

Building Enclosure Design Guide

3M™ Air and Vapor Barrier Products 3015 Series

Peace of Mind, by Design

3M™ Self-adhered Product Solutions for New and Remedial Commercial and Industrial Construction

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Where to buy

To learn more visit our website: 3M.com/airbarrier

Email: 3MBuildingProtection@mmm.com

This building enclosure design guide can help commercial and industrial construction professionals make smarter, more confident building envelope decisions—from product selection through installation and detailing. Inside, readers will find a practical, easy-to-use compilation of 3M building envelope solutions, including wraps and flashing.

Wrap solutions:

3M™ Air and Vapor Barrier 3015NP

3M™ Air Barrier with Permeable Membrane 3015VP

3M™ Air Barrier with Non-Woven Permeable Membrane 3015VP-NW

Flashing and seaming tape solutions:

3015NP (detailing widths)

3015VP (6-inch width)

3M™ Ultra Conformable Flashing Tape 3015UC

3M™ Air and Vapor Through Wall Flashing Tape 3015TWF

For architects and specifiers, it provides a clearer path to selecting the right membrane or flashing solution for the wall assembly, project conditions, and design intent.

For building envelope consultants, it offers a concise technical reference to support continuity, compatibility, and performance-based detailing across transitions, penetrations, joints, and repairs.

For purchasers and project stakeholders, it simplifies product evaluation by clearly outlining where each solution fits, what performance advantages it offers, and how 3M products can help support efficient project execution and labor cost-savings.

For installers, it serves as a practical field-minded resource with application guidance for adhesion testing, substrate preparation, overlaps, corners, openings, panelized construction, and remediation.

More than a guide, this is a reflection of how 3M supports the people behind every project. By organizing critical information in one engaging, accessible resource, 3M helps reduce uncertainty, improve decision-making, and build confidence at every stage of the job. It is one more way we deliver thoughtfully designed products, trusted expertise, and peace of mind by design—so our customers and partners can rely on 3M to help them build with greater assurance.

Air and Vapor Barrier YouTube playlist

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3015 Series Air and Vapor Barriers Self-adhered Membranes for Whole Wall Coverage

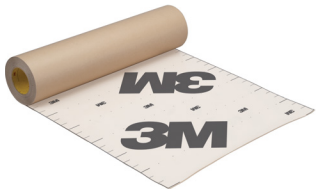
3M™ Building Envelope Membranes lead with product performance and ease of installation, to save you time and enhance the performance of your building.

3M offers three air and vapor barrier membranes that share the following design and performance qualities:

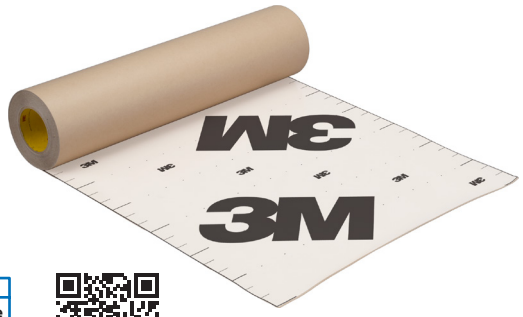
- Lightweight for single person application
- Advanced acrylic, pressure-sensitive adhesive
- Compatible with most common substrates without the use of primer
- Application temperature 0°F (-18°C) up to 150°F (66°C)

Performance Standards

- Meets requirements of ASTM E2178 and CAN/ULC S741-08
- Meets requirements of ASTM E2357 and CAN/ULC S742-11
- Passes water resistance test AATCC 127 (55cm of water for 5 hours)
- Passes low temperature flexibility after 4 hours at -20°F (-29°C) as per ASTM D1970 Sec. 7.6
- Passes AAMA 711-22 section 5.2 for water penetration around fasteners
- NFPA® 285 compliant (as part of an approved wall assembly)

Product	3015NP			3015VP			3015VP-NW	
Roll Appearance								
Roll Widths (in)	36	48	60	15	30	60	29.5	59
Roll Lengths (in)	75			100			100	
Roll Weights (lbs)	21	25	33	11	22	43	23	42
Membrane Composition	Proprietary film backing Slightly translucent Non-permeable backing 6-inch grid lines White with black print			Top Liner Technology Proprietary film backing Permeable backing White with red print			Multi-layer non-woven Permeable backing 4-inch grid lines Black with white print	
Adhesive	High-tack advanced acrylic			Advanced vapor permeable acrylic			Advanced vapor permeable acrylic	
Repositionability	No			Yes ✓			No	
ABAA Evaluated	Yes ✓			Yes ✓			No	
LEED Credit Qualification	Yes ✓			Not yet			Not yet	
Permeability	Non-permeable ≤0.1 perms			Vapor permeable 10–13 perms			Vapor permeable 18–23 perms	
UV Resistance	12 months			12 months			9 months	
Service Temp Low Service Temp High	-40°F (-40°C) Up to 240°F (116°C)			-40°F (-40°C) Up to 240°F (116°C)			-40°F (-40°C) Up to 210°F (98°C)	

3M™ Air and Vapor Barrier 3015NP



UV Resistance 12 Months

Learn More

Qualifies for LEED, GreenGuard, GreenGuard Gold certifications

ABAA evaluated

Performance and Ease of Installation

- High-tack adhesive can be installed in cold and hot weather
- Takes 40% less time often to install than products that need primer
- Slightly translucent to easily see screws and stud location
- Printed with 6-inch grid lines to aid in alignment and cutting

Performance Standards

- Meets requirements of ASTM E2178 and CAN/ULC S741-08
- Meets requirements of ASTM E2357 and CAN/ULC S742-11

3M™ Air Barrier with Permeable Membrane 3015VP



UV Resistance 12 Months

Learn More

ABAA evaluated

Unique Performance

- Lightweight rolls with Top Liner Technology with exposed adhesive for quick, easy installation
- Full coat of permeable advanced acrylic adhesive allows for immediate repositionability leading to reduced waste and improved efficiency

Ease of Installation

- Top Liner Technology — Exposed adhesive and lightweight rolls for single applicator installation

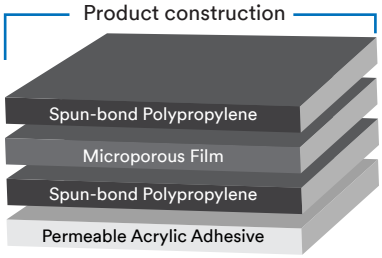
3M™ Air Barrier with Non-Woven Permeable Membrane 3015VP-NW



UV Resistance 9 Months

Learn More

Product construction



Unique Performance

- Service temperature range of -40–210°F (-40–99°C)
- Backing/membrane is a non-woven tri-laminate
- Thickness 24 mil
- Vapor permeable 18–23 perms
- Meets requirements of ASTM E2178 and CAN/ULC S741

Ease of Installation

- Printed with 4-inch grid lines to aid in alignment and cutting
- Excellent adhesion to many substrates without using primer

3015 Series Air and Vapor Barriers — Flashing and Seaming Solutions: Self-adhered Tapes for Wall Detailing

3M™ Building Envelope Membranes lead with product performance and ease of installation, to save you time and enhance the performance of your building.

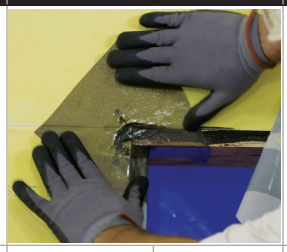
3M has four flashing tapes that share the following design and performance qualities:

- Advanced acrylic, pressure-sensitive adhesive
- Compatible with most common substrates without using primer
- Application temperature 0°F (-18°C) up to 150°F (66°C)

Performance Standards

Meets requirements of ASTM E2178 and CAN/ULC S741-08

Nail sealability: passes ASTM E331/547 per AAMA 711-13, Annex A both before and after thermal cycling

Product	3015NP	3015VP	3015UC	3015TWF
Roll Appearance				
Roll Widths (in)	2⅜ 4 6 9 12 18	6	6 9	4 6 9 12 18
Roll Lengths (in)	75	100	75	75
Roll Weights (lbs)	~2 ~2 3 5 7 9	4	11 15	3 4 6 8 13
Membrane Composition	• Proprietary film backing • Slightly translucent • Slit-liner options • 6-inch grid lines • White with black print	• Proprietary film backing • White with red print	• Proprietary film backing • Gray-translucent	• Polyester, Polyethylene • Black with white print
Roll Adhesive	High-tack advanced acrylic	Advanced vapor permeable acrylic	Acrylic Pressure-sensitive	Aggressive high-tack acrylic
Repositionability	No	Yes ✓	No	No
ABAA Evaluated	Yes ✓	Yes ✓	No	No
LEED credit qualification	Yes ✓	Not yet	Not yet	Yes ✓
Permeability	Impermeable	Permeable	Impermeable	Impermeable
UV Resistance	12 months	12 months	12 months	12 months
Service Temp Low Service Temp High	-40°F (-40°C) up to 240°F (116°C)	-40°F (-40°C) up to 240°F (116°C)	-40°F (-40°C) up to 300°F (148°C)	-40°F (-40°C) up to 240°F (116°C)
Elongation at Break	>700%	40%	>300%	>600%

3M™ Air and Vapor Barrier 3015NP



UV Resistance 12 Months

Learn More

Qualifies for LEED, GreenGuard Gold certifications

Unique Performance

- High-tack adhesive can be installed in cold and hot weather
- Multi-layer elastomeric film self seals to meet AAMA 711-22 section 5.2
- Adheres to damp surfaces that have not absorbed water, like metals, glass and plastics

Ease of Installation

- Takes 40% less time to install than products that need primer
- Slightly translucent to easily see screws and stud location
- Printed 6-inch grid aids in alignment and cutting
- Lightweight for single person installation and easier handling

3M™ Air Barrier with Permeable Membrane 3015VP



UV Resistance 12 Months

Learn More

ABAA evaluated

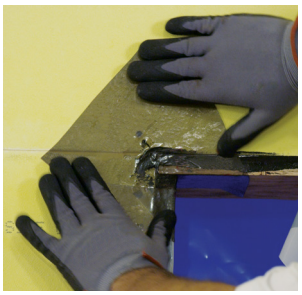
Unique Performance

- Lightweight rolls with Top Liner Technology with exposed adhesive for quick, easy installation
- Full coat of permeable advanced acrylic adhesive allows for immediate repositionability leading to reduced waste and improved efficiency

Ease of Installation

- Top Liner Technology — Exposed adhesive and lightweight rolls for single applicator installation

3M™ Ultra Conformable Flashing Tape 3015UC



UV Resistance 12 Months

Learn More

Qualifies for LEED, GreenGuard Gold certifications

Unique Performance

- Designed to work with both permeable and non-permeable wall systems
- Allows up to 300% elongation in multiple directions to stretch and conform to difficult areas
- Eliminates seams, pinholes, and reduces layer build up
- Can be applied at temperatures as low as 0°F (-18°C)
- Adheres to damp surfaces that have not absorbed water, like metals, glass and plastics

3M™ Air and Vapor Through Wall Flashing Tape 3015TWF



UV Resistance 12 Months

Learn More

Qualifies for LEED, GreenGuard Gold certifications

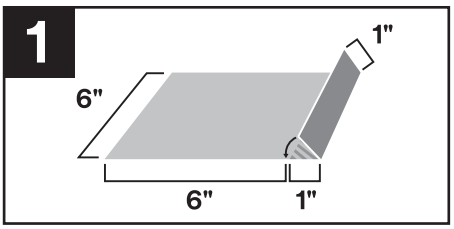
Unique Performance

- Passes AAMA 711-22 section 5.2 for water penetration around fasteners
- Specially designed for use as a through wall flashing and damp proof course
- Can be applied at temperatures as low as 0°F (-18°C) and as warm as 150°F (66°C)
- Adheres to damp surfaces that have not absorbed water, like metals, glass and plastics
- Service temperatures range from -40°F to 240°F (-40°C to 116°C)
- Compatible with many building sealants
- Can withstand up to 12 months of UV exposure

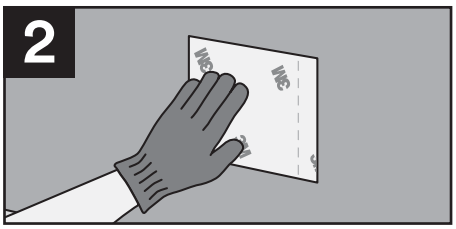
Installation — Surface Conditions

Field Adhesion Test

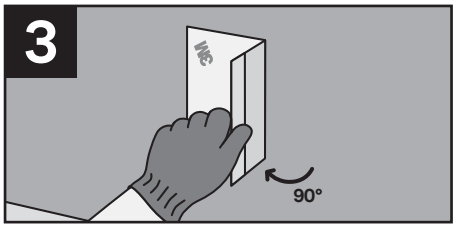
Construction conditions are tough which can limit initial adhesion due to numerous factors, including dampness, water, frost, extreme temperatures, dirt, and other contaminates. A quick field test can be performed using 3M™ Air and Vapor Barrier 3015 Wrap to determine if it has adequate initial adhesion. 3M's acrylic adhesive will continue to build strength over time.



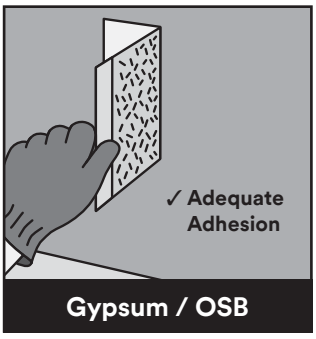
Cut approximately a 6" x 8" piece of 3015 wrap. On the adhesive side fold 1" over onto itself to create a 6" x 6" test strip with a finger tab.



Stick the test strip to the substrate you intend to cover and apply pressure.

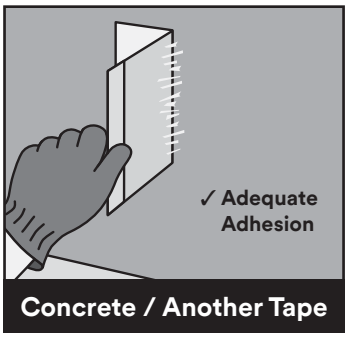


Slowly remove the test strip, pulling the tab up at approximately a 90° angle.



