Presentation By:  The Jacksonville Chapter, CSI

Window Flashing 101
ASTM E2112

American Society for Testing and Materials (ASTM),
It is important to note that the current standard is being revised this year and will likely include such things as:

1. Requirement for sill flashings on all window installs

2. Allowance for self-adhered flashings in a width less than 9", certified to perform by the window mfr, flashing mfr or design pro.

3. And likely test or design criteria for adhesion of flashings.

4. Window flashing requirements for CMU wall systems.

5. Thru wall penetration flashing such as: Pipes, Electrical Boxes and Dryer Vent Hoods.
1.4 This practice covers the installation process from pre-installation procedures through post-installation procedures, for single units or factory-mulled multiple units in a single opening. It does not cover the fabrication or assembly of multiple units, whether such fabrication takes place in a factory or at the intended installation site. The installer should check with the manufacturer of factory-assembled units for instructions for anchoring. When using field-mulled units, follow manufacturer's recommendations and make certain that they meet applicable codes. This practice does not cover the selection of appropriate fenestration products for a given application, nor the selection of other products or systems for use in the installation.

1.5 This practice provides minimum requirements that will help to accomplish the installation of fenestration products in an effective manner. Actual conditions in buildings vary greatly and, in some cases, substantial additional precautions may be required. In the event that the manufacturer's installation instructions provided with the product conflict with requirements of this practice, the manufacturer's instructions shall prevail. This practice is not intended to limit or exclude other new procedures that may refine or further improve the effectiveness of fenestration installation.
5.13.3.1 Unless otherwise specified, flashing material shall provide twenty-four (24) hour minimum protection from water penetration when tested in accordance with Test Method D 779. See Appendix X1—Window/Door Flashing Types.
5.13.3.2 The flashing membrane shall be securely affixed to minimize any weather damage prior to the building's exterior treatment being applied. The fenestration product and flashing shall be integrated into the overall weather resistant barrier. The fenestration and flashing manufacturers shall be consulted for any special flashing requirements unique to their products.
Note 9—Numerous references to properly and securely attaching flashing materials are mentioned in the following sections. The building contractor is responsible for coordination of this work, as it is greatly dependent on the construction schedule. Once installed, local wind and weather conditions, as well as exposure to other trades, can have a detrimental effect on the permanent attachment of flashing.
5.16.3: Use of Pan Flashings - This practice recommends that pan flashings be used under all windows and doors, except where wall construction details incorporating fenestration drainage systems are provided by the building designer, or where wall construction details are specifically provided by fenestration manufacturers’ installation instructions. Where used, pan flashings shall be integrated with the wall's weather resistive barrier in shingle-lap fashion, and the underside of the down-turned leg, and shall be continuously sealed to the weather resistive barrier.

8.1.1.1.4 Use the flashing cut formulas (see Table 6) to determine the length of each strip of flashing for each window. The ASTM standard requires a flexible flashing minimum roll width of 9 in. (230 mm). Wider flashing materials, (for example, 12 in.(300 mm)) may be used, however the actual cut lengths figured by using the chart will increase. The use of self-adhesive type flashing is acceptable. (For future discussion: “Self-adhesive flashings can be effective with widths less than 9 in. (230 mm) (See Section 8.5.3.1.4 for an example of 4-in. (100 mm) minimum widths). “ Self-adhesive type flashing seals itself to the weather resistant barrier and to the mounting flange without the need for additional sealant applied to the exterior face of the flange. Self-adhesive type flashing materials must properly adhere, (creating a water tight joint) to the (WRB) and to the mounting flange material in order to be acceptable for use. Refer to 5.12.3.1. (See Note 18).
Based on the input of the professionals involved in the formulation of this bulletin, the BOAF First Coast Chapter Codes & Standards Committee recommends that the following “best practice procedures” be followed to facilitate the installation of window flashings:

1. The moisture/infiltration barrier and sill flashing should be installed prior to the installation of the windows and subsequent remaining flashing applications.

