



Window Installation and Flashing

June 2021

7th EDITION (2020) FLORIDA BUILDING CODE, RESIDENTIAL

OVERVIEW

This document identifies key installation and flashing requirements for windows in the 7th Edition (2020) Florida Building Code, Residential (FBCR) and provides guidance on best practices to minimize water infiltration as part of a weather-resistant exterior wall envelope. In general, windows are required to be installed in accordance with the manufacturer's installation instruction. While the specific flashing requirements may differ among manufacturers, the recommendations and methods in this fact sheet will apply to most situations.

This Fact Sheet is not intended to address all installation techniques or address all the details for a specific method. It is intended however, to point out specific methods and techniques that are critical to the performance of the window.

The installation and flashing requirements for doors and other fenestration products are included in the code but are not addressed in this document.

Typical Installation and Flashing Methods

Windows are typically installed and flashed using a barrier system or a drainage system.

Barrier system – A barrier system comprises a full perimeter seal at the exterior seal between the window and the wall cavity. The barrier system is intended to prevent any water infiltration at the interface of the window and wall cavity.

Drainage system – A drainage system comprises a discontinuous seal at the exterior sill interface. With a drainage system, water that does infiltrate the interface of the window and wall cavity is redirected with flashing to the sill pan to drain to the exterior.

Topics covered in this document include:

- Installation and flashing requirements for windows in the FBCR (Sections R609.1 and R703.4).
- Exterior window opening flashing options in the FBCR.
- Installation standards referenced in the FBCR.
- Best practices and tips for window installation and water management.
- Maintenance tips to ensure continued performance.

FLASHING AND SEALANTS

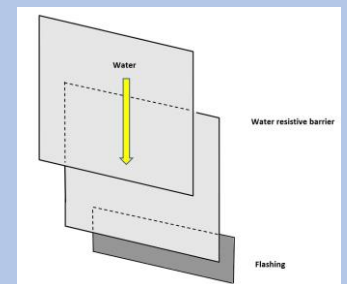
Proper flashing and sealing of windows are integral to preventing water infiltration due to wind driven rain.

The primary function of flashing is to prevent the entry of water into a building from a joint or opening. Flashing is required to be applied in shingle like fashion to direct water down and out of a structure.

In addition, flashing must extend to the surface of the exterior wall or to the water-resistant barrier for subsequent drainage. Section R609.1 of the FBCR requires windows and doors to be flashed in accordance with the fenestration manufacturer's written installation

Shingle Fashion

Applying flashing in a "shingle fashion" refers to way of layering materials such that water that encounters these surfaces is directed away from the building. The top layer laps over the bottom layer to prevent water from draining behind the bottom layer.



Shingle Fashion Example

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instructions and specifically requires flashing to be in accordance with Section R703.4.

There are several types of materials for flashing that are specifically recognized by the FBCR. These include:

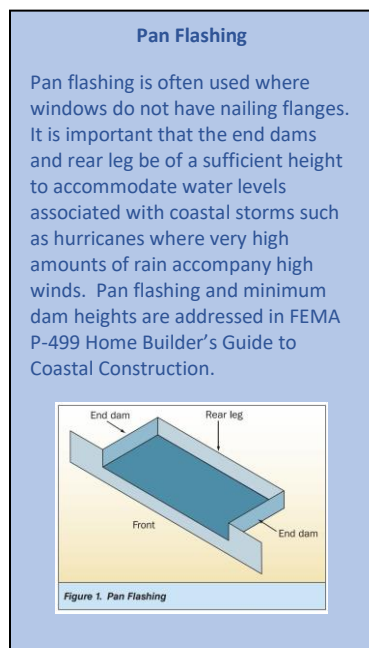
- Corrosion-resistant metal flashing
- Vinyl flashing
- Self-adhered flashing
- Mechanically attached flexible flashing
- Fluid-applied membranes

The type of flashing that is required often depends on the type of window and type of wall the window is installed in. Item 1 of Section R703.4 of the FBCR provides several options for flashing windows which include:

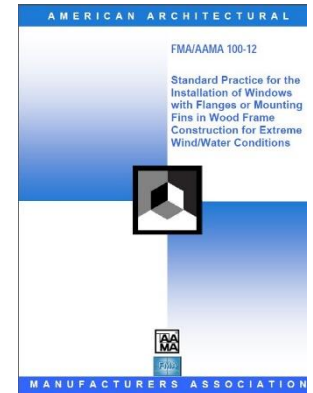
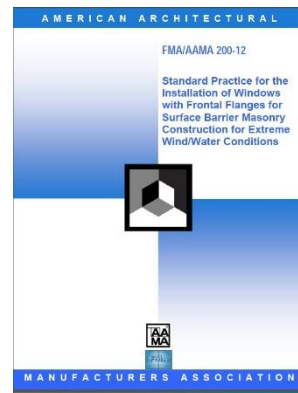
- The written installation instructions of the fenestration manufacturer.
- For applications not addressed by the fenestration manufacturers installation instructions, in accordance with the instructions of the flashing manufacturer.

