PERMA "R" PRODUCTS®
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HALO®

INSTALLATION GUIDE

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This manual will be updated regularly. Current updates will be available at www.PermaRProducts.com

1. PRECAUTIONS FOR HANDLING, STORAGE & INSTALLATION

Precautionary measures taken in packaging, storage, transportation and installation of HALO products can help minimize the potential for damage to the products.

1.1 - JOBSITE STORAGE AND HANDLING

HALO products should be protected from reflective sunlight or prolonged solar exposure.

When storing outside, always keep stored HALO products tarped or covered to protect from weather. Do not use a clear plastic covering film. If possible, store indoors.

1.2 - INSTALLATION

Until cladding is installed over HALO Extrerra the following recommendations will help ensure installed Perma "R" Products products are restored to its original dimensions in the event of thermal expansion, and minimize damage due to reflective sunlight or prolonged solar exposure.

- Remove or cover the surface that is casting a reflection on installed HALO products, or shield the affected HALO products.
- Cover HALO Extrerra if left exposed for more than 30 days. Faded printing on HALO laminates is normal and will not degrade the HALO properties.
- Ensure all butt joints are tightly fitted. "5.6 - SEALING JOINTS AND FASTENER PENETRATIONS" on page 12.
- Immediately tape seal or temporarily cover all joints of inside corners until tape sealant is applied. Edges of Subterra products installed on subgrades and adjacent to HALO Extrerra should also be immediately covered until proper sealant method is applied along the perimeter between HALO Extrerra and Subterra.

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2. USEFUL TOOLS & MATERIALS

Recommended for sealing joints, penetrations, perimeter edges and flashing details

- Perma R Products' Sheathing Tape
- Vapor barrier blue or red "Tuck" Tape
- 3M peel and stick membrane
- Blueskin flashing tape
- Expandable foam.

Recommended for fastening or gluing

- Weather resistive construction glue, such as PL 300
- Plastic cap nails
- Roofing nails with at least 1/2" diameter washers
- Cap staples
- Wood screws with metal roof washers.

When fastening to metal studs use self-drilling screws with at least 1" diameter metal washers.

Additional tools:
- Hammer and cordless drill
- Utility knife and straight edge

3. PRODUCT DESCRIPTION

3.1 - FEATURES

HALO Extrerra is a rigid foam sheathing insulation faced with a polypropylene laminate that is perforated to allow the sheathing to breath. The insulation is made with graphite polystyrene (GPS) which is expanded polystyrene infused with graphite particles. Insulation made with GPS provides up to 18% more R-value than conventional EPS.

Perforated laminate

Perforated laminate

GPS Rigid insulation
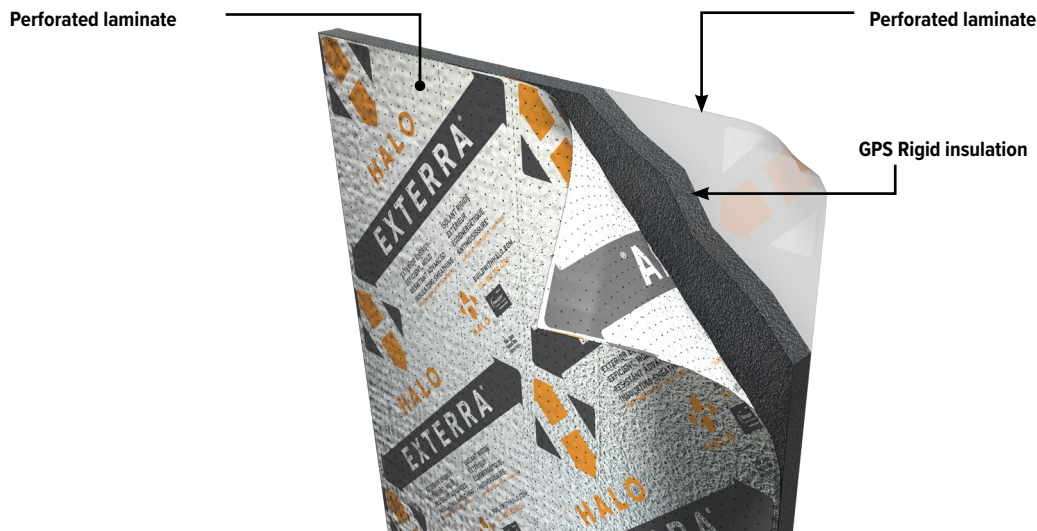
3.2 - BENEFITS

When installed as exterior insulation HALO Extrerra offers the following functional benefits.

- Provides continuous insulation, which reduces thermal breaks.
- Increases the R-value of wall assemblies that cannot be achieved with cavity insulation alone.
- Acts as a water-resistive barrier - eliminates the need for house wrap when the joints are sealed and taped. This reduces air leakage and ensures moisture transmission through the cladding will drain to the outside.
  A house wrap is not required with HALO Extrerra for thicknesses 9/16" or greater.
- Contains perforations, which allow HALO Extrerra to breathe. Because HALO Extrerra is breathable, a vapor barrier may be required for the wall assembly. HALO Extrerra remains breathable up to 2-1/8".
- Reduces heat gains in warm climates when an air gap is provided between HALO Extrerra and the cladding (applicable only where HALO Extrerra is available with a reflective laminate).

3.3 - AVAILABLE SIZES

Available in 4ft x 8ft sheets, 1/2", 9/16", 5/8", 1", 1.5" and 2" thickness. Custom sizes and thicknesses are available. For more information, or to contact a Perma R representative, call 800.647.6130 or visit our website at www.PermaRProducts.com and click "Contact Us".

4. APPLICATION

Suitable for use for new construction and existing buildings, HALO Exterra is designed to completely insulate exterior above-grade walls in residential, multi-residential, commercial, and industrial buildings while providing a breathable water-resistive barrier.

5. INSTALLATION

The following illustrations are typical for the installation of HALO Exterra as interior insulation.

Installation may vary depending on project specific requirements. Before starting, make sure all installation complies with local building code requirements.

HALO Exterra consists of a perforated laminate allowing the sheathing to breath. Therefore, an additional vapor barrier may be required for the wall assembly.

NOTE: Where HALO Exterrao is available with a reflective or white laminate on one side of the insulation it is recommended that HALO Exterra is installed with these laminates facing the exterior.

5.1 - FASTEN THERMO-PRO TO THE WALL SUBSTRATE

HALO Exterra is fastened directly to the wall substrate or framing members, such as wood sheathing, wood or steel stud framing, concrete or masonry walls.
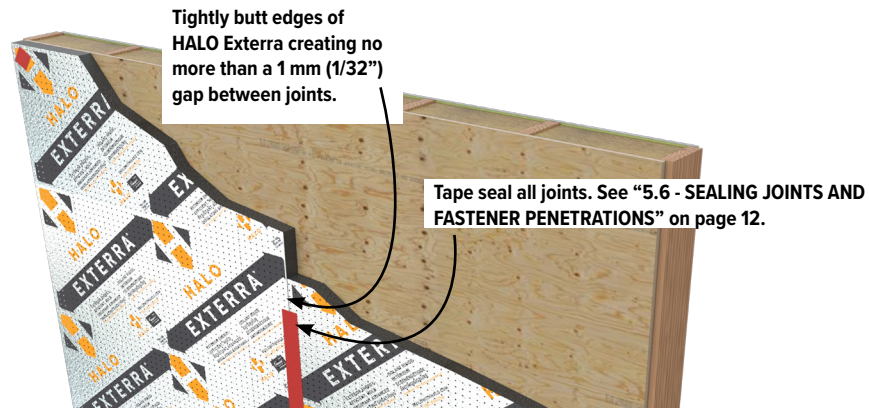
Attach HALO Exterra at corners, as a minimum, to the substrate or framing members. A minimal number of fasteners is required to tack HALO Exterra sheets in place – the attachment of cladding, or strapping will fully secure HALO Exterra sheets.

Place HALO Exterra against the wall substrate either vertically or horizontally. For tall walls installing vertically is preferable.

5.2 - FRAMED WALLS WITH WOOD SHEATHING

Fasten HALO Exterra directly over the wood sheathing. For existing framed wall buildings remove the cladding material and house wrap to expose the wood sheathing.

Tightly butt edges of HALO Exterra creating no more than a 1 mm (1/32") gap between joints.

Tape seal all joints. See "5.6 - SEALING JOINTS AND FASTENER PENETRATIONS" on page 12.

For information on fastening HALO Exterra over wood sheathing see "6.0 – FASTENING" on page 18.

5.3 - FRAMED WALLS WITHOUT WOOD SHEATHING

HALO Exterra can be installed directly over wall studs. Since HALO Exterra is not structural sheathing the walls will require bracing, per local building codes.

5.3.1 - DIAGONAL BRACING

Some examples of typical bracing include metal T-straps, or 1x4 wood let-in. Typical corner bracing includes wood sheathing at the corners, such as OSB or plywood.

Tightly butt edges of HALO Exterra creating no more than a 1 mm (1/32") gap between joints.

Bracing

Tape seal all joints. See "5.6 - SEALING JOINTS AND FASTENER PENETRATIONS" on page 12.
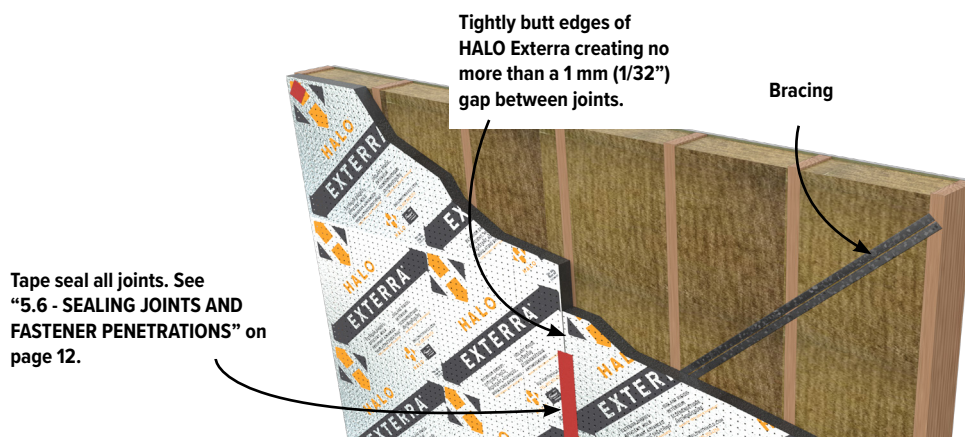
5.3.2 - WOOD SHEATHING BRACING

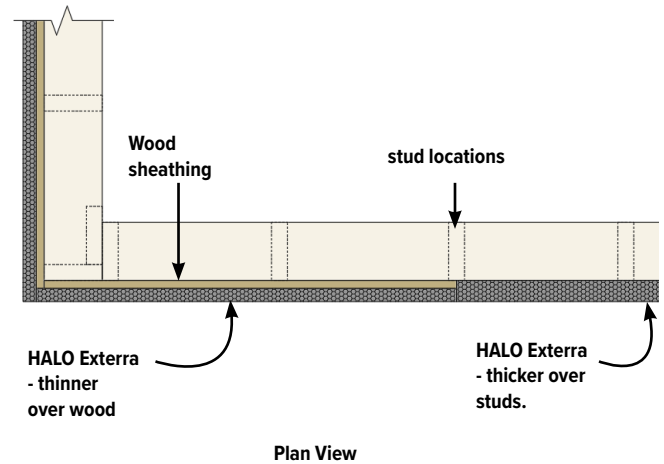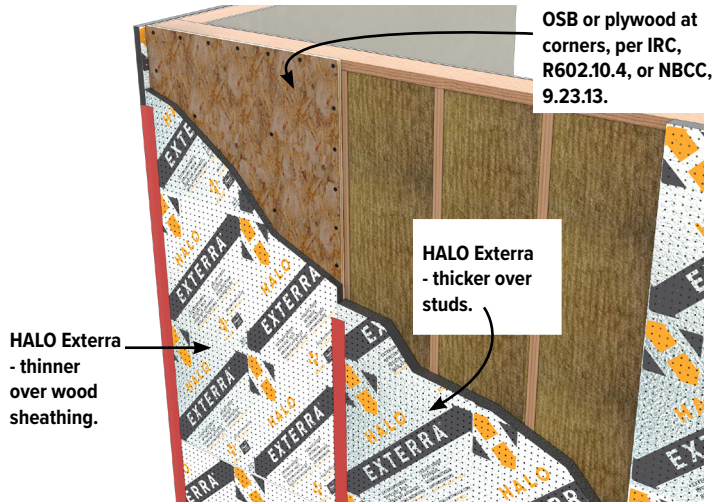HALO Exterra is installed over the entire home after the structural sheathing are installed as corner bracing. The panels add thickness to the framed wall at the corner regions so HALO Exterra will be thinner over the sheathing than areas without sheathing. This ensures the exterior face of HALO Exterra remains flush along the walls.

5.3.3 - INSULATED WOOD SHEATHING BRACING

Insulated wood structural panels, such as Zip System R-Sheathing, used as corner bracing offers continuous insulation built into the structural sheathing. In this case, HALO Exterra is not required over the structural panel but should be thick enough to match the thickness of the structural sheathing and its underlying insulation layer throughout the entire wall.
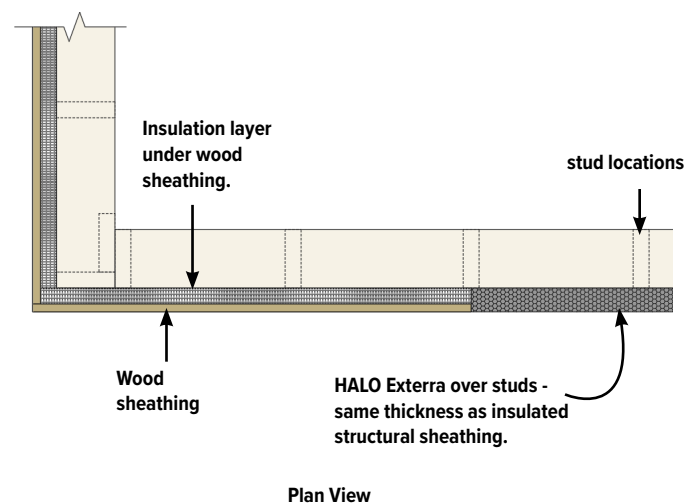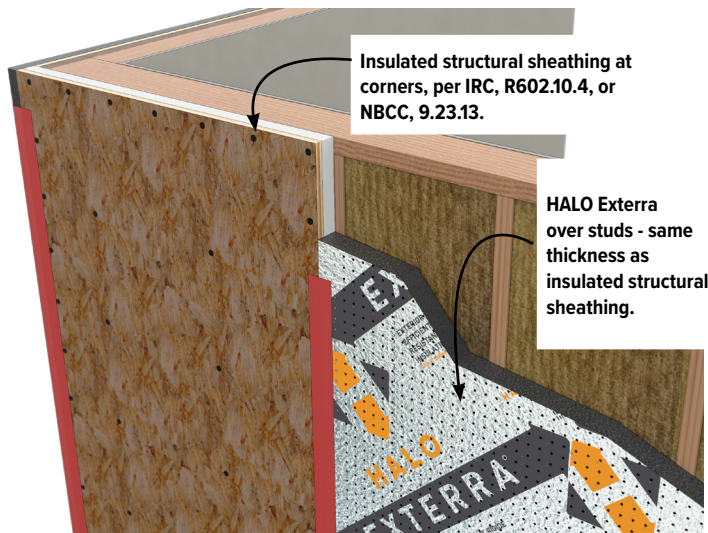
For more information on fastening HALO Exterra direct to wall studs and corner bracing see "6.0 – FASTENING HALO Exterra" and online Technical Bulletin No.12, respectively.

