Important Information

The application and detail drawings in this manual are strictly for illustration purposes and may not be applicable to all building designs or product installations. All projects should conform to applicable building codes for that particular area. It is recommended to follow all building regulations and standard industry practices.

Metal Sales Manufacturing Corporation is not responsible for the performance of the roof system if it is not installed in accordance with the suggested instructions referenced in this manual. If there is a conflict between this manual and the Metal Sales approved erection drawings, the approved erection drawings are to take precedence.

Prior to ordering and installing materials, all dimensions should be verified by field measurements.

Metal Sales reserves the right to modify, without notice, any details, recommendations or suggestions. Any questions you may have regarding proper installation of the Vertical Seam roofing system should be directed to your Metal Sales representative, see page 3.

Oil canning is not a cause for rejection. Oil canning can be described as the amount of waviness found in the flat areas of metal panels. Oil canning is an inherent characteristic of light gauge cold formed metal products, particularly those with broad flat areas. There are many factors which may contribute to oil canning that Metal Sales is not able to control. These factors include: misalignment of the support system, over driving of fasteners used on the panels, stress (whether inherent in the panel or induced), thermal expansion and contraction of the panel, material handling, width, gauge, length, color of panels, and installation. (Reference Metal Construction Association “Oil Canning Position Paper” - Appendix A).

Consult Metal Sales for any additional information not outlined in this manual.

This manual is designed to be utilized as a guide when installing Vertical Seam roofing system. It is the responsibility of the erector to ensure the safe installation of this product system.

SAFETY

STUDY APPLICABLE OSHA AND OTHER SAFETY REQUIREMENTS
BEFORE FOLLOWING THESE INSTRUCTIONS.

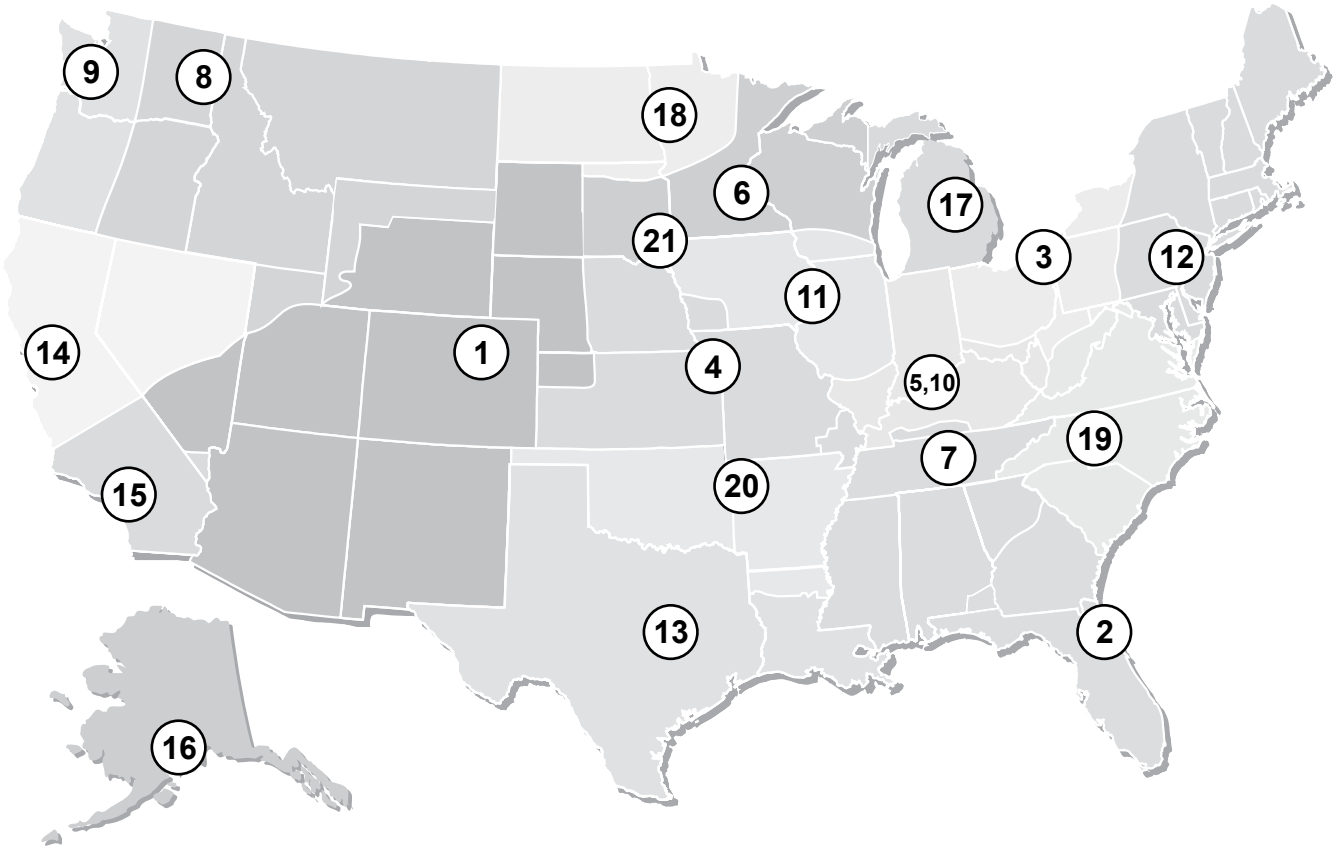
The installation of metal roof systems is a dangerous procedure and should be supervised by trained knowledgeable erectors. USE EXTREME CARE WHILE INSTALLING ROOF PANELS. It is not possible for Metal Sales to be aware of all the possible job site situations that could cause an unsafe condition to exist. The erector of the roof system is responsible for reading these instructions and determining the safest way to install the roof system.

These instructions are provided only as a guide to show a knowledgeable, trained erector the correct parts placement one to another. If following any of the installation steps would endanger a worker, the erector should stop work and decide upon a corrective action.

Provide required safety railing, netting, or safety lines for crew members working on the roof.

Do not use the roof panel as a walking platform. The roof panels will not withstand the weight of a person standing at the edge of the panel.

Do not stand on the roof panel at the ends until the panels have been attached.



metal sales
manufacturing corporation

Metal Sales offers a complete line of metal roof, wall, and fascia panel systems for the commercial, architectural, industrial, residential, and agricultural markets. We offer over 75 profiles with a wide selection of widths, colors, and gauges - new construction or retrofit. In addition, Metal Sales offers Energy Star certified colors, a 45 year paint warranty, and a series of panels that are tested for wind, fire, and uplift.

800.406.7387 • www.metalsales.us.com

METAL SALES LOCATIONS

1.) DENVER BRANCH
7990 E. I-25 Frontage Rd
Longmont, CO 80504
303.702.5440
800.289.7663
800.289.1617 /FAX

2.) JACKSONVILLE BRANCH
7110 Stuart Avenue
Jacksonville, FL 32254
904.783.3660
800.394.4419
904.783.9175 /FAX

3.) JEFFERSON BRANCH
352 East Erie Street
Jefferson, OH 44047
440.576.9070
800.321.5833
440.576.9242 /FAX
800.233.5719 /FAX

4.) INDEPENDENCE BRANCH
1306 S. Powell Road
Independence, MO 64057
816.796.0900
800.747.0012
816.796.0906 /FAX

5.) SELLERSBURG BRANCH
7800 State Road 60
Sellersburg, IN 47172
812.246-1866
800.999.7777
812.246.0893 /FAX
800.477.9318 /FAX

6.) ROGERS BRANCH
22651 Industrial Blvd.
Rogers, MN 55374
763.428.8080
800.328.9316
763.428.8525 /FAX
800.938.9119 /FAX

7.) NASHVILLE BRANCH
4314 Hurricane Creek Blvd.
Antioch, TN 37013
615.641.7100
800.251.8508
615.641.7118 /FAX

8.) SPOKANE BRANCH
East 2727 Trent Avenue
Spokane, WA 99202
509.536.6000
800.572.6565
509.534.4427 /FAX

9.) SEATTLE BRANCH
20213 84th Avenue, South
Kent, WA 98032
253.872.5750
800.431.3470 (outside WA)
800.742.7900 (inside WA)
253.872.2008 /FAX

10.) NEW ALBANY BRANCH
999 Park Place
New Albany, IN 47150
812.944.2733
812.944.1418 /FAX

11.) ROCK ISLAND BRANCH
8111 West 29th Street
Rock Island, IL 61201
309.787.1200
800.747.1206
309.787.1833 /FAX

12.) DEER LAKE BRANCH
29 Pinedale Industrial Rd
Orwigsburg, PA 17961
570.366.2020
800.544.2577
570.366.1648 /FAX
800.544.2574 /FAX

13.) TEMPLE BRANCH
3838 North General Bruce Dr.
Temple, TX 76501
254.791.6650
800.543.4415
254.791.6655 /FAX
800.543.4473 /FAX

14.) WOODLAND BRANCH
1326 Paddock Place
Woodland, CA 95776
530.668.5690
800.759.6019
530.668.0901 /FAX

15.) FONTANA BRANCH
14213 Whittram Avenue
Fontana, CA 92335
909.829.8618
800.782.7953
909.829.9083 /FAX

16.) ANCHORAGE BRANCH
4637 Old Seward Hwy.
Anchorage, AK 99503
866) 640.7663
907) 646.7663
907) 646.7664 /FAX

17.) BAY CITY BRANCH
5209 Mackinaw Rd.
Bay City, MI 48706
989.686.5879
888.777.7640
989.686.5870 /FAX
888.777.0112 /FAX

18.) DETROIT LAKES BRANCH
1435 Egret Avenue
Detroit Lakes, MN 56501
218.847.2988
888.594.1394
218.847.4835 /FAX
888.594.4835 /FAX

19.) MOCKSVILLE BRANCH
188 Quality Drive
Mocksville, NC 27028
336.751.6381 Phone
800.228.6119 Toll Free
336.751.6301 Fax
800.228.7916 Toll Free Fax

20.) FORT SMITH BRANCH
7510 Ball Road
Fort Smith, AR 72908
479.646.1176 Phone
877.452.3915 Toll Free
479.646.5204 Fax

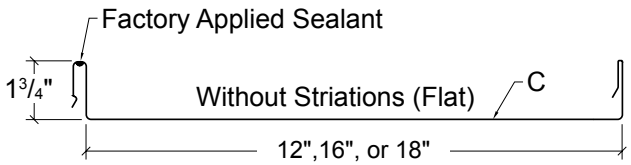
21.) SIOUX FALLS BRANCH
2700 West Third Street, Suite 4
Sioux Falls, SD 57104
605.335.2745 Phone
888.902.8320 Toll Free

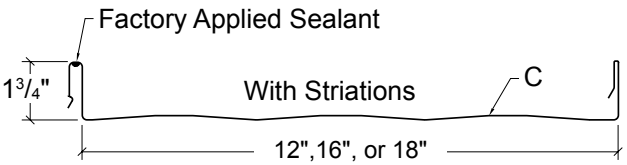
TECHNICAL SUPPORT

TECHNICAL SERVICES
545 South 3rd Street, Suite 200
Louisville, KY 40202
502.855.4300 Phone
800.406.7387 Toll Free
502.855.4290 /FAX

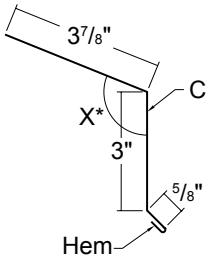
VERTICAL SEAM

Panel / Flashing Profiles



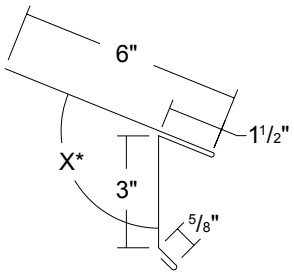


EAVE



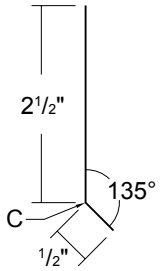
Length 10'-2" - *Specify Slope Angle

EXTENDED EAVE



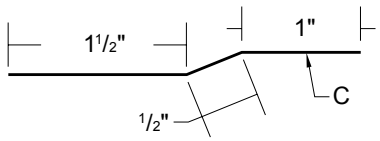
Length 10'-2" *Specify Slope Angle

CLEAT



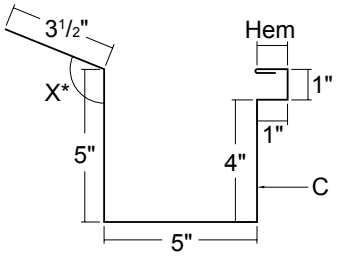
Length 10'-2"

OFFSET CLEAT



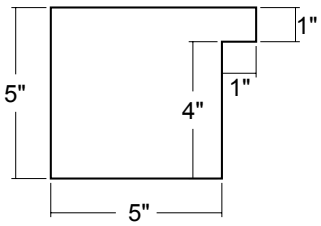
Length 10'-2"

BOX GUTTER

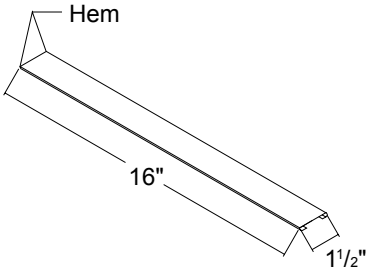


Length 10'-2", 20'-3" - *Specify Slope Angle

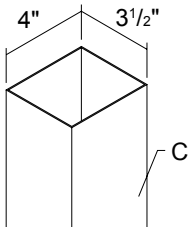
BOX GUTTER END



UNIVERSAL GUTTER/ DOWNSPOUT STRAP

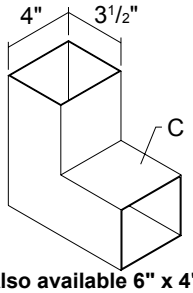


DOWNSPOUT 4" x 3 1/2"



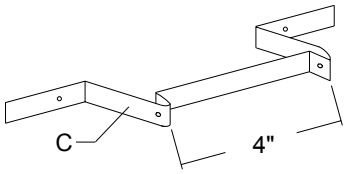
Length 10'-2", 20'-3"
(Also available 6" x 4")

95⁰ ELBOW 4" x 3 1/2"



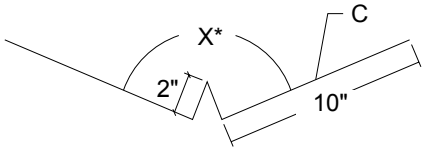
(Also available 6" x 4")

DOWNSPOUT BRACKET



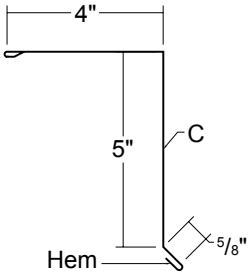
(Also available 6")

VALLEY



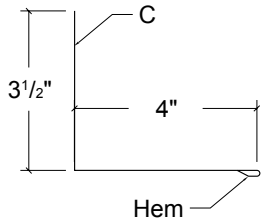
Length 10'-2", 20'-3" - *Specify Slope Angle

RAKE



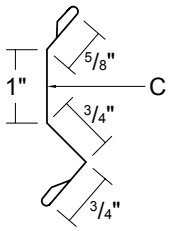
Length 10'-2", 20'-3"

RAKEWALL



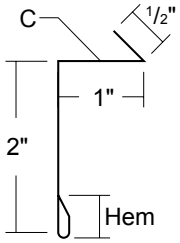
Length 10'-2", 20'-3"

COUNTER FLASHING



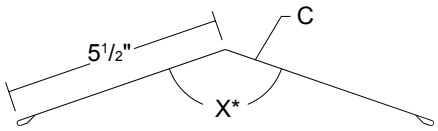
Length 10'-2"

REGLET FLASHING



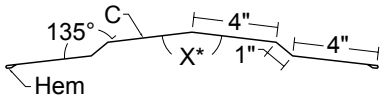
Length 10'-2"

11" RIDGE/HIP COVER



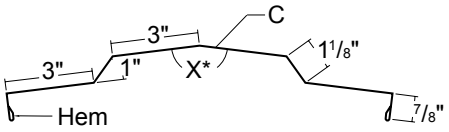
Length 10'-2", 20'-3" - *Specify Slope Angle

SSR RIDGE



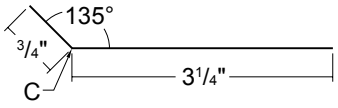
Length 10'-2", 20'-3" - *Specify Slope Angle

VENTED RIDGE COVER



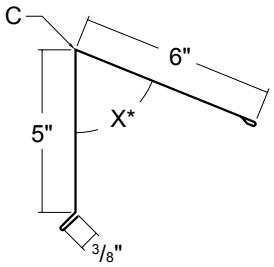
Length 10'-2", 20'-3" - *Specify Slope Angle

VENT DRIP



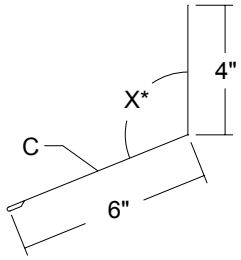
Length 10'-2"

PEAK



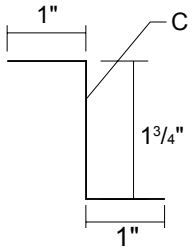
Length 10'-2", 20'-3" - *Specify Slope Angle

PITCH BREAK



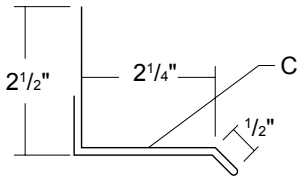
Length 10'-2", 20'-3" - *Specify Slope Angle

Z-CLOSURE



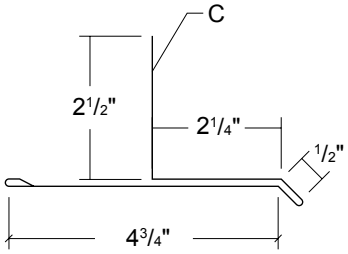
Length 10'-2"

2.25" SILL/HEAD



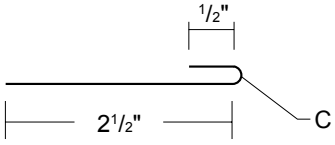
Length 10'-2", 20'-3"

2.25" SILL TO SOFFIT



Length 10'-2", 20'-3"

STARTER

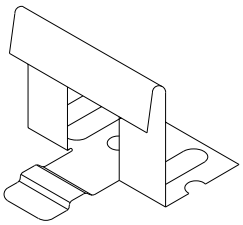


Length 10'-2"

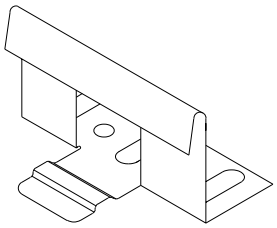
C- Indicates color side of flashing.

VERTICAL SEAM Accessory Profiles

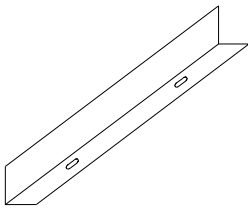
VERTICAL SEAM CLIP



VERTICAL SEAM UL-90 CLIP

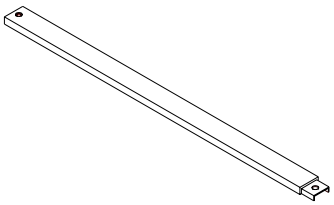


FLOATING RAKE ANGLE



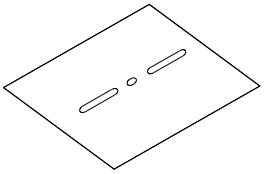
Length 10'-0"
Height 1 3/4"
Galvanized

BACK-UP CHANNEL



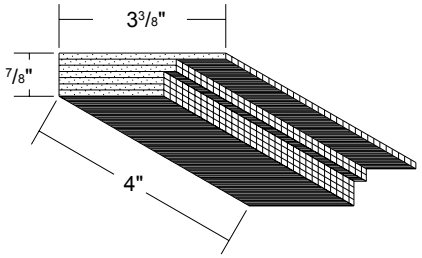
Length 48" and 72"
Galvanized

BEARING PLATE

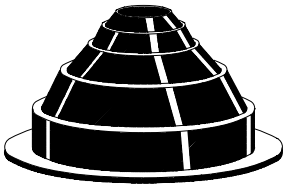


4" X 5"

VENT MATERIAL

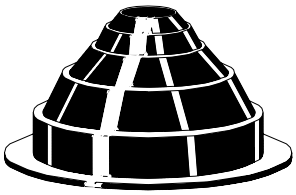


RUBBER ROOF JACK



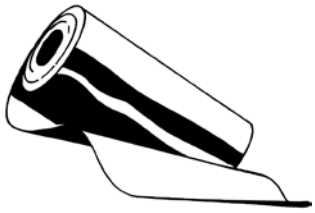
MINI (1/4" to 1 1/8" O.D. Pipe)
#2 (1 3/4" to 3" O.D. Pipe)
#4 (3" to 6" O.D. Pipe)
#6 (6" to 9" O.D. Pipe)
#8 (7" to 13" O.D. Pipe)

RETRO ROOF JACK



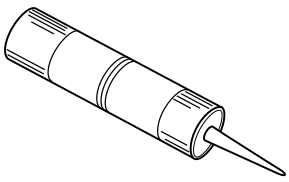
#801RETRO (3/4" to 2 3/4" O.D. Pipe)
#802RETRO (2" to 7 1/4" O.D. Pipe)
#803RETRO (3 1/4" to 10" O.D. Pipe)

RUBBER ROOF FLASH KIT



12" x 50'-0" Flash Kit
18" x 50'-0" Flash Kit

TUBE SEALANT

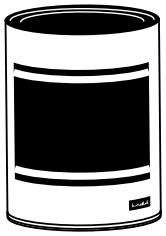


10.3 oz. Cartridge
Urethane

TAPE SEALANT

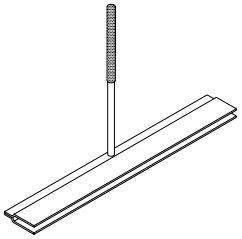
7/8" X 3/16" X 25'
Double Bead
Butyl - Gray

TOUCH-UP PAINT



Available in Pints
PVDF / MS CF30

METAL PANEL HEMMING TOOL



RECEIVING MATERIAL

It is the responsibility of the installer to unload material from the delivery truck. The installer shall be responsible for providing suitable equipment for unloading of material from the delivery truck.

After receiving material, check the condition of the material, and review the shipment against the shipping list to ensure all materials are accounted for. If damages or shortages are discovered, it should be noted on the Bill of Lading at the time of delivery. A claim should be made against the carrier as soon as possible. **Metal Sales is not responsible for any damages or shortages unless they are documented in writing and presented to Metal Sales within 48 hours of delivery.**

GENERAL HANDLING

Each bundle should be handled carefully to avoid being damaged. Care should be taken to prevent bending of the panel or abrasion to finish. Whenever possible, the bundle should remain crated until it is located in its place of storage. If bundles must be opened, we recommend you recrate them before lifting. To avoid damage, please lift the bundle at its center of gravity.

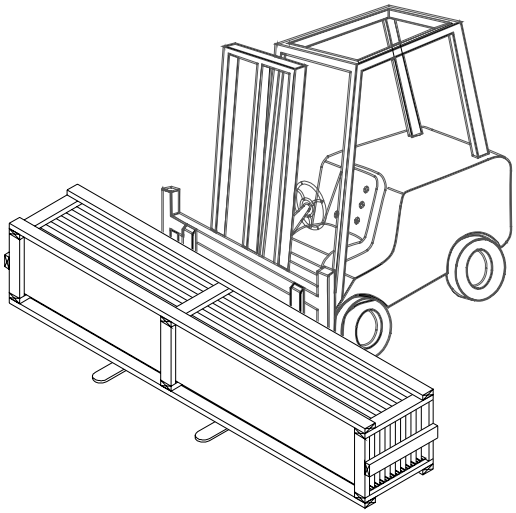
CAUTION

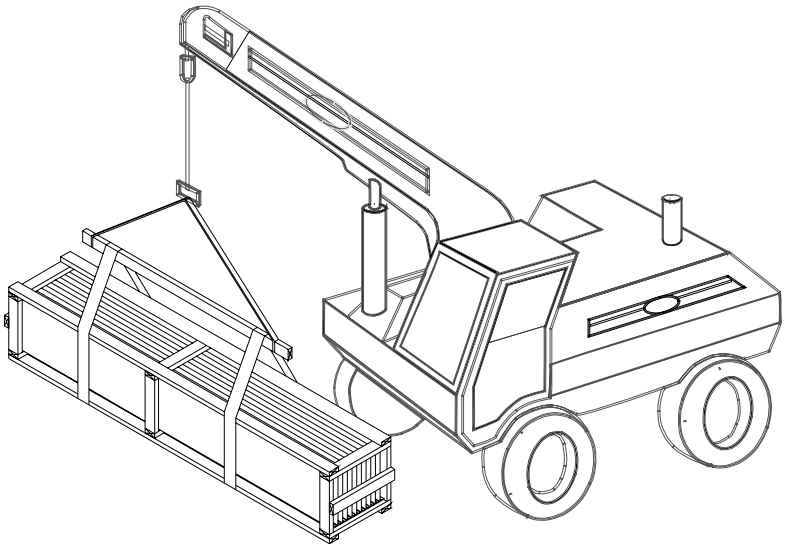
Improper loading and unloading of bundles and crates may result in bodily harm and/or material damage. Metal Sales is not responsible for bodily injuries and/or material damages resulting from improper loading and unloading.

MECHANICAL HANDLING

Forklift - A forklift may be used for panels up to 20'-0" long. Please make sure the forks are at their maximum separation. Do not transport open bundles. When transporting bundles across rough terrain, or over a longer distance, some means of supporting the panel load must be used.

Crane - A crane should be used when lifting panels with lengths greater than 20'-0". Please be sure to utilize a spreader bar to ensure the even distribution of the weight to the pick up points. As a rule when lifting panels, no more than $^1/_3$ of the length of the panel should be left unsupported. Never use wire rope because this will damage the panels.



