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Rigid Board Installation Manual

STRONGER EVERY DAY

INNOVATIVE INSULATION CONSTRUCTION SOLUTIONS FOR ENERGY EFFICIENT AND COMFORTABLE BUILDINGS

31 JANUARY 2022

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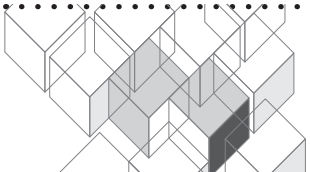
building system

TABLE OF CONTENTS



PREFACE

The continuity of the thermal envelope is extremely crucial for the overall energy performance of any building. Adding continuous rigid insulation to the walls greatly improves the thermal performance of the entire building envelope by reducing the effects of thermal bridging as well as providing additional insulation. As the energy standards become more stringent and energy efficiency becomes much more important, the need for thermal envelope continuity increases as well. Amvic's rigid insulation boards (SilveRboard and Envirosheet) offer a highly versatile solution that aims to provide cost effective products, with great thermal characteristics and simple installation. The combination of double sided lamination and expanded polystyrene foam core gives SilveRboard improved durability, better flexibility, better surface for tape application and overall improved performance. Envirosheet excels at applications where much thicker boards are needed or where the benefit of the double sided film is null with cost effective pricing. Amvic's rigid insulation boards can cover virtually any need, application or use case.

The SilveRboard and Envirosheet product lines are backed-up by Amvic's renowned customer service and technical support and are available through Amvic's extensive distributor network across North America. If any of your questions or concerns are not completely addressed in this manual, feel free to contact us and our staff will be happy to answer your questions. At Amvic, we pride ourselves in offering our customers an exceptional level of customer service.

Amvic Website

The Amvic website is updated regularly with the most updated information including, product data sheets, construction details and installation manuals. This technical and installation manual is posted on the website, see **www.amvicsystem.com**

Technical Support

Please contact us for any inquiries pertaining to information included in this manual or if you require other technical assistance.

Phone: 1 (877) 470-9991 (toll free)

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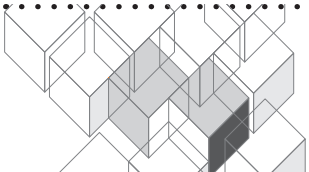

PREFACE

Disclaimer

This document is provided for informational purposes only. The information contained in this document represents the current views of Amvic Inc. on the issues discussed as of the date of publication. These opinions, as expressed, should not be interpreted to be a commitment on the part of Amvic Inc. and cannot guarantee the accuracy of any information presented after the date of publication. The user assumes the entire risk as to the accuracy and the use of this document.

This manual provides a basic guide for the installation of rigid foam insulation boards (Envirosheet and SilveRboard) and is intended to supplement, rather than replace, the basic construction knowledge of a construction professional. All installations of Envirosheet must be in accordance with all applicable building codes and/or under the guidance of a licensed professional engineer. In all cases, applicable building code regulations take precedence over this manual.

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Amvic offers a full range of rigid foam insulation boards to meet any and all requirements and applications. Envirosheet (often abbreviated as EN) is Amvic's standard rigid, closed cell, Expanded Polystyrene (EPS) insulation board that offer the most variety with sizes, densities, compressive strengths and thicknesses at cost effective pricing. SilveRboard (often abbreviated as SB) is also a non-structural, rigid insulation EPS board but with reflective, plastic film on each side. SilveRboard can be a vapor barrier when installed with taped seams but can also be more vapor permeable when the film is perforated. Any perforated product is designated with "XS" in the name. Both Envirosheet and SilveRboard have high density variants that are aimed at below grade construction (or any other application) where higher compressive strengths are needed. These boards can be used in residential, commercial, institutional, agricultural and industrial applications with a full range of Canadian and American testing and certification.

SilveRboard Graphite (often abbreviated as SBG) is the newest addition to the rigid board lineup offering even better thermal performance by using graphite infused particles with the EPS bead giving the foam its signature gray color. SilveRboard Graphite comes as a low density product with perforated film (available without perforations for special order only) to be used in above grade exterior walls or below grade walls. Due to the unique lower density formulation and the double lamination, the board is highly flexible allowing it to be used even in curved applications as well as giving it great durability for on-site usage and handling. The graphics in this guide depict only one of rigid insulation boards per installation section, but in many instances, one or more of the other types of boards can be easily substituted.

Figure 1 – Envirosheet, SilveRboard and SilveRboard Graphite (left to right) with their respective close up view showing the foam core and film

The last SilveRboard variant is called SilveRboard Acoustic which has slightly different manufacturing process giving it slightly different physical characteristics. It is primarily geared towards interior partition walls to improve sound attenuation but can be used on exterior above grade walls as a standard rigid insulation board as well.

Installation Over Sheathing

- Installation should start with a full board placed at the bottom corner at the front face of the building while the cuts and joints are left for the upper portions.
- Vertical and horizontal applications are acceptable depending on what is best fit for a given project.
- It is beneficial to stagger the joints of the sheathing and that of the rigid board insulation to reduce gaps and improve air tightness.
- If a weather resistive membrane is not present in the wall assembly, all seams must be taped with a code approved sheathing tape.
- All gaps should be filled with low expansion foam or sealant (depending on the size of the gap) to ensure thermal continuity.

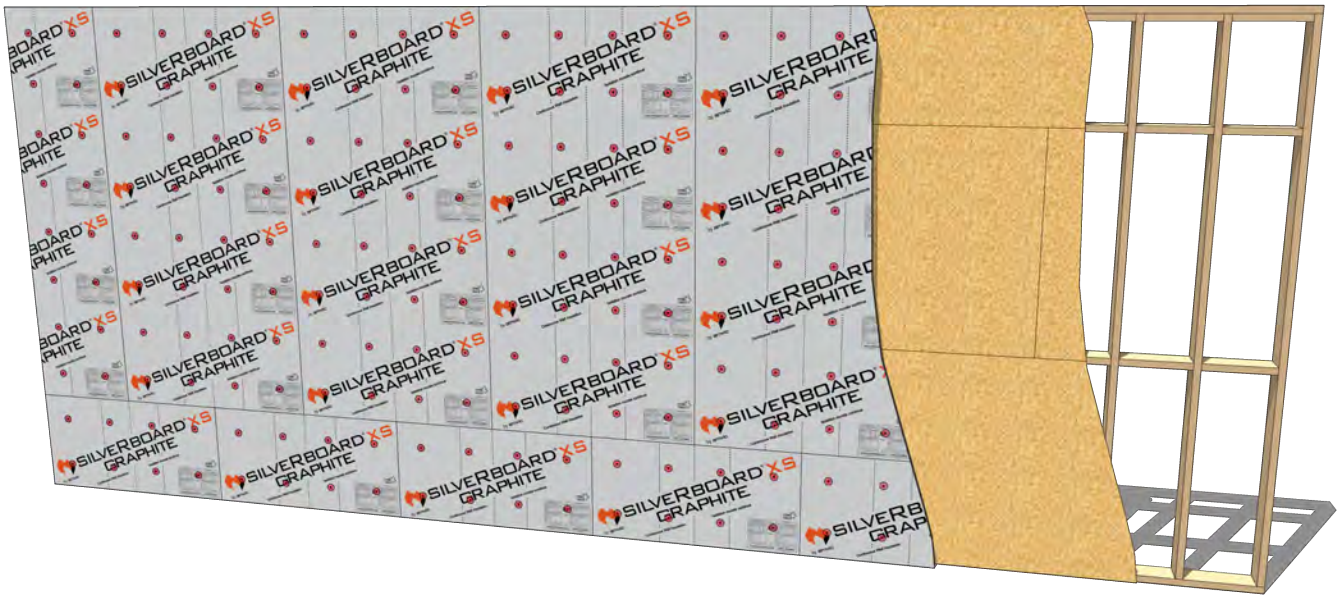


Figure 1 – Vertical SilveRboard installation over sheathing

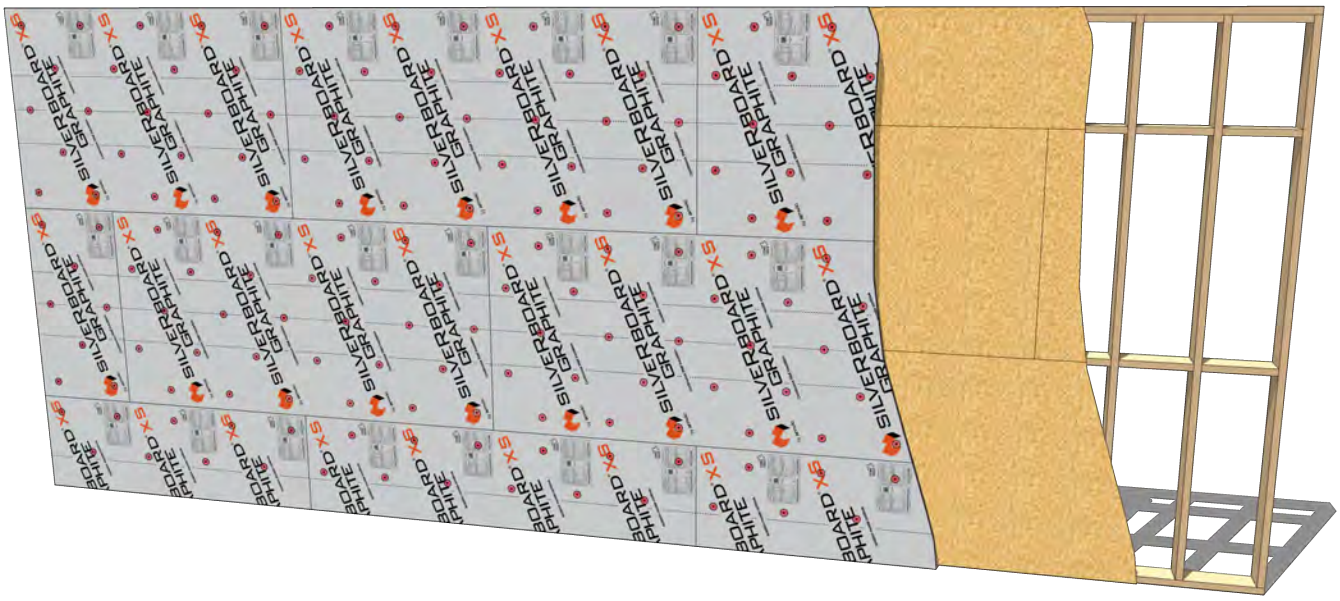


Figure 2 – Horizontal SilveRboard installation over sheathing

Installation Without Sheathing (Open Stud Wall Assembly)

- This type of installation requires the use of corner/wind bracing, check local code guidelines for structural requirements.
- For open stud wall assemblies, it is recommended to use vertical orientation due to the stud center line marking on the boards, for ease of installation (but horizontal is also possible).
- Full boards should be used to cover both the wind bracing and the first one or two vertical studs in order to provide the best layout for the continuous insulation.
- All seams should be taped using code approved sheathing tape (wider tapes are preferred).
- All gaps should be filled with low expansion foam or sealant (depending on the size of the gap) to ensure thermal continuity.

Figure 3 – Vertical SilveRboard installation over open stud wall assembly

Figure 4 – Horizontal SilveRboard installation over open stud wall assembly

Typical Fastening Patterns Over Sheathing

- Sheathing provides sufficient backing for fasteners, allowing for flexibility in the nailing pattern and eliminating the need to fasten into structural members.
- For applications directly on the face of sheathing use cap nails, cap staples or assembled fasteners.
- Allow for a minimum of 1” (25mm) of fastener length, longer than the total thickness of the insulation board e.g. for 1.125” (29mm) SilveRboard Graphite XS + 1” (25mm) = 2.125” (54mm) nail/staple or screw.

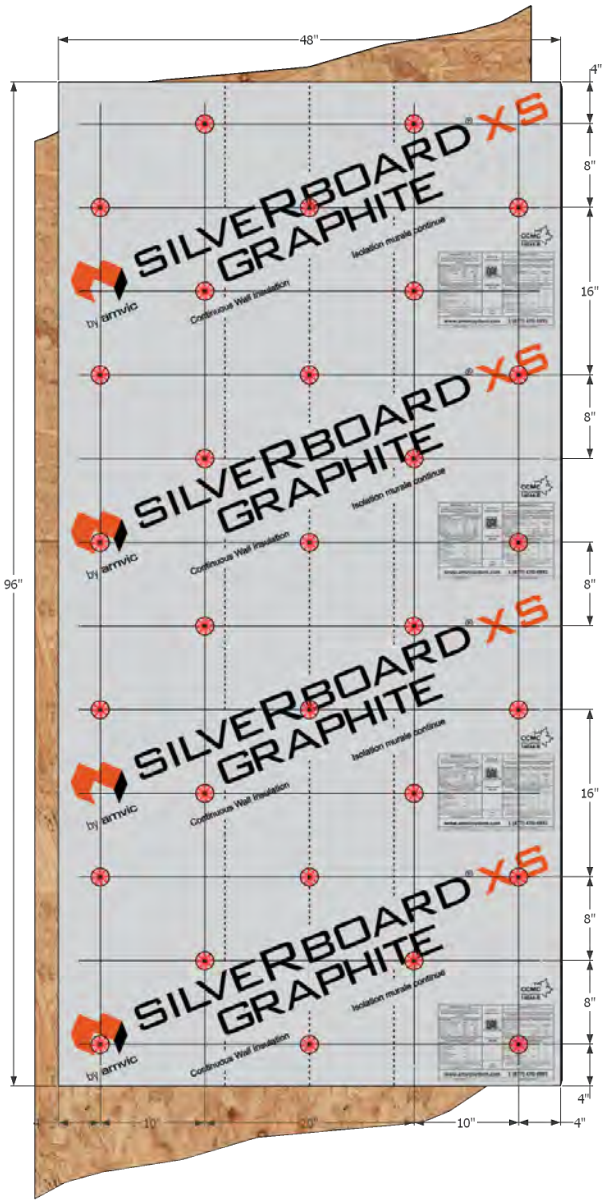


Figure 5 – Vertical nailing Pattern A (30 assembled fasteners)

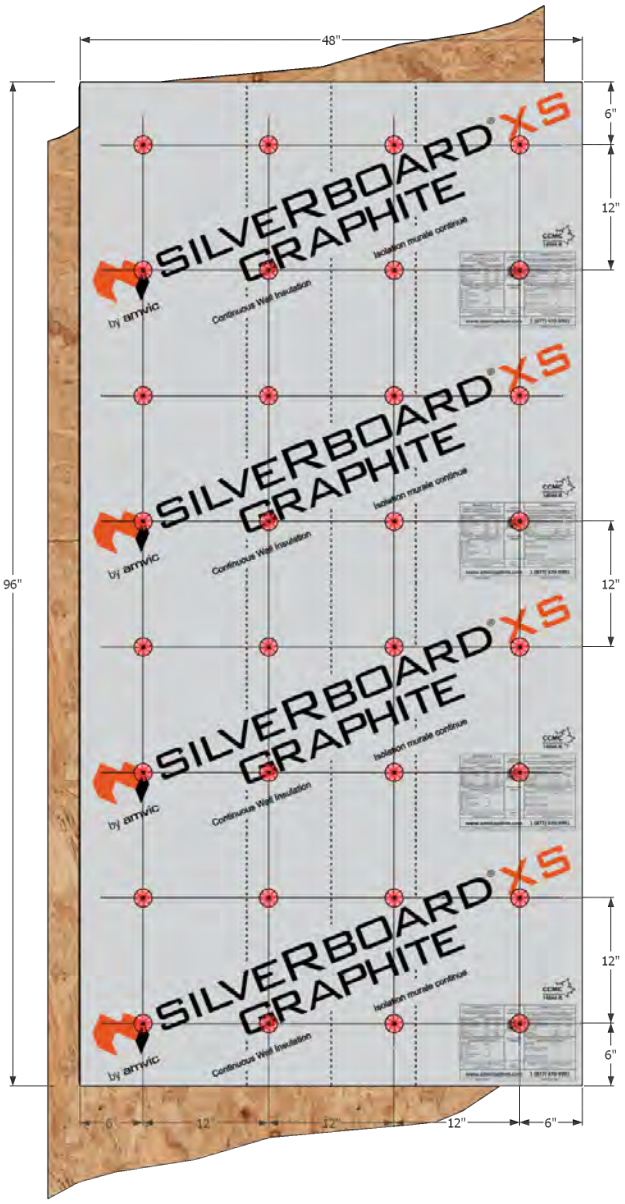


Figure 6 – Vertical nailing Pattern B (32 assembled fasteners)

- Regardless of the chosen configuration, the fasteners should not be more than 18” (457mm) apart around the edges of the boards or 24” (610mm) at the center.
- Brick ties and strapping are considered fasteners, do not duplicate.
- Do not over-torque fasteners.
- Brick ties must fasten through the insulation to the substrate and use 1.5-2” (38-51mm) diameter plastic washers.