5.4 - CONCRETE OR MASONRY WALLS

Use weather resistant construction glue compatible with EPS, such as PL 300, to secure HALO Exterra to the wall.

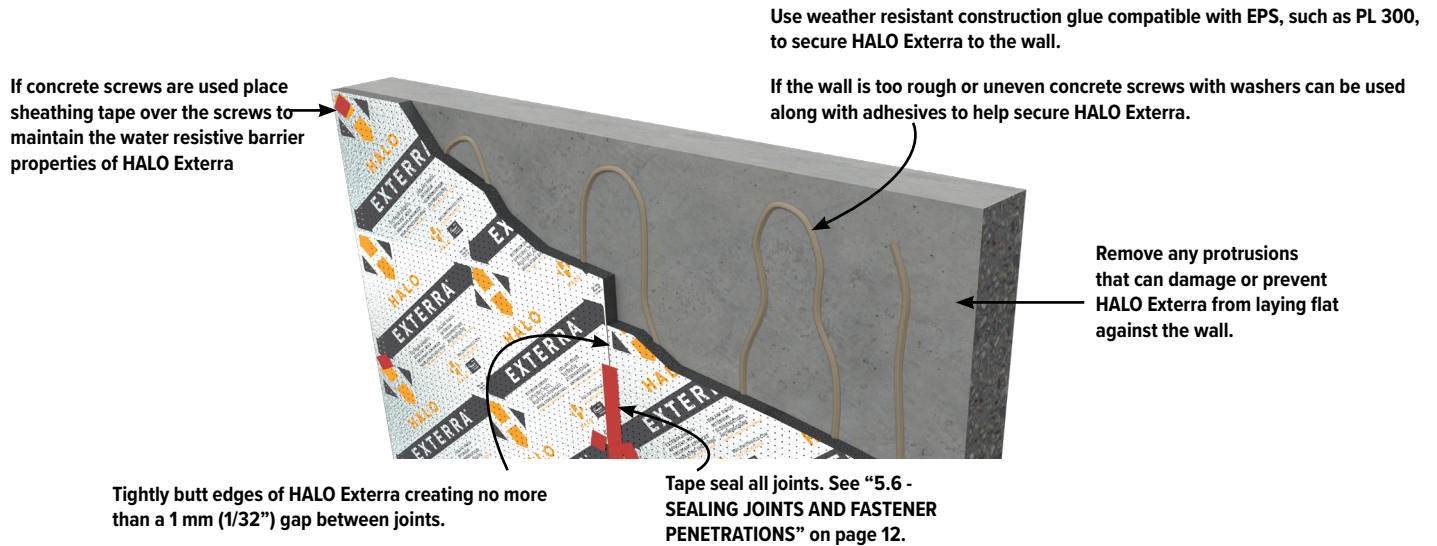If the wall is too rough or uneven concrete screws with washers can be used along with adhesives to help secure HALO Exterra.

If concrete screws are used place sheathing tape over the screws to maintain the water resistive barrier properties of HALO Exterra

Remove any protrusions that can damage or prevent HALO Exterra from laying flat against the wall.

Tightly butt edges of HALO Exterra creating no more than a 1 mm (1/32") gap between joints.

Tape seal all joints. See "5.6 - SEALING JOINTS AND FASTENER PENETRATIONS" on page 12.
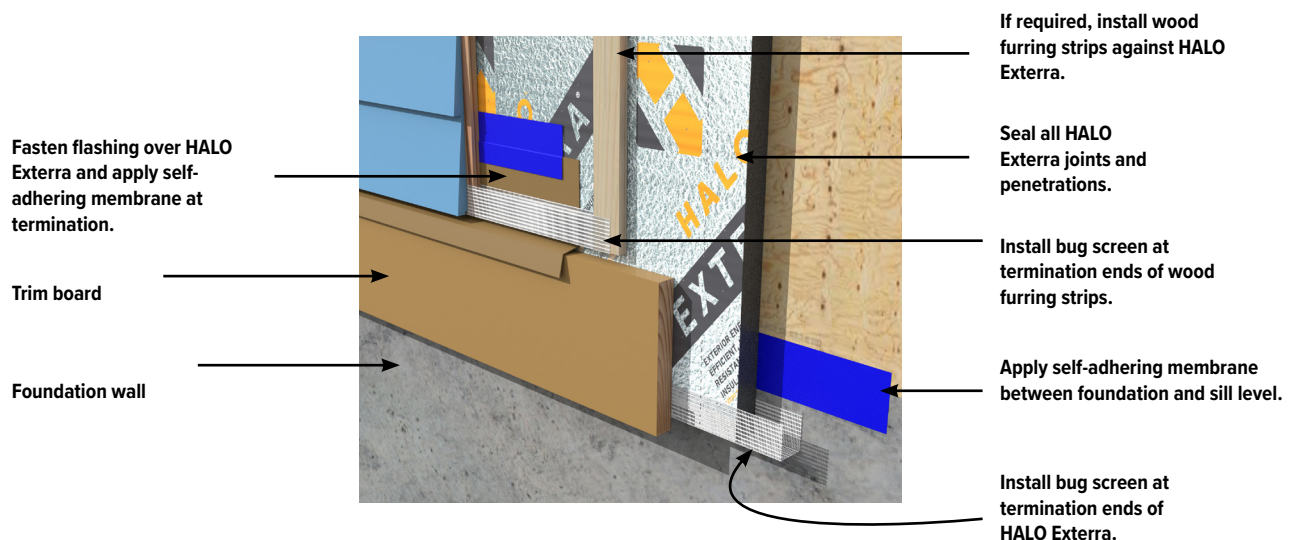
5.5 - TRANSITIONS

There are different methods to ensuring HALO Exterra performs as a water-resistive barrier, and properly drains moisture to the exterior.

The following illustrations are detail examples for transitions the foundation and roof level.

5.5.1 - FOUNDATION TRANSITION

If required, install wood furring strips against HALO Exterra.

Fasten flashing over HALO Exterra and apply self-adhering membrane at termination.

Seal all HALO Exterra joints and penetrations.

Trim board

Install bug screen at termination ends of wood furring strips.

Foundation wall

Apply self-adhering membrane between foundation and sill level.

Install bug screen at termination ends of HALO Exterra.

5.5.2 - ROOF TRANSITION

Spray foam.

Cut HALO Exterra to underside of the roof baffles. Apply spray foam at termination.

Seal all HALO Exterra joints and penetrations.

Install bug screen at termination ends of wood furring strips.
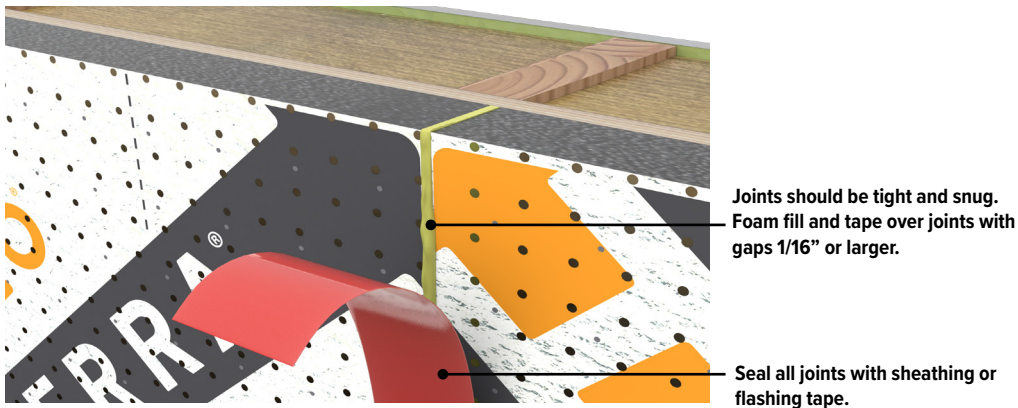
5.6 - SEALING JOINTS AND FASTENER PENETRATIONS

Joints between HALO Exterra boards, and fastener penetrations, should be sealed. This will maintain the water-resistive barrier properties of HALO Exterra, especially when HALO Exterra is intended to be used as the water-resistive barrier, in lieu of a separate membrane such as house wrap.


Joints should be tight and snug. Foam fill and tape over joints with gaps 1/16" or larger.

Seal all joints with sheathing or flashing tape.

Place sheathing tape over fasteners to maintain the water resistive barrier properties of HALO Exterra
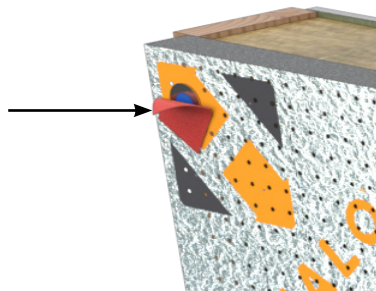
5.6.1 - PENETRATIONS

Measure and cut HALO Exterra to suit the rough opening for penetrations. HALO Exterra boards can be cut using a utility knife. The following illustrations provide a typical example of addressing proper drainage and insulation around a penetration.
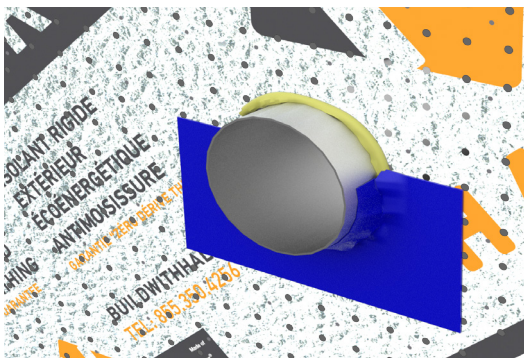
Step 1: Cut a rough opening.

Use a utility knife to cut a section of HALO Exterra.
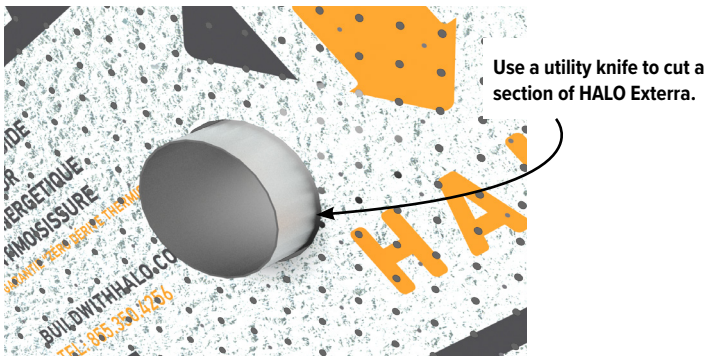
Step 2: Apply spray foam to fill gaps.

Apply spray foam to insulate gaps greater than 1/8".
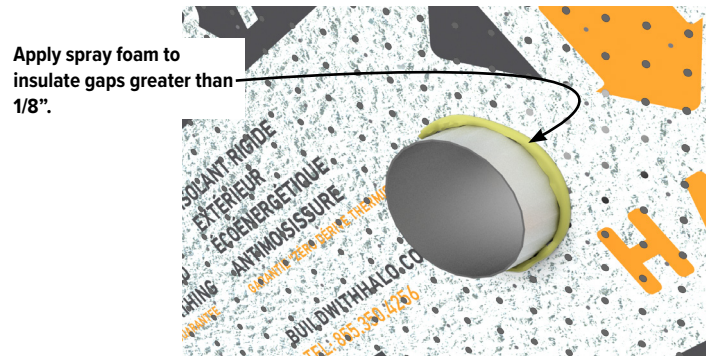
Step 3: Apply self-adhesive membrane at bottom half.

Step 4: Apply self-adhesive membrane at top half.

Provide overlap to maintain proper drainage.

Applying the membrane around the pipe or conduit will provide additional prevention against air ingress.

Step 5: Apply sheathing tape.

Sheathing tape will secure and seal the membrane edge.

Step 6: Install trim block.

Install trim block, if required. Fasten to the underlying substrate, or framing members.

HALO INSTALLATION GUIDE: RIGID FOAM INSULATION
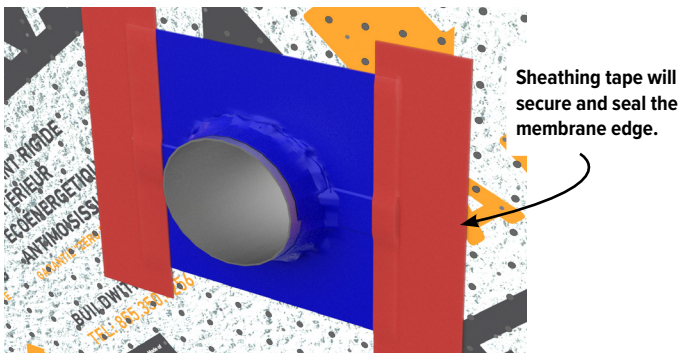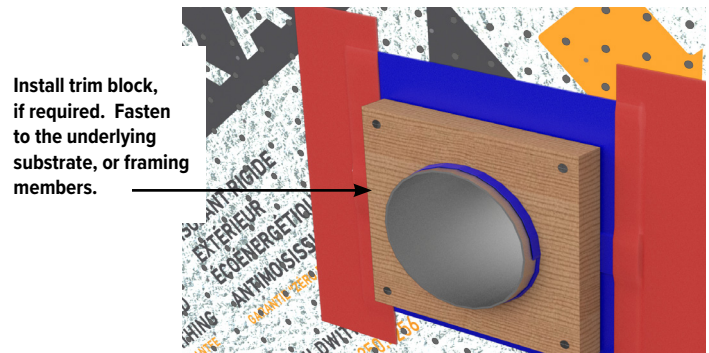
Step 7: Install flashing.
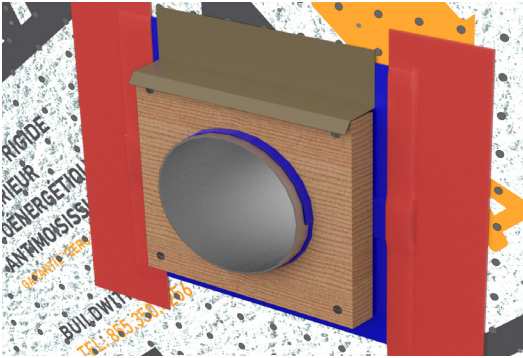
Step 8: Apply sheathing tape to seal edge of membrane and flashing.