2. Screws with profile heads, which will allow verification under the flashing, or other approved manufacturer screws, may be utilized for securing the windows to facilitate inspections if approved by local jurisdictions.

3. It is important to note flashing pans may be required for specific window applications and with approval of local jurisdictions, may be utilized for window installation of Methods A-1 or B-1.
Caulk/Sealant Compatibility Program

Most caulks/sealants contain chemicals and solvents that can adversely affect material performance. Therefore, it is very important that the caulk/sealant is compatible with a broad range of building materials, including Tyvek® wraps and flashing. The caulk/sealant manufacturer should be contacted for information concerning the compatibility of the caulk/sealant with various building materials. DuPont should be contacted for information concerning the compatibility of a caulk/sealant with Tyvek® Weatherization Systems products.

For compatibility testing with Tyvek® Weatherization Systems products, caulks must meet the following basic criteria:

- Must meet or exceed the ASTM C920-25 performance requirements (high performance caulk)
- Must be compatible with common building materials (i.e. wood, aluminum, glass, metal, PVC materials, etc.)
- Must have a broad service and application temperature range
- Must be easy to use

Caulk/sealant compatibility testing is conducted at Architectural Testing Inc. (ATI). The test is called Protocol for Preparation and Evaluation of Barrier Compatibility with Sealants (ATI-ML-0001-122800) and is based upon AAMA 800, Voluntary Specifications and Test Methods for Sealants. It is the expectation that the caulk/sealant manufacturer pay for the testing of their product to determine compatibility with Tyvek® products and DuPont® flashings. The benefit to the manufacturer (if the caulk passes) is that the caulk will be recommended for use with Tyvek® Weatherization Systems products. Please direct manufacturers to Todd Burroughs at ATI (717-764-7700) for quotes on the cost of testing. Any other inquiries concerning the testing should be directed to either Barbara Crowder at DuPont Tyvek (804-383-2409) or Todd Burroughs.

Approved Caulks/Sealants

The following caulks/sealants have passed the ATI compatibility test and are recommended for use with Tyvek® Weatherization Systems products:

- OSI® Pro-Series® Quad® Advanced Formula Sealant
- DAP® Dynaflex 230® Premium Elastomeric Latex Sealant

Please check with the caulk/sealant manufacturer for compatibility with various building materials (i.e. polystyrene, wood, steel, vinyl, etc.).
1 ROUGH OPENING PREPARATION

A. Verify the opening is plumb and level.
   
   Note: It is critical that the bottom is level.
B. Verify the window will fit the opening. Measure all four sides of the opening to make sure it is 3/4" larger than the window in both width and height. On larger openings measure the width and height in several places to ensure the header or studs are not bowed.

Note: 1-1/2" or more of solid wood blocking is required around the perimeter of the opening. Fix any problems with the rough opening before proceeding.
C. Cut the weather resistive barrier (1C).

4th cut: Make a 6" cut up from each top corner at a 45° angle to allow the weather barrier to be lapped over the fin at the head of the window.
D. Fold the weather resistive barrier (1D). Fold side and bottom flaps into the opening and staple to inside wall. Fold top flap up and temporarily fasten with flashing tape.
E. Apply sill flashing tape #1. Cut a piece of flashing tape 12" longer than the opening width. Apply at the bottom of the opening as shown (1E) so it overhangs 1" to the exterior.

Note: The tape is cut 12" longer than the width so that it will extend 6" up each side of the opening.
F. **Tab the sill flashing tape and fold.** Cut 1" wide tabs at each corner (1/2" from each side of corner) (1F). Fold tape to the exterior and press firmly to adhere it to the weather resistive barrier.
G. **Apply sill flashing tape #2.** Cut a piece of flashing tape 12" longer than the opening width. Apply at the bottom, overlapping tape #1 by at least 1". Do not allow the tape to extend past the interior face of the framing (1G).