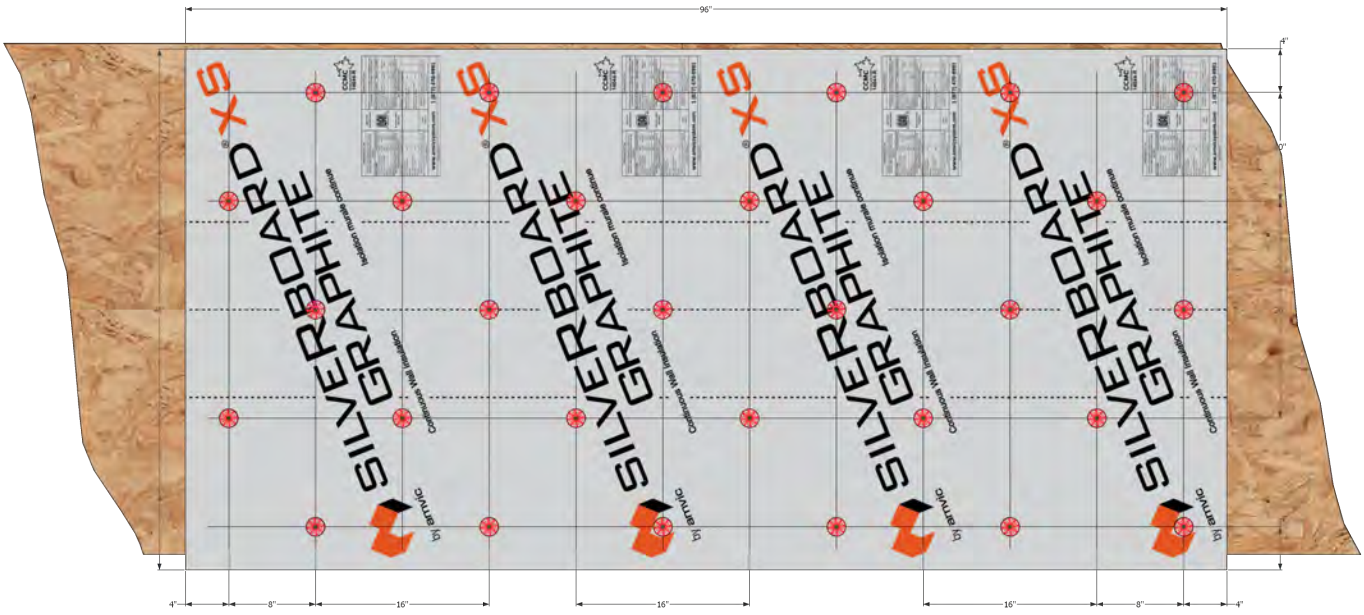


Figure 7 – Vertical nailing Pattern A (30 assembled fasteners)

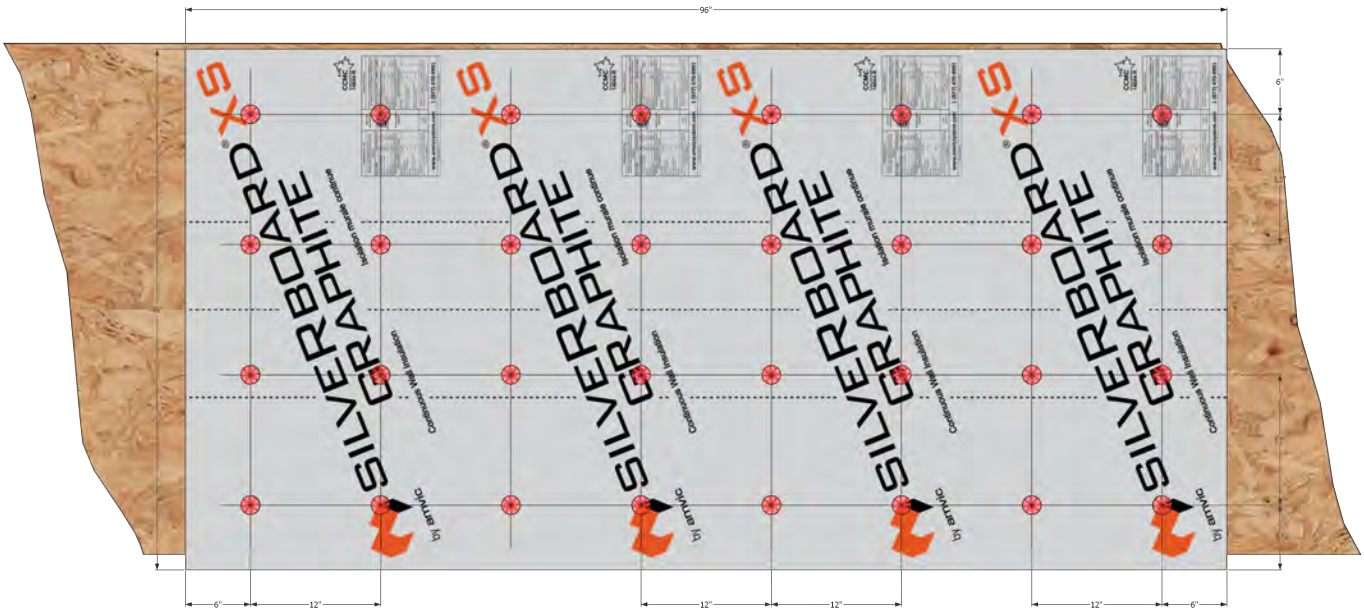


Figure 8 – Vertical nailing Pattern A (30 assembled fasteners)

Typical Fastening Patterns to Wood Stud (Open Stud Assembly)

- For open stud applications, the rigid insulation boards are fastened directly to the studs.
- Mechanical fasteners should be no more than 12-15” (305-381 mm) apart around the outside edge of the boards (brick ties and strapping also qualify as fasteners, do not duplicate).
- Use the printed guidelines on the boards to locate stud centers under the board (for vertical application only).
- Do not over-torque fasteners. Fasteners are required at all outside edges, openings and intermediate framing members (if backing is available).
- Brick ties must fasten through the insulation to the framing and use 1.5-2” (38-51mm) diameter plastic washers.

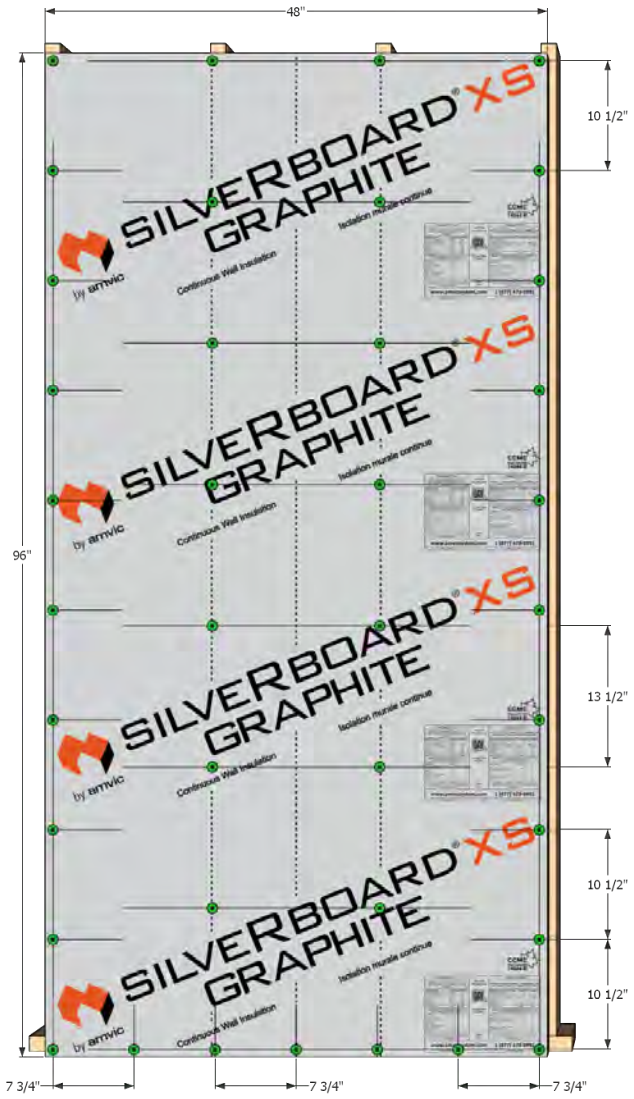


Figure 9 – Vertical nailing pattern at 16” (406mm) o.c. studs (42 cap nails)

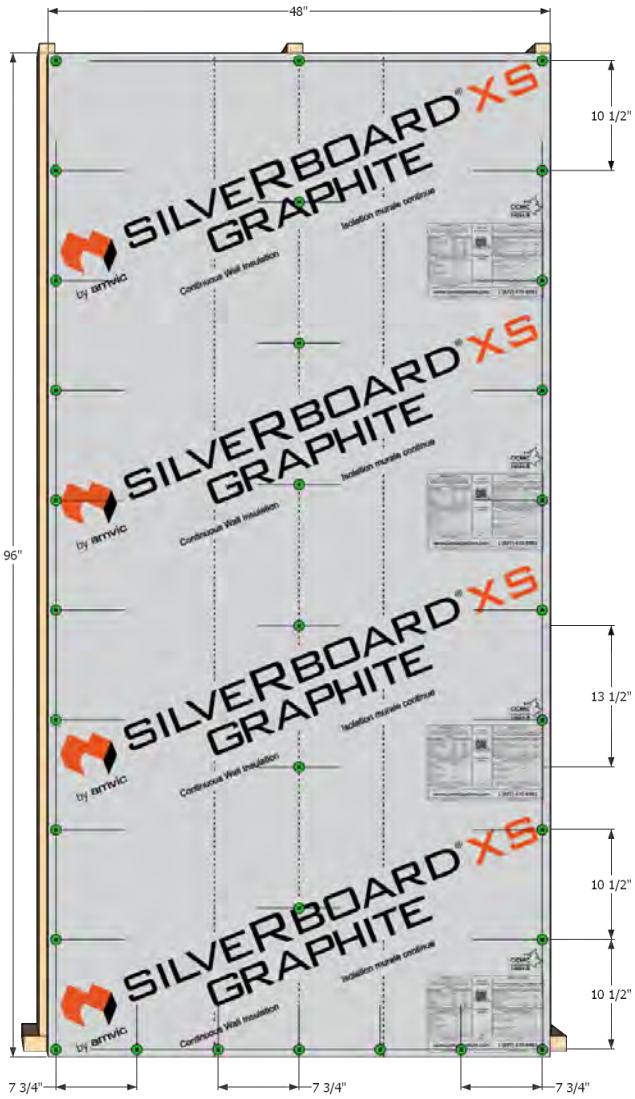


Figure 10 – Vertical nailing pattern at 24” (610mm) o.c. studs (34 cap nails)

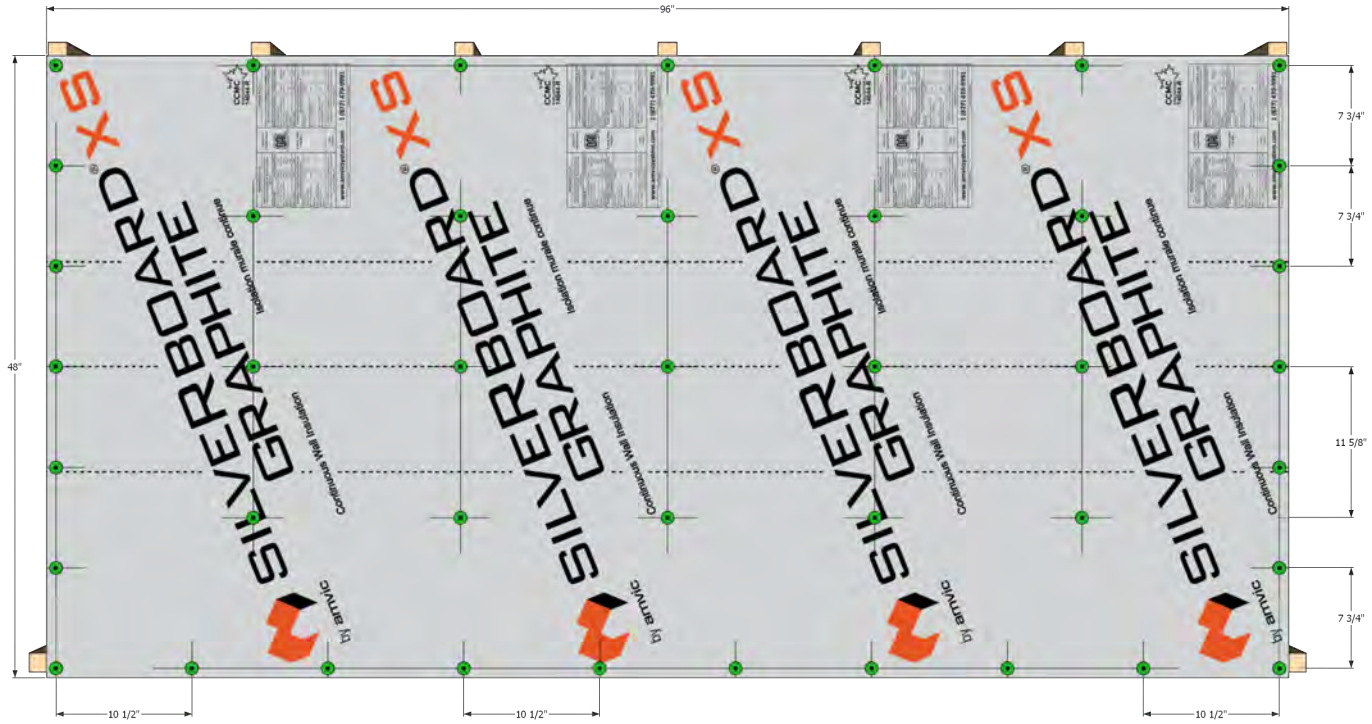


Figure 11 – Horizontal nailing pattern at 16” (406mm) o.c. studs (42 cap nails)

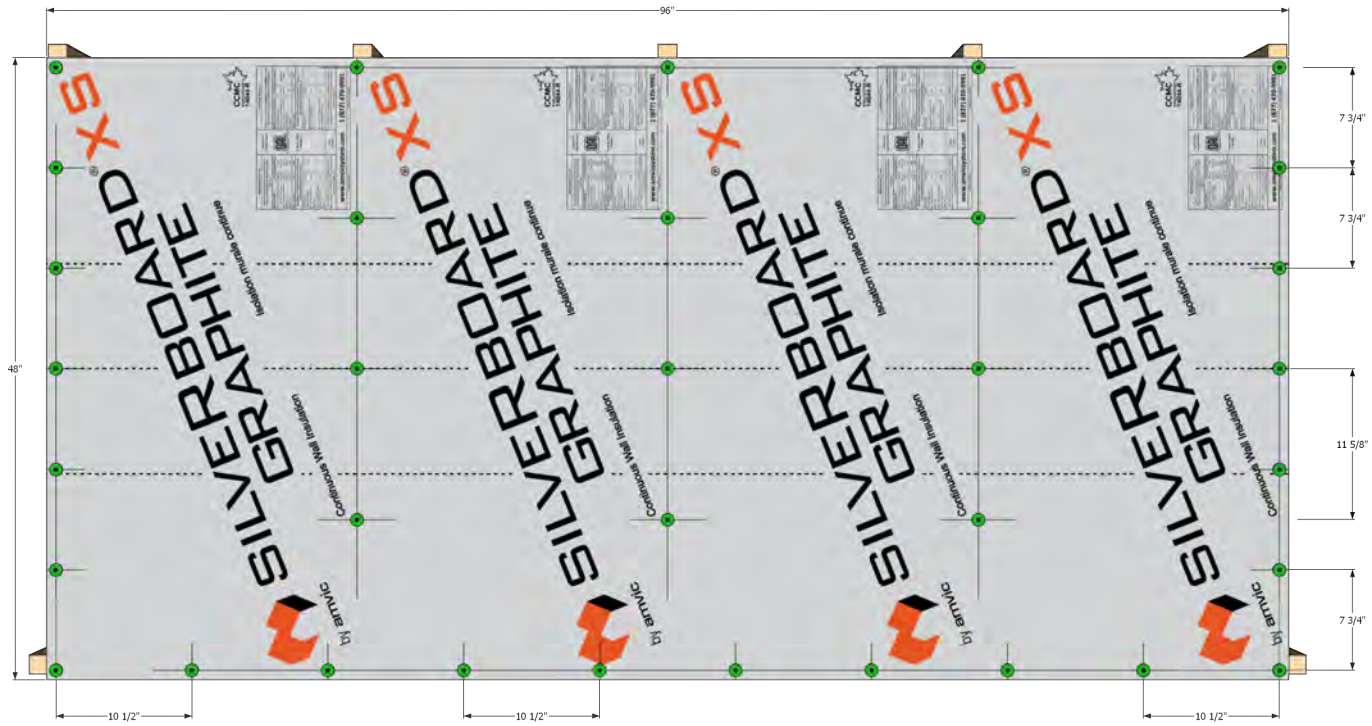
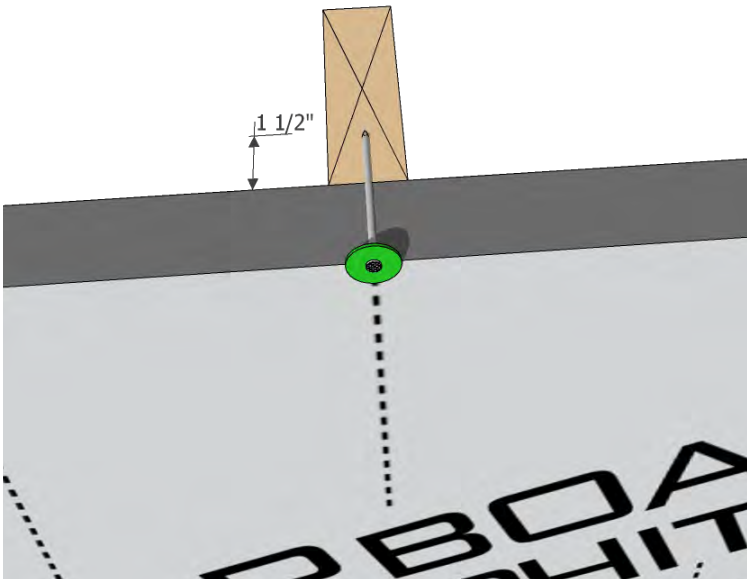


Figure 12 – Horizontal nailing pattern at 24” (610mm) o.c. studs (34 cap nails)

Fastening Details to Wood Stud

- Allow for a minimum of 1.5” (38mm) of fastener length when installing directly over framing e.g. 1.125” (29mm) SilveRboard Graphite XS + 1.5” (38mm) = 2.125” (67mm)
- At edge connections, angle the screws/nails to maintain distance from the edge while having sufficient penetration depth for the screw or nail.
- Minimum fastener diameter is 1” (25mm).
- For larger fasteners that might overlap at the edges, a staggered/alternating pattern with aforementioned spacing is needed.
- A minimum distance of 3/4” (19mm) should be maintained from the edges in order to reduce potential tearing of the material.



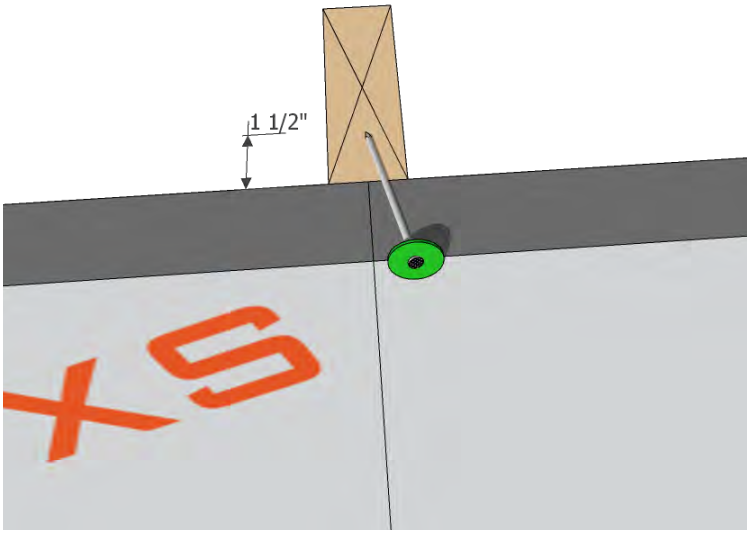
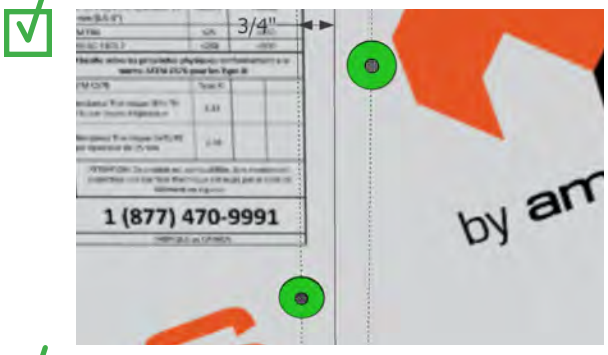
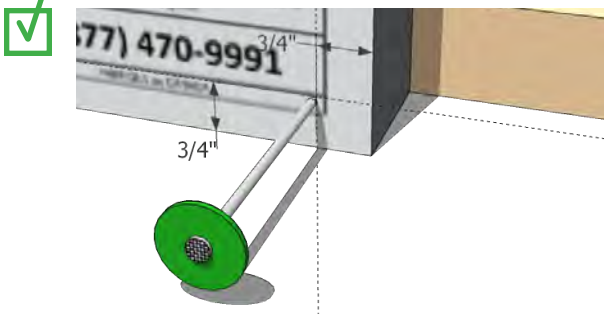


Figure 13 – Proper nail/screw length must be used when installing into wood studs





Typical Fastening Patterns to Metal Stud (Open Stud Assembly)

- For open stud applications, the rigid insulation boards are fastened directly to the studs.
- Mechanical fasteners should be no more than 12-15” (305-381mm) apart around the outside edge of the boards (brick ties and strapping also qualify as fasteners, do not duplicate).
- Use printed guidelines on the boards to locate stud centers under the board.
- Do not over-torque fasteners. Fasteners are required at all outside edges, openings and intermediate framing members (if backing is available).
- It is also recommended that the fasteners be at least 3/4” (19mm) in from edges or corners to prevent product tearing. Do not over-torque fasteners.

