



A BETTER WAY TO BUILD

Assembly Guide



ARTspan

The logo features the word "ARTspan" in a bold, sans-serif font. The "ART" is in blue and the "span" is in grey. Above the text is a blue graphic element resembling a roofline or a stylized arch. Below the text is a solid blue horizontal bar.

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PORTIONS OF THIS PRODUCT
MAY BE COVERED BY ONE OR
MORE U.S. OR CANADIAN
PATENTS AND/OR PENDING
PATENT APPLICATIONS.

1. INTRODUCTION

The purpose of this manual is to complement the drawings and to guide the builder in the proper method of assembly in order to erect a high quality, durable building. Where discrepancies may arise between this guide and the drawing package, the drawings shall govern. Artspan will not be physically involved in the assembly of the building but we will answer any questions regarding assembly procedures. This is a general guide only and does not constitute liability on Artspan's part regarding assembly safety procedures or assembly workmanship. These guidelines will work in general practice but unique conditions will require the builder to adjust the procedure to fit the individual circumstance.

Please study the drawings and assembly guide thoroughly before beginning the assembly process to avoid costly errors and delays.

2. GENERAL NOTES

2.1 Customer Responsibilities

It is the customer's responsibility to ensure plans and products meet local building codes and to obtain necessary approvals and permits before assembly or relocation of the building.

The customer is responsible for overall project coordination.

Please make the necessary arrangements in advance to have the building supplies unloaded upon arrival. A Forklift, Crane or similar equipment will be required. Some panel bundle weights may exceed 6,000 lbs.

Artspan recommends the customer procure liability insurance to ensure against any loss or damage during the assembly process.

2.2 Contractor/Builder Responsibilities

The Builder shall be responsible for obtaining all necessary approvals and permits.

Artspan Inc. assembly methods, quality standards and tolerances shall govern the entire assembly process.

2.3 Misfits and Repairs

Misfits must be reported immediately to Artspan Inc. by the customer. An Artspan representative will determine the course of action to be followed to correct the misfit.

Written approval from Artspan Inc. must be obtained before making changes to the building. Unapproved changes may result in an unsafe building.

2.4 Building Specifications

Artspan buildings are designed and built according to the drawings approved by the customer. Any alterations should be approved by a professional engineer.

The fastener spacings and details listed in this manual are standard guidelines only - please refer to the connection detail in your drawing package or stamped structural drawings.

2.5 Safety

For the safety of all involved in the assembly of the building, we recommend the contractor/builder familiarize themselves with local health and safety regulations and enforce the applicable laws during the entire assembly process.

Exercise extreme caution when walking on the roof; avoid walking on the roof if there is any moisture, snow, frost or dust on the roof as these elements will make the panel extremely slippery. Remove any oil residue from panels.

3. BUILDING SITE PREPARATION AND FOUNDATION

The customer is responsible for having the building site prepared according to local codes prior to assembly of the building.

Note: It is very important that the foundation is solid and perfectly level. When assembling on a steel frame, ensure that the frame remains level in every way by checking it periodically throughout the entire assembly process and shimming it as needed.

4. UNLOADING/HANDLING MATERIALS

Please make the necessary arrangements in advance to have the building supplies unloaded upon arrival. A Forklift, Crane or similar equipment will be required. Some panel bundle weights may exceed 6,000 lbs.

4.1 Receiving and Inspecting Shipment

Please inspect shipments for visible damage before unloading and note any shortages or damage on the shipping documents. Notify Artspan immediately of any shortages or damage. Do not install damaged or substandard components, Artspan will not be liable for costs incurred due to installation or removal of these materials.

Watch for overhead power lines!

Elastomeric polyurethane sealant (Sika-Flex 1A) supplied in 590ml sausage style cartridge.
Sealant must be stored above 0°C, application temperature is 4° to 39°C (39°-102°F)

Use caution when unloading to avoid damaging surfaces, corners or edges, when using a forklift to unload spread the forks as far apart as possible to reduce the risk of bending the panels.

When lifting panels, no point of the panel should be more than 8 feet away from the nearest load bearing point. For example, a 32-foot panel could be lifted using two nylon straps with a 16-foot spreader bar, with the straps placed 8 feet from the end of the panel. For panels longer than 32 feet additional straps will be required as well as a longer spreader bar or multiple lifting devices.

Store panels with one end of the stack slightly higher than the other end to allow rain to run off. The panels should be supported every 8 feet on wooden blocks.



Careful planning of your material layout can reduce double handling and the potential for damage of the panels due to unnecessary handling. Please consult the assembly plan in your drawing package to help in determining the panel package layout.

Gable Wall Panels are stacked in order so that the first panel you will need will be on top, etc., therefore it is critical that the building is begun according to the assembly plan in the drawing package.

4.2 Panel Handling Tips

Avoid handling panels on a windy day as the panel can catch the wind and cut or crush anyone in its path.

Always wear protective gloves when handling panels, the edges may be sharp.

Be sure to have help when lifting panels as the panels weigh approximately 10 lbs. per lineal foot. A 50' roof panel can weigh up to 500 lbs.

Never slide panels as the sharp edges will scratch the surface underneath. Always lift the panel free when removing it from the stack.

Do not walk on panels while they are on the ground. Exercise extreme caution when walking on the roof; avoid walking on the roof if there is any moisture, snow, frost or dust on the roof as these elements will make the panel extremely slippery. Remove any oil residue from panels.

5. RECOMMENDED TOOLS

The following is a basic list of recommended tools for a standard, four person building installation. Additional tools may be required based on number of personnel involved and personal preference.

Lifting Equipment

4 able workers
Ladders and Manlift
4,000-6,000 lb. All-Terrain, Telescoping Forklift
1/2" diam. x 12' Choker or Nylon Straps

Hand Tools

Custom Panel Clamps (at least 2)
Trim Pry Bar
Small Carpenter's Square
Tamping Block – 4" X 4" X 36"
Carpenter Hammer
Sledge Hammer
4' Level
25' Measuring Tape
100' Measuring Tape
Chalk Line
Felt Marker
100' Construction String Line

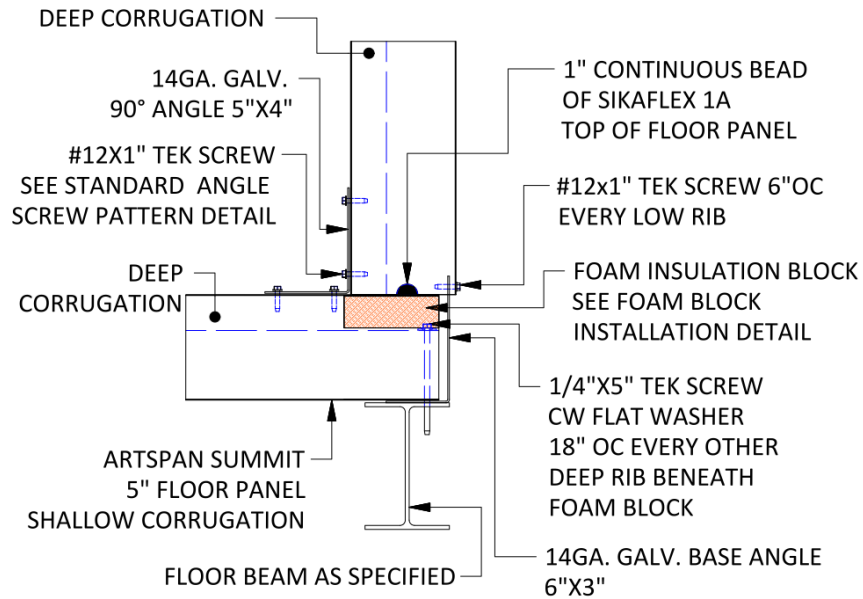


Custom Panel Clamp

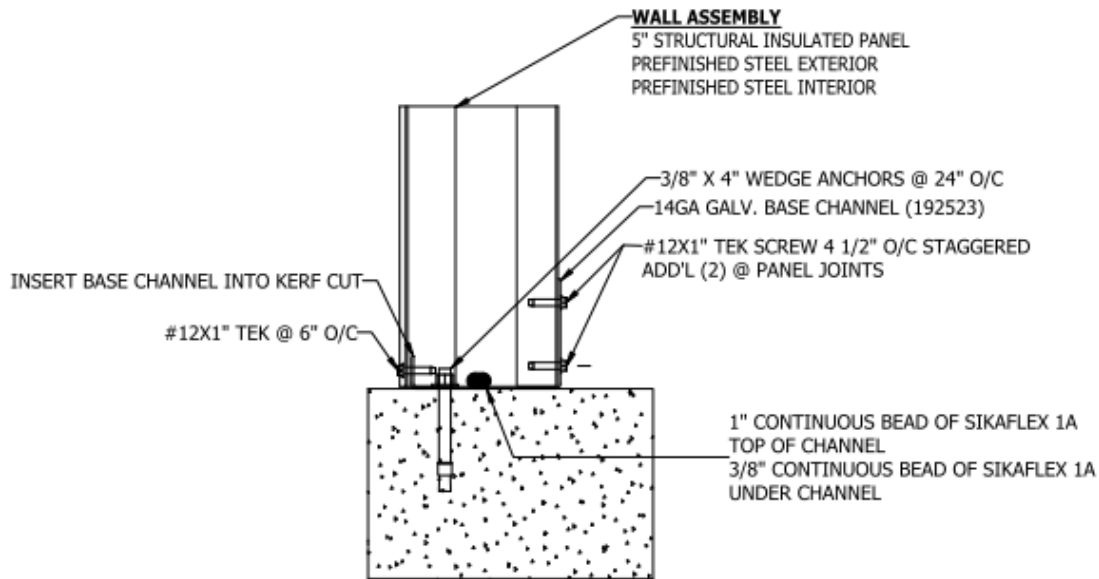
Circular Saw with metal cutting blade
Sabre Saw
Angle Grinder with cutting disc
Electric or Manual Caulking Gun for Sika-Flex 600ml/ 20oz. sausage style cartridges
Foam Gun
Air Compressor with blower nozzle
3/8" Electric Drill
#2 Square Driver Bit
Phillips Driver Bit
Magnetized Screw Gun Sockets - 5/16" and 3/8"
Drill Bit - 1/4" X 7"
Utility Knife
Caulking Gun
Tool Belt w/ Bolt Bag
Protective Eyewear, Face Shield, Hearing Protection & Work Gloves
OSHA Approved Hard Hat
Shims for window and door installation
2x4 or 2x6 material for wall bracing and temporary roof support wall

Safety Precaution: Make certain that the correct tool is utilized for each phase of assembly. Improper tool usage may result in injury.