**Note:** The flashing tape does not need to extend all the way to the interior of the framing.
INTEGRATING THE WINDOW TO THE WEATHER RESISTIVE BARRIER

A. **Apply side flashing tape.** Cut 2 pieces of flashing tape 4" longer than the frame height of the window. Apply one piece to each side over the nailing fin and onto the weather resistive barrier. The tape should extend 2" above the top of the window and 2" below the bottom of the window. Press the tape down firmly.

B. **Apply top flashing tape.** Cut a piece of flashing tape long enough to go across the top of the window and extend at least 1" past the side flashing tape on both sides. Apply the tape over the top nailing fin as shown.

*Note: Do NOT tape or seal the bottom nailing fin.*
C. Fold down top flap of weather resistive barrier (3C).

D. Apply flashing tape to diagonal cuts. Cut pieces of flashing tape at least 1" longer than the diagonal cuts in the weather resistive barrier. Apply the tape covering the entire diagonal cut in the resistive weather barrier at both upper corners of the window.

*Note: Be sure to overlap the top corners (3D).*
INTERIOR SEAL  There are two different methods for creating an interior seal.

Fiberglass Insulation Method

A. Loosely fill the space between the window and the rough opening with fiberglass insulation to within 1" of the interior of the window frame.
   Note: Packing the insulation too tightly may cause the sides of the window to bow.

B. Insert closed cell foam sealant backer rod into the space to within 1/2" of the interior of the window frame.

C. Check the window operation (vent units only) by opening and closing the window.
   Note: If the window does not operate correctly, check for plumb, square and that the sides are not bowed. If the sides are bowed, remove the backer rod and insulation then adjust shims as required and repeat the above steps.

D. Apply interior line of sealant over the backer rod. Tool and finish the interior sealant.
Foam Insulation Method

Caution: Ensure use of low expansion polyurethane window and door installation foams and strictly follow the foam manufacturer's recommendations for application. Use of high expansive foams or improper application of the foam may cause the window to bow and hinder operation.

A. **Apply insulating foam.** From the interior, insert the nozzle of the applicator approximately 1" deep into the space between the window and the rough opening and apply a 1" deep bead of foam. This will allow room for expansion of the foam and will minimize squeeze out. Allow the foam to cure completely (usually 12 to 24 hours) before proceeding to the next step.

   *Note: Do not completely fill the space from the back of the fin to the interior face of the opening. Over filling the space may cause the window frame to bow.*

B. **Check window operation** (vent units only) by opening and closing the window.

   *Note: If the window does not operate correctly, check to make sure it is still plumb, level and that the sides are not bowed. If the sides are bowed, remove the foam with a serrated knife and repeat the above steps.*
STEP 1

CORNER DETAIL
Step 5

Details at Window Flashing

Scale 3/4" = 1'-0"
Integral Flanged Window AFTER Water-Resistive Barrier (WRB)
Integral Flanged Door AFTER
Water-Resistive Barrier (WRB)
STEP 4
A. Flex DuPont™ FlexWrap™ at bottom corners onto face of wall.
4" DuPont™ StraightFlash™
Butyl Adhesive

Tyvek®

Peel Off
Release Paper
and attach to underside of door
Brick Mold Window AFTER Water-Resistive Barrier (WRB)
**Installation Tip:**

If desired, attach first adhesive strip to back of brick mold. Then attach second adhesive strip to the jambs/head.
Make sure the adhesive on these pieces will overlap.