Test Results

If the 3015 wrap test strip is stuck to exterior gypsum or OSB, you should notice small fibers pulling from the substrate. If you are seeing these results, you can be confident you have adequate initial adhesion to continue applying to the walls.



Test Results

If the 3015 wrap test strip is adhered to concrete or another tape, you should see small "legs" where the adhesive is stretching between the tape backing and the substrate. If you are seeing these results, you can be confident you have adequate initial adhesion to continue applying to the walls.

Substrate Surface Requirements

3M™ Air Barrier Systems can be applied to a wide variety of sheathing substrates, typically without priming.

Substrate condition is crucial to the adhesion performance of any adhesive membrane.

Substrate surfaces must be free of grease, oil, un-bonded paint, corrosion or other substances that would adversely affect the adhesive bond between the membrane and substrate.

Substrate surface **must be dry** to the touch for optimum performance.

Substrate surface temperature must be between **0°F and 150°F** (-18°C and 66°C).

Rolls must be stored at a temperature between 0°F and 150°F (-18°C and 66°C) to ensure initial bond performance.

Surface Preparation

Fill gaps and cracks exceeding 1/4" but less than 1/2" width with 3M™ Polyurethane Construction Sealant 540 (or similar), and tool the surface flush and smooth.

Fill gaps exceeding 1/2" width with closed cell foam backer rod, seal with 3M™ Polyurethane Construction Sealant 540 (or similar), and tool the surface flush and smooth.

Concrete substrates must have fins ground flush and void areas filled.

Masonry substrates must have mortar joints tooled or struck flush.

Substrate Specific Guidelines

Exterior gypsum sheathing must have moisture content below 19% with no open joints or cracks wider than 1/2".

Plywood sheathing must have moisture content below 16% with no open joints or cracks wider than 1/2".

Details, Penetrations, Windows and Doors



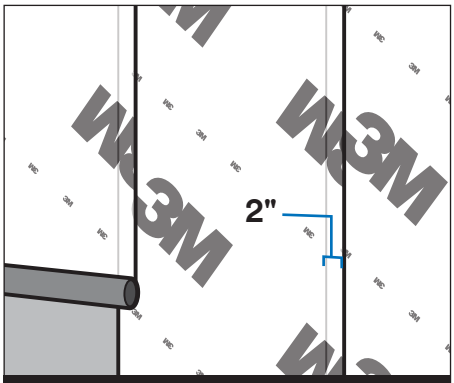
It is recommended to detail window and door penetrations before installing the field membrane, but post-installation is acceptable. All penetrations, including windows and doors, must be installed in proper sequence for appropriate moisture management.

Refer to the *Compatibility Listing for 3M™ Air Barrier 3015 Product Series* for compatible products

Installation — Whole Wall Coverage, “The Field”

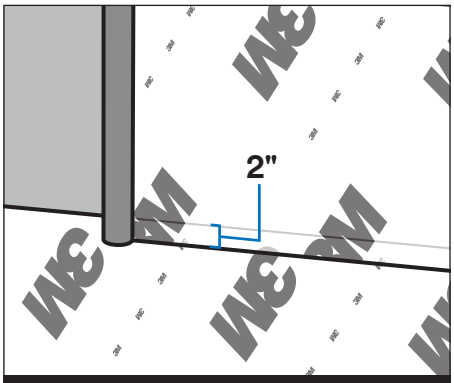
Wall Application

Install 3M™ Air and Vapor Barrier 3015 Wrap vertically or horizontally. During installation, keep the membrane dry and protected from dust and debris. Simply pull the material off the main roll to the desired length then cut the surface to the factory edges using a razor knife. While the membrane may be applied horizontally or vertically, horizontal installation is preferred. Best practice includes a “weatherboard” or “shingle fashion,” starting with the first strip on membrane across the bottom of the wall. Moving up the wall, the next strip higher will overlap the previous strip by 2" (50 mm). Roll all laps and membrane with a J-roller to ensure optimum seal.



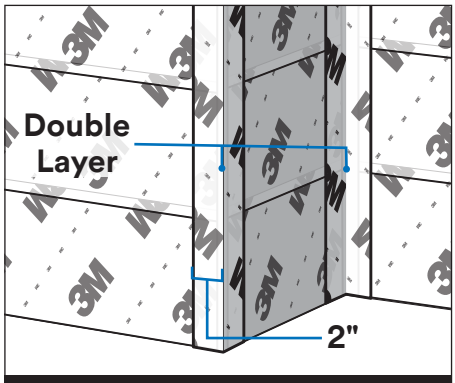
Vertical

Vertical wall applications require a 2" (50 mm) minimum overlap.



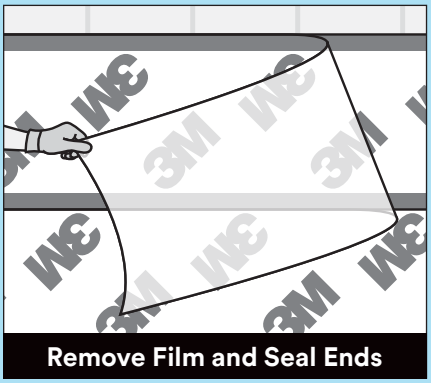
Horizontal

Horizontal wall applications require a 2" (50 mm) minimum overlap. Start at the bottom and work upwards to create positive laps.



Corners

Inside/outside corners should have a double layer of 3015 wrap and will require 2" (50 mm) minimum double layer on the entire corner. If the initial layer of wrap is continuous at corners, it counts as 1st layer. The 2nd layer is achieved with tape. If the initial layer of wrap does not continue around the corner, then two layers of tape are needed. It is recommended to utilize tape at least a 6" (150 mm) wide which provides alignment leeway.



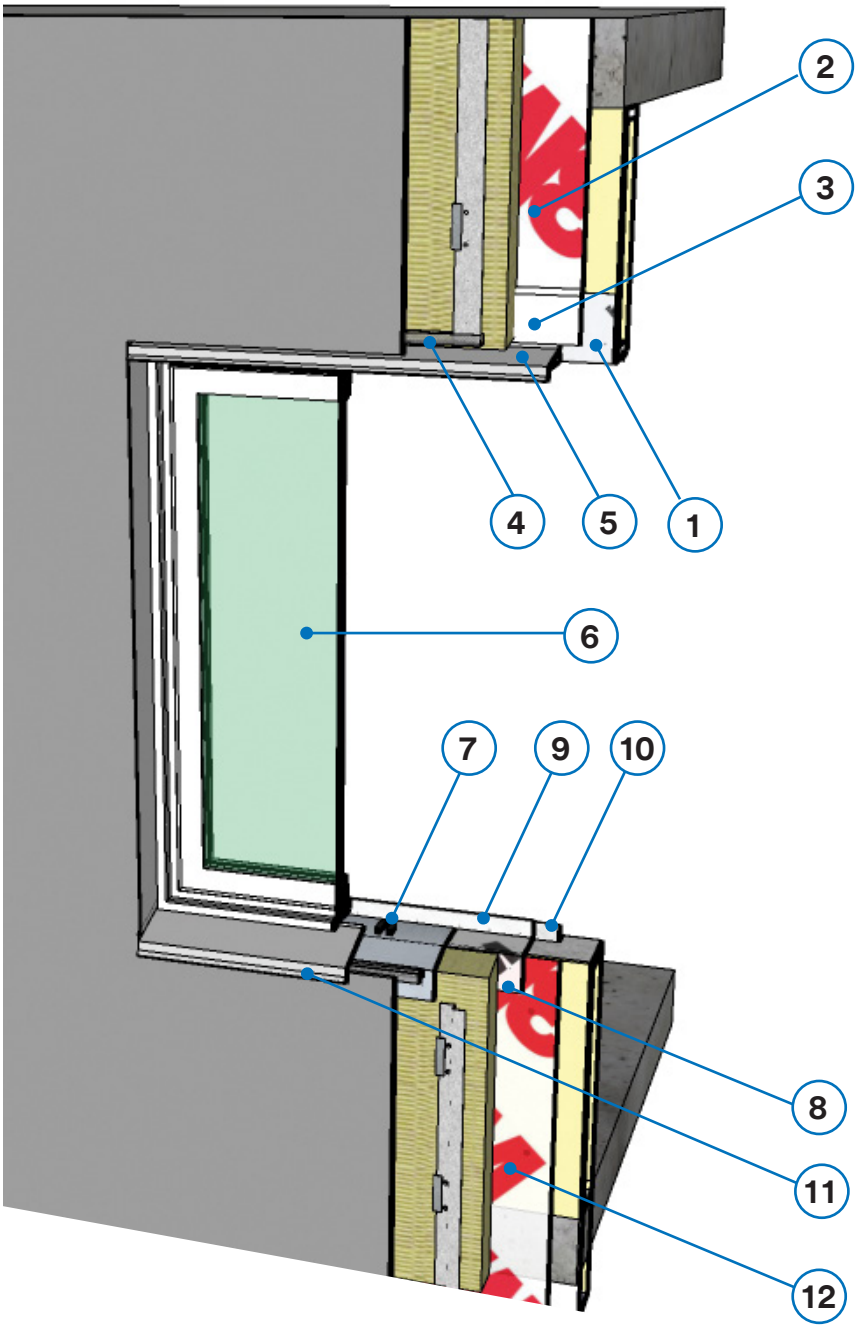
Remove Film and Seal Ends

3M™ Air Barrier with Permeable Membrane 3015VP

Remove clear film cover from the membrane after each course before the next sheet is installed.

Installation — Window Opening Detail, Cut-Away View — Wrapped Sheathing and Flashed Opening

The following detail is for rough openings typical in the construction industry including high moisture exposure conditions. The rough opening application guidance provided previously in the 3M™ Air and Vapor Barrier 3015 Wrap section can be used for typical conditions. When working with 3015 wrap, install the membrane in a “weatherboard” or “shingle fashion”. Begin by pre-cutting membrane into appropriate size, align and position the membrane, remove release liner, and press firmly into place.



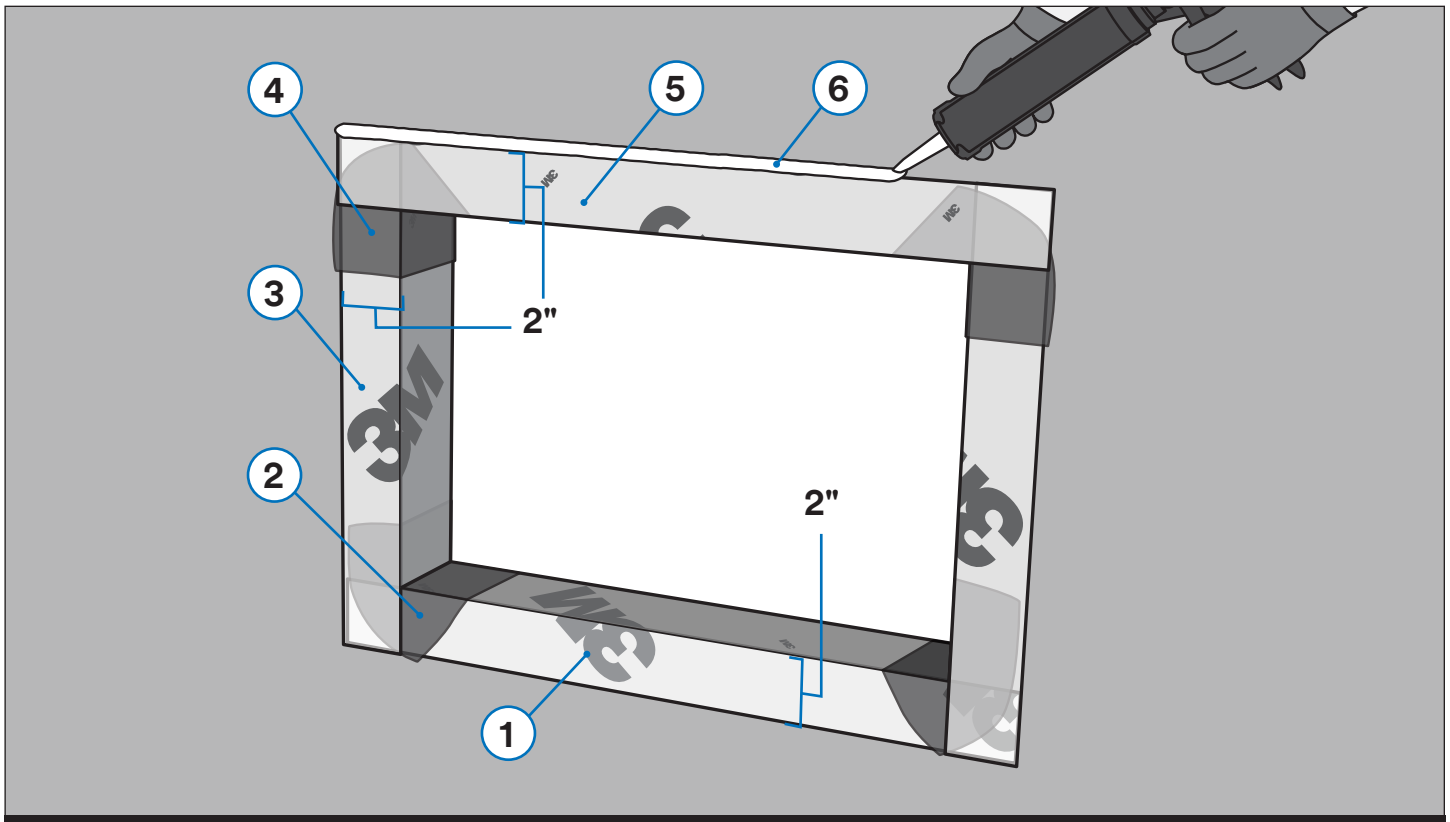
The following list identifies key components of a rough opening preparation detail:

1. Pre-strip rough opening head with 3M™ Air and Vapor Barrier 3015 Wrap extending a minimum of 2" (50 mm) onto face of exterior wall.
2. Sheathing membrane installed shingle lapped over head flashing and tied into rough opening pre-stripping. 3M™ Air Barrier with Permeable Membrane 3015VP sheathing membrane shown.
3. Pre-stripping extends sufficiently onto wall to receive exterior wall sheathing membrane with a minimum 2" (50 mm) overlap.
4. Insect screen along rainscreen cavity.
5. Head flashing complete with drip edge and end dams to aid in water diversion. Tie in sheathing membrane.
6. Window assembly sealed to rough opening pre-stripping with backer rod and sealant to maintain air barrier continuity.
7. Window shims are installed on the sill of the rough opening to aid in water drainage.
8. Pre-strip rough opening sill with 3015 wrap extending a minimum of 2" (50 mm) onto face of wall.
9. Extend pre-stripping onto sill angle to receive sealant for air barrier continuity.
10. Sill back angle.
11. Sill flashing complete with drip edge and end dams to aid water diversion.
12. Sheathing membrane installed shingle lapped. 3015VP sheathing membrane shown.