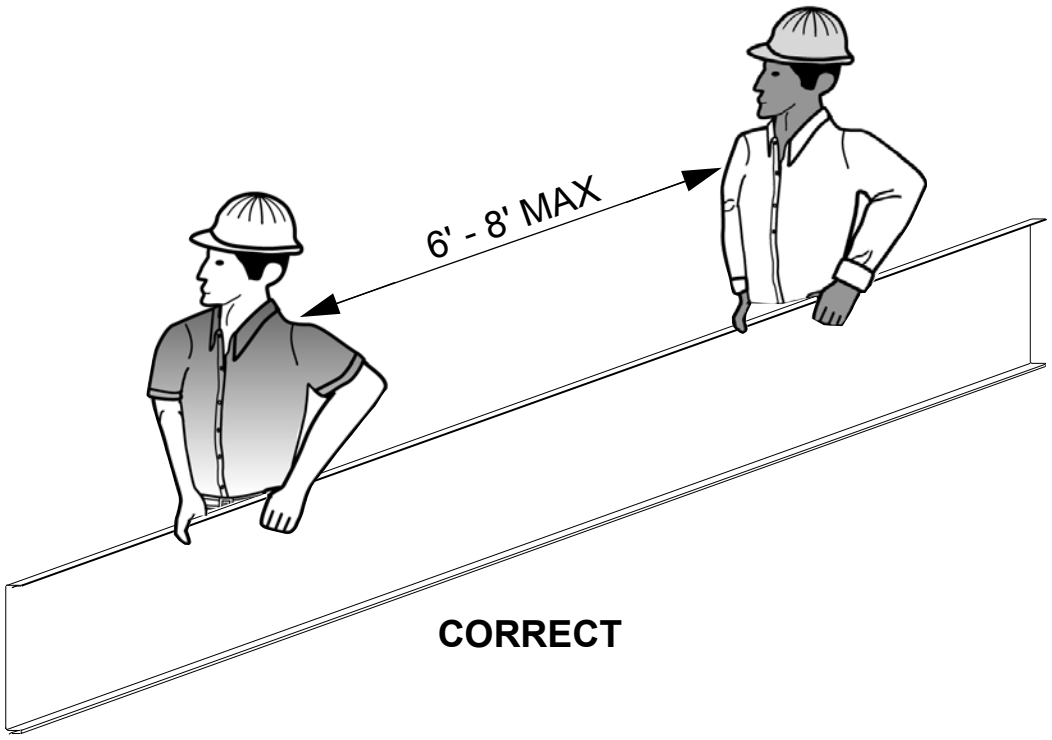


MANUAL HANDLING

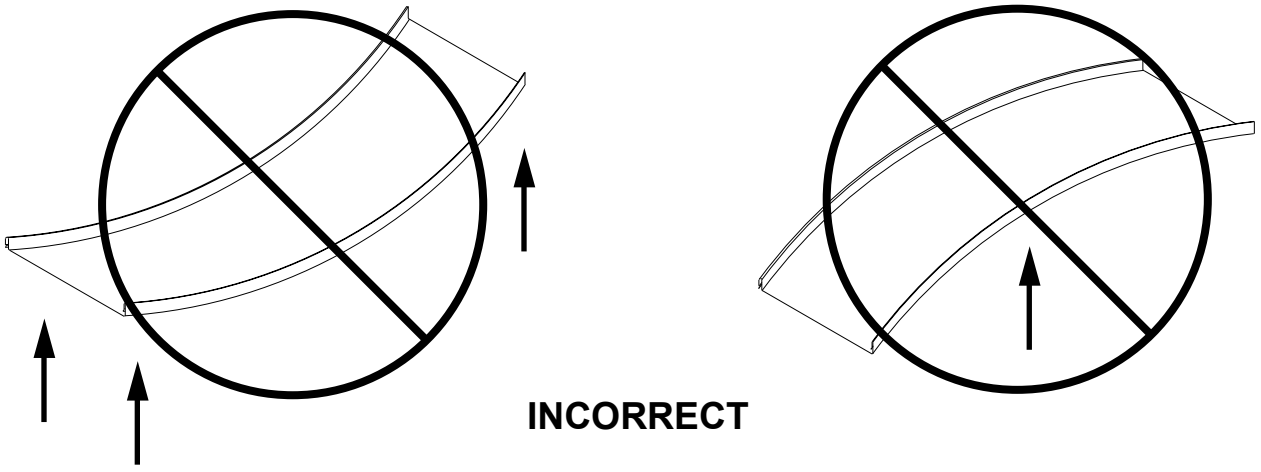
When handling painted steel, care should be taken to prevent scratching of material. Clean gloves should be worn at all times to prevent a reaction with salts found on bare skin. Installers should wear rubber sole shoes to keep from scuffing material while walking on the roof.

Handling of individual panels should be done carefully and properly to avoid bending or damaging. Vertical Seam panels should be carried by grasping the edge of the panel so that the Vertical Seam panel is vertical to the ground. The Vertical Seam panel should not be carried with the panel horizontal to the ground as this could cause the panel to buckle or bend in the center.

Normally individual panels can be handled by people placed every 6'-0" to 8'-0" along the length of the panel.



CORRECT

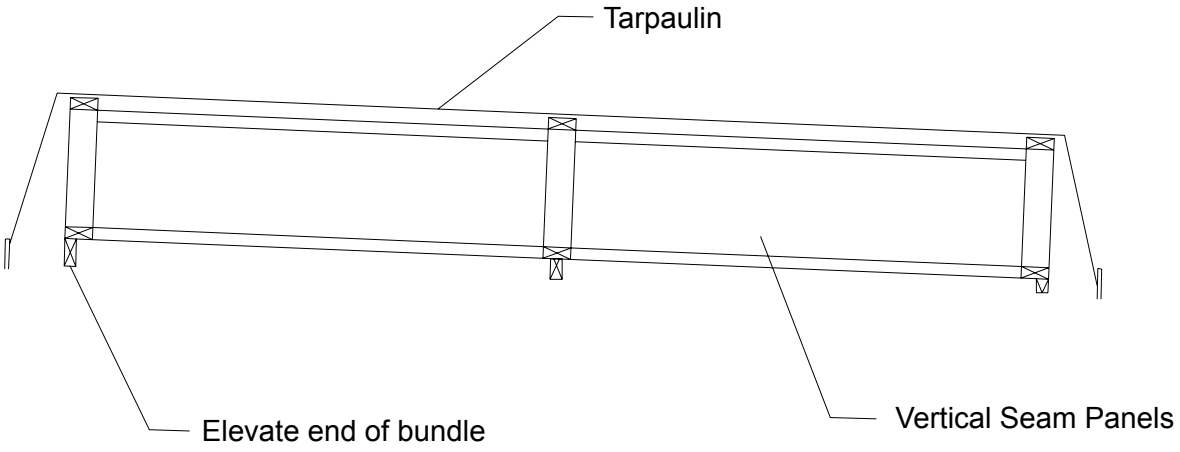


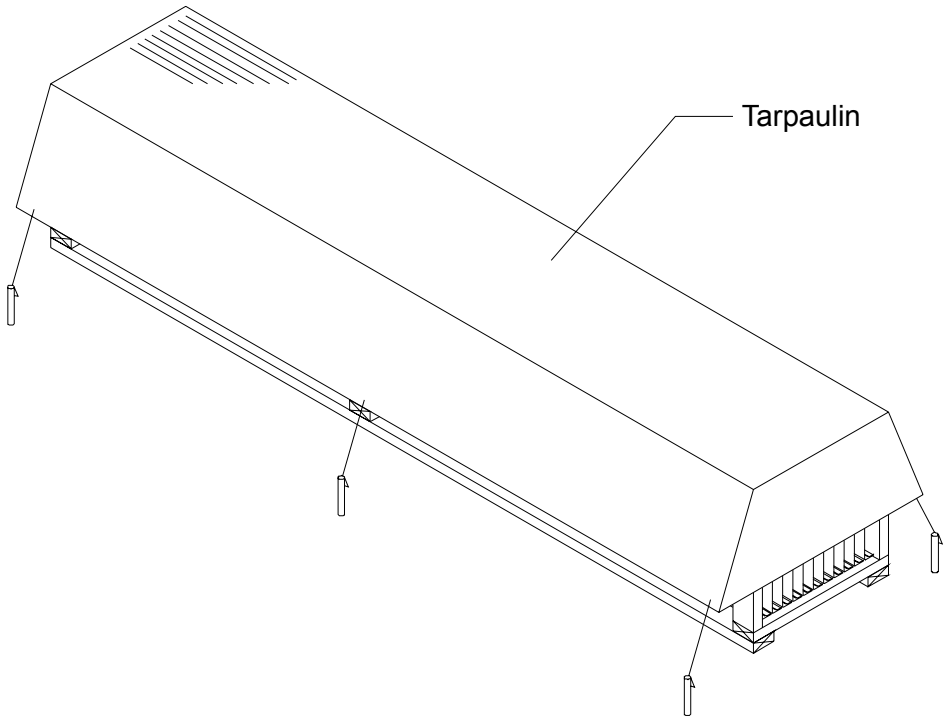
INCORRECT

GENERAL

Please inspect panels for moisture accumulation. If moisture has formed, the panels should be unbundled, wiped dry, and allowed to dry completely. Once dry, carefully restack the panels and loosely recover allowing for ample air circulation.

Bundled sheets should be stored high enough off of the ground to allow for air circulation and prevent contact with accumulating water. If possible, elevate one end of the bundle to allow any moisture to run off the panels. Metal Sales recommends covering the bundle with a tarpaulin. Do not use tight fitting plastic-type tarpaulins as panel bundle covers. While they may provide protection from heavy downpours, they can also retard necessary ventilation and trap heat and moisture that may accelerate metal corrosion. If panels are to be stored in possible bad weather, we suggest they be stored inside. Extended storage of panels in a bundle is not recommended. **Under no circumstances should the sheets be stored near or come in contact with salt water, corrosive chemicals, ash, or fumes generated or released inside the building or nearby plants, foundries, plating works, kilns, fertilizer, and wet or green lumber.**



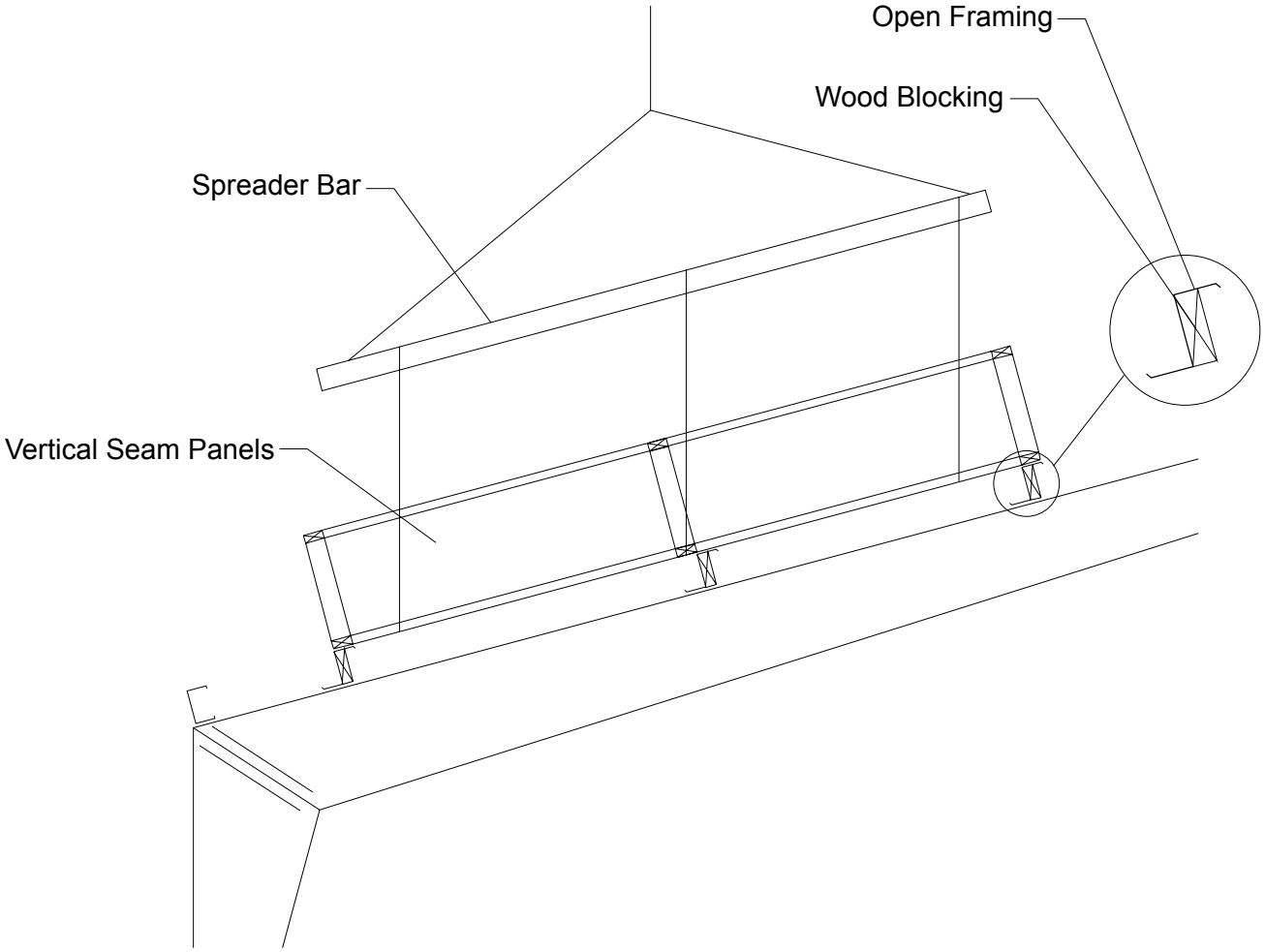


STORAGE ON ROOF

To facilitate the handling of Vertical Seam panels, panel bundles may be lifted and placed on the roof. Loading capabilities of the roof structure must be checked. Bundles need to be placed on the roof in areas that the roof structure can handle the weight.

When lifting packaged sheets, make certain they are adequately supported. Panels less than 20'-0" in length can normally be lifted with a forklift; however, when lifting panels in excess of 20'-0", it is recommended that a spreader bar and slings be used. As a rule, when lifting, no more than 1/3 of the length of the panel should be left unsupported.

Make a plan for bundle placement by determining how much area a bundle of panels will cover. Bundles should be placed on the roof in accordance with the direction the panel will be installed. Consider where the string line, if any, is to run at the eave to set roof panels by. Roof bundles should not interfere with this string line.

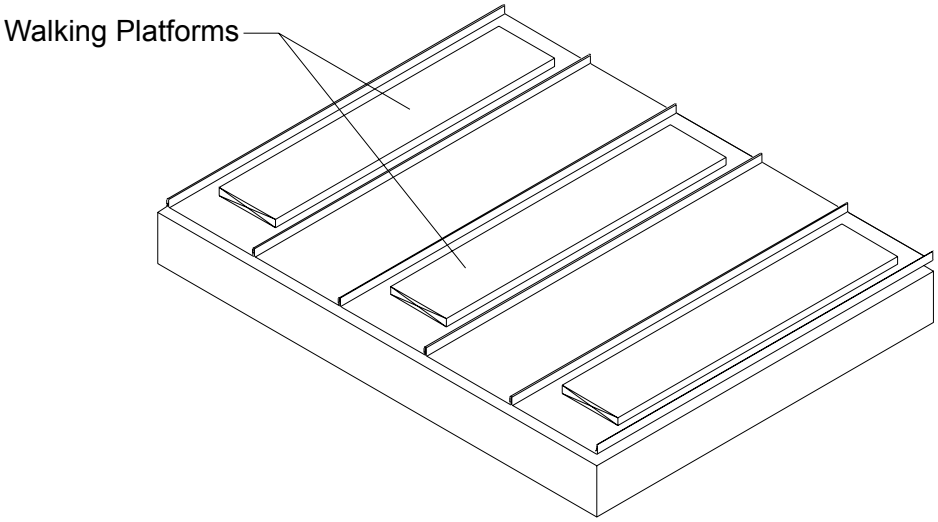


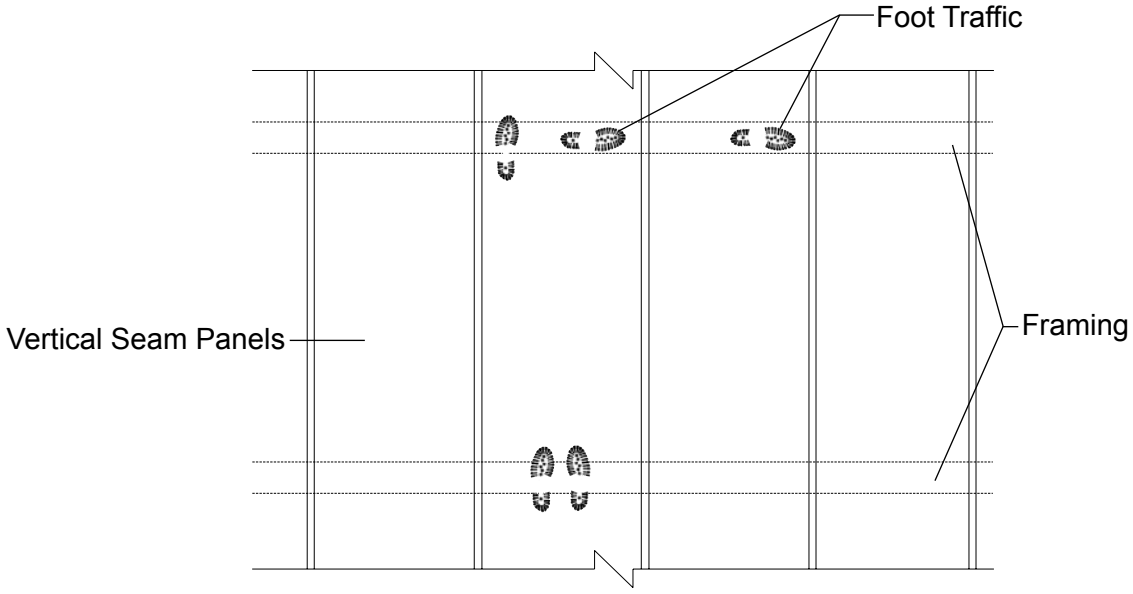
Care of metal panels and flashings must be exercised throughout erection. Foot traffic can cause distortion of panel and damage to finish. Traffic over the installed system must be kept to an absolute minimum. If continuous foot traffic is necessary for maintenance over certain areas of the roof, then a permanent walkway should be installed.

If metal panels are installed over open framing, do not use the roof panel as a walking platform. The roof panels will not withstand the weight of a person standing at the edge of the panel. Provide walking platforms to avoid any panel damage as shown below.

When walking on the roof panels is unavoidable, walk only in the flats of the panel. Walking on the ribs can cause damage to the panels. If Vertical Seam is installed over open framing, step in the flat of the panel only and as close to the framing as possible.

OVER OPEN FRAMING





FIELD CUTTING

Tin snips or a "nibbler" type electric tool are recommended for field cutting Vertical Seam panels. Cutting the steel generates slivers or metal chips. These slivers and metal chips must be immediately removed from the Vertical Seam panels because they will damage the finish and shorten the life of the product.

One method of preventing this problem is to flip the Vertical Seam panels over when cutting. This allows the slivers and metal chips to be brushed from the back side and avoids damaging the paint on the top side of the panels.

When cutting Vertical Seam panels, goggles must be worn for eye protection.

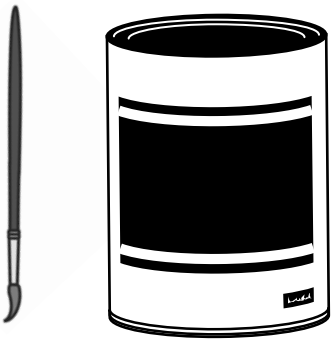
CAUTION

All product surfaces should be free of debris at all times. Installed surfaces should be wiped clean at the end of each work period. Never cut panels over metal surfaces. Metal shavings will rust on the surface, voiding the warranty.

TOUCH-UP PAINT

All painted panels and flashings have a factory applied baked on finish. Handling and installing panels may result in some small scratches or nicks to the paint finish. Touch-up paint is available in matching colors from Metal Sales. It is recommended that a small brush be used to apply touch-up paint to those areas that are in need of repair. Touch-up paint does not have the superior chalk and fade resistance of the factory applied paint finish and will normally discolor at an accelerated rate. Aerosol paint should not be used because of the overspray that may occur.

SPRAY PAINT



TOUCH-UP PAINT

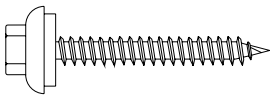
VERTICAL SEAM

Fastener Selection Guide

POP RIVET

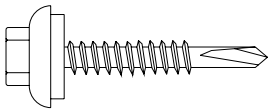
SIZE	TYPE	FINISH	APPLICATION
1/8" x 3/16"	A	Unpainted	Flashing to Panel or Flashing
1/8" x 3/16"	A	Painted	Flashing to Panel or Flashing

WOODSCREW XL



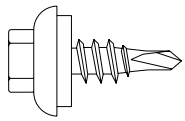
SIZE	TYPE	FINISH	APPLICATION
#9-15 x 1"	A	Unpainted	Panel or Flashing to wood substructure
#9-15 x 1 1/2"	A	Unpainted	
#9-15 x 2"	A	Unpainted	
#9-15 x 1"	A	Painted	Panel or Flashing to wood substructure
#9-15 x 1 1/2"	A	Painted	
#9-15 x 2"	A	Painted	

SELF DRILLER XL



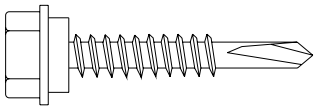
SIZE	TYPE	FINISH	APPLICATION
#12-14 x 1 1/4"	Driller	Unpainted	Panel or Flashing to metal substructure
#12-14 x 1 1/2"	Driller	Unpainted	
#12-14 x 1 1/4"	Driller	Unpainted	
#12-14 x 1 1/4"	Driller	Painted	Panel or Flashing to metal substructure
#12-14 x 1 1/2"	Driller	Painted	
#12-14 x 1 1/4"	Driller	Painted	

STITCH SCREW XL



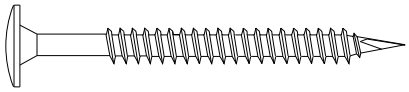
SIZE	TYPE	FINISH	APPLICATION
#1/4 - 14 x 7/8"	Stitch	Unpainted	Flashing to Panel or Flashing
#1/4 - 14 x 7/8"	Stitch	Painted	Flashing to Panel or Flashing

SHOULDER SELF DRILLER



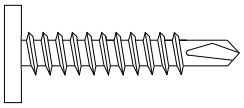
SIZE	TYPE	FINISH	APPLICATION
#12-14 x 1 1/4"	Driller	Plated	For use with Floating Rake Zee to substructure

DEKFAST



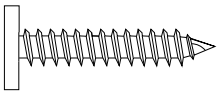
SIZE	TYPE	FINISH	APPLICATION
#14-13 x 1 5/8"	Driller	Black	Panel Clip to metal deck and rigid board insulation assembly or wood substructure
#14-13 x 4"	Driller	Black	
#14-13 x 5"	Driller	Black	
#14-13 x 6"	Driller	Black	
#14-13 x 8"	Driller	Black	

PANCAKE HEAD DRILLER



SIZE	TYPE	FINISH	APPLICATION
#10-16 x 1" (#2 Point)	Driller	Plated	Panel/clip/flashing to metal framing or decking

PANCAKE HEAD WOODSCREW

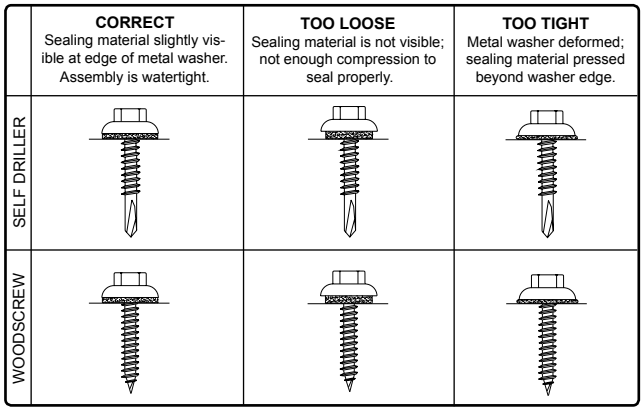


SIZE	TYPE	FINISH	APPLICATION
#10-12 x 1"	A	Plated	Panel/clip/flashing to wood substructure

TECHNIQUE

Recommended Tool Type - Use depth locating nose or adjustable clutch on screw gun to prevent overdrilling and strip out. **Do not use impact tools or runners.**

Seating the washer - Apply sufficient torque to seat the washer - do not overdrive the fastener.



To prevent wobbling - Make sure fastener head is completely engaged in the socket. If the head does not go all the way in the socket - tap the magnet deeper into the socket to allow full head engagement. Metal chips will build up from drilling and should be removed from time to time.

Protect drill point - Push only hard enough on the screw gun to engage clutch. This prevents excess friction and burn out of the drill point. Correct pressure will allow screw to drill and tap without binding.

Drilling through sheet and insulation - Ease up on pressure when drilling through insulation to avoid striking the purlin or girt with the point - apply more pressure after drill point contacts purlin or girt.

Drilling through purlin overlaps - Drilling through lapped purlins requires extra care. Excessive voids between purlins sometimes damages drill points and two self-drillers might be necessary to complete the operation. It is sometimes advantageous to predrill.

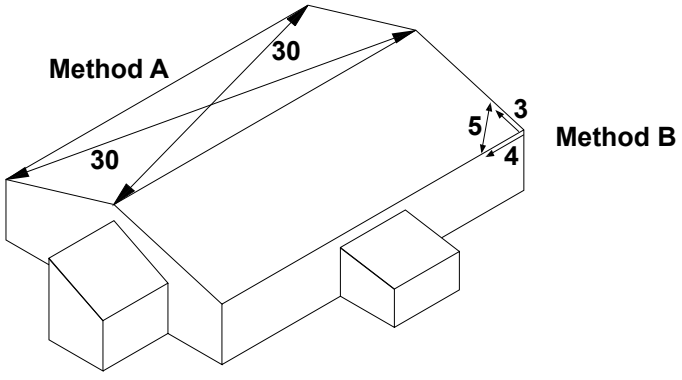
CONDITION OF SUBSTRUCTURE

Whether over solid substrate or open structural framing, panel distortion may occur if not applied over properly aligned and uniform substructure.

The installer should check the roof deck for squareness before installing Vertical Seam panels. Several methods can be used to verify squareness of the structure for proper installation of the panels.

METHOD "A" - One method for checking the roof for squareness is to measure diagonally across one slope of the roof from similar points at the ridge and eave and obtain the same dimension.

METHOD "B" - The 3-4-5 triangle system may also be used. To use this system measure a point from the corner along the edge of the roof at a module of three (3). Measure a point from the same corner along another edge at a module of four (4). Then by measuring diagonally between the two points established, the dimension should be exactly a module of five (5) to have a square corner. Multiple uses of this system may be required to determine building squareness. If the endwall cannot be made square, the roof system cannot be installed as shown in these instructions.