Step 9: Fasten cover to trim block.
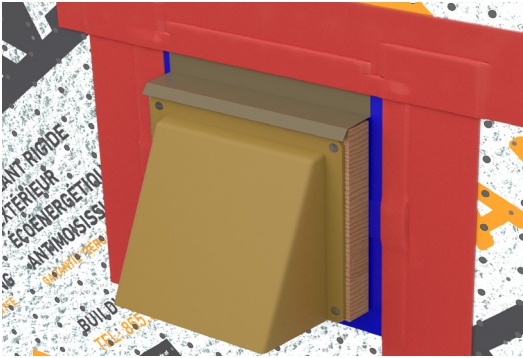
5.6.2 - OPENINGS

The following illustrations provide a typical example of addressing proper drainage and insulation around a flanged window. For additional window opening details refer to "10.0 - EXAMPLE CAD DETAILS" on page 38.
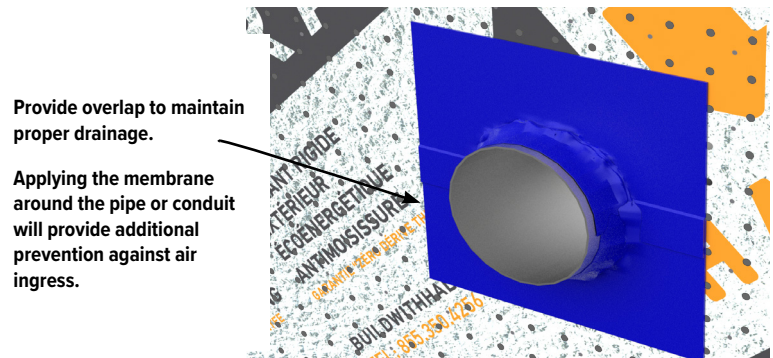
Step 1: After cutting a section of HALO Exterra to match the rough opening, install a self-adhering flashing membrane at the sill.
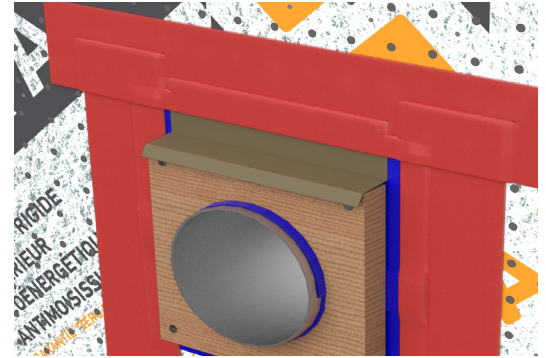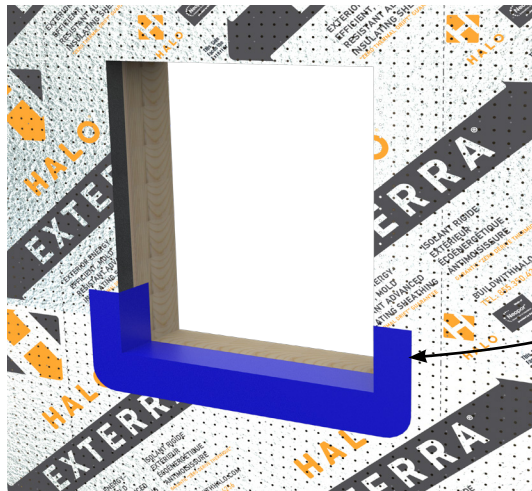

Install a vertical section of the membrane a minimum of 8" up the jamb.

Step 2: Install a self-adhering membrane along the length of the jam.
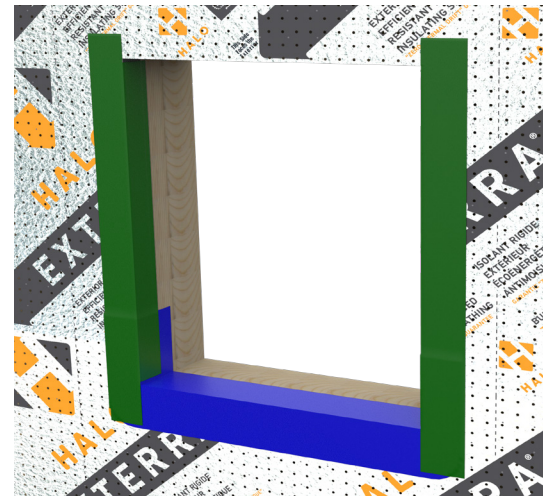
Step 3: Install the flanged window and fasten to the substrate.
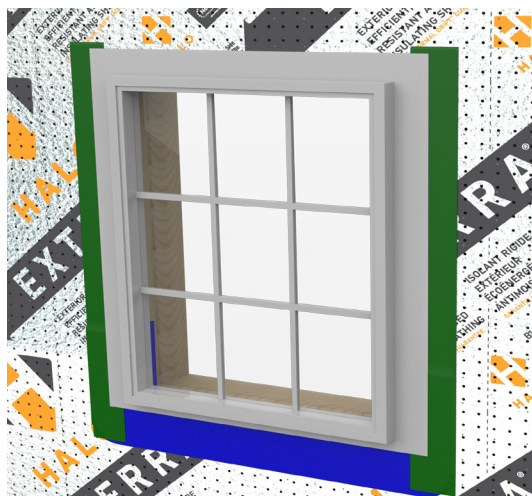
Step 4: Install a self-adhering membrane along the length of the jam over the flanges.

HALO INSTALLATION GUIDE: RIGID FOAM INSULATION
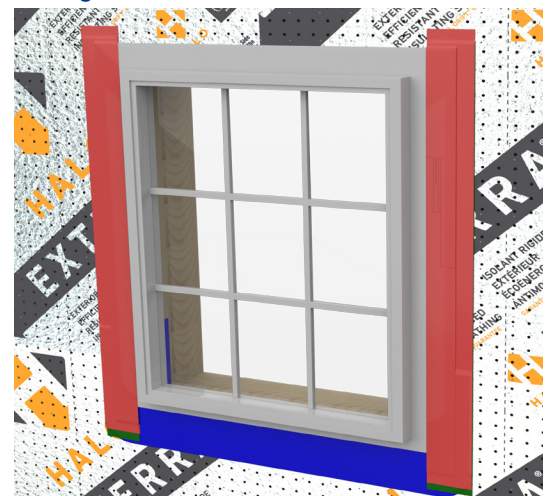
Step 5: Install the head flashing.
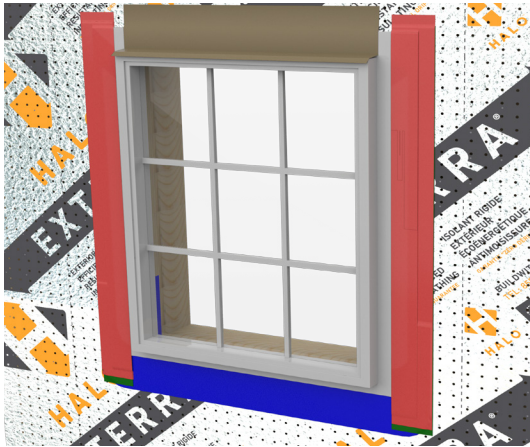
Step 6: Install a self-adhering membrane over the flashing.

Apply sheathing tape lapped over the membrane.

Self-adhering membrane should completely lap the membranes at the jambs.
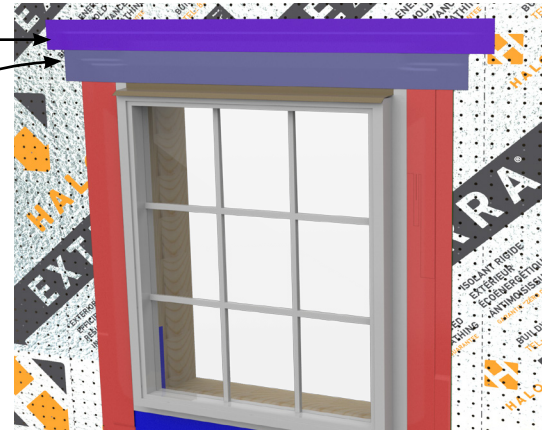
Step 7: if required, install furring strips around the opening.
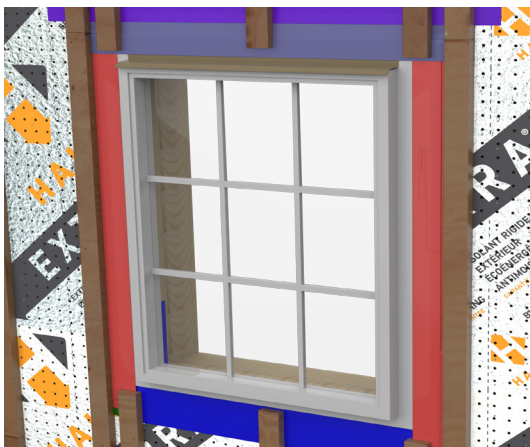
Step 8: Install trim boards and fasten to the furring strips or substrate.
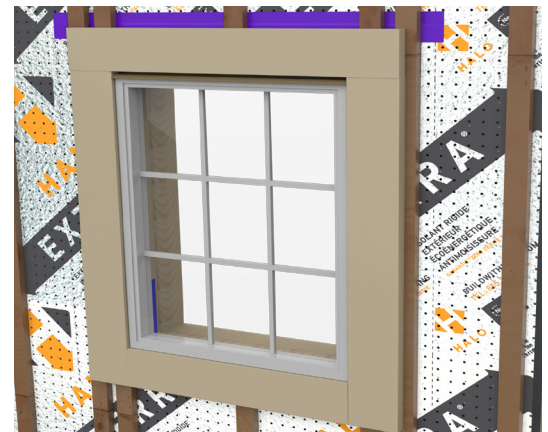
Step 9: Install cladding, as required.

Apply a compatible sealant between cladding and trim boards.
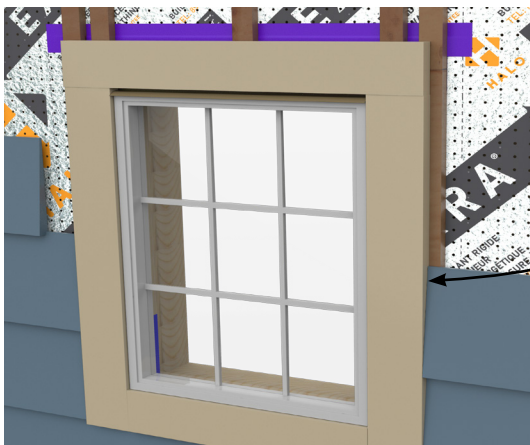
Step 10: Apply spray foam.

Apply spray foam between rough opening and window.

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5.7 - CLADDING

Cladding and wood strapping can be installed directly over HALO Exterra with the use of fasteners.
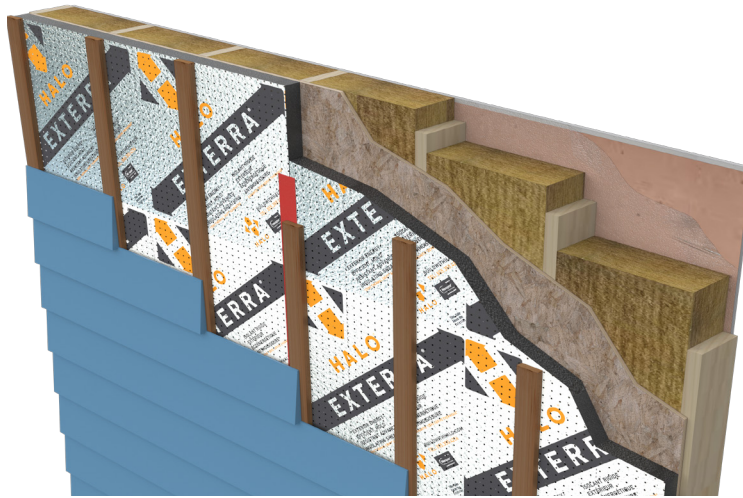
Fasten cladding to the substrate, or if required to the wood furring strips. See "8.0 - CLADDING OVER HALO Exterra" on page 33.

5.8 - CAVITY WALLS

Fasten HALO Exterra directly to the wall substrate using appropriate fasteners.

There are a number of available brick ties designed to be compatible for foam sheathing. Below is a list of compatible brick ties.

- Slotted Stud Tie, Fero Corp., ferocorp.com

Fasteners for brick ties must penetrate the HALO Exterra layer and at least 3/4" into the wall substrate.
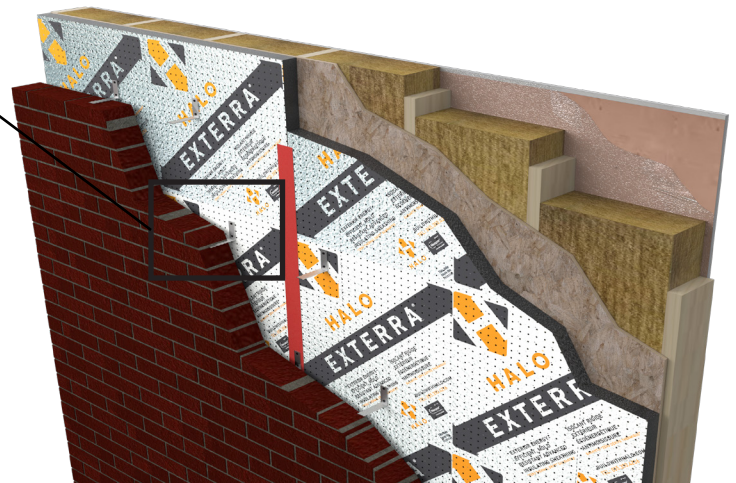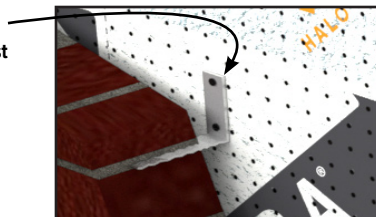
- Pos-i-Tie, Heckmann Building Products, heckmannbuildingprods.com
- X-Seal Anchor, Hohmann & Barnard, H-b.com
- Dur-O-Wal Veneer Anchors, Dayton Superior, daytonsuperior.com.

6. FASTENING HALO EXTERRA

This section is a guide to fastening:

- HALO Exterra to wall substrate
- Cladding or wood strapping over HALO Exterra.

HALO Exterra is not structural so a minimal number of fasteners is required to tack HALO Exterra sheets in place – the attachment of cladding, strapping, and housewrap will fully secure HALO Exterra boards.

6.1 - TYPICAL FASTENER TYPES

Fasteners with washer types are recommended to secure HALO Exterra boards with the top of the fasteners flush to the surface of HALO Exterra boards.

Typical fastener types include, but are not limited to:

- Plastic cap nails
- Roofing nails with at least ½" diameter washers
- Cap staples
- Wood screws with metal roof washers.

When fastening to metal studs use screws with at least 1" diameter metal washers.

6.2 - TYPICAL NAILING PATTERNS OVER WOOD SHEATHING & OPEN STUD ASSEMBLY

The following provides suggested nailing patterns when installing HALO Exterra over wood sheathing or direct to wood studs. Guidelines printed on the HALO Exterra boards can be used to locate studs and fastening points.