Installation — Opening Detail, Utilizing 3015UC for Flashing Alone or Flashing Prior to Wrap Application

Rough Openings Application

When working with 3M™ Ultra Conformable Flashing Tape 3015UC, install the membrane in “weatherboard” or “shingle fashion”. Begin by pre-cutting the membrane into the approximate size, align and position the membrane, remove the release liner, and press firmly into place. Roll all laps and membrane with a J-roller to ensure optimum seal.



Rough Opening

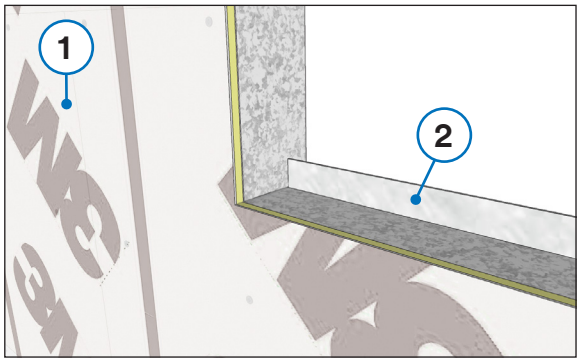
Follow these steps:

1. Apply appropriately sized piece to the bottom of the opening, folding into the opening to form sill and dams. Ensure a 2" (50 mm) lap joint onto the exterior face on the membrane below, up the jamb, and beyond the width of the opening on both sides.
2. Apply detail gusset strips of 3015UC membrane in each sill corner extending a minimum of 2" (50 mm) onto the jamb, sill, and face.
3. Apply appropriately sized pieces on the jambs, extending 2" (50 mm) below, above, and laterally beyond the opening on the exterior face. Fold the membrane into the opening and shingle lap over the previously applied sill wrap.
4. Apply detail gusset strips of 3015UC membrane in each head corner extending a minimum 2" (50 mm) onto the jamb, head, and face.
5. Apply appropriately sized piece at the head extending the membrane 2" (50 mm) above and laterally beyond opening on the exterior face. Fold the membrane into the opening and shingle lap over the jamb wrap. Ensure a 2" (50 mm) lap joint down the jamb wrap.
6. Apply a continuous bead of 3M™ Polyurethane Adhesive Sealant 540 or 3M™ Adhesive Sealant 740UV across the top.

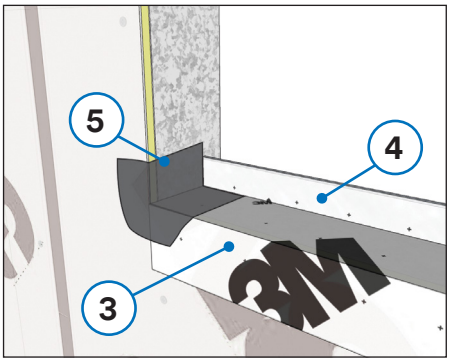
Best practice recommends providing a wider lap (4" or 100 mm) onto the wall face where possible. Alternative applicable products include: 3M™ Air and Vapor Barrier 3015NP and 3M™ Air and Vapor Through Wall Flashing Tape 3015TWF.

Installation — Opening Detail, Utilizing 3015UC on Wrapped Sheathing, Sills and Jambs Bare

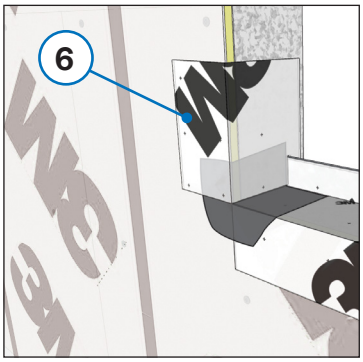
The following list identifies key components and steps of a rough opening penetration detail.



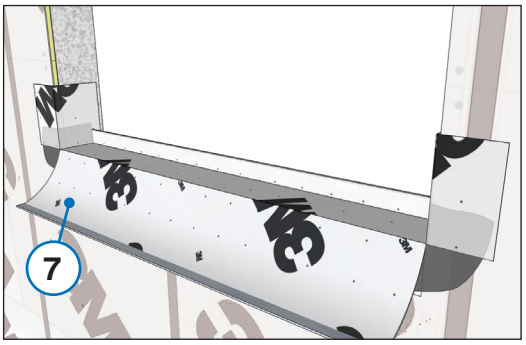
1. Complete installation of the sheathing membrane. Shingle layers from the bottom up, ensuring subsequent layers overlap the layers below and apply pressure to ensure adequate adhesion. Leave a section of the membrane at the head of the rough opening un-adhered with backer material intact for later tie in with the head flashing. 3M™ Vapor Permeable Air Barrier 3015VP shown in figures, though 3M™ Air and Vapor Barrier 3015NP or 3M™ Air Barrier with Non-Woven Permeable Backing 3015VP-NW could be used just the same.
2. Install sill angle at the base of the window rough opening.



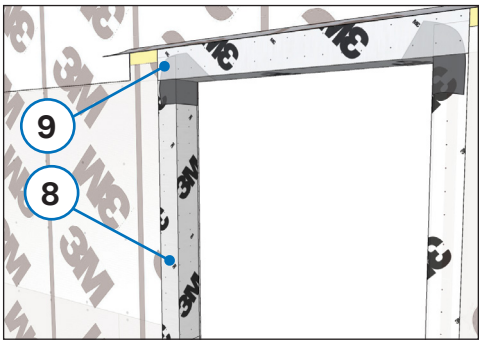
3. Install 3M™ Ultra Conformable Flashing Tape 3015UC as a sill membrane. Ensure to extend the membrane a minimum of 2" (50 mm) on to wall.
4. Ensure the membrane wraps over top of the sill angle.
5. Install 3015UC gussets at lower corners. Ensure to extend the membrane a minimum of 2” (50 mm) on to wall.



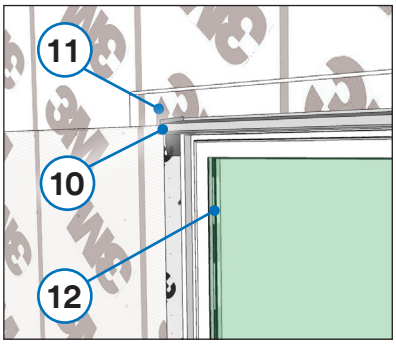
6. Install 3015UC as jamb corner membrane. Extend the membrane a minimum 6" (150 mm) up the jamb and a minimum 2" (50 mm) on to the wall.



7. Tape 3015UC as the sub-sill drainage membrane. Leave section of the membrane un-adhered with backer material intact for later tie in, if required.



8. Install 3015UC membrane pre-stripping up the full height of both jambs extending onto the head of the rough opening. Ensure the membrane laps on to the wall and over the other membranes a minimum of 2" (50 mm).
9. Install 3015UC at the head of the rough opening, lapping over the jamb membrane pre-strips and covering the head of the rough opening a minimum of 2" (50 mm).

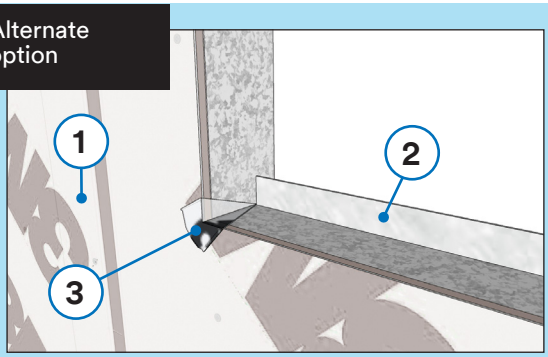


11. Install metal head flashing with end dams to aid in water diversion.
12. Tie in sheathing membrane over the installed head flashing by a minimum of 2" (50 mm).
13. Install window complete with intermittent shims along the sill.

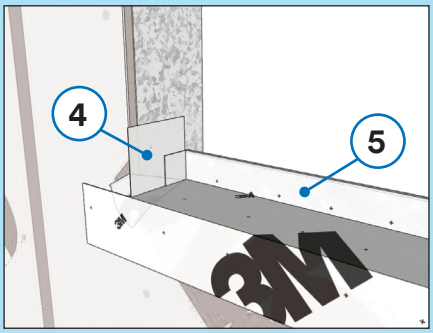
Installation — Opening Detail, Utilizing 3015 Flashings on Wrapped Sheathing, Sills & Jambs Bare

The following list identifies key components and steps of a rough opening penetration detail.

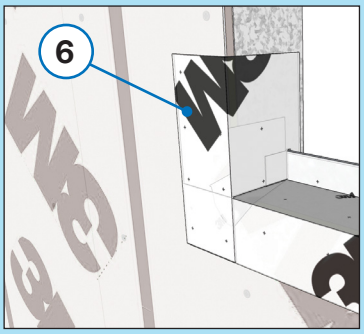
Alternate option



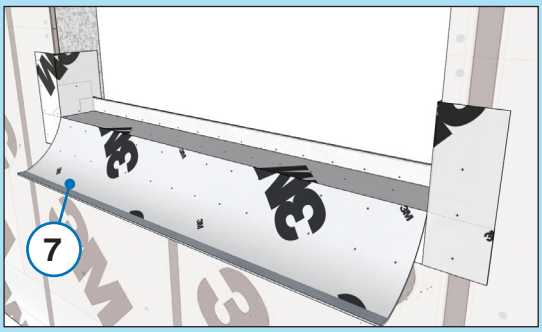
1. Complete installation of the sheathing membrane. Shingle layers from the bottom up, ensuring subsequent layers overlap the layers below and apply pressure to ensure adequate adhesion. Leave a section of the membrane at the head of the rough opening un-adhered with backer material intact for later tie in with the head flashing. 3M™ Air Barrier with Permeable Membrane 3015VP shown in figures, though 3M™ Air and Vapor Barrier 3015NP or 3015VP-NW could be used just the same.
2. Install sill angle at the base of the window rough opening.
3. Install 3015NP gussets at lower corners. Ensure to extend the membrane a minimum of 2" (50 mm) on to wall.



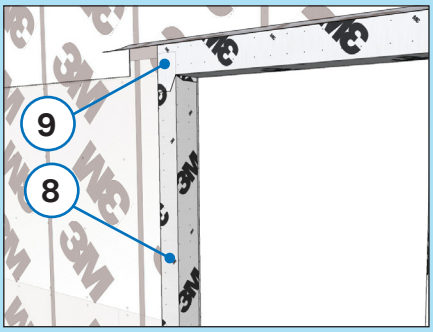
4. Install 3015NP as a sill membrane. Extend the membrane up the jambs and onto the face of the wall. Ensure to extend the membrane a minimum of 2" (50 mm) on to wall and up jambs.
5. Ensure the membrane wraps over top of the sill angle.



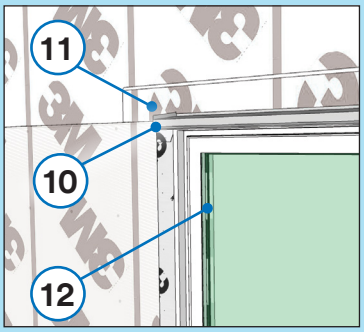
6. Install 3015NP as jamb corner membrane. Extend the membrane a minimum 6" (150 mm) up the jamb and a minimum 2" (50 mm) on to the wall.



7. Install 3015NP as the sub-sill drainage membrane. Leave section of the membrane un-adhered with backer material intact for later tie in, if required.



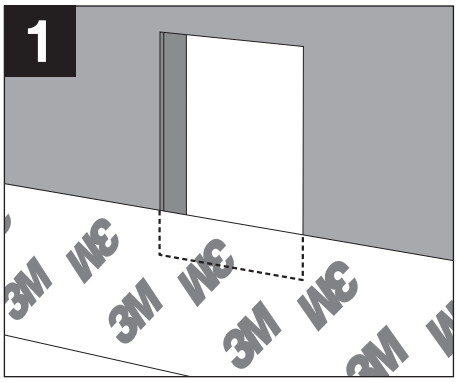
8. Install 3015NP membrane pre-stripping up the full height of both jambs extending onto the head of the rough opening. Ensure the membrane laps on to the wall and over the other membranes a minimum of 2" (50 mm).
9. Install 3015NP at the head of the rough opening, lapping over the jamb membrane pre-strips and covering the head of the rough opening a minimum of 2" (50 mm).



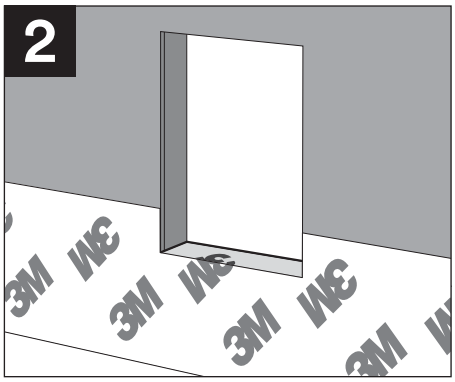
11. Install metal head flashing with end dams to aid in water diversion.
12. Tie in sheathing membrane over the installed head flashing by a minimum of 2" (50 mm).
13. Install window complete with intermittent shims along the sill.

Installation — Opening Detail, Utilizing 3015UC with Wrapped Sheathing into Sills and Jambs

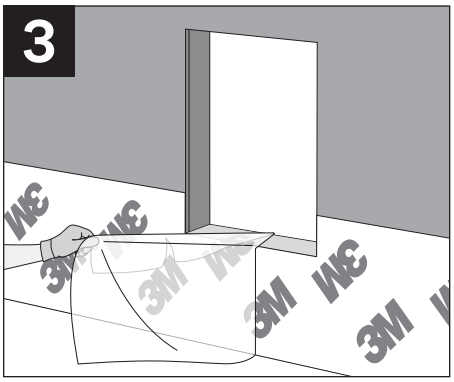
This guide details an acceptable method of flashing a window opening utilizing the wall membrane as the flashing material. This method is acceptable for either 3M™ Air and Vapor Barrier 3015NP, 3M™ Air Barrier with Permeable Membrane 3015VP , or 3M™ Air Barrier with Non-Woven Permeable Membrane 3015VP-NW wall systems.