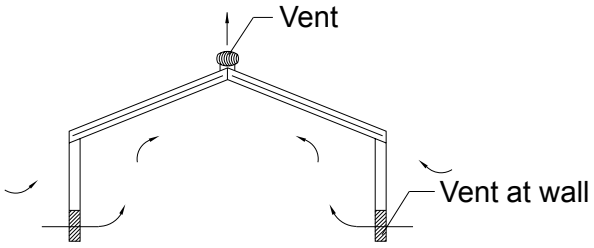
VENTILATION

Proper design and installation of vapor barriers and ventilation systems are important to prevent condensation and the resulting problems of moisture damage and loss of insulation efficiency.

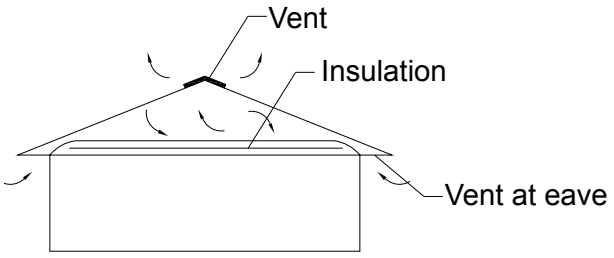
Condensation occurs when moisture laden air comes in contact with a surface temperature equal to or below the dew point of the air. This phenomenon creates problems that are not unique with metal buildings; these problems are common to all types of construction.

The underside of the metal roof on a typical metal building (no attic) should be protected from condensation by insulating with a faced insulation. This should reduce the potential of condensation forming on the underside of the panels.

On buildings that have an attic space or are being retrofitted with a metal roofing system, vents should be placed at both the eave and peak of the roof in order to prevent a buildup of moisture (humidity) in the attic space.



TYPICAL METAL BUILDING (NO ATTIC)

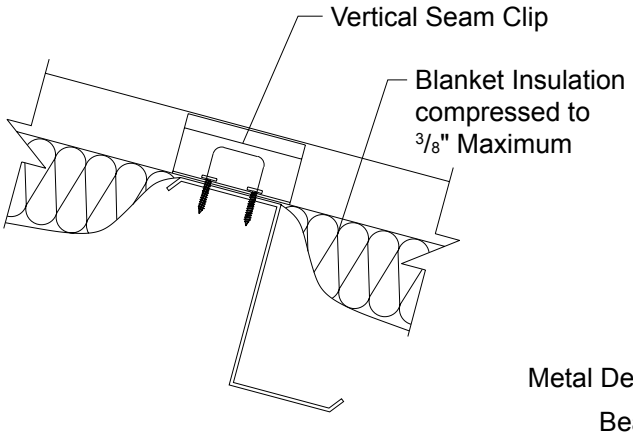


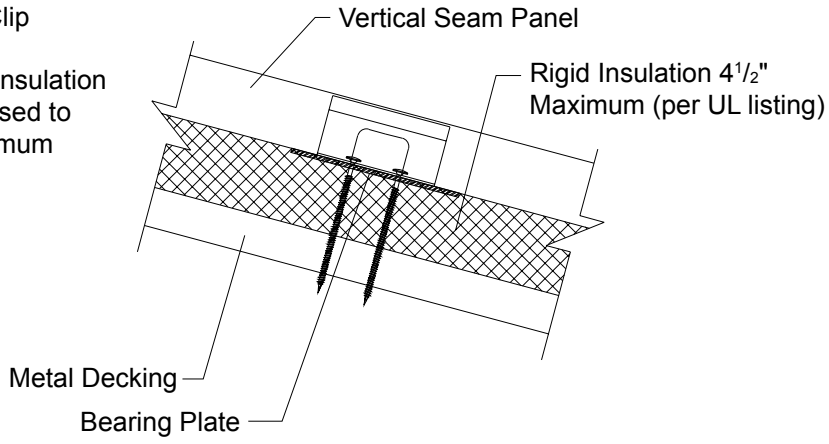
BUILDING WITH ATTIC OR RETROFITTED

INSULATION

Insulation is recommended on all applications to act as a sound barrier, prevent condensation, and increase insulating value of the roof or ceiling system.

Typically, panels are installed over solid substrate but can be installed over open framing or metal decking (shown below) with many different types of insulation. Blanket, rigid, and reflective insulation are just a few. Maximum thickness for blanket insulation is four inches. Please contact your insulation supplier for specific recommendations on type of insulation, vapor barriers, and installation procedures.



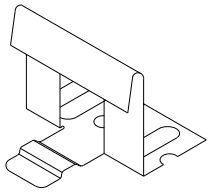


CAUTION

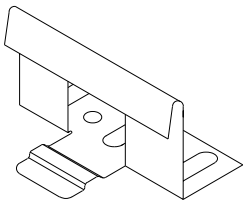
Use extreme care when working next to insulation. The insulation will provide a false sense of security by hiding the view of the ground below the insulation.

SELECTION OF SYSTEM COMPONENTS

Vertical Seam Panel Clip - Clips are placed along the male leg of each panel prior to installing adjacent panels. Design wind uplift must be considered for proper clip spacing.



VERTICAL SEAM CLIP

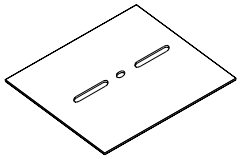


VERTICAL SEAM UL-90 CLIP
(2 Fasteners Required)

The following chart should be used to determine proper fasteners required for clip installation on the selected applications (see Fastener Selection Guide page 14 for other fasteners available).

APPLICATION	INSTALLATION REQUIREMENTS		**CLIP SPACING	TYPE OF FASTENER	# REQ.
CLIPS OVER PURLINS (16 GA. MIN)	UL-90	24 GAUGE	4'-0" O.C.	#10 X 1" PANCAKE HEAD DRILLER	- 2 FASTENERS
	UL-90	22 GAUGE	4'-0" O.C.	#10 X 1" PANCAKE HEAD DRILLER	- 2 FASTENERS
	UL-90	22 GAUGE	5'-0" O.C.***	#10 X 1" PANCAKE HEAD DRILLER	- 2 FASTENERS
CLIPS OVER 5/8" WOOD DECK	UL-90	24 GAUGE	4'-0" O.C.	#10 X 1" PANCAKE HEAD WOOD	- 2 FASTENERS
	UL-90	22 GAUGE	4'-0" O.C.	#10 X 1" PANCAKE HEAD WOOD	- 2 FASTENERS
CLIP OVER RIGID INSULATION / METAL DECK	UL-90	24 GAUGE	4'-0" O.C.	DEKFAST #14*	- 2 FASTENERS
	UL-90	22 GAUGE	4'-0" O.C.	DEKFAST #14*	- 2 FASTENERS

* Length of Dekfast will vary depending on the total thickness of the rigid insulation and metal.
** Contact your local Metal Sales branch representative for more information (see pages 2 and 3).
*** 12" Panel Only.

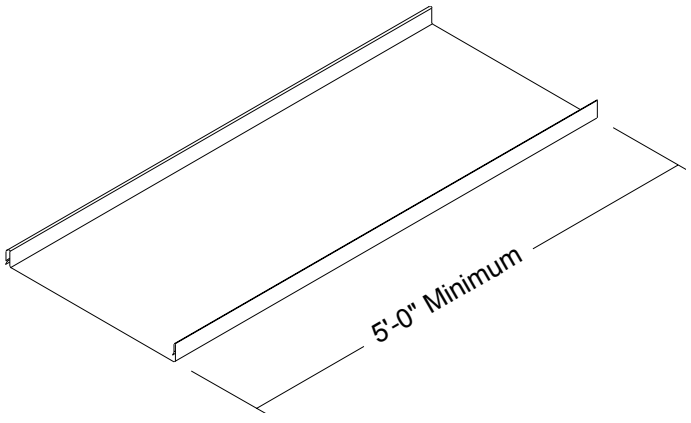


BEARING PLATE
(Flat)

PANEL LENGTH

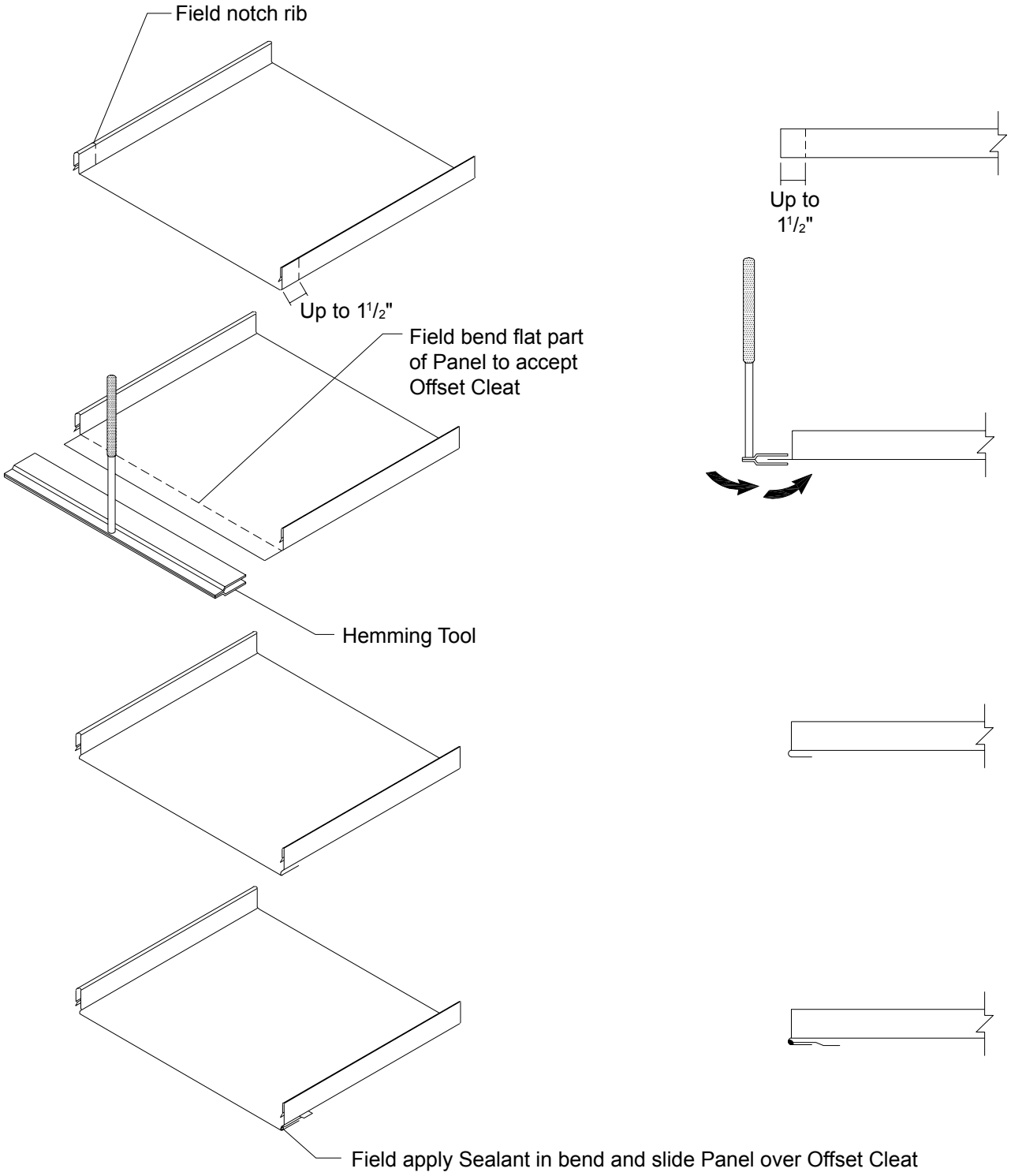
Length - Minimum factory cut length is 5'-0" on panels. Panels over 45'-0" require additional consideration in packaging, shipping, and erection. Please consult Metal Sales for recommendations.

There are two critical measurements involving Vertical Seam roof panels: the length of panel overhang required at the eave, and the peak end. In each case a certain measurement is required. Check each measurement to ensure panel placement gives you the distance required at the eave, and peak condition. In most cases any variance can be taken out at the eave or peak ends.



PANEL HEMMING

Panels must be field notched and hemmed when using an offset cleat.



FIELD HEMMING STEPS

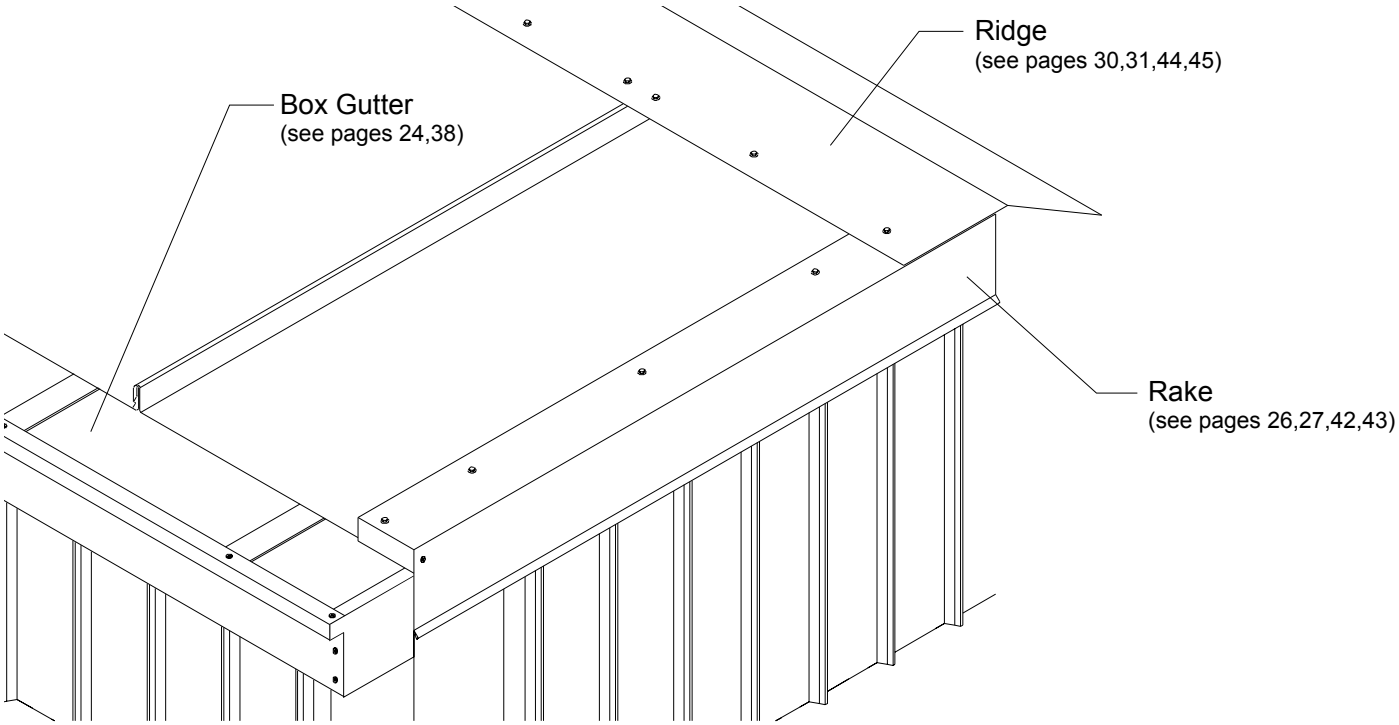
1. Field notch male and female legs of panel up to 1½" from end of panel.
2. Place the hemming tool onto the protruding pan of the panel and bend down to form an open hem.
3. Place a continuous bead of tube sealant inside the open hem.
4. Engage offset cleat into open hem at the end of the panel to start panel installation.

Installation Procedure Overview

The following procedures (pages 20-46) are presented as a general guide for installing Vertical Seam panels, flashings, and accessories on a typical building or residence. Details are shown for installing Vertical Seam and related flashings over solid decking and over open framing. For other applications please contact Metal Sales.

The installation procedures will involve:

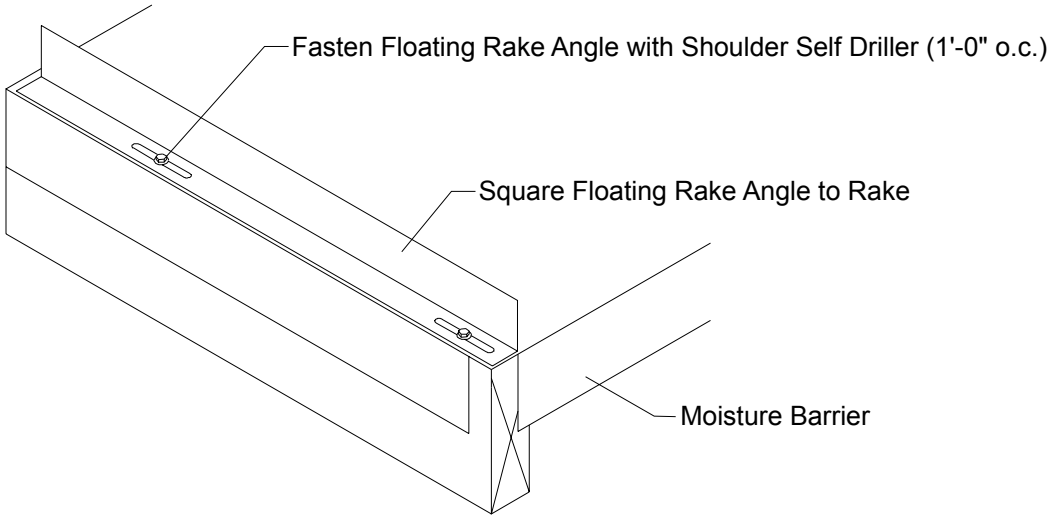
1. Panel installation from left to right (looking from eave to peak).
2. Panel clip installation.
3. Eave condition installation.
4. Extended Eave condition installation.
5. Box Gutter condition installation.
6. Valley condition installation.
7. Rake condition installation.
8. Rakewall condition installation.
9. Ridge condition installation.
10. Vented Ridge condition installation.
11. Peak condition installation.
12. Highside Parapet condition installation.



INSTALLING FLOATING RAKE ANGLE

STEP 1

1. Install Floating Rake Angle at all rake and rake parapet conditions. Square Floating Rake Angle to rake condition. **It is critical that Floating Rake Angle be square to building as this will control alignment of panels (see page 15 to check building square).**
2. Fasten to decking with #12-14 x 1¼" Shoulder Self Driller screws at 1'-0" o.c. **Do not over tighten screws for it is imperative that the Vertical Seam roof system be allowed to float.**
3. If two or more Floating Rake Angles are required, butt ends. **Do not overlap Floating Rake Angles.**

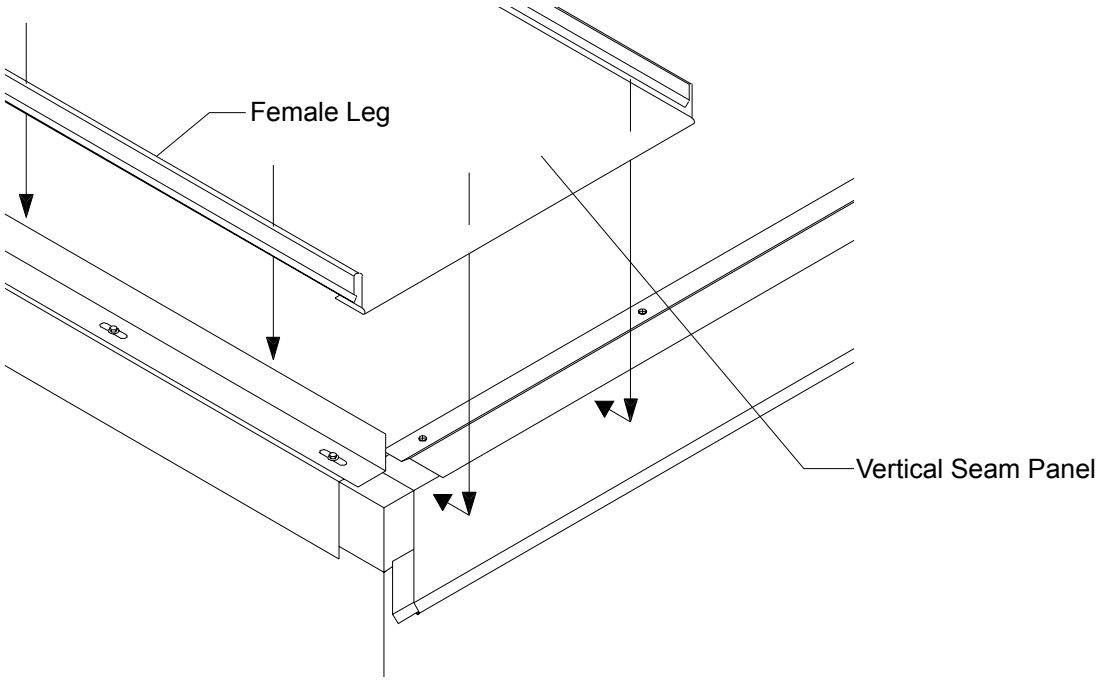


INSTALLING FIRST PANEL

STEP 2

Note: Moisture Barriers, Eave, Gutter, and Valley flashings must first be installed before panel installation can begin (see pages 22-25). Vertical Seam panels must be installed going from left to right when looking from eave to peak.

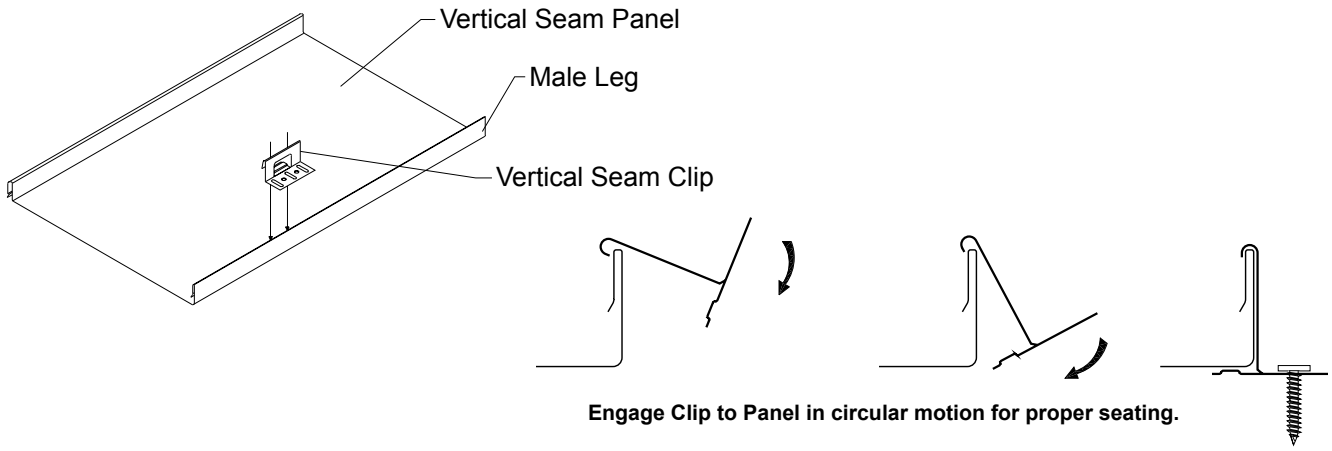
1. Field notch and hem the Vertical Seam panel (as shown on page 18). Apply a single bead of Tube Sealant inside the open hem of the Vertical Seam panel.
2. Position the first panel so female leg is on top of the Floating Rake Angle. Slide the panel toward the peak of the roof engaging the Vertical Seam panel and the Offset Cleat. Offset Cleat must be fully engaged into the Vertical Seam panel. Additional overhang must be considered if using wall panels.



INSTALLING VERTICAL SEAM CLIP

STEP 3

1. Once the first panel has been installed, roll the first clip into lock position over the male leg of the panel (see below).
2. Fasten the Vertical Seam clip to the deck with the proper type and number of fasteners (see chart on page 17). If a fastener strips out, remove the clip and reposition it so the fastener can drill a new hole at least $^{3}/_{8}$" from the stripped hole or install an oversized fastener into the stripped hole. Failure to do so will impact the system to resist the applied loads.
3. Repeat steps 1 and 2 to install clips along the male leg of the panel from eave to peak. For certain building codes and state or county specifications, special clip spacing may be required. Please contact Metal Sales for specific clip and fastener spacing.

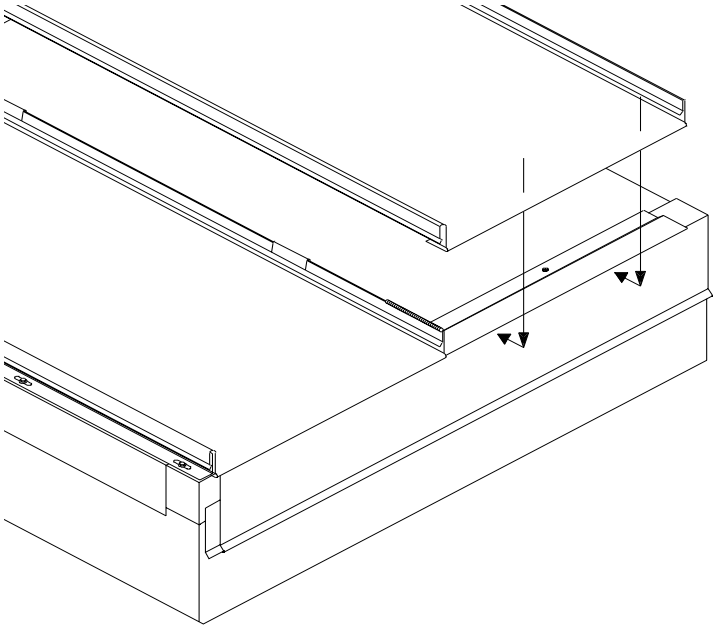


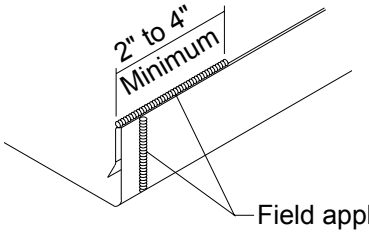
Engage Clip to Panel in circular motion for proper seating.

