

WINDOW & DOOR FLASHING

BUILDING IT RIGHT THE FIRST TIME



SANDY SPRINGS™
GEORGIA

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WHY BUILDINGS LEAK

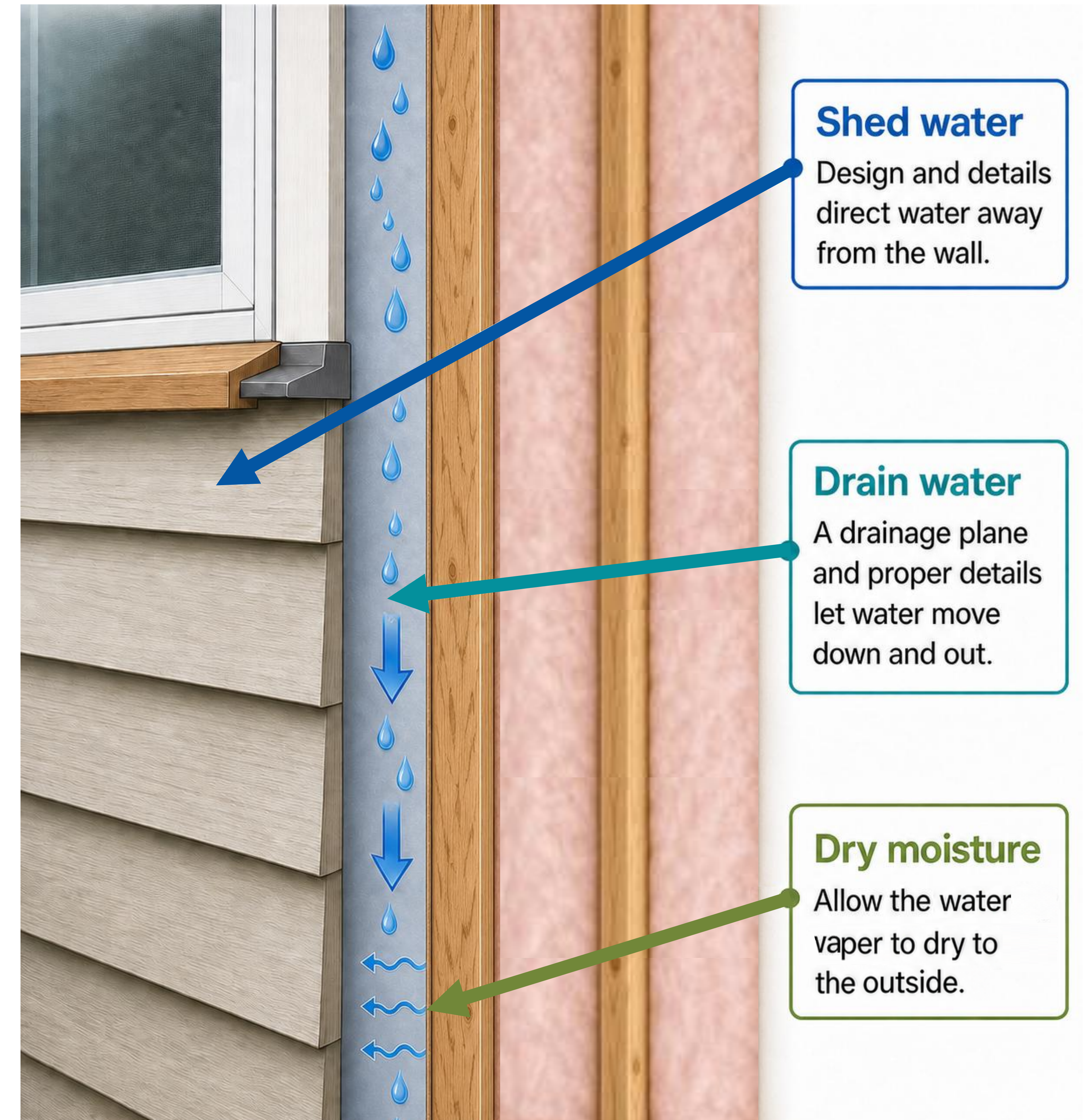
WATER INTRUSION

- Water intrusion remains one of the **most common building failures** that leads to:
 - **Mold and mildew**
 - **Wood rot and decay**
- Most failures are not caused by one bad product
- **Failures typically occur at:**
 - **Connections**
 - **Transitions**
 - **Penetrations**



BUILDINGS ARE NOT WATERPROOF

- Buildings are **designed to manage water**
- The goal is not to stop every drop of water
- The real goal is to:
 - **Shed water**
 - **Drain water**
 - **Dry moisture**



HOW WATER GETS INTO BUILDINGS

1 GRAVITY

Rainwater runs down the wall and window face. If head flashing, drip cap, or sill-pan flashing are missing or reversed, water can drain behind the flange or trim.

2 WIND-DRIVEN RAIN

Wind pushes rain into gaps at the window perimeter, siding-to-trim joints, and unsealed nail-flange or frame joints.

3 CAPILLARY ACTION

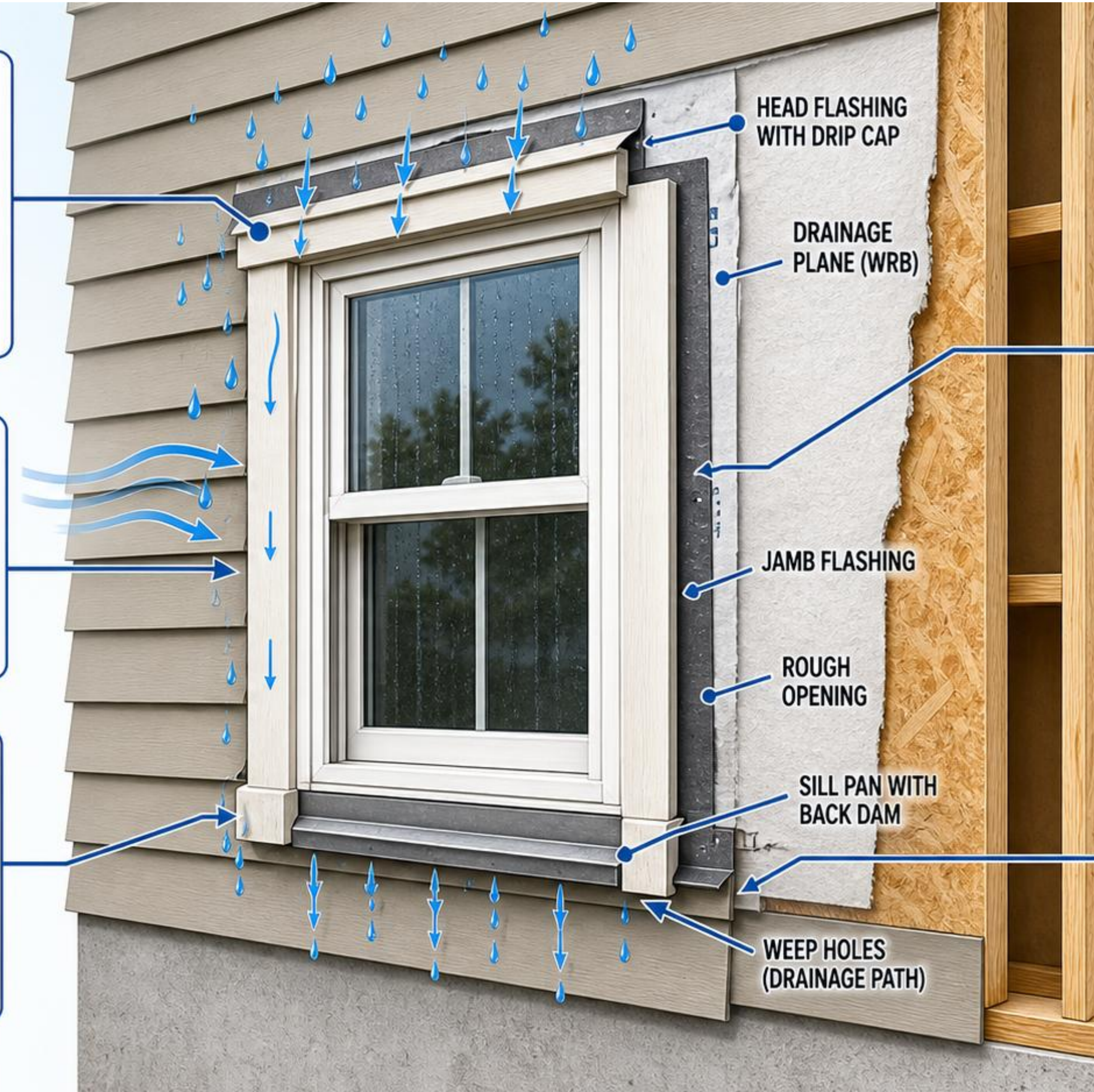
Water can wick through tight gaps at trim, sill, brickmold, and cladding joints when flashing and back dams do not break capillary paths.

4 AIR PRESSURE DIFFERENCES

Pressure differences can pull moist air and rainwater through cracks around the window frame, rough opening, and interior/exterior sealant joints.

5 IMPROPER FLASHING SEQUENCE

Missing, reversed, or poorly lapped sill pan, jamb flashing, head flashing, WRB, or sealant can direct water into the wall instead of out.



WATER-RESISTIVE BARRIERS

WHAT IS A WRB?

- **Water-Resistive Barrier (WRB)**
- It's a material **installed behind the exterior cladding** of a building that is designed to:
 - **Prevent liquid water** from reaching the wall structure
 - Allows trapped **water vapor to escape** to the outside



COMMON TYPES OF WRB

- Some **common WRB materials** include:
 - **Mechanically attached housewraps** (such as Tyvek®, Typar®, etc.)
 - **Sheathing Systems** (such as Zip System, Forcefield, etc.)
 - **Self-adhered membrane** ("peel-and-stick", Blueskin, Vycor)
 - **Liquid-Applied** (Air-Shield, DensDefy, R-Guard, Sikagard, etc.)
 - **Asphalt Felt** (15# minimum)



HOUSEWRAP WRB (TYVEK) INSTALL



- Installed over the exterior wood sheathing
- Start at the bottom and work your way up to create a “shingle” effect
- Lap horizontal joints 6" minimum
- Lap vertical joints 6" minimum
- Lap around corners 12" minimum
- No small pieces

SHEATHING WRB (ZIP SYSTEM) INSTALL

- Is part of the exterior wall sheathing
- Exterior sheathing is coated with a **Water-Resistive Barrier (WRB) coating**
- All joints shall be taped
- Joints over wind/door head shall be taped over the head flashing





FLASHING

WHAT IS FLASHING?

- A material installed to **intercept water**
- **Directs water away** from vulnerable areas
- Creates a **continuous drainage path**
- **Protects transitions** in the wall system
- **Different types of flashing:**
 - **Flashing tapes (straight and flexible)**
 - **Metal or vinyl flashing**
 - **Preformed sill pans**



WRB + FLASHING WORK TOGETHER

- A wall is designed with the expectation that **some water will get behind the cladding** during wind-driven rain.
- The **WRB catches that water and directs it downward.**
- Flashing only works when it is **integrated with the WRB.**



2024 IRC CODE REQUIREMENTS

WHY DOES THE CODE REQUIRE FLASHING?

- 2024 International Residential Code (IRC)
 - R703.4 – Flashing

***“Approved corrosion-resistant flashing shall be applied in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components.*”**

- **Exterior openings are vulnerable** to water intrusion
- Flashing **protects the building envelope**
- **Water** must be **directed back to the exterior**

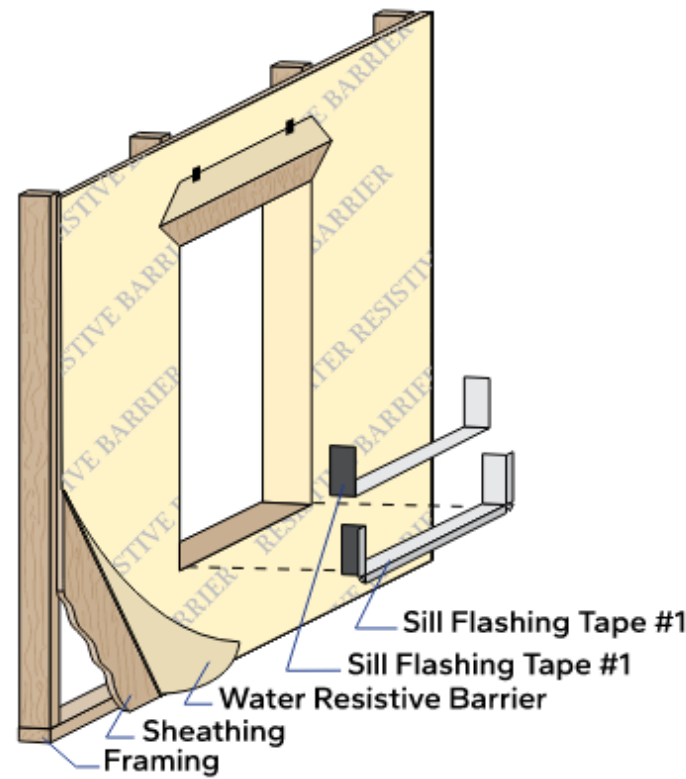


MANUFACTURER INSTRUCTIONS

- 2024 International Residential Code (IRC)
- R703.4 – Flashing Installation At Exterior Window and Door Openings
- **Flashing at exterior window and door openings shall be installed in accordance with:**
 1. The window and door manufacturer's installation and flashing instructions, or
 2. The flashing or WRB manufacturer's instructions.



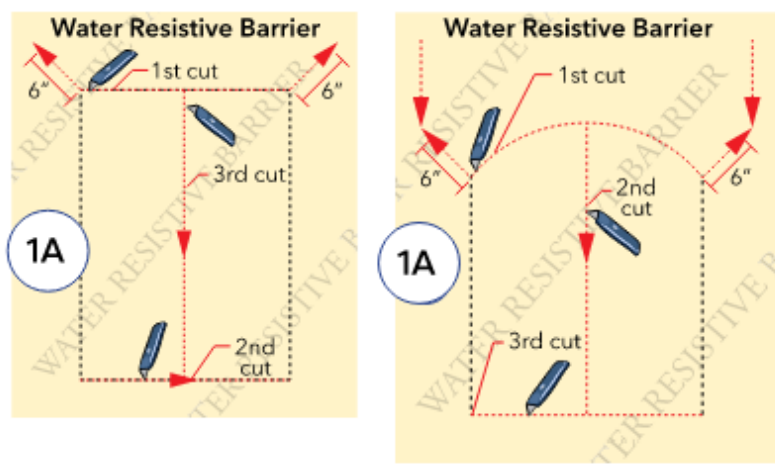
NEW CONSTRUCTION INSTALLATION WITH NAIL FIN AFTER BUILDING WRAP



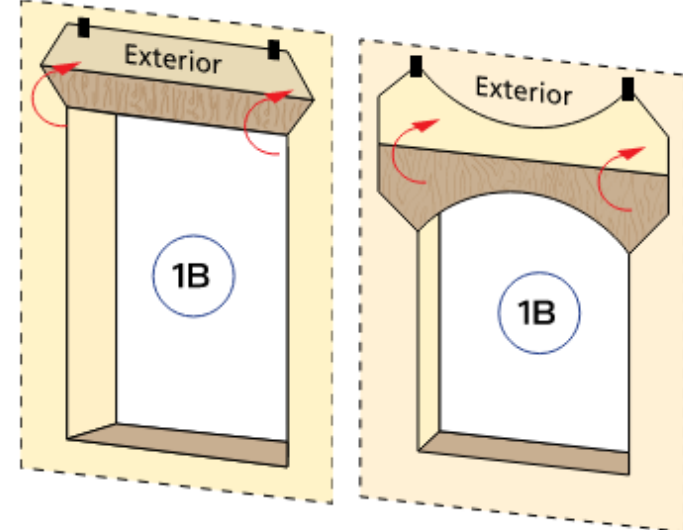
1 PREPARE THE OPENING

Refer to the opening verification and window preparation sections near the beginning of this booklet.

IMPORTANT Window installations in Marine (C) climate zones or Extreme Wind/Water Conditions in Moist (A) climate zones may require additional opening preparation procedure methods indicated in FMA/AAMA 100. Confirm the appropriate method with the building wrap weather barrier manufacturer.