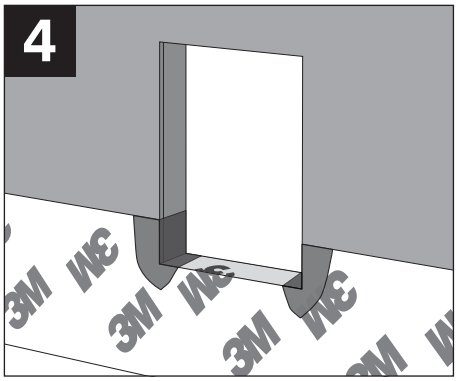
Apply a horizontal row of wall membrane, keeping it the same distance above the window sill as the depth of the window frame.



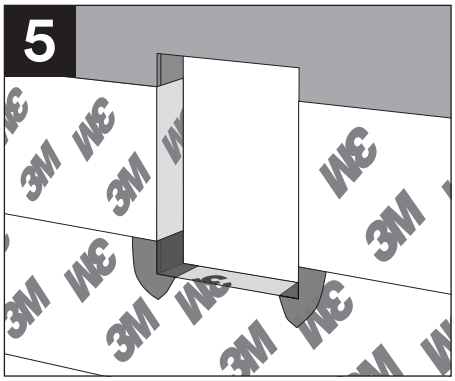
Cut the wall membrane flush on either side of the window opening, then fold over to cover the sill with the membrane.



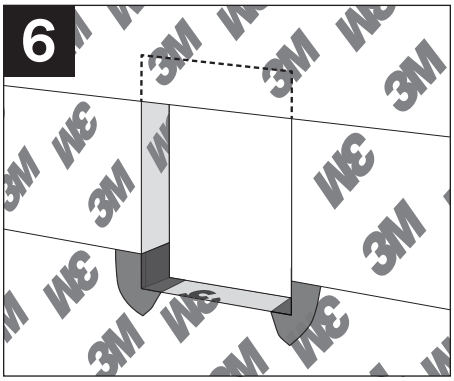
If you are using 3015VP on the walls, be sure to remove the liner before applying your next layer of tape.



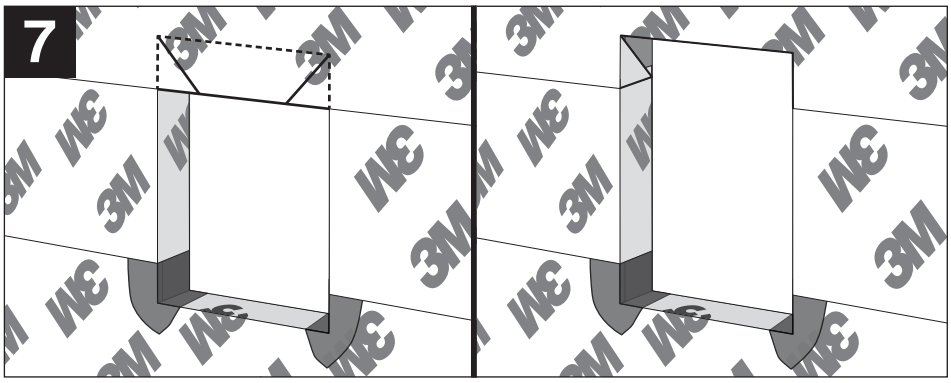
Apply a piece of 3M™ Ultra Conformable Flashing Tape 3015UC flush with top edge of the wall membrane, extending at least 2" onto the sill.



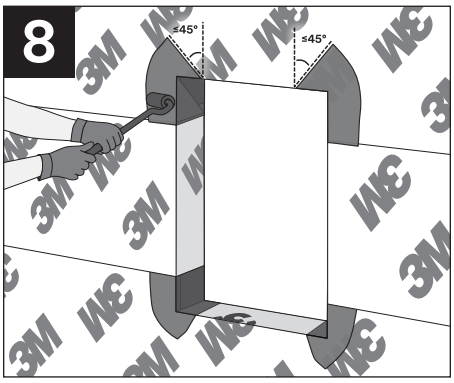
Apply the next row of wall membrane, wrapping around the window frame.



Apply the next row of wall membrane covering the top of the window opening.



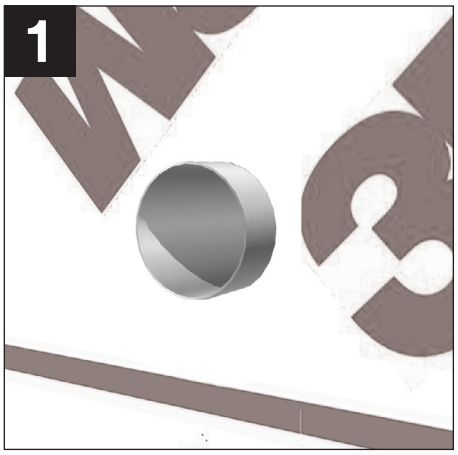
Cut the wall membrane at a 45° angle from each of the top window corners, then fold the wall membrane in to cover the window frame.



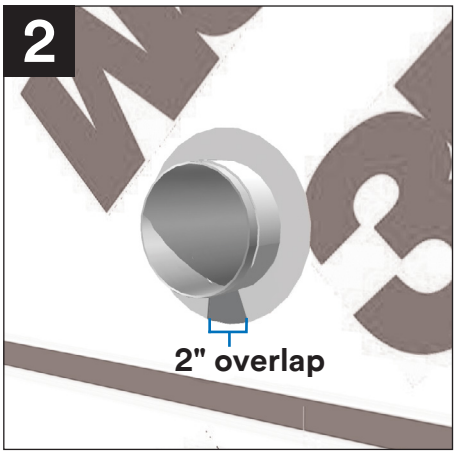
Apply a piece of 3015UC to each of the top corners, ensuring at least a 2" overlap. The exposed edge needs to be at least a 45° angle, creating an acceptable negative lap or apply sealant to the seam.

Installation — Penetration Details

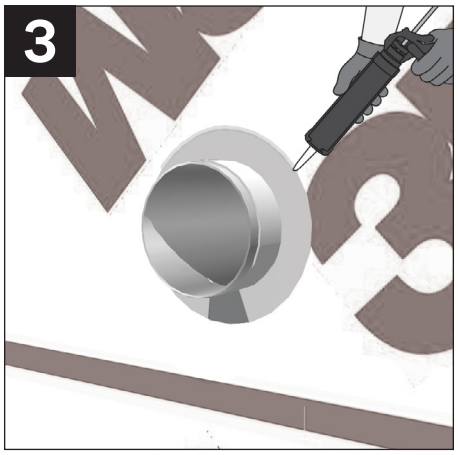
The following list identifies key components and steps of a pipe/duct wall detail which may similarly be applied to many types of penetrations — even non-round penetrations.



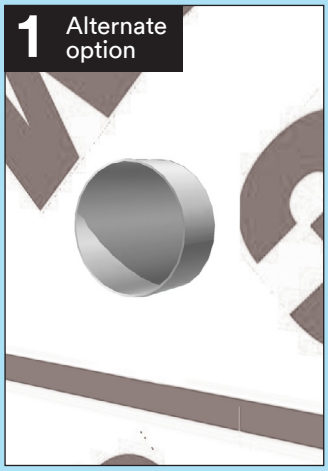
Install sheathing membrane around wall penetration.



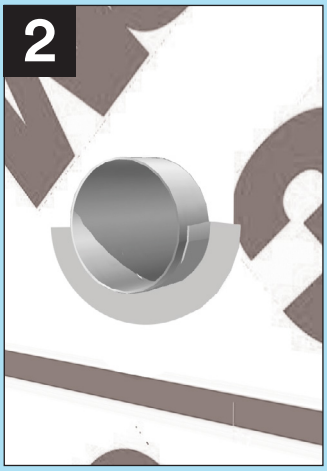
Detail penetration by wrapping 3M™ Ultra Conformable Flashing Tape 3015UC around the penetration, ensuring minimum 2" (50 mm) overlaps onto the wall penetration and sheathing membrane. Ensure the lap ends at the bottom with a minimum 2" (50 mm) overlap.



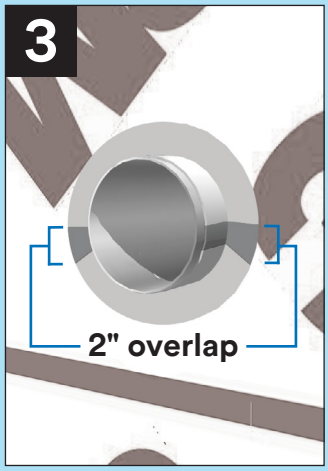
Seal with a bead of sealant along the top edge.



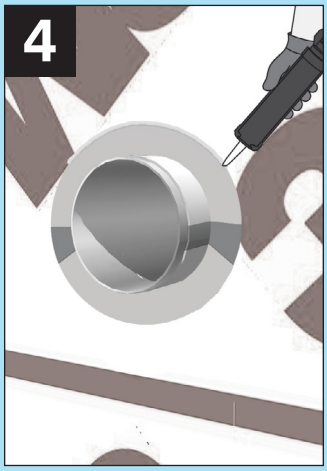
Install sheathing membrane around wall penetration.



Detail penetration by wrapping 3015UC around bottom half of the penetration, ensuring minimum 2" (50 mm) overlaps onto the wall penetration and sheathing membrane.



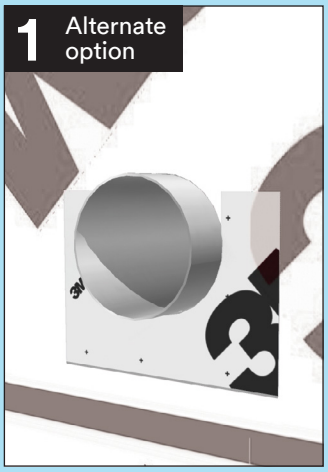
Wrap 3015UC around top half of the penetration, ensuring minimum 2" (50 mm) overlaps onto the wall penetration and sheathing membrane. Ensure a lap on both sides has a minimum 2" (50 mm) overlap.



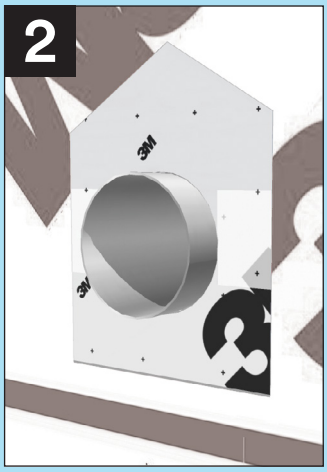
Seal with a bead of sealant along the top edge.

Installation — Penetration Details

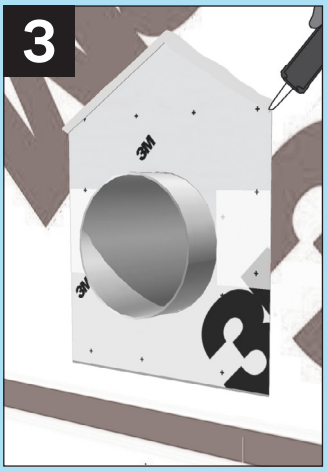
The following list identifies key components and steps of a pipe/duct wall detail which may similarly be applied to many types of penetrations — even non-round penetrations.



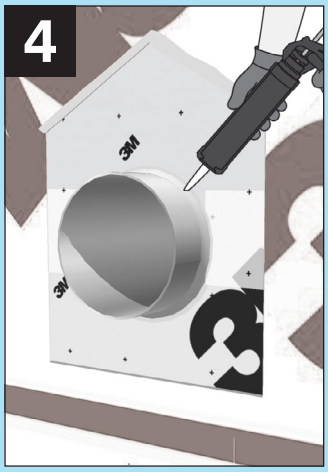
Install U-shaped pre-strip of 3M™ Air and Vapor Barrier 3015NP around the bottom of the wall penetration.



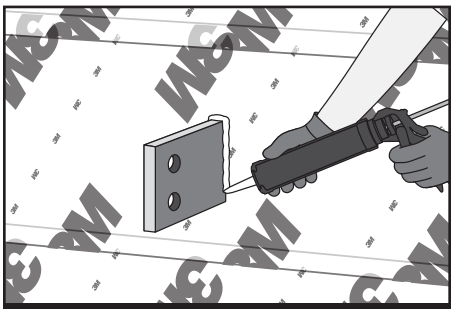
Shingle inverted U-shaped pre-strip over lower U-shaped pre-strip.



Seal exposed negative laps along top edge of inverted U-shaped pre-strip to sheathing membrane.

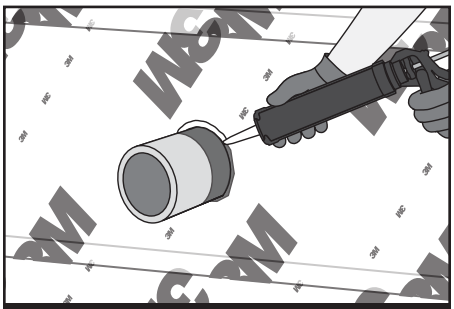


Seal wall penetration to positively lapped pre-strip membrane.



Knife Plates / Brick Ties

Brick tie detailing requires a minimum of 2" tape on all sides, along with a bead of sealant around the entire brick tie. It is acceptable to apply the sealant before or after the tape is applied.



Pipes

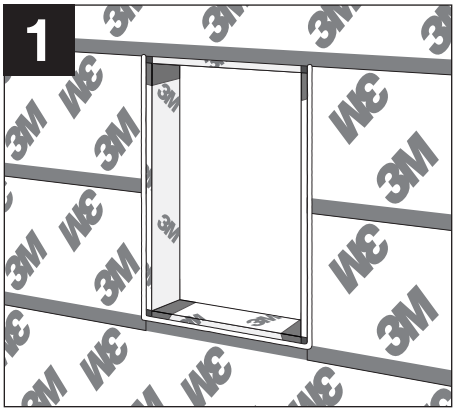
Pipe penetrations should be flashed with 3M™ Ultra Conformable Flashing Tape 3015UC with a minimum of 2" on the wall and 2" on the pipe. A bead of sealant should be applied to the top of where the field tape and the 3015UC meet.

