


Foam Laminates of Vermont

Installation Guide for Timber Framed Homes



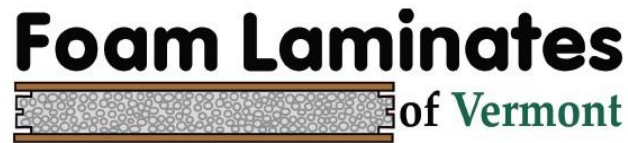
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Introduction

Foam Laminates of Vermont has been manufacturing SIPs for over 30 years. The building industry has changed dramatically over the years. We are building more complicated structures, on an accelerated schedule, in all seasons and weather, with a greater variety of materials and a greater number of contractors. Add into the mix an intense focus on energy efficiency and even the best of new building systems will require a thoughtful application and installation.

This manual gives you the information you need to match the quality of the installation to the quality of the system. Our SIP systems are energy efficient, engineered for strength, with designer flexibility, and lasting excellence.

We believe the way to build high-performance buildings that are safe, comfortable, durable and efficient- is to manage the flow of air and moisture in, around and through the building. Correct installation and a properly sized and installed HRV system will achieve this.

Following the steps in this manual will help to assure a high-performance home to enjoy for years to come.

Panel Delivery

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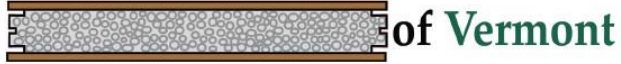
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Our SIPs are generally delivered by tractor trailer truck. The panels are stacked on a flatbed trailer with tarps over them. Typically, the panels are unloaded with a machine with forks or a crane at the owner's expense. We bring a crane and a material handler when we install your panels. The truck driver allows for 2 hours unloading. Anything after 2 hours is billed at \$90 per hour.

This truck is 70 feet long, so site access is important. If you know this truck will not fit in your site, you will need to make special arrangements ahead of time. Sometimes we can deliver with a smaller truck. Most times homeowners find a different spot to unload and the SIPs are shuttled to the job site.

