Standard Practice for Installation of Windows with a Mounting Flange in Wood—Frame Construction Using Exterior for Low Wind/Water Exposure Barrier Methods
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0.0 INTRODUCTION

This practice addresses the recommended methods and/or sequences used to apply/modify the water-resistive barrier (WRB) or other flashing and sealing materials to the open-framed opening. For sheathed wall installations refer to ASTM E2112, "Standard Practice for Installation of Exterior Windows, Doors and Skylights." For a drainage method solution refer to FMA/AAMA 100.

The techniques demonstrated in this standard practice have been developed specifically to establish an air and moisture barrier at the exterior interface to incidental liquid water penetration at the external interface between the window and rough opening. Any water intrusion, whether through the external interface between the window and rough opening, the window joinery, or the installation joints around the perimeter of the window will not have a means to exit to the building exterior. As a result,

**NOTE 1:** For purposes of this standard practice, an air and moisture barrier refers to window installation and not the wall construction.

This standard is recommended for buildings/installations considered at low risk of water intrusion (e.g., southwestern U.S.). The user is responsible for determining the appropriateness of this standard practice for their installation.

The drawings included in this document all illustrate open stud construction however this standard practice shall be permitted in cases where sheathing, wire, etc. provide necessary backing for the flashing.

1.0 SCOPE

1.1 This practice covers the installation of windows in new construction, detached one- and two-family dwellings and townhouses not more than three stories above-grade in height with a separate means of egress. It does not cover retrofit/replacement.

1.2 This practice applies only to windows with a mounting flange where the flange is employed for securing the window into a vertical stud frame wall.

1.3 This practice covers the installation process from pre-installation procedures through post-installation procedures. It does not cover the fabrication or assembly of units windows whether such fabrication takes place in a factory or at the intended installation site.

1.4 This practice covers aspects of installation relating to installation effectiveness and reasonable durability in service. It does not cover aspects of installation relating to window handling and storage or the safety of the person installing the units windows.
1.5 This practice provides minimum requirements that will help to ensure the installation of windows in an effective manner. Actual conditions in buildings vary greatly, and in some cases substantial additional care and precaution will have to be taken.

1.6 This practice does not purport to address all of the safety-security issues associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1.7 This practice is not intended to replace a manufacturer’s installation instructions or federal, state, or local building codes. In all cases follow manufacturer’s instructions and applicable building codes for any special procedures, applications, or requirements. In the event of any conflict between this practice and the manufacturer’s installation instructions, the manufacturer’s installation instructions shall prevail.

1.8 Complex installation and flashing details such as installations in recessed openings are not covered by this standard and are the responsibility of the engineer or architect for the project. Installation and flashing details that do not fall under this standard are the responsibility of the engineer or architect of the project.

EXAMPLE: This practice does not address window installation into recessed openings.

1.9 This practice may not apply to windows whose mounting flange has been damaged — bent, cracked, cut, modified, or removed. If such damage or modification has occurred, consult the manufacturer for repair or special installation instructions.

1.10 Terminology

In this specification, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the specification; “shall be permitted to be” is used to express an option or that which is permissible within the limits of the specification; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express possibility or capability. Notes accompanying sections do not include requirements or alternative requirements; the purpose of a note accompanying a section is to separate explanatory or informative material from the text. Notes to tables and figures are considered part of the table or figure and shall be permitted to be written as requirements.

Section 0.0 and any Notes not attached to figures and tables are non-mandatory.

1.110 The primary units of measure in this document are Inch-Pound (IP) metric. The values stated in SI/ IP units are to be regarded as the standard. The values given in parentheses are for reference only.

1.12 This document was developed in an open and consensus process and is maintained by representative members of AAMA FGIA as advisory information.
2.0 SIGNIFICANCE AND USE

2.1 This practice recognizes that the effectiveness and durability of installed windows depends not only on the choice and quality of materials, design, adequacy of assembly, and support system, but also on their proper installation.

2.2 Improper installation of windows may reduce their effectiveness, lead to excessive air, water and sound leakage, condensation, and may promote the deterioration of wall constructions, windows and their respective finishes.