To maintain the water resistive barrier and continuous insulation properties all fasteners and joints should be covered with sheathing tape. In addition, large gaps should be foam filled prior to covering with sheathing tape. For more information refer to "5.6 - SEALING JOINTS AND FASTENER PENETRATIONS" on page 12.

For information on recommended fastener lengths refer to "6.4 - RECOMMENDED FASTENER LENGTHS" on page 30.

6.2.1 - OVER WOOD SHEATHING

Fastening into wood studs is not required when installing HALO Exterra over wood sheathing - the wood sheathing will provide sufficient backing for fasteners.

HALO Exterra can be placed either horizontally or vertically without the need to stagger vertical joints in a running bond pattern. However, offsetting the joints in HALO Exterra to that of the wood sheathing is recommended to minimize air gaps and improve air tightness.

Offset horizontal and vertical joints between HALO Exterra and wood sheathing when possible.
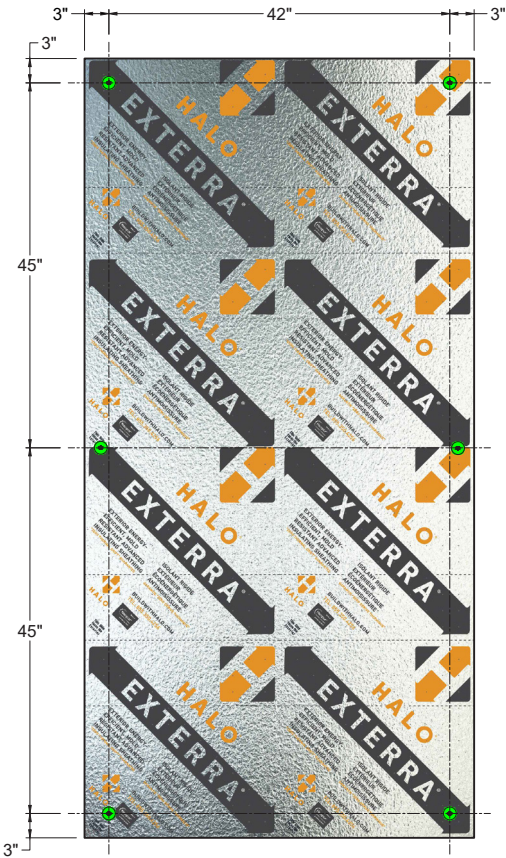
Nailing pattern - Vertical placement against wood sheathing (4'x8' HALO Exterra board shown)
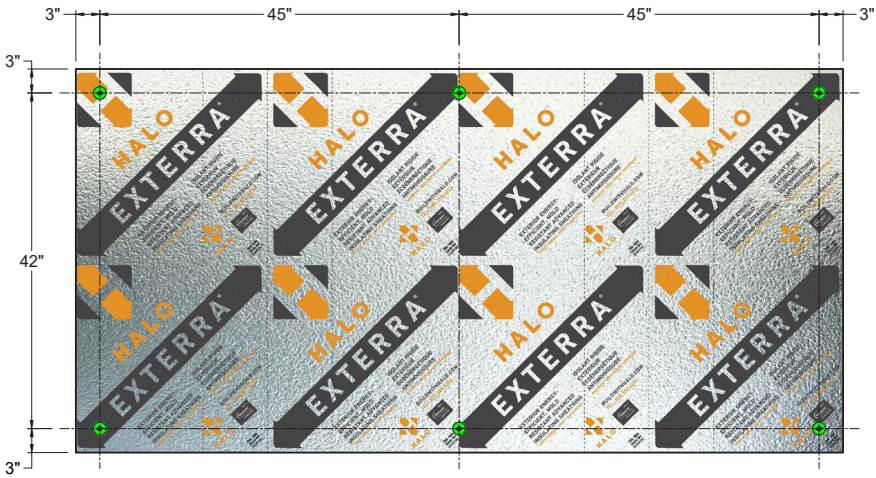
Nailing pattern - Horizontal placement against wood sheathing (4'x8' HALO Exterra board shown)

TYPICAL NAILING PATTERNS OVER WOOD SHEATHING

HALO INSTALLATION GUIDE: RIGID FOAM INSULATION

6.2.2 - OVER OPEN STUD ASSEMBLY

HALO Exterra boards are fastened direct to the wood studs in an open stud wall assembly.

Since HALO Exterra boards are non-structural, the stud wall assembly must be properly braced, as required by building codes or structural specifications.

HALO Exterra can be placed either horizontal or vertically. The vertical joints of HALO Exterra boards should rest fully or halfway on a stud to ensure proper fastening to the stud. [show image]

0.75" Minimum edge distance to stud

Nailing pattern - Vertical placement against 16" wood stud spacing (4'x8' HALO Exterra boards shown). Use printed guidelines on HALO Exterra boards to approximate vertical spacing of fasteners.

TYPICAL NAILING PATTERN OVER OPEN STUD ASSEMBLY
VERTICAL INSTALLATION OVER 16" STUD SPACING

Nailing pattern - Horizontal placement against 16" wood stud spacing (4'x8' HALO Exterra boards shown). Printed guidelines on HALO Exterra boards can be used to locate studs.

TYPICAL NAILING PATTERN OVER OPEN STUD ASSEMBLY
HORIZONTAL INSTALLATION OVER 16" STUD SPACING

Stagger fasteners between HALO Exterra joints. See Section 6.4 for edge nailing details.

Nailing pattern - Vertical placement against 24" wood stud spacing (4'x8' HALO Exterra boards shown). Use printed guidelines on HALO Exterra boards to approximate vertical spacing of fasteners.

TYPICAL NAILING PATTERNS OVER OPEN STUD ASSEMBLY
VERTICAL INSTALLATION OVER 24" STUD SPACING

Nailing pattern - Horizontal placement against 24" wood stud spacing (4'x8' HALO Exterra boards shown). Printed guidelines on HALO Exterra boards can be used to locate studs.

TYPICAL NAILING PATTERNS OVER OPEN STUD ASSEMBLY
HORIZONTAL INSTALLATION OVER 24" STUD SPACING

6.3 - NAILING PATTERNS FOR PREFABRICATED WALL ASSEMBLIES

When HALO Exterra is installed in a factory-built wall system additional fasteners are required to secure HALO Exterra boards due to handling and transportation of the prefabricated wall assembly.

Since HALO Exterra boards are non-structural, the wall assembly must be properly braced, as required by building codes or structural specifications.

Before cladding is installed over HALO Exterra inspect the HALO Exterra boards for any visible signs of damage, and to ensure all taped joints and penetrations are properly adhered to HALO Exterra.

Nailing pattern - Vertical placement against wood sheathing (4'x8' HALO Exterra board shown)

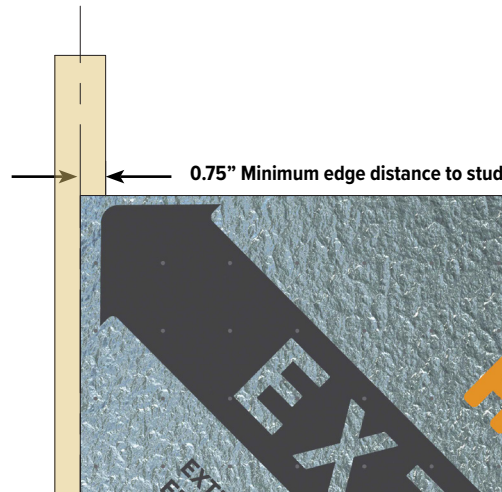Nailing pattern - Horizontal placement against wood sheathing (4'x8' HALO Exterra board shown)
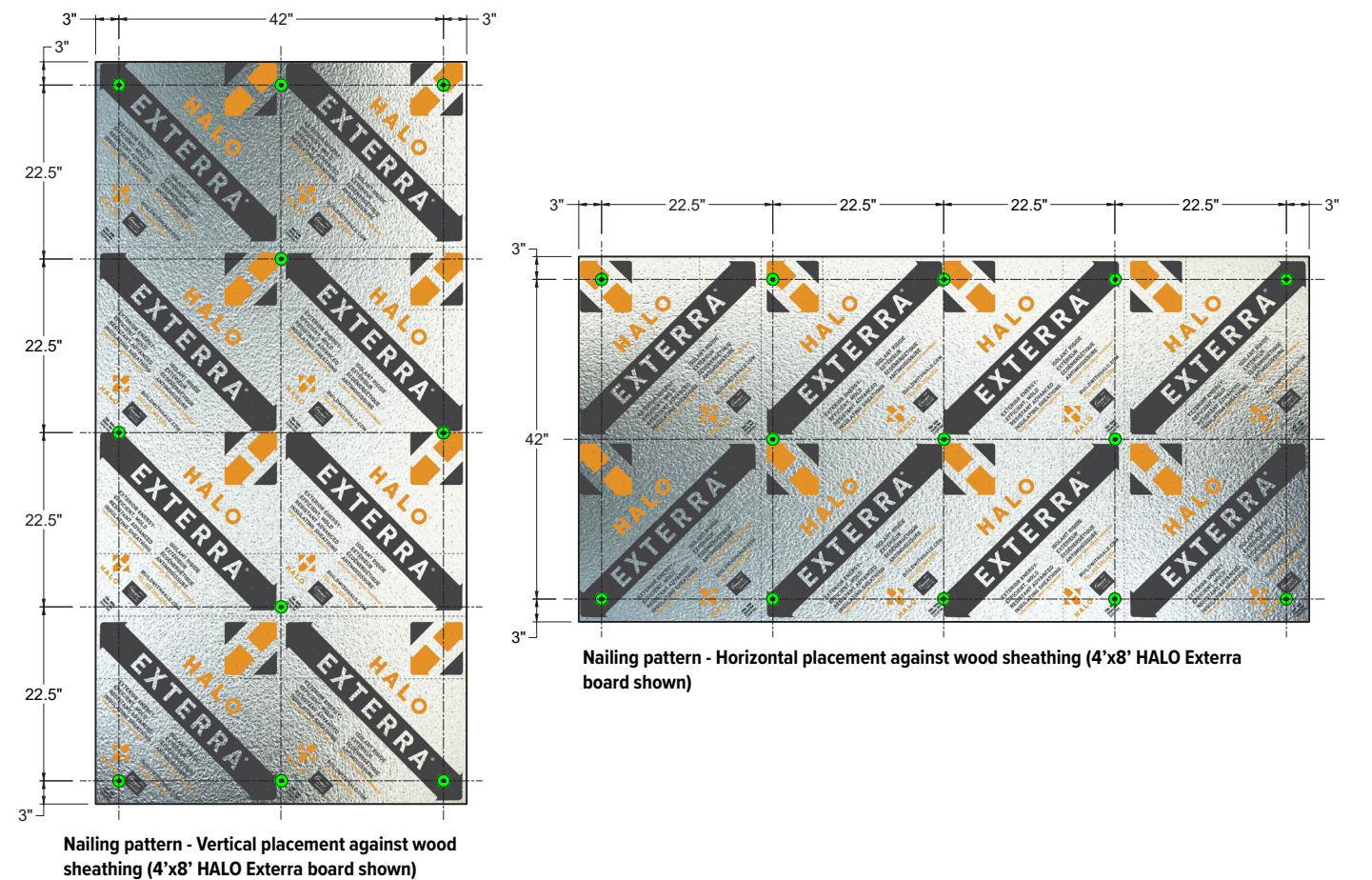
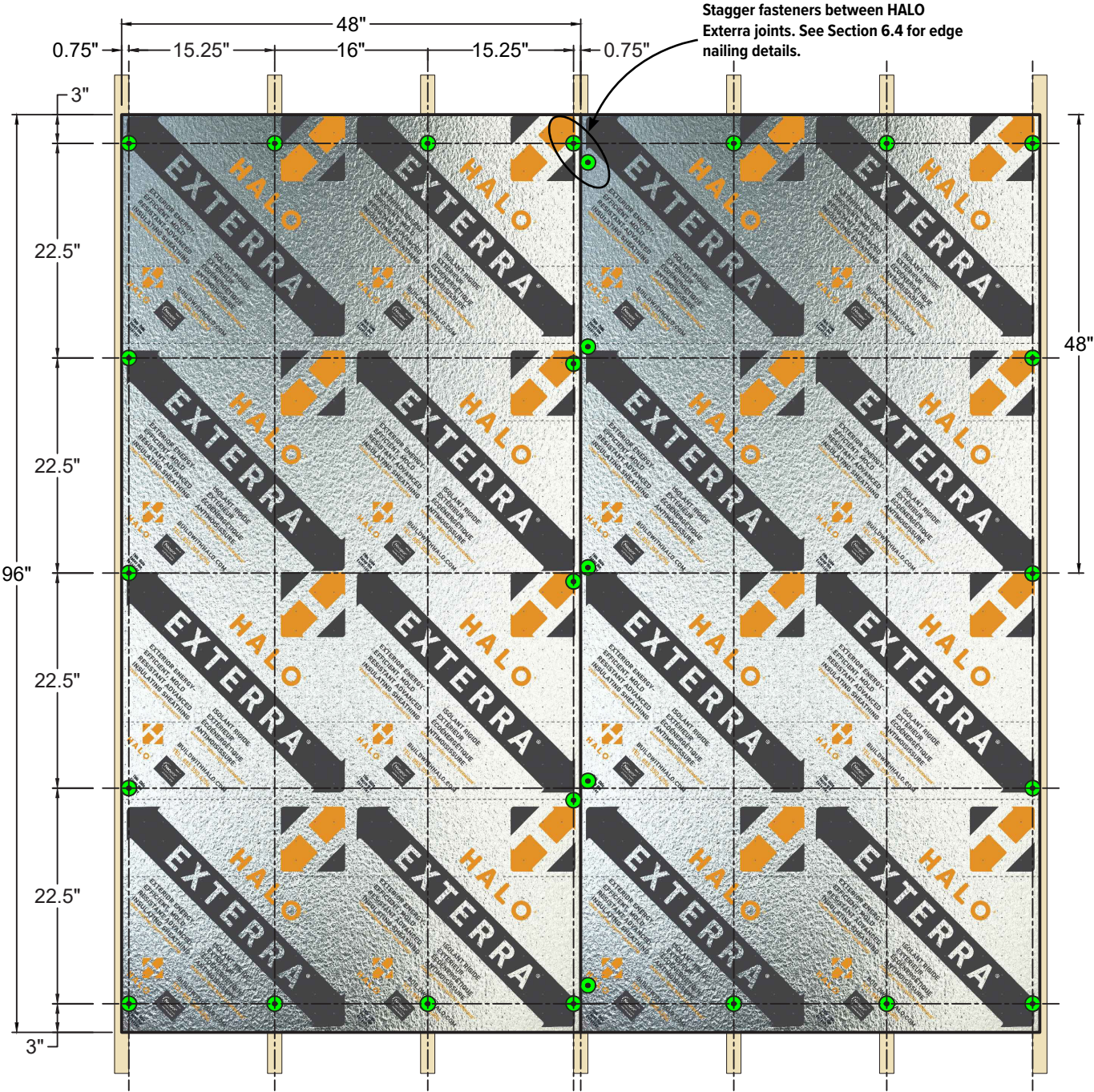**TYPICAL NAILING PATTERNS OVER WOOD SHEATHING PREFABRICATED WALL ASSEMBLIES**

Stagger fasteners between HALO Exterra joints. See Section 6.4 for edge nailing details.