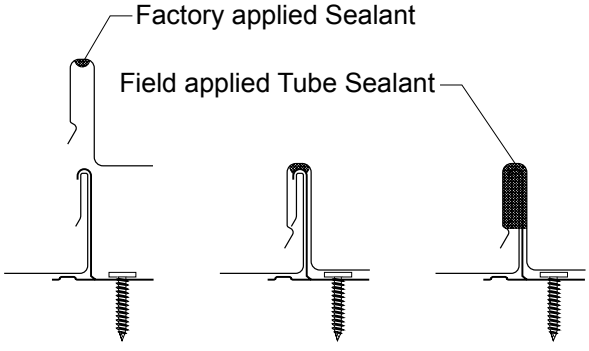
INSTALLING SECOND PANEL

STEP 4

1. Prior to installing the second Vertical Seam panel, Tube Sealant must be placed on the male leg of the first panel (see below).
2. Place the second panel on top of previously installed panel so that the second hemmed panel can be engaged with the Offset Cleat.
3. Begin snapping the panels together working from eave to peak. **It is critical that panels only be snapped in one direction.**
4. Repeat steps 2 and 3 for remaining panels.
5. Make sure all panels are properly snapped into place. Also clean any debris and excess sealant before continuing to the next section of the roof.
6. Once installation is complete, fill the end of each panel rib with Tube Sealant (as shown below).

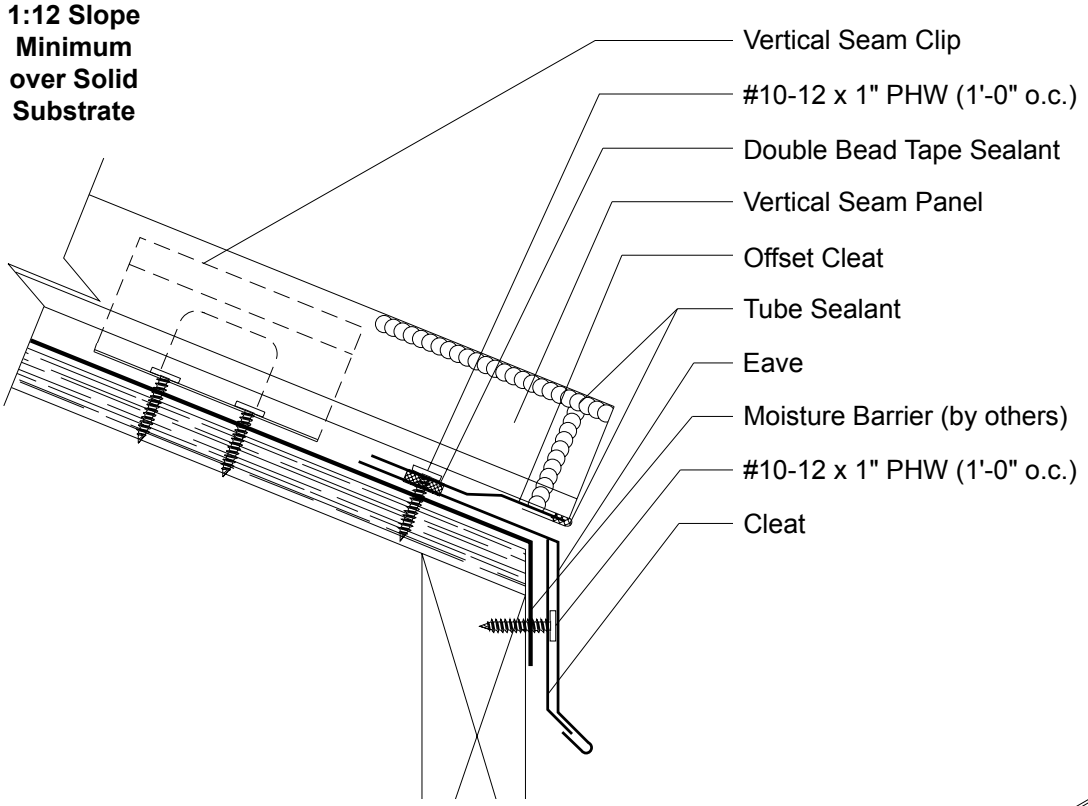


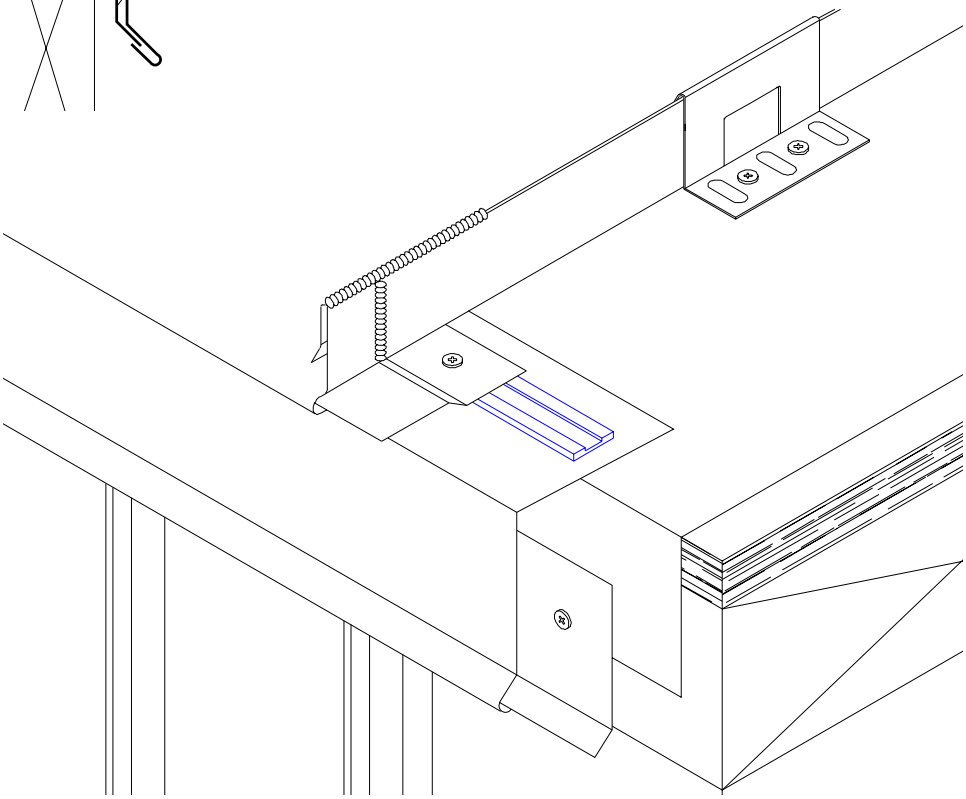




Eave with Offset Over Decking

1:12 Slope Minimum over Solid Substrate





Note:
Panel rib must be field notched and flat part of panel must be field bent to accept Offset Cleat (see page 18).

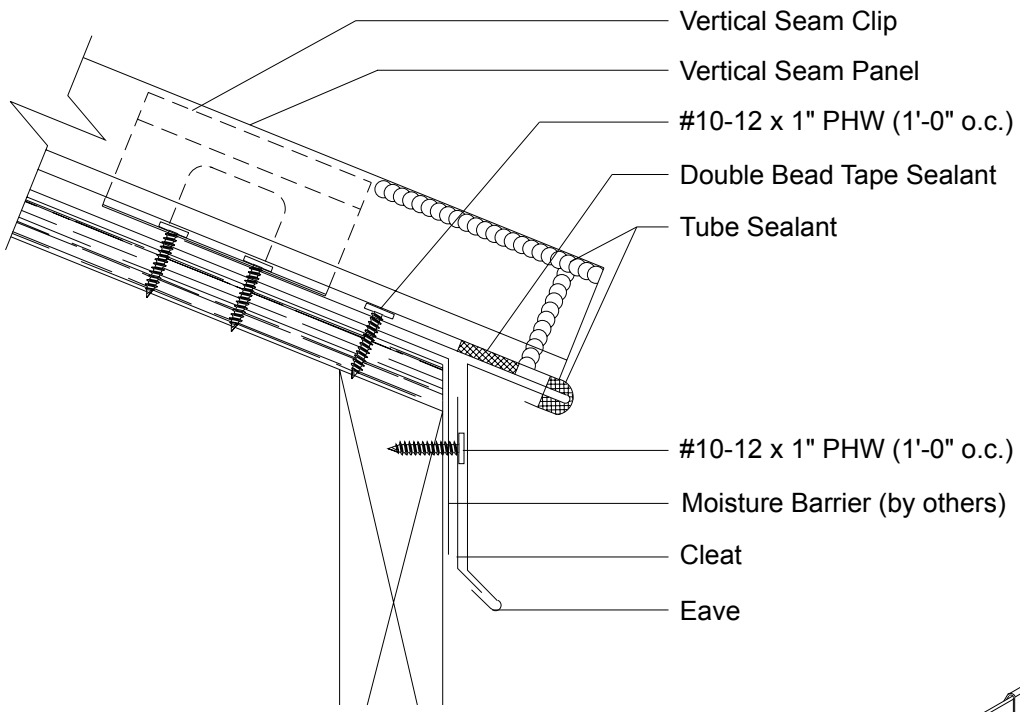
INSTALLATION NOTES

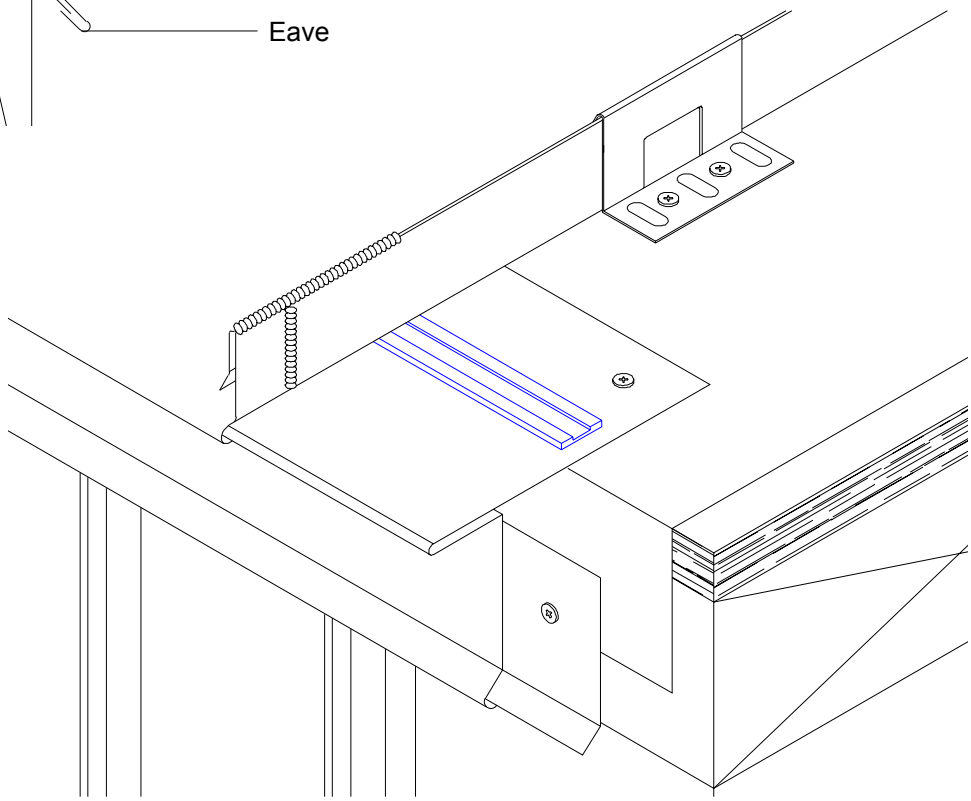
All Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Eave attachment.
2. Install Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the substrate and fasten with #10-12 x 1" Pancake Head Woodscrew (4'-0" o.c.) to hold the Eave Flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant on the bottom leg of the Offset Cleat and fasten to substrate with #10-12 x 1" Pancake Head Woodscrew through top of Eave flashing and into substrate, 1'-0" o.c. Make sure Offset Cleat is lined up to properly accommodate hemmed panel.
4. Install panel by engaging field hemmed end of panel (see page 18) to Offset Cleat (See pages 20- 21 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2.$^{1}/_{2}$" o.c.

Extended Eave Over Decking

1:12 Slope Minimum over Solid Substrate





Note:
Panel rib must be field notched and flat part of panel must be field bent to accept Extended Eave (see page 18).

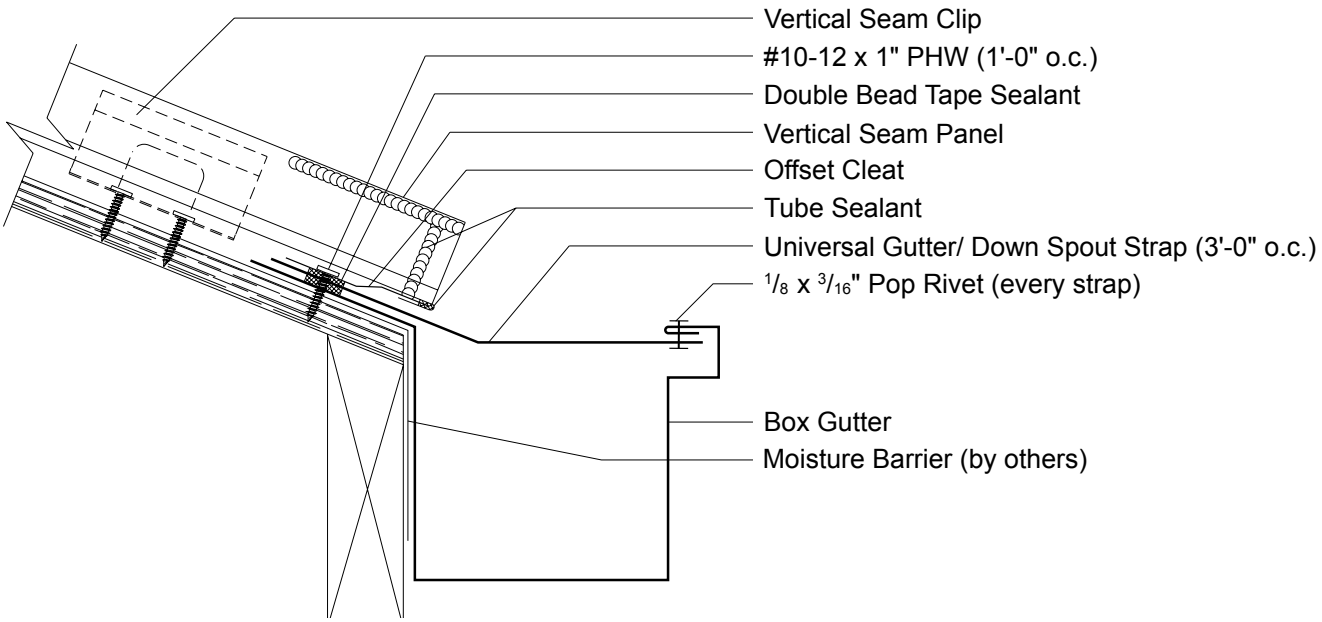
INSTALLATION NOTES

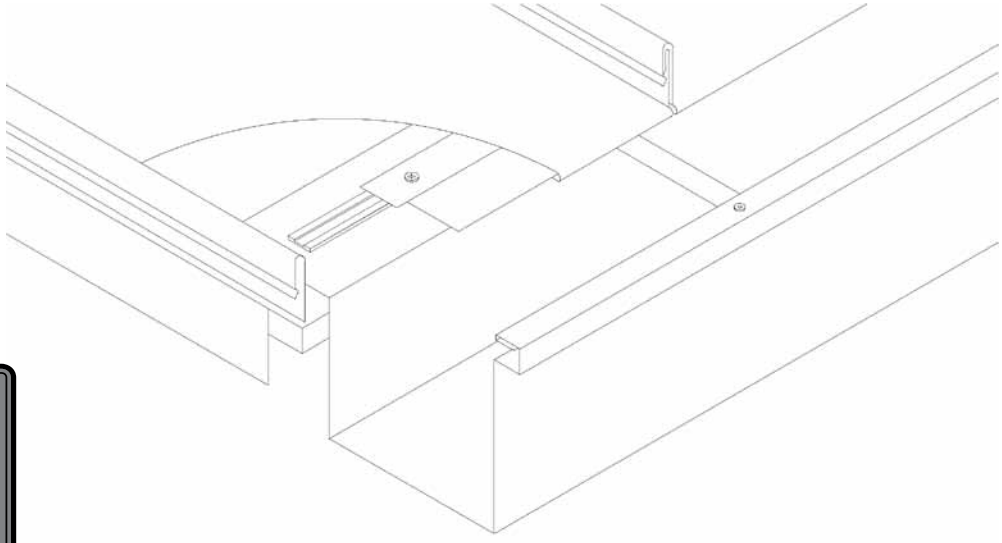
All Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Extended Eave attachment.
2. Install Extended Eave flashing by sliding open hem onto Cleat and resting Extended Eave Flashing back against substrate. Fasten to substrate with #10-12 x 1" Pancake Head Woodscrew, 1'-0" o.c.
3. Apply a row of Double Bead of Tape Sealant to extended leg of the Extended Eave flashing.
4. Install panel by engaging field hemmed end of panel (see page 18) to Extended Eave (see pages 20-21 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2$^1/_2$" o.c.

Box Gutter Over Decking

1:12 Slope Minimum over Solid Substrate





Note:
Panel rib must be field notched and flat part of panel must be field bent to accept Offset Cleat (see page 18).

CAUTION
In locations where heavy rainfall or severe ice and snow may occur, Metal Sales' standard gutters may not be suitable for use.

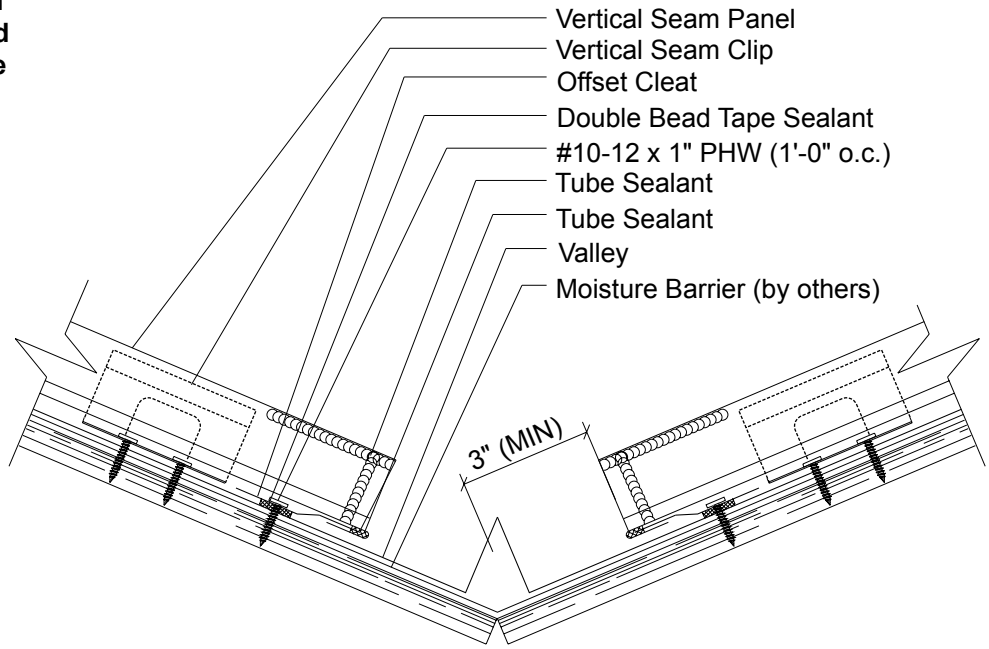
INSTALLATION NOTES

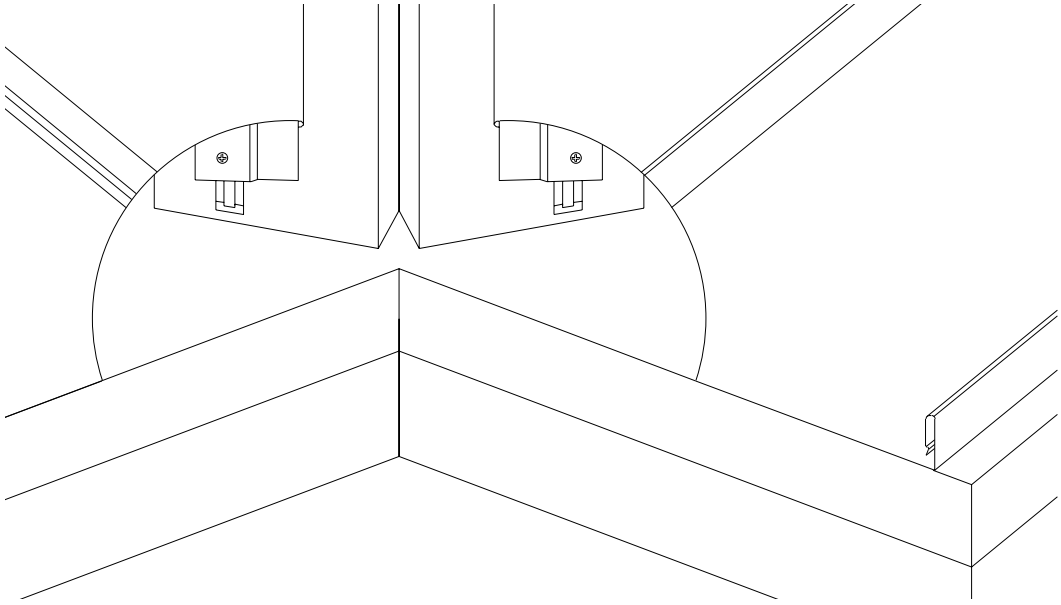
All Gutter Flashings must be installed prior to panel installation.

1. Install Box Gutter flashing back against substrate. To hold Box Gutter flashing in place, fasten to substrate with #10-12 x 1" Pancake Head Woodscrew 4'-0" o.c.
2. Install Universal Gutter/Downspout Straps every 3'-0" of gutter length to substrate with #10-12 x 1" Pancake Head Woodscrew, and fasten to Box Gutter with (1) Pop Rivet per Strap.
3. Apply a row of Double Bead of Tape Sealant to bottom leg of Offset Cleat, position on back leg of Box Gutter, and fasten to substrate with #10-12 x 1" Pancake Head Woodscrew, 1'-0" o.c.
4. Install panel by engaging field hemmed end of panel (see page 18) to Offset Cleat (see pages 20-21 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.
6. Note: Size and gauge of Box Gutter must be designed to applicable governing building code.

VERTICAL SEAM — Valley Over Decking

1:12 Slope Minimum over Solid Substrate





Note:
Panel rib must be field notched and flat part of panel must be field bent to accept Offset Cleat (see page 18).

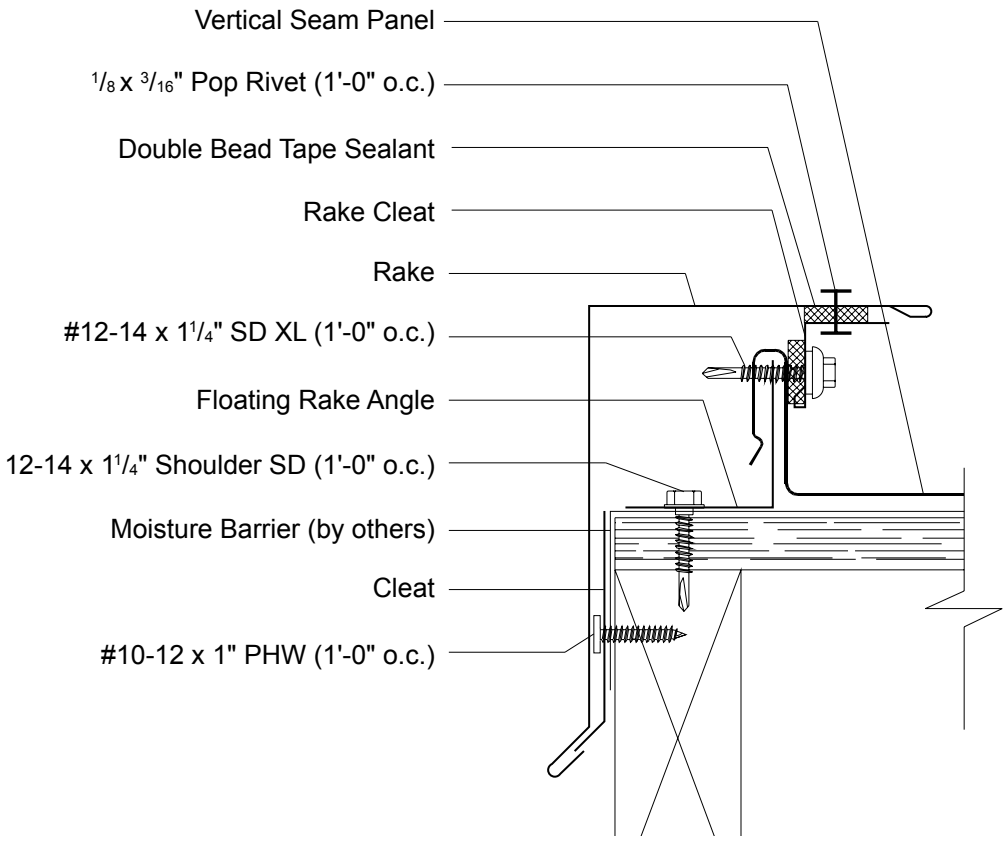
INSTALLATION NOTES

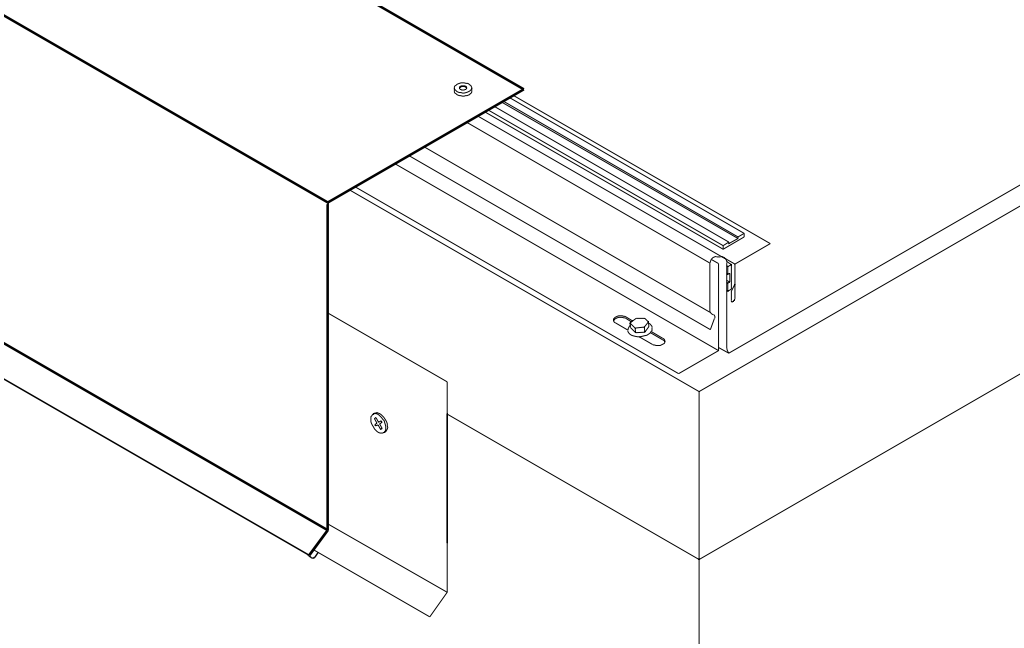
All Valley flashings must be installed prior to panel installation. If two or more valley flashings are required, valley must be installed working from eave to peak. It is recommended that ice and water shield be installed under valley flashing for added moisture protection.