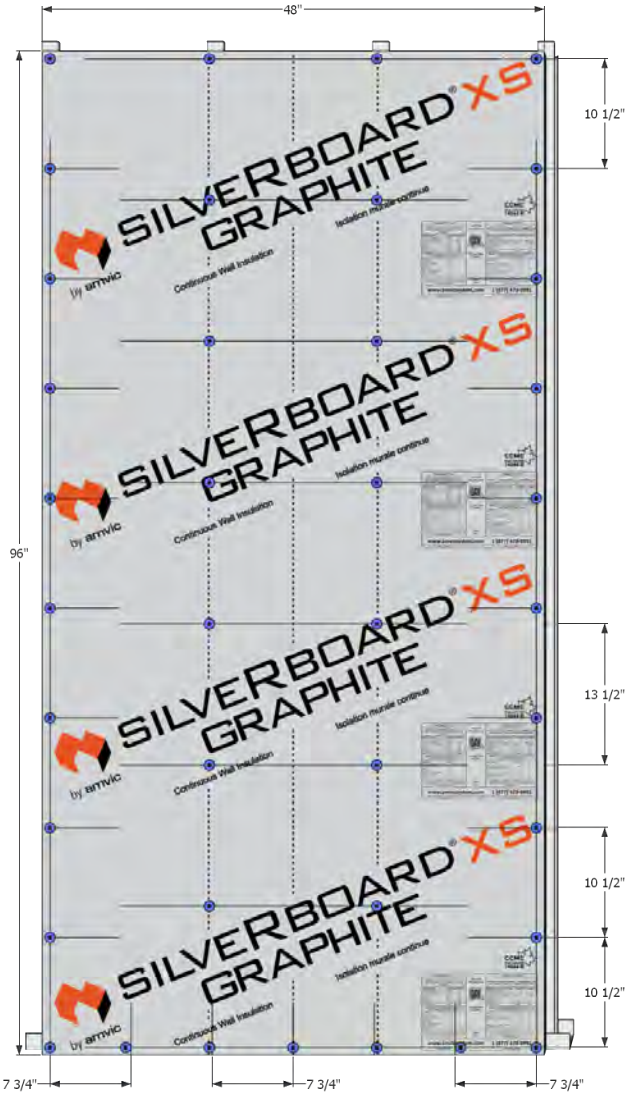


Figure 14 – Vertical nailing pattern at 16” (406mm) o.c. studs (42 cap nails)

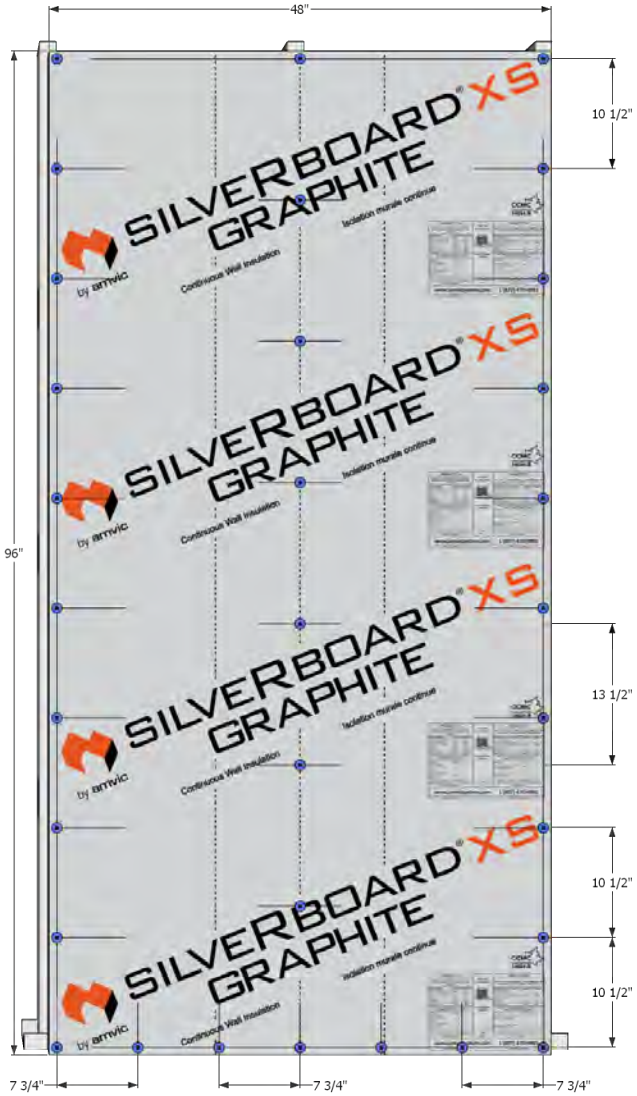


Figure 15 – Vertical nailing pattern at 24” (610mm) o.c. studs (34 cap nails)

Seam Taping

- Tape all joints with a minimum 2-3/8” (60mm) code approved sheathing tape (wider tape is recommended).
- For all tape joints, use shingle lapping technique.
- At the board edges, center tape over the joints to cover fasteners.
- Installed fasteners in the center of the boards do not need to be taped.
- Tape should be installed in 15-120°F (-9.4-48.9°C) outdoor temperature (see tape manufacturer specifications).
- Using a roller greatly reduces the chances of tape wrinkling occurring. It is important to eliminate wrinkles in the tape if they occur as they are potential location for water ingress. If rolling the tape does not remove the wrinkles, that tape section must be replaced with a new one, new tape section should overlap existing tape a minimum of 3” (76mm). Wrinkles can also be covered with another piece of tape and rolled over.

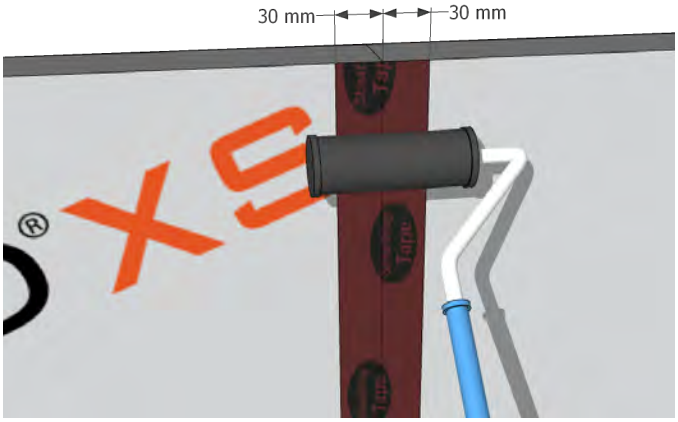


Figure 16 – Tape roller is recommended to remove wrinkles

Figure 17 – Taping pattern for vertical board orientation

Figure 18 – Taping pattern for horizontal board orientation

Exterior Cladding Installation

Amvic's rigid insulation boards (SilveRboard and Envirosheet) are compatible with virtually any typical cladding system on the market. Always make sure to double check with your local building code that the selected anchor is in compliance.

Masonry

When looking at masonry, clay brick is very popular finish for both residential and commercial construction. As with any rigid insulation, choosing the right tie type is crucial. For low rise residential construction, sheet metal anchor is very popular but requires a slight alteration to include a 2" (51mm) plastic washer along with a screw. Screw length should be a minimum of 1" (25mm) longer than the total thickness of the insulation board and sheathing (if any). The washer helps spread the load to a bigger area and keeps the boards against the backstrate.

Corrugated versions of this type of brick tie are used only for low rise residential construction with wood framing while the non-corrugated versions, that are thicker and pre-bent are more appropriate for commercial construction but also primarily for wood frame based structures. This type of tie/anchor is suitable for a maximum of 1" (25mm) air gap and a maximum thickness of 1-1/4" (32mm) for the rigid foam insulation board. This type of brick tie uses typical off the shelf components can be assembled on site if needed.

For thicker thicknesses, a different type of anchor is needed to transfer the loads back directly to the framing/backstate. There are various proprietary anchors with various features such as height adjustment, thermal break, etc. The barrel screw anchor is one such example that allows lateral loads to be transferred directly through the foam to the framing behind. It features height adjustable wire, 2" (51mm) plastic washer and gasket to reduce potential infiltration of air/water. This type of anchor would generally need to be site assembled but the inclusion of the plastic washer means that the rigid boards do not need as many of the regular fasteners reducing labor cost and time.

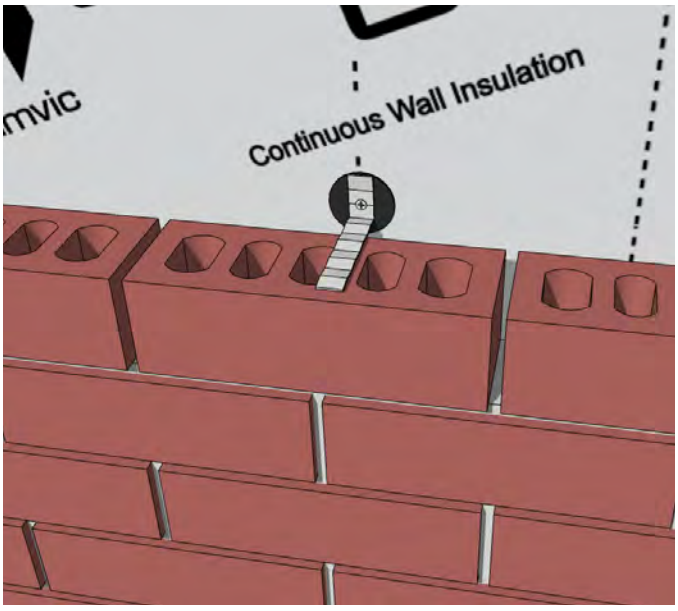


Figure 19 – Corrugated sheet metal brick tie for thinner thicknesses of rigid insulation boards

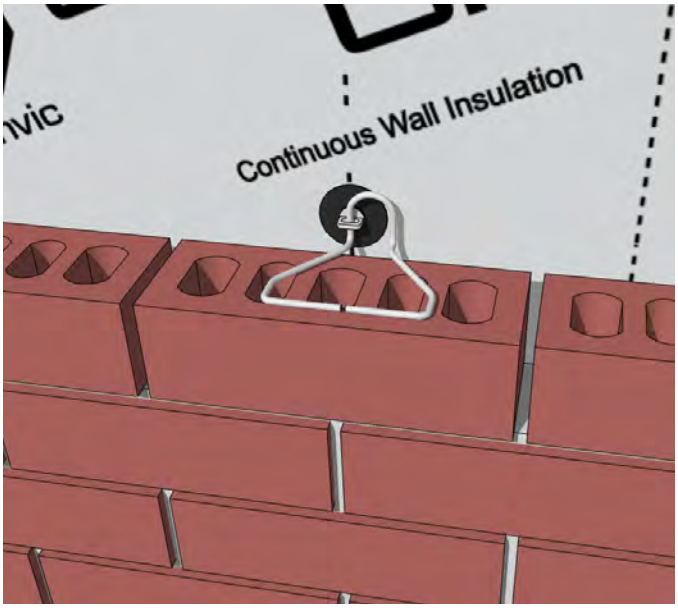
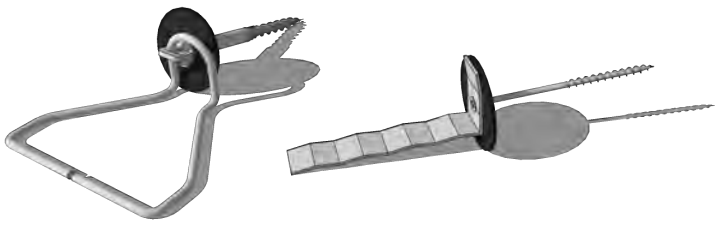


Figure 20 – Adjustable barrel screw type brick tie allows for thicker thicknesses of rigid insulation boards to be used



Siding

Siding is a broad category that includes different materials and different styles of siding. The most common materials are wood/composite, vinyl, fiber cement and metal. For the majority of siding application it highly recommended to build the wall using rain screen principle, i.e. with an air cavity. For low rise residential construction this often achieved using 1x3 lumber or something similar but other material could be suitable as well. The function of the vertical strapping is to provide a pressure equalized air gap to allow water to drain down and out of the wall assembly. This would be applicable for both horizontal and vertical siding installations.

Figure 21 – Horizontal wood/composite siding with wood strapping on 2-1/4 (57mm) SilveRboard Graphite XS

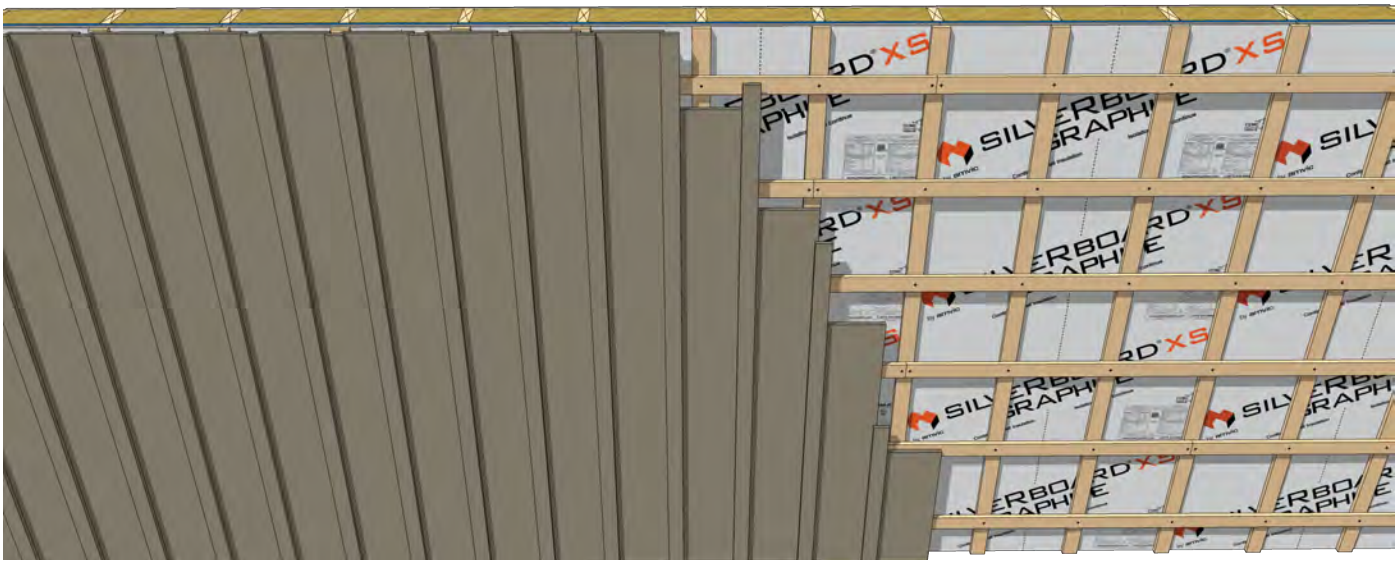


Figure 22 – Vertical board and batten siding with rain screen double layer strapping on 1-1/8 (29mm) SilveRboard Graphite XS

Wood/composite and fiber cement siding installation is fairly typical and requires some sort of vertical wood strapping to be installed over the rigid foam to provide an attachment surface for the siding planks. For vertical applications, the vertical strapping is still recommended along with a secondary layer of horizontal strips to act as the nailing surface. Although installing furring strips horizontally will create an air gap, it will not facilitate easy drainage and could compromise the wall in the long run. It is important to including all the appropriate flashing, trims, vents and bug screens to ensure the longevity of the wall.

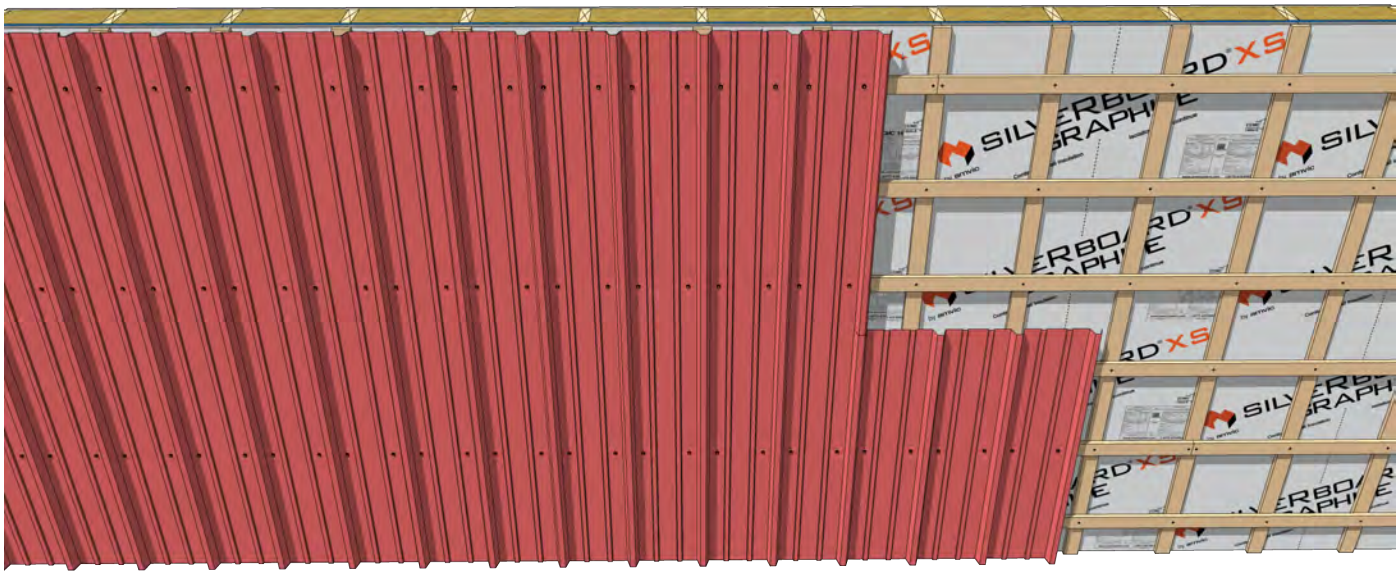


Figure 23 – Vertical metal siding with rain screen double layer strapping on 1-1/8 (29mm) SilveRboard Graphite XS

Vinyl Siding

Vinyl siding is extremely popular among home owners and builders alike due to its low cost, ease of installation and transport. It is used primarily in low rise residential construction. Vinyl siding installation should follow the manufacturer's installation requirements to be compliant with warranty and is generally installed without strapping. Both SilveRboard and Envirosheet rigid insulation board product lines can be used with vinyl siding but foam thickness should be limited to a maximum of 1-1/4" (32mm) since this type of siding is loose fastened.