Installation — Flanged Window into Flush Opening

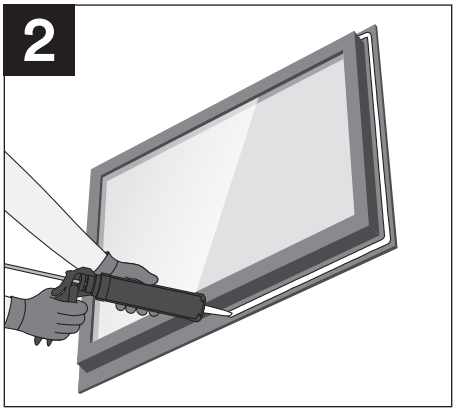
3M™ Air Barrier with Permeable Membrane 3015VP, 3M™ Air Barrier with Non-Woven Permeable Membrane 3015VP-NW, and 3M™ Air and Vapor Barrier 3015NP are constructed with high performance proprietary 3M acrylic adhesive that adheres on contact to most exterior building surfaces without the use of adhesive primer.

- 3015VP, 3015VP-NW, and 3015NP can be applied in temperatures between 0°F and 150°F (-18°C and 66°C) ensuring that construction projects are not delayed due to severe temperatures.
- Both the permeable and non-permeable systems work excellent for flanged window installations.
- Prior to installing a flanged window, the window opening must be properly weatherproofed. Please refer to the flashing installation guide that will be used: *3M™ Ultra Conformable Flashing Tape 3015UC* or *3M™ Flashing Window Openings with Wall Membrane Guide*.

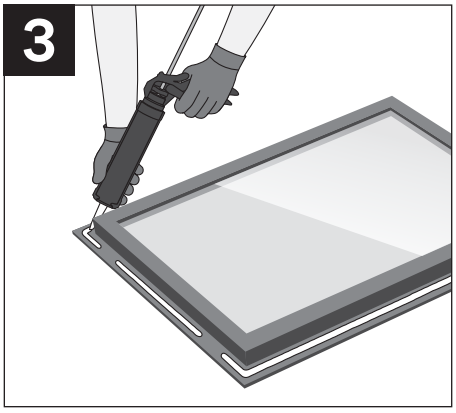




The window opening should be weatherproofed per 3M guidelines.

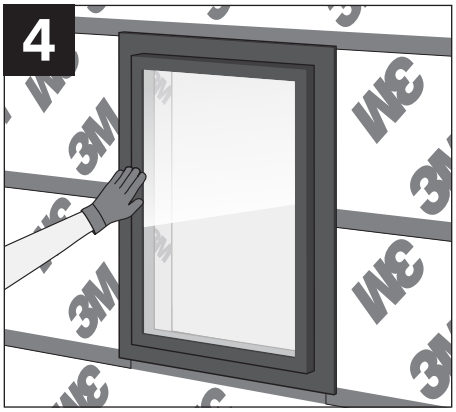


Apply a continuous bead of 3M™ Polyurethane Adhesive Sealant 540 or 3M™ Adhesive Sealant 740UV across the top and down either side of the flanged window.

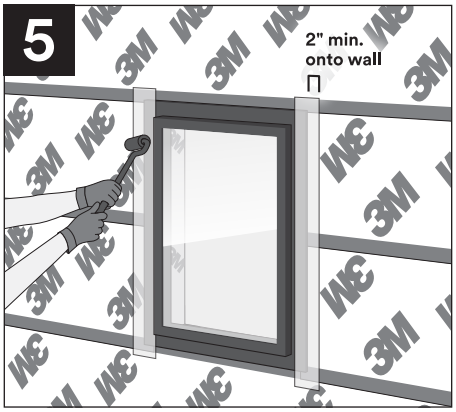


Across the bottom of the window, apply the sealant roughly 2" in from either side, then leave approximately a 2" gap, then continue a solid bead of caulk across the balance of the sill. This will allow drainage should moisture get behind the flange. If a second bead of sealant is needed, apply it directly to the wall.

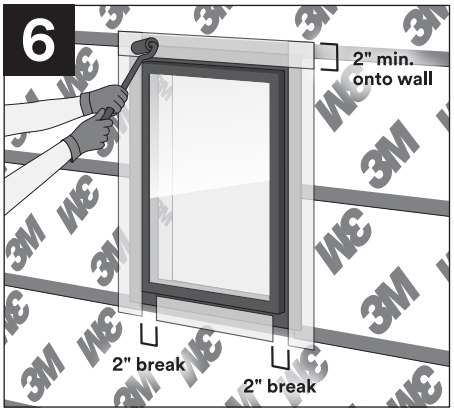
Installation — Flanged Window into Flush Opening



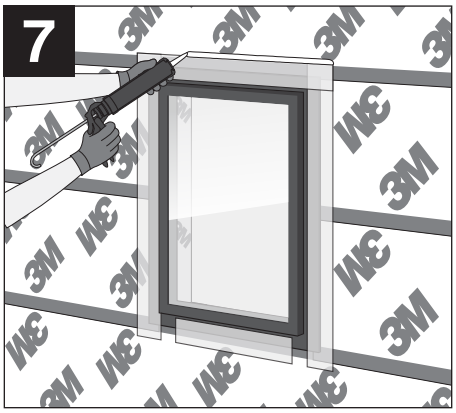
Immediately install the window into the opening and fasten per window manufacturer's instructions.



Seal either side of the window with a strip of 3M™ Air and Vapor Barrier 3015NP detailing tape. The tape should cover the flange and extend onto the wall at least 2".



Extend a third strip of tape across the top of the window. The tape should cover the flange and extend on top of the vertical strips. Apply the bottom tape leaving approximately 2" open on either side to allow drainage should moisture get behind the flange.



Seal the top edge of the flashing tape with 3M™ Polyurethane Adhesive Sealant 540 or 3M™ Adhesive Sealant 740UV.



An alternative method is to use a compatible* liquid flashing to seal over flange on either side and across the top, extending a minimum of 2" onto the wall membrane. Apply the bottom membrane leaving approximately 2" open on either side to allow drainage should moisture get behind the flange.

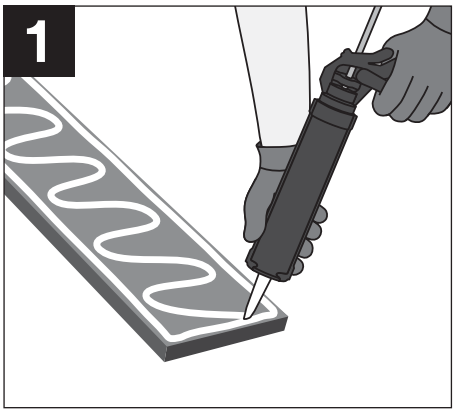
*Refer to the *Compatibility Listing for 3M™ Air Barrier 3015 Product Series* for compatible products

Installation — Flanged Window into Flush Opening Wood Buck

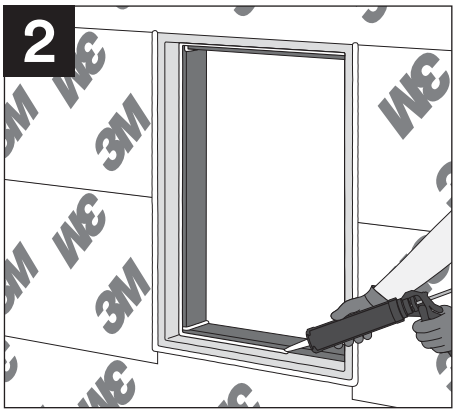
3M™ Air Barrier with Permeable Membrane 3015VP and 3M™ Air and Vapor Barrier 3015NP are constructed with high performance proprietary 3M acrylic adhesive that adheres on contact to most exterior building surfaces without the use of adhesive primer.

- 3015VP and 3015NP can be applied in temperatures between 0°F and 150°F (-18°C and 66°C) ensuring that construction projects are not delayed due to severe temperatures.
- Both the permeable and non-permeable systems work excellent for flanged window installations.
- Prior to installing a flanged window into a 3015NP or 3015VP wall system that utilizes a wood buck as an mounting surface, the window opening must be properly weatherproofed.
- Before the wood bucks are installed, the window rough opening should be weatherproofed the same as a flush wall system. Please refer to the flashing installation guide that will be used: *3M™ Ultra Conformable Flashing Tape 3015UC* or *3M™ Flashing Window Openings with Wall Membrane Guide.*

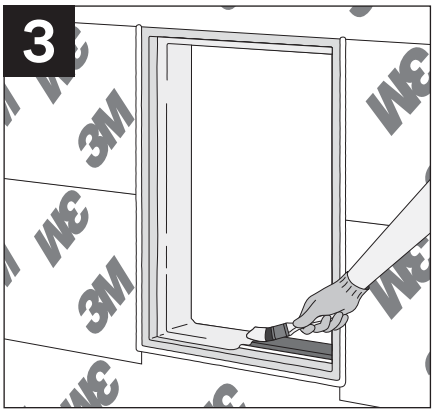




Apply a suitable construction adhesive to the backside of the wood buck. Note: The window opening should be weatherproofed per 3M installation guidelines.



Install the bottom, then the sides, then the top and fasten per local wind load or building code requirements. Once all four sides are installed, apply sealant where the wood joins each other and around the entire perimeter.



Weatherproof the installed wood buck with compatible* liquid flashing.

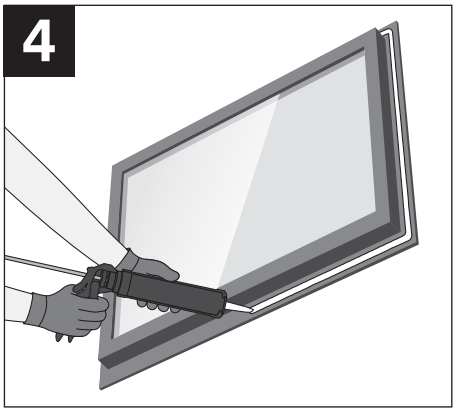
Follow the liquid flashing manufacturer's guidelines for application and thickness. The interior side of the wood buck should remain uncoated, allowing it to dry to the interior if it would get damp.

*Refer to the *Compatibility Listing for 3M™ Air Barrier 3015 Product Series* for compatible products

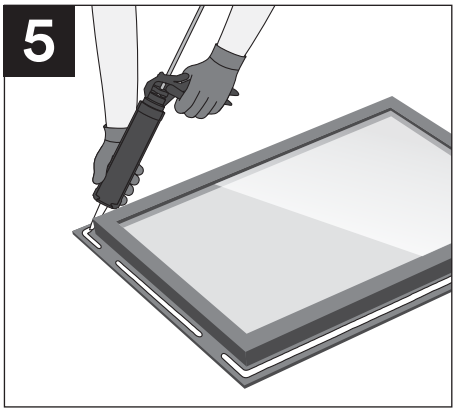
Installation — Flanged Window into Flush Opening Wood Buck



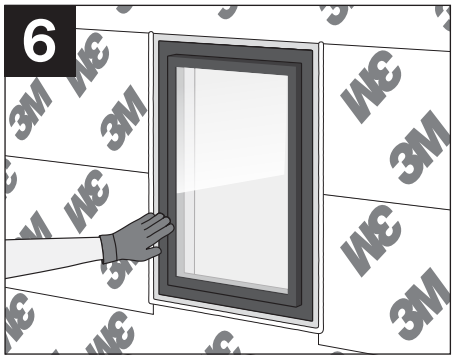
Weatherproof the installed wood buck with 3M™ Ultra Conformable Flashing Tape 3015UC and 3M™ Air and Vapor Barrier 3015NP detailing tape. Ensure the tape is applied to prevent negative laps. The interior side of the wood buck should remain open, allowing it to dry to the interior if it would get damp.



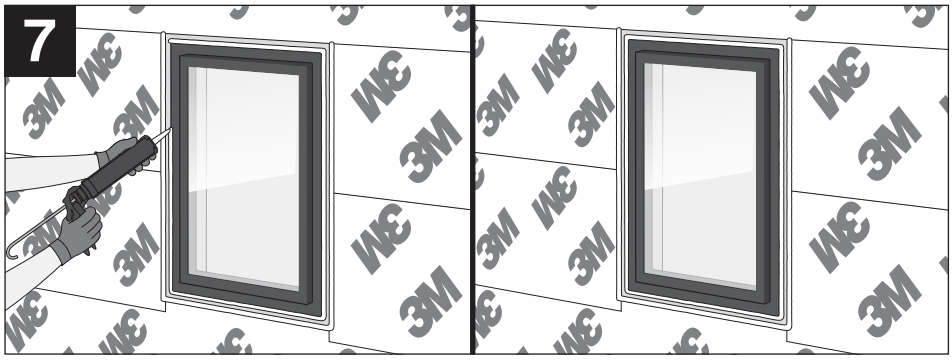
Apply a continuous bead of 3M™ Polyurethane Adhesive Sealant 540 or 3M™ Adhesive Sealant 740UV across the top and down either side of the flanged window.



Across the bottom of the window, apply adhesive sealant 540 or adhesive sealant 740UV in 2" from either side, then leave a 2" gap, then continue a solid bead of caulk across the balance of the sill. If a second bead of sealant is needed, apply it directly to the wood buck.



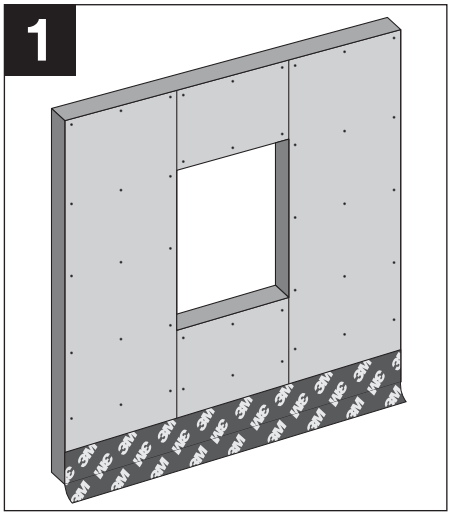
Immediately install the window into the opening and fasten to the wood buck per window manufacturers instructions.