48"
0.75"   15.25"   16"   15.25"   0.75"
3"
22.5"
22.5"
96"
22.5"
22.5"
3"
48"

Nailing pattern - Vertical placement against 16" wood stud spacing (4'x8' HALO Exterra boards shown). Use printed guidelines on HALO Exterra boards to approximate vertical spacing of fasteners.

PREFABRICATED WALL ASSEMBLIES
TYPICAL NAILING PATTERN OVER OPEN STUD ASSEMBLY
VERTICAL INSTALLATION OVER 16" STUD SPACING

HALO INSTALLATION GUIDE: RIGID FOAM INSULATION

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Nailing pattern - Horizontal placement against 16" wood stud spacing (4'x8' HALO Exterra boards shown). Printed guidelines on HALO Exterra boards can be used to locate studs.

PREFABRICATED WALL ASSEMBLIES
TYPICAL NAILING PATTERN OVER OPEN STUD ASSEMBLY
HORIZONTAL INSTALLATION OVER 16" STUD SPACING

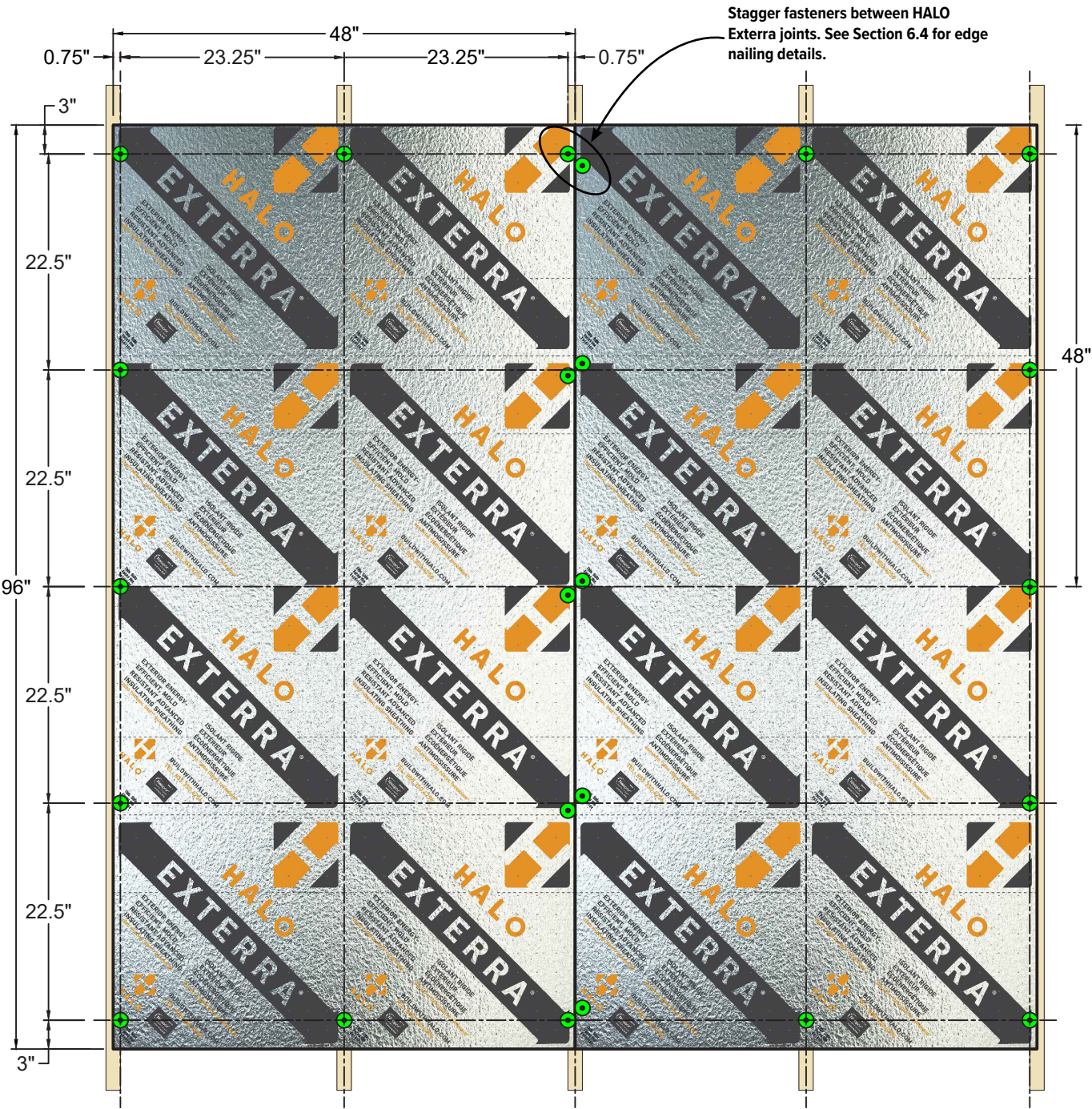**Stagger fasteners between HALO Exterra joints. See Section 6.4 for edge nailing details.**

Nailing pattern - Vertical placement against 24" wood stud spacing (4'x8' HALO Exterra boards shown). Use printed guidelines on HALO Exterra boards to approximate vertical spacing of fasteners.

**PREFABRICATED WALL ASSEMBLIES
TYPICAL NAILING PATTERN OVER OPEN STUD ASSEMBLY
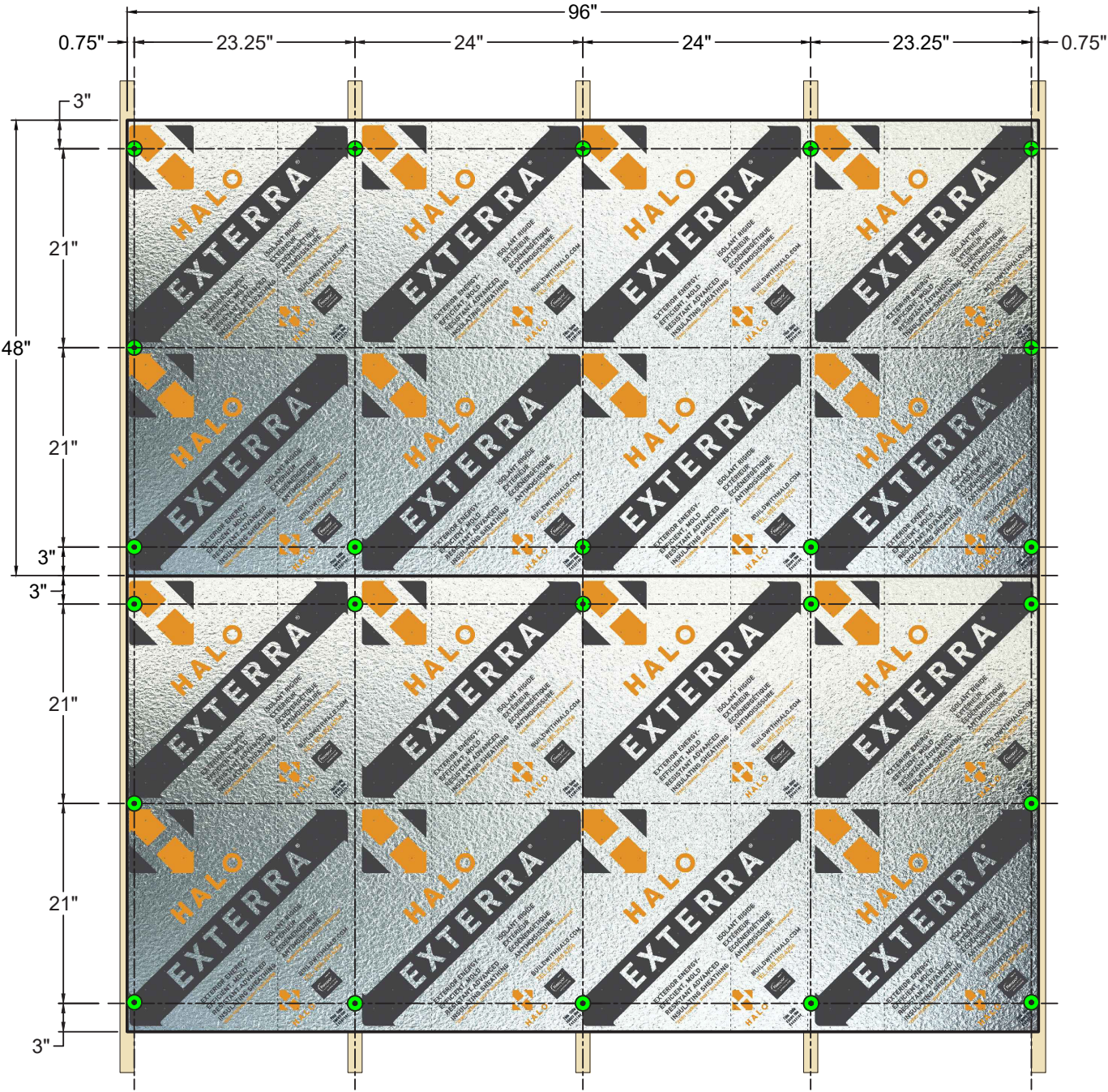VERTICAL INSTALLATION OVER 24" STUD SPACING**

Nailing pattern - Horizontal placement against 24" wood stud spacing (4'x8' HALO Exterra boards shown). Printed guidelines on HALO Exterra boards can be used to locate studs.

PREFABRICATED WALL ASSEMBLIES
TYPICAL NAILING PATTERN OVER OPEN STUD ASSEMBLY
HORIZONTAL INSTALLATION OVER 24" STUD SPACING

6.4 - RECOMMENDED FASTENER LENGTHS

6.4.1 - OVER WOOD SHEATHING
Fasteners should be long enough to penetrate HALO Exterra and completely through the wood sheathing substrate.

Exterra
Wood sheathing
See Table 1
for min. fastener lengths

INTERIOR

EXTERIOR
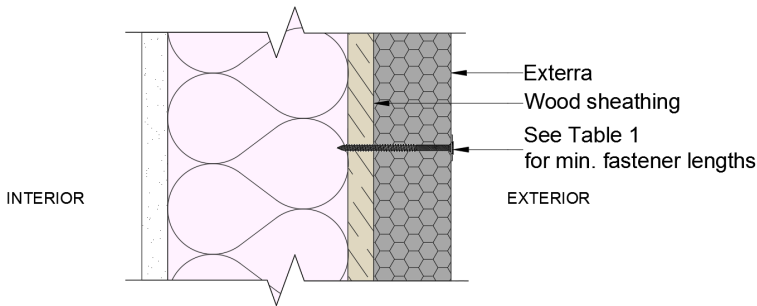
Table 1: HALO Exterra Fastened to Wood Sheathing

HALO Exterra Thickness	Minimum Fastener Lengths		
	1/2" Wood Sheathing	5/8" Wood Sheathing	3/4" Wood Sheathing
9/16" or 5/8"	1 1/8"	1 1/4"	1 3/8"
1"	1 1/2"	1 5/8"	1 3/4"
1 1/2"	2"	2 1/8"	2 1/4"
2"	2 1/2"	2 5/8"	2 3/4"

6.4.2 - OVER WOOD STUD ASSEMBLY
Fasteners should be long enough to penetrate HALO Exterra and at least ¾" into the framing studs or blocking between studs.

Min. ¾" embedment

Exterra
Framing stud
See Table 2
for min. fastener lengths

INTERIOR

EXTERIOR
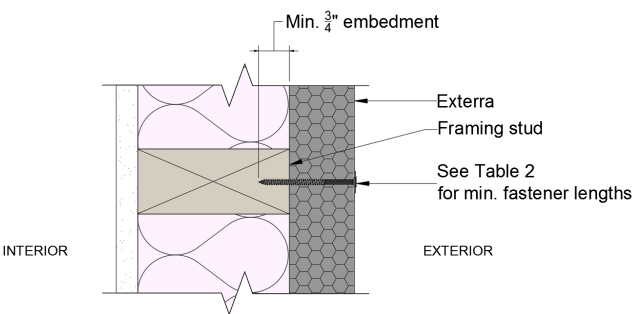
Table 2: HALO Exterra Fastened Direct to Framing Studs

HALO Exterra Thickness	Minimum Fastener Lengths
9/16" or 5/8"	1 3/8"
1"	1 3/4"
1 1/2"	2 1/4"
2"	2 3/4"

To maintain minimum 3/4" edge distance at vertical joints angle the fasteners.

Min. ¾" embedment

Exterra
Framing stud

Min. ¾" fastener edge distance

Angle fastener to maintain ¾" edge distance. Fastener head and washer should flush to face of Exterra, which may compress the Exterra boards. (shown exaggerated for clarity).

INTERIOR

EXTERIOR
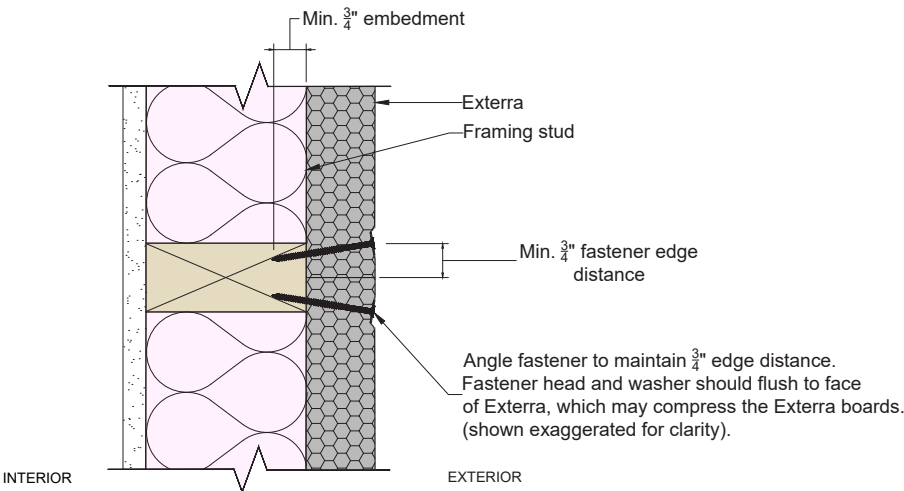
6.5 - OVER CONCRETE OR MASONRY WALLS

Use weather resistant construction glue compatible with expanded polystyrene, such as PL 300, to secure HALO Exterra sheets to the wall. If the wall is too rough or uneven concrete screws with washers can be used along with adhesives to help secure the sheets.

Use weather resistant construction glue compatible with EPS, such as PL 300, to secure HALO Exterra to the wall.