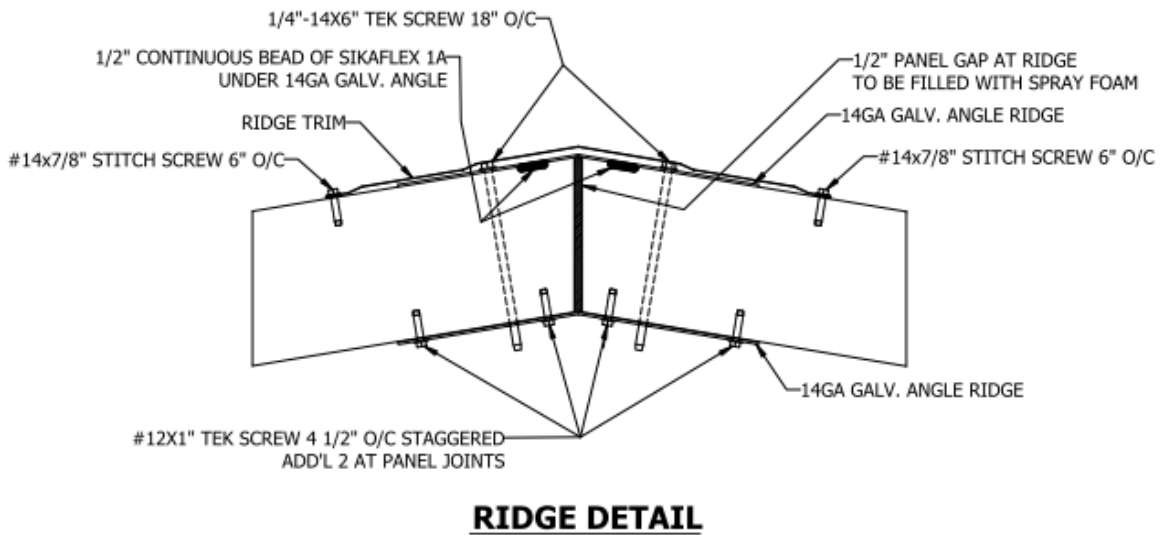
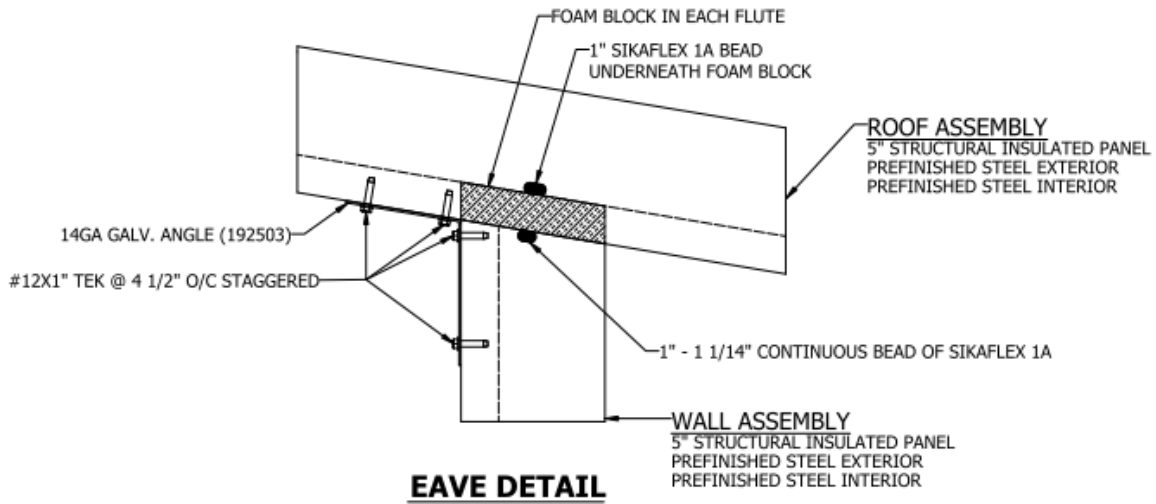
6. STANDARD CONNECTION DETAILS

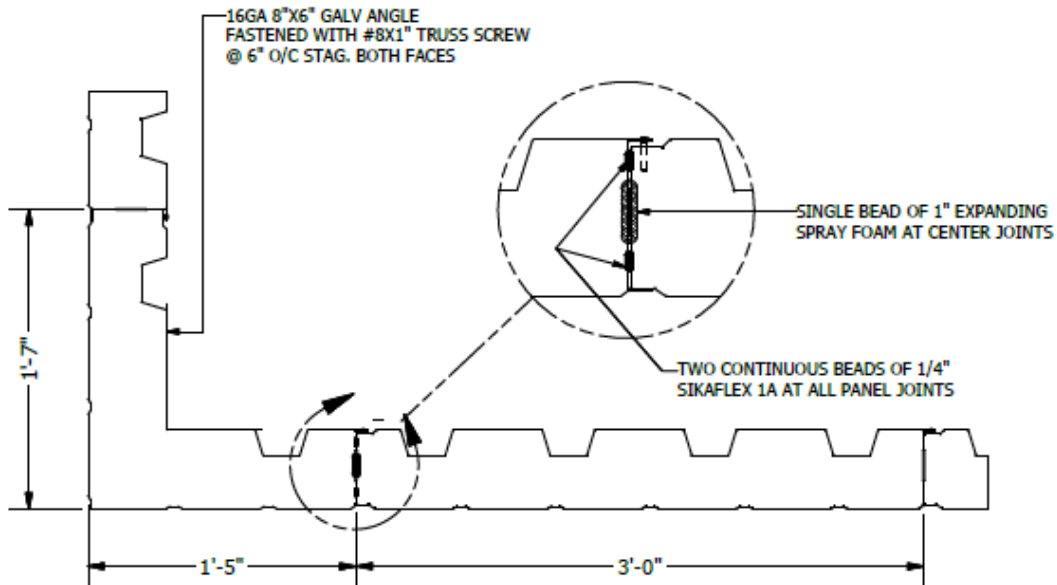


BASE ANGLE DETAIL

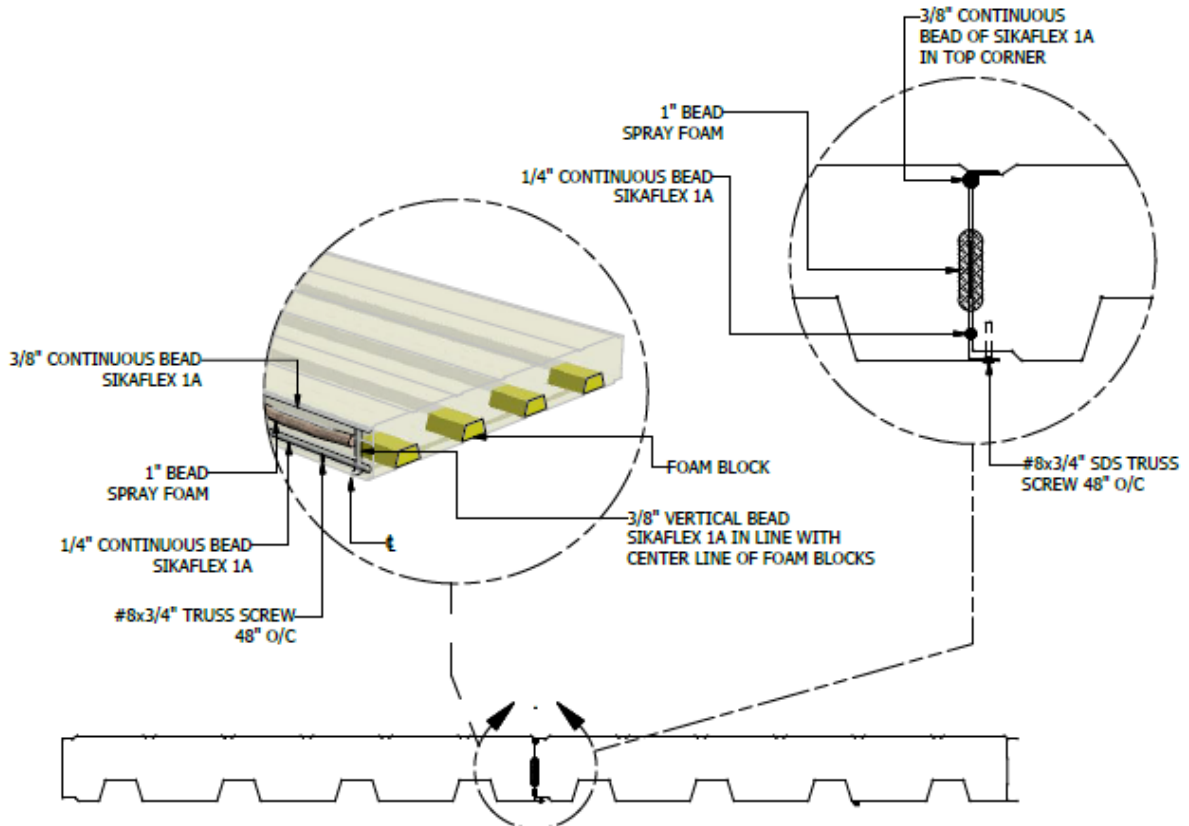


CONCRETE BASE DETAIL





WALL PANEL DETAIL



ROOF PANEL DETAIL

7. INSTALLING BASE ANGLES

7.1 Installing Base Angles when using an Artspan Floor System

7.1.1 ***This step is absolutely critical!*** Ensure that the metal base frame is in the desired location and is perfectly level and square. The frame must be checked periodically throughout the entire assembly process to ensure that it remains level. Make adjustments as needed.

7.1.2 Please refer to the “Plan View” in your drawing package to determine the outside dimensions of the building. To create the perimeter of the “BASE ANGLE” (Part # 192504) on top of the base frame, first calculate your corner measurements to make the most efficient use of material. The material comes in 10-foot lengths and the corner should not be formed closer than 2’6” to the end of the base angle.

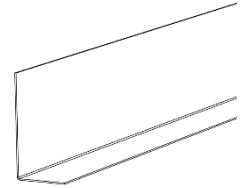


Figure 1: (Part # 192504)

Calculation Example: *If the outside dimensions of the building are 24’ wide by 45’ long, we can center three 10-foot lengths on the “length” sides and be left with 7’6” on each end. We would then bend two pieces at 7’6” from one end and two pieces at 7’6” from the opposite end to make our four corners. This would give us 2’6” of base angle at each corner on the “width” sides, leaving 19’ between the corners, so we would have one full piece and then cut one piece down to 9’ for each end of the building.*

7.1.3 To make the corners, use a square and felt marker to draw a line across the inside face of the base angle at the desired distance from the end. Then draw 2 lines at 45° from the mark across the 3” face so that you have a 90° angle drawn centered on the line. Then, with a cutting wheel on your angle grinder, cut this triangle out of the 3” face. Next, lightly score the 6” face along the mark made earlier (*Caution: do not cut more than half way through the metal when scoring as the metal tends to break when it is bent if the score is too deep*). Now bend the base angle to form a 90° corner as shown in figure 2.



Figure 2: Mitered and Formed Corner

7.1.4 Place one of these corners on the frame corner ensuring that the outside face of the base angle is flush with the outside edge of the frame. Hold it in place with two Pancake Head 1” screws on each side of the angle (*see figure 12 on the following page for screw type*). Place the screws approximately ½” from the inside edge of the base angle, taking precautions to avoid screwing into the webbing of the I-beam frame.

7.1.5 Place the two adjacent corners on the frame, measuring the length and width of the building by hooking your measuring tape over the top edge of the fastened corner and measuring to the outside top edge of the loose corners. Attach each of these corners to the frame with two screws, then place the last corner (*diagonally across from the first corner*), measuring from the previous two corners to determine the placement. Before fastening this corner with screws, check to ensure the corner layout is square by hooking your measuring tape over one corner and measuring the diagonal distance to the furthest corner, then repeat this step for the adjacent corner. Adjust the placement of the corners until these measurements are equal, keeping the width and length measurements accurate.

7.1.6 After you have ensured that the base angle is square and of proper width and length, screw all of the corners down with Pancake head 1" screws placed every 24". Place the straight base angles between the corners, cut as needed and fasten with Pancake head 1" screws every 24".

7.2 Installing Base Angles on Concrete or Wood Floors

7.2.1 Ensure that the concrete base is level, square and sized correctly for your building . Please refer to the "Plan View" in your drawing package to determine the outside dimensions of the building. Mark the outside corners of the building on the concrete base, ensuring proper measurements and squareness.

7.2.2 To create the perimeter of the "BASE CHANNEL" (Part # 192523) on top of the concrete base, first calculate your corner measurements to make the most efficient use of material. The material comes in 10-foot lengths and the corner should not be formed closer than 2'6" to the end of the base angle.