2.3 The application of this practice also requires a working knowledge of applicable Federal, State, and local codes and regulations regarding windows, specifically, but not limited to:

a) a required means of egress or rescue;
b) requirements for safety glazing; and
c) minimum grades of water-resistive barrier WRB materials.

Consult with Refer to local building codes prior to installation.

2.4 The application of this practice also requires a working knowledge of the tools, equipment, and methods necessary for the installation of windows. It further assumes familiarity with caulking and joint sealing and with glass handling procedures, painting where applicable, and an understanding of the fundamentals of residential construction that affect the installation of windows.

2.5 Finish and Sealant Protection

2.5.1 Caution shall be used to avoid damage to windows during and after installation. Prior to installation, store windows in a near vertical position in a clean area, free of circulating dirt or debris and protected from exposure to direct sunlight and other weather elements.

2.5.2 Field-applied protective coatings may damage window sealants and gaskets and may not be recommended. Contact the window manufacturer before applying any such coatings.

2.5.3 Windows installed in walls that are sheathed with weather resistive cladding without an underlying water resistive barrier WRB shall be sealed so as to perform in a surface barrier application.

2.6 This standard practice recognizes that the coordination of trades and proper sequencing are essential for effective installation.

3.0 REFERENCED DOCUMENTS
References to the standards listed below shall be to the edition indicated. Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

### 23.1 American Architectural Manufacturers Association (AAMA)

- AAMA 711-07**13**, Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products
- AAMA 712-14, Voluntary Specification for Mechanically Attached Flexible Flashing
- AAMA 713-08, Voluntary Test Method to Determine Chemical Compatibility of Sealants and Self-Adhered Flexible Flashings
- AAMA 714-19, Voluntary Specification for Liquid Applied Flashing Used to Create a Water-Resistant Seal around Exterior Wall Openings in Buildings
- AAMA 800-40**16**, Voluntary Specifications and Test Methods for Sealants
- AG-13, AAMA Glossary
- AAMA TIR-A9-**91**14, Design Guide for Metal Cladding Fasteners

### 23.2 ASTM International (ASTM)

- ASTM E2112-19b, Standard Practice for Installation of Exterior Windows, Doors and Skylights

### 34.0 DEFINITIONS

Please refer to the most current AAMA Glossary for all definitions.
3.1 FLASHING: Flexible sheet materials with water resistive properties that are used to bridge the joint (gap) between exterior wall penetrations such as window and door framing members and adjacent water-resistive barriers or sealed drainage plane material. The purpose of flashing is to drain water away from the exterior wall penetration and help prevent intrusion of water into the wall assembly.

3.1.1 MECHANICALLY-ATTACHED FLASHING: Flexible sheet materials which depend upon mechanical fasteners for permanent attachment.

3.1.2 SELF ADHERING FLASHING: Flexible sheet materials coated completely, or partially, on at least one side with an adhesive material and which do not depend on mechanical fasteners for permanent attachment.

3.2 GALVANIC CORROSION: A form of deterioration of metal resulting from the electrochemical reaction that occurs when certain dissimilar metals are in contact in the presence of moisture.

3.3 MOUNTING FLANGE: A fin projecting from the window frame parallel to the plane of the wall, also known as a nailing fin, for the purpose of securing the frame to the structure.

3.4 OPEN STUD FRAMING: A building framing system comprised of unsheathed structural components (studs, headers, sills, plates, etc.) and areas of shear wall framing.

3.5 RESIDENTIAL BUILDING: Any building used or intended primarily for a single or multiple family dwelling.

3.6 SEALANT: Any of a variety of compounds used to fill and seal joints or openings in wood, metal, masonry, and other materials, as contrasted to a sealer, which is a liquid used to seal a porous surface.

 NOTE 1: Some common types of sealants are: polysulfide rubber, silicone, acrylic latex, butyl rubber and polyurethane.

3.7 SHIM: A thin, flat or wedge shaped piece of suitable material used to level or plumb a window frame during installation.

3.8 WATER-RESISTIVE BARRIER: The surface or surfaces of a wall responsible for preventing water infiltration into the building interior.

4.0 SIGNIFICANCE AND USE

4.1 This practice recognizes that the effectiveness and durability of installed units windows depend not only on the choice and quality of materials, design, adequacy of assembly, and support system, but also on their proper installation.