If concrete screws are used place sheathing tape over the screws to maintain the water resistive barrier properties of HALO Exterra

If the wall is too rough or uneven concrete screws with washers can be used along with adhesives to help secure HALO Exterra.

Remove any protrusions that can damage or prevent HALO Exterra from laying flat against the wall.

6.4 - CAVITY WALLS

For cavity walls, HALO Exterra will either be placed over wood, concrete or masonry substrates.
Refer to Sections 5.8, 6.2 to 6.5 for appropriate fastening requirements.

HALO INSTALLATION GUIDE: RIGID FOAM INSULATION

7. INSPECTION & REPAIRS

HALO Exterra is designed to be durable and flexible. However, inspecting the condition of installed HALO Exterra boards prior to the attachment of cladding or strapping will ensure HALO Exterra performs as designed.

Inspect installed HALO Exterra boards sufficiently in advance of cladding or strapping placement to ensure

- taped seams are not broken
- joints, penetrations and perimeter are properly sealed
- damaged areas are marked and properly repaired.

In most cases repairing damaged HALO Exterra boards simply requires tape sealing over the damaged area. If the foam and laminate are damaged then removing the damaged section and replacing with a new section will be required.
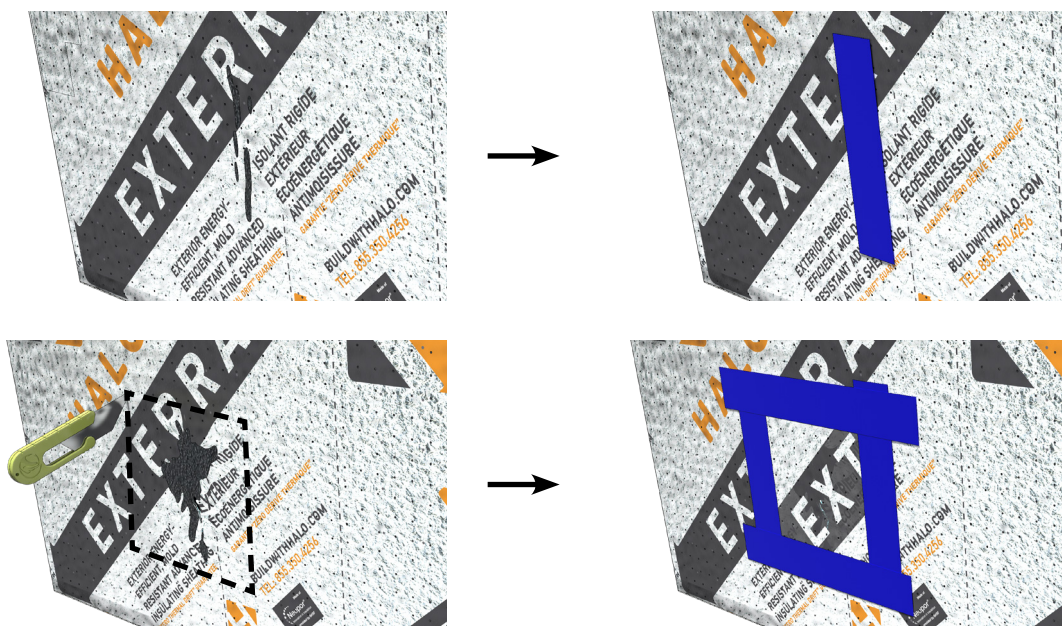
8. CLADDING OVER HALO EXTERRA

This section is a guide to fastening cladding or wood strapping over Perma "R" Products HALO Exterra.

NOTE: Where HALO Exterra is available with a reflective or white laminate on one side of the insulation it is recommended that HALO Exterra is installed with these laminates facing the exterior.

8.1 - CLADDING OVER HALO EXTERRA WITHOUT WOOD STRAPPING

When cladding is attached without wood strapping, nails or screws used to attach cladding directly over HALO Exterra should penetrate HALO Exterra and completely through the wood sheathing. The thickness of the wood sheathing should be structurally adequate to resist the lateral and pull-out loads the cladding may be subjected to. Check with your local cladding supplier to confirm.

In cases where wood sheathing is not present, or will not provide adequate strength, the fasteners should be fastened into the framing members. The nails or screws should penetrate HALO Exterra and at least 1" into the framing studs, or blocking between frami

SIDE VIEW
WOOD SHEATHING IN WALL ASSEMBLY

Cladding
Exterra
Fastener for Exterra. See Table 1.

Fastener for cladding. Long enough to extend beyond wood sheathing

Wood sheathing.

Min. 1" embedment
Cladding
Exterra
Fastener for Exterra. See Table 2.

Fastener for cladding. 1" Min. embedment into framing studs.

PLAN VIEW
NO WOOD SHEATHING IN WALL ASSEMBLY
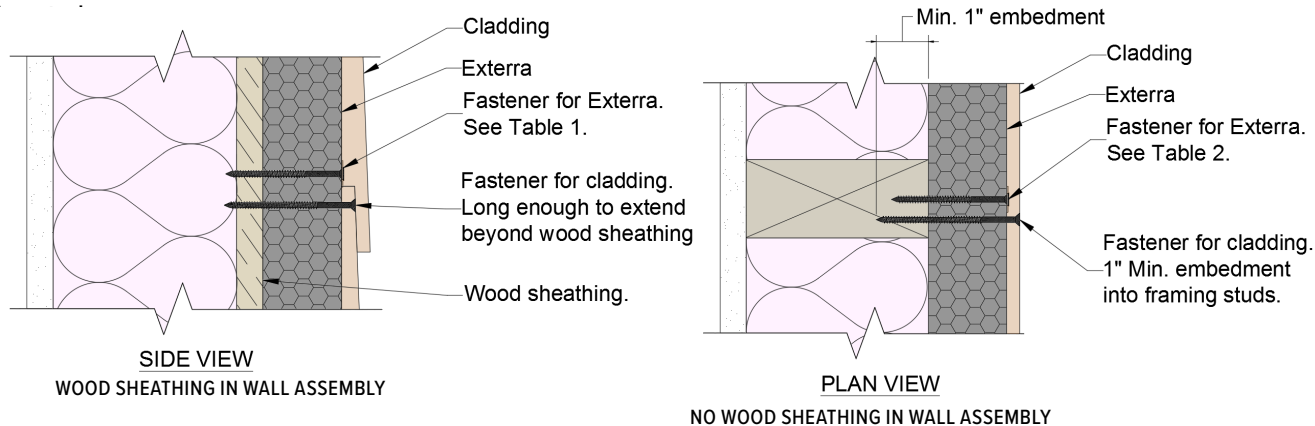
8.2 - CLADDING OVER HALO EXTERRA WITH WOOD STRAPPING

When using wood strapping over HALO Exterra, the cladding will be fastened to the strapping.

1. Wood Strapping Size:

    Minimum ¾" thick. 1 x 3 strapping is recommended.
2. Wood Strapping Location:

    Place vertically or horizontally, as required, and should be spaced a maximum of 16" on center. If placing vertically, align the strapping to the framing studs.
3. Fastener Types:

    Use #8 or #10 non-corrosive wood screws spaced maximum 16" on center.
4. Fastener Length:

    Screws should be long enough to penetrate wood strapping, HALO Exterra, and at least 1" into the framing studs.
5. Attach cladding to wood strapping. Ensure the nails or screws fully penetrate the strapping.

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Min. 1" embedment

Exterra
Framing stud
1x3 vertical wood strapping. Max. 16" o/c at stud locations.
#8 or #10 wood screws. Max. 16" o/c. See Table 3 for min. fastener lengths.
Fastener for cladding. Long enough to extend beyond wood sheathing.

PLAN VIEW

SIDE VIEW (at stud)

VERTICAL STRAPPING

Min. 1" embedment

Exterra
Framing stud
1x3 horizontal wood strapping. Max. 16" o/c.
#8 or #10 wood screws. Max. 16" o/c. See Table 3 for min. fastener lengths.
Fastener for cladding. Long enough to extend beyond wood strapping.

PLAN VIEW

SIDE VIEW (at stud)

HORIZONTAL STRAPPING

Table 3: 1x3 Wood Strapping Over HALO Exterra

HALO Exterra Thickness	Minimum Fastener Lengths		
	1/2" Wood Sheathing	5/8" Wood Sheathing	3/4" Wood Sheathing
9/16" or 5/8"	2 7/8"	3"	3 1/8"
1"	3 1/4"	3 3/8"	3 1/2"
1 1/2"	3 3/4"	3 7/8"	4"
2"	4 1/4"	4 3/8"	4 1/2"

9. AIR BARRIER

HALO Exterra wall assemblies require a separate air barrier system. The air barrier system can be from the exterior, interior, or anywhere in between as long as the continuity of the air barrier system is maintained.

Since 6 mil polyethylene membranes are typically required as the controlling vapor barrier for exterior wall assemblies, it can also provide the controlling air barrier. The following illustrations are examples of a polyethylene air barrier approach for HALO Exterra wall assemblies. Careful attention should be paid to transitions and penetrations.

9.1 - ROOF/CEILING TRANSITION
Lap the 6 mil poly membranes in the ceiling and walls with vapor barrier sheathing tape.

Ceiling with attic insulation.

Sheathing tape.

Drywall

Wall with cavity insulation

Lap joint between ceiling and wall with 6 mil poly membrane with vapor barrier sheathing tape. The sheathing tape should be applied at the sill level, if possible.
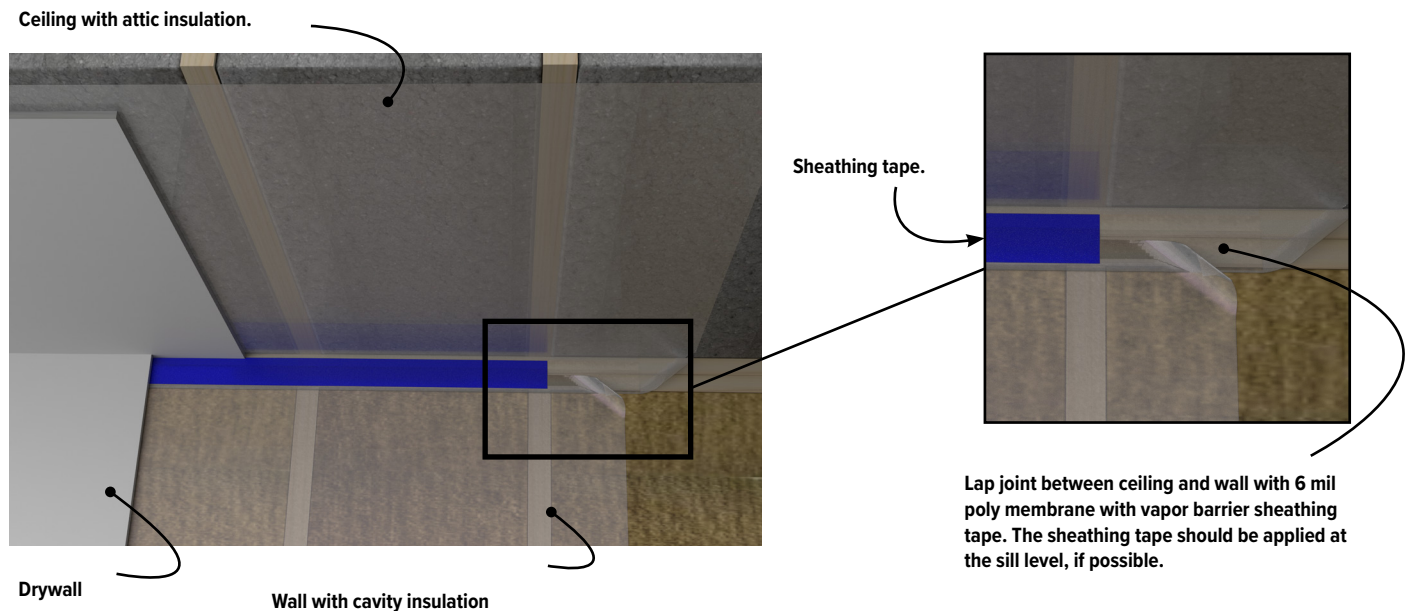
9.2 - WALL PERIMETER AND RIM BOARDS

Seal the 6 mil poly membrane to the framing members. Install rigid insulation against the rim board between floor joists. The insulation should be sealed to maintain the air barrier, and thick enough to act as a vapor/air barrier.

Install rigid insulation between floor joists against the rim board. The insulation value should be the same as the adjoining wall insulation.

Apply spray foam around rigid insulation to fill in gaps and to maintain the air barrier.

Acoustic sealant.

Secure the vapor against the acoustic sealant. Use staples only where the acoustic sealant is applied.

9.3 - FOUNDATION

Install rigid insulation against the rim board between floor joists. The insulation should be sealed to maintain the air barrier. A sealant should also be applied between the sill and top of foundation wall.

Acoustic sealant.

Secure the vapor against the acoustic sealant. Use staples only where the acoustic sealant is applied.

Install rigid insulation between floor joists against the rim board. The insulation value should be the same as the adjoining wall insulation.

Apply spray foam around rigid insulation to fill in gaps and to maintain the air barrier.

Apply compatible sealant at foundation/sill plate transition.

Apply compatible sealant at foundation/sill plate transition.
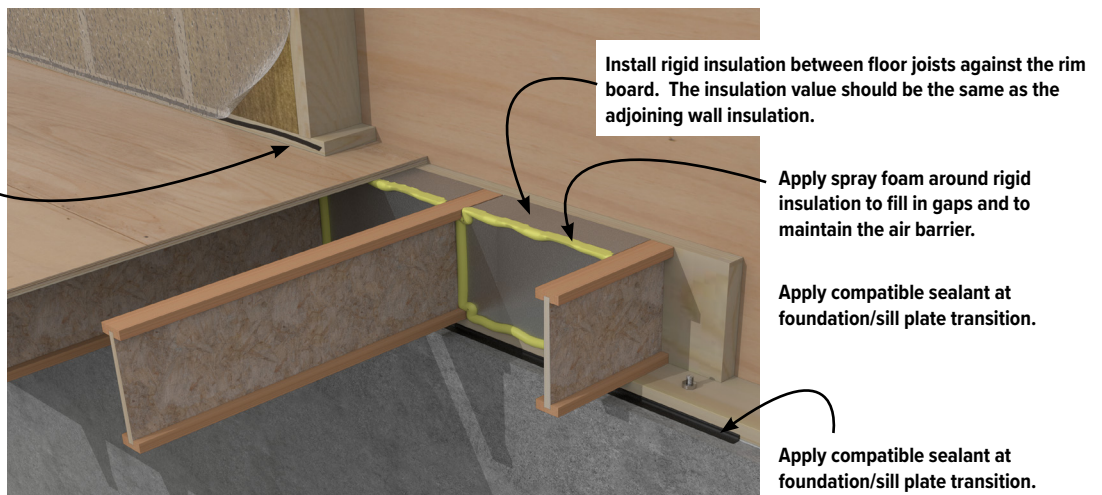
9.4 - PENETRATIONS

Providing a section of plywood sheathing around the penetration provides the required solid backing for 6 mil poly members.