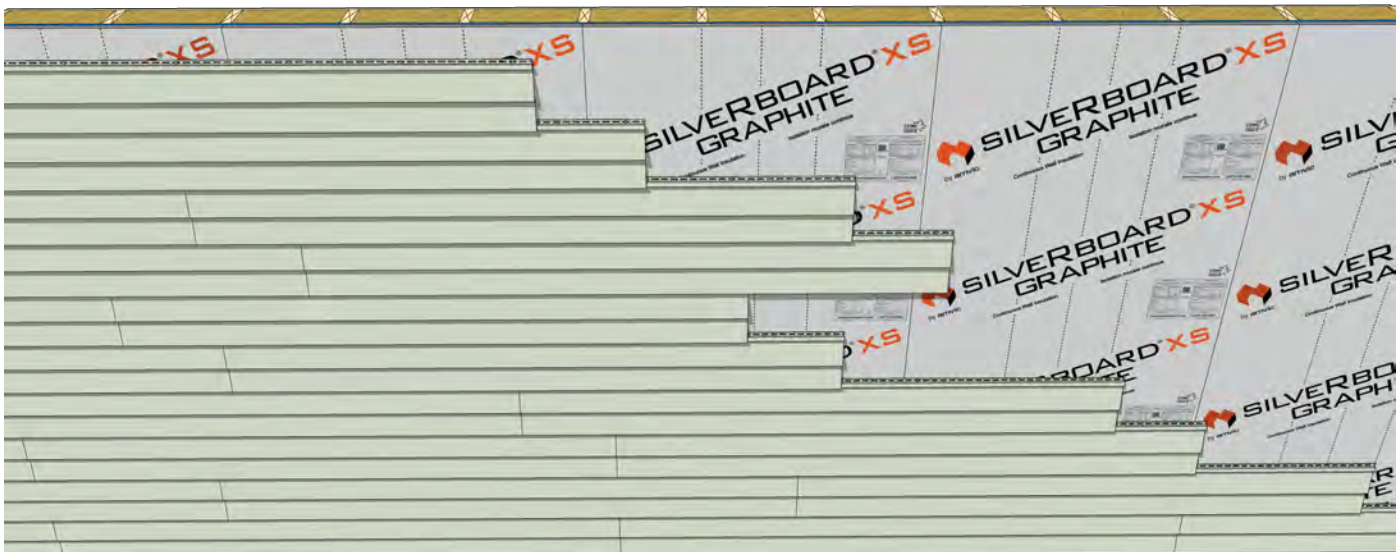


Figure 24 – Horizontal vinyl siding installed directly on 1-1/8 (29mm) SilveRboard Graphite XS

Stucco

Stucco is an exterior finish that has been used for centuries all over the world and has evolved over the years in its application and composition. Currently, in North America, there are two main types of stucco finishes, traditional stucco (sometimes called three coat stucco or hard coat stucco) and synthetic stucco (sometimes called acrylic stucco, one coat or two coat stucco).

Traditional Stucco

In low-rise residential construction, traditional stucco has been typically applied to wood framed walls without a drainage plane. This practice might be acceptable in warmer and drier climates but can cause issues such rotting and mold in other climate zones with more precipitation and temperature fluctuation especially with the addition of continuous rigid insulation. If installing stucco without a dedicated drainage layer, it is recommended to use water resistive barrier (WRB) with crinkled surface. The small vertical grooves would help channel some of the water out of the wall assembly but a proper rainscreen wall is still the best option.

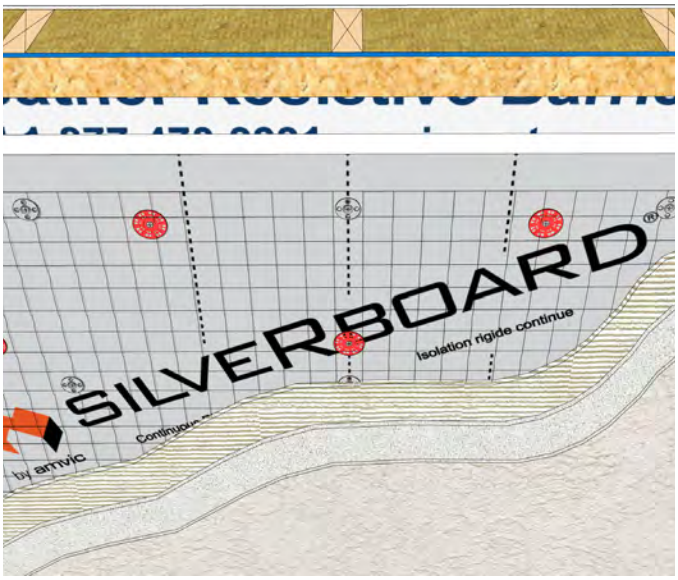


Figure 25 – Traditional stucco installed over 2" (51mm) high density SilveRboard without drainage cavity

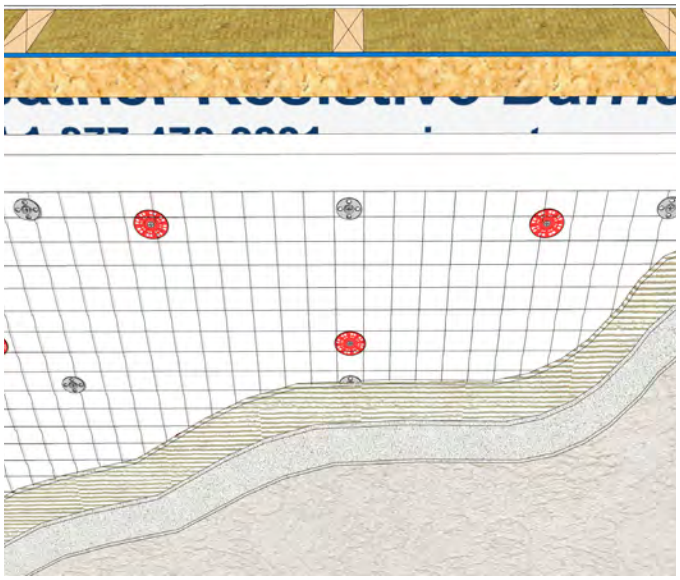


Figure 26 – Traditional stucco installed over 2" (51mm) high density Envirosheet without drainage cavity

In the past, drainage plane has been done with wood strapping and additional sheathing layer but the contemporary method of creating a rainscreen wall with traditional stucco and rigid foam insulation is to use a combination of a water resistive barrier (WRB) and a dimpled/drainage membrane (±3/8" (10mm) thick). One method is to apply the WRB on top of the sheathing, then install rigid foam insulation (SilveRboard or Envirosheet), followed by a dimpled/drainage membrane (it is recommended to use Envirosheet or perforated SilveRboard for this application). Then install the wire lath (17 gauge wire or expanded metal lath) with the assembled fasteners (screw and metal washer) attached back to wood framing (number of fasteners to be used depends on the more restrictive of the requirements) and finished with all the layers of traditional stucco, scratch coat, brown coat and finish coat. This configuration provides absorptive traditional stucco a drainage cavity and reduces changes of moisture driven further into the wall assembly.

The alternative to method is to apply the WRB to sheathing, then the dimpled/drainage membrane followed by rigid foam insulation and then lath and the three coats. Both configurations provide drainage and some amount of ventilation, but due to the immediate proximity of cavity to the WRB, there is greater drying potential for the sheathing which might be needed depending on the climate zone and specific materials used in the assembly. For configurations where drainage membrane is located between the foam the wire mesh, high density perforated SilveRboard or Envirosheet is recommended. Check local building code requirements for required number of WRBs, approved mesh types as well as requirements for drainage cavity for stucco applications before proceeding with the wall assembly design.

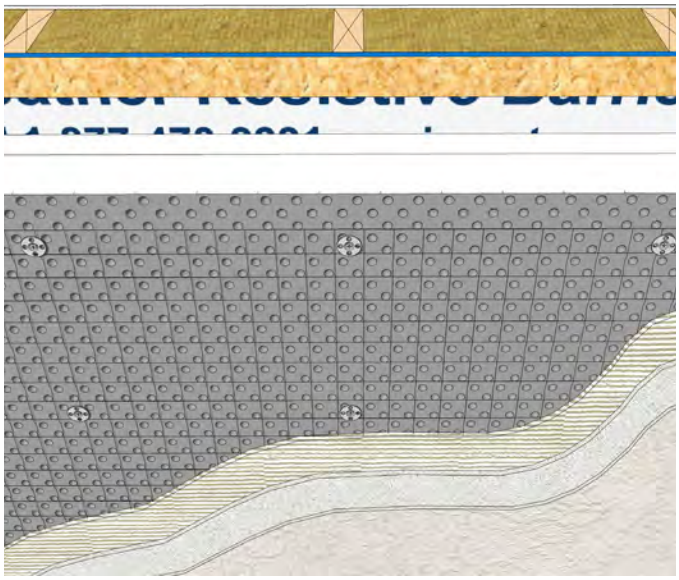


Figure 27 – Traditional stucco with 2" (51mm) high density SilveRboard installed with drainage cavity method 1

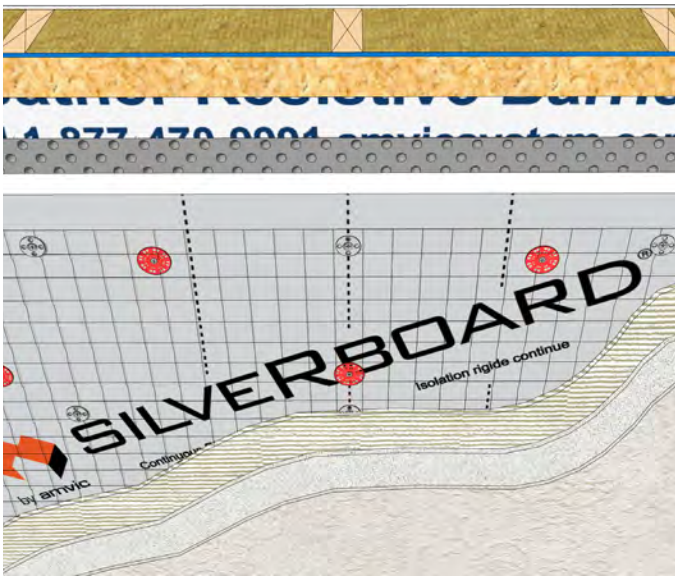


Figure 28 – Traditional stucco with 2" (51mm) high density SilveRboard installed with drainage cavity method 2

Synthetic Stucco

Synthetic stucco is more resistant to water ingress compared to traditional stucco and can also be used in the wall assemblies above with 20 gauge wire lath. Alternatively, if using Envirosheet, fiberglass mesh can be applied directly to the foam surface and finished with base and finish coats. If using fiberglass mesh, the washer in the assembled fastener should be nylon. Both of these configurations can be built with or without a drainage cavity depending on the specific needs of the project. If installing stucco without a dedicated drainage layer, it is recommended to use water resistive barrier (WRB) with crinkled surface. It is extremely important to check local building code requirements for required number of WRBs, approved mesh types as well as requirements for drainage cavity for stucco applications before proceeding with the wall assembly design.

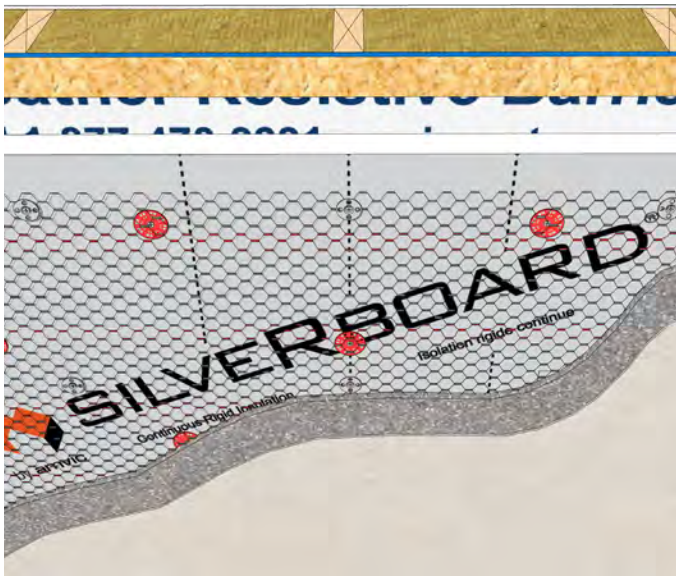


Figure 29 – Synthetic stucco with 2" (51mm) SilveRboard installed without drainage cavity with wire lath

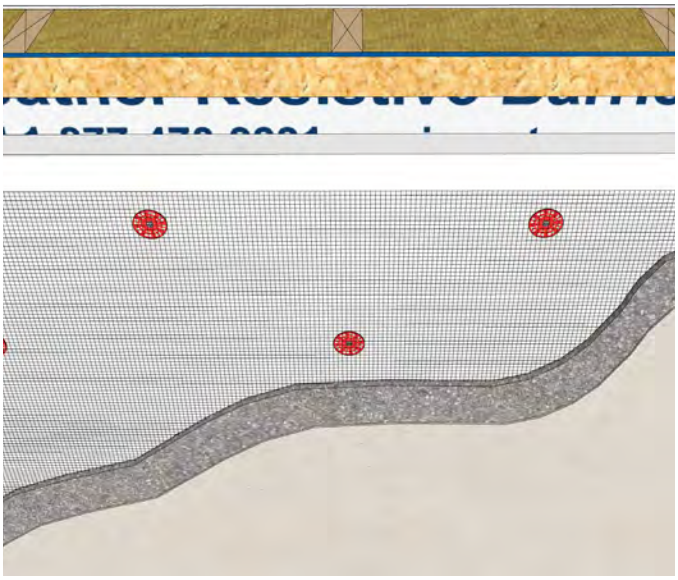


Figure 30 – Synthetic stucco with 2" (51mm) Envirosheet installed without drainage cavity with fiberglass mesh

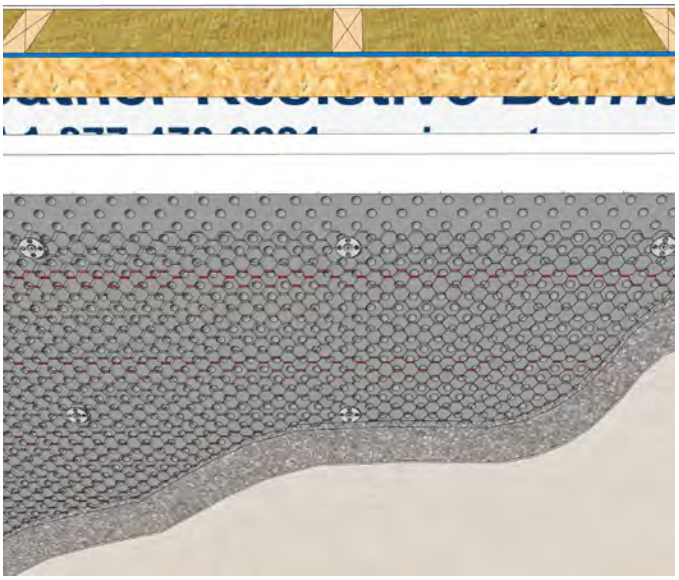


Figure 31 – Synthetic stucco with 2" (51mm) high density Envirosheet installed with drainage cavity method 1

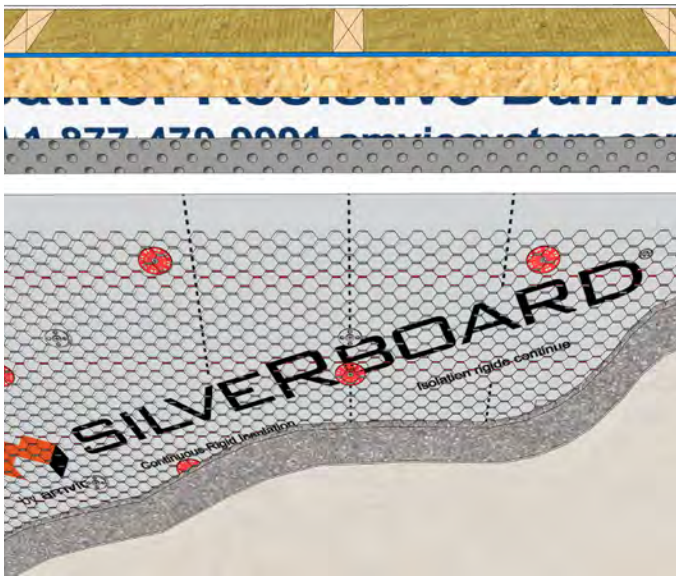


Figure 32 – Synthetic stucco with 2" (51mm) high density SilveRboard installed with drainage cavity method 2

Adhered Masonry Veneer

Thin masonry veneer (sometimes called cultured or manufactured stone) is thinner than typical masonry veneer (0.75-1.5" (19-38mm) versus 3.5-4" (89-102mm)) and is adhered to the wall. It is a popular exterior finish that can be used for the entire facade or for smaller parts to provide a stone looking finish without the need to deal with brick shelf angles or foundation ledges that would be needed for full size masonry veneer. Installation is very similar to that of stucco but with some key differences. The lath/mesh is denser and/or heavier, fastener spacing is tighter and heavier duty, the scratch coat is thicker and mortar setting bed replaces the base and finish coats. As with stucco, rainscreen wall assembly is highly recommended but non-drained versions might be acceptable in warmer and drier climatic zones, check local building code to verify exact requirements.

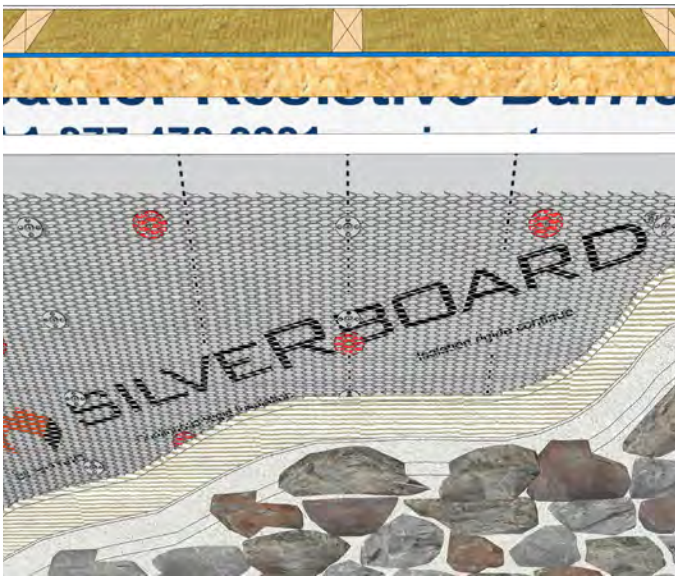


Figure 33 – Thin stone veneer installed with 2" (51mm) high density SilveRboard without a drainage cavity

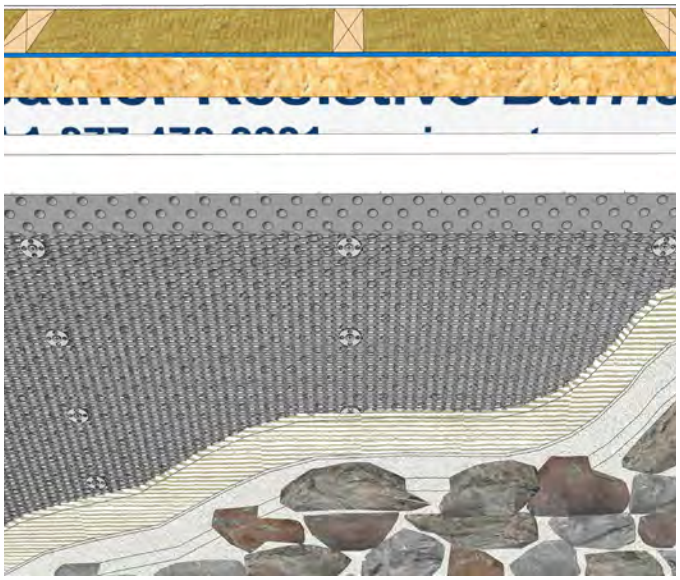


Figure 34 – Thin stone veneer installed with 2" (51mm) high density Envirosheet and a drainage cavity

Sloped Roof With Attic

Typical attic insulation can be supplemented with Amvic's rigid insulation boards. When using non-perforated SilveRboard, the seams can be taped with vapor barrier tape which will create a continuous vapor barrier surface. When using perforated SilveRboard (denoted with XS in the product name/code) or Envirosheet, a dedicated vapor barrier is needed.