1. Install Valley flashing against substrate. To hold Valley flashing in place, fasten to substrate with #10-12 x 1" Pancake Head fastener 4'-0" o.c.
2. Apply a row of Double Bead Tape Sealant across both sides of Valley flashing approximately 5" from center of valley.
3. Properly align and install Offset Cleat on both sides of Valley flashing to accommodate panel hem and fasten to substrate with #10-12 x 1" Pancake Head fastener 1'-0" o.c.
4. Install panel by engaging field hemmed end of panel (see page 18) to Offset Cleat (see pages 20-21 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2", placing a bead of Tube Sealant between the flashings and securing with (2) Pop Rivets in the 1" water diverter.

RAKE (ON MODULE) OVER DECKING

1:12 Slope Minimum over Solid Substrate





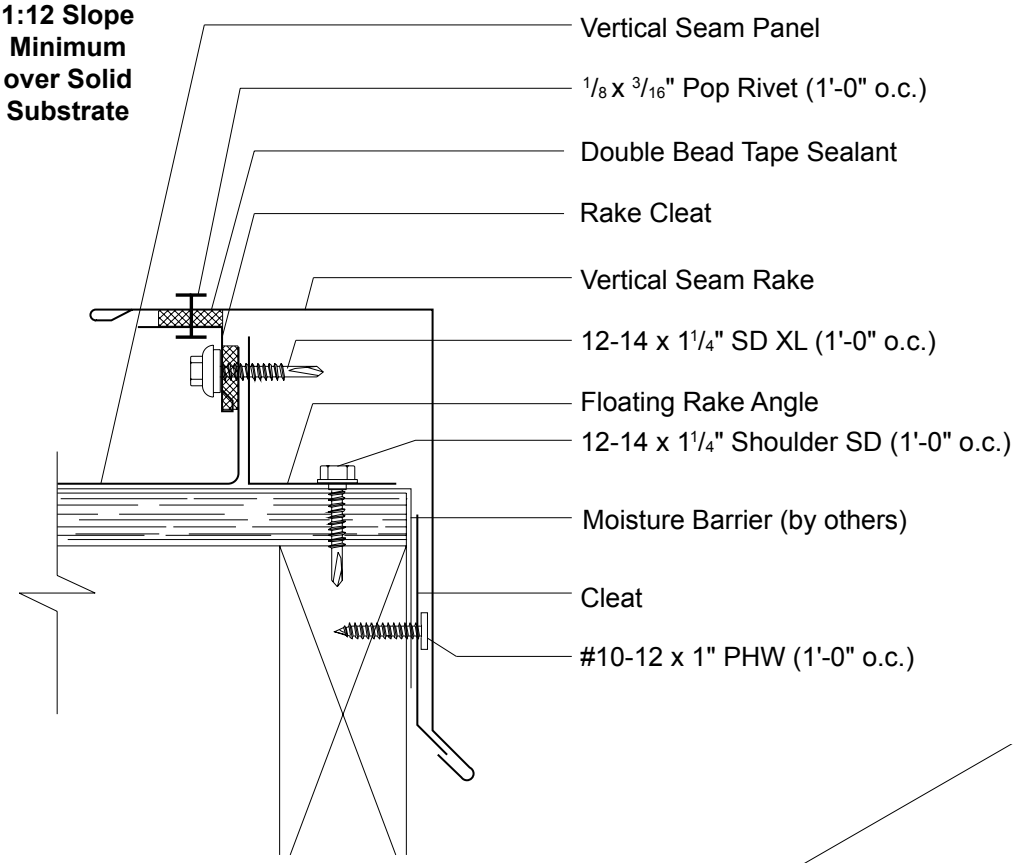
INSTALLATION NOTES

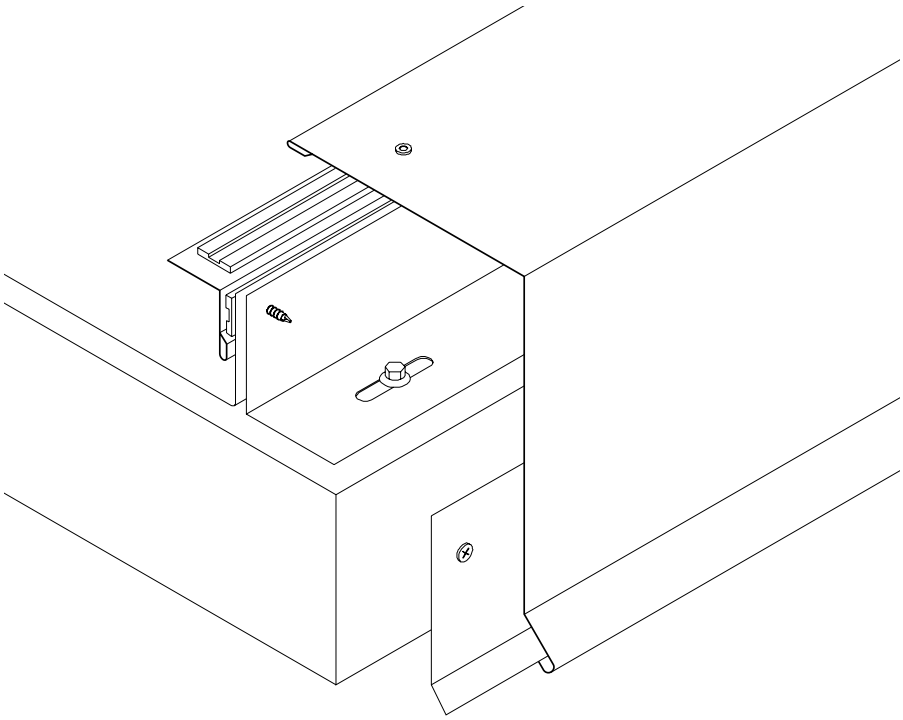
Vertical Seam Floating Rake Angle and Vertical Seam panels must be installed prior to rake installation (see pages 20-21).

1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
2. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self-Driller XL, 1'-0" o.c.
3. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat installation allows for proper Rake attachment.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

VERTICAL SEAM — RAKE (OFF MODULE) OVER DECKING

1:12 Slope Minimum over Solid Substrate





• Field bend panel rib up 1 3/4"

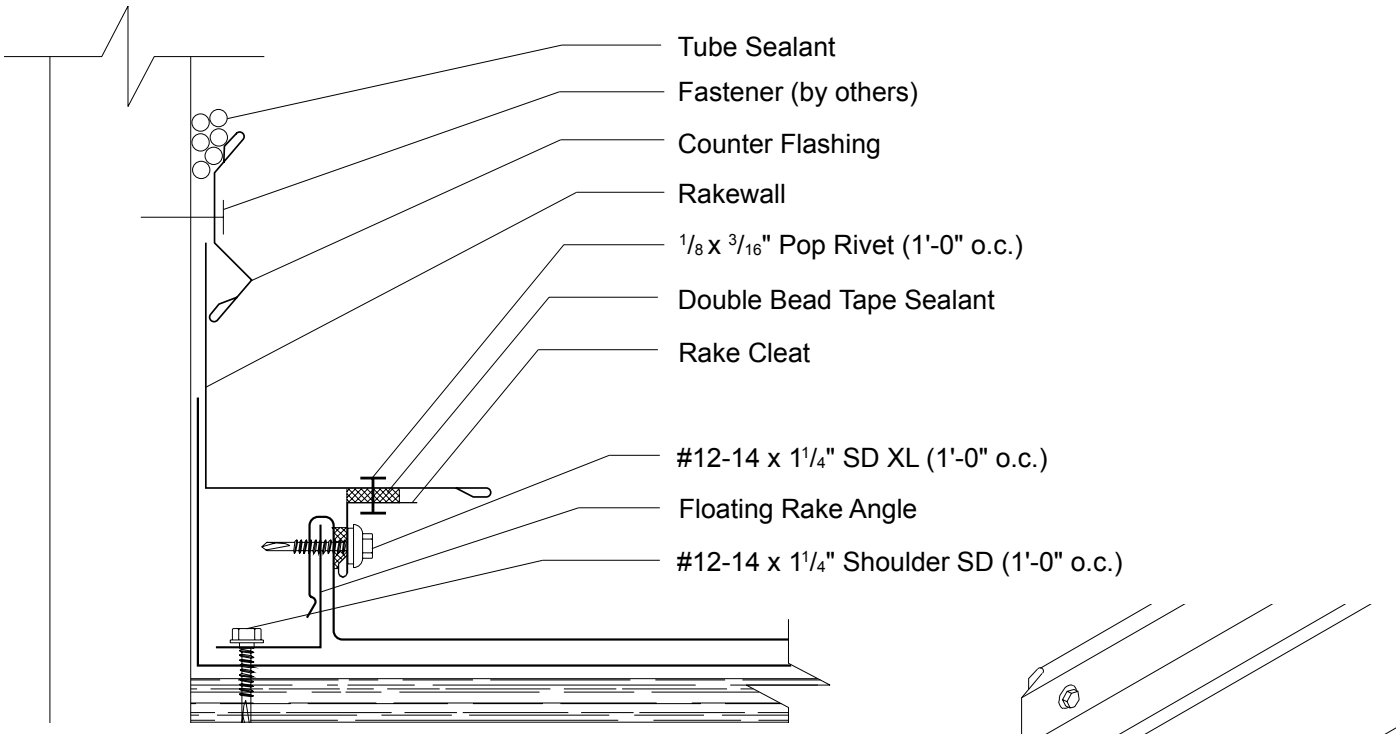
INSTALLATION NOTES

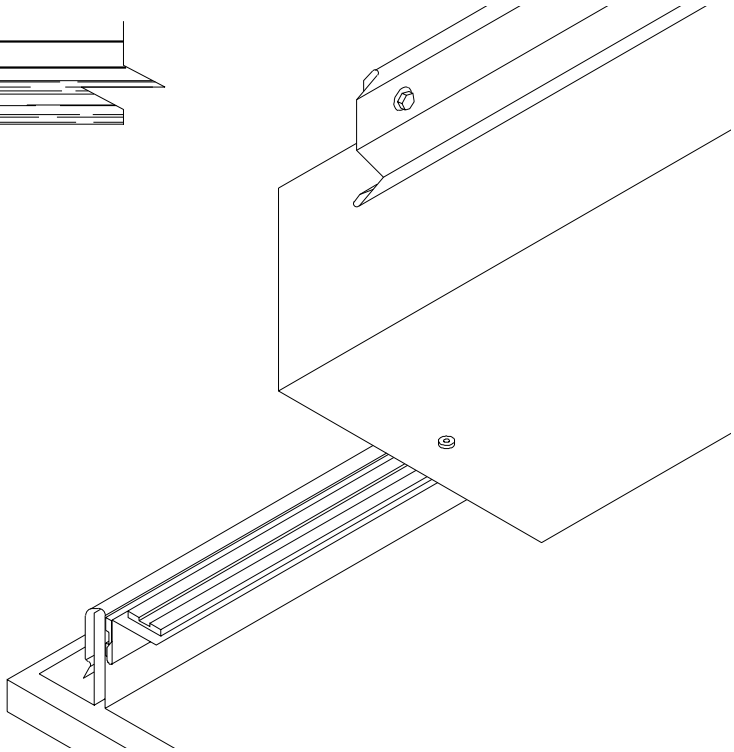
Vertical Seam Floating Rake angle and Vertical Seam panels must be installed prior to rake installation (see pages 20-21).

1. Field cut and bend off module panel up 1 3/4".
2. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self-Driller XL, 1'-0" o.c.
4. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat installation allows for proper Rake attachment.
5. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
6. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8"x3/16" Pop Rivets at 1'-0" o.c.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

RAKE PARAPET (ON MODULE) OVER DECKING

1:12 Slope Minimum over Solid Substrate





INSTALLATION NOTES

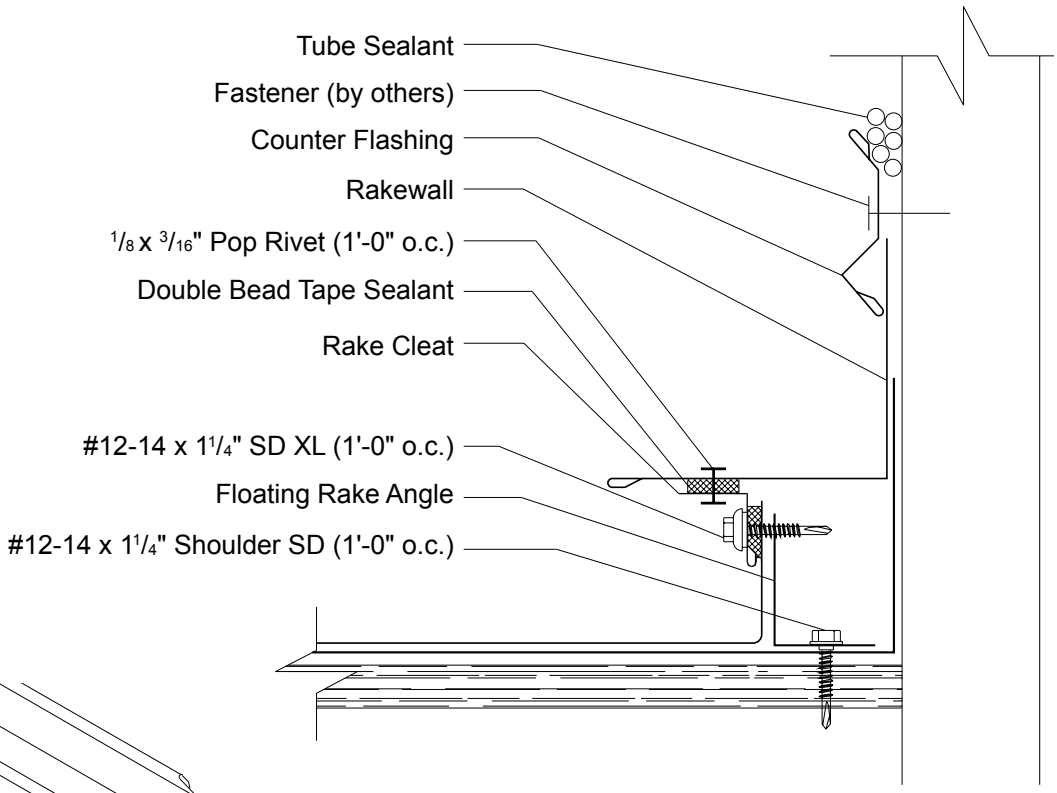
Vertical Seam Floating Rake Angle and Vertical Seam panels must be installed prior to rakewall installation (see pages 20-21).

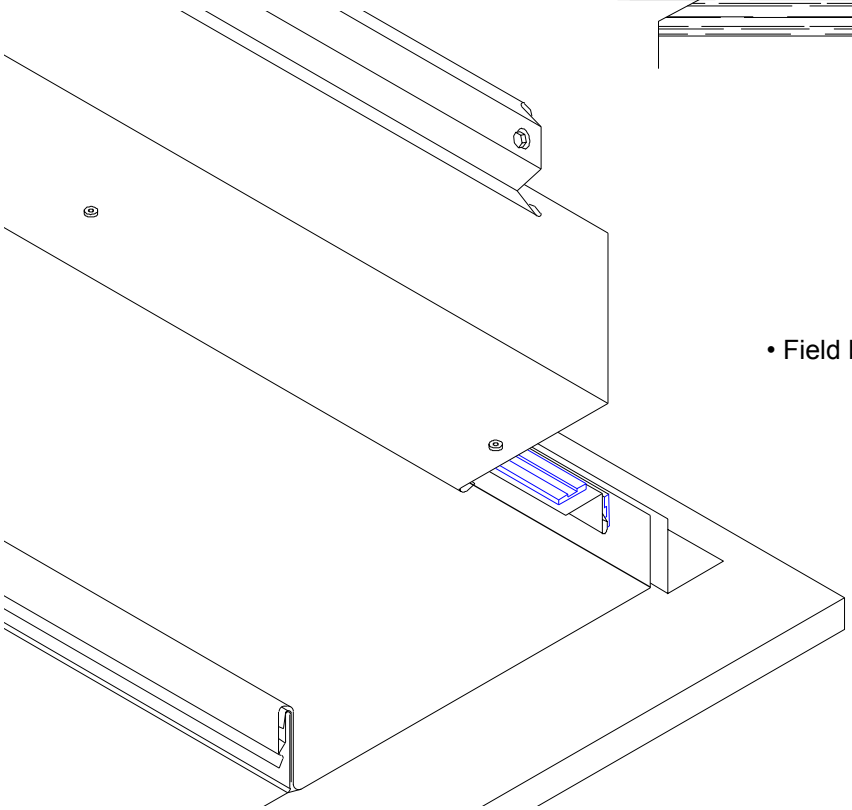
1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam Panel.
2. Position and install Rake Cleat through panel and into Floating Rake Angle with #12-14 x 1 1/4" Self Driller XL, 1'-0" o.c.
3. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
4. Install Rakewall to the Rake Cleat with 1/8"x3/16" Pop Rivets at 1'-0" o.c.
5. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do **NOT** fasten Rakewall to wall.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

VERTICAL SEAM

Rake Parapet (Off Module) Over Decking

1:12 Slope Minimum over Solid Substrate





• Field bend panel rib up 1 3/4"

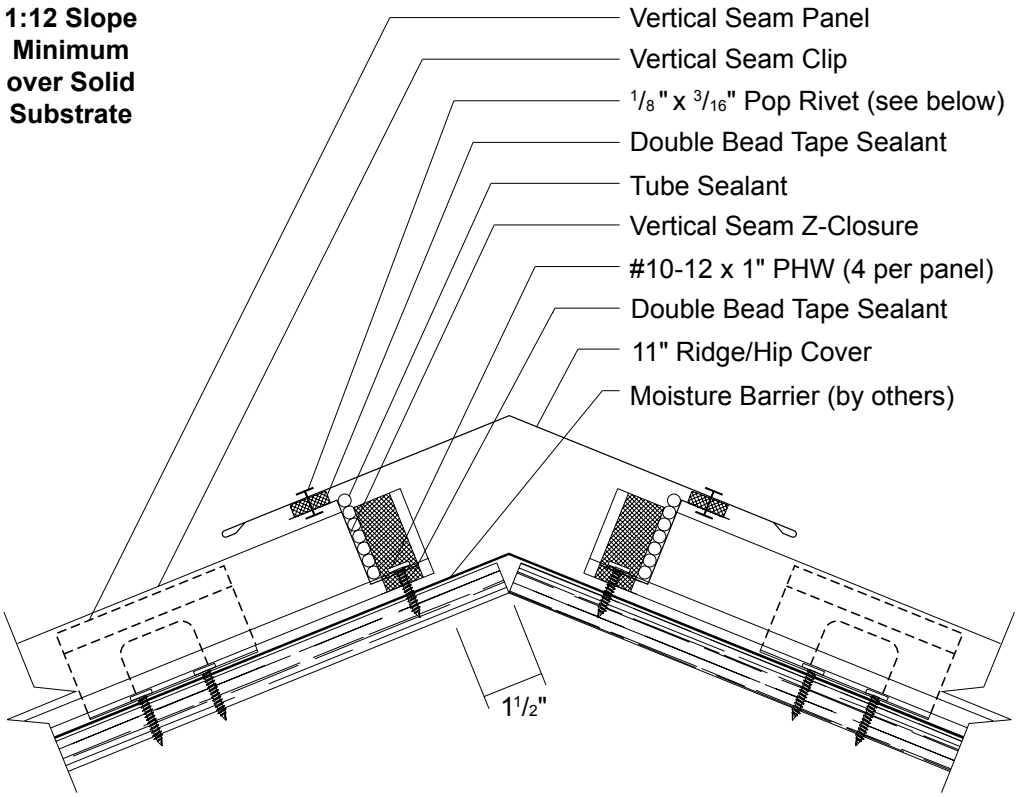
INSTALLATION NOTES

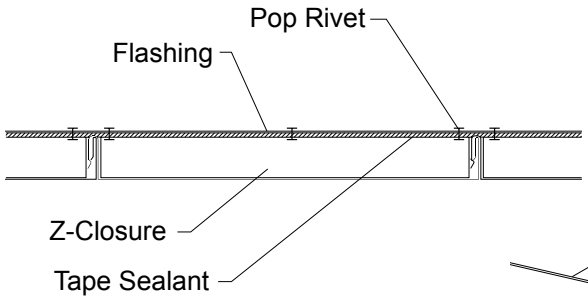
Vertical Seam panels must be installed prior to rake installation (see pages 20-21).

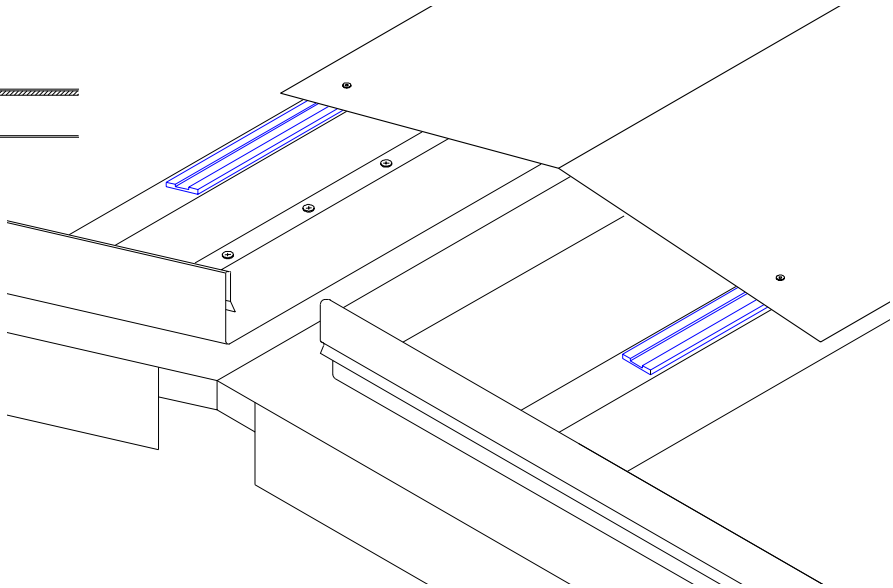
1. Field cut and bend off module panel up 1 3/4"
2. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self Driller XL, 1'-0" o.c.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rakewall to the Rake Cleat with 1/8"x3/16" Pop Rivets at 1'-0" o.c. Do **NOT** fasten Rakewall to parapet wall.
6. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do **NOT** fasten Rakewall to wall.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

VERTICAL SEAM 11" Ridge/Hip Over Decking

1:12 Slope Minimum over Solid Substrate







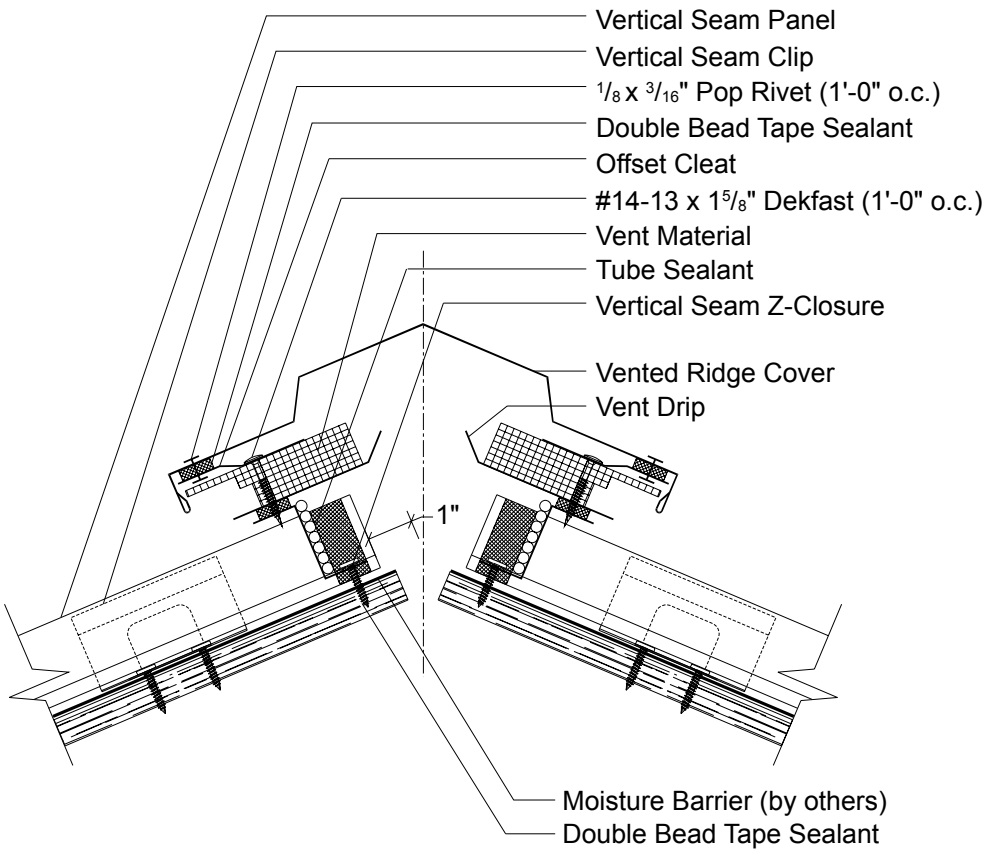
CAUTION
Additional screws may be required for high snow loading and steep slopes.