Calculation Example: *If the outside dimensions of the building are 24' wide by 45' long, we can center three 10-foot lengths on the "length" sides and be left with 7'6" on each end. We would then bend two pieces at 7'6" from one end and two pieces at 7'6" from the opposite end to make our four corners. This would give us 2'6" of base angle at each corner on the "width" sides, leaving 19' between the corners, so we would have one full piece and then cut one piece down to 9' for each end of the building.*

7.2.3 To make the corners, use a square and felt marker to draw a line across the outside faces of the base channel at the desired distance from the end. Then, starting at the outside bend, draw 2 lines at 45° from the mark across the bottom face (4 3/4") so that you have a 90° angle drawn centered on the line, continue these lines up the outside face of the inside flange (3 1/2") of the channel as shown in figure 4. Then, with a cutting wheel on your angle grinder, cut this shape out of the bottom and the inside flange. Next, lightly score the 1" flange along the inside face (*Caution: do not cut more than half way through the metal when scoring as the metal tends to break when it is bent if the score is too deep*). Now bend the base angle to form a 90° corner.



Figure 3: Concrete Base Channel Part # 192523



Figure 4: Marking the cut lines for making a corner

ATTENTION: If your order includes Base Flashing it must be installed BEFORE the wall panels are installed. To install the base flashing slip the open hem of the base flashing over the base channel or base angle outer lip. Then later, slip the kerf in the bottom of the wall panels over the flashing.



7.2.4 Lay a smooth, continuous, 3/8" bead of Sika-Flex sealant down on the concrete, approximately down the middle of the area where the channel will be installed. Place the base channel corners on the concrete base with the outside corners of the channels lined up with the marks you made earlier. A string line or laser may be used to ensure that the legs of each corner line up with the other corners. Now anchor the base channel corners to the concrete base.



Figure 5: An installed base channel

7.2.5 Please refer to your local building codes or stamped drawing details for anchor size and placement (**anchors not included unless specified otherwise**). Place the straight base channels between the corners, cut as needed and anchor.

8. INSTALLING FLOOR PANELS

It is critical that all surfaces that will contact the Sikaflex 1A bead or the Sikaboom bead be frost free, dust free, clean, dry and above 4°C during the assembly stage.

8.1 To begin laying the floor panels, first ensure that the panels are approximately 1/2" shorter than the width of the building. Lay the first panel inside the base angle with the embossed face down and the fluted face up (figure 8), the channel side (figure 7) against the base angle and the tenon side (figure 6) set to receive the channel side of the next panel.



Figure 6: Tenon Side



Figure 7: Channel Side

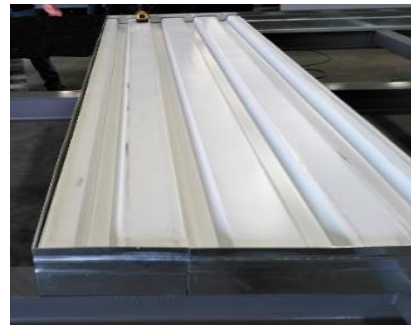


Figure 8: First panel laid inside the base angle frame

8.2 Set the next panel on its tenon side, blow off any debris that may be inside the channel side, lay a smooth, continuous bead of Sikaflex-1a at least 1/4" high and approximately 1/2" in away from the corner as shown in figure 11. Then lay a bead of Sika Boom Foam approximately 1" – 1 1/4" high down the middle of the channel side as shown in figure 12.

8.3 Lay the panel inside the base angle, flush one end with the end of the panel already in place, insert the panel's channel over the previous panel's tenon starting at one end (as shown in figure 13) and clamp the panels together as shown in figure 16.

Note: A Trim Pry Bar (figure 14) may be needed to help get the panel started as the channels are designed to fit snugly over the tenon.



Figure 10: Sika Boom Foam



Figure 11: Sikaflex Bead Size ¼"



Figure 12: Foam 1" Bead

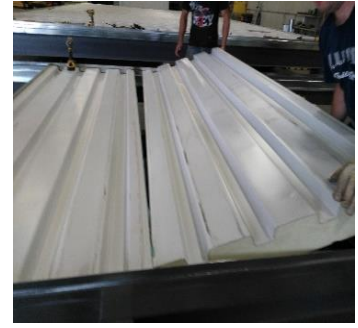


Figure 13: Laying Floor Panel



Figure 14: Trim Pry Bar used to help start inserting the tenon side into the channel side of the previous panel



Figure 15: Pancake Head 1" Self Drill Screw



Figure 16: Panel Clamp

8.4 Clamp placement should be 3" from the inside of the base angle. While ensuring that this end remains clamped tight, clamp the other end tight as well. Ideally there should be less than 1/8" of tenon flat area visible of the previous panel and it should be equal all along the entire panel. (When you have 3 or more panels down you can measure from the lip of the channel of one panel to the lip of the channel of the next panel, this measurement should be 36 1/16").

8.5 Screw the channel to the tenon of the previous panel by placing a Pancake Head 1" Self Drill Screw (figure 15) approximately ¼" in from the edge of the channel and ½" in from the end of the panel as shown in figure 17. Refer to the drawing package for additional screw spacing.



Figure 17: Pancake Head Screw Placement

- 8.6 Repeat steps 2.2 to 2.4 until you have 5 panels installed, then square this assembly of panels with the base angle. Once you are content that this portion is perfectly square, take four $\frac{3}{8}$ " flat washers, slip them over four Hex Washer Head $\frac{1}{4}$ "-14 x 5" Self Drill Screws as shown in figure 18. Place a screw $1\frac{1}{2}$ " in from the edge of the panel in the first flute and another in the third flute, to attach the panel to the I-Beam underneath as shown in figure 19. Repeat on the other end as well.



Figure 18: 5" Hex Screw with Washer

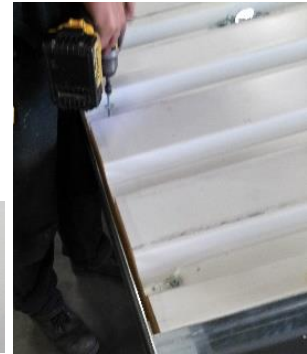


Figure 19: Hex Washer Head Screw Placement

Caution: Avoid screwing into the webbing of the I-Beam and use low speed and high pressure to reduce the risk of breaking the screws.

- 8.7 Repeat steps 2.2 to 2.4 until you reach the last floor panel.

- 8.8 Measure the space left between the tenon of the last installed panel and the inside of the base angle as shown in figure 20, add $\frac{1}{2}$ " to this measurement to calculate your last floor panel width. Hook your measuring tape over the channel side of the last panel and mark according to the measurement you calculated. Repeat this step for the other end as well, then snap a chalk line from one mark to the other. If your saw blade cannot penetrate the entire panel, repeat this step for the other face of the panel as well. Cut the panel along your chalk line, blow it off to remove any debris and repeat steps 2.2 to 2.4 for this last floor panel.



Figure 20: Last Floor Panel Measurement

- 8.9 Now go back to the second panel you installed, take the Hex Washer Head $\frac{1}{4}$ "-14 x 5" Self Drill Screws with $\frac{3}{8}$ " flat washers and, beginning with the flute closest to the channel side of the panel, install one in every second flute (see figure 19) as described in step 2.5 the full length of the building.
- 8.10 Snap a chalk line along the floor above each of the middle floor beams and screw the panel down in the same way you did along the sides. Avoid screwing into the webbing of the beam underneath.
- 8.11 With Hex Washer Head $\frac{1}{4}$ "-14 x 6" Self Drill Screws with $\frac{3}{8}$ " flat washers attach the first and last panels along the long side to the I-Beam underneath approximately every 4', placing the screws $1\frac{1}{2}$ " in from the inside of the base angle. Avoid screwing into the webbing of the I-Beam and torque the screws so tight that the screw is sucked down so that the top of the screw is flush with the top of the panel, making a dent in the panel at each screw as can be seen in figure 20.
- 8.12 Use an angle grinder with a cut-off wheel to remove the part of the screws that penetrates beneath the top flange of the I-Beam.

8.13 To fill the void between the base angle and the floor panels with foam (*figure 21*). Insert the tip of the nozzle of the Sika Boom Foam gun right to the bottom of



Figure 21: Base Angle Void

the panel and slide it along to fill it about halfway to the top, then go around again for a second pass to fill it to the top.



Figure 22: 1 1/2" X 1 1/2" Structural Lumber

8.14 If the cut on the last floor panel ends up in or near a flute, a wooden 2 x 4 can be cut down to fill the flute (*as shown in figure 22*) so that you have a solid base for your wall to rest on. This lumber should be sealed to the floor panel beneath with a 1/4" bead of Sikaflex 1A the entire length and the remaining gaps should be fill with foam.

8.15 Install Foam Closures by dry fitting the blocks to ensure they are flush with the top of the panel. Shave with a knife as needed. Lay a 1/2" bead of Sikaflex 1A all the way across the flute so that some excess will squeeze out the top, place the Foam Closure flush with the end of the panel as shown in figure 23, slide it back and forth a little to ensure good contact, then fill the void for this area as stated in 2.13.



Figure 23: Foam Closures

Caution: The Foam Closures should be installed just prior to the wall panel installation to avoid the hardening of the Sikaflex 1A, which can create an uneven base for the wall panel. Typically, the closures are installed and the void filled 2 or 3 panels ahead of the wall panels.

9. WALL ASSEMBLY

Note: If your building requires Base Flashing you will need to install it before installing wall panel.

Note: It is critical that all surfaces that will contact the Sikaflex 1A bead or the sika boom bead be frost free, dust free, clean, dry and above 4°C during the assembly stage.

9.1 To determine at which corner to begin the wall assembly review your drawing package. Always install panels in a clockwise direction, beginning with the "C1" corner panel. Corner panels are pre-cut to the roof pitch, ensure that you have the right corner panel for the corner before installing.

9.2 **Note:** *The first corner must NOT be glued down as it will need to be removed later on.*
 After removing all debris from the area of the floor where you will be working, stand the corner panel up by slipping the kerf cut in the bottom of the panel over the top edge of the base angle. This can be done by leaning the top of the corner panel out while slipping one side over the base angle, then aligning the other side before straightening it. Ensure that the corner panel is standing solid on the floor, it may need to be tamped down with a tamping block on top of the corner panel. If you are having difficulty getting it to sit solid on the floor, check the depth of the kerf in the panel and clear out any debris.

9.3 **Corner Installation:** While standing on the outside of the building and facing one face of the corner panel, hold a 4' level against the other face. To attach the corner panel to the base angle, while it is standing perfectly plumb, insert a Hex Washer Head Screw #12-14 X 1" into the second recess on the exterior of the corner panel at approximately 3/8" up from the bottom edge of the corner panel (as indicated by the circled screws in figure 25), on the face that you are facing. Then move to the other face and repeat this procedure, ensuring that the corner panel stands perfectly plumb on both faces before fastening this face at the bottom. This procedure will require one person to hold the panel level while another person fastens it with screws at the bottom.



Figure 24:
#12-14 X 1" Screw



Figure 25: First Corner Installation

9.4 If there is not a door opening next to the corner then lay a 1" bead of Sikaflex 1A down on the floor where the wall panel will stand, approximately 1 1/2" in from the base angle (see figure 26). Stand up the next panel and slip the kerf over the base angle.