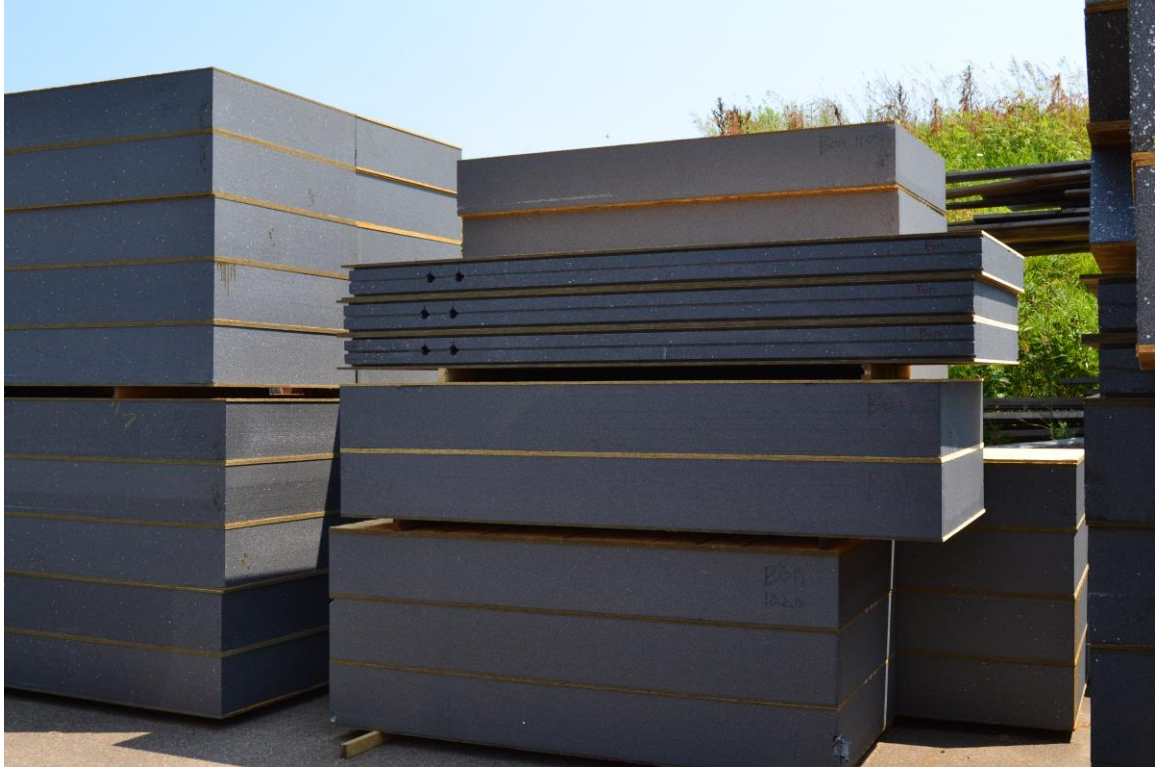


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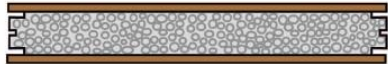


Panel Storage

It is important that your SIPs stay dry when they are stored on site. We recommend that SIPs be stacked at least 3” off the ground. OSB can swell when it gets wet. This can make installation more difficult at times. Make sure your splines, spray foam, fasteners, and tools are in a dry place as well.



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SIP Tools

All Structural Insulated Panel quotes from Foam Laminates of Vermont include tools to help ease SIP installation. These are the tools we provide:

Panel Saw

Our panel saw is an attachment made by Prazi USA. It is essentially a chain saw bar and a gear box that mounts to a circular saw. This kit fits 7-1/4" circular saws manufactured by Skil, Bosch, Dewalt, Craftsman, Black & Decker, Rigid, Milwaukee, Porter Cable, Hitachi, and Makita. (Excluding Front Plate Adjustable Saws)

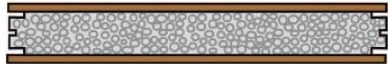
We can also get a kit for worm drive saws. Please tell us when making your order if you want the worm drive kit.

This kit is used to cut your SIPs. This will be used to cut panels to length and width. It will also be used to cut window and door openings.

If you elected to purchase a full pre-cut from Foam Laminates of Vermont this tool won't be necessary.



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Hot Knife

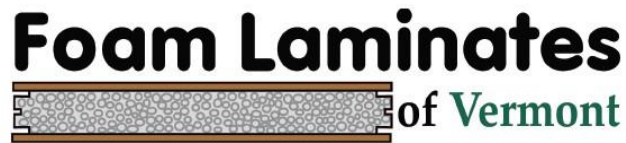
The hot knife is a hot iron used to recess foam for 2x lumber. This tool has an adjustable bar for depth. Caution should be used with this tool. It gets very hot.



Foam Gun

The foam gun is to be used in conjunction with the cans of spray foam that we send with your SIPs. It is very important to foam all your panel joints after all the SIPs are installed. Always leave a can of foam on the foam gun! If you remove the can and leave the gun the foam inside will harden which will ruin the gun.





Applying SIPs to a timber framed home

Getting Started

The first step of panel installation is to check the timber frame to make sure it is true. If not, plumb it up and secure with 2x bracing. Once the frame is square, we recommend installing the tongue and groove boards over the rafters. We typically rip the edge of the first board, so it is flush with the timber frame. Start from the bottom and work your way up the frame to the peak.

After boards are installed, we recommend applying a synthetic underlayment like Rooftop Guard II or Grace Triflex. This will not only protect your boards during the installation process but will also act as a vapor retarder when your house is completed. Run the paper approx. 6" beyond the boards so it will cover the top of your wall panels. This will keep the water out of the wall panels if it rains while installing panels. After the boards are papered you can start working on wall panel installation. This is a good time to have your electrician scheduled to run any wiring in the ceiling for interior lighting.

Interior wall finish

FLV recommends the use of Structural panels (OSB skin-foam core-OSB skin). We recommend applying your wall finish once your structure is closed in. This prevents moisture damage sometimes caused by the weather.

Generally, if you would like to use 1/2" drywall for your wall finish you might pad your timber frame with 5/8" padding before installing the panels this will allow a gap between the panel and the timber frame. This allows the drywall to slide behind the timber frame for a nice clean look.