**Installation Tip:**
For ease of window installation temporarily secure head and jamb flashing with tape to exterior window.
Brick Mold Door AFTER Water-Resistive Barrier (WRB)
Note: Secure fastener along the bottom outer edge of the DuPont™ FlexWrap™ at flexed corners.
Installation Tip:
If desired, attach first adhesive strip to back of brick mold. Then attach second adhesive strip to the jambs/head.
Make sure the adhesive on these pieces will intersect.
Installation Tip:

All butyl on back should be covered by DuPont Tyvek®.
First layer with 6" Protecto Flex to protect window sill, head and wood jam casing. Second layer with 9" WaterBlock to intersect wood jam to CMU. Best practice to protect the complete window opening.
INSTALL 6' SELF-ADHERING MEMBRANE FLASHING OVER ALL FLANGES OF NON-MOVABLE FRAME. SEQUENCE OF FLASHING TO BE:
1. BOTTOM
2. SIDES
3. TOP

INSULATE PIPE MIN 12' EXT. WALL

APPLY SEALANT AT PERIMETER OF NON-MOVABLE FRAME AND STUCCO JOINT ON ALL SIDES

HOODED VENT CAP - APPLY SEALANT AT TOP AND SIDES ONLY.

HOODED VENT ÇAP

DRYER VENT ASSEMBLY W/ FLAP CLOSURE

VINYL CASING BEAD AT PERIMETER OF FRAME

STUCCO/CV FIN (SEE TYP WALL SECTION)

APPROVED HOUSEWRAP

SHEATHING OVER WOOD STUDS (SEE STRUCT DUGS)

LOONEY RICKS KISS ARCHITECTS, INC.

PER 2004 FBC Exterior Plastering 703.6
Exterior use of portland cement plaster shall comply with the application requirements of ASTM C 926.
Installation of exterior lathing and framing shall comply with ASTM C 1063.
**STEP 1**
- Cut opening in approved housewrap for box installation.

**STEP 2**
1. Apply 3x12' self-adhering membrane flashing over box and approved house wrap.
2. Press membrane flashing firmly against all sides of box and onto housewrap.
3. Cut "X" into self-adhering membrane flashing.

**STEP 3**
- Approved housewrap over exterior sheathing.
- Turn self-adhering membrane flashing into box.

**SECTION**
- Approved housewrap over sheathing.
- 3x12' self-adhering membrane flashing over box and approved house wrap.
- Turn self-adhering membrane flashing into box.
- Press membrane flashing firmly against all sides of box and onto housewrap.
- 60# min grade "D" felt.
- Galv mtl lath.
- Stucco/cv finish (see typ wall section).
**STEP 1**
CUT X" x X" FLAP IN FLASHING AND FOLD DOWN.
X" WIDTH OF PIPES/WIRE
APPLY 1st LAYER OF SELF-ADHERING FLASHING OVER APPROVED HOUSE WRAP.

**STEP 2**
ROLL SELF-ADHERING FLASHING OVER BOTTOM OF PIPE.

**STEP 3**
APPLY 2nd LAYER OF SELF-ADHERING FLASHING OVER APPROVED HOUSE WRAP AND 1st LAYER OF FLASHING.
CUT X" x X" FLAP IN FLASHING AND FOLD UP.
X" WIDTH OF PIPES/WIRE

**STEP 4**
ROLL SELF-ADHERING FLASHING OVER TOP OF PIPE.

**STEP 5**
APPLY PARCE自我-ADHERING FLASHING AROUND PIPE.
X" WIDTH OF PIPES/WIRE

**STEP 6**
ROLL SELF-ADHERING FLASHING AROUND PIPES/WIRE AND SEAL TO SELF-ADHERING FLASHING.

**SECTION**
STUCCO/CV FINISH
(SEE TYP WALL SECTION)
GALV MTL LATH
60 MIN GRADE "D" FELT
2nd LAYER SELF-ADHERING FLASHING OVER APPROVED HOUSE WRAP.
CONTINUOUS SEALANT AT PERIMETER OF PIPE/WIRE
3rd LAYER SELF-ADHERING FLASHING AROUND PIPE.
4th LAYER SELF-ADHERING FLASHING OVER APPROVED HOUSE WRAP.
INSTALL APPROVED HOUSEWRAP OVER SHEATHING

**4 DETAIL**
4.6.3 THRU WALL PENETRATION FLASHING (PIPS 2" OR LESS, ALL Wiring.)
PER 2004 FBC Exterior Plastering 703-6
Exterior use of portland cement plaster shall comply with the application requirements of ASTM C 926.