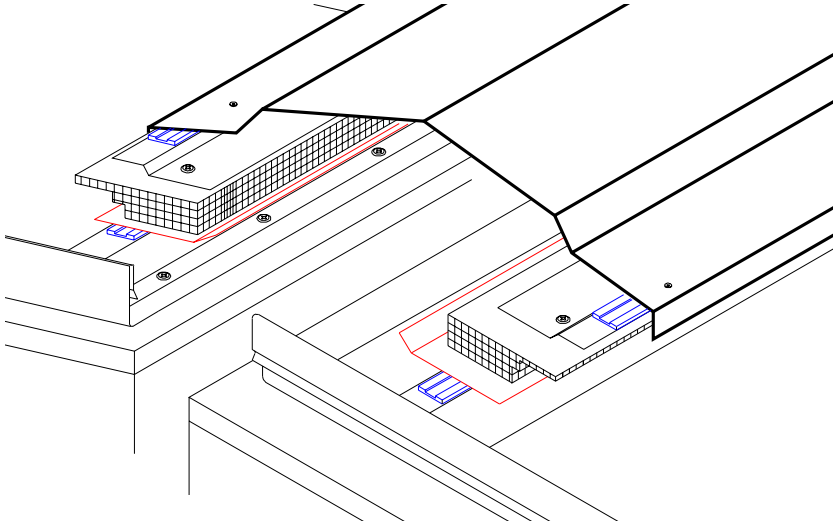
INSTALLATION NOTES

1. Once panels have been installed, field cut the Vertical Seam Z-Closure (see page 47) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure placement will accommodate 11" Ridge/Hip cover.
3. Install field cut Z-Closure (as shown on page 47).
4. Fasten Z-Closure through panel with #10-12 x 1" Pancake Head Woodscrews (4 per panel).
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Position and install 11" Ridge/Hip Cover flashing to Z-Closure with 1/8" x 3/16" Pop Rivets (as shown).
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

VERTICAL SEAM — VENTED RIDGE OVER DECKING

1:12 Slope Minimum over Solid Substrate





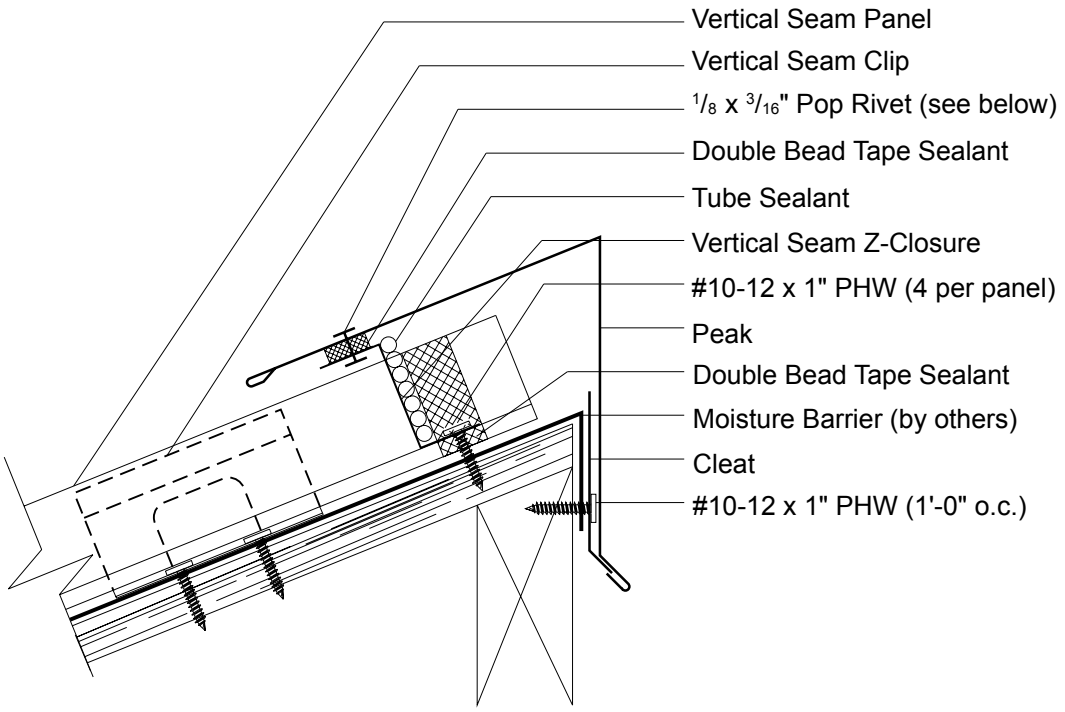
CAUTION
Additional screws may be required for high snow loading and steep slopes.

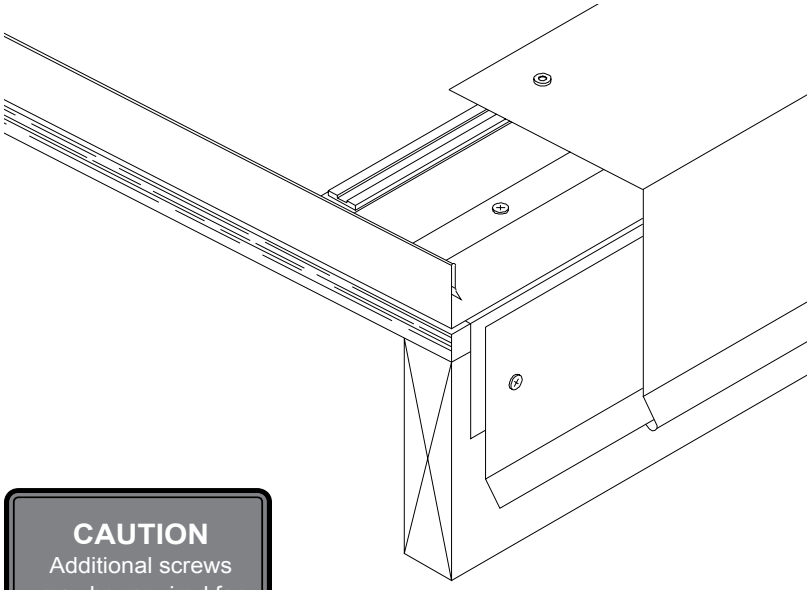
INSTALLATION NOTES

1. Once panels have been installed, field cut the Vertical Seam Z-Closure (see page 47) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding, make sure Z-Closure placement will accommodate Vented Ridge cover.
3. Install field cut Z-Closure (as shown on page 47).
4. Fasten Z-Closure through panel with #10-12 x 1" Pancake Head Woodscrews (4 per panel).
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Install Vent Drip, Vent Material, and Offset Cleat, as shown above with #14-13 x 1 5/8" Dekfast screws, 1'-0" o.c. and apply a row of Double Bead Tape Sealant to the top leg of the Offset Cleat.
7. Install Vented Ridge Cover to Offset Cleat with 1/8" Pop Rivets at 1'-0" o.c.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

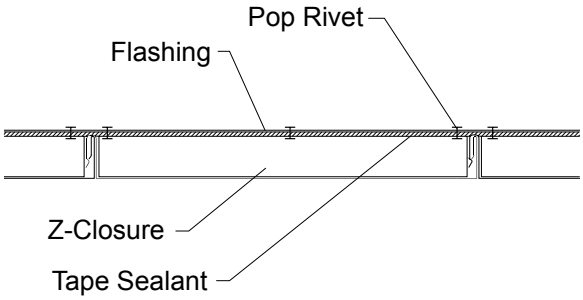
VERTICAL SEAM — Peak Over Decking

1:12 Slope Minimum over Solid Substrate





CAUTION
Additional screws may be required for high snow loading and steep slopes.

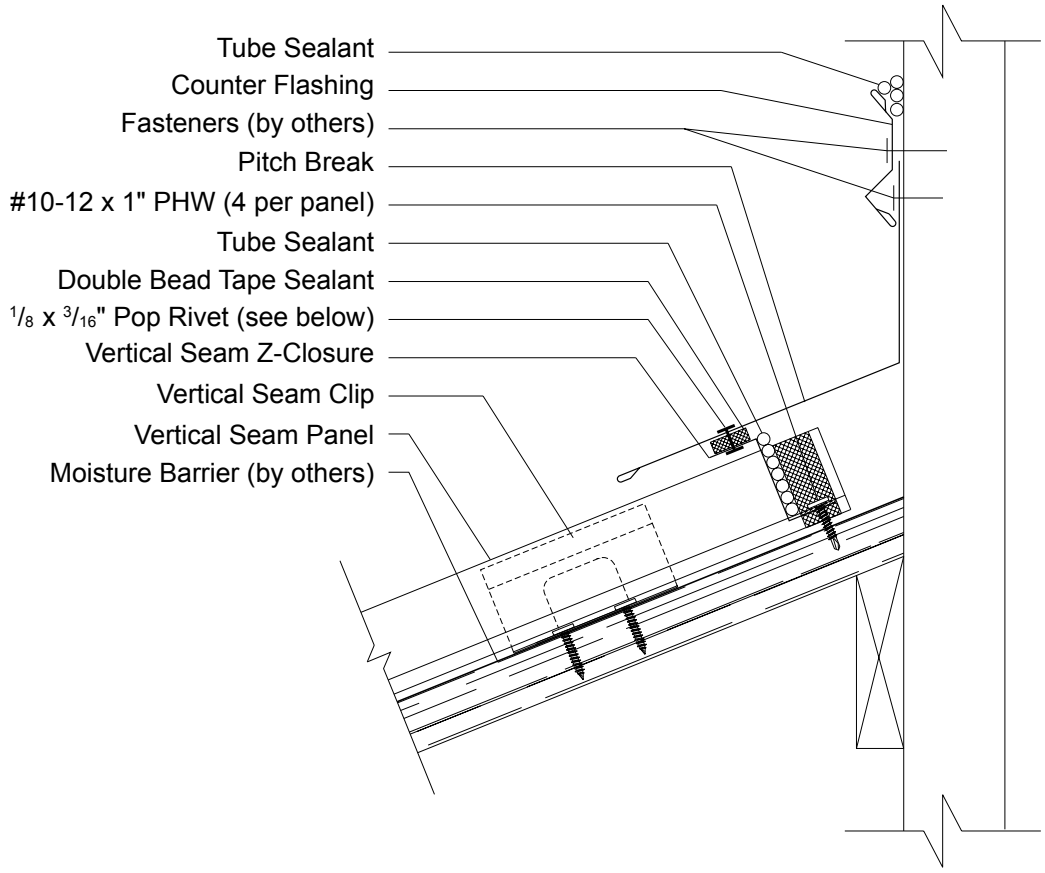


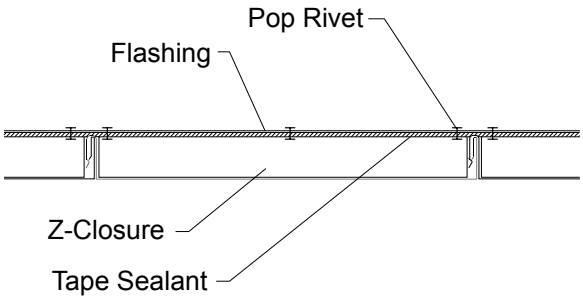
INSTALLATION NOTES

1. Once panels have been installed, field cut the Vertical Seam Z-Closure (see page 47) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure placement will accommodate Peak cover.
3. Install field cut Z-Closure (as shown on page 47).
4. Fasten Z-Closure through panel with #10-12 x 1" Pancake Head Woodscrews. (4 per panel)
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Position and install Cleat to the wall with the appropriate fastener, 1'-0" o.c. Make sure cleat allows for proper Peak attachment.
7. Install Peak flashing by sliding the open hem onto the Cleat and then attaching to the Z-Closure with 1/8" x 2/16" Pop Rivets, at the spacing shown above.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2” placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

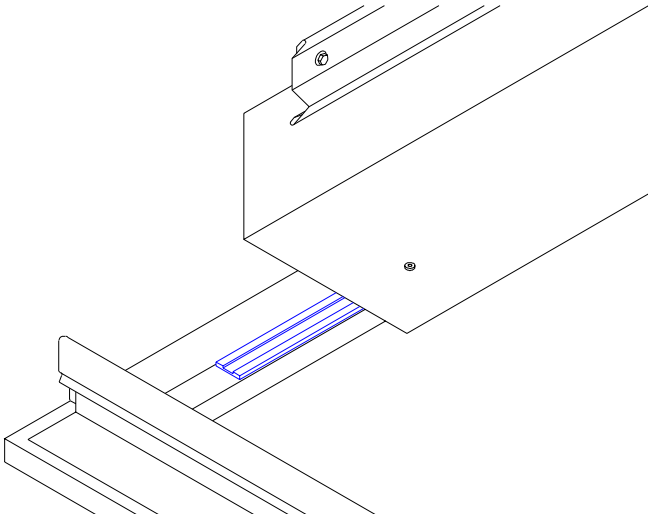
VERTICAL SEAM — HIGHSIDE PARAPET OVER DECKING

1:12 Slope Minimum over Solid Substrate





CAUTION
Additional screws may be required for high snow loading and steep slopes.



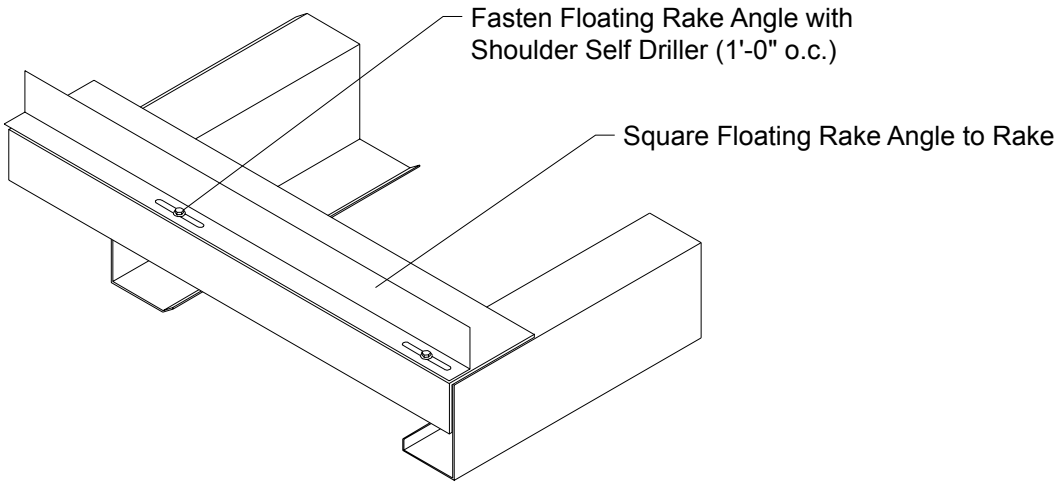
INSTALLATION NOTES

1. Once panels have been installed, field cut the Vertical Seam Z-Closure (see page 47) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure placement will accommodate Pitch Break flashing.
3. Install field cut Z-Closure (as shown on page 47).
4. Fasten Z-Closure through panel with #10-12 x 1" Pancake Head Woodscrews (4 per panel).
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs. Position and install Pitch Break flashing to Z-Closure with 1/8" x 3/16" Pop Rivets (as shown).
6. Fasten vertical leg of Pitch Break to the parapet wall with the appropriate fastener. (1'-0" o.c.)
7. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with tube sealant. Do **NOT** fasten Rakewall to wall.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

INSTALLING FLOATING RAKE ANGLE

STEP 1

1. Install Floating Rake Angle at all rake and rake parapet conditions. Square Floating Rake Angle to rake condition. **It is critical that Floating Rake Angle be square to building as this will control alignment of panels (see page 15 to check building square).**
2. Fasten to framing with #12-14 x 1¼" Shoulder Self Driller screws at 1'-0" o.c. **Do not over tighten screws for it is imperative that the Vertical Seam roof system be allowed to float.**
3. If two or more Floating Rake Angles are required, butt ends. **Do not overlap Floating Rake Angles.**

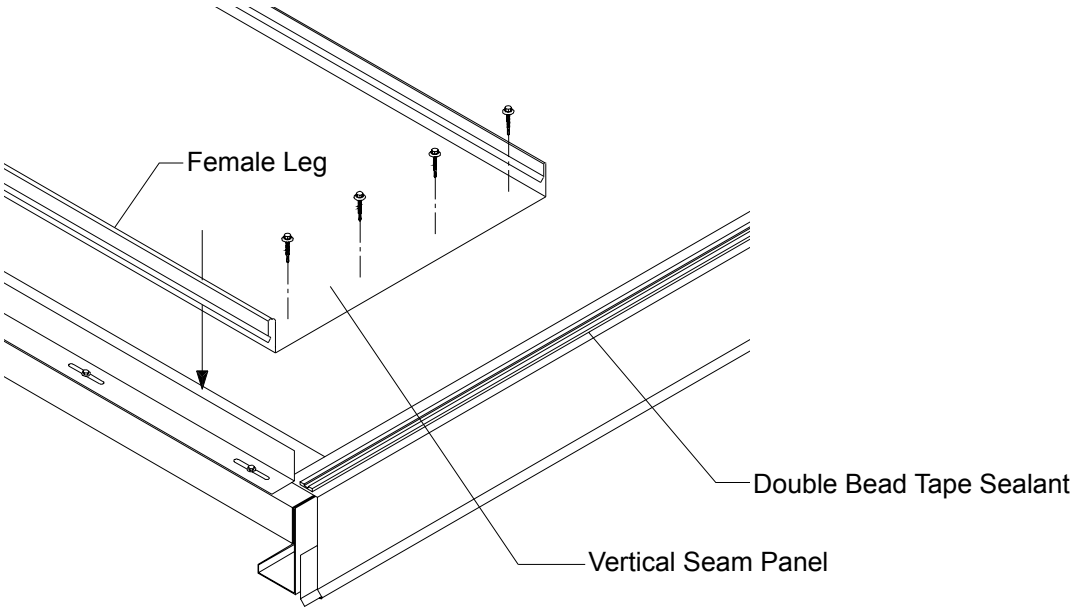


INSTALLING FIRST PANEL

STEP 2

Note: Insulation, Eave, Gutter, and Valley flashings must first be installed before panel installation can begin (see pages 36-39). Vertical Seam panels must be installed going from left to right when looking from eave to peak.

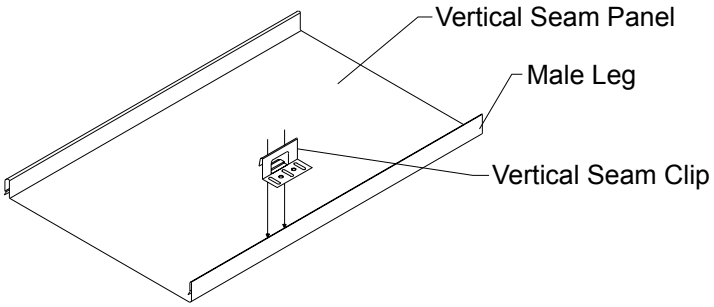
1. Apply a row of Double Bead Tape Sealant across the top leg of the Eave (Extended Eave, Gutter) flashing.
2. Install the first panel so that the female leg is on top of the Floating Rake Angle, and has the proper overhang. Make sure that the panel is square to the eave and rake.
3. Fasten Vertical Seam panel with (4) #12-14 x 1¼" Self Driller XL screws through the Double Bead Tape Sealant, flashing, and into the framing (as shown below).

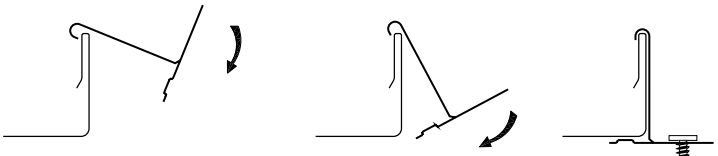


INSTALLING VERTICAL SEAM CLIP

STEP 3

1. Once the first panel has been installed, roll the first clip into lock position over the male leg of the panel (see below).
2. Fasten the Vertical Seam clip to the framing with the proper type and number of fasteners (see chart on page 17). If a fastener strips out, remove the clip and reposition it so the fastener can drill a new hole at least $^{3}/_{8}$" from the stripped hole or install an oversized fastener into the stripped hole. Failure to do so will impact the system to resist the applied loads.
3. Repeat steps 1 and 2 to install clips along the male leg of the panel from Eave to Peak at every framing member. For certain building codes and state or county specifications, special clip spacing may be required. Please contact Metal Sales for specific clip and fastener spacing.



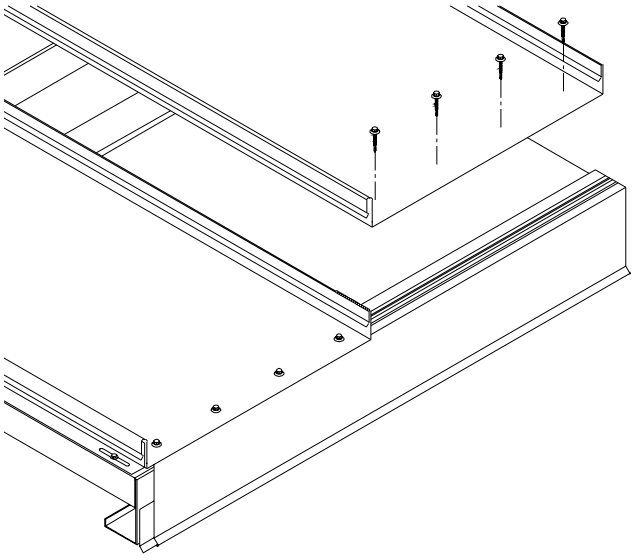


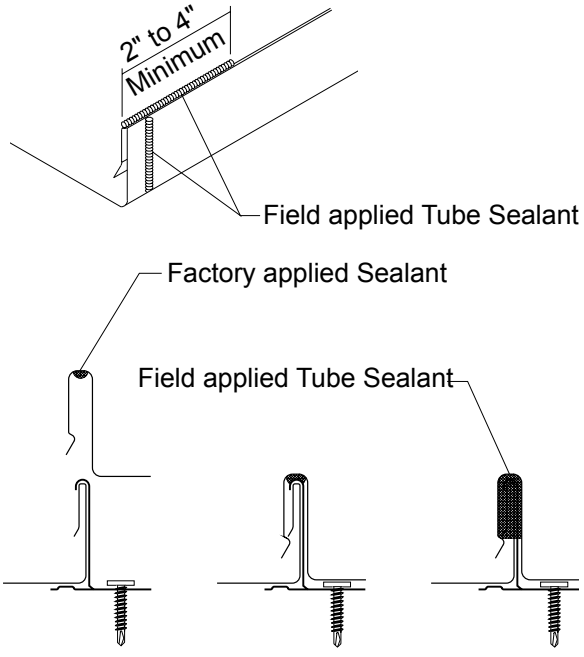
Engage Clip to Panel in circular motion for proper seating.

INSTALLING SECOND PANEL

STEP 4

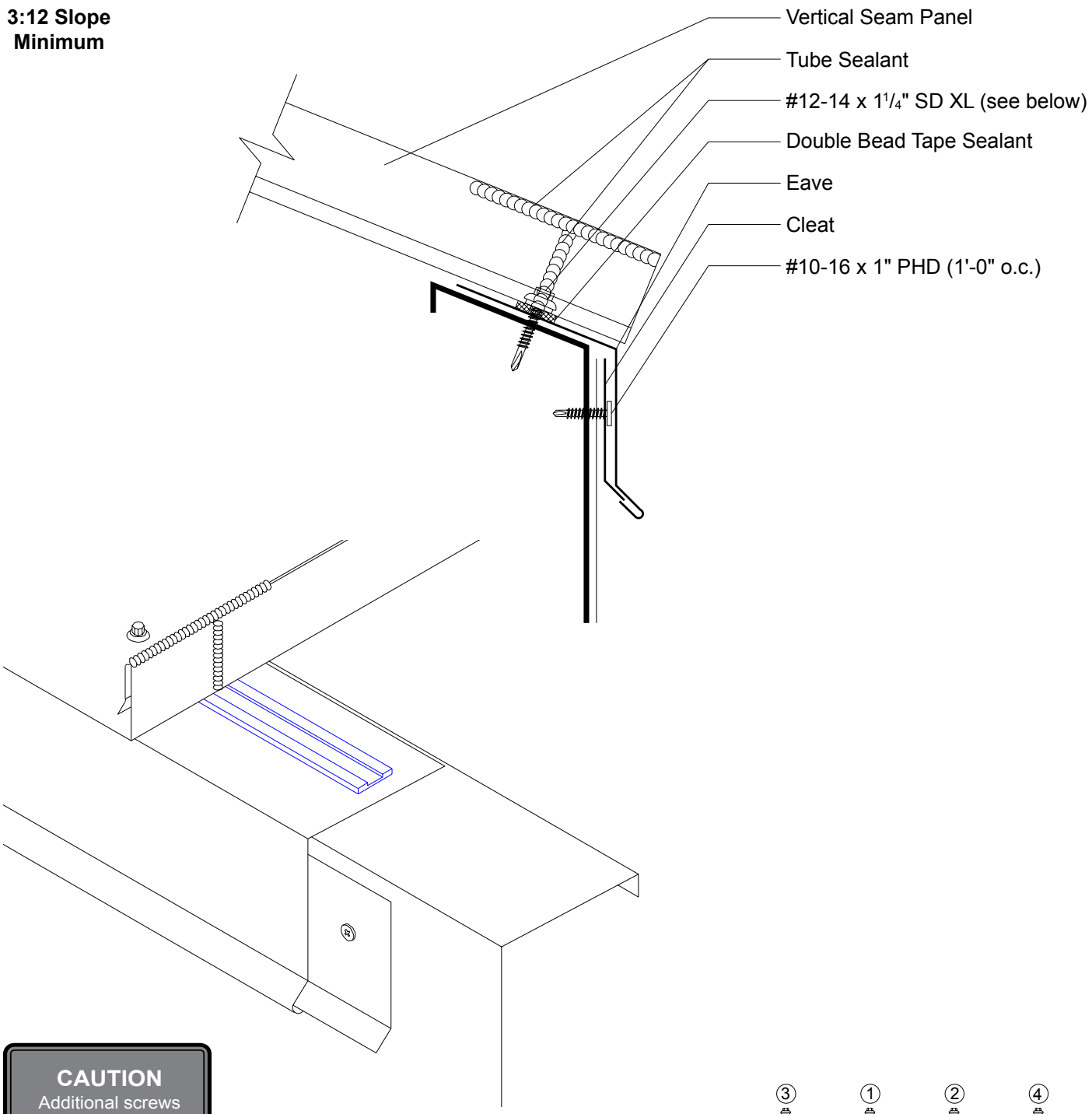
1. Prior to installing the second Vertical Seam panel, Tube Sealant must be placed on the male leg of the first panel (see below).
2. Snap the second panel in place making sure panel ends at eave are properly aligned. **It is critical that panels only be snapped in one direction.**
3. Fasten Vertical Seam panel with (4) #12-14 x $1^{1}/_{4}$" Self Driller XL screws through the Double Bead Tape Sealant, flashing, and into the framing, as shown below.
4. Repeat steps 2 and 3 for remaining panels.
5. Make sure all panels are properly snapped into place. Also clean any debris and excess sealant before continuing to the next section of the roof.
6. Once installation is complete, fill the end of each panel rib with Tube Sealant (as shown below).