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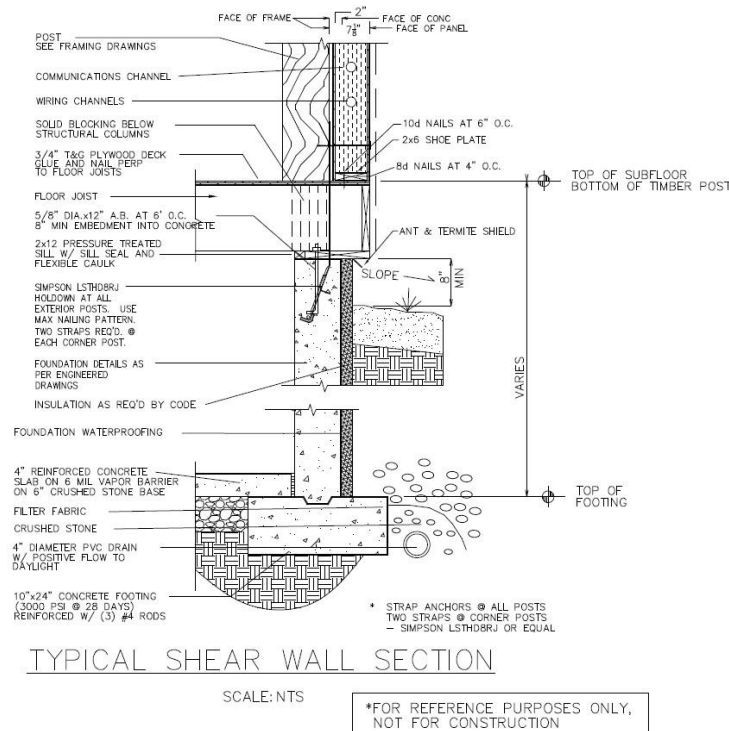
Typical First Floor Deck

Our typical foundation detail shows the foundation 2" larger on all sides of the structure. This will allow 2" of bearing for the SIPs. Typically, the first-floor deck is the same dimension as the timber frame and SIPs combine.

The 2"x12" pressure treated sill plate for a standard 6 1/2" wall panel with 5/8" padding applied to the outside of the timber frame should extend 7-1/8" beyond your timber frame. Adjustments will need to be made for different thickness wall panel or finish. For this standard detail a 2"x6" KD plate should then be applied for the panel to lock over this plate. 2x6 plates are typically fastened with galvanized ring shank nails or screws. **A termite shield may be applied between the concrete and the pressure treated plate.** Nails are typically faster with modern pneumatic nail guns.

Once all your plates are sealed and fastened you can move on to installing your first-floor wall SIPs.

All plates are glued, and foam sealed.



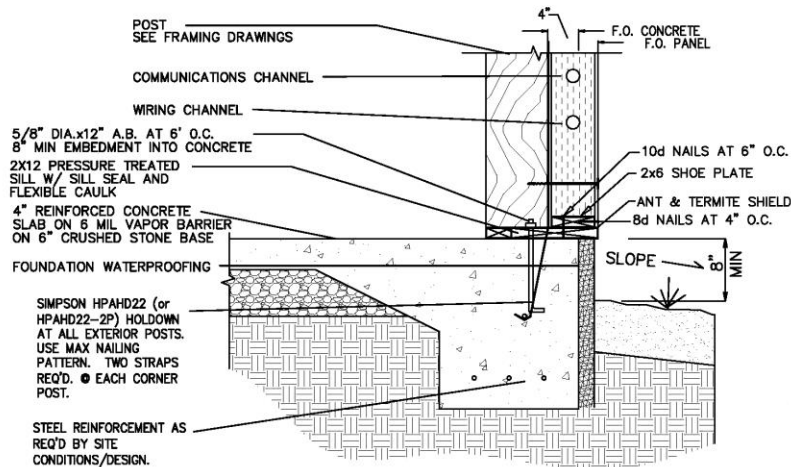
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Slab Detail

There are several different ways to apply SIPS to a slab. We like to see a pressure treated plate under the SIP. The detail keeps the bottom of the panel elevated and away from moisture. This plate needs to be the same width as your wall panels. Typically, a 2x8 is ripped to 6-1/2" for a standard wall panel, 7" if field applying drywall. This sill plate will be bolted to your slab or curb. Make sure sill seal is used between plates and the concrete. Apply termite shield if needed.

Add another layer of sill seal to the 2x PT plate. Apply a 2x6 plate in the center of the PT sill plate. This will act as your shoe plate for your wall SIPS. See the detail below for illustration.