4.2 Improper installation of units windows may reduce their effectiveness, lead to excessive air, water and sound leakage, condensation, and may promote the deterioration of wall constructions, windows and their respective finishes.
4.3 The application of this practice also requires a working knowledge of applicable Federal, State, and local codes and regulations regarding windows, specifically, but not limited to:

a) a required means of egress or rescue;
b) requirements for safety glazing; and
c) minimum grades of water-resistive barrier materials.

Consult with local building codes prior to installation.

4.4 The application of this practice also requires a working knowledge of the tools, equipment, and methods necessary for the installation of windows. It further assumes familiarity with caulking and sealing and with glass handling procedures, painting where applicable, and an understanding of the fundamentals of residential construction that affect the installation of windows, these units.

4.5 FINISH AND SEALANT PROTECTION

4.5.1 Caution shall be used to avoid damage to windows during and after installation. Prior to installation, store windows in a near vertical position in a clean area, free of circulating dirt or debris and protected from exposure to direct sunlight and other weather elements.

4.5.2 Field-applied protective coatings may damage window sealants and gaskets and may not be recommended. Contact the window manufacturer before applying any such coatings.

4.6 This standard practice recognizes that the coordination of trades and proper sequencing are essential for effective installation.

5.0 PROCEDURE

5.1 Framing Requirements

The rough framed opening to receive the window shall be sufficiently larger in width and height than the actual frame dimensions of the window. To assure adequate clearance, the framer shall follow the manufacturer’s literature for the recommended rough opening dimensions. Per ASTM E2112, the framing members comprising the rough opening shall be within 6 mm (1/4 in) of plumb, level, square and true prior to the installation of the window (see Figure 1). Manufacturer’s installation instructions may supersede these tolerance ranges. The studs and sheathing shall be free of voids, holes, chipping, twisting, or other conditions that will not allow the sealant to maintain continuous contact (see Figure 1).
Backing is Required for all Window Flashing Systems

Fig. 1A
Open StudWall With 18 Ga. Wire Backing

Fig. 1B
Open StudWall 3/4" Backing Set Flush with Framing

Fig. 1C
Sheathed Wall Provides Backing

Rough Framed Openings Sufficiently Larger in Width and Height than actual Window Frame Dimensions to Assure Adequate Clearance. Consult Manufacturer's Literature for Proper Rough Opening Dimensions. All Framing is Plumb, Level and Square.

Backinsg Is Required for All Window Flashing Systems

OPEN STUDWALL WITH 18 GA. WIRE BACKING

OPEN STUDWALL SOLID BACKING WITH SAF

SHEATHED WALL PROVIDES BACKING

ROUGH FRAMED OPENINGS SUFFICIENTLY LARGER IN WIDTH AND HEIGHT THAN ACTUAL FRAME DIMENSIONS TO ASSURE ADEQUATE CLEARANCE. CONSULT MANUFACTURER'S LITERATURE FOR PROPER ROUGH OPENING DIMENSIONS. ALL FRAMING IS LEVEL AND SQUARE.

FIGURE 1: Rough Window Opening and Support
**FIGURE 1: Rough Window Opening**

Flashing material used on an open stud wall requires the openings between the framing members to be filled or covered with a material sufficient to support the flashing material. If self-adhered flashing material is used the wall framing needs to be covered by backing support (as shown in Figure 1A) before the flashing can be applied. The flashing material will be applied onto the backing support (see Figure 1A) and the window will be mounted with the nailing fin mounting flange flush against the applied backing support. The backing support must be applied before the building wrap.
5.2 Compatibility

All materials such as, but not limited to, coatings, flashings and sealants that come into contact with each other shall exhibit chemical compatibility for the intended purpose (see AAMA 713).

5.3 Corrosion Resistance

5.3.1 Metal products shall be isolated from dissimilar or corrosive materials with a nonconductive coating or sealant material.

5.3.2 All fasteners shall be corrosive resistant, in accordance with ASTM B456, B633, or B766 as indicated in AAMA TIR-A9.

5.4 Flashing Requirements

Proper flashing and/or sealing is necessary as a barrier to prevent water from infiltrating into the building. Flashing and/or an appropriate method of sealing shall be designed as a part of an overall water-resistive barrier WRB system.
NOTE 224: The general contractor, or his [*their* designated agent], should ensure that the flashing material is protected from damage by weather, other trades, or vandalism. The general contractor, or [*his* *their* designated agent], should also ensure that the flashing system [*be* *is* properly integrated into the water-resistive barrier [*WRB*] for the entire building.