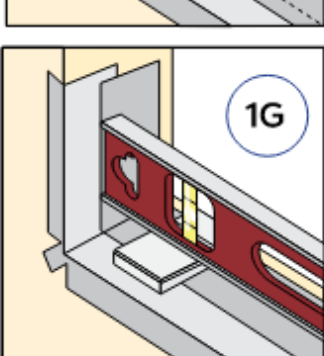
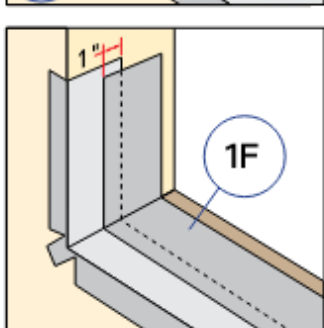
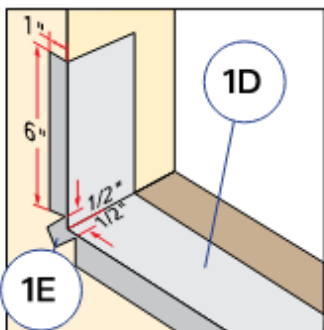


- A. Cut the building wrap. Refer to the diagram for other window shapes on the next page.
- B. Fold the building wrap in at the jambs and staple it in place. Fold the top flap up and temporarily fasten with flashing tape.



Note: A box cut pattern is also acceptable, provided flashing tape is used on each side adhered 1" onto the weather barrier and wrapped into the opening.

- C. Cut 2 pieces of flashing tape 12" longer than opening width.
- D. Apply sill flashing tape #1 at the sill extending 1" to the exterior and 6" up each jamb.
- E. Cut 1" wide tabs at each corner by tearing the foil 1/2" each way from corner.
- F. Apply sill flashing tape #2 overlapping tape #1 by 1" minimum.



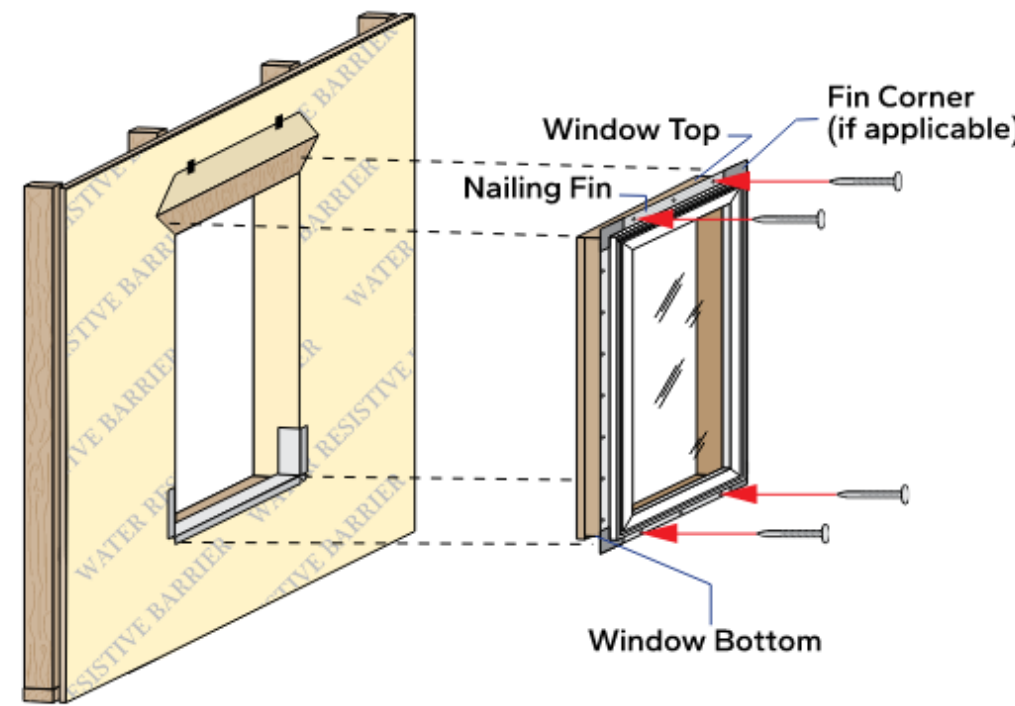
NOTICE Press all tape down firmly.

- G. Install and level sill shims. Place 1" wide x 1/4" to 3/8" thick shims 1/2" from each side. Keep shims back 1/2" from interior face of window. Place additional shims under each mullion and sliding window interlocker.

For vinyl windows: Add shims so maximum spacing is 18". Rotate shims to avoid projecting interior of frame.

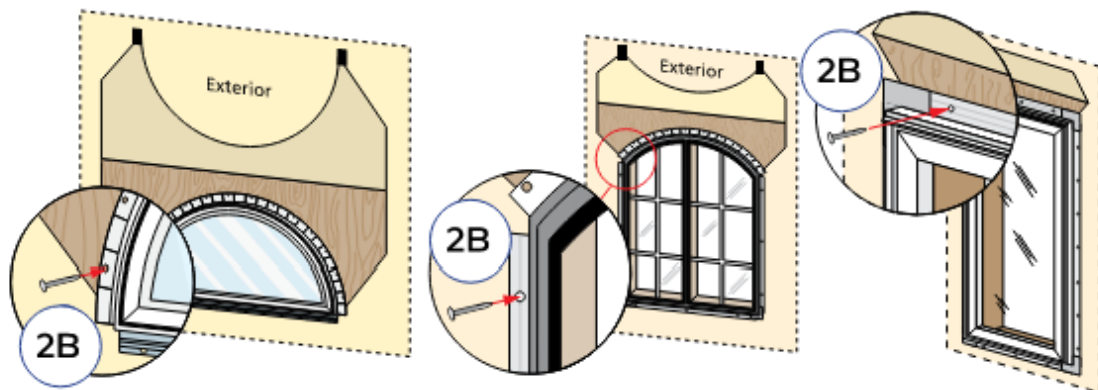
- H. Once level, attach shims with flashing tape to prevent movement.

NOTICE Improper placement of shims may result in bowing the bottom of the window.



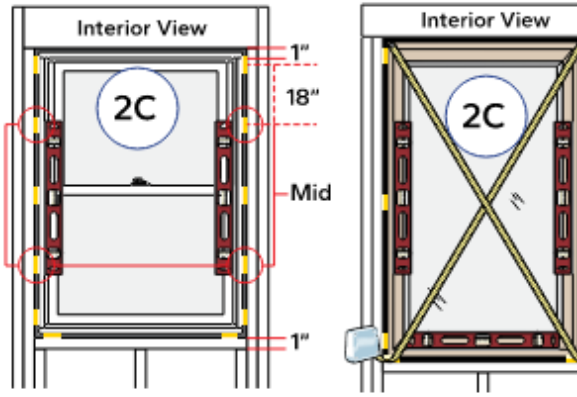
2 SET AND FASTEN THE WINDOW

- A. Insert the window into the opening on the sill shim spacers. Center the window between jambs.
- Note:** Using sealant behind head and jamb fins is optional.
- B. Drive two fasteners, one near each end of the top nailing fin. (See nail fin anchor instructions at the end of this booklet).

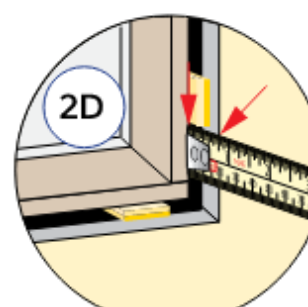


- C. Plumb and square the window using shims at the locations shown. Adjust shims to plumb and square the window. Keep shims 1/2" short of window frame depth.

NOTICE DO NOT shim above the window. Additional shims are required at screw locations for large units and combinations. See the nail fin anchor instructions at the end of this booklet.



- D. Check the window placement by measuring from the interior surface of the window frame or jamb extension to the interior surface of the wall for consistency. If the dimensions are not equal, confirm the fins are folded fully to 90° (if applicable).
- E. Drive two fasteners, one near each end of the sill nailing fin.



- F. Check window operation. **Vent Awning and Casement:** Refer to applicable hardware instructions. Unlock and open the window to remove the shipping spacers. Open and close the window to test for proper operation. **Double-Hung:** Cut the checkrail bands (if applicable) and remove shipping spacers. Open, close and tilt the sashes to test for proper operation. Check for equal sash to frame reveal from top to bottom.

IMPORTANT Adjust shims to correct any issues with plumb, square, operation or reveal. If necessary, secure window frame to ensure window placement and sash to frame reveal is maintained.

- G. Close and lock the window.
- H. Finish driving fasteners into the nailing fin. Straighten the frame before driving fasteners as necessary. Do not over-drive fasteners.

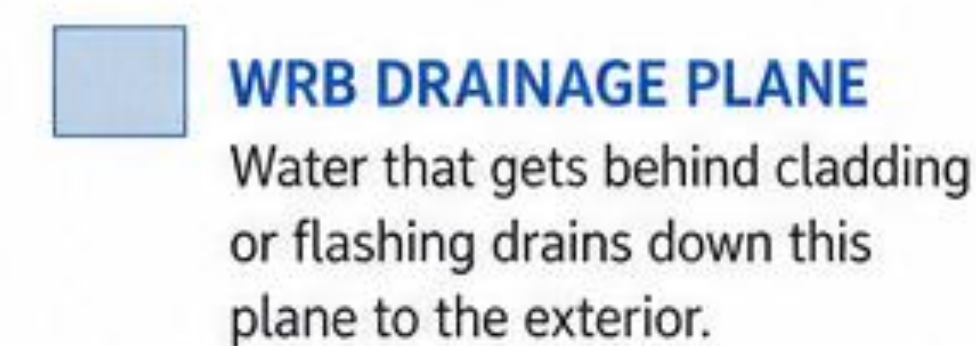
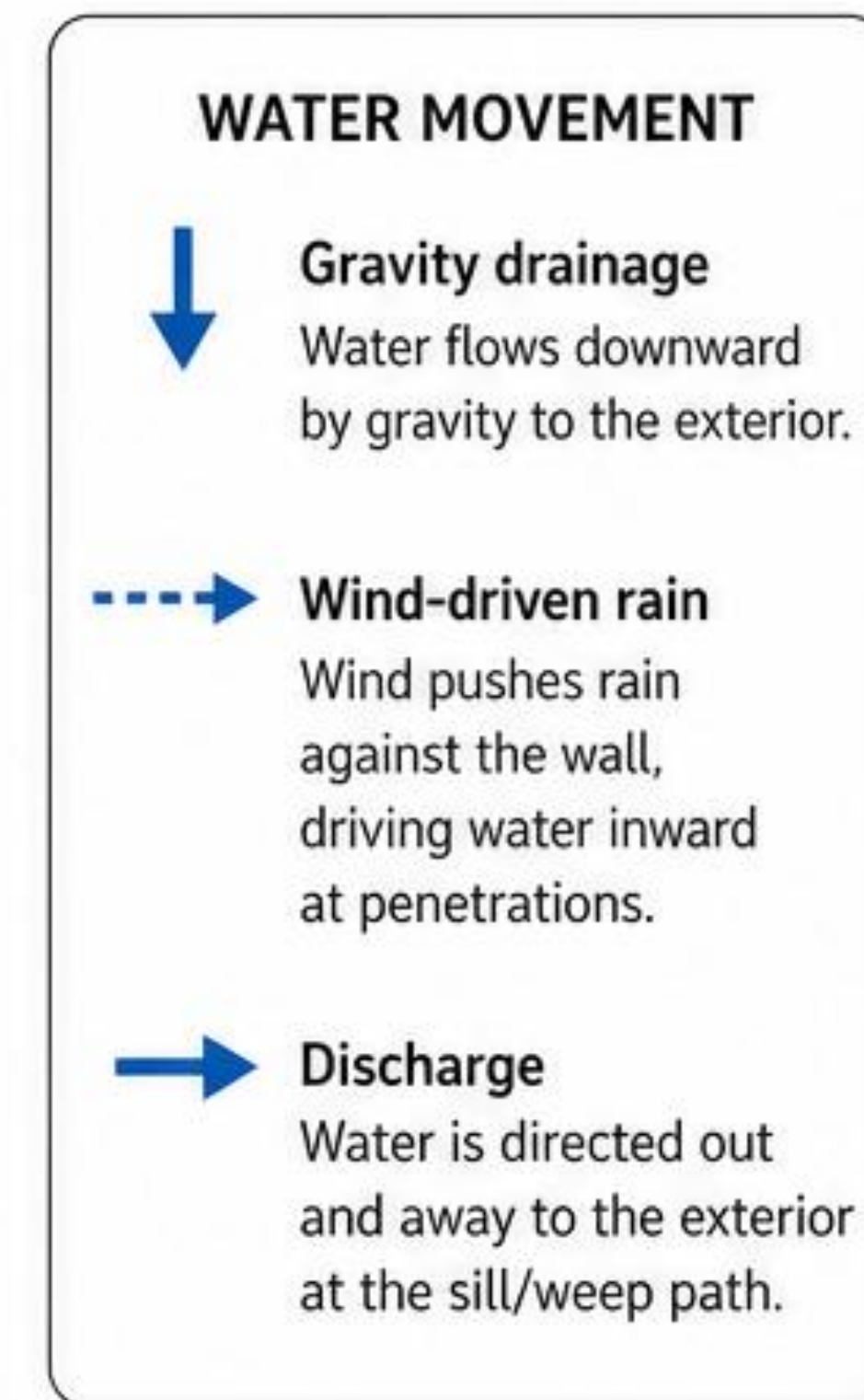
MANUFACTURER INSTRUCTIONS (cont.)

3. Where **flashing instructions** or details are **not provided**:
 - **Pan flashing shall be installed at the sill**
 - **Pan flashing shall be sealed or sloped**
 - **Flashing shall be at the head and sides**
4. The **flashing design** or method of a ***registered design professional***.
5. With other **approved methods by the Building Official**.



HOW IT WORKS

- For a **Typical Window**:
 - **Head flashing diverts water away** from the top of the window.
 - The **WRB overlaps the flashing in a "shingle fashion."**
 - **Sill flashing directs any water** that reaches the rough opening **back to the exterior.**
- If these layers are **installed in the wrong sequence, water can be directed into the wall** instead of out of it.



THE “SHINGLE” PRINCIPLE

- Always install flashing such that:

- 1 Upper layers overlap lower layers

HEAD FLASHING
(Upper layer)

JAMB FLASHING
(Middle layer)

SILL FLASHING
(Lower layer)



Each upper layer overlaps the layer below it.



- 2 Water flows downhill



Gravity is your friend. Keep water moving out and down.



Ensure water always flows to the exterior.