FLOATING SLAB DETAIL

SCALE: NTS

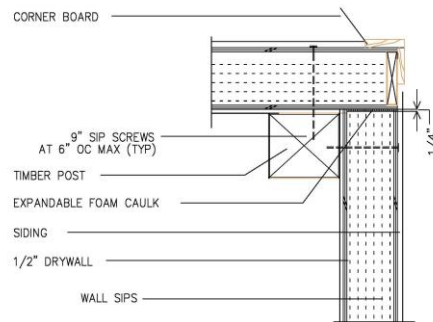
THE PURPOSE OF THIS DETAIL IS TO ILLUSTRATE THE CONNECTION BETWEEN THE FRAME, PANELS AND FOUNDATION. THE DESIGN FOR THE FLOATING SLAB SYSTEM BY OTHERS.

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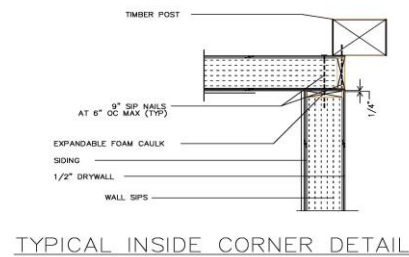
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Corner Installation

A SIP corner is made by running one panel by the other. (See Detail 1) This is important to remember when laying plates. You need to have a 1/2" gap between plates at all corners. This allows the inside skin of OSB to slide between the plates. If field applying sheetrock be sure to stop sheet rock on the post. Follow the fastening schedule on panel plan.



TYPICAL CORNER DETAIL



TYPICAL INSIDE CORNER DETAIL

We recommend starting wall panel installation on a corner to make sure the corner is square and plumb before fastening the panels to the timber frame post. This will help to stabilize the frame so you can take bracing material off the frame as you work your way down the wall.

The next step is to install more wall panels. Typically, panels are stood up next to one another. 3" OSB splines are dropped into the spline channels from the top. Splines are fastened with 8d Galv. Ring shank nails after the window and door openings are cut.

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First Floor Wall SIPs

The first step is to apply triple expanding spray foam on top of the 2x6 plate. This will need to be done right before applying each SIP. Concussion collapses this spray foam so caution must be taken when applying SIPs. Typically, all your first floor SIPs will be recessed on the bottom to accept a plate. Bottom and tops of panels always break on a beam. After setting panel, secure according to fastening detail.

If possible, we usually try to use one panel to run from the sill plate to the bottom of the roof SIPs at the eaves. Gable ends generally break 3" down from the top of the second-floor plate. This will allow the second-floor wire channels to be at the appropriate height. See the panel plan for details.



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Second Floor Walls

Second floor wall panels will start on a beam and extend to the bottom of the roof panel. Make sure to leave a 1/2" to 3/4" gap between all wall SIPS and the roof line. This gap will be used to make a tight air seal between the wall and roof with spray foam.



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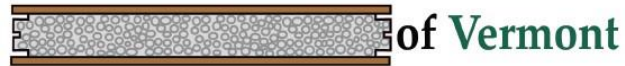
Openings

Window and door openings that require a header should be laid out on the plates. Panel joints usually land on the edge of these openings so 2x lumber can be added to support headers. Headers should be pre-built and ready for installation. Each panel joint will have 2 studs on each side of the header. One will extend from the bottom plate to the first timber frame beam. The other will extend from the bottom plate to the bottom of the header. You will need to frame these openings as the panels are installed. A panel will be provided to slide over the header. This panel will be run horizontally.

Openings without headers will be cut out of the SIPs after they are installed. This will be done with the Prazi saw and your hot knife. These openings can be laid out on the inside of the panel to the appropriate RO of the window or door.