- Provide wind baffles (insulation stops) along the perimeter of the wall to maintain minimum 2" (51mm) air gap to promote air flow for proper attic ventilation.
- Rigid insulation boards are installed to underside of roof trusses. If using wood/metal furring strips, the foam boards only need to be held in place until furring strips are installed. If furring strips are not used and gypsum board is installed directly over the rigid foam, fasteners with washers are needed to secure the foam boards to the trusses before gypsum board is installed.
- Optional: Install wood furring (16 or 24" (406 or 610 mm) o.c.), securing them directly into the trusses. Allow for a minimum of 1" (25mm) of fastener length, over and above the total thickness of the insulation board and furring strips.
- Overlap the wall vapor retarder a minimum of 4" (102mm) onto the face of the SilveRboad. Tape and seal all joints with approved vapor barrier tape.
- Use longer screws/nails to accommodate for the thicknesses of the foam (if installed without strapping). Once gypsum boards are installed, attic insulation (loose fill or batt) can be placed on top of the boards to the required thickness.

It is important to provide a sufficiently sized air gap around heated penetrations such as recessed lights and heating flues. Allow electrical rough-ins to accommodate for extra thickness insulation and furring strip thickness.

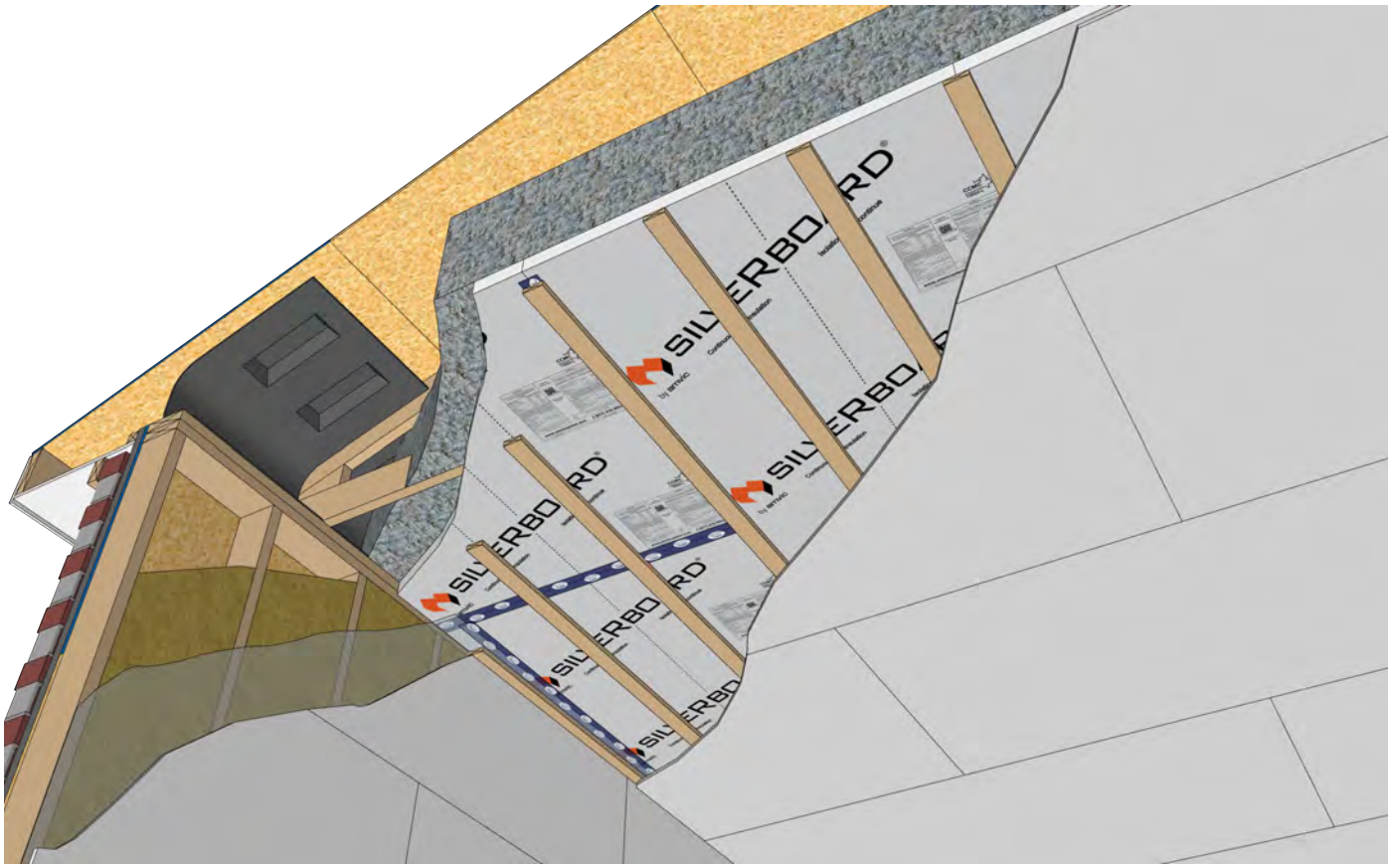


Figure 1 – 2" (51mm) high density SilveRboard installed with furring strips to underside of wood trusses

Sloped Roof With Interior Insulation (Cathedral/Vaulted Ceiling)

For cathedral style ceilings, rigid foam boards can also be used to supplement the batt insulation that is found in the cavity to reach higher R-values as can be needed for higher energy efficiency. When using non-perforated SilveRboard, the seams can be taped with vapor barrier tape which will create a continuous vapor barrier surface. When using perforated SilveRboard (denoted with XS in the product name/code) or Envirosheet, a dedicated vapor barrier is needed.

- Typically, a 2” (51mm) air cavity is needed on the underside of the roof sheathing to provide adequate ventilation (easily achieved with a wind baffle). Appropriate ridge and soffit vents are needed to make sure minimum level of ventilation are provided for long term performance of the roof assembly.
- Place mineral wool batt insulation at the appropriate thickness to fill the cavity between the roof rafters (keep in mind the thickness of wind baffle as underside of batt insulation and rafters should be flush).
- Rigid insulation boards are installed to underside of roof rafters. If using wood/metal furring strips, the foam boards only need to be held in place until furring strips are installed. If furring strips are not used and gypsum board is installed directly over the rigid foam, fasteners with washers are needed to secure the foam boards to the trusses before gypsum board is installed.
- Optional: Install wood furring (16 or 24” (406 or 610 mm) o.c.), securing them directly into the trusses. Allow for a minimum of 1” (25mm) of fastener length, over and above the total thickness of the insulation board and furring strips.
- Overlap the wall vapor retarder minimum of 4” (102mm) onto the face of the SilveRboad. Tape and seal all joints with approved vapor barrier tape.
- Use longer screws/nails to accommodate for the thicknesses of the foam (if installed without strapping).

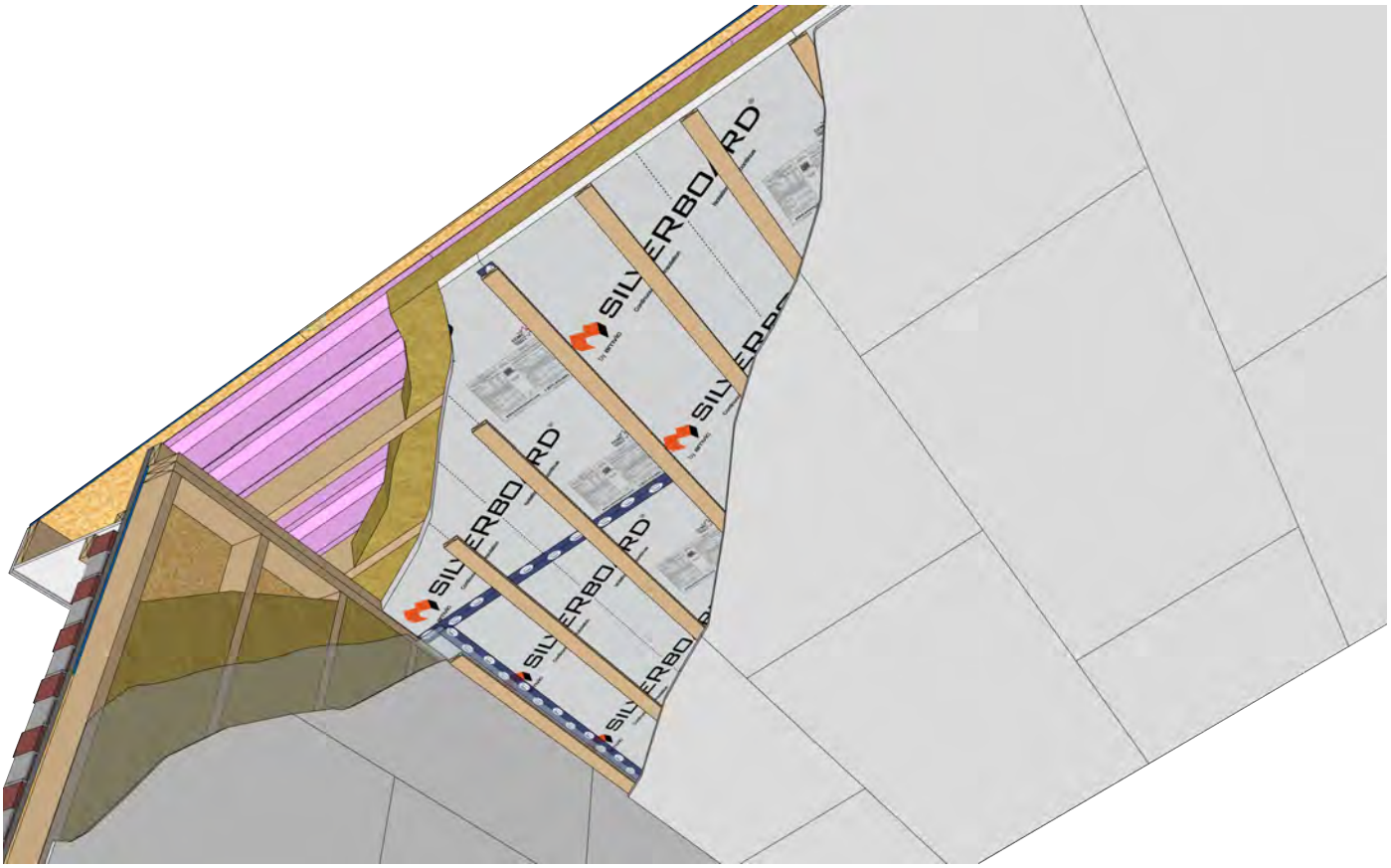


Figure 2 – 2” (51mm) high density SilveRboard installed with furring strips to underside of wood rafters

Sloped Roof With Exterior Insulation

Cathedral style roofs can also be achieved using exterior insulation which allows for much higher performing roofs that can be used to meet very energy stringent standards such as passive house, net zero, etc. In the render below, high density versions of Envirosheet are used in multiple, staggered layers in both the wall and the sloped roof to provide a 2/3 of the insulation value outside of the wood sheathing. The framed wall is 2x4 with the appropriate batt size. This allows the wall and roof membrane to act as both the vapor and air barrier. At minimum, the roof membrane should be self adhering as to allow air tight and sturdy installation and durability. It is important to use specifically a self adhering roof membrane which often times would have a nonslip surface to allow installers to safely walk on it. The wall membrane does not necessarily need to be self adhering, although that would be beneficial, but it is crucial to overlap the roof membrane with the wall membrane to ensure water/air/vapor barrier continuity.

The wood strapping used is located 16” (406mm) o.c. and is attached directly into wood studs/rafters using longer screws. The screw should go a minimum of 1.5” (38mm) into the stud/rafter to provide proper mechanical attachment. These heavier duty screws are available up to 16” (406mm) in length. During installation, it is critical to properly transfer the center for studs/rafters to each layer of foam to ensure that the furring strips are fastened to the structural framing members and not the sheathing.

In situation where a few screws have missed the stud/rafter, it is important to insulate the ends of the screws on the interior to prevent potential condensation issues. This can be easily done by taking a scrap piece of foam, applying spray foam adhesive to one side and sliding it over the protruding screw. Interior batt insulation can be installed at much later time and drywall can be easily installed directly unto the studs/rafters without the need for any additional membranes (e.g. a vapor barrier).

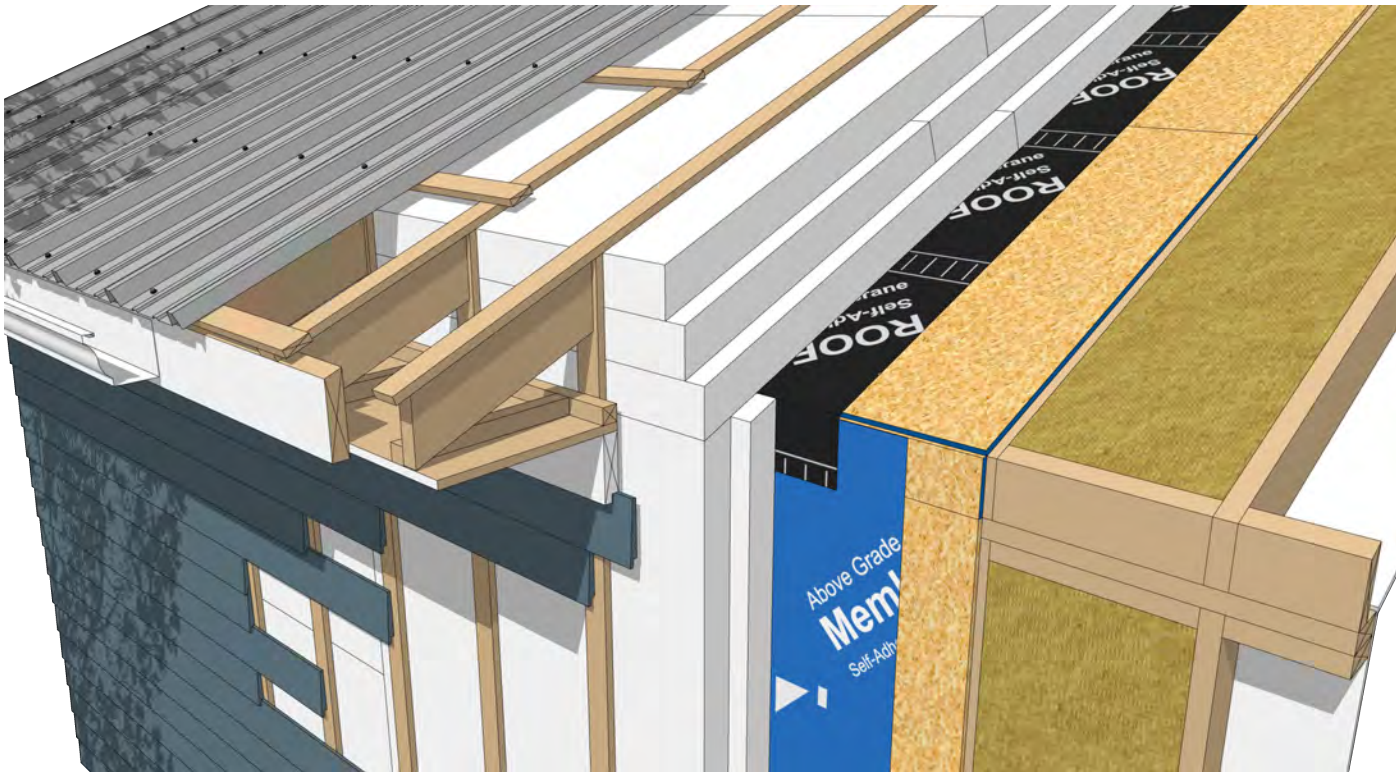


Figure 3 – Multiple layers of high density Envirosheet are installed on the walls and roof

Exterior Foundation Insulation

Insulating the foundation wall from the exterior is the preferred method to ensure the continuity of the thermal envelope which will provide the proper coverage with reduced thermal bridges for the best performance. For this application, it is recommended to use only high density SilveRboard or Envirosheet products.

- Prepare the exterior surface of the foundation wall for application of waterproofing by removing any debris, dirt or protrusions making for clean, dry and flat surface.
- Once the waterproofing is applied (self-adhered and liquid applied membranes are recommended), allow sufficient time to set (if required).
- Install rigid boards tightly butting the edges.
- Orient boards vertically, starting with a full panel at the top of the footing.
- Provide covering/protection with proper flashing at the top of the insulation to ensure water does get behind the insulation and protect at grade from impact.