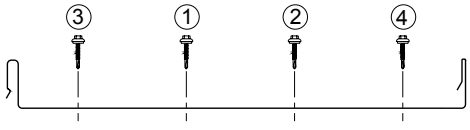


Eave Over Open Framing

3:12 Slope Minimum



CAUTION
Additional screws may be required for high snow loading and steep slopes.



Vertical Seam Fastening Pattern

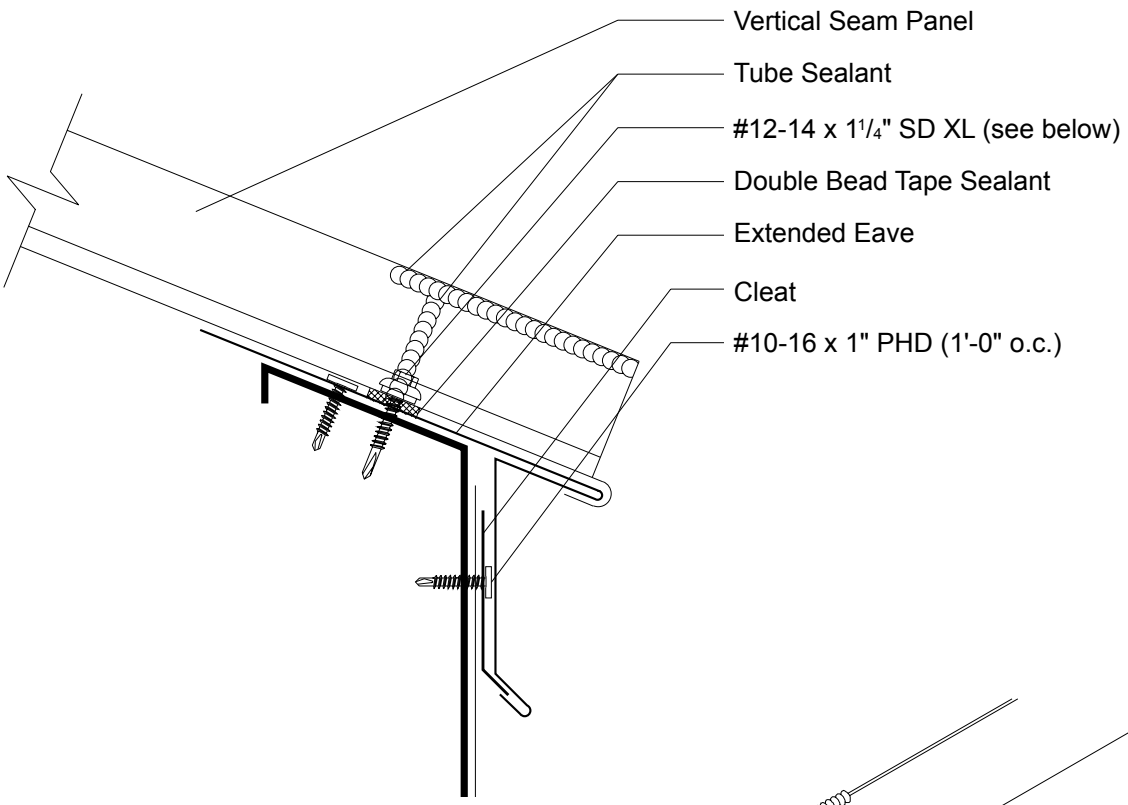
INSTALLATION NOTES

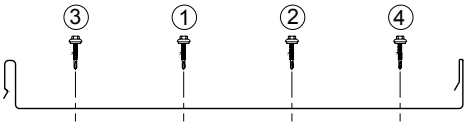
All Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Eave attachment.
2. Install Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the substrate and fasten with #10-16 x 1" Pancake Head Driller (4'-0" o.c.) to hold the Eave Flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant along the top leg of the Eave flashing about 2" from the end.
4. Install panel by fastening through with #12-14 x 1¼" Self Driller XL screws (see pages 34-35 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2½" o.c.

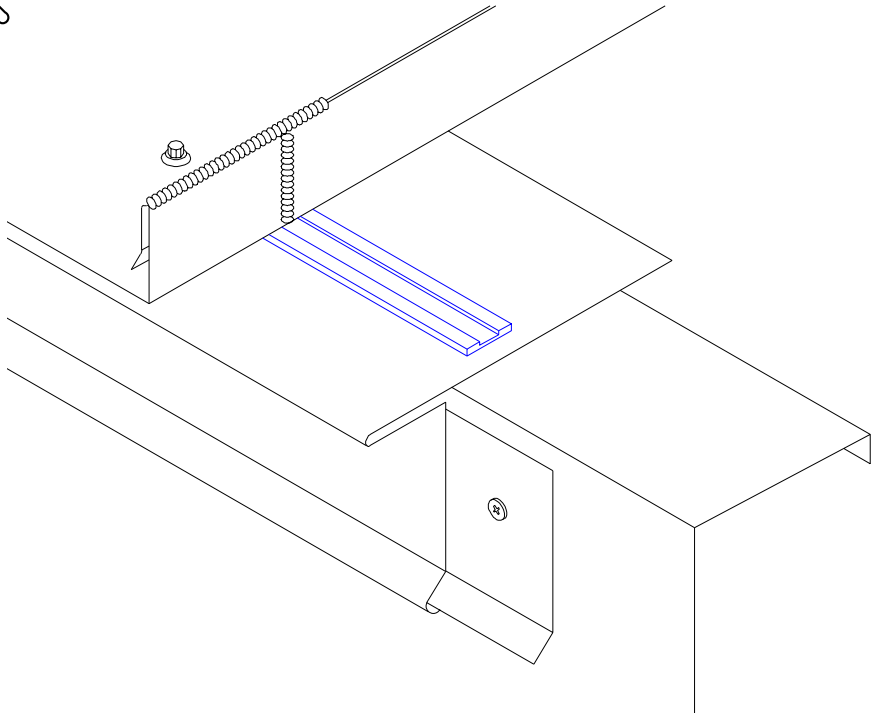
VERTICAL SEAM — EXTENDED EAVE OVER OPEN FRAMING

3:12 Slope Minimum





Vertical Seam Fastening Pattern



CAUTION
Additional screws may be required for high snow loading and steep slopes.

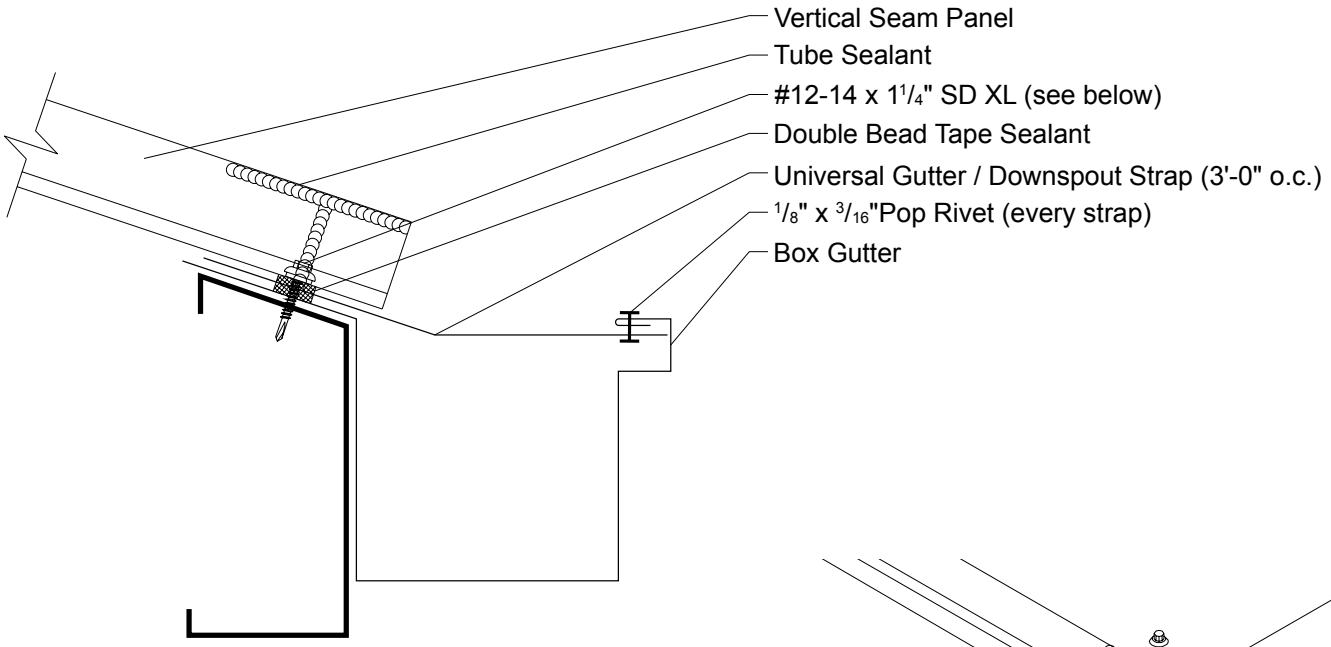
INSTALLATION NOTES

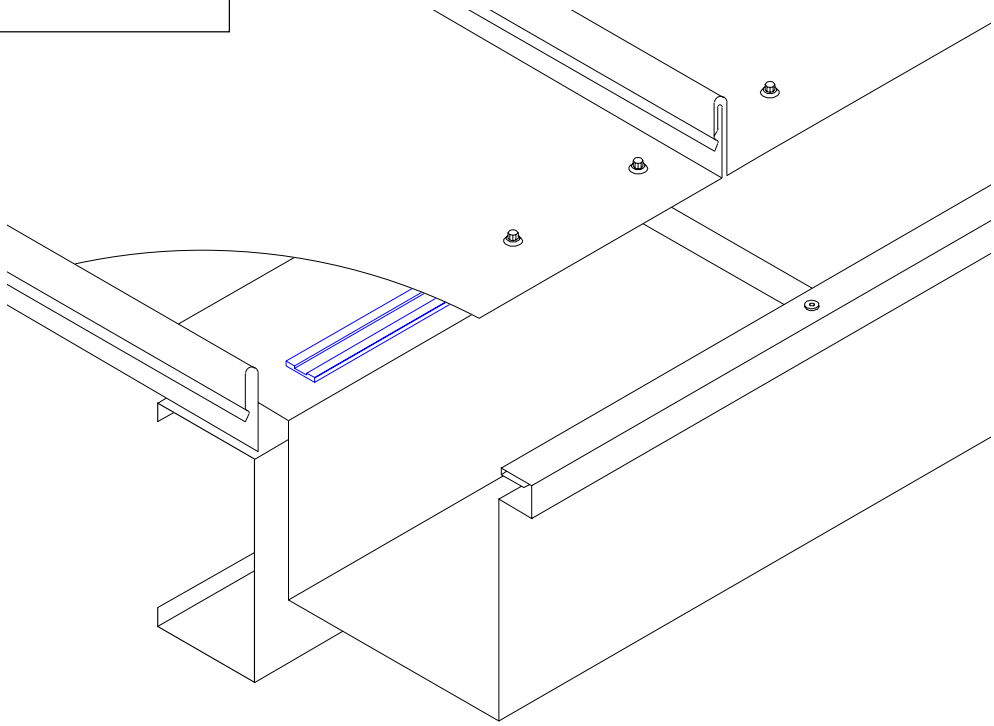
All Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure cleat allows for proper Extended Eave attachment.
2. Install Extended Eave flashing by sliding open hem onto Cleat and resting Extended Eave Flashing back against substrate. Fasten to substrate with #10-16 x 1" Pancake Head Driller (4'-0" o.c.) to hold Extended Eave flashing in place during installation.
3. Apply a row of Double Bead of Tape Sealant to the Extended Eave flashing.
4. Install panel by fastening through with #12-14 x 1¼" Self Drillers XL Screws (see pages 34-35 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2½" o.c.

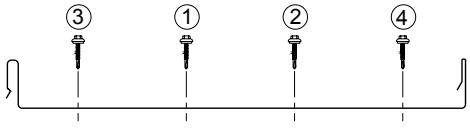
Box Gutter Over Open Framing

3:12 Slope Minimum





CAUTION
In locations where heavy rainfall or severe ice and snow may occur, Metal Sales' standard gutters may not be suitable for use.



Vertical Seam Fastening Pattern

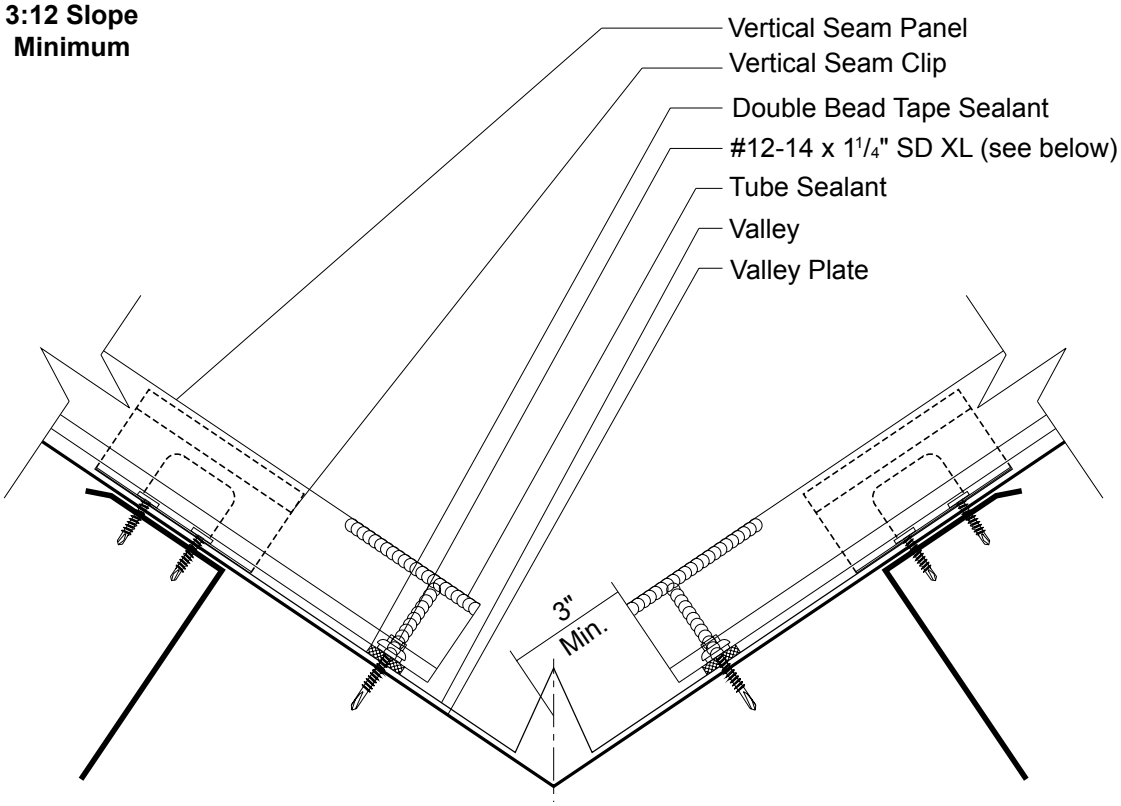
INSTALLATION NOTES

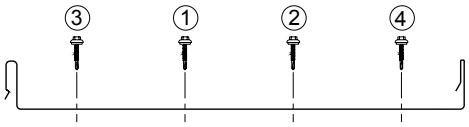
All Gutter Flashings must be installed prior to panel installation.

1. Install Box Gutter flashing back against substrate. To hold Box Gutter flashing in place, fasten to substrate with #10-16 x 1" Pancake Head Drillers 4'-0" o.c.
2. Install Universal Gutter/Downspout Straps every 3'-0" of gutter length to substrate with #10-16 x 1" Pancake Head Drillers, and fasten to Box Gutter with (1) Pop Rivet per Strap.
3. Install panel by fastening through with #12-14 x 1¼" Self Driller XL screws (see pages 34-35 for panel installation).
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2½" o.c.

VERTICAL SEAM — Valley Over Open Framing

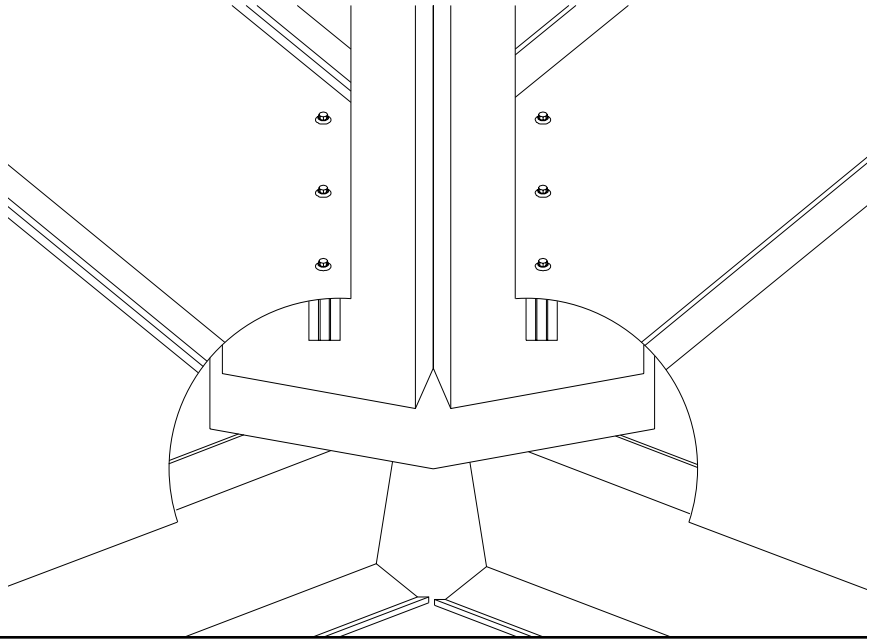
3:12 Slope Minimum





Vertical Seam Fastening Pattern

CAUTION
Additional screws may be required for high snow loading and steep slopes.



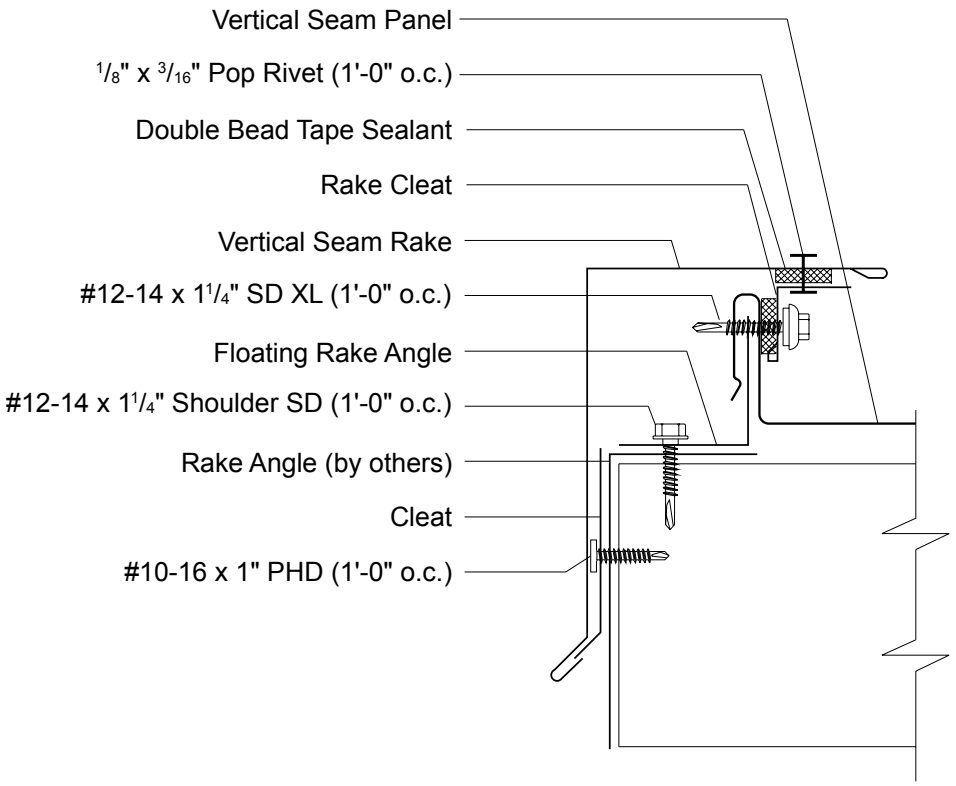
INSTALLATION NOTES

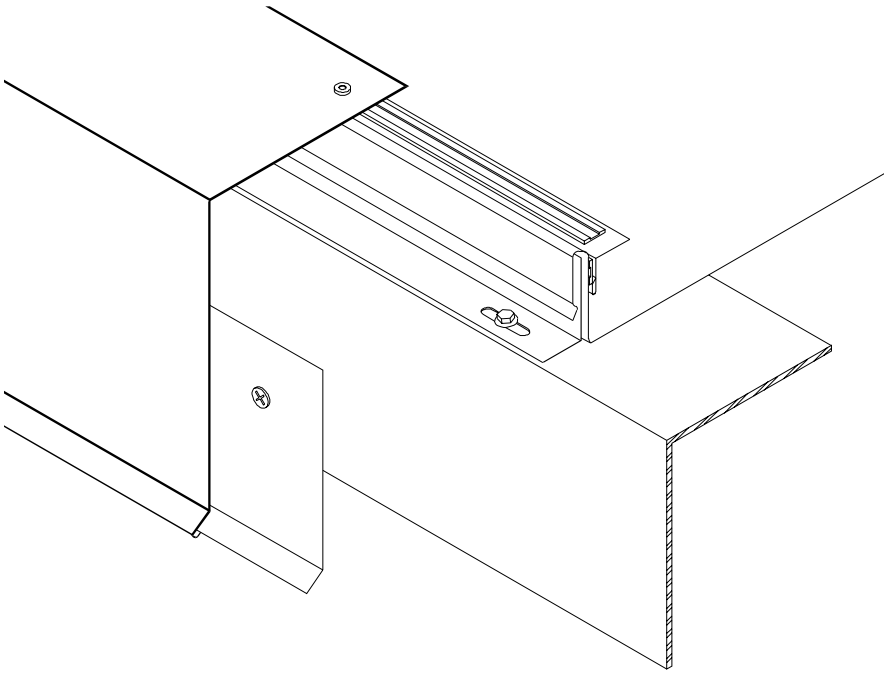
All Valley Flashings must be installed prior to panel installation. If two or more Valley Flashings are required, Valley must be installed working from Eave to Peak.

1. Install Valley flashing back against substrate and fasten with #10-16 x 1" Pancake Head Driller (4'-0" o.c.) to hold flashing place during installation.
2. Apply a row of Double Bead Tape Sealant across both sides of Valley flashing about 3" from the center of the valley.
3. Field cut the Vertical Seam panel to the appropriate angle and install over the Valley flashing, with (5) #12-14 x 1¼" Self Driller XL screws, as shown above (see pages 34-35 for panel installation).
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with (2) pop rivets in the 1" water diverter.

Rake (On Module) Over Open Framing

3:12 Slope Minimum





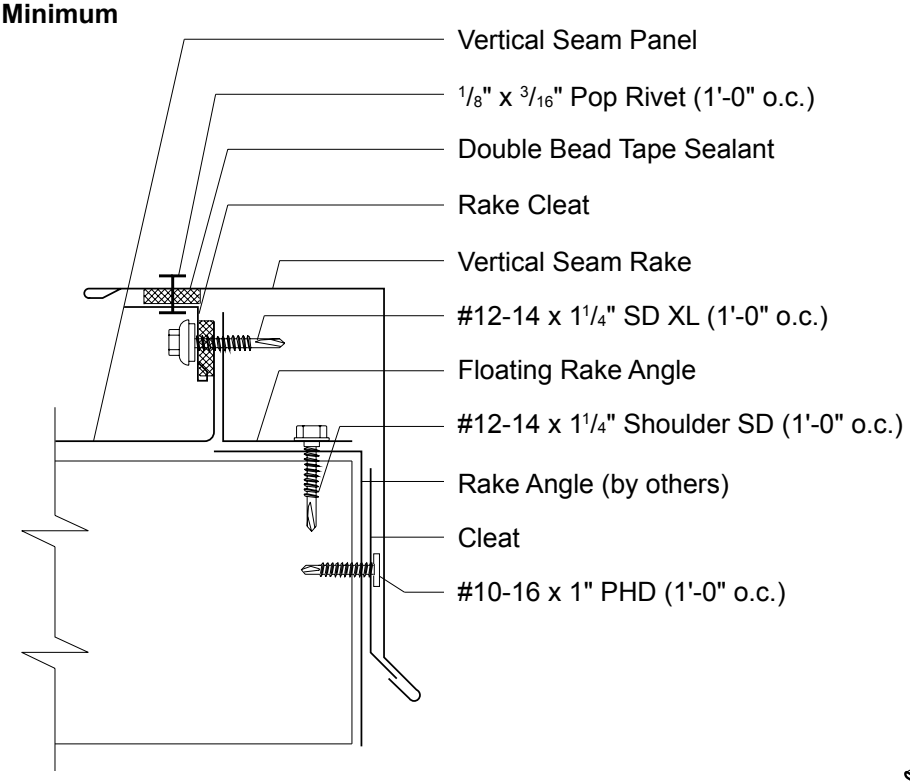
INSTALLATION NOTES

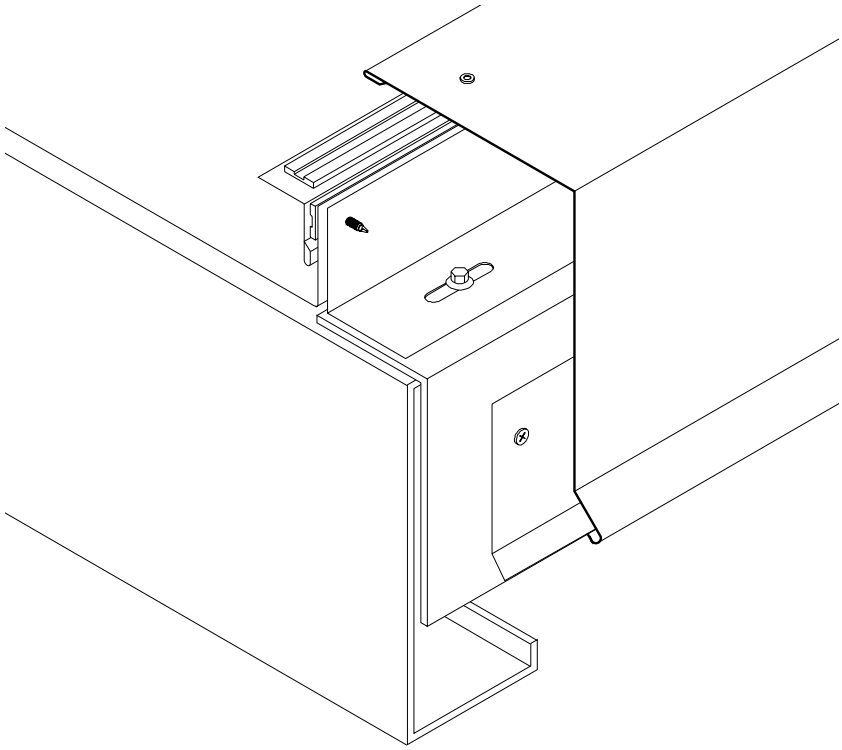
Vertical Seam Floating Rake angle and Vertical Seam panels must be installed prior to rake installation (see pages 34-35).