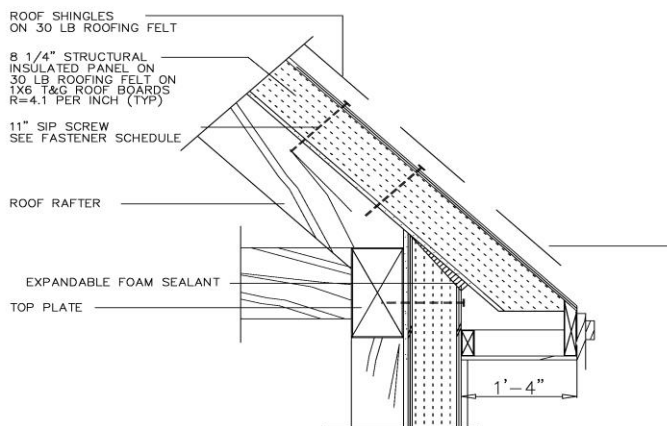
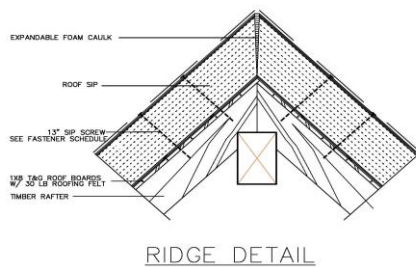


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Roof Panels

Roof panels typically start from the eave and work up towards the ridge. Be sure to check overhang dimensions and details. Panel ends must break on supporting rafters or purlins. Our SIPs drawings will usually show a measurement from the heel of the rafter to your first panel joint. Use this measurement to screw a 2x4 to the roof. You will use the 2x to pull the roof panel into the correct location. See diagram below.




After your eave panels are installed, you can remove the 2x4 block. Slide your roof panels into place and add supplied spline if called for. Leave approx. 3/8" gap at all butt joints as well as the ridge for spray foaming.

When applying panels over T&G boarding panels are sometimes spaced 3/8" at all ends for a better foam seal.

Follow all fastening schedules supplied with plans.

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After Installation

Once wall and roof SIPs are installed you can move on to finishing SIP related items. These items include, cutting window and door openings, installing 2x in openings and corners, nailing off splines, wiring, foaming, and wrapping your SIPs with 30# felt.

Roof Foaming


All the SIP joints in your roof should be foamed immediately after installation. Roof splines should be nailed off before foaming starts.

We like to use a drill and fill method. Wrap tape around a 3/8" drill bit to set your depth to the foam channel in the center of the panel. Start at the ridge drilling holes every 8"-10" in all the panel seams. Once all the holes are drilled you can start foaming. Start at the ridge and work your way down. Spend 3-4 seconds per hole foaming. You should start to see foam creeping into the next hole.

FLV recommends foaming in temperatures above 40-degree Fahrenheit. Spray foam expands much better in these temperature ranges which will provide a better seal. If foaming must be done in colder temperatures, you will need to water mist the foam which will help expansion. We have other air sealing options available.



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Window Cut outs

Any window cut outs that were not framed during wall panel installation should be cut at this time. This will be done with the Prazi saw and your hot knife. These openings can be laid out on the inside for the panel. Lines should be chalked to represent the edges of the opening.

After the opening is cut you will use the hot knife in your kit to rout the edges to accept a 2x6. Once all foam is routed you can install the window lumber. Apply a bead of foam to all 2x6 lumber before installation. Tap the lumber into place lightly so you don't collapse the foam. Lumber should be fastened through the OSB skin with 8d galv. Ring shank nails.

Wall Foaming

Do not foam your walls until all wiring is done, window cut outs are finished, and splines are nailed off. Wall foaming should be done before windows and doors are installed. This will ensure that you do not get spray foam on your windows and doors.

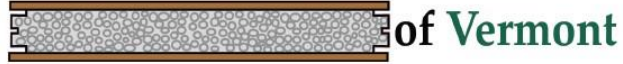
Wall foaming is done much like the roof. You need to drill holes in all panel seams 8"-10' apart. Make sure you chalk lines where all electrical chases are located so you do not drill into the wiring. Once all holes are drilled you can start foaming. We recommend starting at the bottom of each seam and working towards the top. 3-4 seconds for each hole should suffice.

FLV recommends foaming in temperatures above 40-degree Fahrenheit. Spray foam expands much better in these temperature ranges which will provide a better seal. If foaming must be done in colder temperatures, you will need to water mist the foam which will help expansion. Other sealing options are available.

SIP Covering

We recommend 30# felt because it works great for protecting your SIPs. Builders have been using this for years. Often siding is removed 10-15 years down the road for additions and the OSB still looks brand new. Some of the more popular house wraps cannot make this claim. Asphalt felt has a permeance rating of only 5 perms when dry, but a much higher rating of 60 perms when wet. The felt can soak up water that gets behind it and gradually dry to the exterior. Plastic house wraps are non-absorbent. Any water trapped behind them can only pass through to the exterior as vapor. We do not recommend using synthetic products over our SIPs.