Weatherproof the outer edge of the flange by sealing with a bead of adhesive sealant 540 or adhesive sealant 740UV, ensuring any remaining exposed wood buck is coated. The exterior of the window is now ready for the stucco or exterior cladding to be applied.

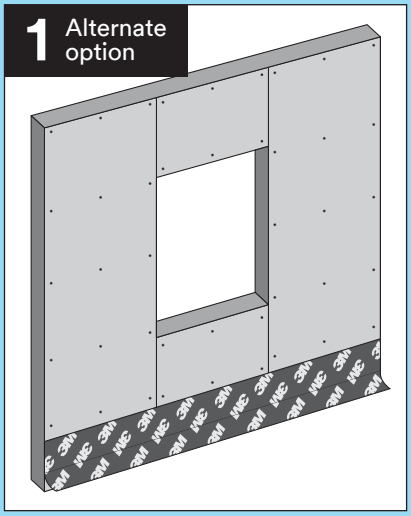
Installation — Factory Fabricated Panelized Construction Wraps and Flashings

1



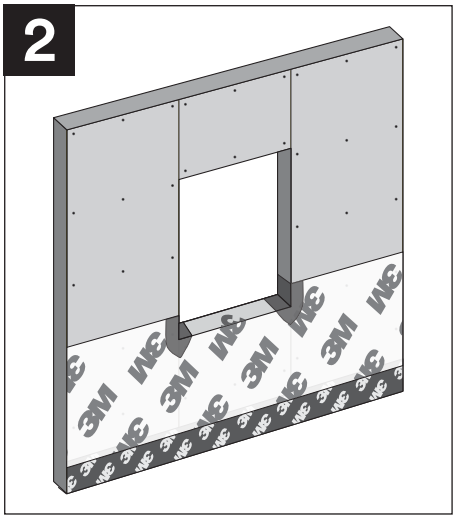
3M™ Air and Vapor Through Wall Flashing Tape 3015TWF installed to bottom of panel onto metal track. 6" unattached with release film extending below panel edge.

1 Alternate option



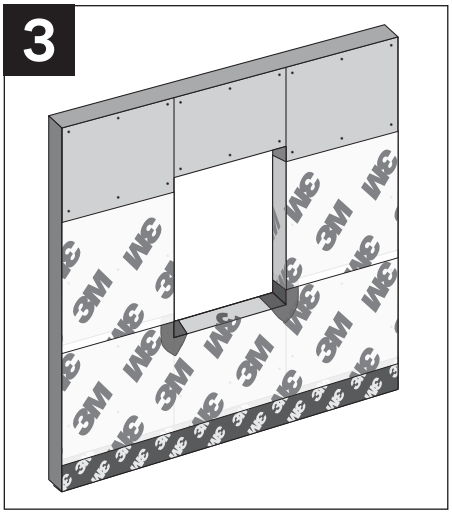
Tape 3015TWF installed to bottom of panel onto metal track. 6" unattached with release film ending at panel edge.

2



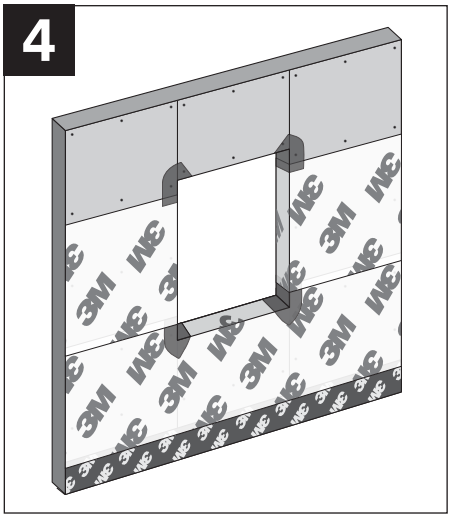
Apply a horizontal row of wall membrane, keeping it the same distance above the window sill as the depth of the window frame. Cut the wall membrane flush on either side of the window opening, then fold over to cover the sill with the membrane. Install 3M™ Ultra Conformable Flashing Tape 3015UC gussets at lower corners. Ensure to extend the membrane a minimum of 2" (50 mm) on to wall.

3



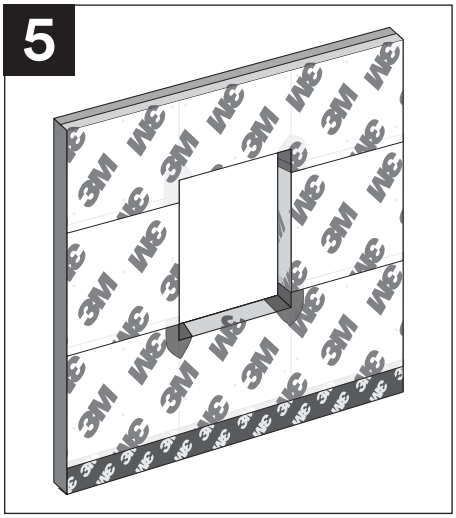
Apply the next row of wall membrane, wrapping around the window frame.

4



Install 3015UC gussets at upper corners. Ensure to extend the membrane a minimum of 2" (50 mm) on to wall.

5

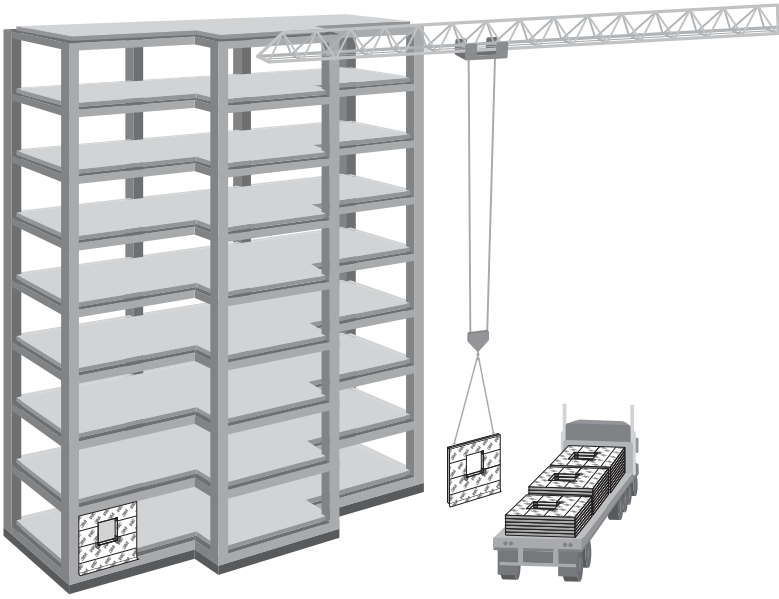


Apply the next row of wall membrane covering the top of the window opening. Panel ready for installation.

Installation — Factory Fabricated Panelized Construction Panel Setting

Setting the Panel

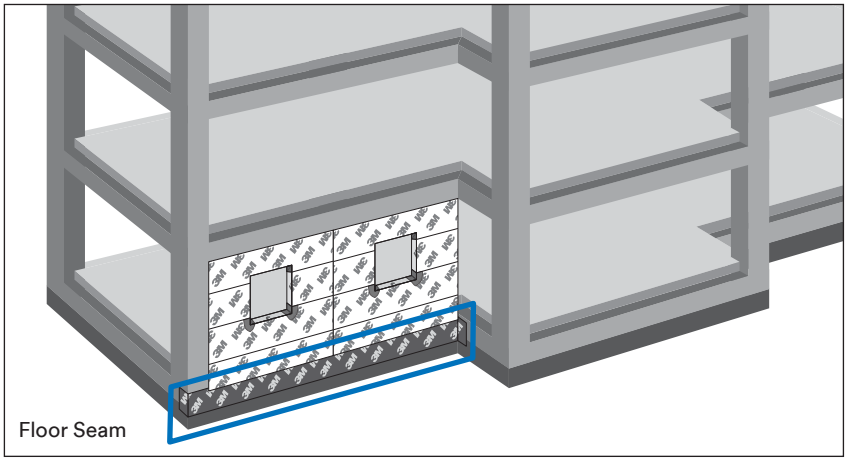
The panels have arrived to the site and are ready to be set.



Floor Seam

For panels fabricated by method **Step 1** (see prior page), place the panel and secure it, while taking care that the 3M™ Air and Vapor Through Wall Flashing Tape 3015TWF at the bottom of the panel remains accessible. Said differently, the 3015TWF should not be allowed to fold underneath the panel. Once the panel is set and secured, peel back the liner and secure the 3015TWF down to the substrate beneath it, maintaining proper shingling.

For panels fabricated by method **Step 1, Alternate Option** (see prior page) place the panel and secure it. Since the 3015TWF is flush with the bottom edge of the panel, there's no overhang material positioning concerns. Once the panel is set and secured, to tie-in flashing beneath the panel, fold up the 6" linered region of wrap at the bottom of the panel to reveal the base wall. Install flashing onto the base wall extend it lower beyond the bottom edge of the panel with appropriate overlap. Then peel back the liner and secure the 3015TWF to the face of the just-installed flashing to complete the seal.

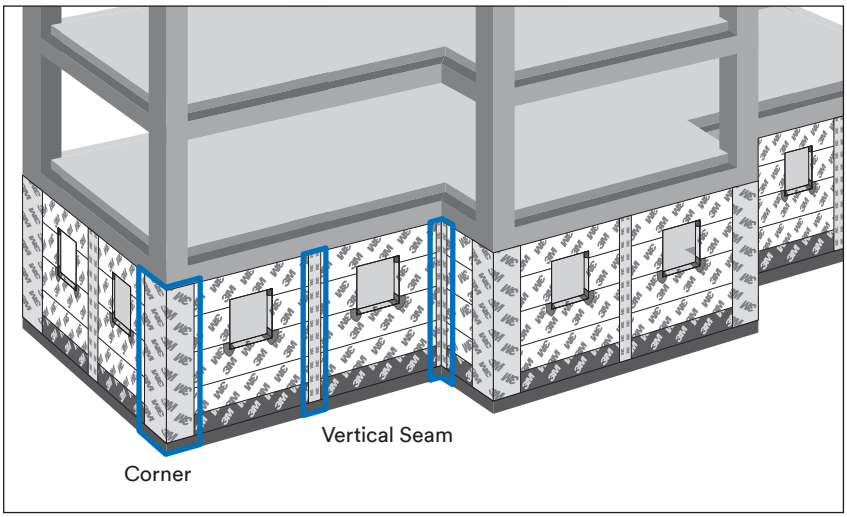


Vertical Seam

Detailing tape (3M™ Air and Vapor Barrier 3015NP, 3M™ Vapor Permeable Air Barrier 3015VP, or 3015TWF) installed at all vertical seams with a 2" minimum overlap onto each panel (e.g. tape must be 4" wide). Surface Preparation/Crack and Gap Filling guidelines apply (see page 8).

Corner

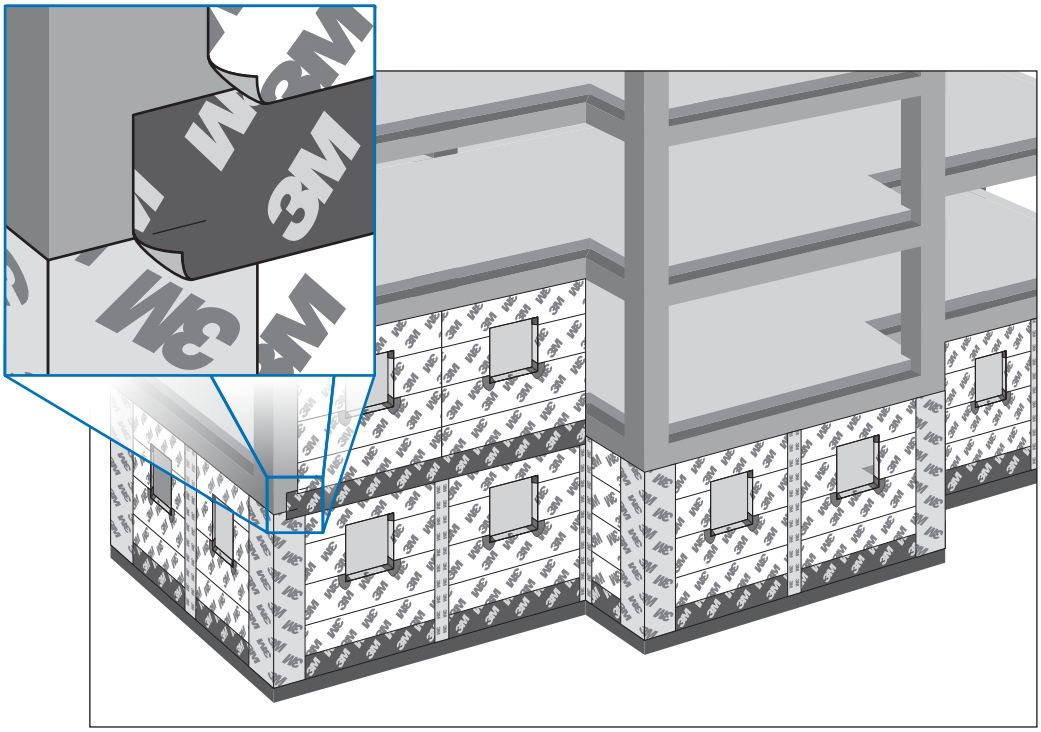
Inside/outside corners should have a double layer of 3M™ Air and Vapor Barrier 3015 Wrap and will require 2" (50 mm) minimum double layer on the entire corner. If the initial layer of wrap is continuous at corners, it counts as 1st layer. The 2nd layer is achieved with tape. If the initial layer of wrap does not continue around the corner, then two layers of tape are needed. It is recommended to utilize tape at least a 6" (150 mm) wide which provides alignment leeway.