- Pan flashing is required to be installed where flashing instructions or details are not provided. When pan flashing is installed, install the pan flashing as follows:

1. Pan flashing is required to be installed at the sill of exterior window openings.
2. Pan flashing must be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage.
3. Openings using pan flashing are required to incorporate flashing or protection at the head and sides.

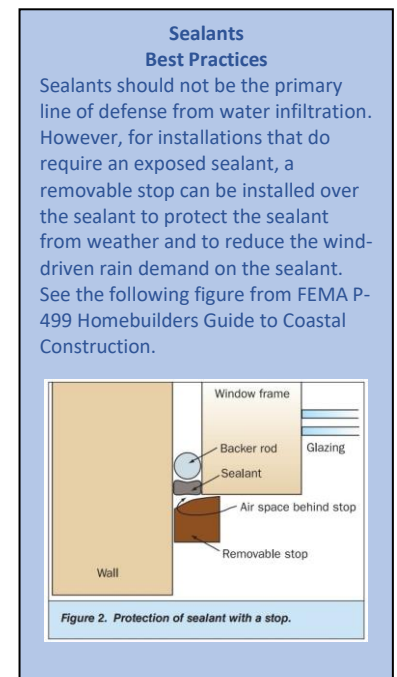


- In accordance with the flashing design or method of a registered design professional
- In accordance with other approved methods
- In accordance with:
 1. FMA/AAMA 100,
 2. FMA/AAMA 200,
 3. FMA/WDMA 250,
 4. FMA/AAMA/WDMA 300 or
 5. FMA/AAMA/WDMA 400



Section R703.4 of the FBCR requires all exterior fenestration products to be sealed at the juncture with the building wall with a sealant complying with one of the following standards:

- AAMA 800
- ASTM C290 Class 25 Grade NS or greater
- ASTM C1281
- AAMA 812
- other approved standard as appropriate for the type of sealant.



To summarize, all intersections of the window with the rough opening must be flashed and/or sealed to prevent water infiltration. While there are many methods to flash and seal a window, the following recommendations from FMA/AAMA 100 and 200 are highlighted here because they address common

window installations in Florida and were developed through industry cooperation. Additionally, these methods have been tested and shown to be effective in preventing water infiltration. The following recommendations are not complete flashing and installation instructions but do point out key flashing and installation details. Users should defer to the manufacturer's installation instructions and the FMA/AAMA documents for complete flashing and installation instructions.

Flashing and sealing for windows with frontal flanges installed in masonry or concrete.

This installation is common throughout Florida in buildings with masonry or concrete exterior walls.

1. Prior to installing a buck, protect the masonry or concrete rough opening with a liquid applied flashing to form a continuous sealed area around the complete perimeter of the rough opening.

(Note: the flashing can also be applied to the interior and exterior face around the perimeter of the opening to provide additional protection.

FEMA Hurricane Michael in Florida Recovery Advisory 2

FEMA Hurricane Michael in Florida, Recovery Advisory 2 *Best Practices for Minimizing Wind and Water Infiltration Damage* provides guidance and recommendations for reducing wind and water infiltration damage to glazed openings and doors for new and existing residential buildings.

2. Apply liquid applied flashing or a sealant to all buck surfaces that will be in contact with the rough opening.
3. After the bucks have been attached, apply a fillet bead of sealant at the buck joints and the intersection between the buck and the rough opening.
4. Apply a self-adhered membrane or liquid applied flashing to all exposed surfaces of the buck.
5. Apply a 3/8-inch diameter bead of sealant to the window flanges.
6. Install fasteners as required by the manufacturer and the Product Approval.

Figure A2 from FMA/AAMA 200 provides a good summary of these recommendations. While the drainage seal method is permitted in FMA/AAMA 200, the barrier sill method is recommended in Florida due to wind driven rain levels associated with hurricanes.