Installation of exterior lathing and framing shall comply with ASTM C 1063.

INTERIOR CORNER

1' wide self-adhering membrane flashing directly over exterior sheathing full height of wall (prime sheathing per manufacturer's written instruction)

STUCCO/CV FINISH (SEE TYP WALL SECTION)

1/2' GUB

3' wide self-adhering membrane flashing directly over exterior sheathing full height of wall (prime sheathing per manufacturer's written instruction)

STUCCO/CV FINISH (SEE TYP WALL SECTION)

UNFACED FIBERGLASS BATT INSULATION

ADDITIONAL LAYER OF 15# BLDG FELT OVER BASE LAYER OF 60# MIN BLDG FELT AT OUTSIDE CORNER LOCATIONS.

CORNER BEAD

12' MIN.

12' MIN.

EXTERIOR CORNER

Looney Ricks Kiss Architects, Inc.

DETAIL

EXTERIOR CORNERS - STUCCO
PER 2004 FBC Exterior Plastering 703.6
Exterior use of portland cement plaster shall comply with the application requirements of ASTM C 926.

Installation of exterior lathing and framing shall comply with ASTM C 1080.

0.5” wide self-adhering membrane flashing directly over exterior sheathing full height of wall.
(Prime sheathing per manufacturer written instructions)

6’ MIN.

LRK
Looney Ricks Kiss Architects, Inc.

INTERIOR CORNER

STUCCO/CV FINISH
(SEE TYP WALL SECTION)

1/2” GUB

UNFACED FIBERGLASS BATT INSULATION

EXTerior CORNER

0.5” wide self-adhering membrane flashing directly at outside corner locations.

Corner Bead

6’ MIN.

6’ MIN.
ARCHITECTURAL FIBERGLASS
SHINGLE ROOFING OVER 30# FELT
OVER 1/2" OSB OVER PRE-ENG
WD TRUSSES • 24" OC

INSULATION BARRIER BETWEEN EA TRUSS
HURR CLIP • EA TRUSS
(SEE ENGINEERING DWS)
(2) 2x PLATE • 2 SYM
EXTEND FINISH ASSEMBLY
TO PLATE

PRE-FINISHED ALUMINUM DRIPL
OVER FT 1/2 OVER VINY
WRAPPED FT 2X6 FASCIA
VENTED VINYL SOFFIT INSTALLED PER
MANUF SPEC
VINYL J CHANNEL AT FASCIA • WALL
2X STUDS • 16" OC (SEE STRUCTURAL DWS)
ATC SYSTEM, SEE ENGINEERING

WOOD SHEATHING
(SEE 6HTG DETAIL • STRUCTURAL DWS)

ELASTOMERIC COATING (SPRAYED •
BACK-ROLLED • 14-18 MIL DRT) OVER THREE
COAT STUCCO FINISH (¾' NOM) OVER GALV
ML LATH OVER 60 MIN GRADE 'D' BLDG
FELT OVER DRAINAGE HOUSEWRAP

CONTINUOUS SHEET MEMBRANE
WATERPROOFING (WR GRACE
"PERM-A-BARRIER") OR APPROVED EQUAL
EXTEND 6' ABOVE TOP OF BAND

CV BAND (PROFILE VARIES • SEE ELEV)
(1" PROJECTION FROM STONE FACE)
SEE ENLARGED DETAIL

SYNTHETIC STONE VENEER OVER
STUCCO BROWN COAT

HOLD EXT SHEATHING 1/2' ABV SLAB
(SEE DETAIL)