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Vented or “Cold” Roof

A vented roof system is achieved by running strapping over the top of the roof SIPs and adding an extra layer of sheathing. Vents will be added at the ridge and eave. This assembly provides air movement over the top of the panels, which promotes drying if moisture develops at the surface of the roof.

Many shingle manufacturers will not warranty their products over an unvented (hot) roof. Always check with your shingle manufacturer if you plan on applying asphalt shingles without a vented roof system.

Metal roofing is commonly used over roof SIPs. This can be applied directly to the SIP with 30# felt or over a vented roof assembly. We do not recommend an air space between the metal roof and the sheathing. This can cause condensation under the metal which may cause rusting.

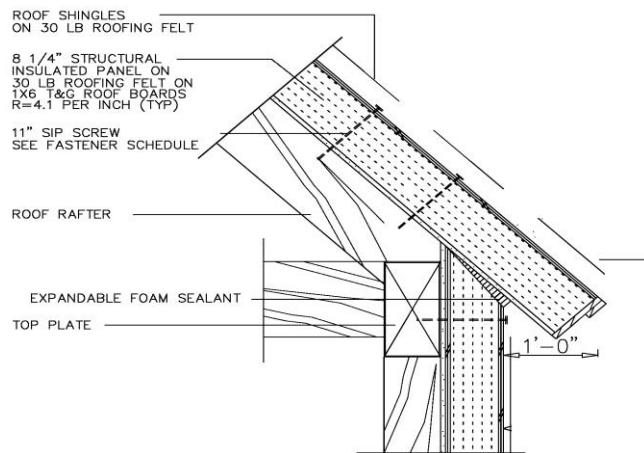


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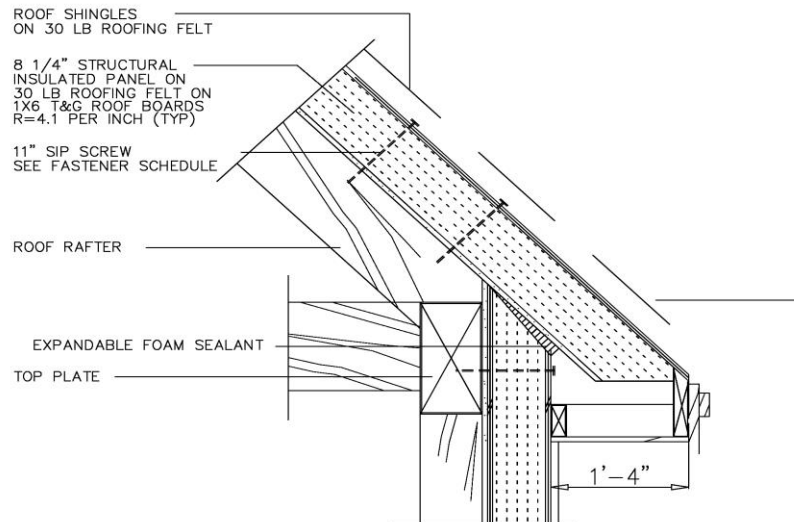
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Sub Fascia


Sub Fascia should be installed along the roof before roofing is applied. If you went with a square detail this will be as simple as routing out the edges of the panels with your hot knife and adding 2x lumber to the edges. The 2x lumber should be fastened to the OSB skins using 8d galv ring shank nails.



If you went with a flat soffit detail you will need to build ladders on the ground and put them into place.



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Home Slicker®:

Home Slicker® is a product that creates an air space between your siding and your felt paper/SIP. This product will ensure that the SIP and your siding will dry out if water gets behind the siding. This product is not needed for Vinyl siding. The air space created by this product will reduce the forces that draw water into your siding assembly. Water that does migrate into this area will drain away from the wall and allow the cavity to dry quickly.



Siding Options

Shiplap: We recommend adding furring strips to your SIPs for shiplap siding. This will increase the fasteners holding power. We recommend ring shank nails for application. Adding furring strips negates the need for Home Slicker because this will create an air space behind the siding.

