48°F (9°C).

M2301.2.6.1 Drain-back systems.

Drain-back systems shall be designed and installed to allow for manual gravity draining of fluids from areas subject to freezing to locations not subject to freezing, and air filling of the components and piping. Such piping and components shall maintain a horizontal slope in the direction of flow of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope). Piping and components subject to manual gravity draining shall permit subsequent air filling upon drainage and air venting upon refilling.

M2301.2.6.2 Freeze-protection valves.

Freeze-protection valves shall discharge in a manner that does not create a hazard of structural damage.

M2301.2.7 Storage tank sensors.

Storage tank sensors shall comply with ICC 900.SRCC 300.

M2301.2.8 Expansion tanks.

Expansion tanks in solar energy systems shall be installed in accordance with Section M2003 in solar collector loops that contain pressurized heat transfer fluid. Where expansion tanks are used, the system shall be designed in accordance with ICC 900/SRCC 300 to provide an expansion tank that is sized to withstand the maximum operating pressure of the system.

Exceptions: Expansion tanks shall not be required in the collector loop of drain-back systems.

M2301.2.9 Roof and wall penetrations.

Roof and wall penetrations shall be flashed and sealed in accordance with Chapter 9 to prevent entry of water, rodents and insects.

M2301.2.10 Description and warning labels.

Solar thermal systems shall comply with description label and warning label requirements of Section M2301.2.11.2 and ICC 900/SRCC 300.

M2301.2.11 Solar loop.

Solar loops shall be in accordance with Sections M2301.2.11.1 and M2301.2.11.2.

M2301.11.1 Solar loop isolation.

Valves shall be installed to allow the solar loop to be isolated from the remainder of the system.

M2301.11.2 Drain and fill valves and caps.

Drain and fill valves shall be labeled with a description and warning that identifies the fluid in the solar loop and a warning that the fluid might be discharged at high temperature and pressure. Drain caps shall be installed at drain and fill valves.

M2301.2.12 Maximum temperature limitation.

Systems shall be equipped with means to limit the maximum water temperature of the system fluid entering or exchanging heat with any pressurized vessel inside the dwelling to 180°F (82°C). This protection is in addition to the required temperature and pressure relief valves required by Section M2301.2.3.

M2301.2.13 Thermal storage unit seismic bracing.

In Seismic Design Categories D₀, D₁ and D₂ and in townhouses in Seismic Design Category C, thermal storage units shall be anchored in accordance with Section M1307.2.

M2301.3 Labeling

Labeling shall comply with Sections M2301.3.1 and M2301.3.2.

M2301.3.1 Collectors and panels.

Solar thermal collectors and panels shall be listed and labeled in accordance with ICC 901/SRCC 100. Factory-built collectors shall bear a label indicating the manufacturer's name, model number and serial number.

M2301.3.2 Thermal storage units.

Pressurized water storage tanks shall bear a label indicating the manufacturer's name and address, model number, serial number, storage unit maximum and maximum allowable operating temperatures and storage unit maximum and minimum allowable operating pressures. The label shall clarify that these specifications apply only to water storage tanks.

M2301.4 Heat transfer gases or liquids and heat exchangers.

Essentially toxic transfer fluids, ethylene glycol, flammable gases and flammable liquids shall not be used as heat transfer fluids. Heat transfer gases and liquids shall be rated to withstand the system's maximum design temperature under operating conditions without degradation. Heat exchangers used in solar thermal systems shall comply with Section P2902.5.2 and ICC 900/SRCC 300.

Heat transfer fluids shall be in accordance with SRCC 300. The flash point of the heat transfer fluids utilized in solar thermal systems shall not be less than 50° (28°C) above the design maximum nonoperating or no-flow temperature attained by the fluid in the collector.

M2301.6 Filtering.

Air provided to occupied spaces that passes through thermal mass storage systems by mechanical means shall be filtered for particulates at the outlet of the thermal mass storage system.

M2301.7 Solar thermal systems for heating potable water.

Where a solar thermal system heats potable water to supply a potable hot water heater distribution system, the solar thermal system shall be in accordance with sections M2301.7.1, M2301.7.2, and P2902.5.5.

M2301.7.1 Indirect systems.

Heat exchangers that are components of indirect solar thermal heating systems shall comply with Section P2902.5.2.

M2301.7.2 Direct systems.

Where potable water is directly heated by a solar thermal system, the pipe, fittings, valves, and other components that are in contact with the potable water supply in the solar heating system shall comply with the requirements of Chapter 29.