Figure 26: 1" Sika-Flex Bead on Floor

Note: *This first panel should not have Sikaflex 1A or foam applied to the channel side yet, as the corner will need to be removed again later.*

Slip the channel side of the panel over the tenon of the corner panel, ensure that they are flush at the bottom and clamp it within an inch of the end of the panel at the top and bottom (see figure 27). Then, on the inside face of the panel, insert a Pancake Head 1" Self Drill Screw approximately 3/8" in from the edge of the lip of the panel and approximately 2" from the end at the top and bottom, see connection details in your drawing package for additional screw spacing. (See figure 28)



Figure 27: Panel Clamping



Figure 28: Screw Placement

- 9.5 Now plumb this assembly and then screw it to the base angle by inserting a Hex Washer Head Screw #12-14 X 1" into each of the recesses on the outside of the panel at approximately $\frac{3}{8}$ " up from the bottom edge. All corners, *except the first one*, should have Sikaflex 1A and foam applied in the same manner as the wall panels. The first corner will have these applied later on.
- 9.6 After the corner assembly has been set, when standing outside of the building, mark the panel locations for the wall to the left of the corner by measuring from the tenon of the corner assembly to the other end of the building, and making a mark every 36" on the inside bottom of the base angle. If, as you are installing the wall panels, you notice that you are exceeding this space and covering up your marks, you will need to clamp the panels tighter and tamp them harder with the tamping block, so that you achieve an average panel spacing of 36". If this is not possible the last panel may need to be cut down as described in section 3.9 below.
- 9.7 Set the next panel on it's tenon side, blow off any debris that may be inside the channel, lay a smooth continuous bead of Sikaflex 1A at least $\frac{1}{4}$ " high and approximately $\frac{1}{2}$ " in away from the corner as shown in figure 11 on page 9. Then lay a bead of Sika Boom Foam approximately 1" – 1 $\frac{1}{4}$ " high down the middle of the channel side of the panel (*see figure 12 on page 9*). Lay a 1" bead of Sikaflex 1A down on the floor where the wall panel will stand, approximately 1 $\frac{1}{2}$ " in from the base angle (*see figure 26*). Stand the panel up and slip the kerf over the base angle. Slip the channel side of the panel over the tenon of the previous panel and clamp it within an inch of the end of the panel at the top and bottom (*see figure 27*), ensure that it's plumb and resting firmly on the base, then screw it to the base angle by inserting a Hex Washer Head Screw #12-14 X 1" into each of the recesses on the outside of the panel at approximately $\frac{3}{8}$ " up from the bottom edge. Then, on the inside face of the panel, insert a Pancake Head 1" Self Drill Screw approximately $\frac{3}{8}$ " in from the edge of the lip of the panel and approximately 2" from the end at the top and bottom as well as one in the middle. Please see drawings for minimum screw spacing (*See figure 28*). Follow this procedure for all subsequent wall panels and corner panels, keeping an eye on your marks to ensure that you're not exceeding the allowed space. See figure 29 to get an idea of what the joints should look like with a 36 $\frac{1}{16}$ " panel allowance.

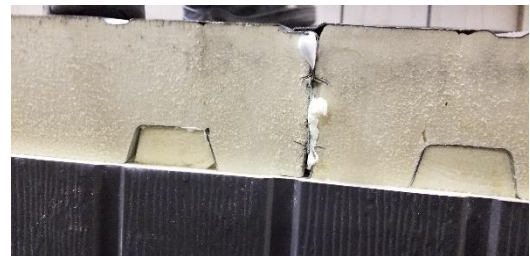


Figure 29: Acceptable Joint with proper squeeze out

- 9.8 If there will be a door at the next panel location, mark the height of the rough opening on the previous panel according to the dimensions shown in the drawing package. Mark the rough opening height on the panel to be installed to the left of the door and, after applying Sikaflex 1A and foam, attach the header panel to this panel before erecting it. When attaching the header panel to the wall panel, clamp it within an inch of the end of the panel at the top and bottom (*see figure 27*), and insert four Pancake Head 1" Self Drill Screws approximately $\frac{3}{8}$ " in from the edge of the header panel and $\frac{3}{8}$ " in from the edge of the lip, one at the top corner and



Figure 30: Screw Placement on Header Panel

one at the bottom corner of the panel and on both the inside and the outside faces (*Figure 30*). Next, on the channel side of the header panel, lay a smooth continuous bead of Sikaflex 1A at least $\frac{1}{4}$ " high and approximately $\frac{1}{2}$ " in away from the corner as shown in figure 11 on page 9. Then lay a bead of Sika Boom Foam approximately $1" - 1\frac{1}{4}"$ high down the middle of the channel side of the panel (*see figure 12 on page 9*) Lay a 1" bead of Sikaflex 1A down on the floor where the wall panel will stand, approximately $1\frac{1}{2}"$ in from the base angle (*see figure 26*).

Note: *If the header panel is to be attached to the first corner panel do not apply Sikaflex 1A or foam yet as the corner will need to be removed later.*

Stand up the panel with the header panel attached and slip the kerf over the base angle. Slip the channel side of the header panel over the tenon of the corner panel and clamp and screw it in the same way you attached it to the panel on the other side of the door opening. Verify that the spacing for the door is correct and that the panel is set solid on the floor, then plumb the panel by holding a 4' level along the tenon side of the panel and against one of the faces. To attach the panel to the base angle, while it is standing perfectly level, insert a Hex Washer Head Screw #12-14 X 1" into each of the recesses on the outside of the panel at approximately $\frac{3}{8}"$ up from the bottom edge.

9.9 Narrow Wall Panels: If the building measurements require that a partial width panel be installed

in the wall, the width of the last wall panel can be calculated in the following manner. Dry fit the corner panel by setting it up over the base angle, measure the space left between the tenon of the last installed panel and the inside of the channel, add $\frac{3}{4}"$ for the channel lip. Now hook your measuring tape over the channel side of the panel you wish to cut and mark according to the measurement you calculated. Repeat this step for the other end as well, then snap a chalk line from one mark to the other. If your saw blade cannot penetrate the entire panel, repeat this step for the other face of the panel as well and then cut the panel along your chalk line. (**Caution:** *To reduce the risk of scratching the panel as you cut it, ensure that the base plate of the saw is clean and smooth*) Next, set this panel down on it's channel side, then with your circular saw, cut 5 kerfs $2\frac{1}{2}"$ deep down the full length of the cut side of the panel as shown in figure 31. This will allow you to squeeze the panel enough to fit it into the channel of the next corner panel. Clear both the channel and the kerfs of any debris and then install it in the same manner as the previous panels. If your cut placement ends up in a deep flute of the inside panel, cutting these kerfs will not be necessary. However, the inside will need to be shimmed between the panel and the inside of the channel to keep the cut panel pressed against the outside of the channel until the Sikaflex 1A has cured (*at least 24 hours in warm weather, longer if it's cold*). Use scrap lumber to shim between the inside of the channel and the cut panel as shown in figure 32.



Figure 31: Narrow Panel Kerfs

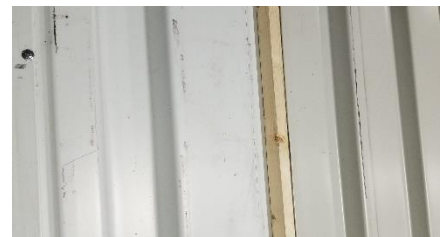


Figure 32: Shim for cut panel

9.10 **The Last Corner:** When you get back around to the first corner, remove the screws that hold it in place. Remove the corner panel and apply Sikaflex 1A and Foam to these panels in the same manner as described in step 3.7. Now, spread the top of the opening by pushing outward on both of the walls near the corner, then, lifting the corner panel high, carefully bring it down while aligning the tenons and channels on both faces with the wall panels and slipping it over the base angle. This may require the use of a trim pry bar (figure 14 on page 9) and a tamping block if the tolerances are tight. This procedure will require at least four able workers, more if the corner is tall.

10. ANGLE INSTALLATION

Remove protective film from panel before attaching angles to floor, walls or roof.

10.1 The angle used to fasten the wall to the floor on the inside is a 5" X 4" galvanized 14-gauge metal angle (Part # 192503). The 5" face should be laid on the floor with the 4" face against the wall. Start in any corner, cut to size as needed using a cutting wheel on an angle grinder (remove any burrs), and when you get to the next corner overlap the corner. With the angle pushed firmly down into the corner, using Hex Washer Head Screw #12-14 X 1" (see figure 24, page 14), attach it to the wall by placing the screws near the edge of the flat of the panel. 2 screws in each flat, one on one side of the flat and the other on the other side of the flat, one side approximately 3/8" from the edge of the angle, the other side approximately 3/8" from the corner (as shown in figure 35). It should be attached to the floor in the same manner. Put two screws into any panel joint as shown.

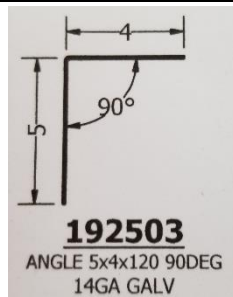


Figure 33: Part# 192503



Figure 34: Floor to Wall Angle

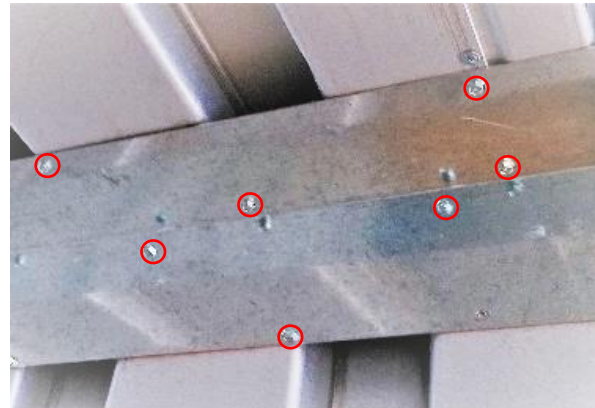


Figure 35: Screw Placement

10.2 An uneven base, improper setting or panels set slightly out of plumb may result in "stepping" at the top of the panels. Prior to installing the wall to roof angles, the walls may need to be trimmed to size. Measure and mark your eave and peak heights on the gable walls and side walls according to the drawings. Snap a chalk line and cut the panels as needed using your circular saw.

Caution: To reduce the risk of scratching the panel as you cut it, ensure that the base plate of the saw is clean and smooth.

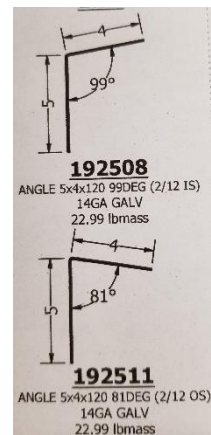


Figure 36: Side Wall Angles

10.3 The angle used to fasten the wall to the roof depends on the roof pitch and the wall on which the angle is being installed. A 5" X 4" galvanized 14-gauge metal angle (*Part # 192503 figure 33*) is installed on the inside of the gable walls with the 5" face against the wall and the 4" face against the roof. Figure 36 shows the angles you would install on the inside of the sidewall of a building with a 2/12 roof pitch. If the building has a gable roof the top angle (*Part # 192508*) shown in figure 36 would be used on both sides of the building, but if it's a mono pitch roof the bottom angle (*Part # 192511*) shown in figure 36 would be installed at the higher side and the top one (*Part # 192508*) on the low side. Screw placement is the same as the wall to floor angle screw placement.

Note: All wall to roof angles should be installed 1/8" lower than flush so that the roof panels can be sucked down tight to the wall when they are fastened.

10.4 Exterior wall to roof angle may be required for certain applications, please refer to your drawing package to determine whether or not your building requires them (*See figure 37*). A gable roof will require the lower angle in figure 36 at the eave and the angle shown in figure 33 at the gable. A mono pitch roof will require the lower angle in figure 36 at the low eave and the angle shown in figure 33 at the gable, but will require the top angle in figure 36 at the high eave.