- 3 Never reverse the lap

INCORRECT

HEAD FLASHING
(Upper layer)

JAMB FLASHING
(Middle layer)

SILL FLASHING
(Lower layer)



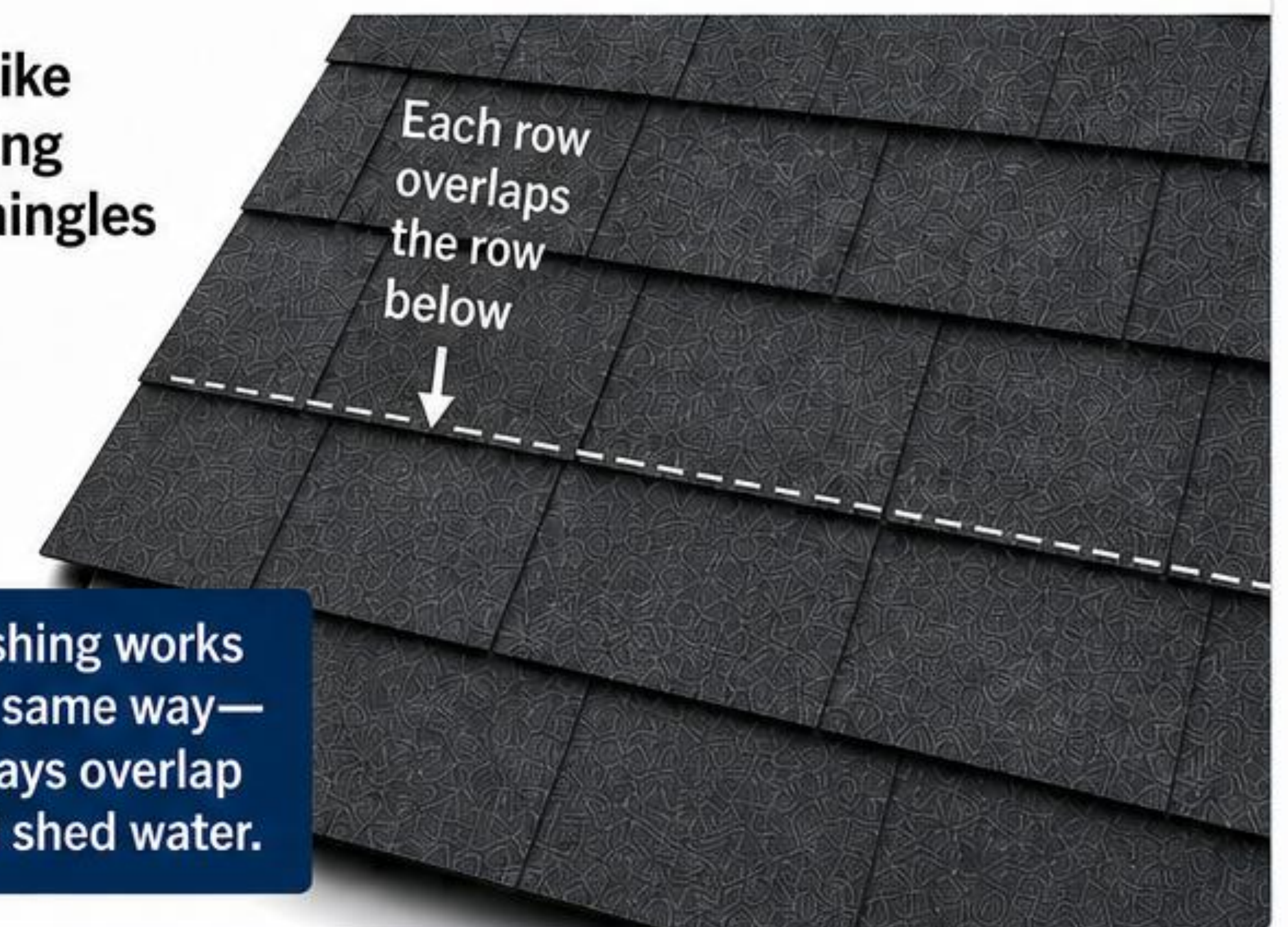
Reversed lap allows water to get behind the flashing.



- 4 Think like installing roof shingles



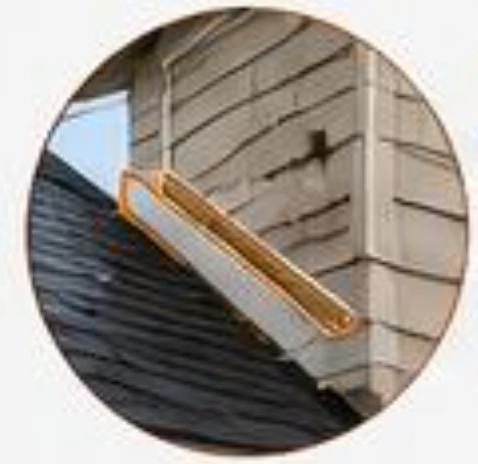
Flashing works the same way—always overlap and shed water.



WHERE IS FLASHING REQUIRED?



- 1 Chimney**
Where the chimney meets the roof.



- 2 Roof-to-Wall Intersections**
Where roof meets vertical wall.



- 3 Dormers**
At the sides and top of dormer walls and roofs.



- 4 Windows (Head)**
Above all window openings.



- 5 Windows (Jambs)**
Along the sides of window openings.



- 6 Windows (Sill)**
At the bottom of window openings.



- 7 Roof Valleys**
Where two roof planes meet.



- 8 Eaves & Rakes**
Along the edges of roof eaves and rakes.



- 9 Porches & Sheds**
Where roof meets walls.



- 10 Garage Doors (Above)**
Above overhead door openings.



- 11 Wall Penetrations**
Around pipes, vents, meters, and other penetrations.



FLASHING'S JOB:

Prevent water from entering the wall assembly and direct it to the exterior.

GENERAL PRINCIPLES:

- Flashing must be installed to shed water.
- Upper flashing must overlap lower flashing.
- Flashing must integrate with the WRB.



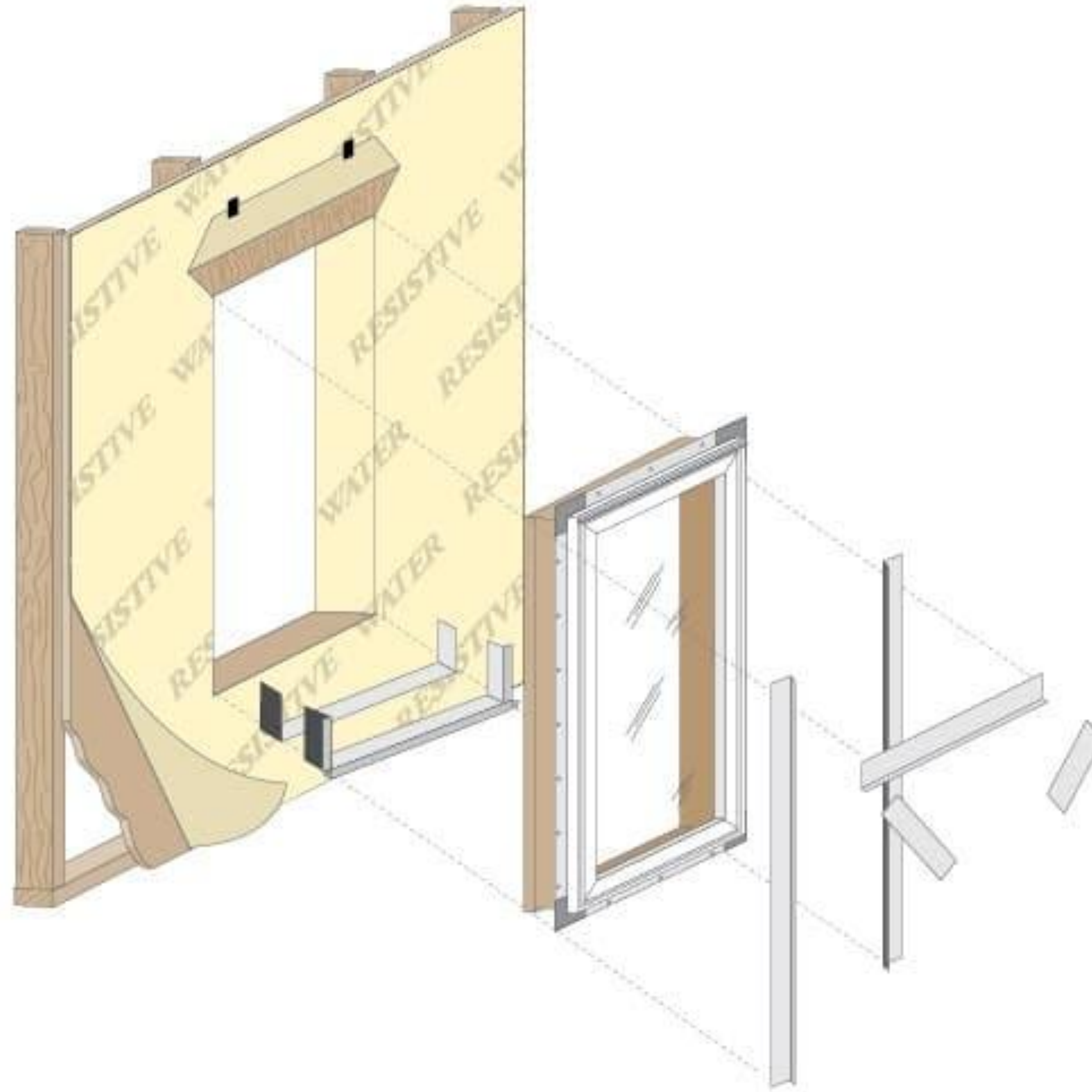
2024 IRC REFERENCE (FYI)

R703.4 – FLASHING

Flashing shall be installed in such a manner as to prevent moisture from entering the wall or to redirect moisture to the exterior.

FLASHING WINDOWS & DOORS

NAIL FIN WINDOW OVER HOUSEWRAP

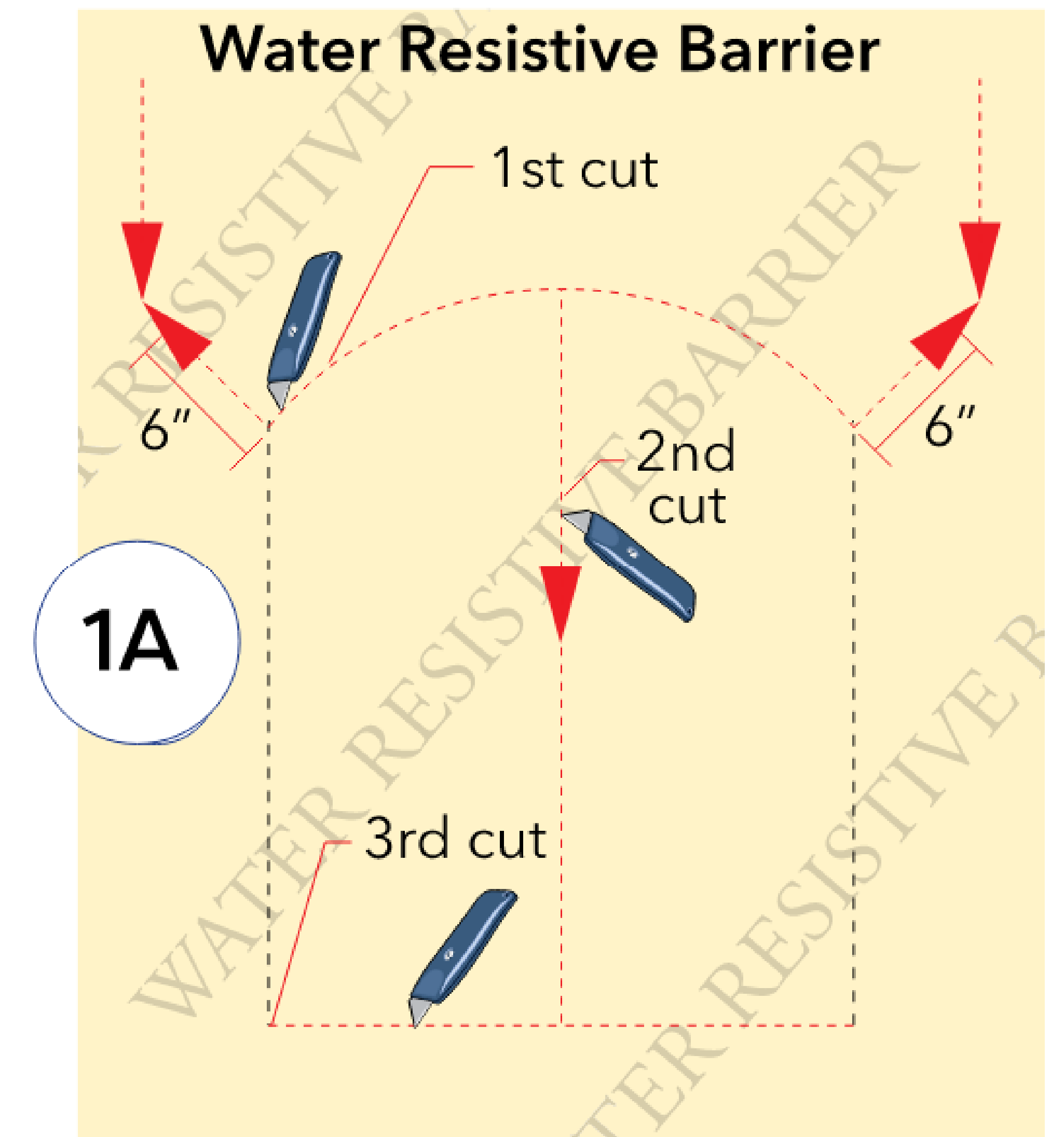
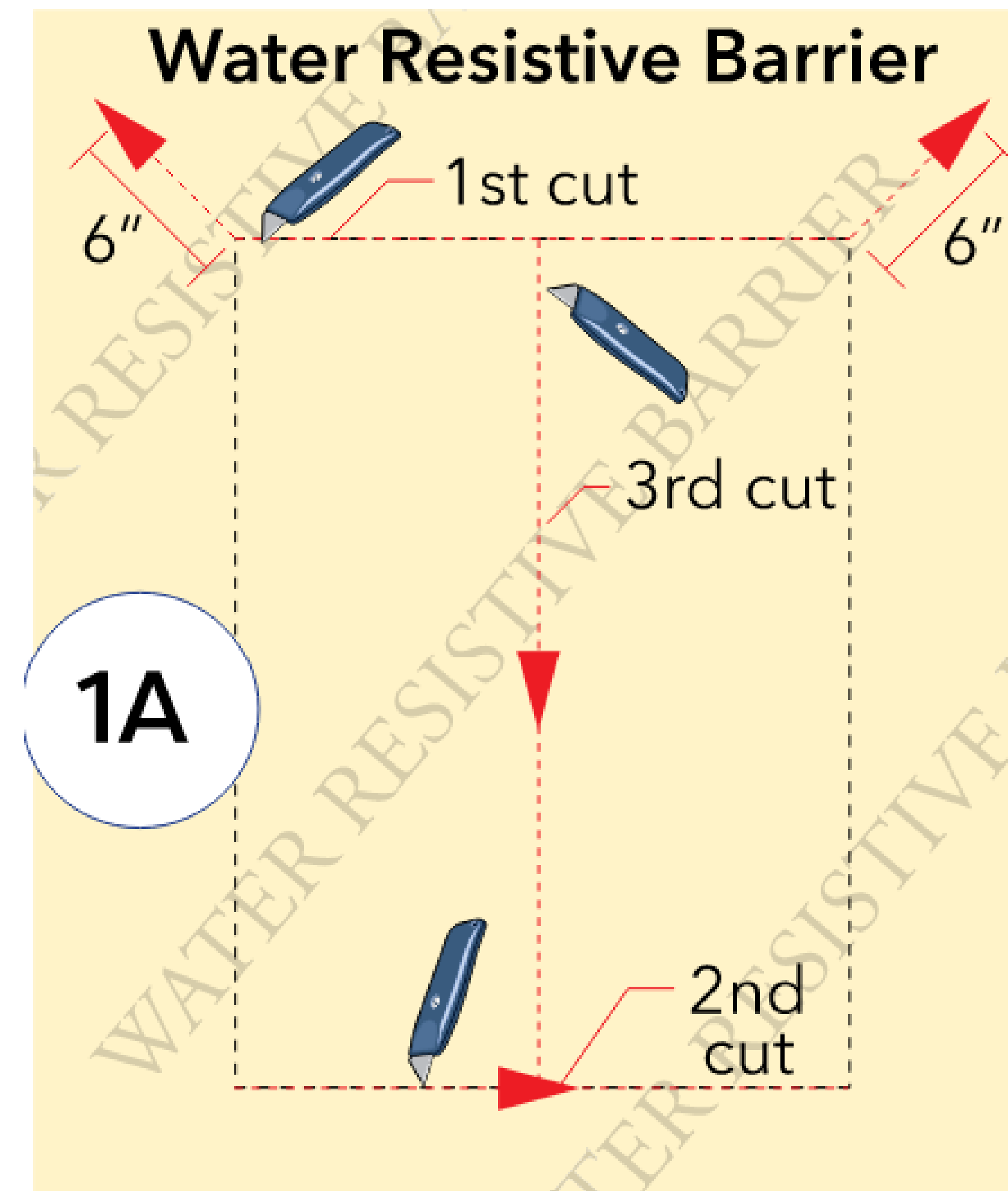
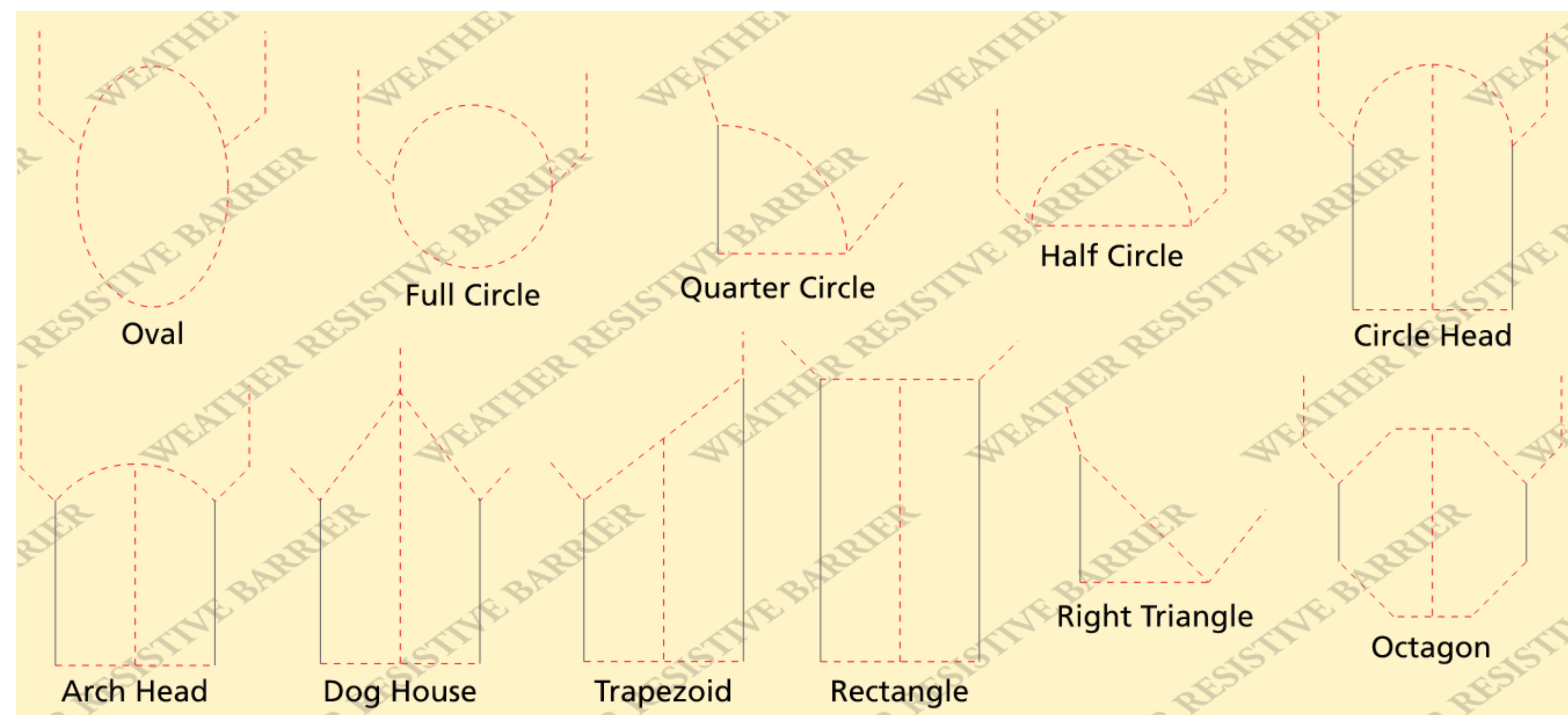


NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

Step 1: Cut the building wrap. (1A)

Refer to the diagram for other window shapes

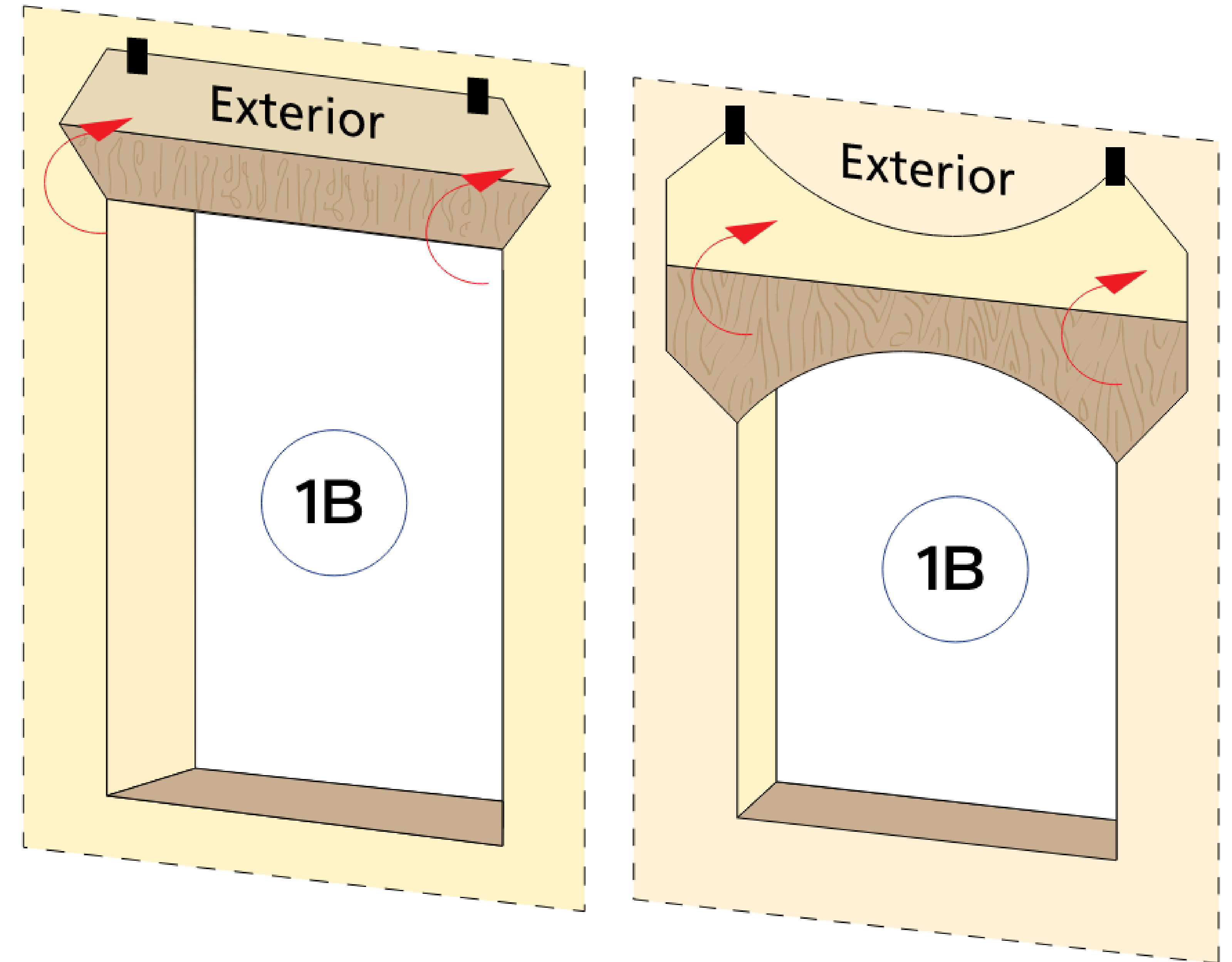
Building Wrap Cutting Patterns for Window Shapes:



NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

Step 2: Fold the building wrap in at the jambs and staple it in place. (1B)

Fold the top flap up and temporarily fasten with flashing tape.



NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

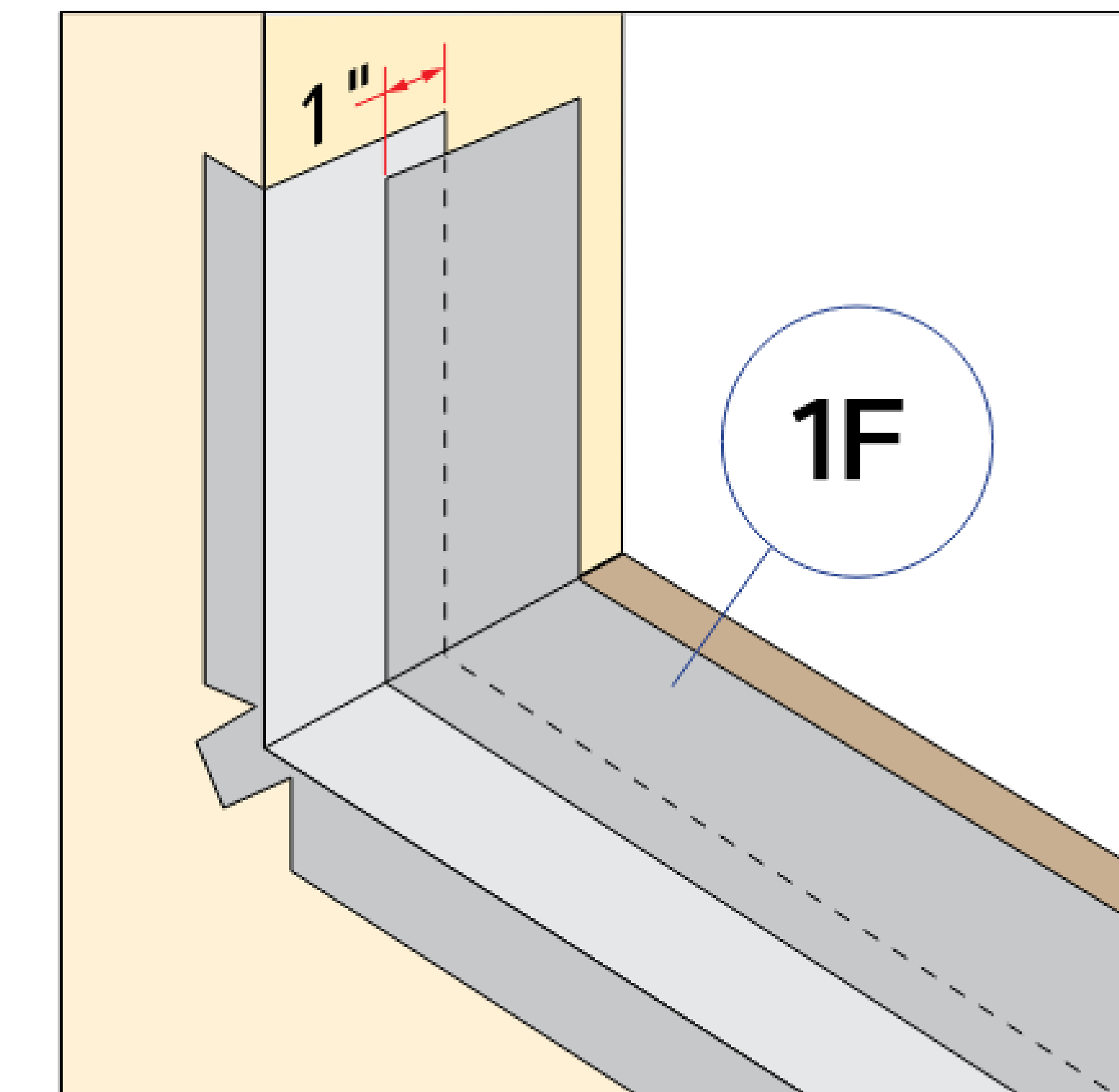
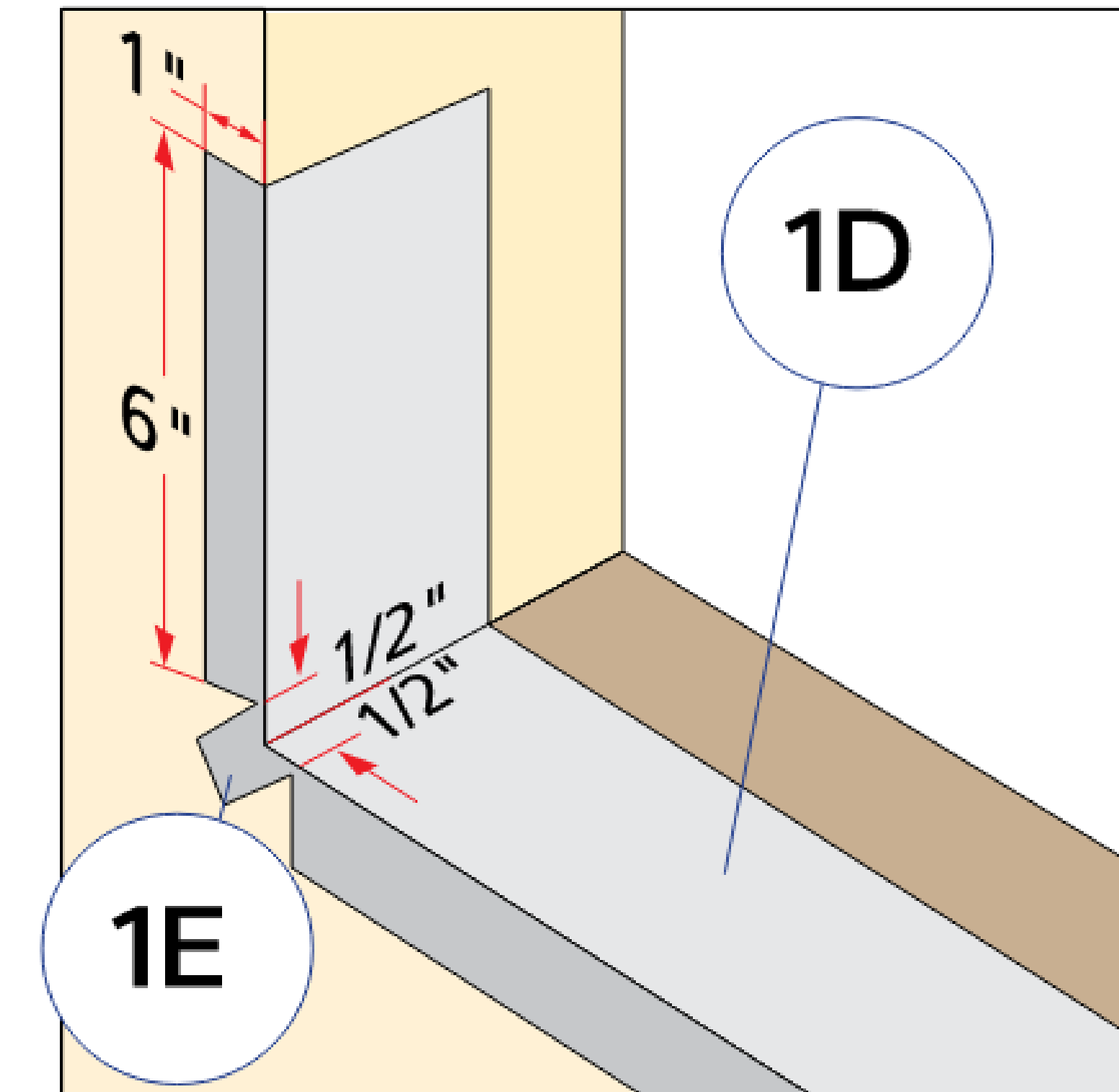
Step 3: Cut 2 pieces of flashing tape 12" longer than opening width.