Attached a section of wood sheathing. Fasten to blocking and keep flush to face of studs.

This will provide a solid backing for the 6 mil poly around the opening and secures the duct, pipe or conduit in place when connecting additional sections.

Wood blocking.

Compatible air barrier sealant applied around the duct, pipe or conduit.

Acoustic sealant.

6 mil poly membrane (partially shown).

Place over the acoustic sealant and staple in place. Staples should be applied over the acoustic sealant.
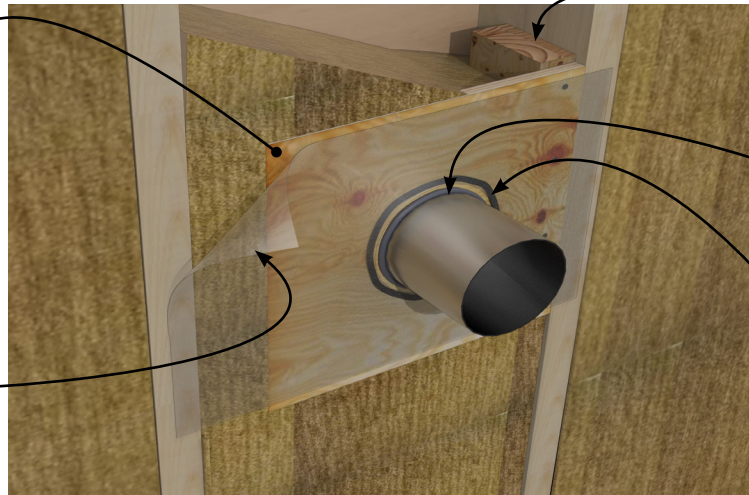
9.5 - INTERIOR ELECTRICAL RECEPTACLES

Vapor/air barrier polyethylene boots should be used to maintain the air barrier around electrical receptacles.

Fasten wood blocking to stud. This will provide a solid backing for the vapor barrier boot.

Vapor/air barrier boot.

Apply acoustic sealant around the vapor/air barrier boot.

6 mil poly membrane (partially shown).

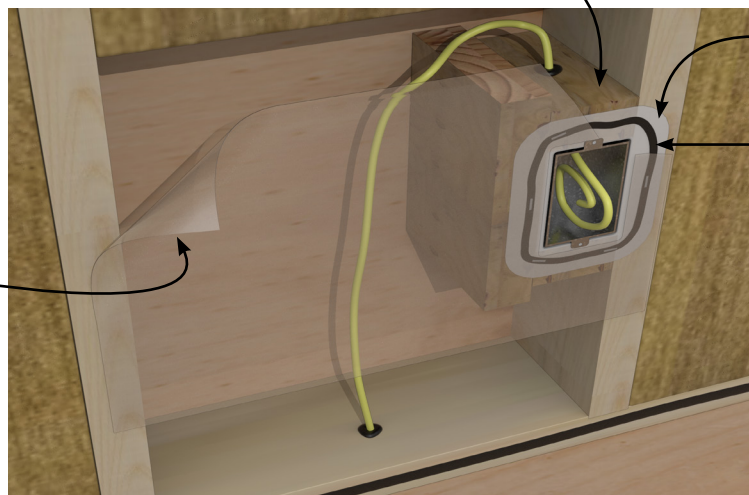**Place over the acoustic sealant and staple in place. Staples should be applied over the acoustic sealant.**

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HALO INSTALLATION GUIDE: RIGID FOAM INSULATION

10. EXAMPLE CAD DETAILS

THE DRAWINGS REPRESENTED HEREIN ARE BELIEVED TO BE ACCURATE AND CONFORMING TO CURRENT DESIGN AND CONSTRUCTION PRACTICES. HOWEVER, THE DRAWINGS SHOULD BE USED AS A REFERENCE GUIDE ONLY. THE USER SHALL CHECK TO ENSURE THE DRAWING MEETS LOCAL BUILDING CODES, DESIGN AND CONSTRUCTION PRACTICES BY CONSULTING LOCAL BUILDING OFFICIALS AND PROFESSIONALS, INCLUDING ANY ADDITIONAL REQUIREMENTS. PERMA "R" PRODUCTS RESERVES THE RIGHT TO MAKE CHANGES TO THE DRAWINGS WITHOUT NOTICE AND ASSUMES NO LIABILITY IN CONNECTION WITH THE USE OF THE DRAWINGS INCLUDING MODIFICATION, COPYING OR DISTRIBUTION.

10.1 - FLANGED WINDOW INSTALLED AGAINST WOOD SHEATHING
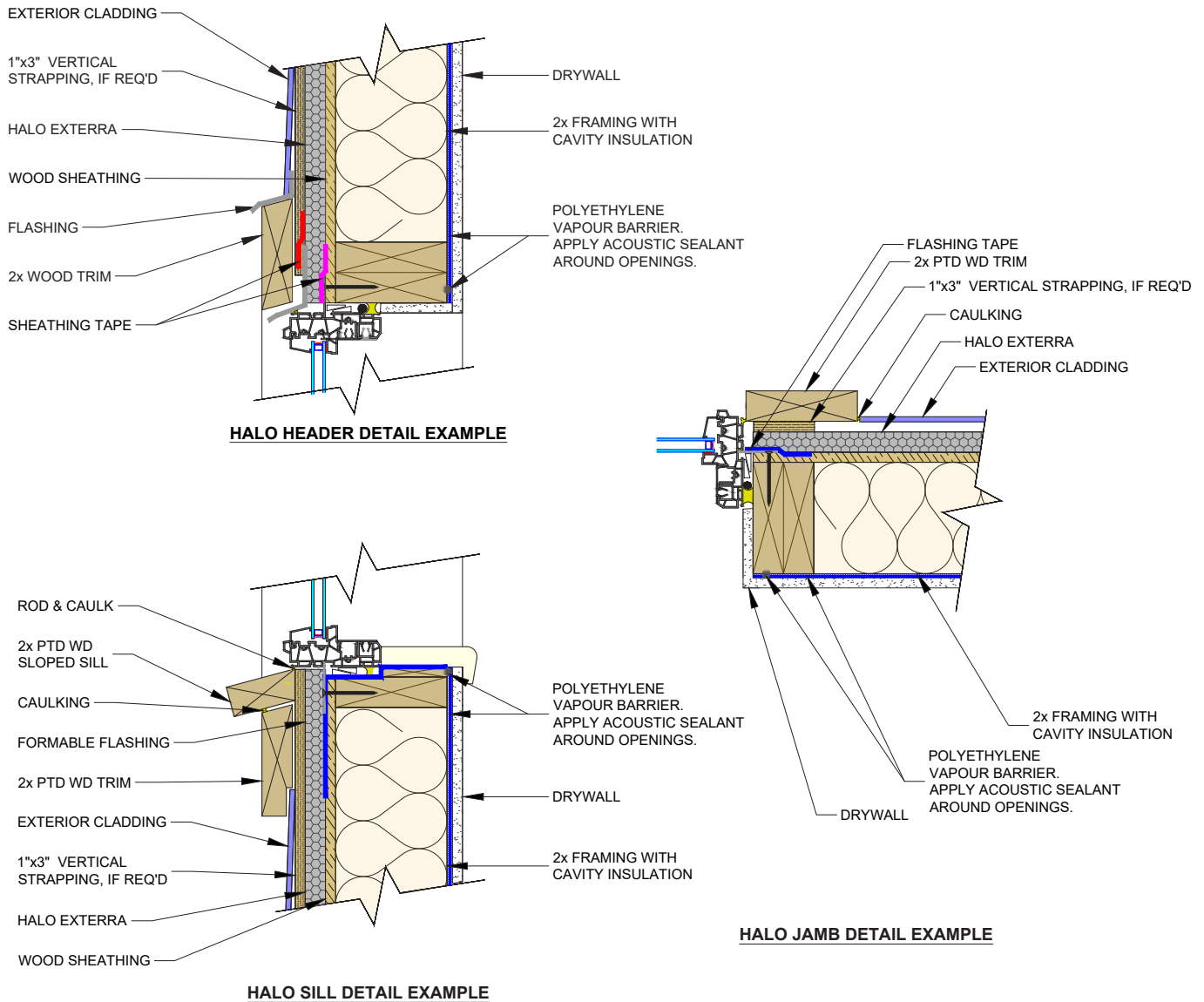
EXTERIOR CLADDING

1"x3" VERTICAL STRAPPING, IF REQ'D

HALO EXTERRA

WOOD SHEATHING

FLASHING

2x WOOD TRIM

SHEATHING TAPE

DRYWALL

2x FRAMING WITH CAVITY INSULATION

POLYETHYLENE VAPOUR BARRIER. APPLY ACOUSTIC SEALANT AROUND OPENINGS.

HALO HEADER DETAIL EXAMPLE

FLASHING TAPE
2x PTD WD TRIM
1"x3" VERTICAL STRAPPING, IF REQ'D
CAULKING
HALO EXTERRA
EXTERIOR CLADDING

2x FRAMING WITH CAVITY INSULATION

POLYETHYLENE VAPOUR BARRIER. APPLY ACOUSTIC SEALANT AROUND OPENINGS.

DRYWALL

HALO JAMB DETAIL EXAMPLE

ROD & CAULK

2x PTD WD SLOPED SILL

CAULKING

FORMABLE FLASHING

2x PTD WD TRIM

EXTERIOR CLADDING

1"x3" VERTICAL STRAPPING, IF REQ'D

HALO EXTERRA

WOOD SHEATHING

POLYETHYLENE VAPOUR BARRIER. APPLY ACOUSTIC SEALANT AROUND OPENINGS.

DRYWALL

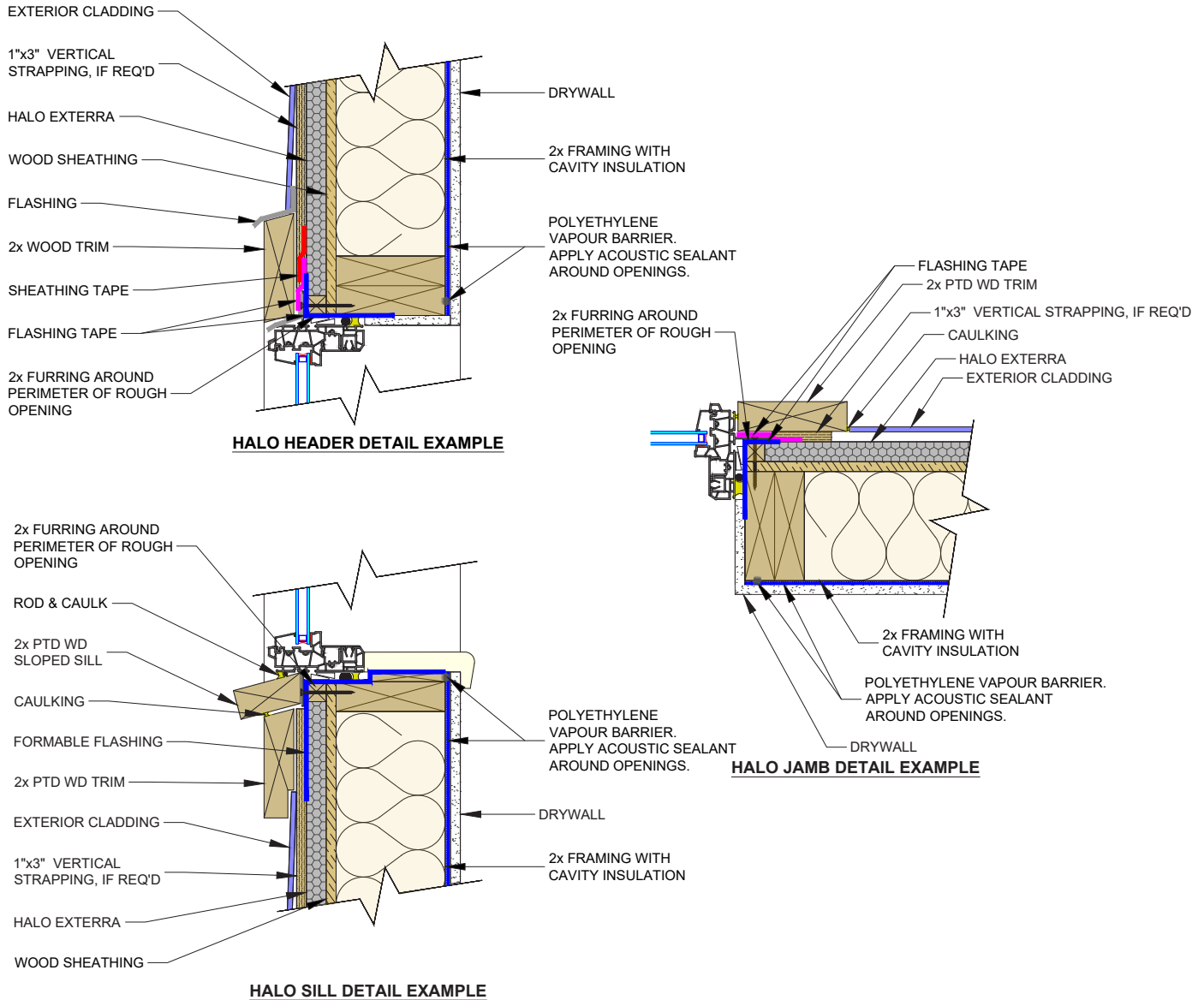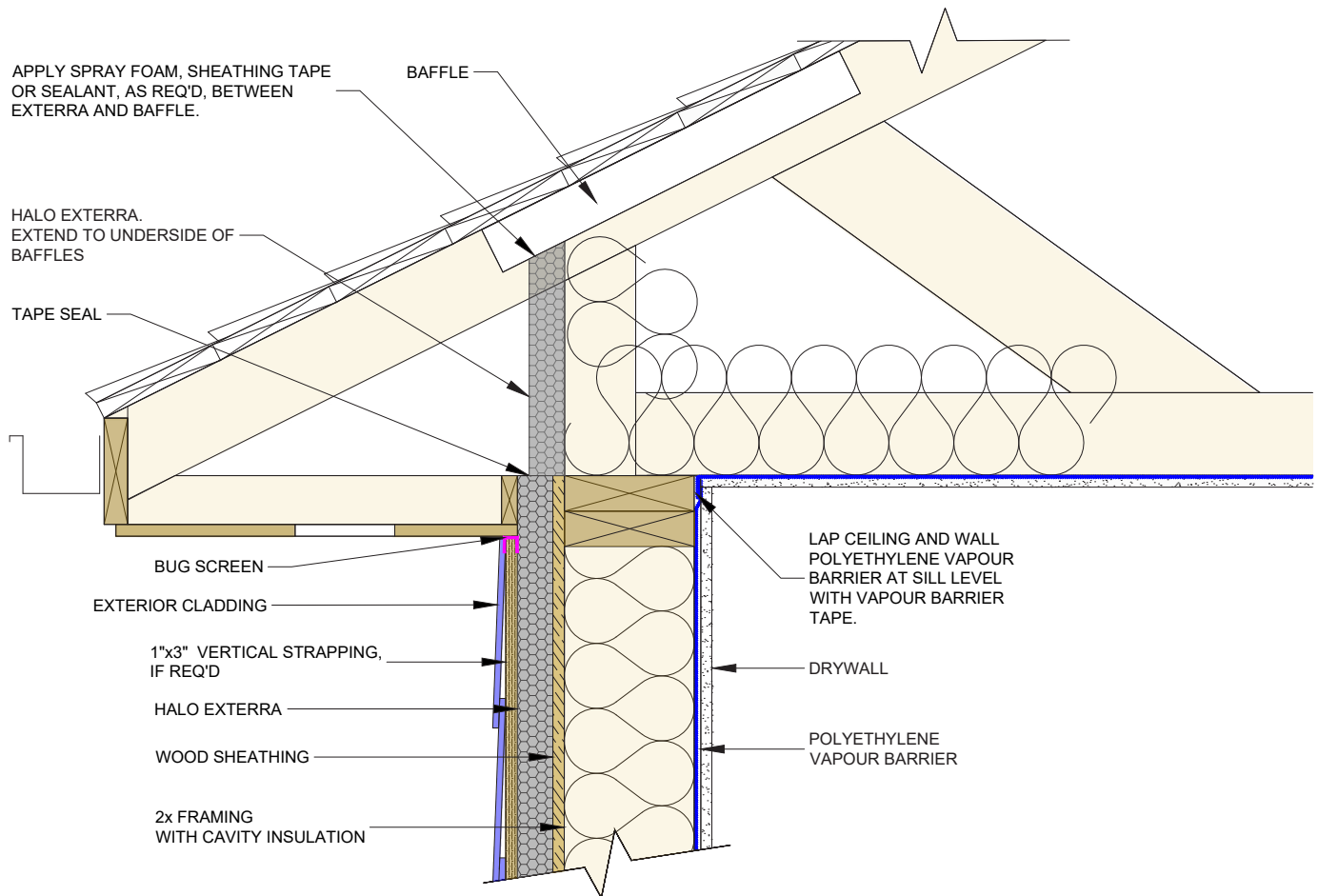2x FRAMING WITH CAVITY INSULATION