Figure 37: Exterior wall to roof angle with J-Channel for soffit installed

11. WALL & ROOF SUPPORT BRACING

CAUTION! If the building is equipped with floor heat, be mindful of the location of the floor heat water lines to avoid puncturing them when fastening blocks or bracing to the floor.

- 11.1 Before the roof is installed the walls will need to be braced to keep the walls perfectly plumb and straight from end to end. Attach the top of the brace as shown in figure 40, then ensure that the wall is plumb by holding a 4' level against the face of the wall near the brace. Next, screw a block to the floor as shown in figure 39 and attach the brace to the block while maintaining plumb on your wall. Good quality 2 X 4 or 2 X 6 lumber is recommended for bracing material.



Figure 38: Brace



Figure 39: Brace Base



Figure 40: Top of Brace

- 11.2 Spacing of the braces will depend on the wall height and weather conditions. Use your own discretion when placing the braces but bear in mind that strong winds can do a lot of damage to an incomplete building. Err on the side of caution if leaving the project without a completed roof overnight.



Figure 41: Temporary Support Wall with a mono pitch roof

- 11.3 For a mono slope pitch roof requiring support beams and/or bearing walls, if possible, install the support beams and/or bearing walls first. If this is not possible, if the roof panels span greater than 15 feet a temporary support wall (as shown in figure 41) will be required to help support the panels in the middle before constructing the roof.
- 11.4 For a gable roof, a temporary support wall will be required along the full length of the building, approximately 24" back from the peak, to support the side of the roof that you plan to assemble first. Ensure that the temporary wall height is calculated to support the roof panels at their desired height.

12. ROOF ASSEMBLY

It is critical that all surfaces that will contact the Sikaflex 1A bead or the sika boom bead be frost free, dust free, clean, dry and above 4°C during the assembly stage.

12.1 For a gable roof, run a string from the peak of one gable wall to the peak of the other gable wall as a guide to aid in roof panel alignment. The roof can be begun from either end but consideration should be given to prevailing winds, for example, if the prevailing winds are from the West or North you should start assembling your roof from the East or South end of the building. Both sides of the roof must be started from the same end. Complete one side of the roof before beginning the next side.



Figure 43: Foam Closures ½" Sikaflex 1A Bead



Figure 42: Trim Foam Closure

12.2 Before Installing the roof panels, determine the overhang measurements on the eave and the gable from the drawings. On the bottom face of the panel, mark the location of the outside of the wall for the end of the panel (as well as for the gable side on your first panel). Read 7.8 before beginning. Install Foam Closures by dry fitting the blocks to ensure they are flush with the lower face of the panel. Shave with a knife as needed (see figure 42). Lay a ½" bead of Sikaflex 1A all the way across the flute so that some excess will squeeze out the bottom, place the Foam Closure up against the marks you made, slide it back and forth a little to ensure good contact (see figure 44). When the roof panel has been installed the foam closure should be above the wall and flush with the outside of the wall panel.



Figure 44: Installed Foam Closures

IMPORTANT: Ensure all holes drilled through the foam blocks for electrical wiring, i.e. exterior pot lights or receptacles, are sealed with Sikaflex 1A to keep the building airtight.

12.3 Lay a smooth continuous 1" bead of Sikaflex 1A 1 ½" in from the outside edge of the panel on the gable wall and far enough along the side wall that the entire roof panel will be sealed to the wall with some Sikaflex 1A extending past the panel as shown in figure 45. Be careful not to let the panel down until you have it in the right position to avoid disturbing your bead of Sikaflex 1A. If the roof has no overhang, flush the channel side of the panel with the gable wall (see figure 46), the bottom end should be set in slightly, so that the end of the roof panel is flush with the recess of the side wall panel. Typically, you should be left with approximately 1/8" to 1/2" gap

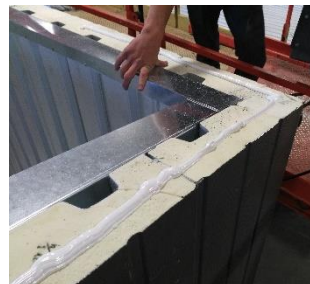


Figure 45: 1" Sikaflex 1A bead 1 ½" in from outside edge on the



Figure 46: Roof without overhang



Figure 47: Roof with Overhang

between the panel and the string. If you see greater variations, check your roof panel lengths and the straightness of the side wall from one end to the other, adjustments to your wall bracing may be required. If the panels are longer than the drawing calls for, and they extend up past the string, they will need to be trimmed down in order to keep your ridge straight. If the roof has an overhang, position the panel according to the marks made earlier, check your overhang measurements all around, and fasten the panel to the angle on the inside of the gable wall using Hex Washer Head Screw #12-14 X 1" screw at the top and another at the bottom.

NOTE: *If there is any variation between the lengths of roof panels, the eave end of the panel should be aligned with the previous panel. Small variations at the peak will be foamed and covered later.*

NOTE: *The following step is slightly different for roof panels than wall or floor panels as the top bead of Sika-Flex should be right up in the top corner on a roof panel, and the roof panels require the air barrier bead at both ends of the panel.*

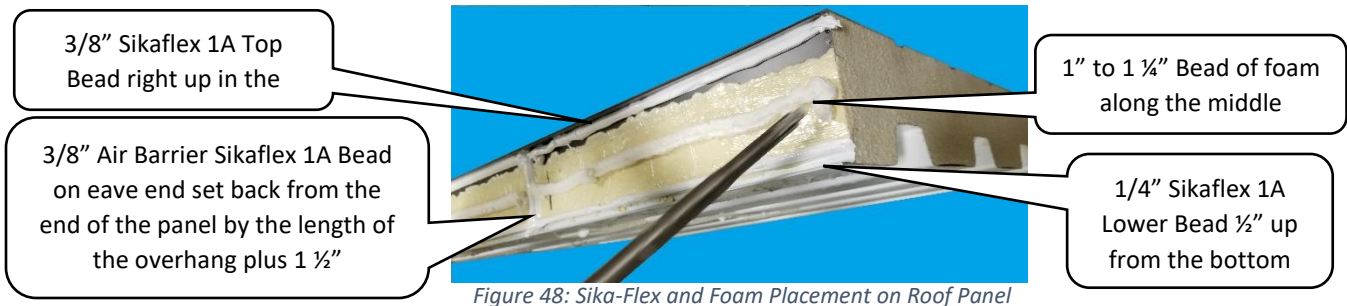


Figure 48: Sika-Flex and Foam Placement on Roof Panel



Figure 49A: Air barrier at the peak end, down the side and across the lower lip of the roof panel



Figure 49B: Air barrier at the eave end, down the side and across the lower lip of the roof panel
A mono slope roof will require this bead above the wall at the high end in the same manner



Figure 50: Roof screw spacing according to connection detail in drawing package

- 12.4 Set the next panel on its tenon side, on the bottom side of the panel, mark the location of the outside of the wall for the ends of the panel, install Foam Closures, blow off any debris that may be inside the channel, lay a smooth continuous bead of Sikaflex 1A at least 3/8" high right up in the top corner of the channel and another 1/4" bead approximately 1/2" up from the bottom of the channel, lay a connecting bead across the channel and the lower lip in line with the Foam Closures (1 1/2" in from your overhang mark at the eave end and 1/2" in from the peak end) to complete the air barrier (see Figures 49A and 49B). Then lay a bead of Sika Boom Foam approximately 1" – 1 1/4" high along the middle of the channel as shown in figure 48.

- 12.5 Extend your 1" bead of Sikaflex 1A along the top of the wall for the next panel, lay the panel down flush with the previous panel at the low end, clamp it tight and attach it to the previous panel on the inside face of the panel using Pancake Head 1" Self Drill Screws approximately 3/8" in from the edge of the lip of the panel and approximately 2" from the end at the higher end and lower end. Space additional screws according to the connection detail in your drawing package (see figure 50) along the inside of the panel. Follow this procedure for the next two roof panels.

Note: It may be necessary to work the channel of the panel over the tenon of the previous panel by raising and lowering the free side, as well as tamping it with your tamping block before clamping and screwing it. It is critical that these panels be clamped tight and that the assembly remains square, see figure 51.



Figure 51: Acceptable Joint with proper squeeze out

- 12.6 After four panels have been installed in this way, the assembly needs to be squared. Check your walls to ensure that they are plumb and straight. Measure your overhang to ensure that it measures as it should. Now measure from the far wall to the last roof panel installed, at the high end and at the low end. **These two measurements must be equal!** If the screws holding the first panel have to be removed to achieve this, then do so. Once the assembly is squared to the far wall, attach the angles on the inside to the roof panels in the same way you attached the angles to the floor using the same pattern for your screw locations. Check your measurements from the far wall to the last installed panel every three panels to ensure that your roof remains square. Adjust the clamping as needed. Continue to repeat steps 7.3 to 7.5 until you have installed the second last roof panel. **Caution! If the entire roof can not be completed in one shift, ensure that all installed panels are fastened snugly and securely before leaving the site. The Sikaflex 1A will cure enough overnight to prevent any further manipulation of the panel.**
- 12.7 For the last roof panel, measure from the tenon of the last panel installed to the outside edge of the wall, add 3/4" for the channel lip, then add the desired overhang to calculate the width of the last panel. Now hook your measuring tape over the channel side of the panel you wish to cut and mark according to the measurement you calculated. Repeat this step for the other end as well, then snap a chalk line from one mark to the other. If your saw blade cannot penetrate the entire panel, repeat this step for the other face of the panel as well and then cut the panel along your chalk line.

Building dimensions and overhang dimensions will determine whether or not the flutes in the roof panel will be positioned directly above either of the end walls. If a flute in the roof panel will be positioned above the wall, a piece of 2x4 structural lumber should be cut down to fit in the flute. This lumber must reach from the foam closure to the other end of the panel. Lay a ¼" continuous bead of Sikaflex 1A all the way down the flute and up the end of the foam block to create an air barrier, then attach the lumber to the panel by laying it in the flute and fastening it to the steel with deck screws. Next, fill the voids alongside of the lumber with Sika-Boom spray foam to insulate the flute (see figure 52). If you will not be installing this panel right away, you will need to cut off the excess foam flush with the panel. If the "wall to roof" angle is positioned directly beneath a flute on the end wall, a piece of 2x4 structural lumber should be cut down to fit in the roof panel flute and installed using deck screws. The angle can then be screwed to this lumber and the wall.

Caution: To reduce the risk of scratching the panel as you cut it, ensure that the base plate of the saw is clean and smooth.

- 12.8 If your building has a gable roof, install the Angle Ridge Support (figure 54) by attaching it to the underside of the peak end of the roof panels (see figure 55). Ensure that the peak is centered and in line with the string. Use Hex Washer Head Screw #12-14 X 1" screws placed in the same manner as on the floor to wall angles.

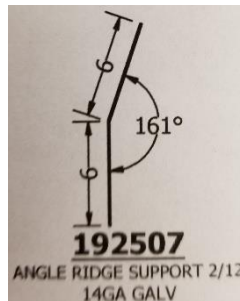


Figure 54: Angle Ridge Support



Figure 52: Structural lumber installed in flute above wall sealed with Sika-Flex and spray foam and fastened with deck screws.