Step 4: Apply sill flashing tape #1 at the sill extending 1" to the exterior and 6" up each jamb. (1D)

Step 5: Cut 1" wide tabs at each corner by tearing the foil 1/2" each way from corner. (1E)

Step 6: Apply sill flashing tape #2 overlapping tape #1 by 1" minimum. (1F)

- **NOTICE:** Press all tape down firmly.
- **ALTERNATE:** Install per manufacturer's specifications



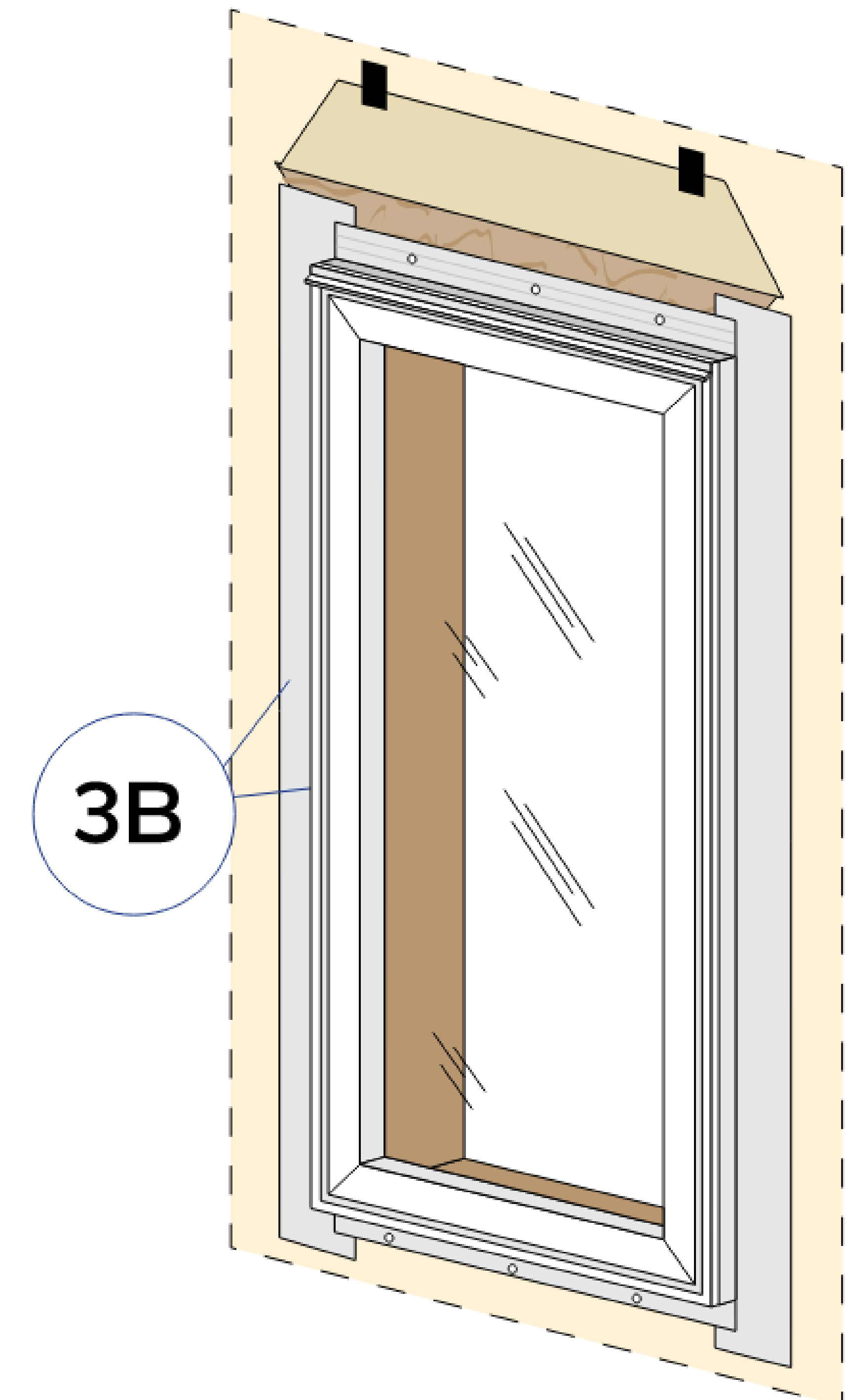
NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

Step 7: Set and fasten the window per the manufacturer's specifications (not shown).

Step 8: Apply straight side flashing tape. Cut two pieces of flashing tape 4" taller than straight sides.

Apply tape over the fin and onto weather resistive barrier.

Extend tape 2" above and below straight sides.
(3B)

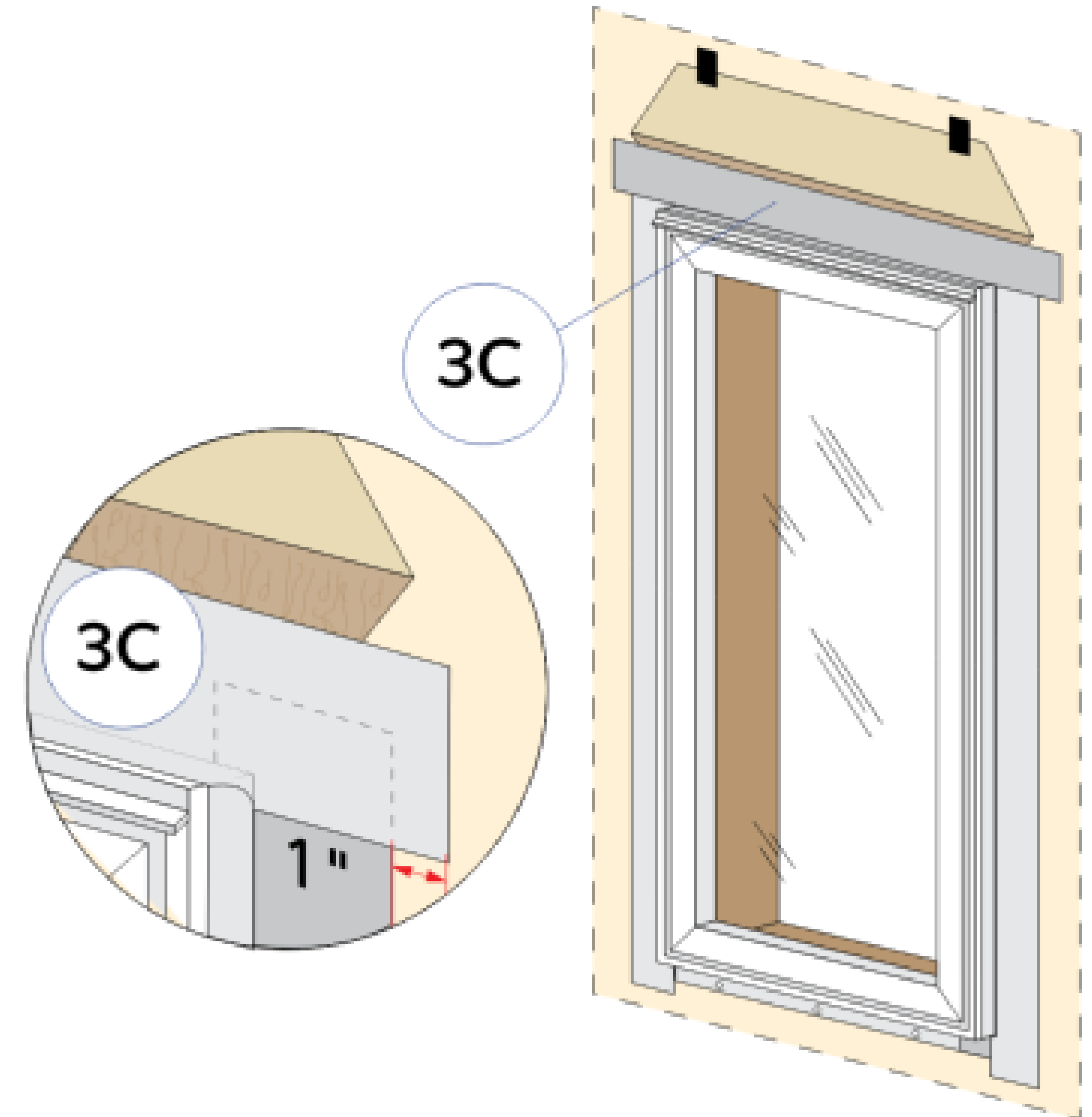


NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

Step 9: Apply top flashing tape. (3C)

Rectangular Units: Cut one piece of flashing tape to extend 1" past both side flashing tapes.

Curved Top Units: Using several short pieces, start taping from the sides of the window working towards the peak. Cut each piece short enough so each piece overlaps the previous piece. Tighter curved frames will require shorter



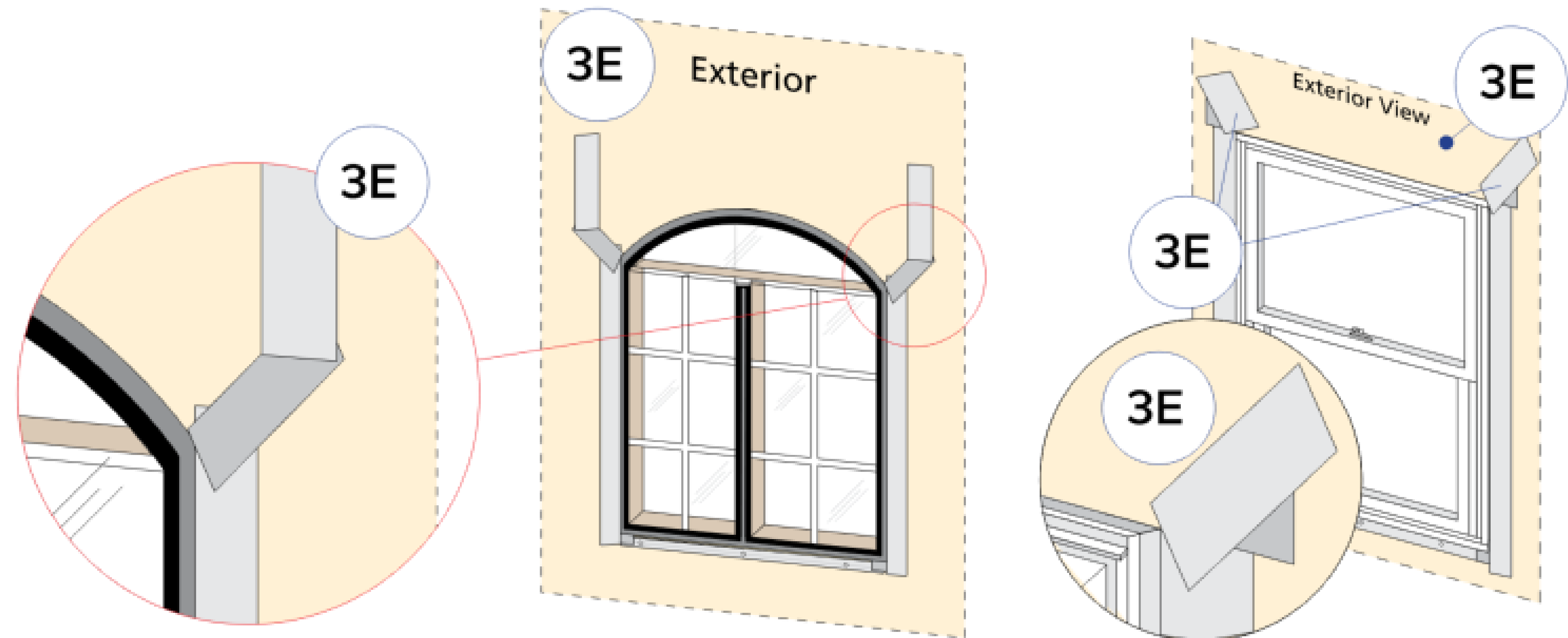
NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

Step 10: Fold down top flap of weather resistive barrier. (3E)

Step 11: Apply flashing tape to top diagonal cuts. Cut pieces of flashing tape at least 1" longer than each diagonal cut. (3E)

Lap tape 1" past end of cut onto weather barrier.

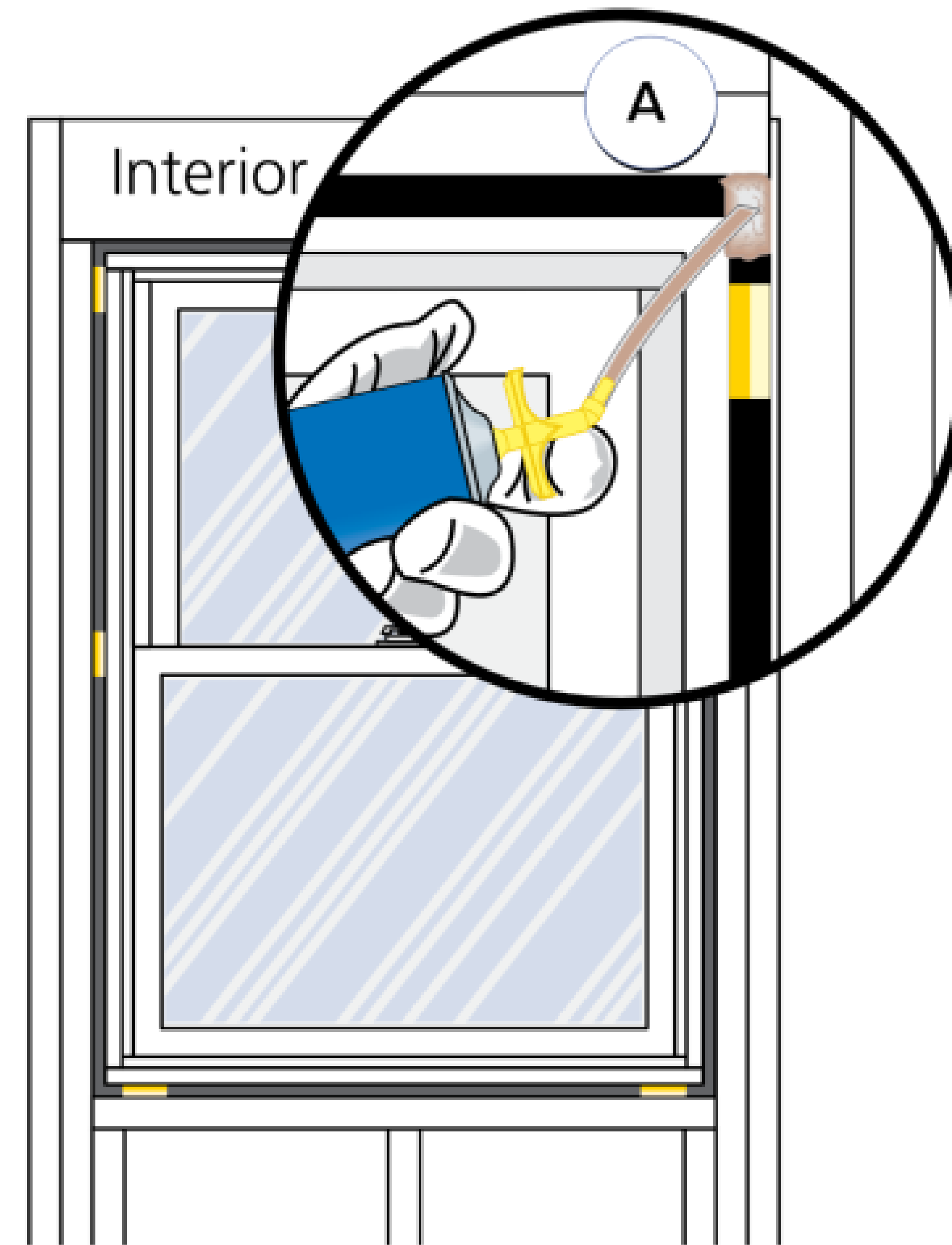
Overlap multiple pieces of tape by 1" when necessary.



Notes: 1) Refer to the water resistive barrier manufacturer's instructions for compliant tapes

NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

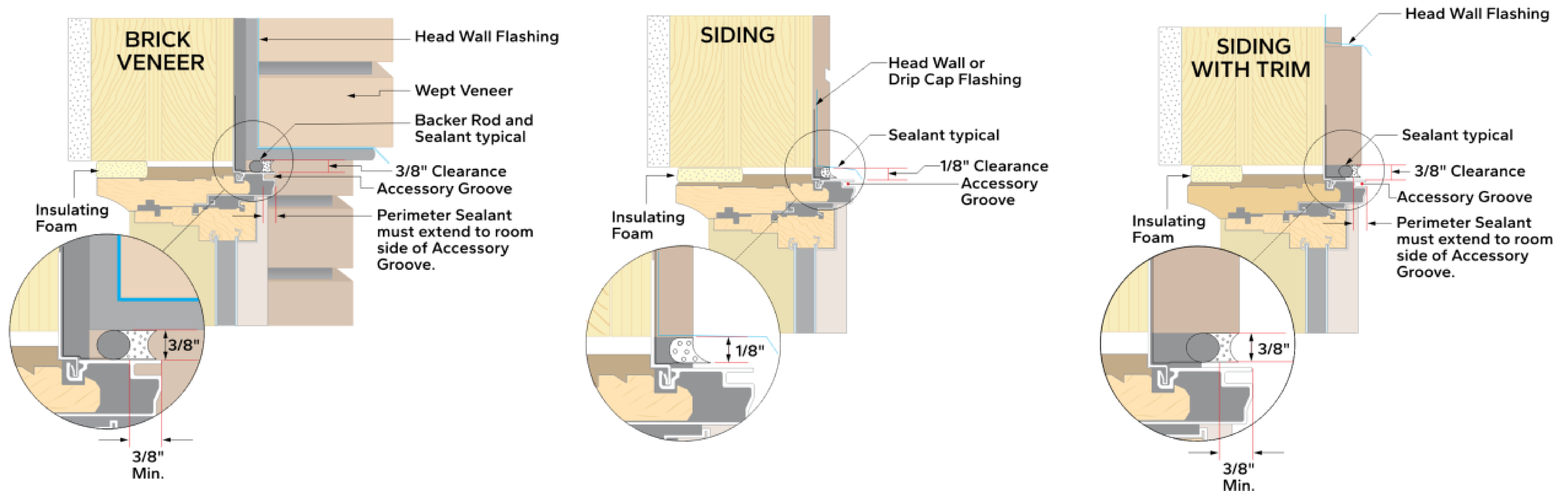
Step 12: Install interior expandable foam sealant per manufacturer's specifications.
(A)



NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

Step 13: Install headwall flashing, properly incorporating it with the siding and building wrap according to applicable code requirements.