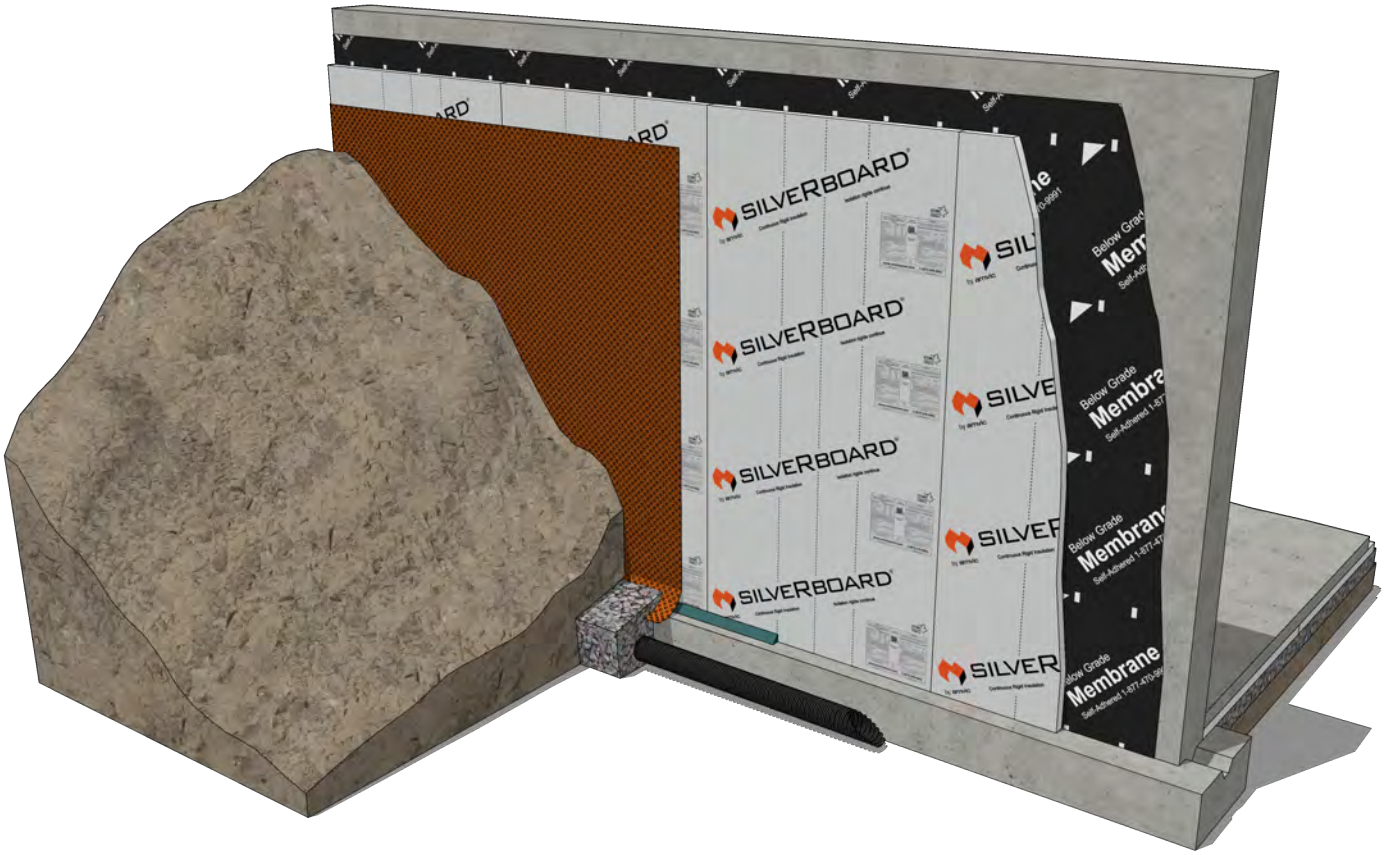


Figure 1 – 2" (51mm) high density SilveRboard installed on the exterior of waterproofing membrane

Interior Basement Insulation

Insulating a basement from the interior is not recommended since it less effective than exterior continuous insulation and can be more difficult to be done correctly from a moisture management perspective. Unfortunately, in many instances it has to be insulated from the inside since it is significantly easier, and insulating from the exterior is prohibitively expensive, disruptive and time consuming. For the most part, any of SilveRboard or Envirosheet product can be used with some slight variation depending on the specifics of a given project. Typical installation steps for insulating on the interior of a foundation wall are as following:

- Prepare the interior side of the foundation wall by removing any debris, dirt or protrusions making for a clean, dry and flat surface.
- Start by placing the first row on the slab (vertical orientation is recommended), continuing to underside of ceiling. Use compatible construction adhesive secure boards in place.
- Install rigid boards tightly butting the edges. Boards should be tacked in place until framing is installed by using mechanical fasteners or adhesive.
- Install wood/metal framed wall to the desired depth/thickness and fill cavities with mineral wool insulation. Decouple bottom plate from concrete by using a sill gasket.
- Install a smart vapor barrier (could also be called smart vapor retarder) with proper overlapping, sealing and taping as per manufacturer's guidelines followed by interior finishes (e.g. gypsum board).

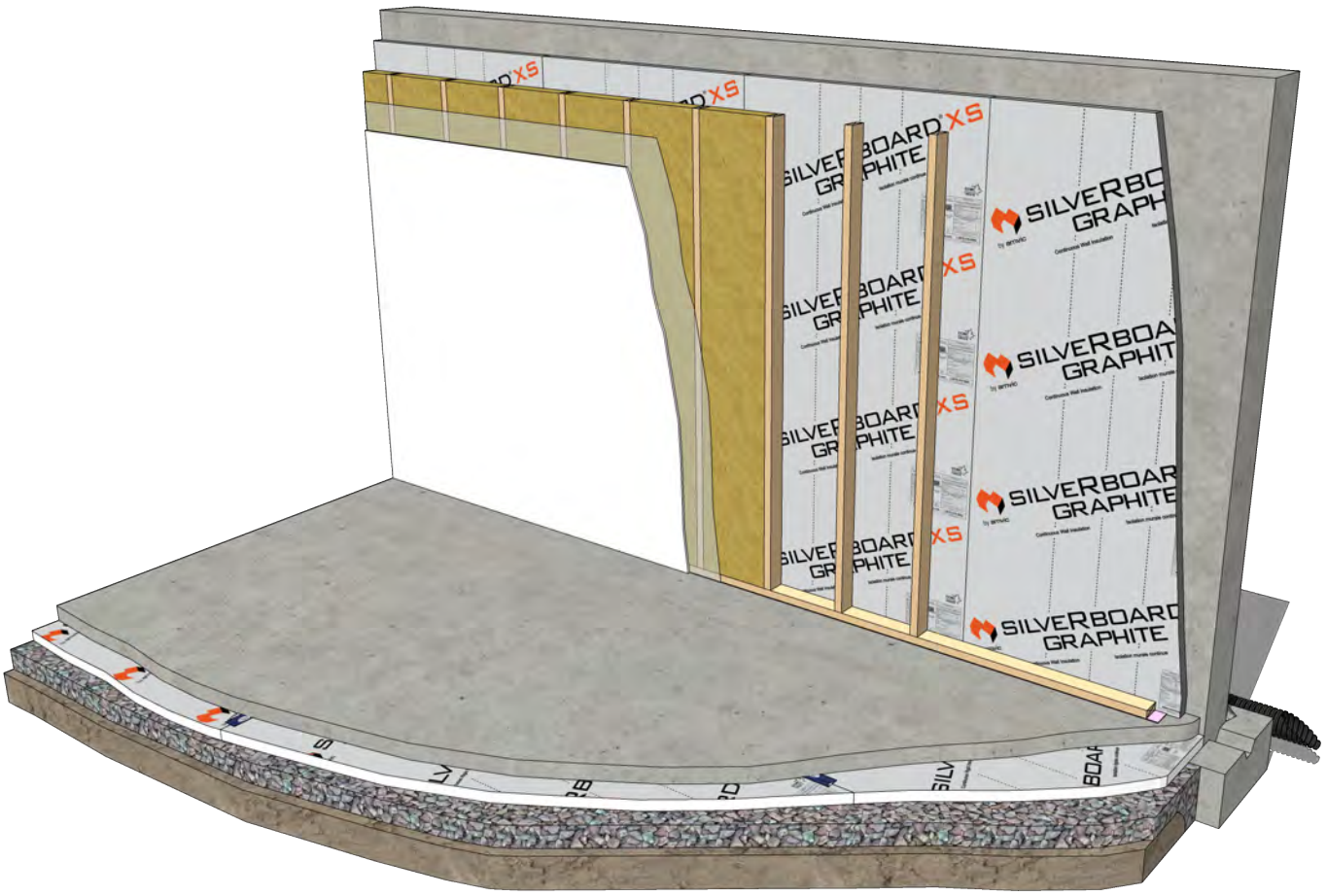


Figure 2 – 2-1/4" (57mm) SilveRboard Graphite XS between framed wall and concrete

Under Concrete Slab

Insulating concrete slabs is a widespread requirement in many localities and can be done quite easily with Amvic's rigid foam insulation boards. High density SilveRboard or Envirosheet should be used for this application. For projects with higher loads on the concrete slab such as fire stations, heavy equipment garages, etc, higher density rigid boards are available.

Before installation, make sure the soil and granular fill are well compacted and flat. SilveRboard/Envirosheet are placed flat on granular fill, butting edges tightly. When using the boards in a multi-layer configuration, stagger the joints. The non perforated versions of SilveRboard can function as a vapor barrier when the seams are taped with a vapor barrier tape. In most instances, when using Envirosheet or not taping the seams with SilveRboard, a dedicated vapor barrier membrane is needed between the insulation and the concrete slab. In locations with higher concentrations of soil gases, a dedicated membrane might be required regardless if SilveRboard seams are taped or not, check the local building code.

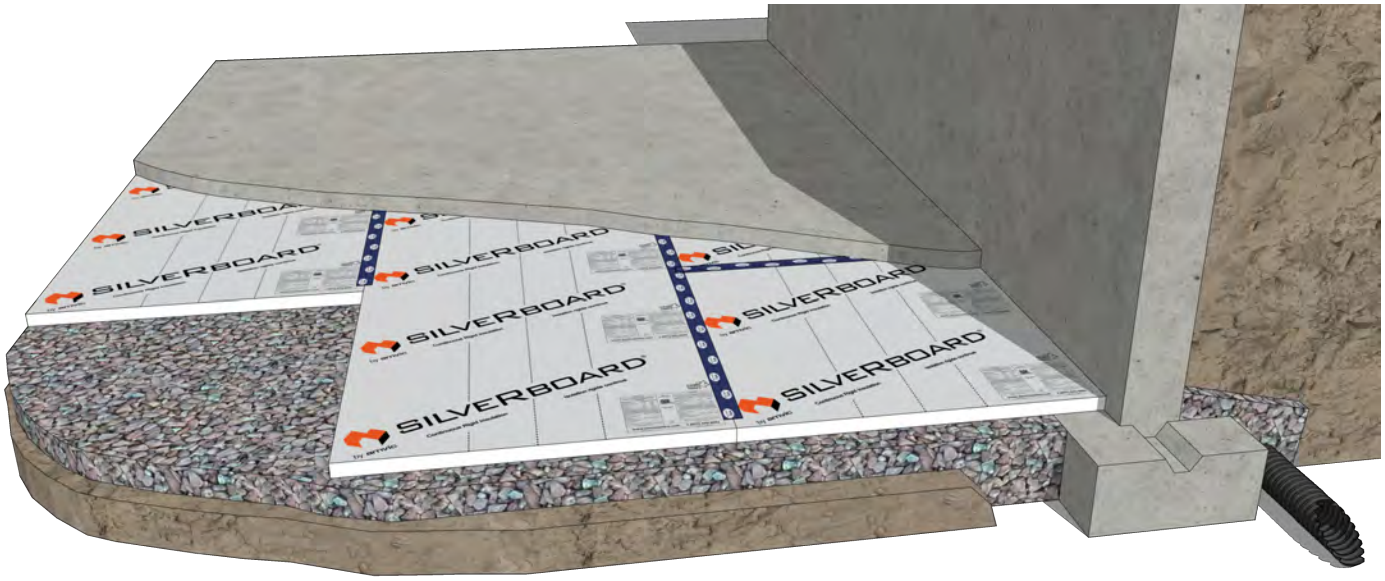


Figure 1 – 2" (51mm) high density SilveRboard under basement slab

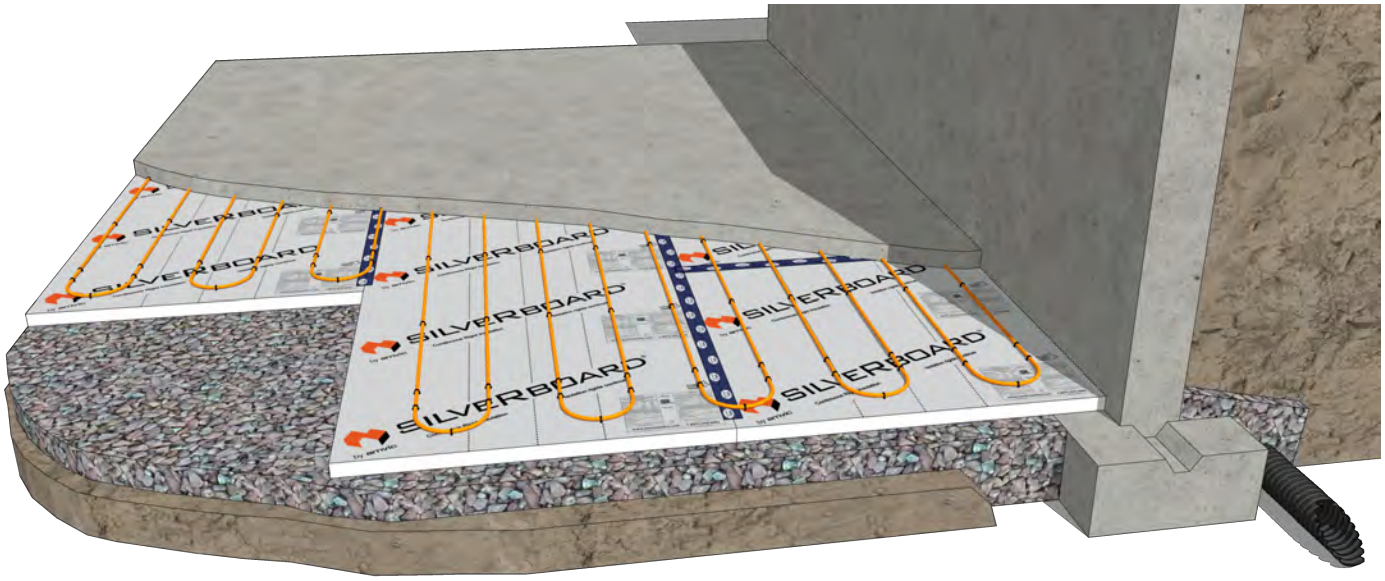


Figure 2 – PEX piping stapled to 2" (51mm) high density SilveRboard with a typical basement slab

Above Concrete Slab

The best way to insulate a concrete slab is to include rigid insulation under it which needs to be placed prior to the pour. Although this is best practice, it might not be possible especially with many older buildings thus needing to insulate above the slab. It is recommended to use high density rigid foam boards for this application. Typical installation steps for insulating above concrete slab as following:

- Remove any protrusions from the surface and clean all debris from the slab to provide clean and even surface.
- If a vapor barrier membrane is not present below slab, it can be placed on top of the concrete slab and held in place with the strapping.
- Start with the installation of wood strapping along the perimeter of space. Install intermediate strapping every 25-1/2" (648mm) to allow 2' (610mm) wide sheets of rigid to be installed in between. Alternate the installation of insulation boards and the strapping for best fit. Use self-tapping concrete screws or nails to secure strapping to concrete slab.
- Thickness of strapping should match to that of the insulation boards to eliminate cutting the strapping to size.
- Install SilveRboard/Envirosheet between the strapping tightly butting the edges.
- It is recommended to mark the center line of the strapping on the walls to be used a reference during the subfloor securement to the wood strapping.
- Select appropriate thickness of subfloor sheathing to span the wood strapping to eliminate as much flex in the floor as possible.
- Use adhesive along with screws at 8" (203mm) o.c. to secure the subfloor to strapping. Stagger joints for best results.
- Once the subfloor is secured, standard finish installation procedure follows.

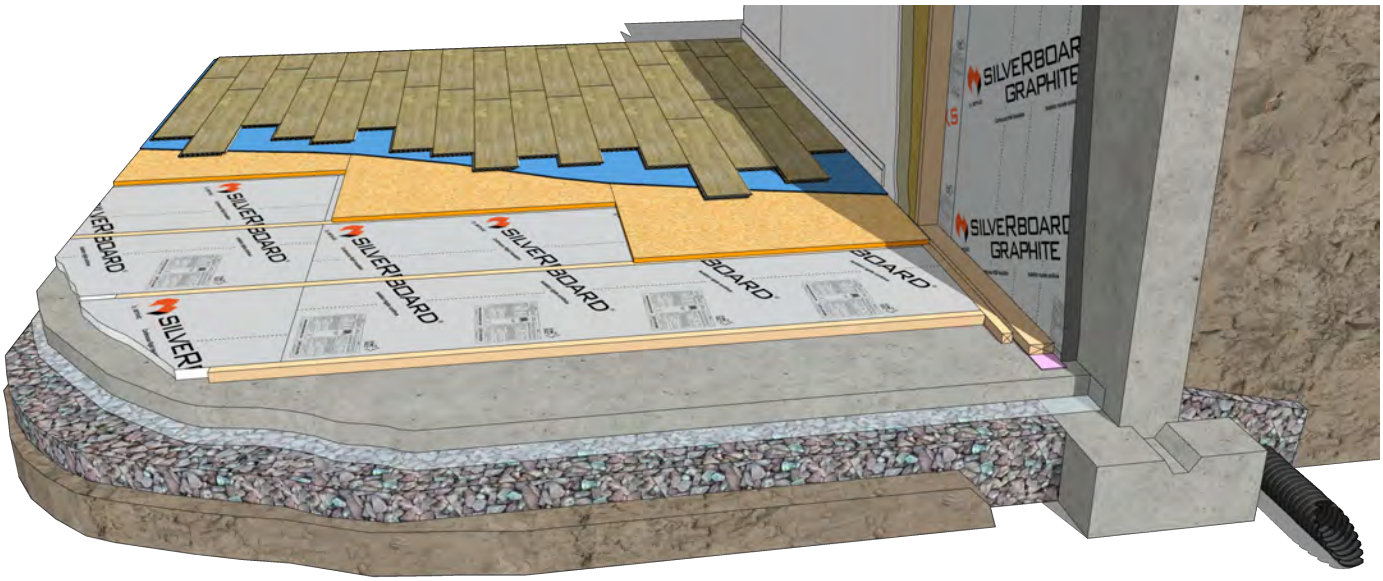


Figure 3 – 1-1/2" (38mm) high density SilveRboard inlaid between 2x2 wood strapping with subfloor above

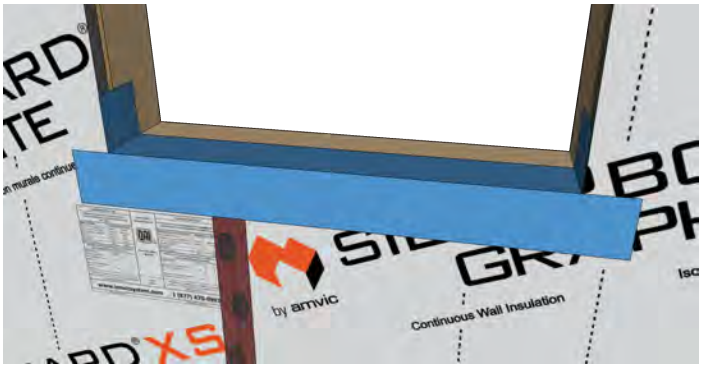
Openings in SilveRboard follow a similar methodology throughout most applications with emphasis on creating a water tight seal, with provisions to drain water away if needed while maintaining the continuity of the thermal, air and vapor planes. Depending on the thickness of the continuous insulation, the installation for some components could be vastly different (e.g. windows) or exactly the same (e.g. pipes). For applications which were not covered by this guide, contact Amvic's technical services department for assistance.

Flanged Window

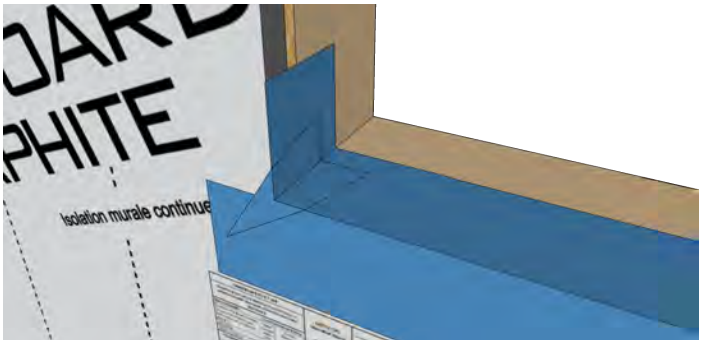
The following steps illustrate one type of installation for flanged window with siding. Variations to these steps exist and could be fully acceptable, refer to window manufacturer or window installation standards (CSA 440A) for more information.

1. Once the rough opening is cut to size, make sure it is level and plumb. Check that opening is square by measuring the diagonals.
- A wood back-dam (not shown) or a sloped sill plate should be used to facilitate water drainage.
- Prime the sill area and allow to dry.
- For thicker thicknesses of rigid foam and larger windows, the window might need to be furred out with wood blocking to provide adequate support.