Figure 53: Structural lumber installed in flute above angle fastened with deck screws

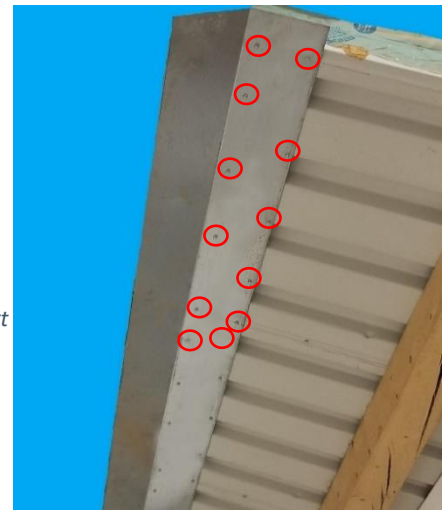


Figure 55: One side of roof with Ridge support angle installed underneath while panels are supported on a temporary wall.

12.9 For a gable roof, install the panels for the other side of the roof in the same manner as the first side, resting the high end of the panels on the ridge support angle. After all of the roof panels have been fastened to the ridge support angle and the wall to roof angles at the eave and at the gables, then from on the roof, fill the gap between the panels at the peak with Sika Boom Foam. Next, lay a smooth, continuous 1" bead of Sikaflex 1A along both sides of the peak, approximately 3" down from the peak and install the Angle Ridge Support (*figure 54*) by centering it on the peak and fastening it with Hex Washer Head ¼"-14 x 6" Self Drill Screws. Screw placement should be 1" up from the edge of the Angle Ridge Support, the first screw should go through the middle of the first flat area (*avoid going through the flutes on the underside*), after the first screw they should be installed every 18" the full length of the roof, on both sides of the Angle Ridge Support. These screws should penetrate the top Angle Ridge Support, the thick part of the panel and the bottom Angle Ridge Support (*see figure 56*).



Figure 56: Ridge cap, top and bottom ridge support angles with roof panels sandwiched between

12.10 The next step is to ensure that the wall is sealed to the roof panels to create a continuous air barrier. Check around each foam closure and along the underside of the roof panels for any gaps that have not been sealed by the Sikaflex 1A. Seal these gaps with an exterior sealant (*see Figure 57*). Next, cut a kerf on the eave end of the roof panels (*see figure 58*). Use an angle grinder with a 5" cutting wheel to cut the kerf just below the top metal sheet of the panel to the maximum depth the cutting wheel will allow. This kerf will be used to accommodate the top lip of the eavestrough supports and eave fascia with drip edge.



Figure 57: Sealing the roof panel to the wall and sealing the Foam Closures
This must be done on roofs with or without eave overhang

IMPORTANT: When installing eave fascia, apply a bead of sealant at the kerf on top of the drip edge fascia to seal the kerf to prevent water from running back into the kerf and dripping out on the inside of the fascia. (See figure 59)



Figure 58: Kerf cut in the roof eave to accommodate fascia trim and eavestrough supports



Figure 59: Sealing the roof eave kerf

12.11 If no seam caps will be installed on the roof, remove any adhesive that has squeezed out of the roof joint and then blow out all debris. Lay a bead of exterior sealant the full length of each panel joint on both sides of the roof. Work the sealant into the joint to seal it against the weather. This sealant should be checked annually and replaced as necessary (see figures 60, 61, 62 and 63).



Figure 60: Translucent Exterior Silicone



Figure 61: Removing debris from the roof panel joint



Figure 62: Applying silicone to the joint



Figure 63: Working the silicone into the joint

If you will be installing Seam Caps on your roof, blow the area around the panel joint free of all debris and clean 3" on both sides of the seam by wiping with a dry cloth to remove any dust or oil residue. Next, snap a chalk line 2" beside the seam as shown in figure 64. Then roll out the Air & Vapor Barrier, aligning one edge with the chalk line as shown in figure 66. Beginning at one end, apply the barrier by removing the protective film as you press it firmly over the seam. Ensure that the entire surface of the barrier has proper adhesion by firmly pressing it into the recess and along both sides of the recess (see figure 67).



Figure 64: Snap a chalk line 2" from the seam.



Figure 65: Air & Vapor Barrier



Figure 66: Aligning the barrier with the chalk line



Figure 67: Applying the barrier

- 12.12 Center the roof seam cap (*figure 68*) over the air & vapor barrier and set it flush with the lower end of the roof panel. Fasten it to the roof panels with stitch screws (*see figure 69*). Beginning 2" from the bottom end, work your way up the cap by placing the screws every 16" on both sides of the cap as shown in figure 70. Overlap the next cap 4" over the installed cap and repeat the screw placement pattern of the first cap, beginning 2" up from the lower end of the cap.

NOTE: Roof seam caps may not be exactly as shown

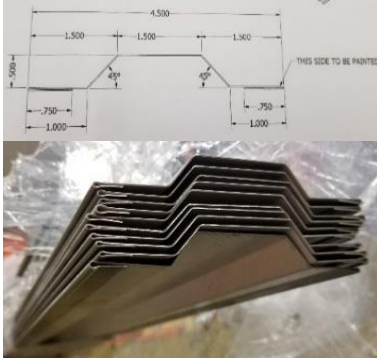


Figure 68: Roof Seam Cap



Figure 69: #14 x 7/8" Stitch Screw

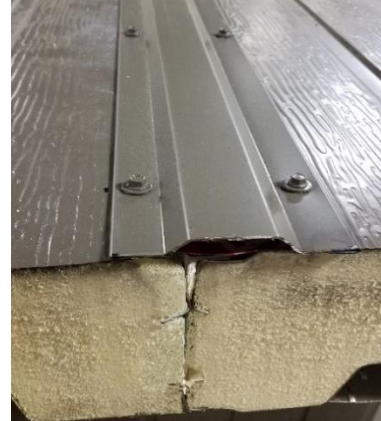


Figure 70: Roof Seam Cap installed with stitch screws spaced 16" apart

13. DOOR/WINDOW HEADERS

- 13.1 Door and window openings may require headers – refer to drawing package or retain the services of a certified engineer to determine requirements.
- 13.2 Header type, dimensions and fastener specifications may vary, depending on the application. Please refer to your drawing package or retain the services of a certified engineer for header details.



Figure 71: Header angle installed in window rough opening



Figure 72: Header installed in garage door opening

14. SUGGESTED DOOR/WINDOW INSTALLATION METHODS

Important items to note:

Approved window and door installation methods may vary by jurisdiction and/or manufacturer. Please check and confirm with local building codes and/or window and door manufacturer for approved methods of window/door installations.

Brickmould style windows and doors are best suited for the Artspan panel system. Windows/doors with a flanged nailing fin will require flashing to cover the exposed nailing fin/fasteners

Artspan panels are 5" thick and window/door jambs should be ordered according to this wall thickness plus interior finishing thickness.

*Suggested installation materials/tools pertaining to window/door installations listed in this section (including but not limited to windows, doors, shims, liquid flashing, fiberglass batt insulation, metal flashing material, drip cap, flashings, fasteners, Sikaflex 1A sealant, backer rod, sealant, spray foam) are **not** included with Artspan panel packages unless specifically listed on the quotation and drawings.*

14.1 Marking and Cutting Out the Rough Opening:

Note: Please check your local building codes for rough opening size. Consideration must be given to the width of the brickmold surface, ensuring that the window fasteners will have sufficient backing, therefore keeping the rough opening size to the bare minimum is recommended.

14.1.1 After determining the exact size and location desired for the window rough opening, mark the corners of the rough opening on the outside of the wall. Ensure that the marks are square, level and that the measurements are correct. Next, using a drill with a ¼" by 12" drill bit, drill a hole at each corner, taking care to ensure that the bit remains perpendicular the face of the wall. This can be achieved by using a right-angle jig or speed square to guide you. A right-angle jig can be made by cutting two 5" long 2X4 pieces of lumber, make sure the ends are cut square and fasten one to the other to make an "L" shape. Then keep the jig pressed firmly against the panel and the drill bit aligned with the inside corner of the jig to keep it perpendicular to the panel.

14.1.2 Once the four corner holes have been drilled all the way through the panel, double check the measurements on the inside of the panel and make corrections as needed before marking the corners on the inside of the panel. Then, using a straight edge and a felt marker, draw the four sides of the rough opening by marking lines from corner to corner on both the inside and the outside of the panel.

Note: For a sloped sill, the outside bottom line should be marked ¼" lower than the center of the drilled holes and the inside bottom line should be marked ¼" higher than the center of the drilled holes.

14.1.3 The use of gloves, hearing protection, safety glasses and/or a face shield is strongly recommended for this step, as ***the saw will spit shards of steel***. Using a circular saw with a fine-tooth blade and a clean, bur free base, cut along the lines you have marked. Ensure that the saw is held perpendicular to the panel and pressed firmly against it. Cut as close to the corner as you safely can, but be careful not to cut past the corner (***Extreme caution must be employed when backing the saw through a panel joint, as may be required when cutting the angled sill cut. The extra layers of metal tend to grab the blade and cause it to leap backwards***). To cut the bottom line for a sloped sill cut-out, set you blade angle at 5°. Be sure to have the angle set upward when cutting from the outside and downward when cutting from the inside. After you have cut all four sides on both the inside face and the outside face of the panel, it may be necessary to connect the cuts by running a sabre saw through to cut any connecting foam.

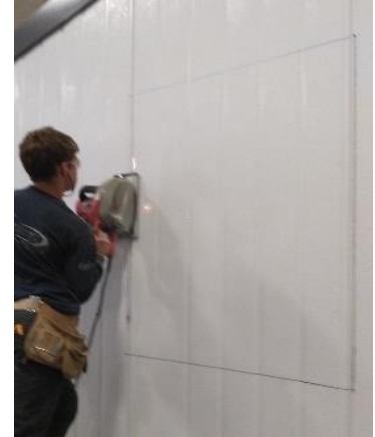


Figure 72: Cutting Rough Opening

Caution: As much as is possible, avoid cutting the metal with a sabre saw as the vibration from the reciprocation of the blade can weaken the adhesion of the foam to the metal skin of the panel. A block of wood can be used to tap the cut-out inward, tapping at all four corners to keep it straight. Whenever possible, the cut-out should be knocked into the building from the outside to avoid breaking the adhesion on the exterior steel. On a sloped sill the cut-out will have to be knocked outward; ensure that it does not hook the exterior steel.

14.2 Flashing Out the Rough Opening

14.2.1 Using compressed air or a brush, remove all debris and dust from the rough opening. Apply liquid flashing according to the flashing manufacturers instructions, ensuring that all panel joints and any other crevices or voids are properly filled and sealed. Lay a serpentine bead on the side and bottom rough opening surfaces, spread the bead evenly with a putty knife, then, using a wet mil thickness gauge, verify that the thickness of the film meets the manufacturers recommendations. Allow the liquid flashing to cure before proceeding with the window installation.



Figure 73: Serpentine bead of liquid flashing



Figure 74: Properly spread liquid flashing



Figure 75: Shim support flashing and shims

14.3 Rough Opening Prep and Shim Placement

14.3.1 To avoid having the weight of the window pressing the shims down into the foam, a 3" wide strip of metal flashing material should be laid along the full length of the sill. Window shims should be placed according to the window manufacturers recommendations. Typically, both sides of the frame and any mullions would be supported by shims. Measure the height of the window frame and stack your shims so as to center the window in the opening, ensuring that the shims are level. Cut a layer of fibreglass batt insulation to insulate the bottom of the window as shown in figure 75.

Note: A small dab of Sikaflex 1A on each shim will keep it from sliding around during the window installation.

Note: The following step should only be performed when you are prepared to install the window immediately after applying the Sikaflex 1A sealant.



Figure 76: Fibreglass batt insulation on the sill cut to fit around the shims



Figure 77: Sealant bead with drain gap

14.3.2 Apply a smooth, continuous ¼" bead of Sikaflex 1A sealant, or equivalent sealant with comparable adhesive qualities, to the outside face of the wall around the edge of the rough opening, ensuring that the brickmold of the window will cover the bead after it has been compressed. This bead should be continuous on both sides and on top but the bottom should allow a 2" space within 2" of each side as well as a 2" space under each mullion for draining any moisture that may penetrate past the brickmold.