5.4.1 Flashing material shall carry continuous manufacturer identification.

5.4.2 **Mechanically attached flashing material shall meet the requirements of AAMA 712.** When mechanically attached flashing is used, a roll width dimension of not less than 230 mm (9 in) shall be required. Mechanically attached flashing material shall provide twenty-four (24) hour minimum protection from water penetration when tested in accordance with ASTM D779.

5.4.3 Self adhering flashing shall meet the performance requirements of AAMA 711. *They are used to bridge the joint (gap) between fenestration framing members and the adjacent water-resistive barriers.*

5.4.4 Fluid applied flashing shall meet the requirements of AAMA 714.

5.5 Joints and Anchorages

Joints and anchorages between the building envelope (WRB assembly) and fenestration product shall be designed to accommodate differential thermal expansion and contraction, as well as the structural requirements within the window/wall assembly.

5.6 Sealant Requirements

5.6.1 Sealing/[*caulking*] required between the window and the flashing can be accomplished with sealant material conforming to AAMA 808.3 within AAMA 800. Use sealant recommended and approved by the sealant/flashing manufacturer. To ensure compatibility, follow the sealant manufacturer’s printed application procedures and precautions. *ASTM E2112 gives guidance on sealant selection and application.*

5.6.2 Where sealant is required in this standard, an application of a nominal 10 mm (3/8 in) diameter sealant bead or an equivalent butyl mastic sealant tape as recommended by the sealant manufacturer is intended.

**5.6.3 NOTE 3:** Where wet sealant is used, *the installer shall look for the sealant to a small amount of “squeeze out” is favorable to indicate or appear along the edge of the flange/flashing to assure a continuous seal. Any “squeeze out” shall should be promptly troweled smooth.*

5.6.4 Install the window immediately after sealant application, before a skin forms or contamination occurs on the sealant surface.

5.7 Flashing and Sealant Application
5.7.1 One of the two following methods shall be selected as the application to be followed. Once a method is selected, all procedures of that method shall be performed in the described sequence. Substitution of a procedure from one method to the other is not permitted. Mounting Flange windows are installed, sealed and flashed in accordance with one of two methods, Method A and Method B.

Both methods start at the rough sill, where the sill flashing is fitted flush to the bottom of the opening and extends past the opening a distance equal to the width of the flashing. (see Figure 2). The lengths of all the pieces of flashing can be calculated using Table 1. In some open stud applications the sill and head flashings may have to be extended to reach the first stud beyond the opening in order to be properly supported.

<table>
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<tr>
<td>Sill Flashing</td>
<td>( RO_W + (2 \times \text{Flashing Width}) )</td>
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<tr>
<td>Jamb Flashing</td>
<td>( RO_H + (2 \times \text{Flashing Width}) - 1&quot; )</td>
</tr>
<tr>
<td>Head Flashing</td>
<td>( RO_W + (2 \times \text{Flashing Width}) + 2&quot; )</td>
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**Legend**
- \( RO \) = Rough Opening
- \( RO_H \) = Rough Opening Vertical Height
- \( RO_W \) = Rough Opening Horizontal Width

Table 1 – Flashing Lengths and Cut Formulas

5.7.2 If the water-resistive barrierWRB is applied to the wall prior to the window installation, the water-resistive barrierWRB may need to be modified. See Appendix A for recommended water-resistive barrierWRB modification.

5.7.3 Method A and Method B differ only with regard to the placement and sealing of the jamb (side) flashings. In Method A, the jamb flashings are applied “after” the window is installed within the opening. In Method B, the jamb flashings are applied “before” the window is installed within the opening. (flashing over the face of the mounting flange) (Jamb flashing is applied “After” the window is installed)

5.7.3.1 A strip of approved mechanically-attached or self-adhered flashing material shall be applied in a weatherboard fashion around the full perimeter of the opening according to the following procedures:

5.7.3.2 Apply the first strip horizontally immediately below the sill, cut it sufficiently long to extend past each side of the window, so that it projects even with the vertical jamb flashing to be applied later (see Figure 2).