Installation — Factory Fabricated Panelized Construction Panel Setting

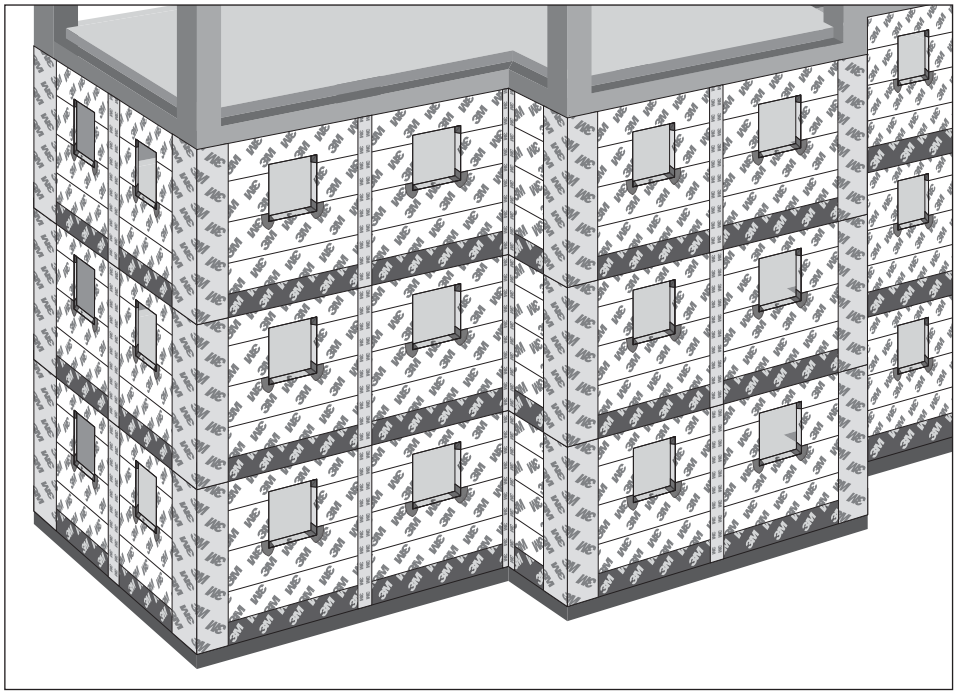
Adding the Next Panel + Second Levels

With next tier of panels are placed and set, complete the fusion of upper to lower by flipping up the 6" overhand of 3M™ Air and Vapor Through Wall Flashing Tape 3015TWF, remove the liner, then fold the 3015TWF down to the face of the lower panel. Use a J-roller to apply pressure to the 3015TWF so the adhesion bond is made.



Transitioning

Repeat steps for remaining floors and panels ensure the top of wall is sealed to prevent water intrusion during construction. As appropriate, follow the project's architectural details for prevailing requirements.

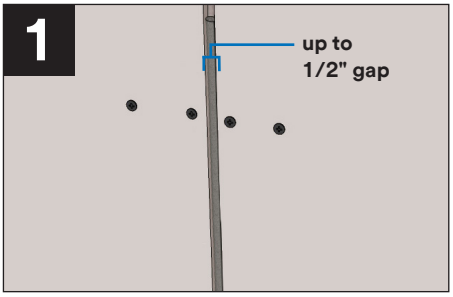


Installation — Joints and Transitions

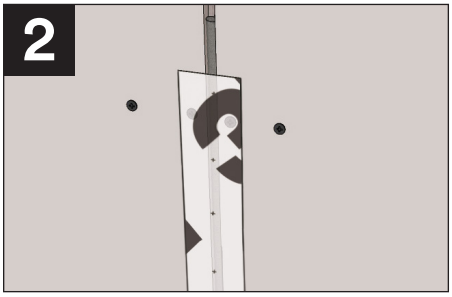
Description	Movement	Purpose	Approach
Control Joint	Small Movement Compression Only	Built to manage shrinkage and curing stresses in materials like concrete, masonry, and stucco.	3M tape applied tautly over joint, then 3M membrane applied over top of tape.
Expansion Joint	Larger Movement. Extension and Compression	Designed to separate large building sections so the structure can safely expand and contract due to temperature changes or building shifts.	**Option A.** 3M tape installed centered over joint with excess tape bellowed into the bare joint. **Option B** Joint filled with backer rod which protrudes beyond the face of the substrate. 3M tape installed centered over joint, following the contour of the backer rod. For both Options, the amount of excess tape should be sized to accommodate the expected expansion.
Deflection Joint	Larger Movement. Extension and Compression	Built to handle vertical movement (deflection) of overhead floor or roof slabs so the structure does not crush interior walls.	

Control Joint

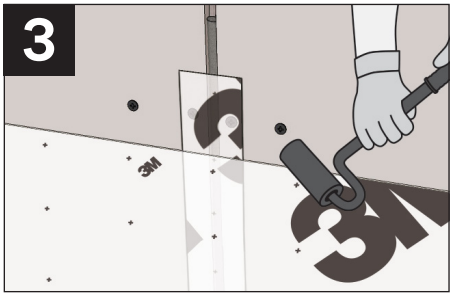
The following list identifies key components and steps of a control joint detail.



For gaps up to 1/2" (12 mm), install appropriately sized backer rod into control joint.



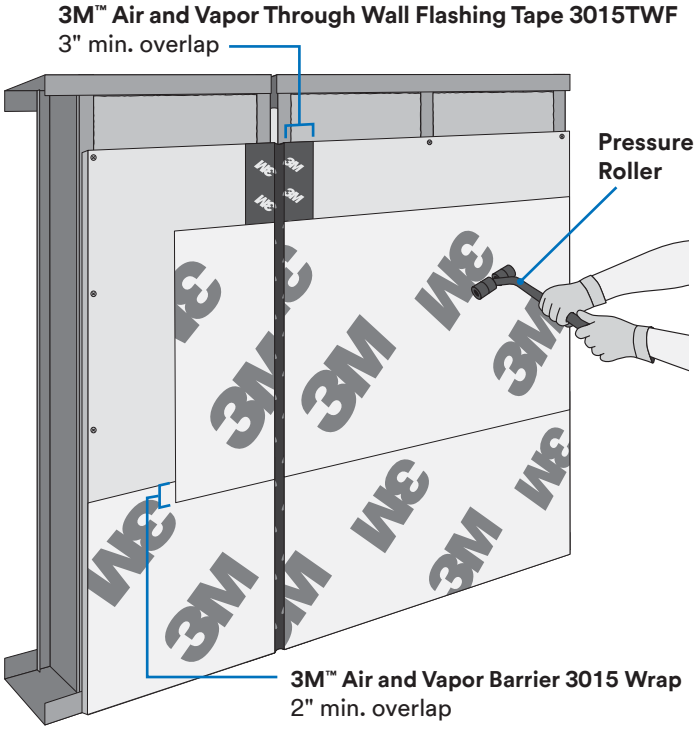
Install 6" (150 mm) wide 3M™ Air and Vapor Barrier 3015 detailing tape over control joint. Ensure a 2" (50 mm) overlap is achieved on either side of the control joint.



Install field membrane over exterior wall. Roll all laps and membrane with a J-roller to ensure optimum seal.

Expansion Joint – Tape 1st, Wrap 2nd

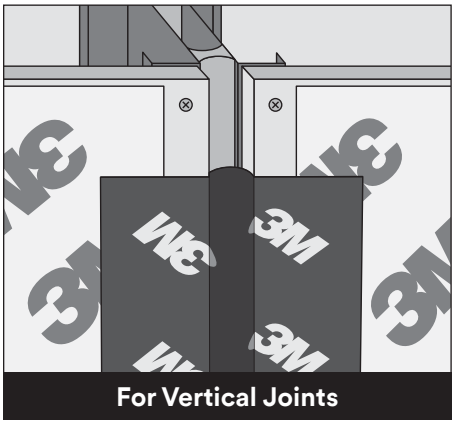
1. Substrate is glass mat gypsum sheathing in compliance with ASTM C1177, Exterior Grade or Exposure 1 wood-based sheathing, or cementitious sheathing in compliance with ASTM C1325 Type A.
2. Apply 3M™ Air and Vapor Through Wall Flashing Tape 3015TWF of appropriate width centered over the joint and extending a minimum 3" (76mm) onto edges of the sheathing, and creating a stress-relief loop by forming a 'U' shape as the tape dips in and out joint.
3. **IMPORTANT:** After 3015TWF application is in place, immediately apply firm, uniform pressure using a hard rubber roller to create a wrinkle-free surface.
4. Continue on to installing the 3015 wrap, but keep the vertical edge of the 3015 wrap held back 1" (25mm) from the edges of the joint.



Installation — Joints and Transitions

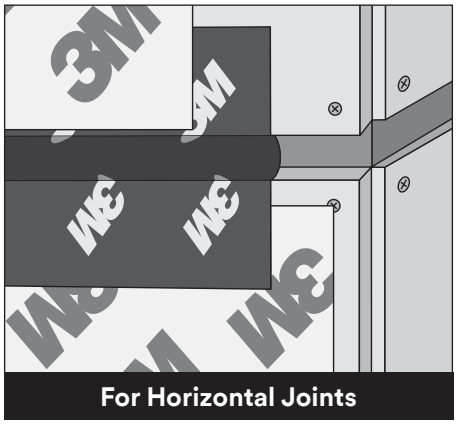
Expansion Joint — Wrap 1st, Tape 2nd

Interrupt field wrap by terminating within 1" of each side of expansion joint and bridge the span using 3M™ Air and Vapor Through Wall Flashing Tape 3015TWF.



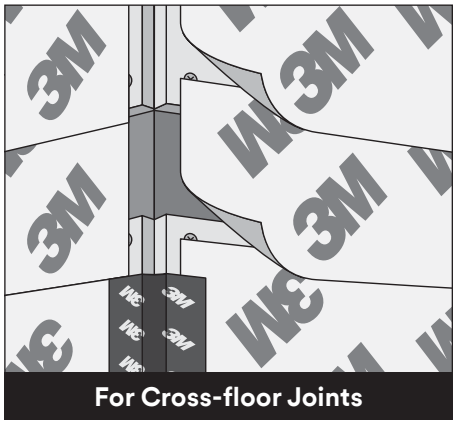
For Vertical Joints

- Install 3M™ Air and Vapor Barrier 3015 Wrap to bridge the span and capture both edges of 3015 wrap
- Create stress-relief loop into joint
- Apply centered along joint



For Horizontal Joints

- Terminate lower course of field WRB/AB before installing 3015 wrap
- Create a stress-relief loop into joint
- Ensure positive weather lapping of subsequent field WRB/AB layers

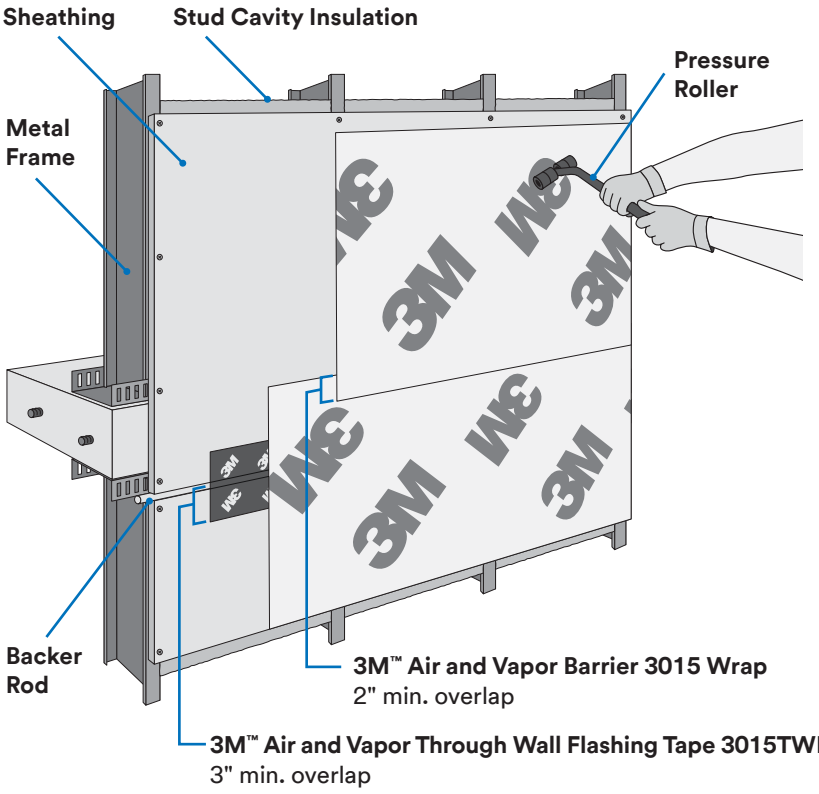


For Cross-floor Joints

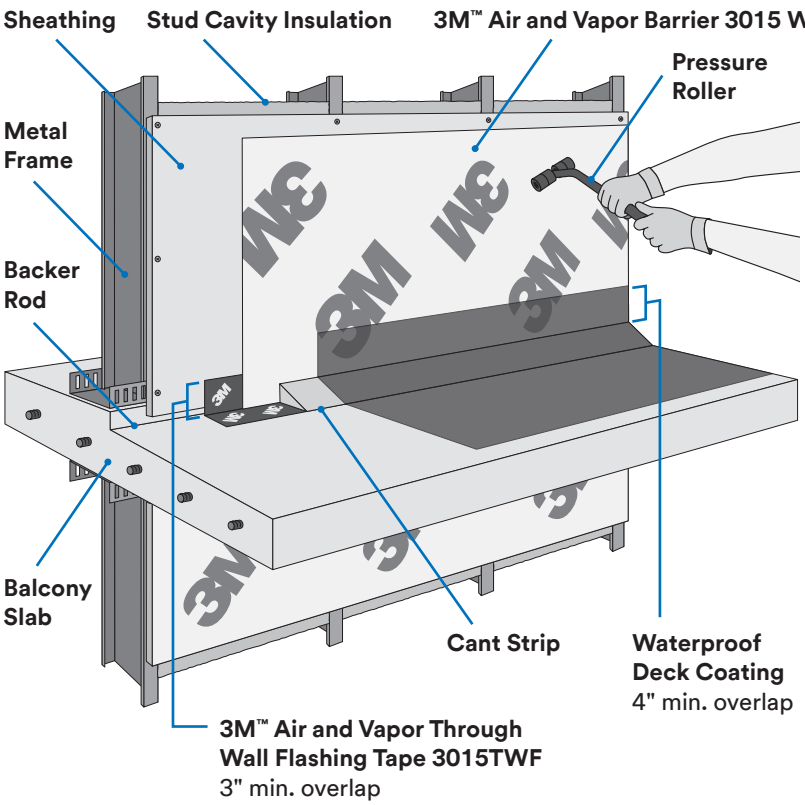
- Install band of 3015 wrap to decouple field WRB/AB at mixed substrates
- For horizontal control joints, apply minimum 4" onto upper substrate
- Maintain lapping requirements

Deflection Joint

1. Substrate is glass mat gypsum sheathing in compliance with ASTM C1177, Exterior Grade or Exposure 1 wood-based sheathing, or cementitious sheathing in compliance with ASTM C1325 Type A.
2. Fill gap joint with closed cell foam backer rod.
3. Apply 3M™ Air and Vapor Through Wall Flashing Tape 3015TWF of appropriate width centered over the joint and extending a minimum 3" (76mm) onto edges of the sheathing, and creating a stress-relief loop by forming a 'U' shape as the tape over the contour of the backer rod.
4. **IMPORTANT:** After 3015TWF application is in place, immediately apply firm, uniform pressure using a hard rubber roller to create a wrinkle-free surface.
5. Continue on to installing the 3015 wrap, but keep the vertical edge of the 3015 wrap held back 1" (25mm) from the edges of the joint.