3/4" VINYL WEEP SCREEED/STOP (SET IN
BEAD OF SEALANT • SEE DETAIL), EXTEND
BLDG FELT • APPROVED DRAINAGE
HOUSEWRAP OVER NAILING FLANGE

PLASTER SKIM COAT OR
PAINTED FOUNDATION WALL
FINISH SOD

PER 2004 FBC Exterior Planning 703.8
Exterior use of portland cement plaster shall comply with
the application requirements of ASTM C 920
Installation of exterior lathing and framing shall comply with
ASTM C 1063

NOTE
SEE STRUCT ENG DWS FOR CONNECTION
TYPES AND DETAILS

NOTE
INSTALL ALL
VINYL CV ACCESSORIES
PER MANUF WRITTEN
SPECIFICATIONS

EXTEND BLDG FELT •
HOUSEWRAP OVER
FLANGE

SILL SEAL

2X PT PLATE, SET BACK 1/2'
FROM SLAB EDGE, OVER
FOAM SILL SEAL (SEE STRUCT
DWS FOR ANCHORAGE)

6 MIL POLYETHYLENE
VAPOR BARRIER OVER
CLEAN COMPACTED •
TERMITE TREATED SOIL

FOUNDATION FOOTING VARIES
(SEE STRUCT DWS)

TYP WALL SECTION
1" = 1'-0"
ALTERNATE SILL DETAIL

SCALE: 1/2" = 1'-0"

ARCHITECTURAL FIBERGLASS SHINGLE ROOFING OVER 30# FELT OVER 1/16" OSB OVER ENGINEERING WD TRUSSES # 34' OC

INSULATION BAFFLE BETWEEN EA TRUSS
HURR CLIP V EA TRUSS
(SEE ENGINEERING DWGS)
(2) 2x PLATE STP
EXTEN FINISH ASSEMBLY TO PLATE

PRE-FINISHED ALUMINUM DRAIN OVER PT 1x2 OVER VINYL WRAPPED PT 2X6 PASCIA
VENTED VINYL SOFFIT INSTALLED PER MANUF SPEC
VINYL J CHANNEL AT PASCIA # WALL

PER 2004 PBC Exterior Plastering 703.6:
Exterior use of precast cement plaster shall comply with the application requirements of ASTM C 920.
Installation of exterior stucco and framing shall comply with ASTM C 1094.

2x STUDBS # 16" OC (SEE STRUCTURAL DWGS)
WOOD SHEATHING (SEE DETAIL # STRUCTURAL DWGS)

ELASTOMERIC COATING (SPRADED & BACK-ROLLED 14-16 MIL DRT) OVER THREE COAT STUCCO FINISH (5/4" NOM) OVER GALV FLUSH OVER 60 MIN GRADE 'C' BLDG FELT OVER DRAINAGE HOUSEWRAP

ATC SYSTEM, SEE ENGINEERING

HOLD EX SHEATHING 1/2" ABV SLAB (SEE DETAIL)

3/4" VINYL WEEP SCREEN/STOP
(SEE DETAIL)

EXTEND BLDG FELT & APPROVED DRAINAGE HOUSEWRAP OVER NAILING PLANGE
PLASTER SKIM COAT OR PAINTED FOUNDATION WALL

FINISH BOD

SILL SEAL

NOTE: INSTALL ALL VINYL CYL ACCESSORIES PER MANUFACTURER SPECIFICATIONS

EXTEND BLDG FELT & HOUSEWRAP OVER FLANGE

NOTE: INSTALL ALL VINYL CYL ACCESSORIES PER MANUFACTURER SPECIFICATIONS

6 MIL POLYTETETRFLNE
VAPOR BARRIER OVER CLEAN COMPACTED & TERMITE TREATED SOIL.

FOUNDATION/FOOTING VARIES (SEE STRUCT DWGS)

TYP WALL SECTION 1" = 1'-0"