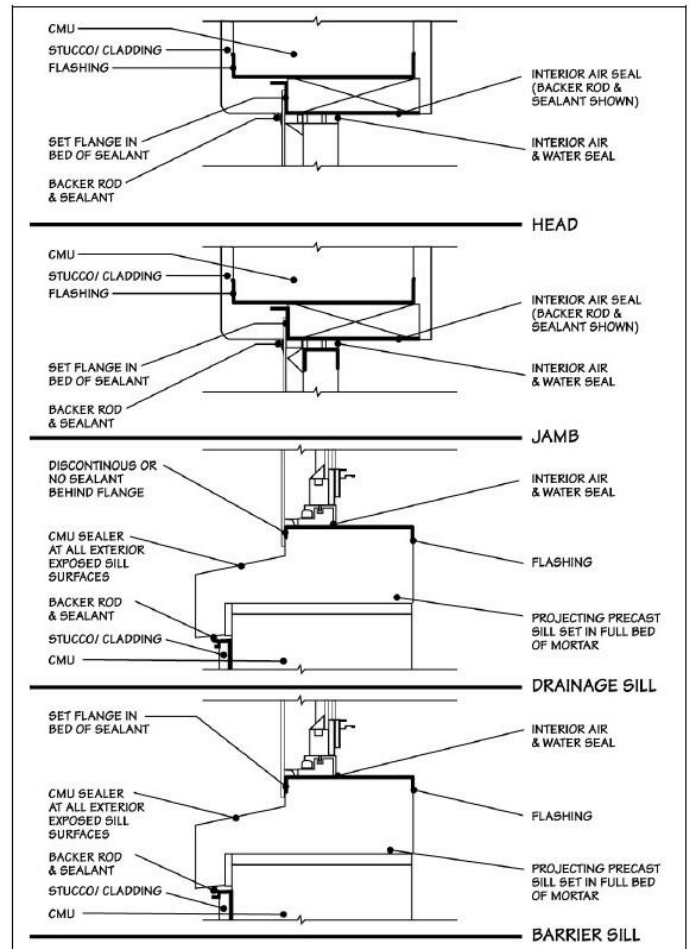


FIGURE A2: Representative Window Installation Details
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Flashing for Wood Clad Windows in a Masonry or Concrete Wall

Wood clad windows in masonry or concrete wall are typically installed using the barrier flashing method. They are installed with buck that is typically recessed within the masonry or concrete wall opening. The masonry or concrete rough opening and the buck should be sealed as described by FMA/AAMA 200 and this Fact Sheet. A backer rod is installed between the buck and window. A continuous bead of sealant complying with Section R703.4 of the FBCR is then applied between the buck and window to create a water-resistant seal.

Flashing and sealing for windows with flanges or mounting fins in wood frame construction

For this type of installation, it is important to integrate the flashing with the water-resistive barrier.

1. Install the water-resistive barrier (WRB) prior to installing the window.
2. Seal the WRB to the wall sheathing at the rough opening. The WRB is required be installed per WRB manufacturer's instructions and that penetrations through the WRB shall also be in accordance with the WRB manufacturer's instructions.

(Note: FMA/AAMA 100 provides details and figures for 3 acceptable methods to seal the WRB to the wall sheathing at the rough opening. One such method from FMA/AAMA 100 is shown below.)

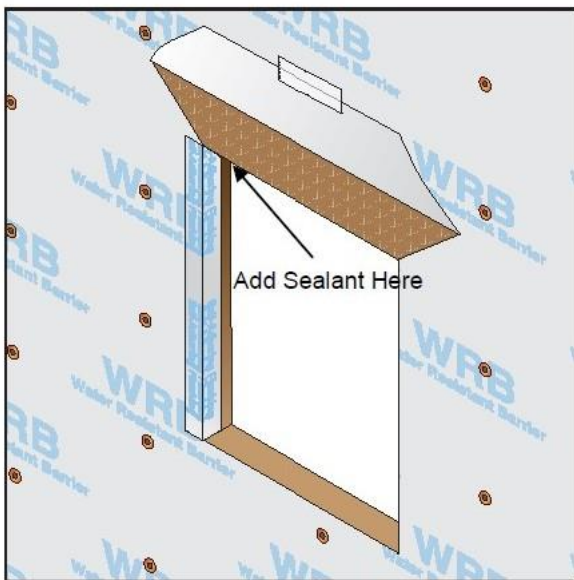
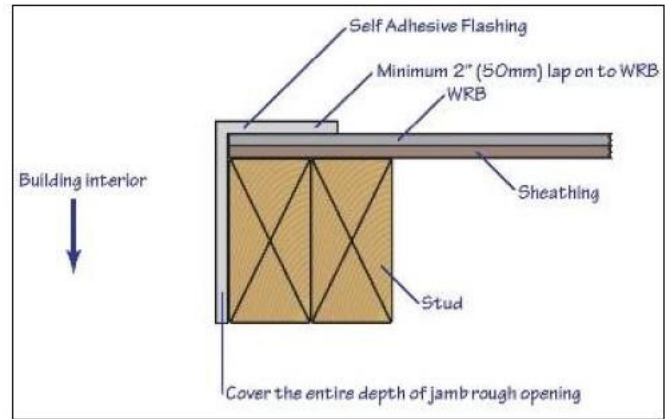


FIGURE 2

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Schematic 1 (Top View)

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3. Install sill pan flashing. If a self-adhering membrane is used, ensure that end dams are minimum 6 inches.