Step 14: Install exterior sealant. (After wall cladding is installed)

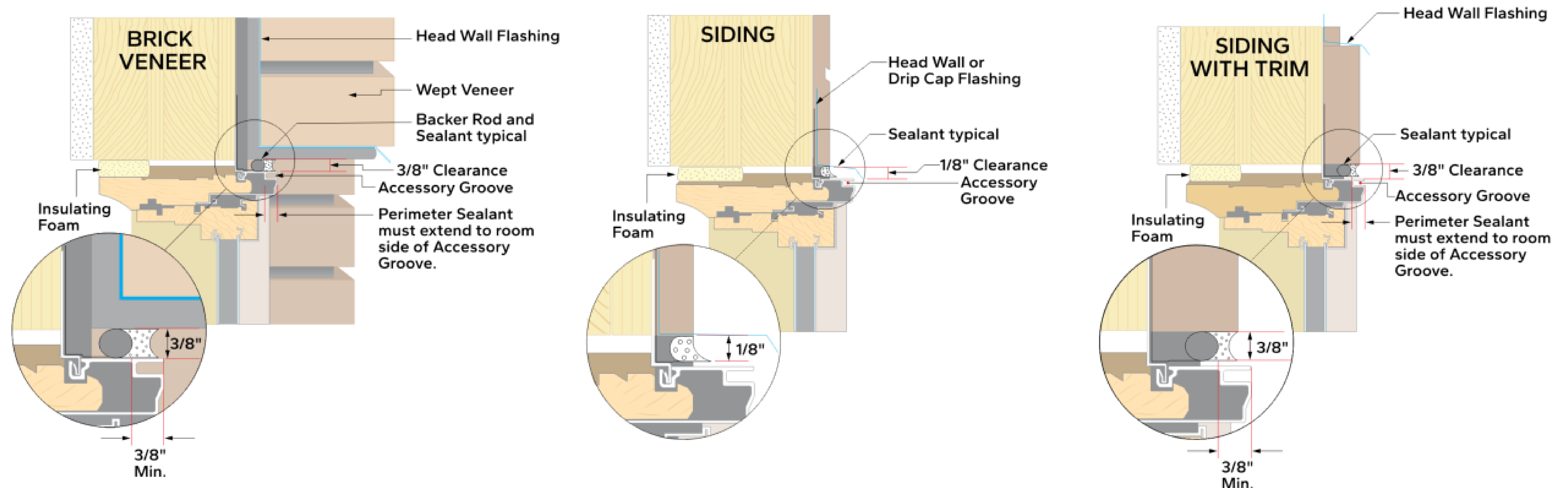


Note: Refer to wall cladding manufacturer's instructions.

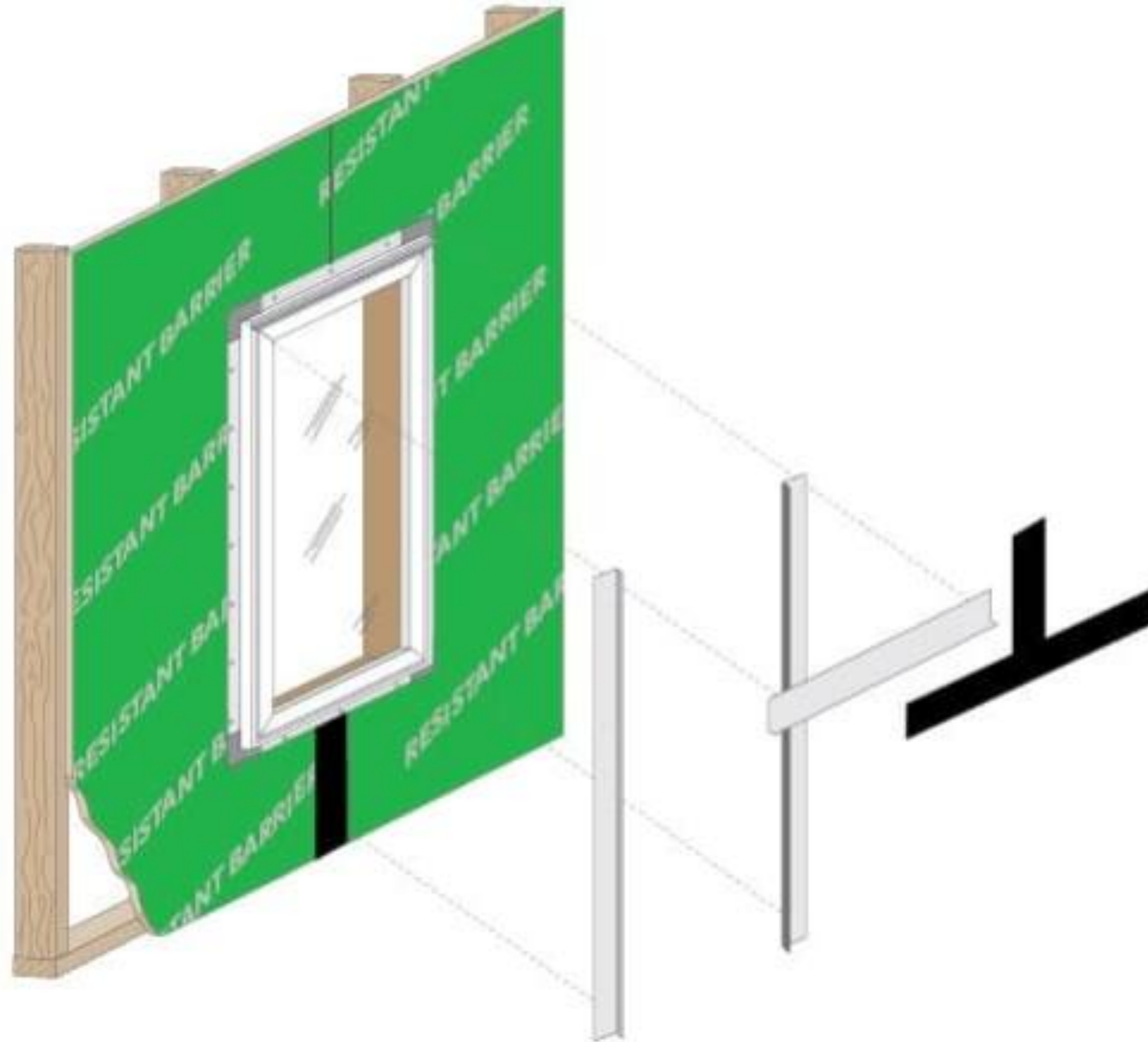
NAIL FIN WINDOW OVER HOUSEWRAP (cont.)

Step 14: Install exterior sealant. (After wall cladding is installed) refer to the exterior sealant instructions at the end of this booklet.

Note: Refer to wall cladding manufacturer's instructions.



NAIL FIN WINDOW OVER ZIP SYSTEM

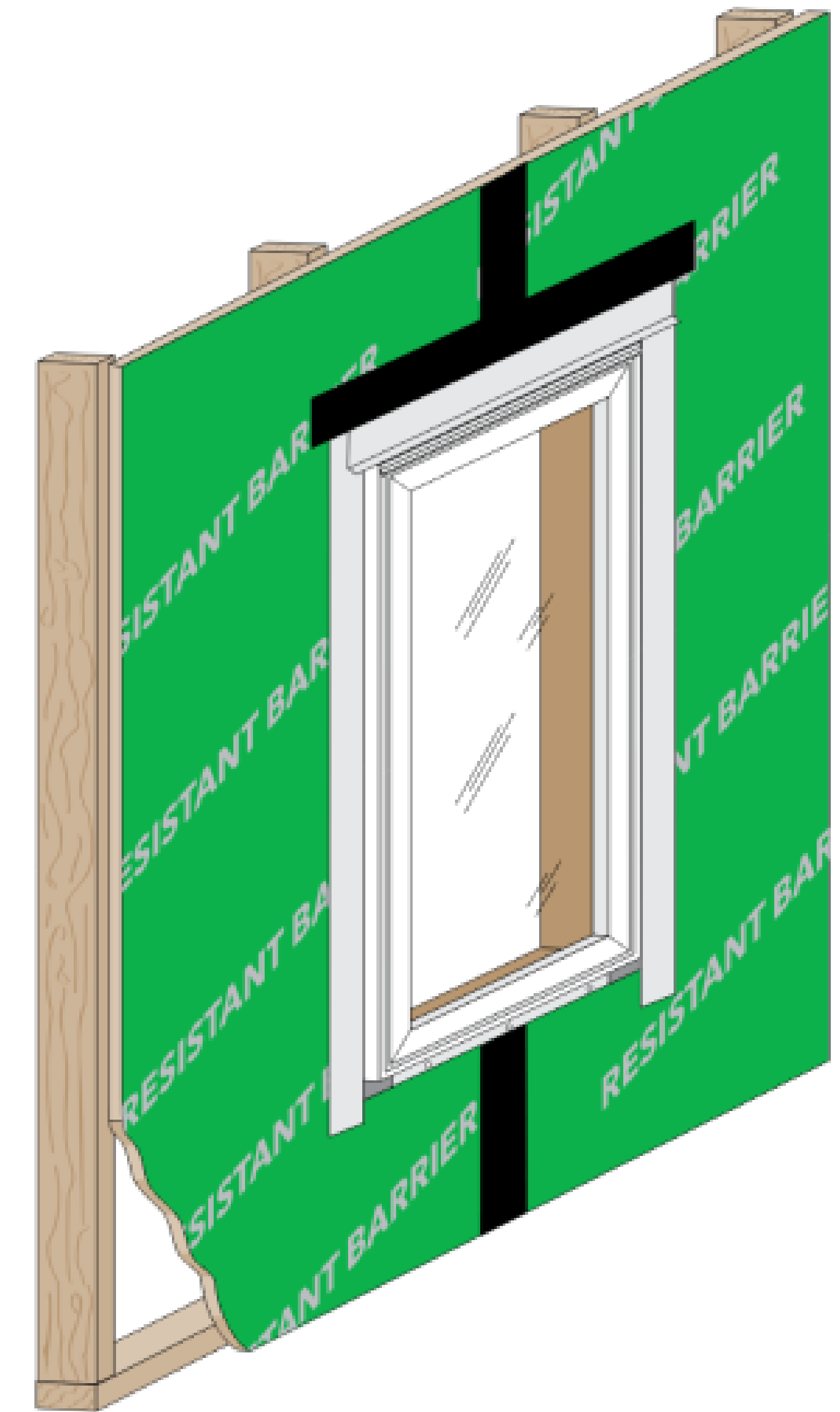
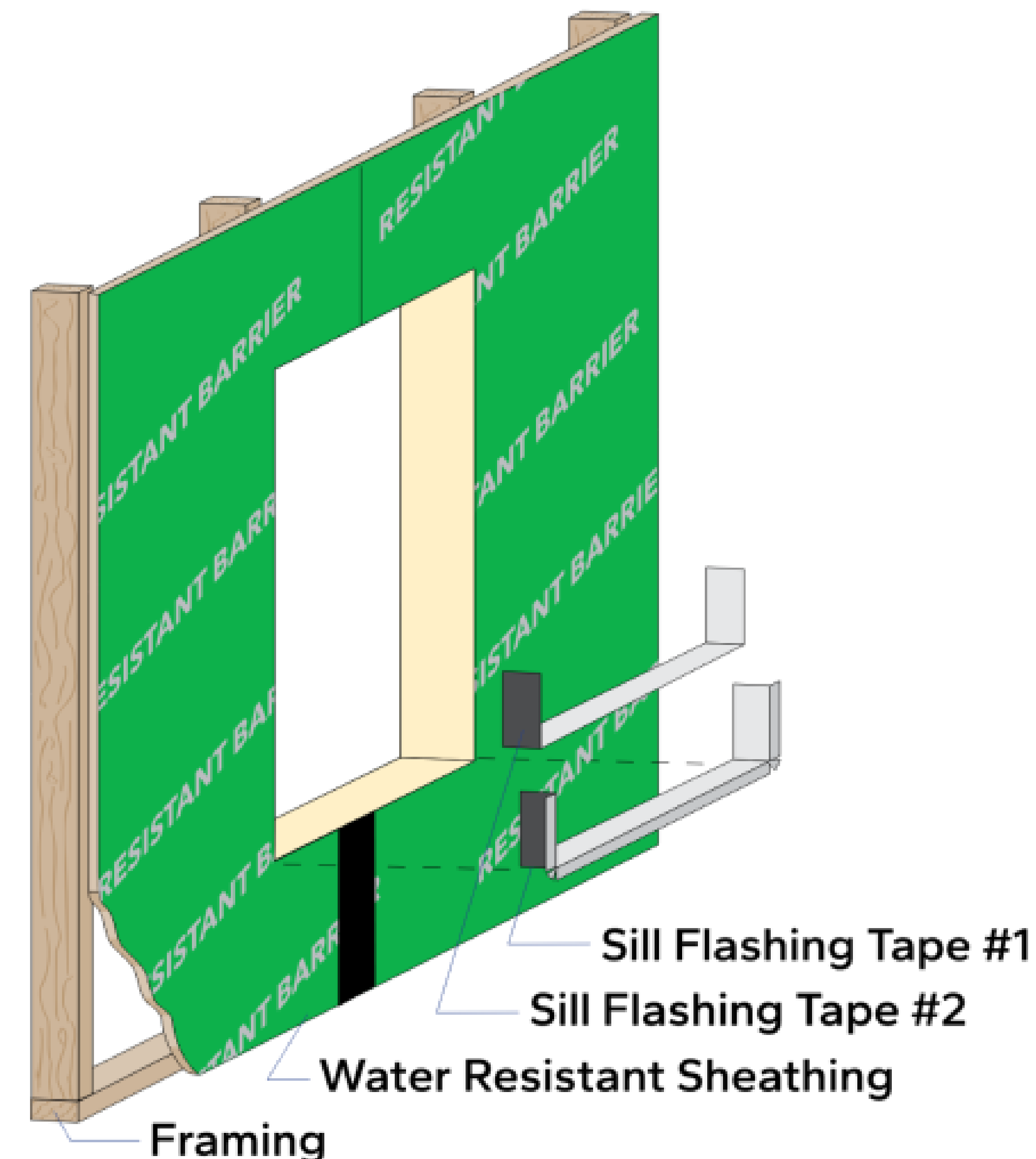


NAIL FIN WINDOW OVER ZIP SYSTEM (cont.)