**NOTE X:** If a metal pan is used, additional steps are recommended to reduce thermal conductance, such as a thermal break.
NOTE 342: Coordinate between horizontal and vertical flashing applications to ensure that no gaps remain at the transition between components. One way to do this is to cut head and sill flashings to exactly the width of the window opening plus twice the width of the jamb flashing, and then install them with precision so that the edges of the jamb flashing, which is applied later, align with the edges of the head and sill flashing. Head flashing width should be cut so that it extends beyond the outer edges of the jamb flashing by a minimum of 25 mm (1 in.) on each side. Sill flashing should be cut so that it is equal to the width of the window plus two times the width of the flashing minus one inch for proper shingling. Head flashing should be cut so that it is equal to the width of the window plus two times the width of the flashing plus two inches. In addition, free ends of mechanically-attached flashing components should be secured to prevent curling prior to installing the exterior facade. One way to do this is to extend the head and sill flashing past the next framing stud in the wall, and mechanically attach the flashings to the stud.

5.7.3.3 Installation of Sill Flashing

Fasten or adhere the top edge of the sill flashing to the framing. For mechanically attached flashing, place fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later. Fasten or adhere the top edge of the sill flashing, but do not fasten or adhere the lower edge or any flashing that extends beyond the rough sill the last 230 mm (9 in) of each end, so the water resistive barrier (WRB) applied later may be slipped up and underneath the flashing in a weatherboard fashion (see Figure 2).
5.7.3.4  Any applied (non-integral) mounting flanges shall be sealed to the window frame.

5.7.3.5  For mechanically joined window frames, apply sealant at corners the full length of the seam where mounting flanges meet and to the outside of the frame corner joints (see Figure 3A). Apply a continuous 3/8" bead of sealant to the backside (interior) of the window mounting flange around the entire perimeter of the window along the head and jambs in line with any pre-punched holes or slots in the mounting flange (see Figure 3A). The bead of sealant on the mounting flange along the sill shall have at least two gaps at least 50 mm (2 in) wide to permit drainage from the sill to the exterior or the drainage plane. The window shall then be installed in accordance with Section 5.8 Window Installation.

NOTE 753: In applications where wall sheathing is used, sheathing shall be applied prior to flashing and window installation.

NOTE X3: A continuous seal to the backside of the sill mounting flange is not recommended as it may trap water, leading to degradation of the rough opening sill framing.

5.7.3.6  For mechanically attached flashing, apply a continuous 3/8" bead of sealant to the exposed mounting flange at the top (head) and sides (jambs) of the installed window. Apply sealant in line with any pre-punched holes or slots on the mounting flange and over the heads of the fasteners. Continue jamb sealant vertically approximately
215 mm (8 1/2 in) above the top of the window. The sealant applied horizontally across the head should not extend beyond the jamb sealant (see Figure 4A).

**NOTE 6X:** For Method A installations using self-adhered flashing, sealant is not required on the exterior side of the mounting flange.

![Figure 4A: Jamb Flashing (Method “A”)](image)

**NOTE 4:** The application of sealant to the exterior surface of the mounting flange may not be necessary if using a self-adhesive type flashing over the mounting flange. Consult the flashing manufacturer.

5.7.3.6-5 Starting at each jamb, embed the jamb flashing into the sealant and fasten or adhere in place. Do not fasten or adhere the bottom 230 mm (9 in) of the jamb flashing, so the water-resistive barrier (WRB) applied later may be slipped up and underneath the flashing in a weatherboard fashion. Extend this flashing to approximately 13 mm (1/2 in) less than the bottom of the sill flashing and beyond the top of the window to approximately 13 mm (1/2 in) less than the top of the head flashing (see Figures 4A and 5).

5.7.3.6 Method B. Method B jamb flashings are applied in weatherboard fashion after the sill flashing is applied and “Before” the window is installed, as described above. If Method B is selected the bead of sealant applied to the interior side of the mounting flange will contact the face of the jamb flashings instead of the framing or sheathing.