(Note: For additional protection from water infiltration, apply a 4-inch-wide strip of self-adhered flashing complying with AAMA 711 on the face and sides of the jamb overlapping the sill flashing by 2 inches.

4. Apply a 3/8-inch diameter bead of sealant to the window mounting fins.
5. Install the window and fasten as required by the manufacturer and the Product Approval.
6. Install flashing over the mounting flanges at both jambs in accordance with the manufacturer's instructions. If self-adhered flashing is used, it should be minimum 4 inches in width and comply with AAMA 711.
7. Install flashing at the head of the window in accordance with the manufacturer's instructions. If self-adhered flashing is used, it should be minimum 4 inches in width, overlap and extend 2 inches beyond the jamb flashing, and comply with AAMA 711.

ANCHORAGE

While the FBCR does specify minimum anchorage requirements in Section R609.7, it primarily refers to manufacturer's installation instructions. Detailed information about window and door installation is also provided in the American Society for Testing and

Materials (ASTM) standard ASTM E 2112 (*Standard Practice for Installation of Exterior Windows, Doors and Skylights*), a comprehensive installation guide.

The most important consideration is that windows be installed with the type and number of fasteners required by the manufacturer. Windows are required to be tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 or TAS 202 for a design wind pressure rating (DP rating). Proper anchorage is critical to the wind performance of the window.

Installation and Florida Product Approval Requirements

The Florida Product Approval System, established by Rule 61G20-3 of the Florida Administrative Code, applies to products that comprise the building envelope and the structural frame for compliance with the structural requirements in the code. The purpose of Florida Product Approval System is to ensure that safe products and technologies are used in building construction that meets the structural requirements in the FBC. Windows are specifically referenced in the rule as requiring product approval. A company may have its products approved for local or state use. Click on “Product Approval” at www.floridabuilding.org for more information.

It is particularly important that windows be installed specifically in accordance with their Product Approval. These products have been tested for wind loads and water infiltration and are required to be installed as indicated in the Product Approval to provide the expected performance against wind and water.

BEST PRACTICES

- Always follow the water management principles described in this fact sheet, the manufacturer’s recommendations, of the FMA standards.
 - Flashing
 - Sealing
- Always make sure windows are plumb, level, and square after shimming, fastening and sealing.
- Never skip the shimming process required by the manufacturer’s instructions and the Product Approval.
- Always use the recommended type, number, and spacing of fasteners required by the

manufacturer’s instructions and the Product Approval.

- The use of an impact resistant covering such as a hurricane shutter can limit the amount of wind driven rain impacting a window during a hurricane and decrease the possibility of water infiltration.

MAINTENANCE TIPS

- Sealant joints are maintainable joints and must be periodically checked for proper performance. If the sealant is cracked or damaged or if there is a gap between the window frame and the building, replace the entire joint with a sealant complying with the standards specified in Section R703.4 of the FBCR.
- Check to make sure all windows close tightly and firmly latch.
- Regularly wipe tracks and sills with a damp cloth or use a vacuum to remove dirt and debris.
- Inspect and clean the weatherstrip with a damp cloth or a mixture of mild soap and water. Rinse and dry the weatherstrip thoroughly. If the weatherstrip is damaged, replace it to ensure a proper seal.
- Routinely inspect and clean water drainage openings (weep systems) to maintain proper drainage.

REPLACEMENT WINDOWS

For replacement applications, the flashing application often differs considerably from new construction. Typically, the primary seal is a backer rod and sealant joint. Replacement windows are often installed directly into the CMU block. For clad wood windows, the nail fin/flange is removed, the CMU opening is sealed with a roll-on sealant and the unit is installed with fasteners through the frame or a jamb clip. For a wood clad window, the window frame should be wrapped with a self-adhered membrane to protect the wood frame from moisture penetration. A backer rod and sealant are used on the exterior for the primary water proofing. The sealant should be protected with a removable stop.

While the methods described are for typical installation of replacement windows, it’s important to install flashing

and to apply sealants as required by the manufacturer's installation instructions and the Product Approval.

RESOURCES

Florida Building Code, www.floridabuilding.org

International Code Council, www.iccsafe.org

Insurance Institute for Business and Home Safety,
www.ibhs.org

FEMA Hurricane Michael in Florida Recovery Advisory 2,
*Best Practices for Minimizing Wind and Water Infiltration
Damage*, www.fema.gov

FEMA P-499, *Home Builder's Guide to Coastal
Construction*, www.fema.gov

Fenestration Manufacturers Association
www.fenestrationonline.org

Fenestration & Glazing Industry Alliance
www.fgiaonline.org

Window and Door Manufacturers Association,
www.wdma.com

Don't know where to go for an answer to a specific question?

Contact: Florida Building Commission 850-487-1824
www.floridabuilding.org

Contact: Building A Safer Florida, Inc. 850-222-2772
www.buildingasaferflorida.org