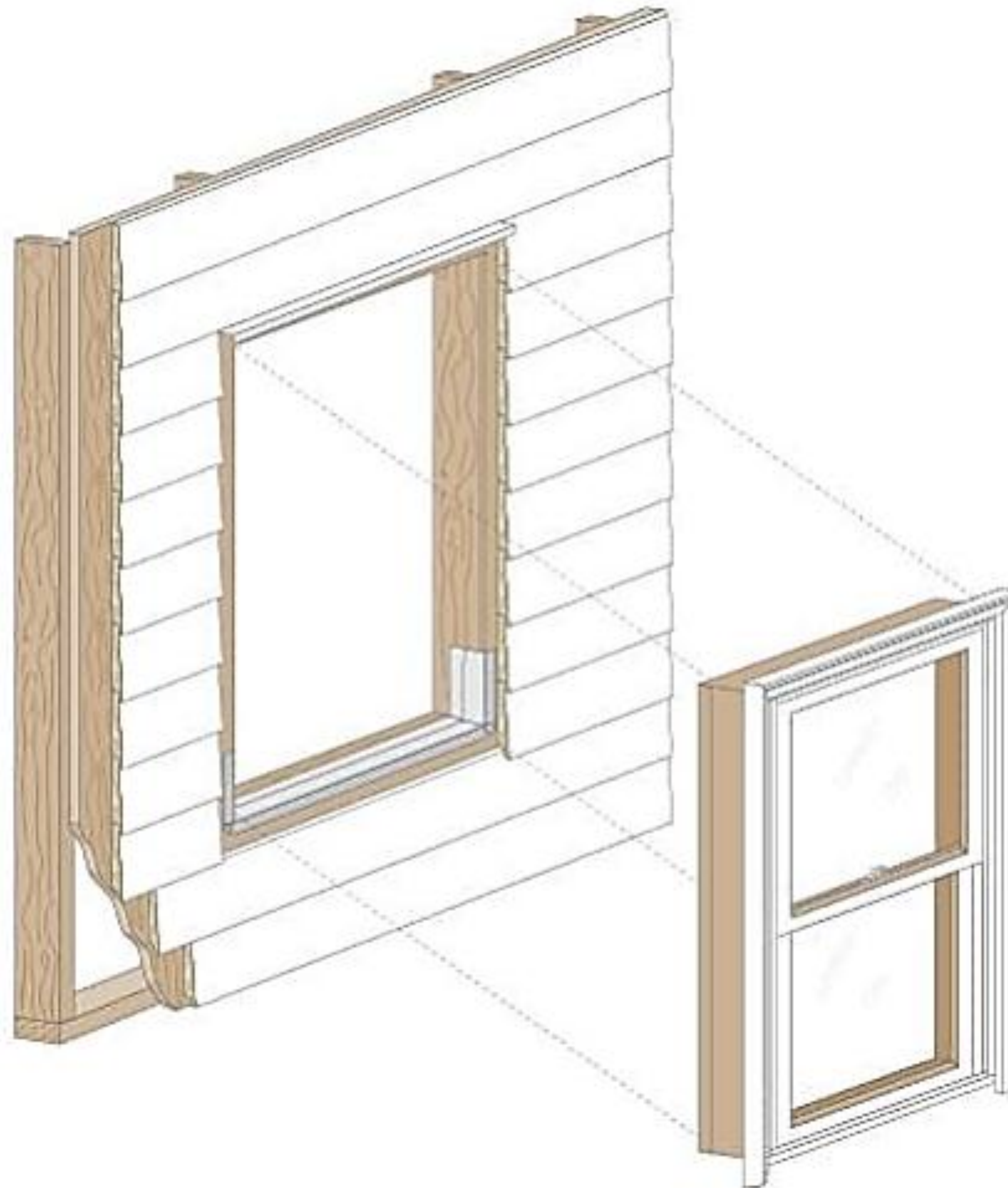
Note: Zip system installation is essentially the same as a nail fin window install.

Exception:

- 1. Any vertical joints below the window opening shall be sealed with tape before the sill pan flashing is installed.**
- 2. Any vertical joints above the window opening shall not be taped until all head flashing is installed.**



BRICK MOLD WINDOWS



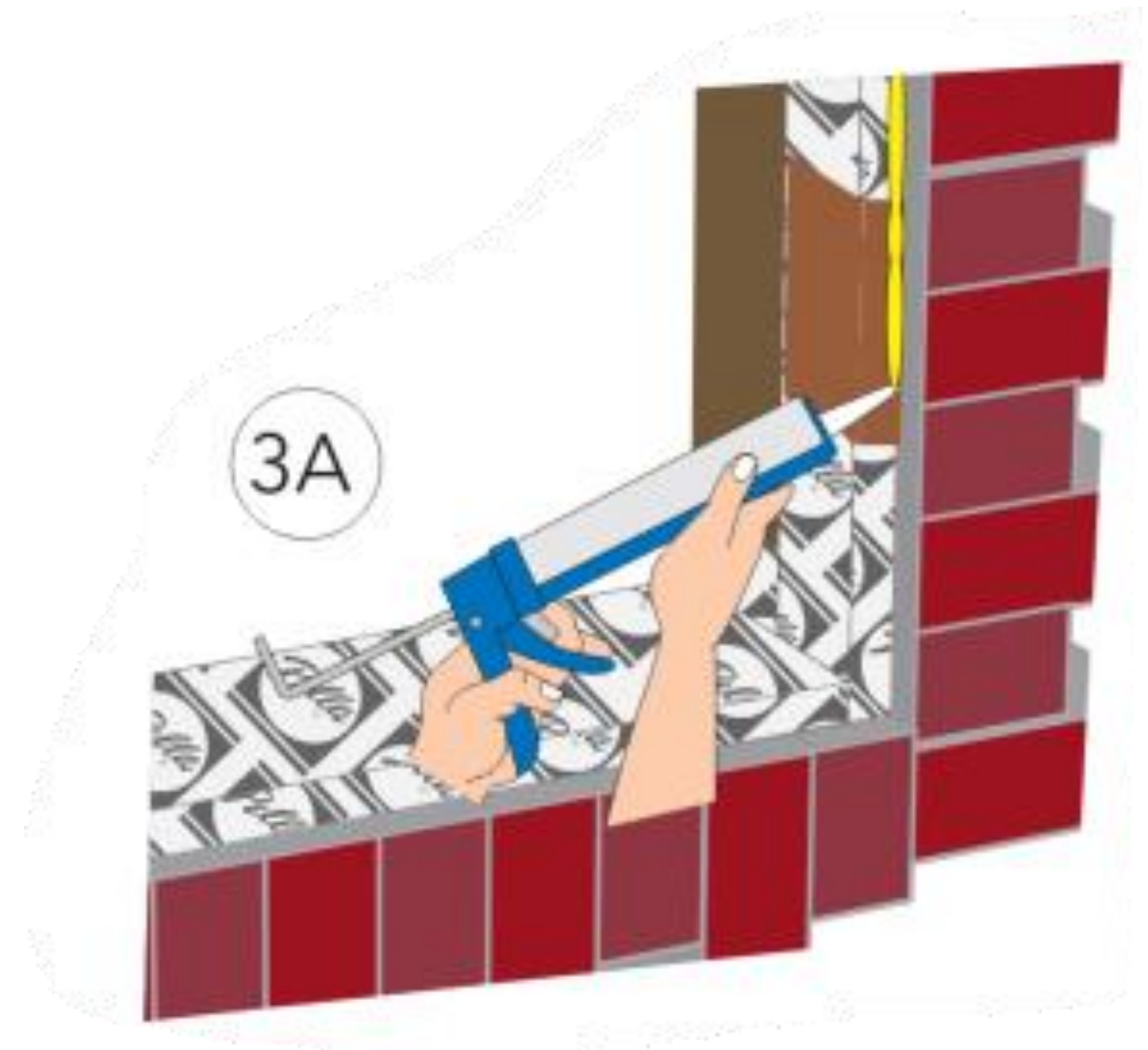
BRICK MOLD WINDOWS (cont.)

Note: Brick mold window installation is essentially the same as a nail fin window install.

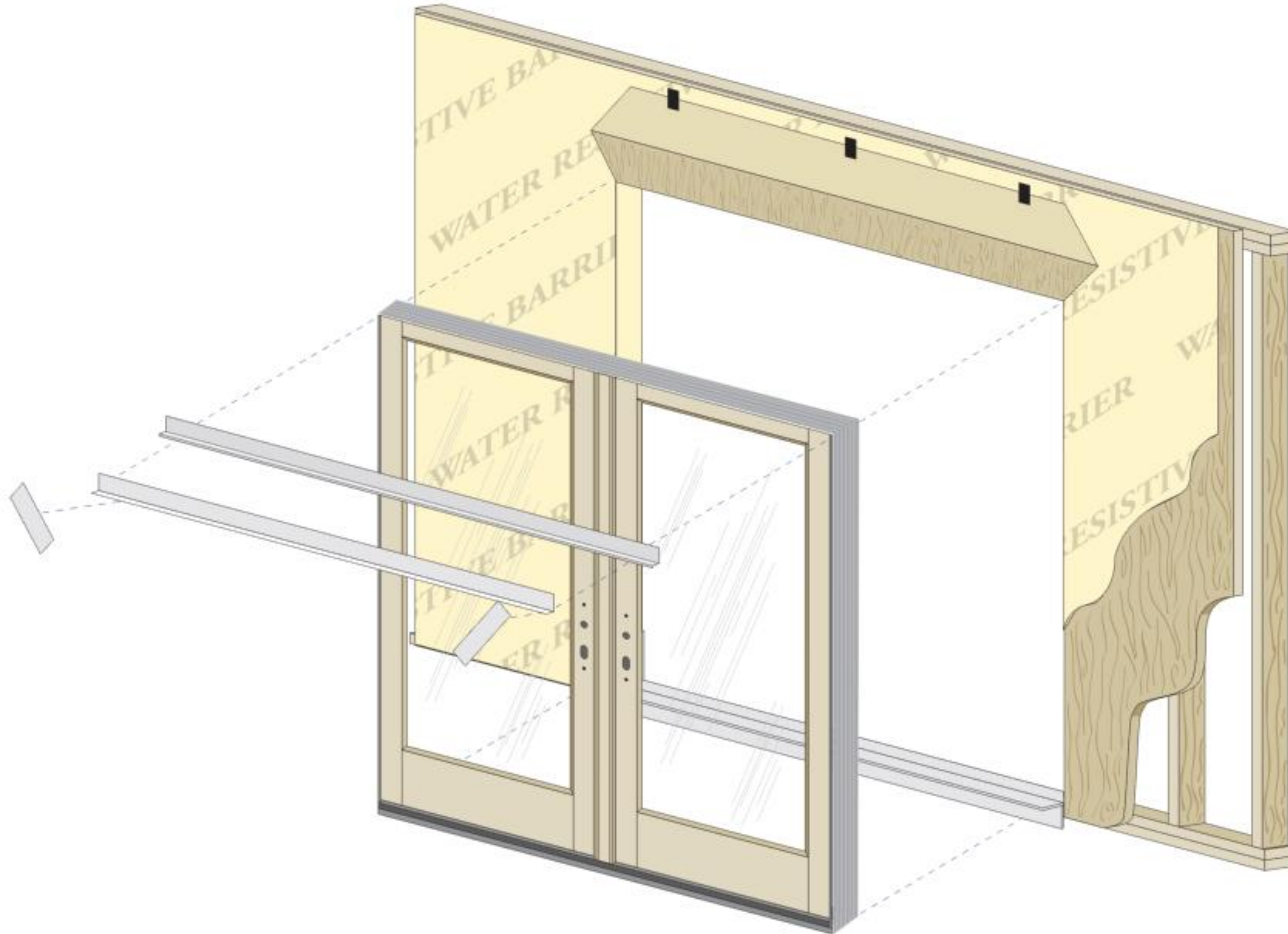
Exception:

- 1. Before you set the window, place a continuous 3/8" bead of sealant on the surface of the wall where the brickmould will be placed.**

Leave 2" gaps near each jamb along the sill.



DOORS



DOORS (cont.)

Note: Door installation is essentially the same as a nail fin window install.

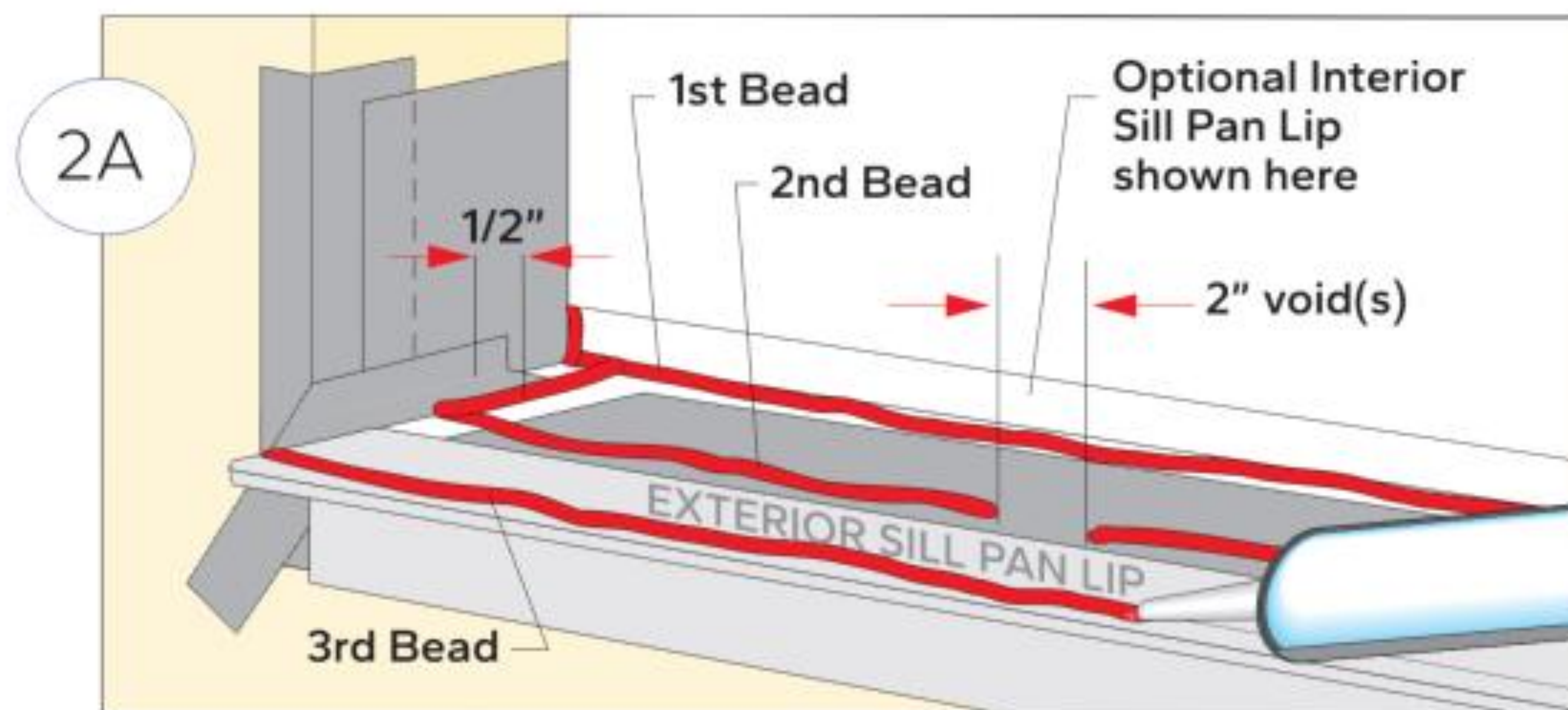
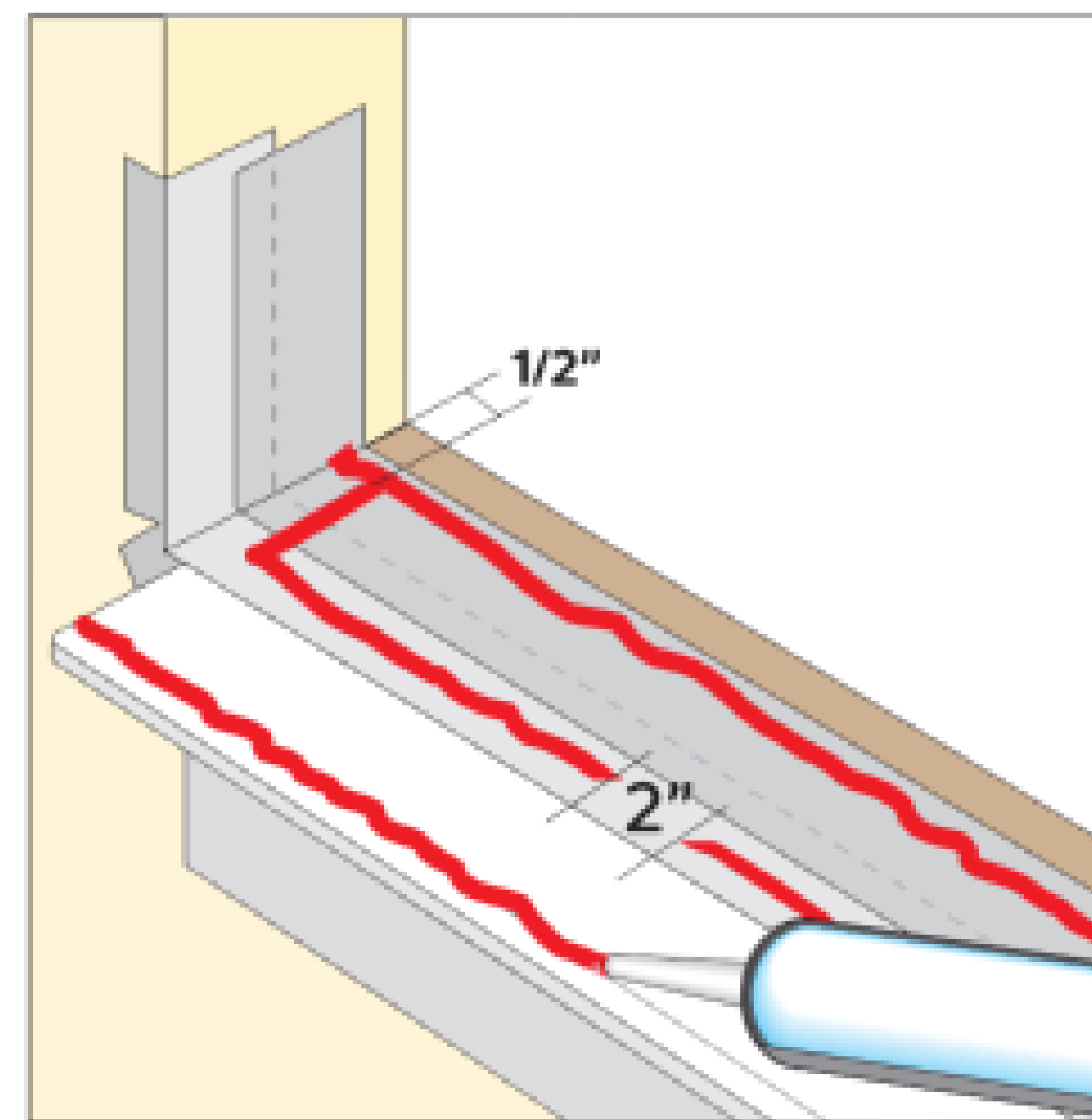
Exception:

- 1. Place three 3/8" beads of sealant across the opening sill. Place the interior-most bead 1/2" from where the interior of the door sill will remain after installation. Continue this bead up the sill pan lip, if applicable.**
- 2. Place a second bead beginning from the interior bead 1/2" from each side, out to the exterior of the framing and along the opening. Leave 2" voids 4" from the corner and at the center.**
- 3. Place a third bead where the exterior of the door sill will remain after installation.**



DOORS (cont.)