Method B jamb flashings are fastened or adhered along each vertical edge (jamb) of the opening. For mechanically attached flashing position fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later. Extend this flashing to approximately 1/2 in less than the bottom of the sill flashing and beyond...
Do not fasten or adhere the bottom 9 in of the jamb flashing, so the water-resistive barrier WRB applied later may be slipped up and underneath the flashing in weatherboard fashion.

**METHOD "A":**
Embed bottom of the head flashing against the previously applied sealant. (Flashing goes over sealant) extend head flashing beyond each jamb flashing. Fasten or adhere in place.

**METHOD "B":**
Apply continuous seal along top (head) mounting flange. Embed bottom of head flashing against sealant (flashing goes over sealant). Extend head flashing beyond each jamb flashing. Fasten or adhere in place.

5.7.3.7 Finally, embed the flashing into the sealant over on the mounting flange at the window head. Cut this flashing sufficiently long so that it will extend approximately 25 mm (1 in) beyond each jamb flashing. Fasten or adhere flashing in place (see Figure 5).

5.7.4 Method B (flashing behind the face of the mounting flange) (Jamb flashing is applied “Before” the window is installed)
5.7.4.1 A strip of approved mechanically-attached or self-adhered flashing material shall be applied in a weatherboard fashion around the full perimeter of the opening according to the following procedures:

5.7.4.2 Apply the first strip horizontally immediately below the sill, cut it sufficiently long to extend past each side of the window, so that it projects even with the vertical jamb flashing to be applied later (see Figure 2).

**NOTE 5:** Coordinate between horizontal and vertical flashing applications to ensure that no gaps remain at the transition between components. One way to do this is to cut head and sill flashings to exactly the width of the window opening plus twice the width of the jamb flashing, and then install them with precision so that the edges of the jamb flashing, which is applied later, align with the edges of the head and sill flashing. Head flashing width should be cut so that it extends beyond the outer edges of the jamb flashing by a minimum of 25 mm (1 in.) on each side. In addition, free ends of mechanically-attached flashing components should be secured to prevent curling prior to installing the exterior facade. One way to do this is to extend the head and sill flashing past the next framing stud in the wall, and mechanically attach the sill flashing to the stud.

5.7.4.3 Fasten or adhere the top edge of the sill flashing to the framing. For mechanically attached flashing place fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later. Fasten or adhere the top edge of the sill flashing, but do not fasten or adhere the lower edge or the last 230 mm (9 in) of each end, so the water-resistive barrier applied later may be slipped up and underneath the flashing in a weatherboard fashion (see Figure 2).

5.7.4.4 Next, fasten or adhere strips of flashing along each vertical edge (jamb) of the opening. For mechanically attached flashing position fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later. Extend this flashing to approximately 13 mm (1/2 in.) less than the bottom of the sill flashing and beyond the top of the window to approximately 13 mm (1/2 in.) less than the top of the head flashing (see Figure 3B). Do not fasten or adhere the bottom 230 mm (9 in) of the jamb flashing, so the water-resistive barrier applied later may be slipped up and underneath the flashing in weatherboard fashion.
5.7.4.5 Apply a continuous seal to the backside (interior) of the mounting flange along the head and jambs near the outer edge or a continuous seal to the head and jambs perimeter of the opening at a point to assure contact with the backside (interior) of the mounting flange. Apply sealant in line with any pre-punched holes or slots on the mounting flanges (see Figure 4B). The bead of sealant on the mounting flange along the sill shall have at least two gaps at least 50 mm (2 in) wide to permit drainage from the sill to the exterior or the drainage plane. Avoid disrupting the continuous seal.

NOTE 6: Caution shall be taken to avoid disrupting the continuous seal.

NOTE X6: A continuous seal to the backside of the sill mounting flange is not recommended as it may trap water, leading to degradation of the rough opening sill framing.

5.7.4.6 For mechanically joined window frames, apply sealant at corners the full length of the seam where mounting flanges meet and the outside of the frame corner joints (see Figure 4B).
5.7.4.7 The window shall be installed in accordance with Section 5.8, Window Installation.

5.7.4.8 Next, apply a continuous seal to the exterior face of the mounting flange at the window head in line with any pre-punched holes or slots on the mounting flange and over the heads of the fasteners. Cut the head flashing sufficiently long so that it will extend approximately 25 mm (1 in) beyond each jamb flashing. For mechanically attached flashing, embed the bottom of the flashing over the sealant and the mounting flange and fasten or adhere in place (see Figure 5).