14.4 Window Installation

14.4.1 Window installation will require one person on the inside of the building and another on the outside. With the top of the window tilted out slightly, raise the window a few inches higher than the sill of the rough opening. Insert the window slowly until the brickmold is about ½" from the exterior face of the wall, then set it down on the shims, taking care to keep the window from making contact with the Sikaflex 1A sealant. While the person on the outside holds the window, the person on the inside should center the window and check that the window is level, adjusting the shims as needed. Next, from the outside, press the window firmly against the wall and fasten at both of the bottom corners with #8 x 2" Square Pan Socket Metal Screws. When the bottom corners have been fastened,



Figure 78: Install windows as per manufacturers instructions

square the window and fasten the top corners. After double checking that the window is centered, level and square, install the remaining fasteners.

14.5 **Insulating the Window**

14.5.1 Using an open cell backer rod that is at least 30% larger than the gap between the window frame and the rough opening, push the backer rod up against the backside of the brickmold from inside the building. Do this for the top and both sides of the window and ensure that there are no gaps in the backer rod. To aid in proper curing of the spray foam, lightly spray clean water into the gap all around the window to dampen the surfaces to which the foam will adhere. Next, take your can of Sika Boom Spray Foam for Window and Door Insulation, shake it vigorously for approximately one minute, then, keeping the can upside down during application, insert the nozzle into the gap till it touches the backer rod, pull the trigger and lay a continuous bead of foam approximately one inch deep around the entire perimeter of the window. Lightly spray with water again and allow the foam to cure for approximately ten minutes. Repeat these steps until the cured foam reaches within one quarter of an inch of the interior steel of the panel. Any excess foam will need to be cut back later.

14.6 **Sealing the Window**

14.6.1 Using an exterior grade sealant, lay a $\frac{1}{4}$ " bead along the top of the brickmold of the window. Ensure that the sealant makes full contact on both the exterior steel surface and the brickmold and that all panel joints and recesses are filled. Lay an $\frac{1}{8}$ " bead down both sides of the window. Underneath the window, lay an $\frac{1}{8}$ " bead; leaving a 2" space within 2" of each side as well as a 2" space under each mullion. These spaces will allow any moisture that may penetrate the glass seals of the window to drain to the outside of the building. Next, using a spray bottle filled with soapy water, and while wearing latex gloves, spray the bead of sealant and the surrounding surfaces. Then, using your finger, smooth the sealant, wiping the excess on a paper towel. This step must be performed while the silicone is still fresh.

14.6.2 Now, on the inside of the building, cut the spray foam back at least $\frac{1}{8}$ " from the edge of the window jamb on the flat parts of the panel and flush with the inside steel inside the flutes. Next, lay a continuous bead of sealant all the way around the window inside this space, large enough to fully contact the steel and the window jamb. Smooth it out in the same manner you did the exterior sealant. This creates the interior vapor and air barrier.

14.7 Installing the Window Drip Cap

14.7.1 If the distance between the top of the window or door trim and the underside of the soffit exceeds one quarter of the soffit overhang, a drip cap should be installed.

Example: With an 18" overhang, the distance from the soffit to the top of the window could be up to 4 ½", with a 24" overhang the distance could be up to 6".

14.7.2 Measure the total width of the window, from outside edge to outside edge of the brickmold. Cut both the drip cap and the membrane cap two inches longer than the total window width. Center the drip cap on top of the window, holding the back firmly against the exterior wall with the ledge resting on the window, draw a mark all along the top edge of the drip cap. Lay a ¼" high bead of Sikaflex 1A sealant ½" below this mark, ensuring that all panel joints and recesses are filled, stay back ½" from the ends of the drip cap. Press the drip cap firmly against this bead of Sikaflex 1A while it is still fresh, ensuring that it is centered above the window and resting on the brickmold the entire length. Attach the drip cap to the wall using ¾" Pancake Head Truss Screws spaced 12" apart and ½" down from the top edge of the drip cap. Place a screw 1" in from each end.

14.7.3 Using 2" masking tape, mask the ledge portion of the drip cap, apply a length of tape to the wall 1" above the top edge of the drip cap, apply masking tape ¼" in from each end. The resulting bordered area should be slightly smaller than the Membrane Cap, which needs to cover this entire area later on.

14.7.4 Next, apply a serpentine bead of liquid flashing according to the flashing manufacturers instructions, ensuring that all panel joints and panel recesses are properly filled and sealed. Spread the bead evenly with a putty knife, then, using a wet mil thickness gauge, verify that the thickness of the film meets the manufacturers recommendations. Immediately remove the masking tape and allow the liquid flashing to cure before proceeding with the membrane cap installation.

14.7.5 After the liquid flashing has cured, install the membrane cap by centering it on the drip cap with the short, bent face on top pressed against the wall, resting the bottom on the drip cap ledge, and fastening it to the wall with color matched stich screws. Screw placement should be ½" below the bend, 16" or less apart and approximately 2" from each end.



Figure 79: Drip cap centered above window with 1" overlap on both sides



Figure 80: Serpentine bead of liquid flashing applied to drip cap



Figure 81: Liquid flashing spread to manufacturers thickness specifications



Figure 82: Completed window cap

14.7.6 Door installation is the same as window installation with the following three exceptions.

(1) You may want to install $\frac{3}{4}$ " plywood as extra backing on the hinge side of the door so that the screws that hold the door hinge to the jamb can be replaced with longer screws for improved support.

(2) Lay a $\frac{1}{2}$ " bead of Sikaflex 1A on the floor, 1" back from the outside of the wall as shown in figure 83, to seal the threshold to the floor.

(3) When filling the gap around a door it is critical to have the door closed while the Window & Door Low Expansion Foam is curing. You may need to use shims to ensure that the proper gap between the door and the jamb is maintained all around the door during this curing time.



Figure 83: $\frac{1}{2}$ " bead of Sikaflex 1A for sealing the threshold to the floor



Figure 84: Ensuring the door is plumb and level before fastening



Figure 85: Sikaflex 1A bead around door opening

15. INSTALLING SOFFIT, FASCIA, RIDGE CAP TRIM

15.1 J-Channel and Soffit installation for Artspan panels is similar to wood construction. Install the Soffit J-Channel using #8 x $\frac{3}{4}$ " Sheet Steel Screws, space screws as required. Insert the soffit into the J-Channel and fasten as per the manufacturer's recommendations. Attach with sheet steel screws as shown in figure 88 and 89. Exterior wall to roof angle may be required for certain applications, please refer to your drawing package to determine whether or not your building requires them.



Figure 87: J-Channel with exterior angle installed



Figure 86: Installing Soffit J-Channel



Figure 88: Installing soffit



Figure 89: Fastening the Soffit



Figure 90: Eavestrough backing in the middle of each panel

- 15.2 If the building will receive eavestrough you will need to insert eavestrough backing into the roof kerf as shown in figure 90. The backing should be placed in the middle of each roof panel, this allows for one eavestrough anchor every 36" apart. Do not fasten with screws yet, the screws that fasten the drip edge will hold the eavestrough backing as well.



Figure 91: Drip edge fastened from the top in each panel recess

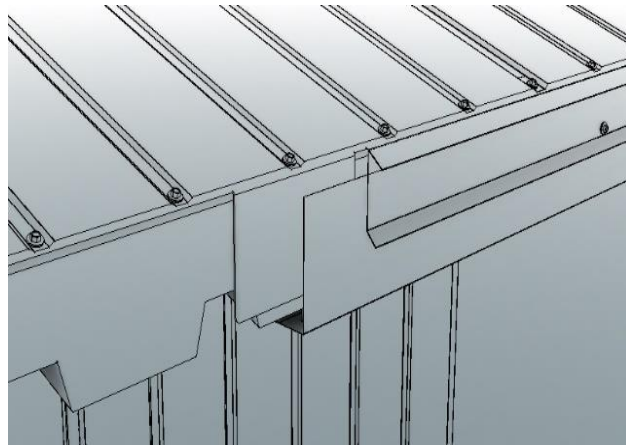


Figure 92: Drip edge, eavestrough backing and fascia installed

- 15.3 Insert the top flange of the drip edge into the roof kerf, covering the eavestrough backing. Fasten from above with colored 7/8" stitch screws (see figure 69 on page 24) in each roof panel recess, as shown in figures 91 and 92. Slip the Fascia behind the Drip edge and attach from underneath with colored 1 1/2" sheet steel screws. Space the screws approximately 3' apart, or as required, taking care not to warp the fascia. Insert a screw through both the drip edge face and the fascia approximately every 5', or as needed.

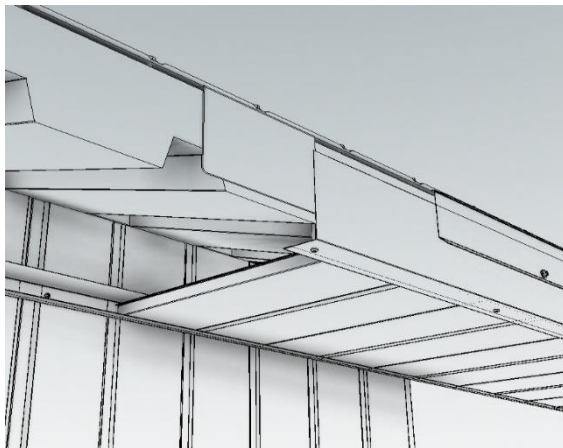


Figure 93: Fascia fastened from underneath



Figure 94: Fascia and Drip Edge installed prior to eavestrough installation

IMPORTANT: When installing eave fascia, apply a bead of sealant at the kerf on top of the drip edge to seal the kerf to prevent water from running back into the kerf and dripping out on the inside of the fascia. If your building has no overhang this water can potentially work its way to the inside of the wall. (See figure 59 on page 23)

15.4 Gable Drip Edge and Fascia installation is similar to eave installation but the screw spacing from above is approximately 16" instead of 6".

15.5 Ridge Cap should be installed with regard to the direction of the prevailing winds in the area. Start on the opposite end of the building to the direction from which your prevailing winds blow. Fasten with 7/8" colored Stitch Screws at every third recess in the roof panels as shown figure 96. 4 screws at each end is typically enough, more screws may be added in high wind areas.