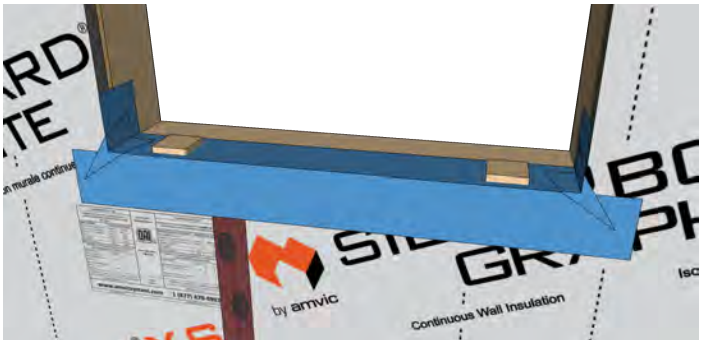
2. Use a self adhering flashing membrane to field fabricate a sill pan.
- Create end dam terminations by extending the self adhering flashing membrane up the vertical surface of the jambs a minimum of 6" (152mm).
- Finish the self adhering flashing membrane a minimum of 2" (51mm) into the cavity opening.
- Flashing membrane should extend a minimum of 4" (102mm) onto the face of the wall below the opening.



3. Install self adhering flashing membrane patches/ gussets at lower corners.
- Triangular patch rough dimensions are 2x3" (51x76mm).
- Bow tie patch rough dimensions are 3x3" (76x76mm)



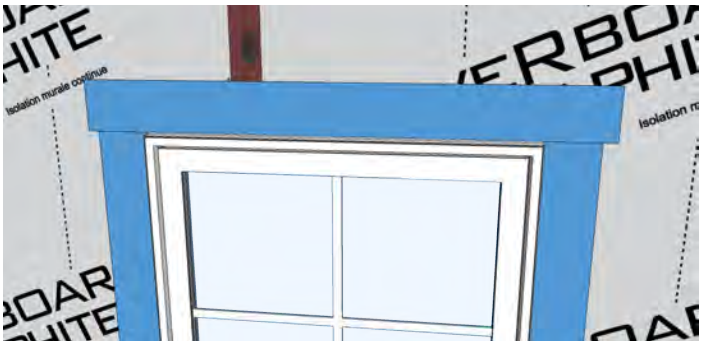
4. Apply sealant to secure wood blocking in place.
- A gap of 1/4-5/8” (6-16mm) on all four sides is required.
- Apply sealant around the perimeter of opening with notches/breaks under the sill to allow for drainage.



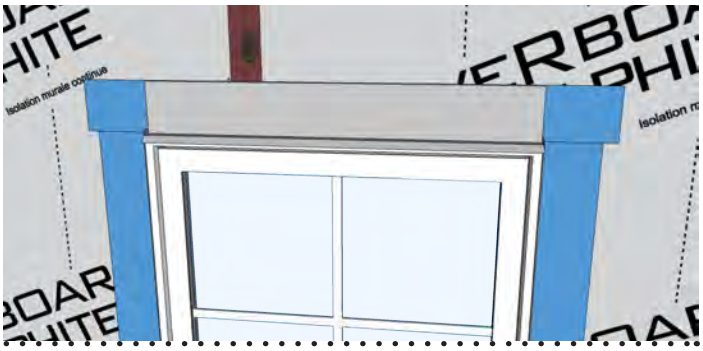
5. Install the window as per manufacturer’s specifications.
- Use galvanized roofing nails or truss screws.
- Do not fasten 3-8” (76-203mm) from corners.
- Fasten in center of every other slot (4-8” (102-203mm) spacing).
- Do not dent the nailing fin.
- Fastener heads should be flush.

6. Apply self adhering flashing membrane along the sides of the window.
- Extend membrane a minimum of 2” (51mm) above the edge of the nail fin/flange.
- Provide a minimum 2” (51mm) overlap over the sill flashing.

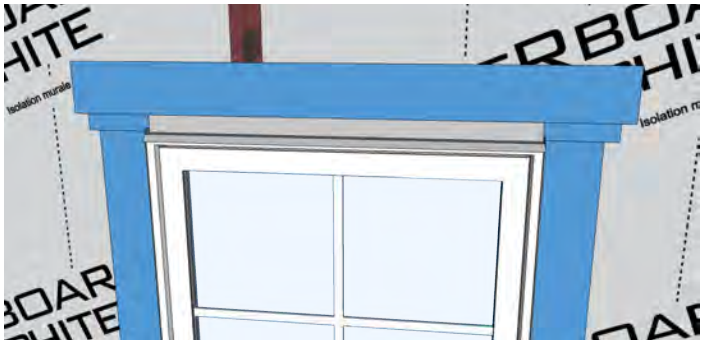
7. Apply self adhering flashing membrane along the top of the window overlapping the side strips by at least 2” (51mm).
- A J-roller can be used to make sure membrane strips are properly adhered by removing gaps and bubbles.
- Remove and replace parts that damaged as necessary.



8. Install preformed metal flashing at the head of the window.
- Apply sealant between the window and the underside of the metal flashing.



9. Seal the leading edge of the preformed metal flashing with self adhering flashing membrane.
- Provide a minimum of 2” (51mm) overlap with the metal flashing and the substrate.
- Flashing membrane should be installed in shingled-styled lapping.

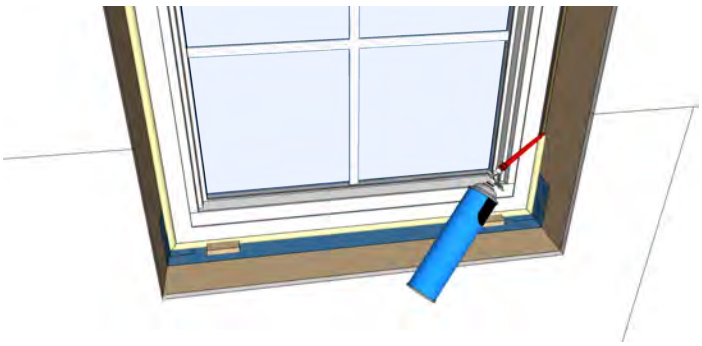


10. Install strapping for siding.
- Provide bugs screens at the top and bottom of the strapping.

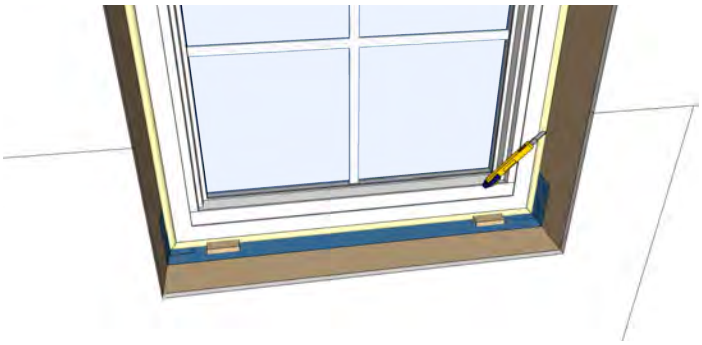
11. Install window trim boards.
- Apply sealant around the perimeter of the window between the frame and the trim boards.
- Nail the trim boards together either during or after installation.

12. Install siding.

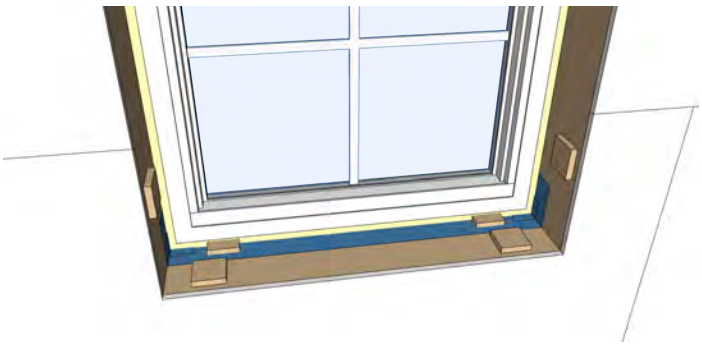
13. Apply low expansion spray foam insulation in cavity between the window and the rough opening.
- It is recommended to apply the foam between 40-100°F (4.4-37.8°C) for best results.



14. Let the spray foam fully cure and trim it using a sharp knife to be flush with the window frame.



15. Install wood blocking/shims around the perimeter to the rough opening.



16. Install jamb extensions, securing them through the wood blocking to the rough opening.

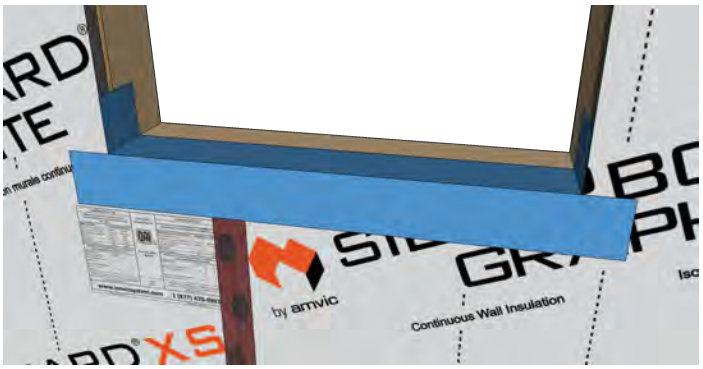
17. Install window casing/trim.

Non-flanged Window

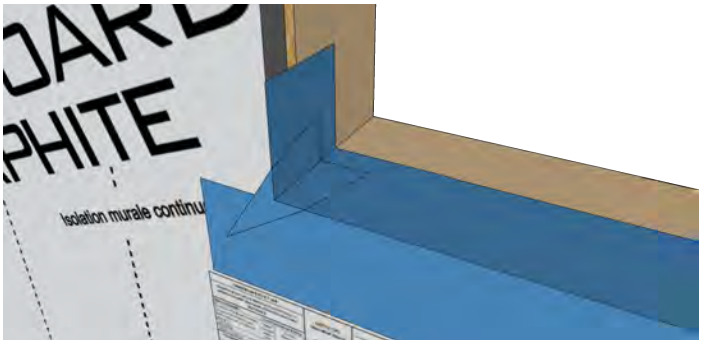
The following steps illustrate a typical installation for non-flanged window with siding. Variations to these steps exist and could be fully acceptable, refer to window manufacturer or window installation standards (CSA 440A) for more information.

1. Once the rough opening is cut to size, make sure it is level and plumb. Check that opening is square by measuring the diagonals.
- A wood back-dam (not shown) or a sloped sill plate should be used to facilitate water drainage.
- Prime the sill area and allow to dry.

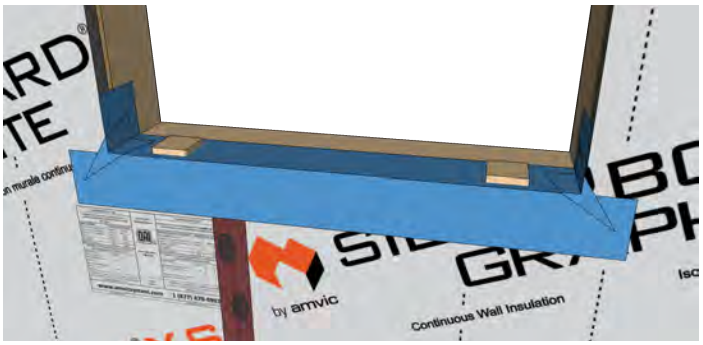
2. Use a self adhering flashing membrane to field fabricate a sill pan.
- Create end dam terminations by extending the self adhering flashing membrane up the vertical surface of the jambs a minimum of 6” (152mm).
- Finish the self adhering flashing membrane a minimum of 2” (51mm) into the cavity opening.
- Flashing membrane should extend a minimum of 4” (102mm) onto the face of the wall below the opening.



3. Install self adhering flashing membrane patches/ gussets at lower corners.
- Triangular patch rough dimensions are 2x3” (51x76mm).
- Bow tie patch rough dimensions are 3x3” (76x76mm).



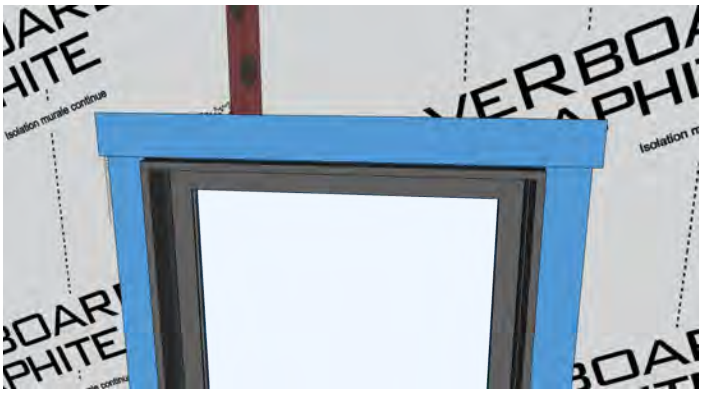
4. Apply sealant to secure wood blocking in place.
- A gap of 1/4-5/8” (6-16mm) on all four sides is required.



5. Install the window as per manufacturer's specifications.
- Boxed style window will fasten directly into rough opening through the frame or with metal clips/ plates.
- Depending on the window frame type and depth of window installation, exterior jamb extensions might be required.

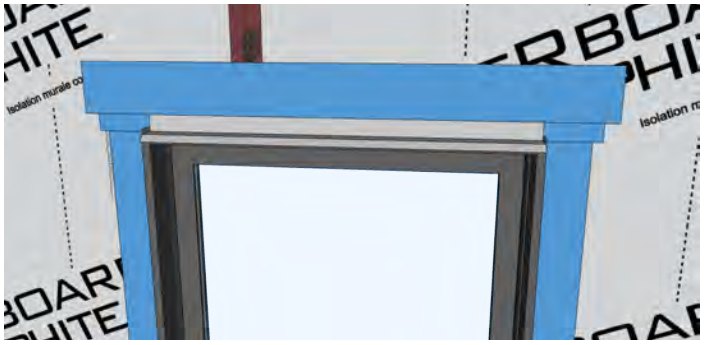
6. Apply self adhering flashing membrane along the sides of the window.
- Use pre-folded/bent tape or fold the tape on site. Flashing membrane/tape should adhere a minimum of 5/8" (16mm) onto the window frame, spanning over the gap, with the rest of the tape width adhering to the substrate surface.
- Sufficient pressure must be used to ensure proper adhesion to both surfaces.
- Extend membrane a minimum of 2" (51mm) above the edge of window frame.
- Provide a minimum 2" (51mm) overlap over the sill flashing.

7. Apply self adhering flashing membrane along the top of the window.
- Overlap the side strips by at least 2" (51mm).
- Use pre-folded/bent tape or fold the tape on site. Flashing membrane/tape should adhere a minimum of 5/8" (16mm) onto the window frame, spanning over the gap, with the rest of the tape width adhering to the substrate surface.
- Sufficient pressure must be used to ensure proper adhesion to both surfaces.
- Ensure corners are properly sealed.



8. Install preformed metal flashing at the head of the window.
- Apply sealant between the window and the underside of the metal flashing.

9. Seal the leading edge of the preformed metal flashing with self adhering flashing membrane/ tape.
- Provide a minimum of 2” (51mm) overlap with the metal flashing and the substrate.
- Flashing membrane should be installed in shingled-styled lapping.

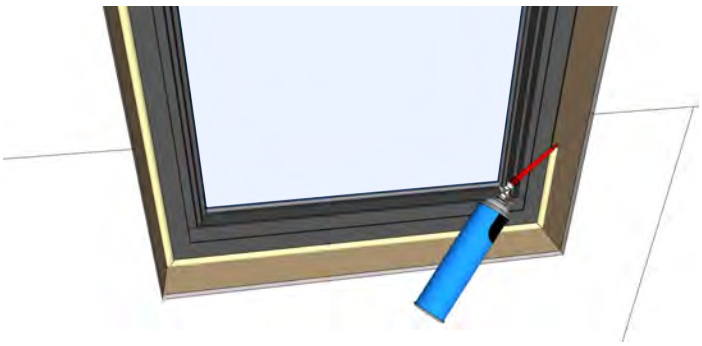


10. Install strapping for siding.
- Provide bugs screens at the top and bottom of the strapping.

11. Install window trim boards.
- Apply sealant around the perimeter of the window between the frame and the trim boards.
- Nail the trim boards together either during or after installation.

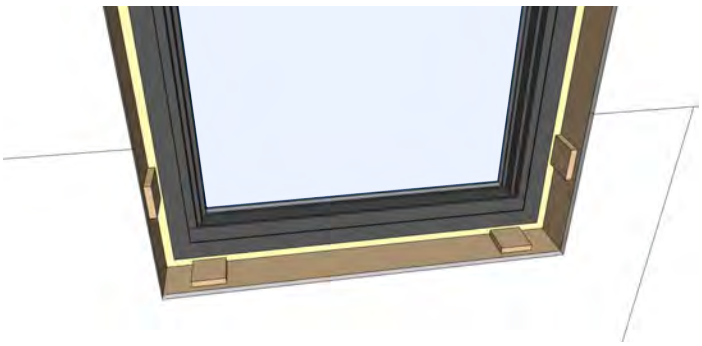
12. Install siding.

13. Apply low expansion spray foam insulation in cavity between the window and the rough opening.
- It is recommended to apply the foam between 40-100°F (4.4-37.8°C) for best results.



14. Let the spray foam fully cure and trim it using a sharp knife to be flush with the window frame.

15. Install wood blocking/shims around the perimeter to the rough opening.



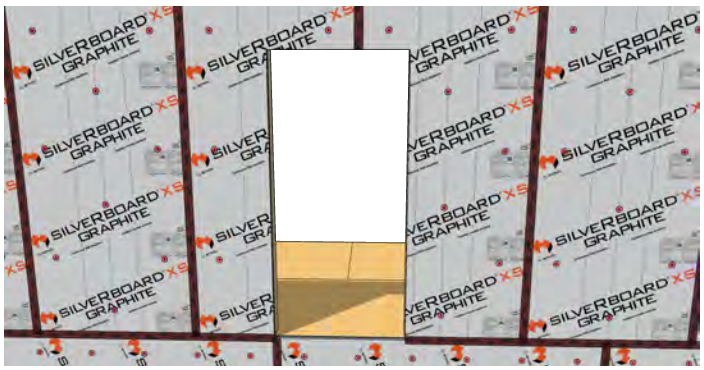
16. Install jamb extensions, securing them through the wood blocking to the rough opening.

17. Install window casing/trim.

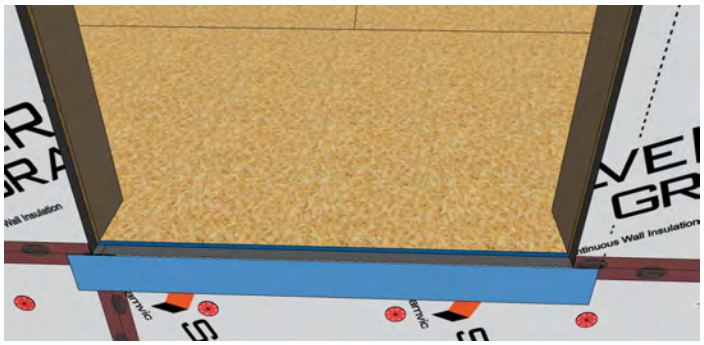
Swing Door

The following steps illustrate a typical installation for an exterior swing door with siding. Variations to these steps exist and could be fully acceptable, refer to window & door manufacturer or door installation standards (CSA) for more information.