5.8 Window Installation

5.8.1 Shim the window as necessary to ensure a square, level and plumb installation. The sill must be supported in a straight and level position to prevent sagging, deflection and sill rotation.

**NOTE 7X:** Some manufacturers require a continuous shim under the window sill. Follow the manufacturer’s recommendations.

5.8.2 Close and lock the window. Shim and adjust the window as necessary to achieve a plumb, square and level condition, as well as centering the window in the frame opening. When manufacturer’s installations instructions do not specify the fasteners and spacing to be used, secure the full perimeter with the minimum equivalent of 6d fasteners on a maximum of 405 mm (16 in) centers using pre-punched holes, if provided. Hinged and pivoted windows may require additional fasteners located near the hinge or pivot point. For certain windows it may be appropriate to fasten the head in a manner
to allow for possible movement. In all cases follow the manufacturer’s instructions for any special procedures or applications.

**NOTE 7:** Avoid overdriving fasteners. Use an appropriately sized fastener to cover the width of any pre-punched hole and adequately secure the window to the structure.

5.8.3 *When manufacturer’s installations instructions do not specify the location of fasteners in relation to the corners,* in each direction from all corners there shall be a fastener within 250 mm (10 in), but no closer than 75 mm (3 in) to prevent frame distortion or fracture of joint seals.

**NOTE 8:** If any damage to window frame joint seals or mounting flanges is observed during installation, the installer shall repair it or consult the manufacturer for guidance.

6.15.8.4 After installation is complete, check the window for proper operation and locking.

5.8.4 The Owner/General Contractor is responsible to ensure that the water-resistive barrier is effectively integrated around the window frame in a weatherboard fashion (see Figure 6).
6.0 BEST PRACTICES POST WINDOW-INSTALLATION PROCEDURES

The following is a list of best practices that should be observed after installing windows. In many cases these steps are completed after the window installer has left the property and may be the responsibility of other trades including owner/contractor.

6.1 After installation is complete, check the window for proper operation and locking.

6.2 Ensure that flashing materials are covered (installation of exterior wall surface) in a time frame recommended by the flashing manufacturers.

6.3 Repair damaged flashings or water-resistant barrier WRBs shall be repaired prior to installation of exterior wall surface in order to ensure the continuity between the water-resistant barrier and the new materials cladding.
6.4 For windows that do not have features such as J-channel, stucco key's, etc., that are typically used to account for expansion and contraction of the window/siding/cladding system, maintain a minimum 6-mm (1/4 in.) joint between the window frame and the final exterior wall surface (siding, stucco, etc.).

6.5 Install appropriate sized open-cell backer rod which is approximately 1/3 larger in size than in the joint between the window frame and the final exterior wall surface (siding, stucco, etc.) then apply sealant per the sealant manufacturer's recommendations.

For insulation purposes a low-pressure aerosol foam, tested in accordance with AAMA 812, may be used between the window frame and rough opening.

NOTE X: For insulation purposes a low-pressure aerosol foam, tested in accordance with AAMA 812, may be used between the window frame and rough opening.

- Ensure that the water-resistive barrier WRB is effectively integrated around the window frame in a weatherboard fashion (see Figure 6).
- Flashing materials are to be covered (installation of exterior wall surface) within a time frame recommended by the flashing manufacturers.
FIGURE 6: Primary Water-Resistive Barrier (WRB) Application by Others

7.0 DRAWINGS
FIGURE 1: Rough Window Opening

ROUGH FRAMED OPENING SUFFICIENTLY LARGER IN WIDTH & HEIGHT THAN THE ACTUAL FRAME DIMENSIONS OF THE WINDOWS. TO ASSURE ADEQUATE CLEARANCE CONSULT THE WINDOW MANUFACTURER’S LITERATURE FOR THE RECOMMENDED ROUGH OPENING DIMENSIONS.
FIGURE 1A: Backing Support Attached Around the Perimeter of the Rough Window Opening
FIGURE 2: Sill-Flashings