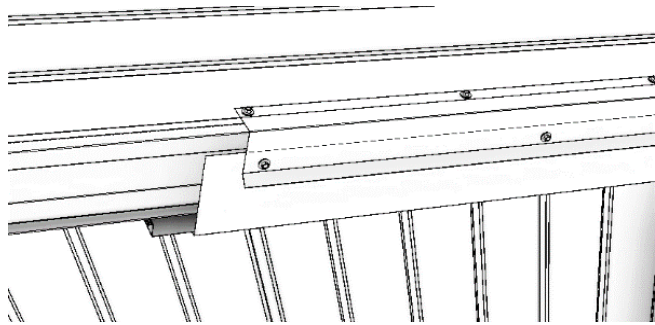


Figure 95: Gable Drip Edge and Fascia installed



Figure 96: Colored stitch screws fastening the Ridge Cap



16. ARTSPAN LOAD TABLES

Maximum Specified Uniform Distributed Load (psf)

Span - ft	Simple Span - ft								Flat Side up (Rib Side Down)							
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Bending / Shear	1000	667	500	400	300	220	169	133	108	89	75	64	55	48	42	37
Deflection (L/180)			400	225	149	110	90	85	80	73	65	58	50	42	23	13

Span - ft	Simple Span - ft								Flat Side Down (Rib Side Up)							
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Bending / Shear	1000	667	500	400	333	253	193	153	124	102	86	73	63	55	48	43
Deflection (L/180)			400	225	150	110	90	85	80	73	65	58	50	42	23	13

Span - ft	Two Equal Spans - ft Flat/Rib Side Either Way (Up or Down)																	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Bending / Shear	800	533	400	320	267	220	169	133	108	89	75	64	55	48	42	37	33	30
Deflection (L/180)					359	265	217	205	193	175	157	139	120	101	55	31	20	13

Span - ft	Three Equal Spans - Flat/Rib Side Either Way (Up or Down)																	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Bending / Shear	833	556	417	333	278	238	208	167	135	112	94	80	69	60	53	47	42	37
Deflection (L/180)				425	281	208	170	160	151	137	123	109	94	79	43	25	16	10

Maximum Uniform Distributed Snow Load (psf)

Factored for Bending / Shear

Snow Load Factor for Bending/Shear= 1.5

Servicability for Deflection Is=0.9

Servicability Importance Factor for Deflection Is= 0.9

Span - ft	Simple Span - ft								Flat Side up (Rib Side Down)							
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Bending / Shear (Factored)	1500	1000	750	600	450	331	253	200	162	134	113	96	83	72	63	56
Servicability / Deflection (L/180)			444	250	166	122	100	94	89	81	72	64	56	47	26	14

Span - ft	Simple Span - ft								Flat Side Down (Rib Side Up)							
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Bending / Shear (Factored)	1500	1000	750	600	500	379	290	229	186	153	129	110	95	83	72	65
Servicability / Deflection (L/180)			444	250	167	122	100	94	89	81	72	64	56	47	26	14

Span - ft	Two Equal Spans - ft Flat/Rib Side Either Way (Up or Down)																	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Bending / Shear (Factored)	1200	800	600	480	400	331	253	200	162	134	113	96	83	72	63	56	50	45
Servicability / Deflection (L/180)					399	295	241	228	214	194	174	154	134	112	62	35	23	14

Span - ft	Three Equal Spans - Flat/Rib Side Either Way (Up or Down)																	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Bending / Shear (Factored)	1250	833	625	500	417	357	313	250	203	167	141	120	103	90	79	70	63	56
Servicability / Deflection (L/180)				472	312	231	189	178	168	152	136	121	105	88	48	27	18	11



Maximum Uniform Distributed Wind Load (psf)

Factored for Bending / Shear

Wind Load Factor for Bending/Shear= 1.4

Servicability for Deflection Is=0.75

Servicability Importance Factor for Deflection Is= 0.75

Span - ft	Simple Span - ft Flat Side up (Rib Side Down)															
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Bending / Shear (Factored)	1400	933	700	560	420	309	236	187	151	125	105	89	77	67	59	52
Servicability / Deflection (L/180)			533	300	199	147	120	113	107	97	87	77	67	56	31	17

Span - ft	Simple Span - ft Flat Side Down (Rib Side Up)															
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Bending / Shear (Factored)	1400	933	700	560	467	354	271	214	173	143	120	103	88	77	67	60
Servicability / Deflection (L/180)			533	300	200	147	120	113	107	97	87	77	67	56	31	17

Span - ft	Two Equal Spans - ft Flat/Rib Side Either Way (Up or Down)																	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Bending / Shear (Factored)	1120	747	560	448	373	309	236	187	151	125	105	89	77	67	59	52	46	42
Servicability / Deflection (L/180)					479	353	289	273	257	233	209	185	161	135	74	42	27	17

Span - ft	Three Equal Spans - ft Flat/Rib Side Either Way (Up or Down)																	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Bending / Shear (Factored)	1167	778	583	467	389	333	292	233	189	156	131	112	96	84	74	65	58	52
Servicability / Deflection (L/180)				566	375	277	226	214	201	182	164	145	126	106	58	33	21	13

Notes for the preceding table

- 1) Tables are based on allowable stress design.
- 2) Determination of the specified wind and snow load is contained in the 2010/2015 editions of the National Building Code of Canada (NBCC). Importance factors are applied to both strength (ULS) and servcability/deflection (SLS) as well as importance category of the application. For snow - specified load = LL+0.8333DL. For wind dead load would not be considered.
- 3) Tables based on 5" Artspan panel with 24 ga light profile exterior and 24 ga fluted interior panel (Min Grade 50 ksi)
- 4) Structural capacity of the purlins/girts are not considered and must be examined independently
- 5) Fasteners are not considered and must be examined independently

17. WARRANTY AND LIMITATION OF LIABILITY

Between Artspan Inc. (“Artspan”) and the Purchaser, Dealer, Builder or Buyer (the “Purchaser”)

WARRANTY AND LIMITATION OF LIABILITY

- (1) Artspan warrants that its Goods when installed in a normal and proper manner, shall be free from any defect due to materials or workmanship for a period of one (1) year from the date of delivery. Artspan’s sole obligation under this warranty is to repair or replace such part or parts that are shown to the satisfaction of Artspan to be defective within the warranty period to an amount not in excess of the amount under this Agreement. The Purchaser shall notify Artspan in writing immediately upon discovery of any defect and Artspan shall have no liability hereunder for any claims, including shortages and field re-work. This warranty does not apply:
 - a. to any Product sold by Artspan where said Product is used in areas exposed to corrosive or aggressive conditions including, but not limited to, salt water, acids, alkaloid, ash, cement dust, animal waste or other corrosive chemicals from either inside or outside the structure;
 - b. for failures or defects arising out of damage during shipment or during storage on site;
 - c. to materials replaced or repaired under this Warranty except to the extent of the remaining term under this Warranty (if any);
 - d. to damage resulting from misuse, negligence, accident or improper site preparation by the Purchaser;
 - e. to parts and accessories and other components of the Product that are not manufactured by Artspan;
 - f. if the Product has been altered or modified by persons other than Artspan;
 - g. in the case of coating failures where the failure is the result of damage by the buyer, lack of proper maintenance by the buyer or the buyer’s failure to remove road salt and/or other contaminants the Product may have come into contact with;
 - h. to loss of time, inconvenience, loss of material, down time or any other consequential damage;
 - i. to coating repairs in respect of minor blemishes or rusting that occurs in the ordinary course and is associated with general maintenance of the Product;
 - j. to excessive wear on interior coatings of the Product;
 - k. to the Product, if used for a purpose which differs from the purpose intended by Artspan;
 - l. if the Product has not been erected, operated and installed strictly in accordance with Artspan’s manuals and instructions;
 - m. to damage caused by acts of God, falling objects, external forces, explosions, fires, riots, civil commotions, and acts of war, excessive radiations, or any other occurrences beyond the Manufacturer’s control.
 - n. to damage to the panels resulting from edge corrosion or failure of the metal substrate is not covered by this warranty.
 - o. to damage to the panels caused directly or indirectly by panel contact with fasteners is not covered by this warranty. The responsibility for selection of suitable long- lasting fasteners rest solely with the Purchaser.
 - p. to damage caused by steel shavings or minute particles from sawing sparks that come into contact with the pre-painted finish
 - q. to defects or damage to the pre-painted finish of the product, after delivery by Artspan, resulting from handling, shipping, transit, processing, improper storage or installation, or prolonged moisture contact or contact with corrosives and/or similar
- (2) Artspan shall not be liable for any incidental loss or damage, however caused, including, without limitation, normal wear and tear. In addition, the warranty expressed hereunder shall be void in the event that an alteration or repair is made to the Goods by any person other than as authorized by Artspan. This warranty does not include expendable components, if any, and any components not manufactured by Artspan.
- (3) Artspan makes no express or implied warranties of any nature whatsoever except for such express warranties as set out herein. The warranty provided herein is in lieu of and excludes all other warranties, guarantees or conditions pertaining to the Goods, written or oral, statutory, express or implied, (except the warranty as to title) including any warranty as to the merchantability or fitness for any particular purpose. Artspan expressly disclaims all other representations, conditions or warranties, express or implied, statutory or otherwise and any representations, warranties or conditions that may arise from a course of dealing or usage of trade. The warranty provided herein shall constitute Artspan’s sole obligation and liability and the Purchaser’s sole remedy for breach of warranty. No other warranty has been made by any employee, agent, or representative of Artspan and any statements contained in any other printed material of Artspan is expressly excluded herefrom. Artspan shall not be responsible for any warranty offered by the Purchaser to any of its customers with respect to the Goods and the Purchaser shall indemnify Artspan with respect to same if any of those customers make a claim against Artspan relating to any such warranty. The warranty of Artspan is not assignable by the Purchaser.
- (4) Artspan may at its sole discretion provide an extended warranty on the Goods, including but not limited to Galvalume® or pre-painted panels against perforation or paint failure. Such warranty shall be in writing and shall be signed on behalf of Artspan.

- (5) In no event will the total liability of ARTSPAN for any damages incurred by the Purchaser ever exceed the fees actually paid by the Purchaser to ARTSPAN under this Agreement, regardless of the form of action, whether based in contract, tort, warranty, negligence, strict liability, products liability or otherwise.
- (6) Oil canning and perceived waviness in the surfaces of insulated steel panels is an inherent part of the light gauge formed metal used for the faces. Surface irregularities may also be more noticeable when the metal face is coated with a highly reflective paint finish or certain colours. Oil canning is not cause for rejection or warranty claim. As an aesthetic issue only, it in no way affects the performance, structural integrity, or the paint associated with Artspan products.
- (7) Artspan shall not have any obligation under this Warranty until all accounts for materials, installation and erection of the Product, including all labor and other costs associated with the work performed by Artspan, have been paid for in full by the Purchaser.
- (8) The obligation of Artspan under this Warranty shall not arise until Artspan is notified in writing and this Warranty is presented together with a written statement by the buyer specifying the claim or defect. Such notice and written statement to be delivered to Artspan within thirty (30) days of the date the defect was first discovered.
- (9) If it is determined by Artspan, in its sole discretion, upon inspection, that a claim for a defective Product is valid, liability for breach of this Warranty and the sole remedy of the Purchaser shall be limited to either repairing or replacing the defective part(s) of the Product. No other remedy (including but not limited to the recovery of assembly or disassembly costs, shipping costs, direct, incidental, special, indirect consequential damages for lost profits, lost sales, injury to person or property or any other loss, whether arising from breach of contract, breach of warranty, tort, including negligence, strict liability or otherwise) shall be available to the Purchaser or any other person or entities whether by direct action, third party claim, or indemnity or otherwise against Artspan and/or its officers, directors, servants and agents.
- (10) The obligation of Artspan hereunder extends only to the original buyer to whom the Product was sold. This Warranty is non-transferable and non-assignable without the prior written consent of Artspan.
- (11) The Purchaser acknowledges that the Product has been customized for the buyer and the buyer has made its own independent decision to approve the use of the supplied materials in the Product as well as the specific fabrication and construction procedures utilized to complete the Product and has satisfied itself as to the suitability of the Product for its particular application.
- (12) Artspan does NOT warranty that any building material or any other material used in the manufacturing process of the Product meets local or municipal ordinances, codes, or other regulations.
- (13) The buyer shall inspect material received from Artspan prior to installation so as to mitigate expenses involved in repairing, repainting or replacing defective panels.
- (14) Warranty Claim Procedure:
 - a. Notify Artspan in writing upon discovery of any defect(s), and in any event, no later than thirty (30) days from the date the defect was first discovered.
 - b. Complete the warranty claim statement and submit with a copy of this Warranty to the Artspan for review. To be effective, the buyer shall include in all claims under this Warranty adequate identification of material(s) involved in the claim, including original invoice.
 - c. Artspan shall then have a reasonable opportunity to inspect the product before any further action shall be taken.