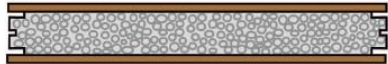
Vinyl Siding: Home Slicker is not needed for this product but can still be used for added ventilation. Vinyl is applied with roofing nails. See manufacturers' recommendation for fastening intervals.

Hardie Plank®: Hardie Plank is a very popular siding choice by many of our customers. We recommend installing this product over Home Slicker®. Please see the following link for fastening requirements.

<http://www.jameshardie.com/pdf/technical-bulletins/12-installation-over-sips.pdf>

Clapboards/Shakes: We recommend installing these products over Home Slicker®. Typical installation is done with galvanized ring shank nails.

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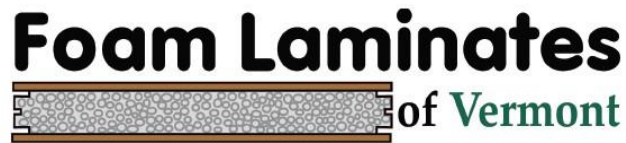
The logo for Foam Laminates of Vermont features a horizontal rectangular bar with a brown border. Inside the bar is a pattern of small, light-colored circles on a darker background. The text "Foam Laminates" is positioned above the bar, and "of Vermont" is positioned to the right of the bar.

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In summary, your SIP installation should be done in the following order:

1. Check frame, straight & plumb
2. Install T&G and vapor retarder
3. apply 2x plates to sills
4. Install field applied drywall
5. install wall SIPs
6. Install roof SIPs
7. Foam Roof
8. Apply 30# felt to roof panels
9. Cut window and door openings
10. Run Electrical
11. Nail off splines
12. Foam Walls, eaves, corners, gables, etc.
13. Install Sub-Fascia
14. Install windows and doors
15. Add 30# felt to wall panels
16. Apply Home Slicker for drain plane
17. Apply siding

If you have taken the steps in this manual during your SIP installation you will have a high-performance wall and roof system that will be reliable for years to come. If you have any questions about your SIP installation, please do not hesitate to contact Foam Laminates of Vermont.



Wall and Roof Foaming


Roof Foaming

- Drill holes every 8"-10" at your panel joints from the outside of the building. Attach a piece of tape to the drill bit to set the proper depth to reach the foam channel.
- Start foaming from the top and work your way down. 2-3 seconds per hole usually works or until you can see foam at the next hole.
- If it is 40 degrees or less outside, we recommend water misting the foam as it is applied. This will help the foam expand properly.

Wall Foaming

- Wall foaming should not be done until all electrical work is complete. All window and door cut out should be done with inlays applied. Windows and doors should be installed after foaming is complete.
- Chalk lines on the outside of the building where the electrical chases are. This is done so that you do not drill into the wiring.
- Drill holes every 8"-10" at your panel joints from the outside of the building. Attach a piece of tape to the drill bit to set the proper depth to reach the foam channel.
- Start foaming from the top and work your way down. 2-3 seconds per hole usually works or until you can see foam at the next hole.
- If it is 40 degrees or less outside, we recommend water misting the foam as it is applied. This will help the foam expand properly.

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ELECTRICAL HINTS:

- Use a remodeler's box that clamps the wire securely to the box and has flanges so that the box can be fastened to the panel skin.
- Do NOT cut long grooves in the panel skins. (If necessary, use a 24" drill to go from one 4" access hole to another access hole)
- Use interior stud walls whenever possible. Rather than trying to bend around a 90 degree turn into the SIP, drill a long diagonal hole from the stud through the wall panel and into the horizontal chases. Wires will slide much easier through this configuration.
- Push all wires through a chase at the same time. With Electrician's pliers, fold and crimp the longest wire back on itself about 1". Use electrical tape and cover that end. Stagger the ends of any additional wires and tape over these. Keep all wires flat when taping together.
- You can gain access to wire chase intersections by using a 4" hole saw. Use a flat blade screwdriver to pry out the plug. Keep the plug to re-install later. After all wires are pulled, spray foam the hole and replace the plug.
- Try to locate all switch boxes next to a door opening. You can create a groove in the side of the opening by running your hot knife up the side of the opening. You can then drill a hole to get to the switch box.
- There are several videos available on YouTube that go into more detail about wiring. You can gain access to these videos by searching "SIP Wiring".