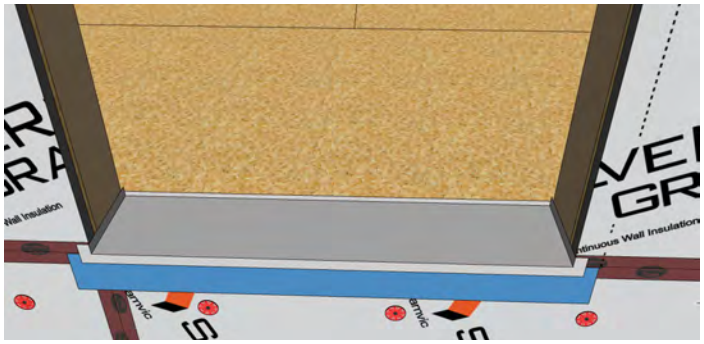
1. Once the rough opening is cut to size, make sure it is level and plumb. Check that opening is square by measuring the diagonals.



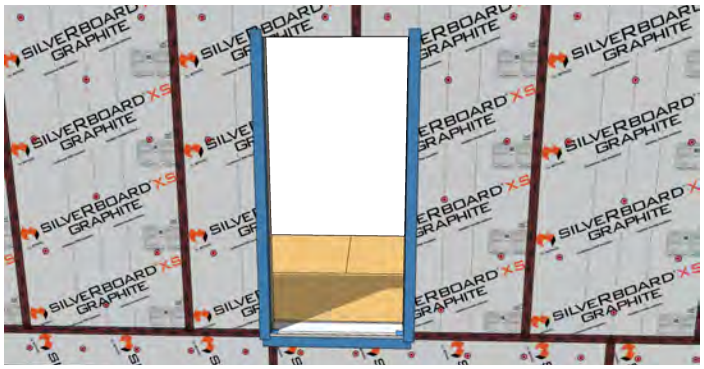
2. Apply self adhering flashing membrane along the bottom of the opening.
   - Extend membrane a minimum of 4” (102mm) on the face of the insulation.



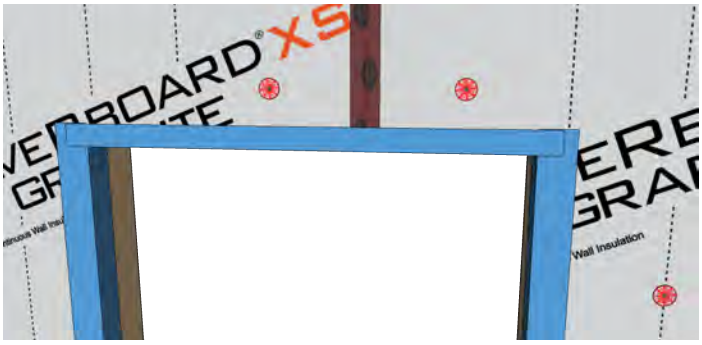
3. Install and seal pan flashing along the bottom of the opening.



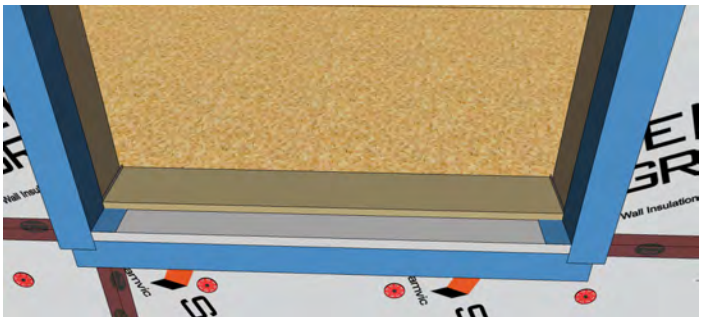
4. Apply self adhering flashing membrane along the sides of the opening.
   - Extend membrane a minimum of 4” (102mm) on the face of the insulation and door opening jambs.
   - Provide a minimum of 1” (51mm) overlap over the pan flashing.



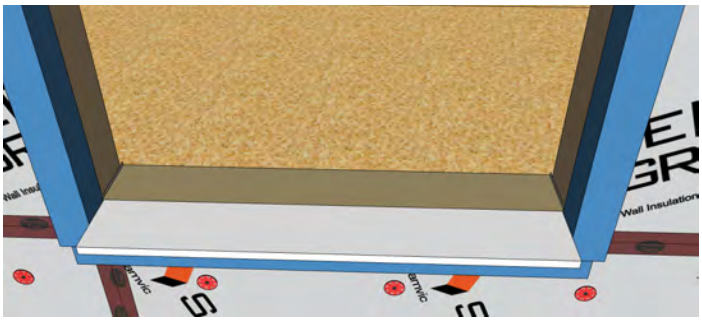
5. Apply self adhering flashing membrane along the top of the window opening.
- Extend membrane a minimum of 4” (102mm) on the face of the insulation and window opening jambs.
- Provide a minimum 2” (51mm) overlap over the jamb flashing.



6. Install pressure treated subsill.
- Apply sealant to secure subsill to pan flashing.



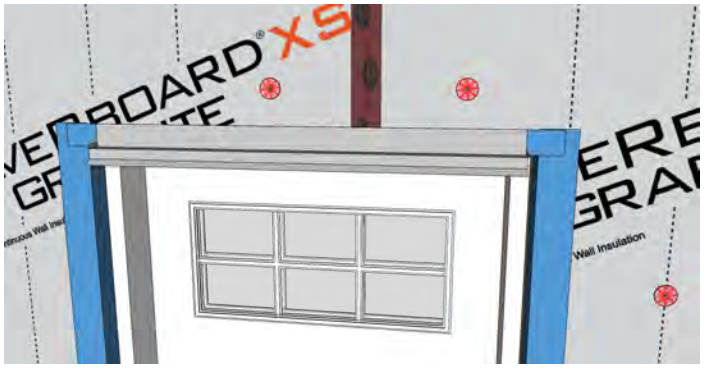
7. Install pre-finished sill extension.
- Provide a minimum slope of 2% for drainage.



8. Install the door as per manufacturer’s specifications.
- Apply two sets of sealant beads to the threshold.

9. Install sealant and backer rod around the exterior perimeter of the door frame.

10. Install preformed metal flashing at the head of the window.



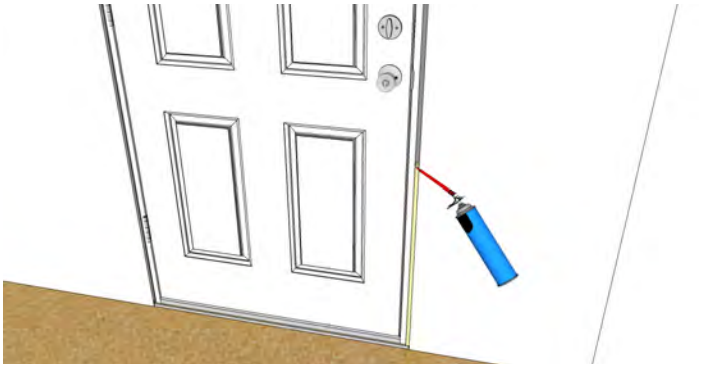
11. Apply self adhering flashing membrane to seal the leading of the metal flashing.
- Provide a minimum of 2” (51mm) overlap with the metal flashing and the substrate.

12. Install strapping for siding.
- Provide bug screens at the top and bottom of the strapping.

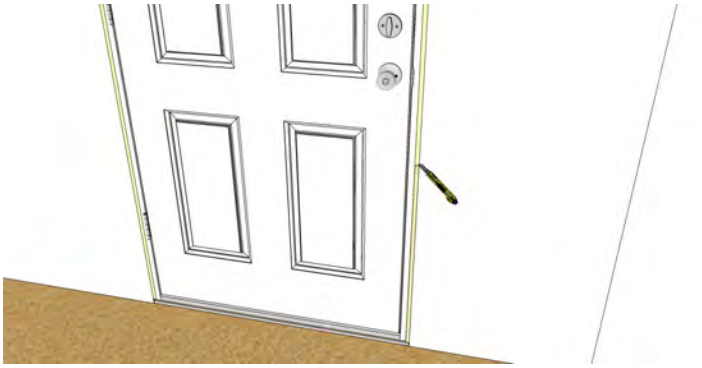
13. Install door trim boards and returns.
- Nail the trim boards together either during or after installation.
- Apply sealant between door frame, trim boards and sill extension.

14. Install exterior siding.

15. Apply low expansion spray foam insulation in cavity between the window and the rough opening.
- It is recommended to apply the foam between 40-100°F (4.4-37.8°C) for best results, see manufacturer requirements.



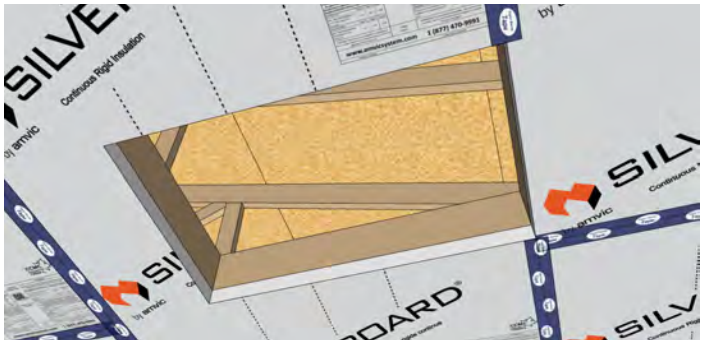
16. Let the spray foam fully cure and trim it using a sharp knife to be flush with the window frame.



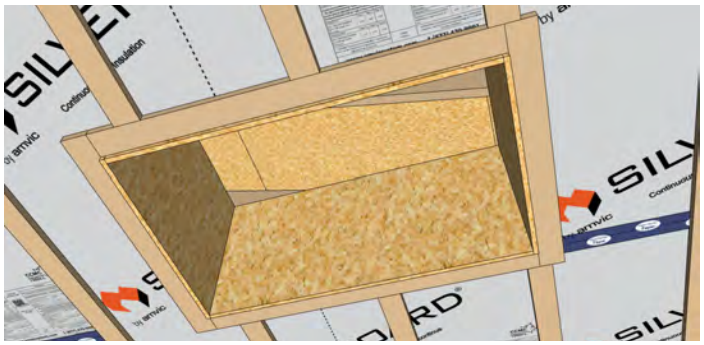
17. Install door casing/trim.

Attic Access Hatch

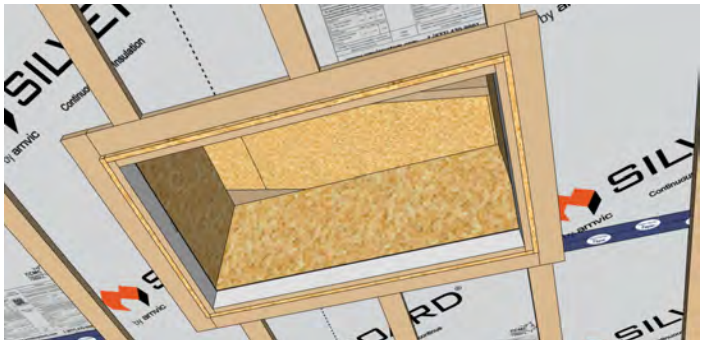
1. Install wood blocking between the joists. Cut the SilveRboard to be flush with the opening. Tape using sheathing tape over all the seams to ensure vapor barrier continuity. If using Envirosheet, install a vapor barrier membrane directly under the foam boards.



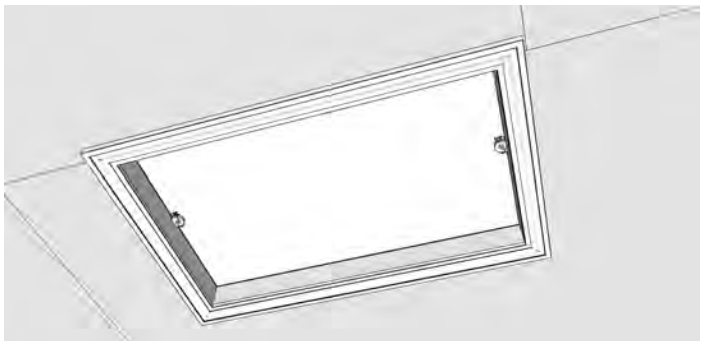
2. Install furring strips for the entire ceiling area as well as around the opening. Install OSB along the sides to the height of the roof insulation in order to prevent it from interfering with hatch opening/closing operation. Apply sealant along the perimeter of the rough opening and the OSB sides to eliminate potential paths for air leakage.



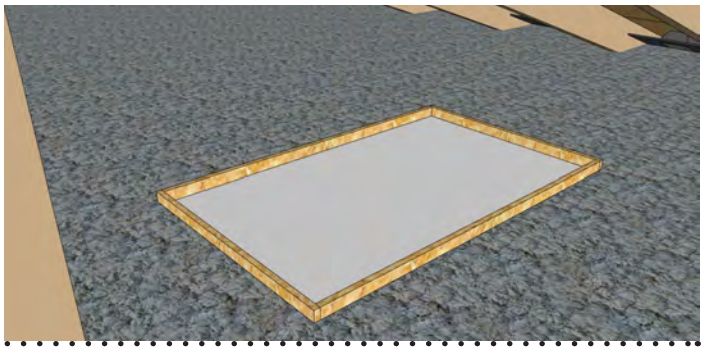
3. Install wood stops to for the hatch to rest on. Add a narrow border of adhesive-backed foam weather stripping around the perimeter on top of the stops to maintain air barrier continuity.



4. Attach gypsum board to the furring strips through the ceiling area. Install casing/trim pieces around the perimeter. Make sure sash locks are in place to engage cover to compress weather stripping.



5. Place the removable hatch cover before adding attic insulation. Hatch cover consists of a piece of plywood (finished on underside) attached to insulation boards cut, glued to the required thickness to achieve similar R-value as the rest of the roof assembly insulation.



Penetrations

1. Install duct/pipe/vent into appropriately sized penetration in the sheathing and sheathing membrane. Provide additional blocking/support on the interior side of the wall as needed to secure it place.

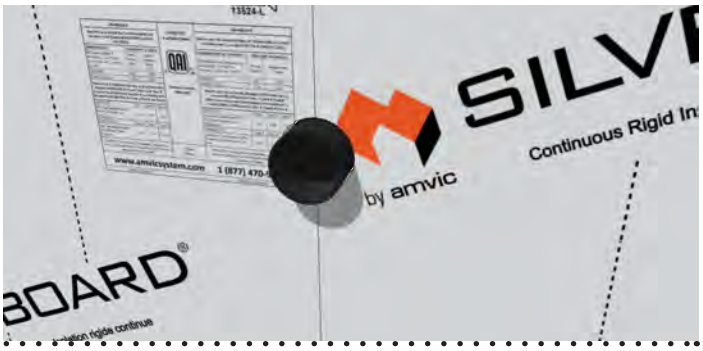
2. Install the lower horseshoe-shaped self adhering membrane below the duct/pipe/vent.

* If a WRB is not present in the wall assembly, apply all steps to the outer surface of the SilveRboard film.

3. Install the upper horseshoe-shaped self adhering membrane above the duct/pipe/vent. Taper the top edge of membrane to facilitate water drainage. Seal the top leading edge with mastic or another compatible sealant/method.

4. Apply a bead of sealant between the duct/pipe/vent and the self adhering membrane to maintain air barrier continuity.

5. Cut the SilveRboard (or Envirosheet) boards using a utility knife to fit snuggly around the duct/pipe/vent. When installing siding, additional strapping might be needed to provide support for adapter flanges, covers, etc.



Repairs

When SilveRboard or Envirosheet are installed without the use of a weather barrier behind them. It is important to seal various holes and gaps in order to maintain the continuity of the water shedding surface acting as the second plane of protection in a cavity wall. For damages that do not compromise the integrity of the board, the following methodologies can be used for repair.

1. Broken pieces can be reattached to the board by using sheathing tape from both sides to secure the broken piece in place. Alternatively, spray foam adhesive can also be used to glue back the broken piece (applicable for SilveRboard and Envirosheet).

2. For cracks and tears in the film (applicable to SilveRboard only) use sheathing tape to patch and reinforce the affected area. Use vapor barrier tape if SilveRboard is used as a vapor barrier.

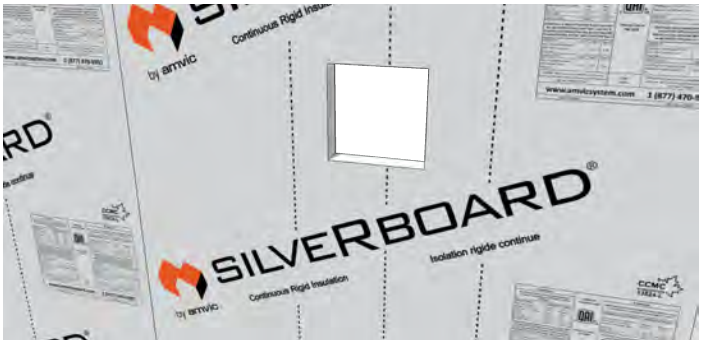
3. Small holes can be filled with sealant. Sealant must be compatible with polystyrene foam.

4. Medium sized holes can be filled with spray foam insulation. Once the foam is cured, cut excess and tape over area with sheathing tape (taping applicable only to SilveRboard).

1. For larger holes it may be necessary to replace the entire board. If that is not the case, the following steps outline the repair procedure.

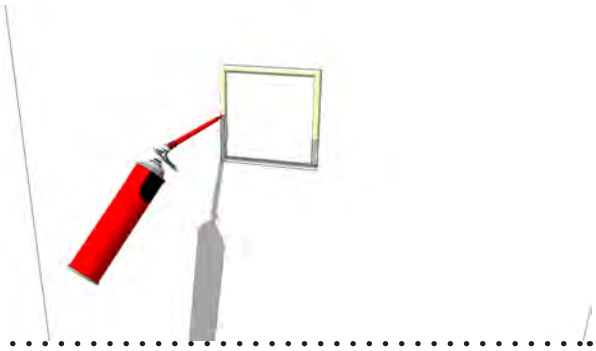
2. Cut out a rectangular replacement piece from a scrap board which is larger than the hole.

3. Use the replacement piece to outline and cut out the damaged area.



4. Place the replacement piece inside the opening. Using shingle method, tape over the joints with sheathing tape (both sides if possible).

5. For Envirosheet, cut out a rectangular replacement piece from a scrap board which is larger than the hole. The edges be beveled towards the outside. Use the replacement piece to outline and cut out the damaged area. Use spray foam insulation around the perimeter. Trim flush excess foam after it is cured and dry.



SilveRboard and Envirosheet product lines are high quality, rigid insulation boards designed for both residential and commercial applications. Envirosheet is a cost effective rigid insulation board while SilveRboard is a high performance board suitable for both above and below grade installation. Competitive pricing, extensive product distribution and excellent technical support are combined to provide our clients with a simplified approach to a superior finished product. If any of your questions or concerns are not completely addressed in this manual, please contact us and our staff will be happy to answer your questions. At Amvic, we pride ourselves in offering our customers an exceptional level of customer service.

Disclaimer

Information contained in this document is provided as a guideline only, without any warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, and freedom of infringement.

This document provides a basic guide for installation of Amvic's rigid insulation boards, (SilveRboard/Envirosheet) and is intended to supplement, rather than replace, the basic construction knowledge of a construction professional. All installations of SilveRboard/ Envirosheet must be in accordance with all applicable building codes and/or under the guidance of a licensed professional engineer. In all cases, applicable building code regulations take precedence over this manual.

Technical Support

Please contact us for any inquiries pertaining to information included in this guide, or if you require any other technical assistance.

Phone 1 (877) 470-9991 (toll free)

Email technical@amvicsystem.com

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