Note: Door installation is essentially the same as a nail fin window install except there is a sill pan lip at the threshold



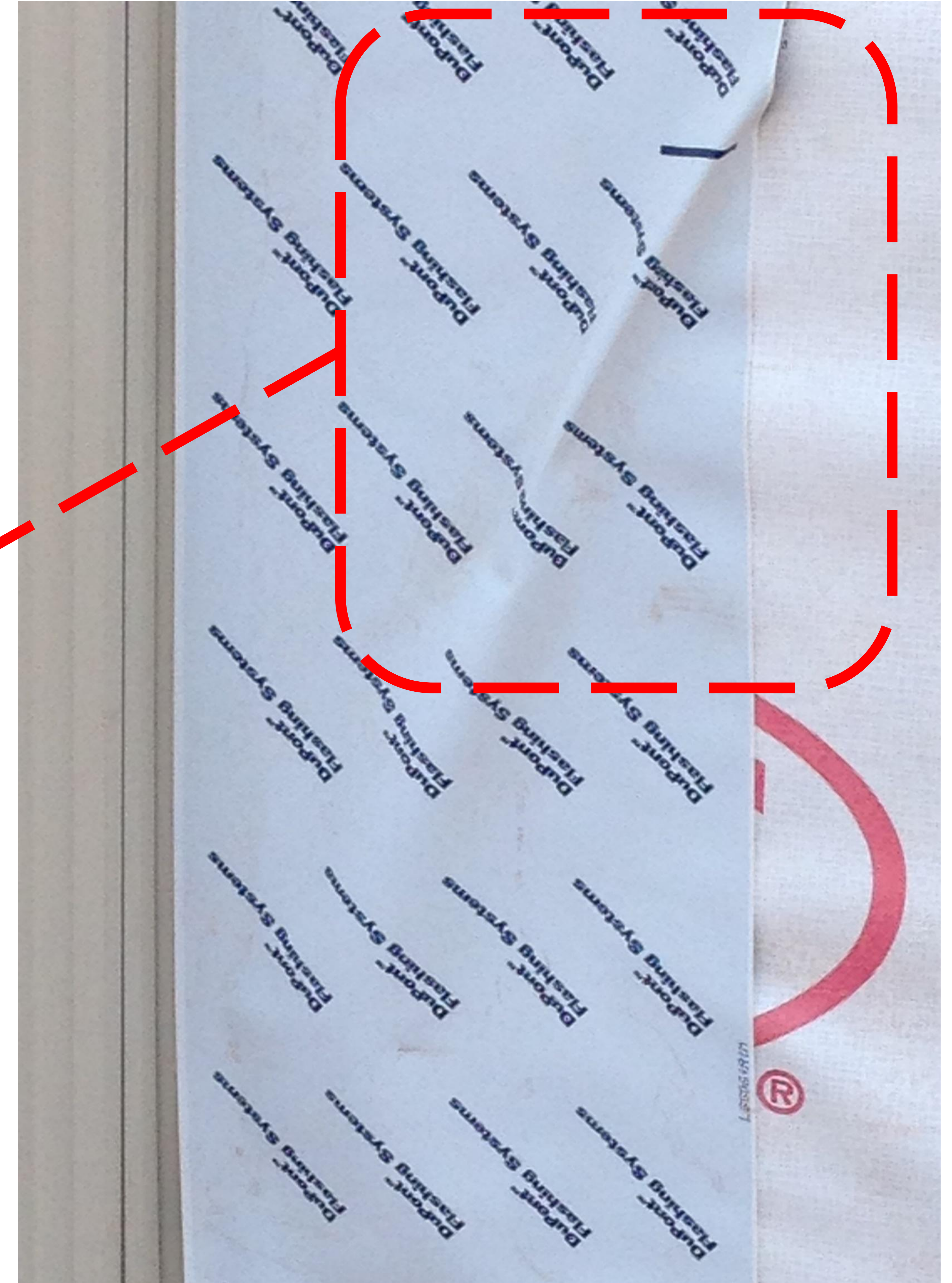
Exception:

1. **Place three 3/8" beads of sealant across the opening sill.** Place the interior-most bead 1/2" from where the interior of the door sill will remain after installation. Continue this bead up the sill pan lip, if applicable.
2. **Place a second bead beginning from the interior bead 1/2" from each side, out to the exterior of the framing and along the opening.** Leave 2" voids 4" from the corner and at the center.
3. **Place a third bead where the exterior of the door sill will remain after installation.**

COMMON FLASHING FAILURES

WHAT'S WRONG?

1. The flashing has a "fishmouth" (wrinkle)
 - This creates a point for water to enter
2. The flashing was not rolled
 - This does not create a tight bond with the WRB which allows water to penetrate



WHAT'S WRONG?

1. Improper jamb flashing

- The jamb flashing does not cover the sill flashing
- This does not create the proper "shingle" effect that potentially allows water to penetrate

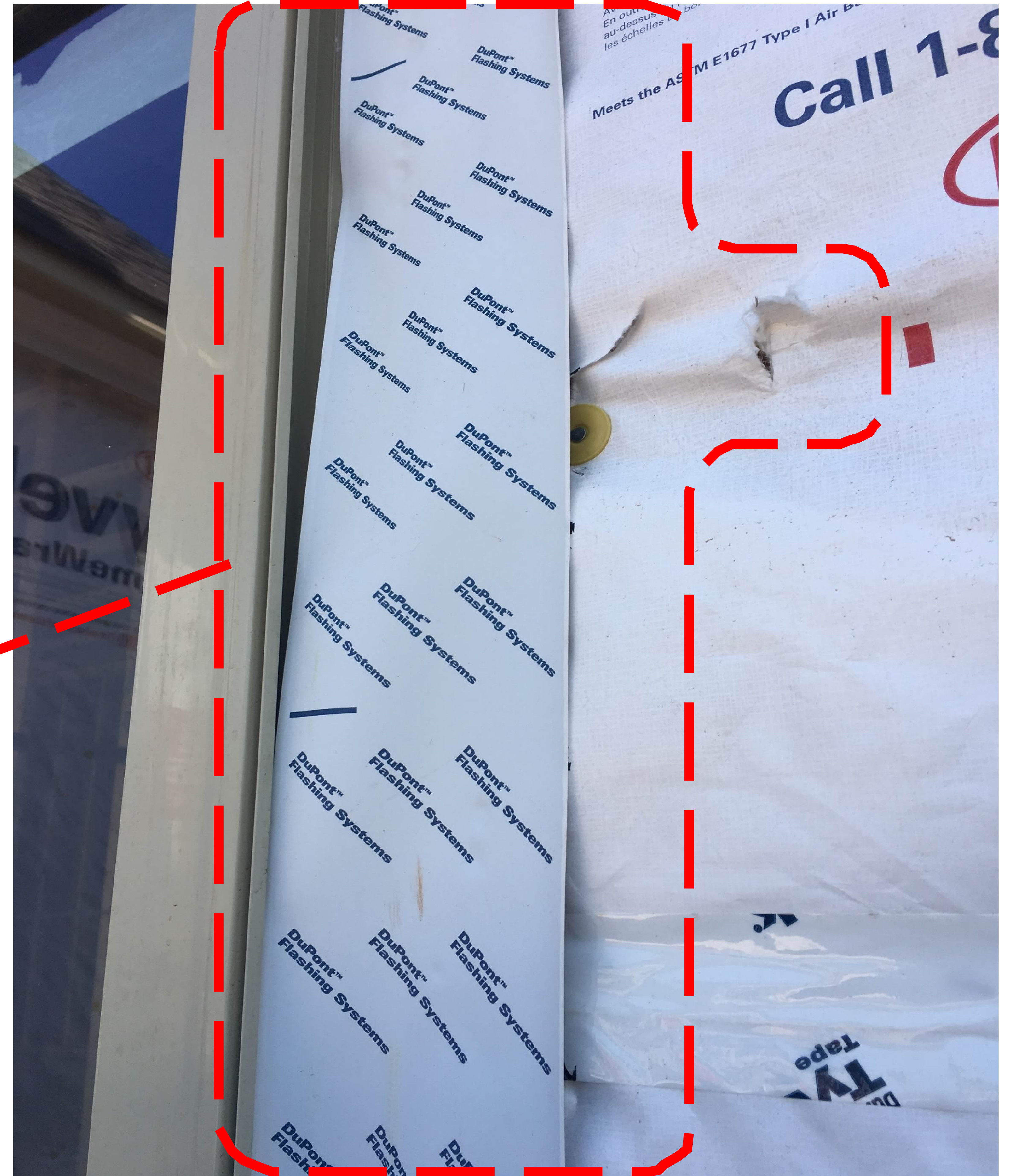
2. Improper sill flashing

- The sill tape rolled back on itself at the top right which does not create the proper bond
- The sill tape may be overstretched



WHAT'S WRONG?

- 1. The flashing was not rolled**
 - This does not create a tight bond with the WRB which allows water to penetrate
- 2. Tear in the housewrap**
 - Allows water to come in direct contact with the wood
- 3. Fastener under the flashing tape**
 - Fasteners underneath can interfere with proper tape adhesion and create pathways for water or air



WHAT'S WRONG?

1. Improper head flashing

- The head flashing does not extend beyond the jamb flashing
- This does not create the proper "shingle" effect that potentially allows water to penetrate



WHAT'S WRONG?

1. Missing WRB head flap

- The housewrap does not overlap the head flashing to create the “shingle” effect

2. Reverse shingle

- Non-rectangular windows have special WRB overlap requirements

❖ **All of this creates a potential source for water penetration**



WHAT'S WRONG?

1. Improper jamb flashing

- The jamb flashing does not cover the sill flashing
- This does not create the proper “shingle” effect that potentially allows water to penetrate



WHAT'S WRONG?

1. Improper seam tape at window head

- The vertical seam tape for the WRB above the window must overlap the window head flashing to create the “shingle” effect to prevent potential water penetration.



WHAT'S WRONG?

1. WRB head flap is not taped

- Allows water to come in direct contact with the wood

2. Missing/Improper head flashing

- The head flashing does not cover the jamb flashing
- Potentially allows water to penetrate



WHAT'S WRONG?

1. Missing WRB head flap

- The housewrap does not overlap the head flashing to create the “shingle” effect

2. Reverse shingle

- Non-rectangular windows have special WRB overlap requirements

❖ **All of this creates a potential source for water penetration**



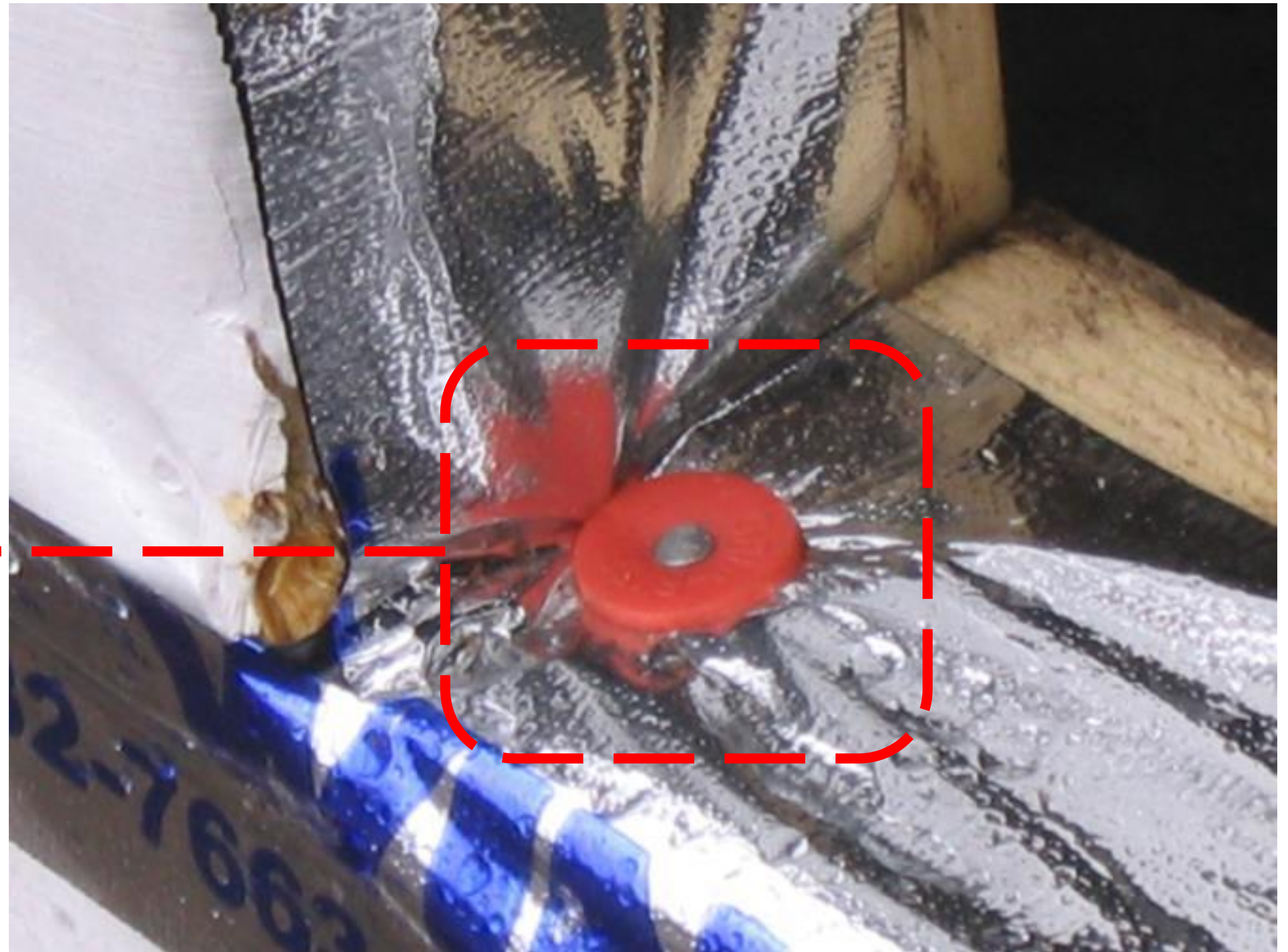
WHAT'S WRONG?

1. Improper sill pan flashing

- The corners and 6" sides are not sealed which allows water to penetrate the wood

2. There is a nail in the sill pan flashing

- This creates a penetration at one of the worst locations for water to penetrate



SUMMARY

PUTTING IT ALL TOGETHER

- **Good Flashing:**
 - Starts with the **Water Resistive Barrier (WRB)**
 - Uses **proper "shingle" sequencing**
 - **Protects** every transition
 - **Follows the manufacturer's instructions**
 - **Directs water** to the exterior