1. **Wall Sheathing (Where It Occurs):** Verify sheathing edges are flush with the frame opening.
2. **Sill Flashing:** Extend sill flashing horizontally to project beyond vertical jams. Flashing applied later.
3. **Back Support (Where It Occurs):** Verify edges are flush with the frame opening.
4. **Apply Sill Flashing Horizontally Below the Sill:** Fasten the top edge of the sill flashing to the frame, but do not fasten the lower edge so the water resistive barrier applied later may be slipped up & underneath the flashing in a weatherboard fashion.
5. **Self-Adhering Flashing:**
6. **Re-seal Outside Joints:**
7. **Shim & Adjust Window to Achieve Square, Plumb & Level:**
8. **Use Corrosion-Resistant Fasteners:** Fasten within 25mm (1") and no closer than 75mm (3") in each direction from every corner. Secure window around frame opening with equivalent of 6d fasteners at 400mm (16") O.C. minimum.
FIGURE 3A: Window Installation (Method “A”)  

NOTE 79: In applications where wall sheathing is used, sheathing shall be applied prior to flashing and window installation.

FIGURE 3B: Jamb Flashing (Method “B”)
FIGURE 5: Head Flashing

**METHOD "A":**
Embed bottom of the head flashing against the previously applied sealant. (Flashing goes over sealant) Extend head flashing beyond each jamb flashing. Fasten or adhere in place.

**METHOD "B":**
Apply continuous seal along top (head) mounting flange. Embed bottom of head flashing against sealant (flashing goes over sealant). Extend head flashing beyond each jamb flashing. Fasten or adhere in place.
WHERE RECOMMENDED AS PART OF AN EXTERIOR WALL FINISH SYSTEM, INSTALL WATER-RESISTIVE BARRIER. APPLY IN A WEATHERBOARD FASHION STARTING FROM BOTTOM TO TOP OF THE WALL.

BY OTHER TRADES:
INSTALL WATER-RESISTIVE BARRIER, INSULATION BOARD OR OTHER MATERIALS OVER HEAD FLASHING AND OVER TOP OF MOUNTING FLANGE AT HEAD OF WINDOW FRAME.

3rd COURSE OF WATER-RESISTIVE BARRIER.

2nd COURSE OF WATER-RESISTIVE BARRIER.

1st COURSE OF WATER-RESISTIVE BARRIER.

SLIP BOTTOM OF JAMB FLASHING & SILL FLASHING OVER WATER-RESISTIVE BARRIER AT BOTTOM OF WINDOW SILL.

FIGURE 6: Primary Water-Resistive Barrier Application by Others
**APPENDIX A – MODIFY WATER-RESISTIVE BARRIER (WRB)**

*(Excerpted and modified from the IM-TM, InstallationMasters™ Training Manual)*

**A1.0** If the water-resistive barrier **WRB** has already been installed, some modifications will be necessary. Modify the water-resistive barrier **WRB** in the following manner:

**THIS NEEDS TO BE REVIEWED AT FALL 2019 CONFERENCE**

1. **When the water-resistive barrier** **WRB** covers the window opening, the water-resistive barrier **WRB** needs to be either cut flush with the window rough opening or the modified “I-Cut” can be made in the barrier

   1. **make a modified “I-Cut” in the barrier** as shown in Figure A1.

2. **Fold bottom and side flaps over and behind the interior sides of the rough framing.**

3. **Fasten flaps on interior with staples set every 300 mm to 400 mm (12 in to 16 in)** (see Figure A2).

   2. **Measure for diagonal cuts at top of window corners** of water-resistive barrier **WRB** for both building paper or both building paper and house wrap (see Figure A23).

      a. Measure from the former **225 mm (9 in)** up and **225 mm (9 in)** over, and mark (45° diagonal).
      b. Cut on the diagonal from marked point to the rough opening corner.
      c. Measure and cut the other upper corner.

3. **Gently raise the top edge of the water-resistive barrier** **WRB** and tape the corners and center to the barrier surface above. This will allow for later installation of the window and flashing.

![Diagram of water-resistive barrier modifications](image-url)
FIGURE A1: Modify Water-Resistive Barrier (WRB)

CUT WRB AND FOLD TO INTERIOR. ATTACH AND TRIM AS REQUIRED AT SILL AND JAMB.

FIGURE A2: Water-Resistive Barrier – Interior
FIGURE A23: Cut Flap at Head and Tape