HALO SILL DETAIL EXAMPLE

The tables and drawings represented herein are believed to be accurate and conforming to current design and construction practices. However, the tables and drawings should be used as a reference guide only. The user shall check to ensure the drawing meets local building codes, design and construction practices by consulting local building officials and professionals, including any additional requirements. Perma "R" Products reserves the right to make changes to the tables and drawings without notice and assumes no liability in connection with the use of the tables and drawings including modification, copying or distribution.

10.2 - FLANGED WINDOW INSTALLED AGAINST HALO EXTERRA

EXTERIOR CLADDING

1"x3" VERTICAL STRAPPING, IF REQ'D

HALO EXTERRA

WOOD SHEATHING

FLASHING

2x WOOD TRIM

SHEATHING TAPE

FLASHING TAPE

2x FURRING AROUND PERIMETER OF ROUGH OPENING

DRYWALL

2x FRAMING WITH CAVITY INSULATION

POLYETHYLENE VAPOUR BARRIER. APPLY ACOUSTIC SEALANT AROUND OPENINGS.

2x FURRING AROUND PERIMETER OF ROUGH OPENING

HALO HEADER DETAIL EXAMPLE

FLASHING TAPE
2x PTD WD TRIM
1"x3" VERTICAL STRAPPING, IF REQ'D
CAULKING
HALO EXTERRA
EXTERIOR CLADDING

2x FRAMING WITH CAVITY INSULATION

POLYETHYLENE VAPOUR BARRIER. APPLY ACOUSTIC SEALANT AROUND OPENINGS.

DRYWALL

HALO JAMB DETAIL EXAMPLE

2x FURRING AROUND PERIMETER OF ROUGH OPENING

ROD & CAULK

2x PTD WD SLOPED SILL

CAULKING

FORMABLE FLASHING

2x PTD WD TRIM

EXTERIOR CLADDING

1"x3" VERTICAL STRAPPING, IF REQ'D

HALO EXTERRA

WOOD SHEATHING

POLYETHYLENE VAPOUR BARRIER. APPLY ACOUSTIC SEALANT AROUND OPENINGS.

DRYWALL

2x FRAMING WITH CAVITY INSULATION

HALO SILL DETAIL EXAMPLE

The tables and drawings represented herein are believed to be accurate and conforming to current design and construction practices. However, the tables and drawings should be used as a reference guide only. The user shall check to ensure the drawing meets local building codes, design and construction practices by consulting local building officials and professionals, including any additional requirements. Perma "R" Products reserves the right to make changes to the tables and drawings without notice and assumes no liability in connection with the use of the tables and drawings including modification, copying or distribution.
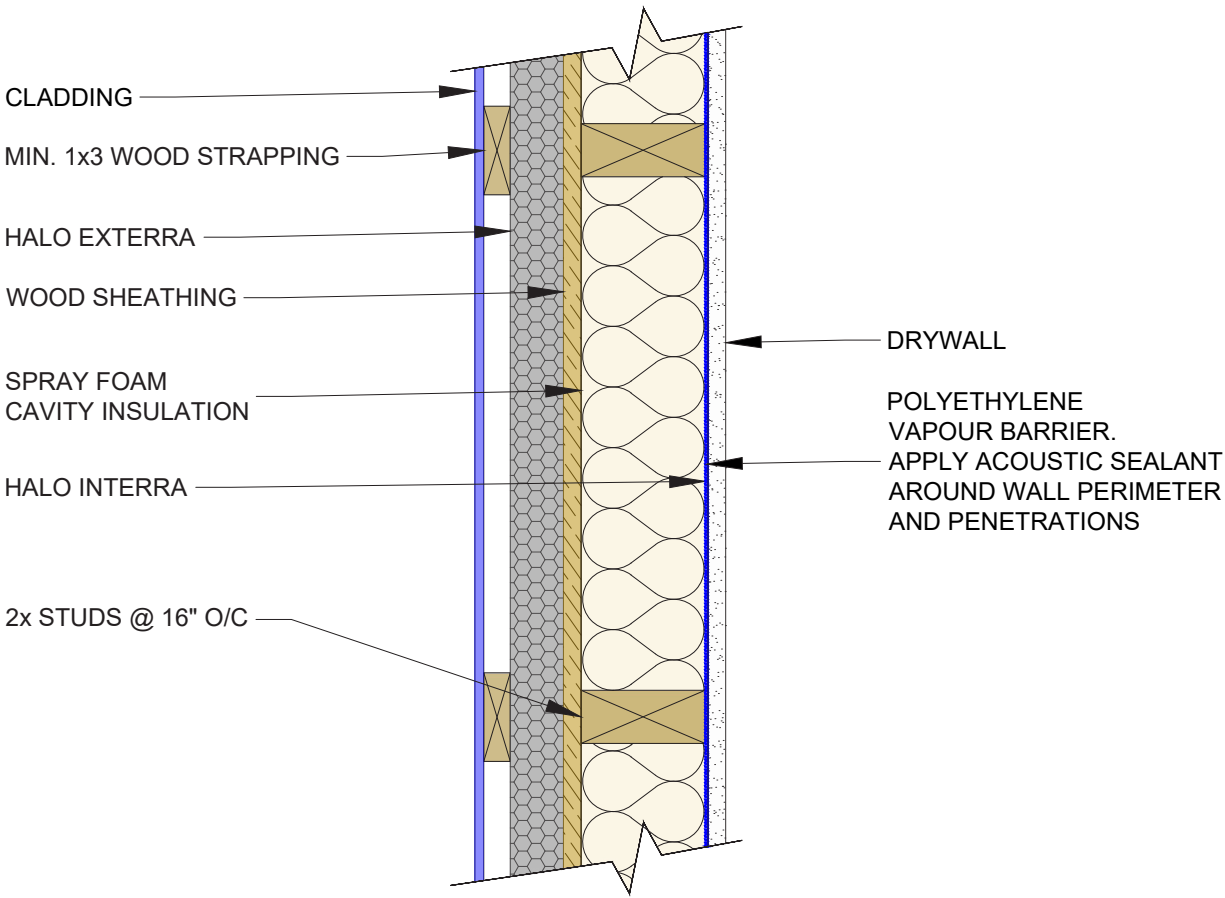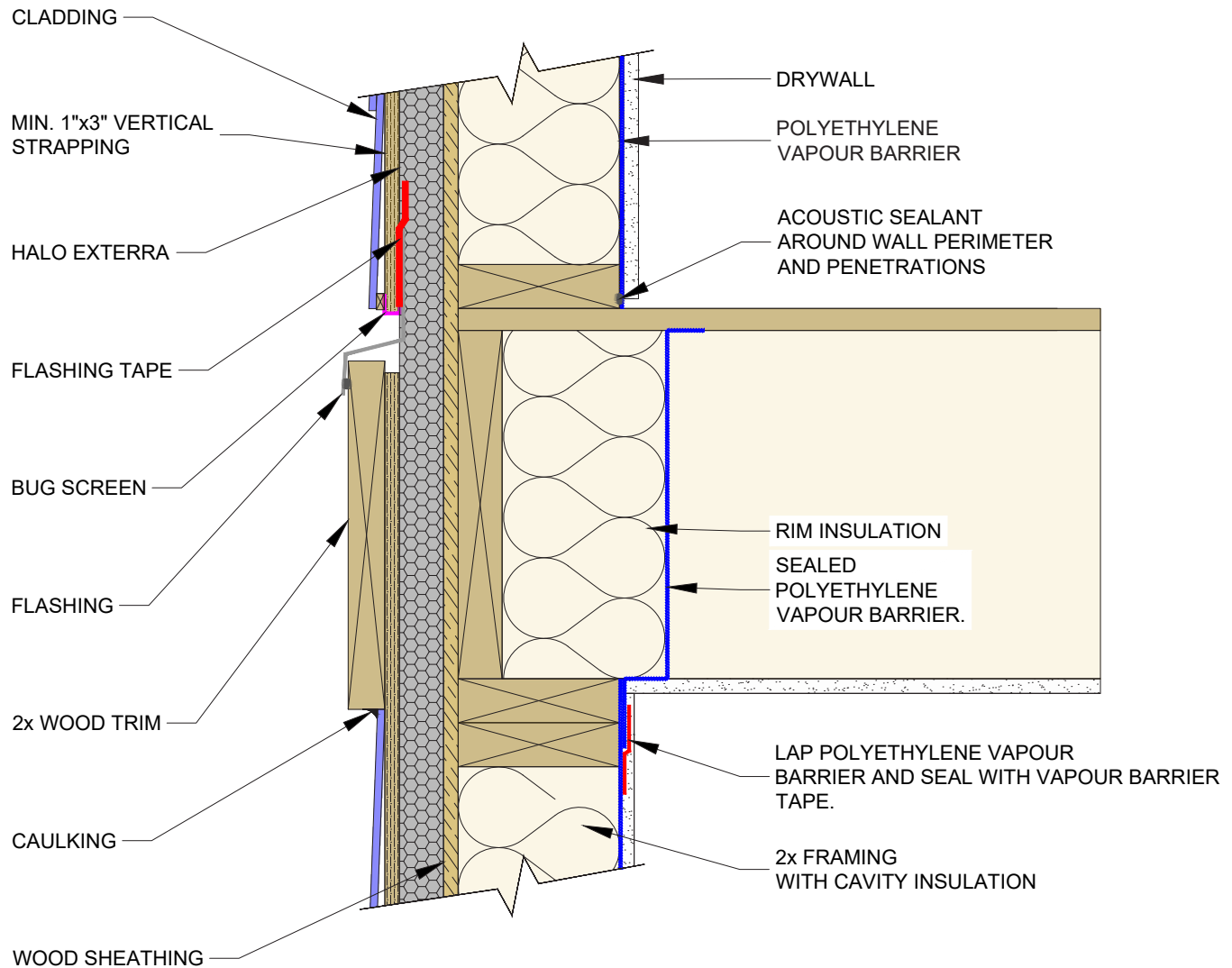
APPLY SPRAY FOAM, SHEATHING TAPE OR SEALANT, AS REQ'D, BETWEEN EXTERRA AND BAFFLE.

BAFFLE

HALO EXTERRA. EXTEND TO UNDERSIDE OF BAFFLES

TAPE SEAL

BUG SCREEN

EXTERIOR CLADDING

1"x3" VERTICAL STRAPPING, IF REQ'D

HALO EXTERRA

WOOD SHEATHING

2x FRAMING WITH CAVITY INSULATION

LAP CEILING AND WALL POLYETHYLENE VAPOUR BARRIER AT SILL LEVEL WITH VAPOUR BARRIER TAPE.

DRYWALL

POLYETHYLENE VAPOUR BARRIER

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HALO INSTALLATION GUIDE: RIGID FOAM INSULATION

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CLADDING

MIN. 1x3 WOOD STRAPPING

HALO EXTERRA

WOOD SHEATHING

SPRAY FOAM
CAVITY INSULATION

HALO INTERRA

2x STUDS @ 16" O/C

DRYWALL

POLYETHYLENE
VAPOUR BARRIER.
APPLY ACOUSTIC SEALANT
AROUND WALL PERIMETER
AND PENETRATIONS

10.5 - FLOOR TRANSITION

CLADDING

MIN. 1"x3" VERTICAL STRAPPING

HALO EXTERRA

FLASHING TAPE

BUG SCREEN

FLASHING

2x WOOD TRIM

CAULKING

WOOD SHEATHING

DRYWALL

POLYETHYLENE VAPOUR BARRIER

ACOUSTIC SEALANT AROUND WALL PERIMETER AND PENETRATIONS

RIM INSULATION

SEALED POLYETHYLENE VAPOUR BARRIER.

LAP POLYETHYLENE VAPOUR BARRIER AND SEAL WITH VAPOUR BARRIER TAPE.

2x FRAMING WITH CAVITY INSULATION

10.6 - FOUNDATION TRANSITION

WOOD SHEATHING

EXTERIOR CLADDING

1"x3" VERTICAL STRAPPING, IF REQ'D

FLASHING TAPE

BUG SCREEN

FLASHING

TRIM BOARD

HALO EXTERRA

SEAL JOINTS AT SHEATHING/FOUNDATION WALL INTERFACE WITH MEMBRANE, OR SEALANT.

BUG SCREEN

DRYWALL

POLYETHYLENE VAPOUR BARRIER

2x FRAMING WITH CAVITY INSULATION

ACOUSTIC SEALANT AROUND WALL PERIMETER AND PENETRATIONS

VAPOUR BARRIER AND INSULATION. SHOWN: CHROME GPS OR HALO INTERRA PLUS. CUT SNUG BETWEEN FLOOR JOISTS. TAPE, SPRAY FOAM, OR APPLY SEALANT AROUND PERIMETER.

GASKET

SPRAY FOAM SPACE BETWEEN FLOOR JOIST AND SILL.

INTERRA

FRAMED WALL

DRYWALL

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