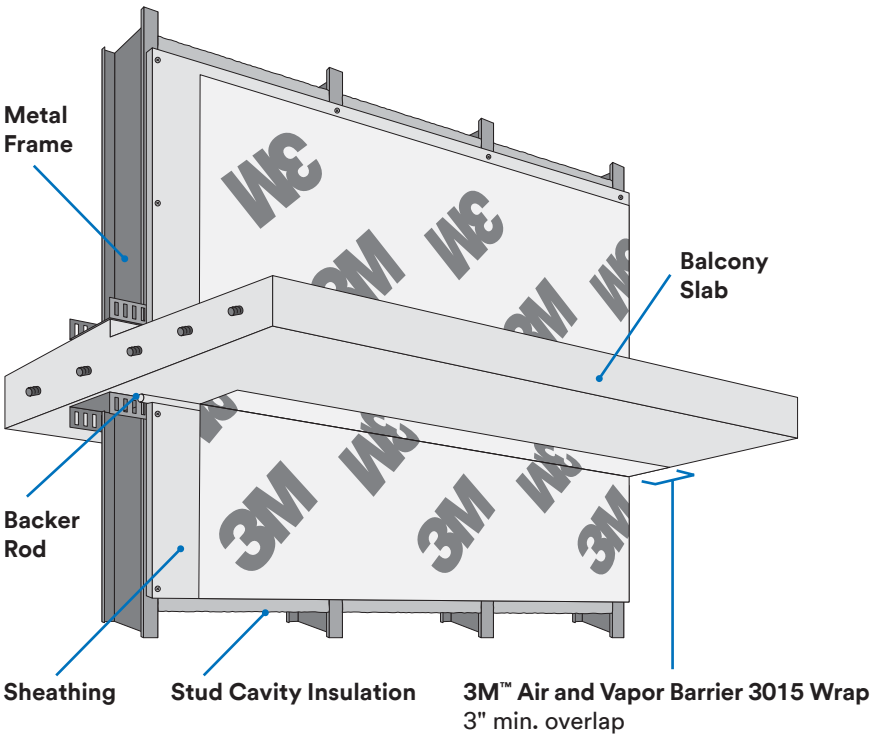


Installation — Joints and Transitions



Balcony Floor to Wall Transition

1. Glass mat gypsum sheathing in compliance with ASTM C1177, Exterior Grade or Exposure 1 wood-based sheathing, or cementitious sheathing in compliance with ASTM C1325 Type A.
2. Apply 3M™ Air and Vapor Through Wall Flashing Tape 3015TWF centered at the balcony/sheathing interface. The split liner feature of the product is helpful at 90-degree inside corner locations such as this.
3. Apply 3M™ Air and Vapor Barrier 3015 Wrap with minimum 2" (51mm) shingle laps at horizontal seams.
4. **IMPORTANT:** After 3015 wrap application is in place, immediately apply firm, uniform pressure using a hard rubber roller to create a wrinkle-free surface.
5. Components not identified as 3015 wrap are furnished by other manufacturers and are not necessarily installed by trades who install 3015 wraps. Refer to project specific contract documents.
6. Verify compatibility of waterproof deck coating with 3M wrap via lab or field adhesion tests, or both.



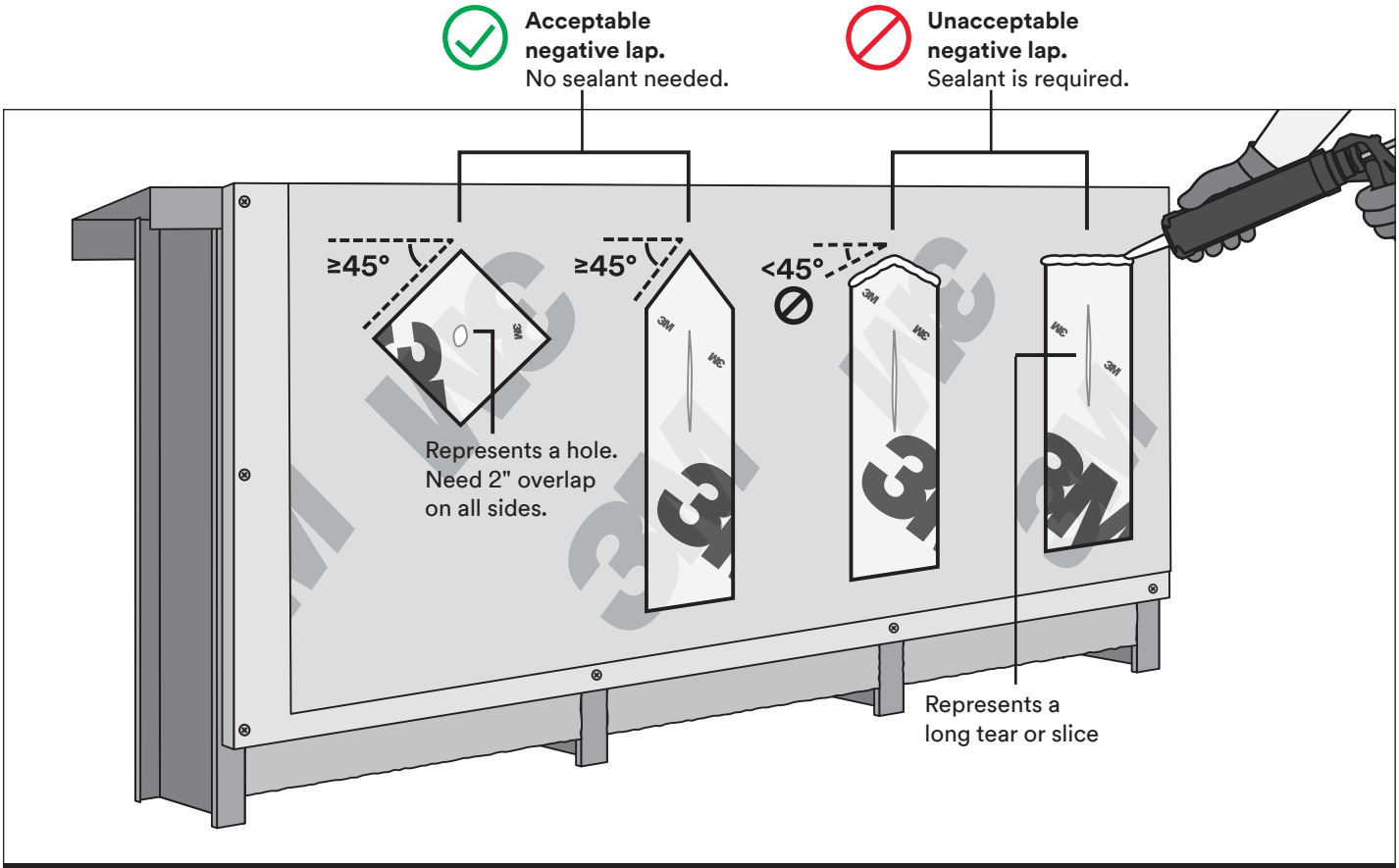
Balcony Ceiling with Deflection Joint

1. Glass mat gypsum sheathing in compliance with ASTM C1177, Exterior Grade or Exposure 1 wood-based sheathing, or cementitious sheathing in compliance with ASTM C1325 Type A.
2. Apply 3015 wrap with minimum 2" (51mm) shingle laps at horizontal seams.
3. **IMPORTANT:** After 3015 wrap application is in place, immediately apply firm, uniform pressure using a hard rubber roller to create a wrinkle-free surface.
4. Components not identified as 3M™ Air and Vapor Barrier 3015 Wrap are furnished by other manufacturers and are not necessarily installed by trades who install 3015 wrap. Refer to project specific contract documents.

Common Repairs

Small holes or damaged areas of the wrap can easily be repaired with 3M™ Air and Vapor Barrier 3015 Tapes. Follow the same negative/positive lap guidelines for repairing damaged areas.

If damage affects the surface beneath the tape, holes 1/4"–1/2" require sealant and holes greater than 1/2" require a backer rod and sealant.

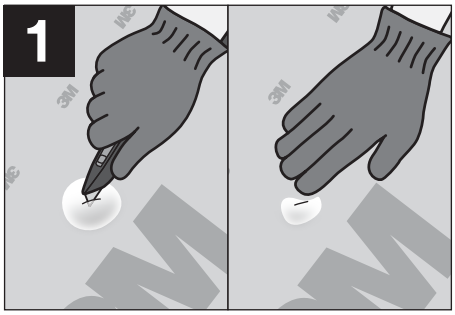


Minor Damage

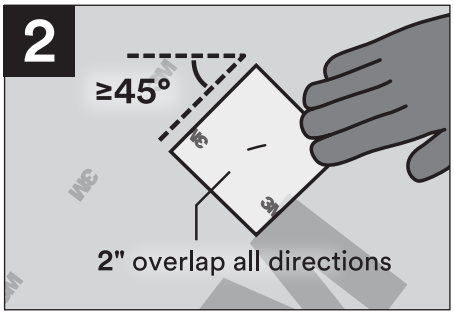
1. Glass mat gypsum sheathing in compliance with ASTM C1177, Exterior Grade or Exposure 1 wood-based sheathing, or cementitious sheathing in compliance with ASTM C1325 Type A.
2. Apply tape 3015 over the damaged area and extending minimum 2" (51mm) beyond onto the adjacent sound substrate.
3. **IMPORTANT:** After 3015 wrap application is in place, immediately apply firm, uniform pressure using a hard rubber roller to create a wrinkle-free surface.

Air Entrapment Repair

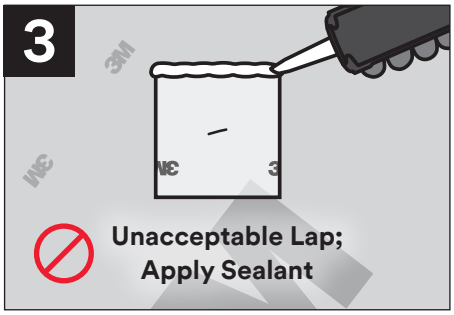
When applying 3015 wraps, it is critical to apply pressure from middle towards the edge so air is not entrapped creating a bubble. Bubbles larger than 1" should be popped and repaired.



Poke or make a small slit to pop the bubble. Force the entrapped air out.

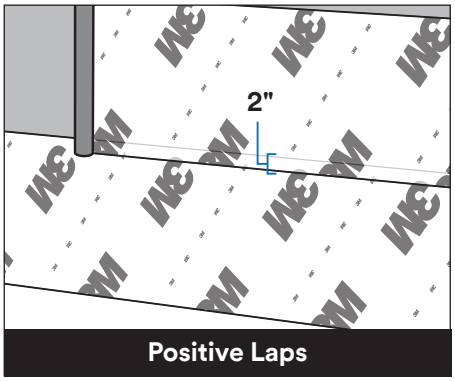


Apply a patch of 3015 wrap/tape over the hole at a 45° angle to create an acceptable negative lap. Ensure a 2" minimum overlap in all directions.

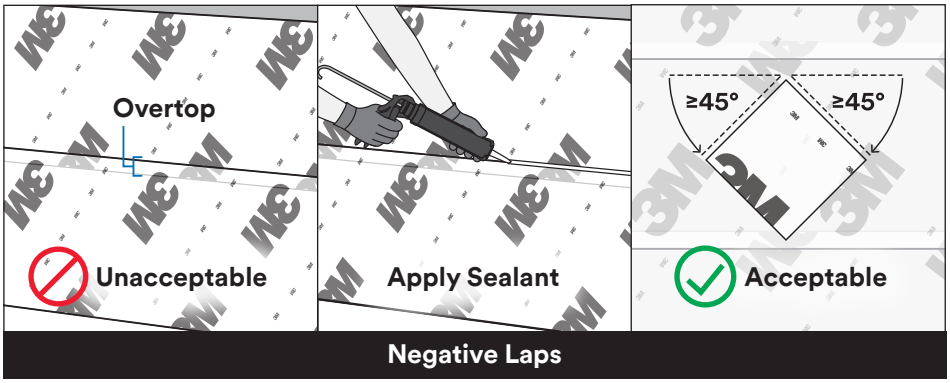


If the patch is applied at less than a 45° angle, the top edge will need a bead of sealant.

Negative Laps



This method is preferred for wall applications. On a vertical surface with multiple horizontal rows of wrap, positive laps are created when the **higher course of wrap covers the wrap below it.** In this configuration, sealant is not needed because the positive wraps shed water.



When positive laps are not possible, a treatment of sealant is required at the top edge of negative-lapped wrap/tape material. On a vertical surface with multiple horizontal rows of wrap, negative laps are created when the **lower wrap is applied overtop** of the higher wrap. To address a negative lap, apply a bead of 3M™ Polyurethane Adhesive Sealant 540 or 3M™ Adhesive Sealant 740 UV (or equivalent) to the seam. For any negative lap where the covering tape is applied at a **45° or greater angle** from a horizontal tape, no sealant is needed.

Construction is never a perfect environment. Cold, hot, damp, dusty, multiple substrates and complex penetrations are just a few of the difficult situations that must be overcome to keep a project on schedule.

3M's proprietary acrylic adhesive technology helps take on these tough conditions. This guide is designed to provide instructions on how to overcome many common construction challenges, what is required for a satisfactory repair, know when conditions will limit performance and how much overlap is needed in common tape overlays.

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Learn more Canada:

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