1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
2. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self-Driller XL, 1'-0" o.c.
3. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat installation allows for proper Rake attachment.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

RAKE (OFF MODULE) OVER OPEN FRAMING

3:12 Slope Minimum





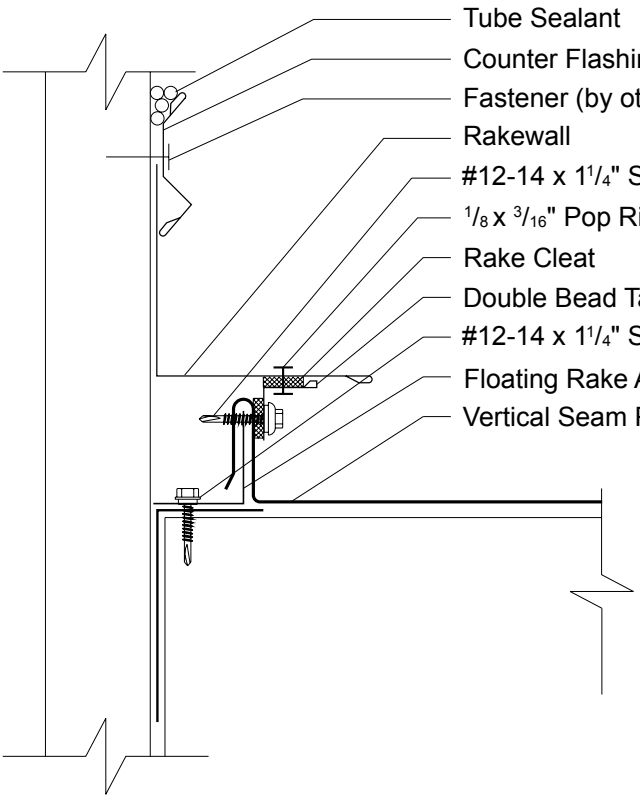
INSTALLATION NOTES

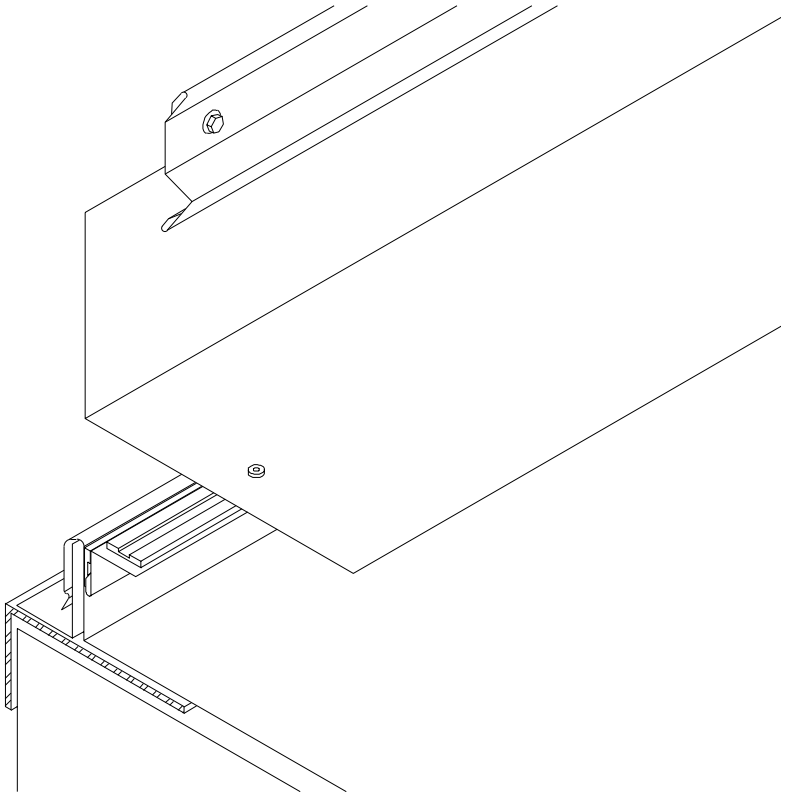
Vertical Seam Floating Rake angle and Vertical Seam panels must be installed prior to rake installation (see pages 34-35).

1. Field cut and bend off module panel up 1 3/4".
2. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self-Driller XL, 1'-0" o.c.
4. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat installation allows for proper Rake attachment.
5. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
6. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

RAKE PARAPET (ON MODULE) OVER OPEN FRAMING

3:12 Slope Minimum





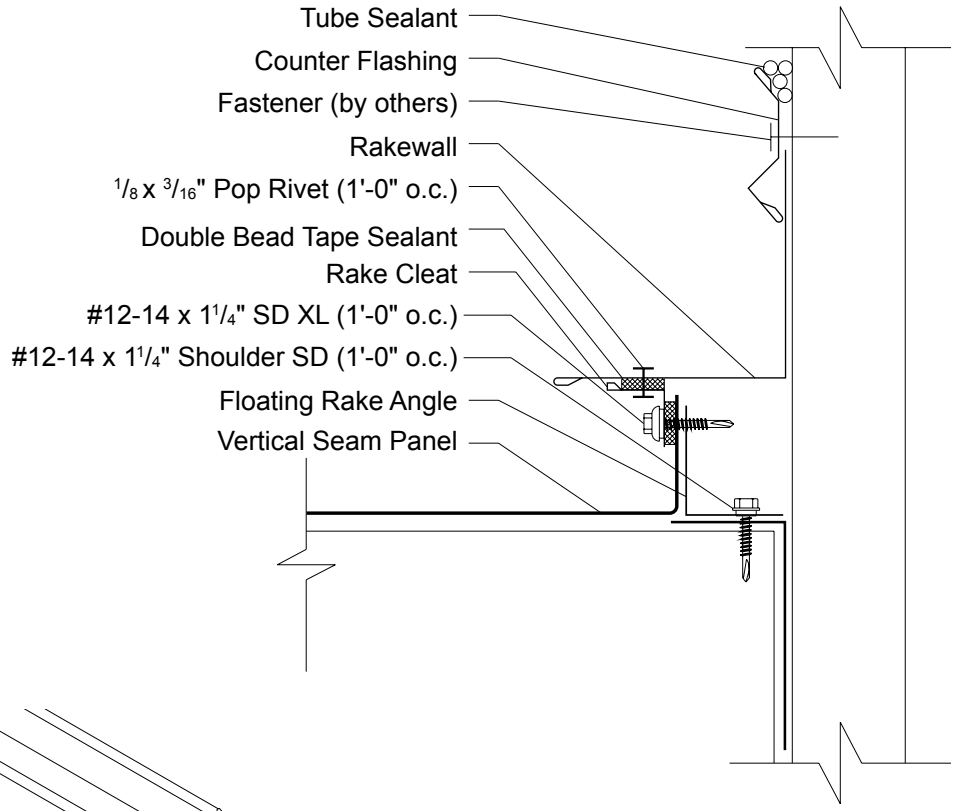
INSTALLATION NOTES

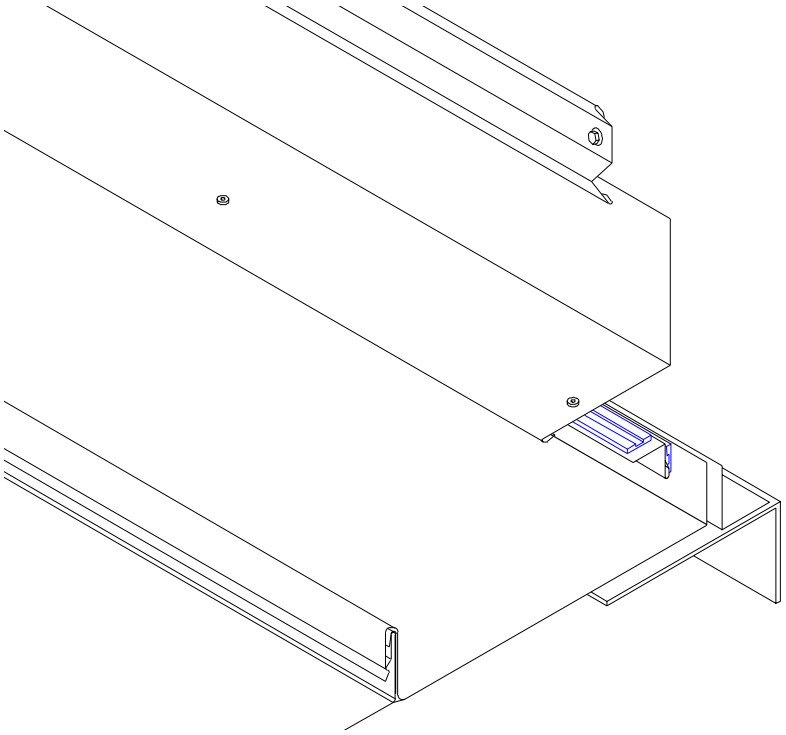
Vertical Seam Floating Rake Angle and Vertical Seam panels must be installed prior to Rakewall installation (see pages 34-35).

1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam Panel.
2. Position and install Rake Cleat through panel and into Floating Rake Angle with #12-14 x 1 1/4" Self Driller XL, 1'-0" o.c.
3. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
4. Install Rakewall to the Rake Cleat with 1/8"x3/16" Pop Rivets at 1'-0" o.c.
5. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do **NOT** fasten Rakewall to wall.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

Rake Parapet (Off Module) Over Open Framing

3:12 Slope Minimum





- Field bend Panel rib up 1 3/4"

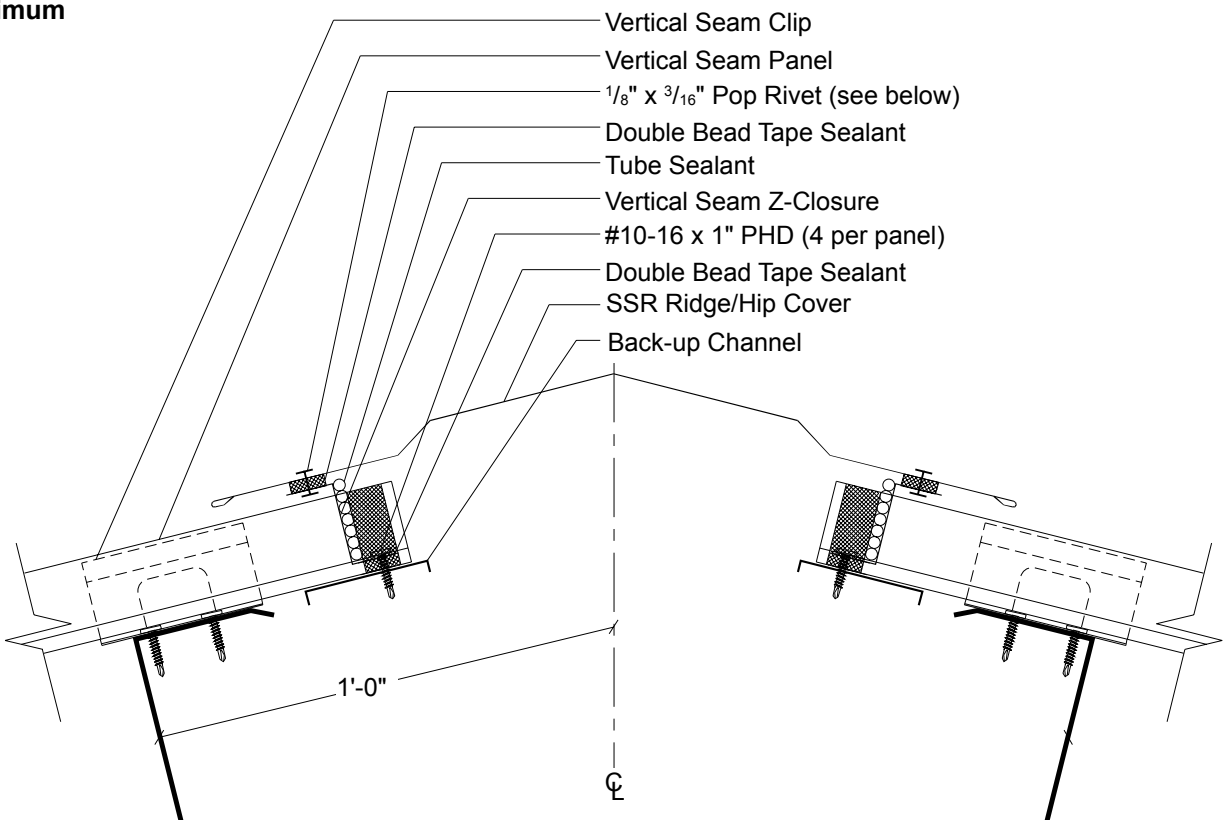
INSTALLATION NOTES

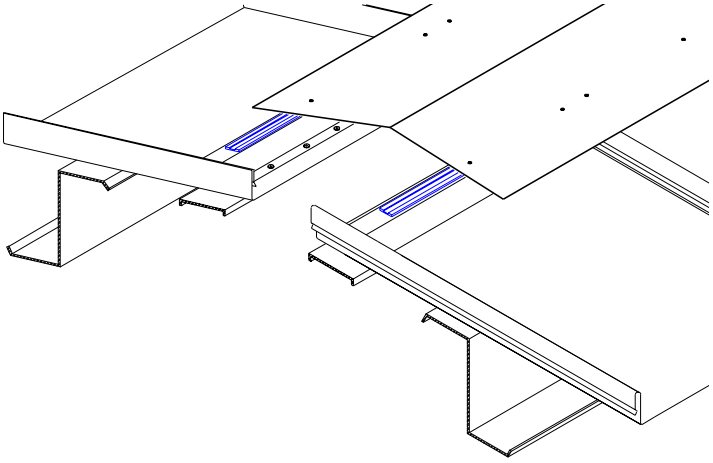
Vertical Seam panels must be installed prior to Rake installation (see pages 34-35).

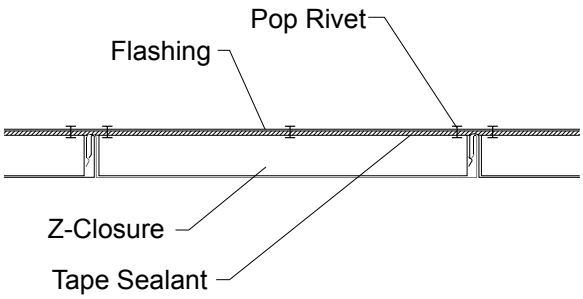
1. Field cut and bend off module panel up 1 3/4"
2. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self Driller XL, 1'-0" o.c.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rakewall to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c. Do **NOT** fasten Rakewall to parapet wall.
6. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do **NOT** fasten Rakewall to wall.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

SSR Ridge/Hip Over Open Framing

3:12 Slope Minimum





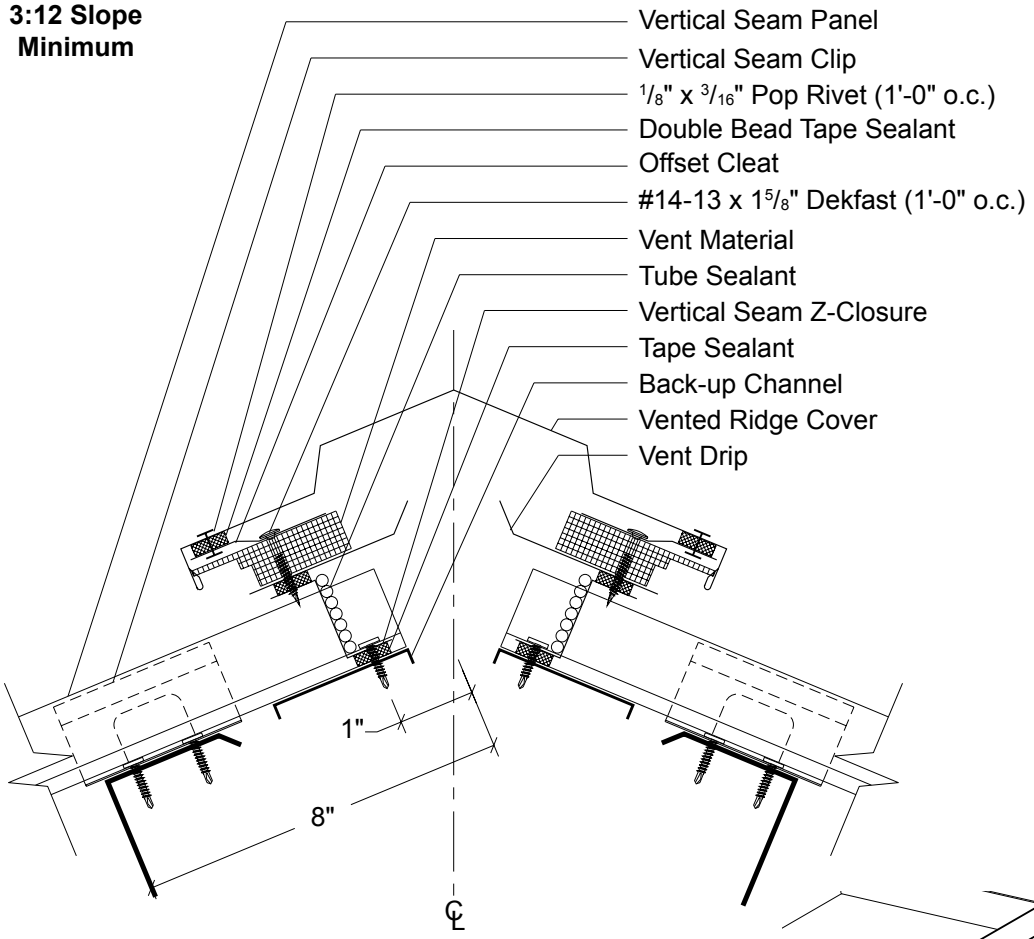


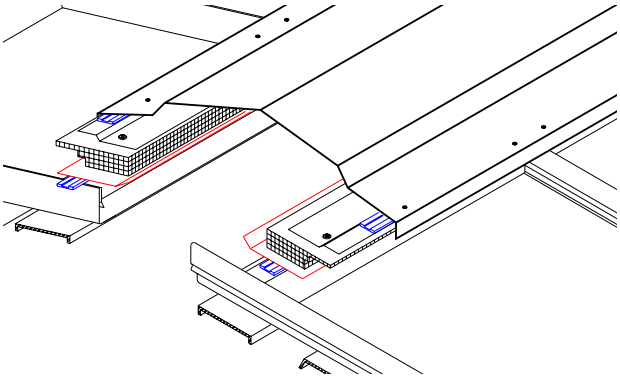
INSTALLATION NOTES

1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Position Back-Up Channel to allow for proper installation of Ridge/Hip assembly. Use C-clamps to hold Back-Up Channel in place.
2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approximately 2" from panel end on both sides of Ridge/Hip.
3. Install Vertical Seam Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure placement will accommodate SSR Ridge Cover (see page 47 for Z-Closure installation).
4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure, tape sealant, Vertical Seam panel, and into Back-Up Channel with (4) #10-16 x 1" PHD per panel. C-clamps may be removed once closures have been fastened.
5. Once all Z-Closures have been installed, place a row of Double Bead Tape Sealant across top of the Z-Closure on both sides of the Ridge/Hip. Tube sealant must be used to fill any and all gaps left around the Z-Closures.
6. Install SSR Ridge Cover and secure to top leg of Z-Closure with Pop Rivets as shown above.
9. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2"o.c.

VERTICAL SEAM — Vented Ridge Over Open Framing

3:12 Slope Minimum



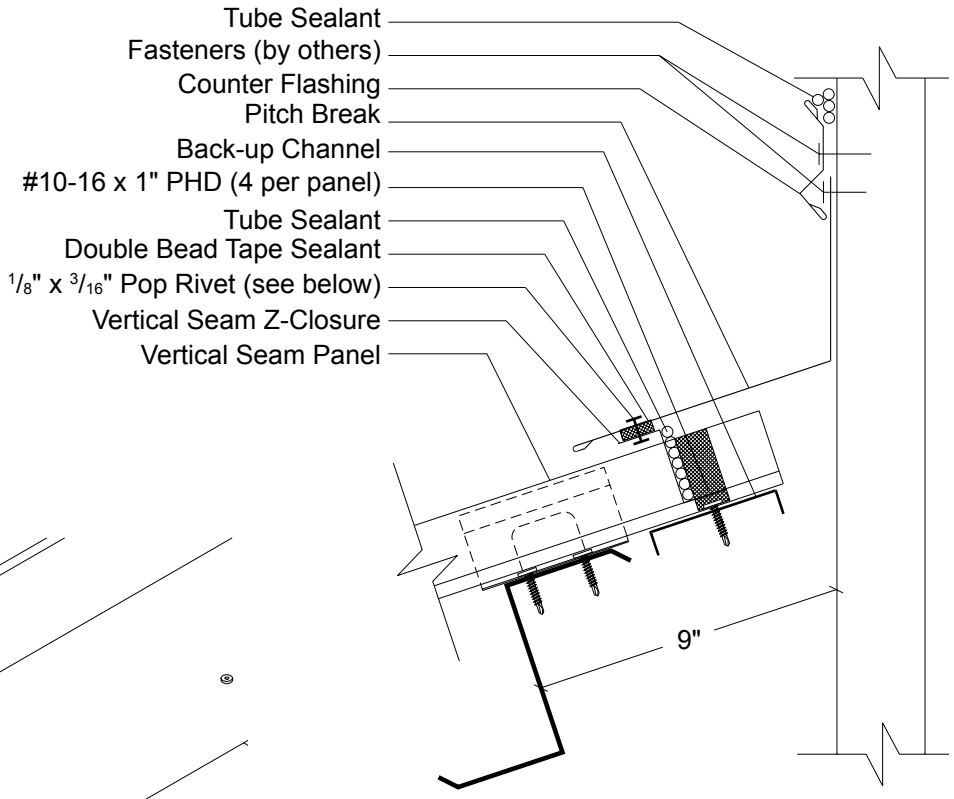


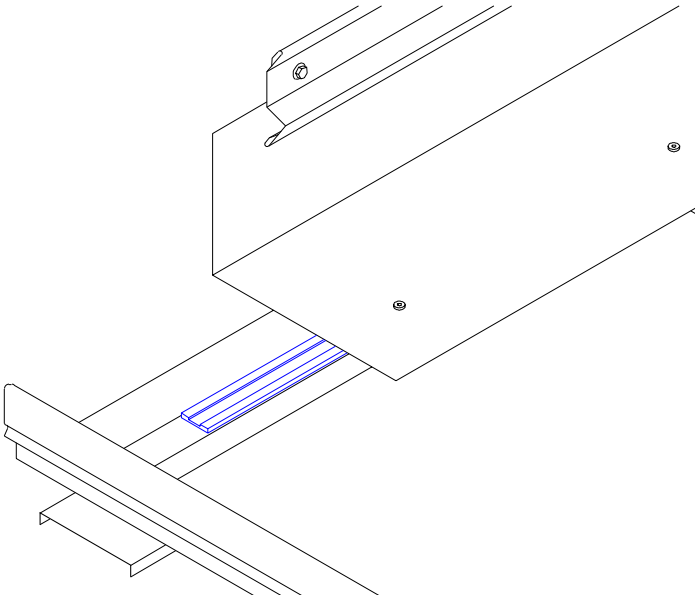
INSTALLATION NOTES

1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Position Back-Up Channel to allow for proper installation of Vented Ridge assembly. Use C-clamps to hold Back-Up Channel in place.
2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approximately 2” from panel end on both sides of ridge.
3. Install Vertical Seam Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure placement will accommodate Vented Ridge Cover (see page 47 for Z-Closure installation).
4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure, tape sealant, Vertical Seam panel, and into Back-Up Channel with (4) #10-16 x 1” PHD per panel. C-clamps may be removed once closures have been fastened.
5. Once all Z-Closures have been installed, place a row of Double Bead Tape Sealant across top of the Z-Closure on both sides of the ridge. Tube sealant must be used to fill any and all gaps left around the Z-Closures.
6. Install Vent Drip, Vent Material, and Offset Cleat (in order) and fasten to top leg of Z-Closure with #14 Dekfasts at 1’-0”o.c.
7. Apply a row of Double Bead Tape Sealant across outer leg of Offset Cleat.
8. Install Vented Ridge Cover and secure to outer leg of Offset Cleat with Pop Rivets as shown above.
9. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2” placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2”o.c.

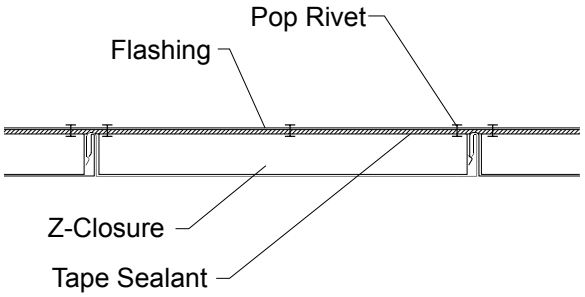
HIGHSIDE PARAPET OVER OPEN FRAMING

3:12 Slope Minimum





CAUTION
Additional screws may be required for high snow loading and steep slopes.



INSTALLATION NOTES

1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Position Back-Up Channel to allow for proper installation of Endwall assembly. Use C-Clamps to hold Back-Up channel in place.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end.
3. Install field cut Z-Closure over Double Bead Tape Sealant. Before continuing, make sure Z-Closure placement will accommodate Pitch Break Flashing (see page 47 for proper Z-Closure installation).
4. Once Z-Closure is set in Tape Sealant, fasten through Z-Closure, and into Back-Up Channel with #10-16 x 1" Pancake Head Drillers (4 per panel).
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings or openings around panel ribs. Position and install Pitch Break flashing to Z-Closure with 1/8" x 3/16" Pop Rivets (as shown).
6. Fasten vertical leg of Pitch Break to the parapet wall with the appropriate fastener (1'-0" o.c.).
7. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do **NOT** fasten Rakewall to wall.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 1/2" o.c.

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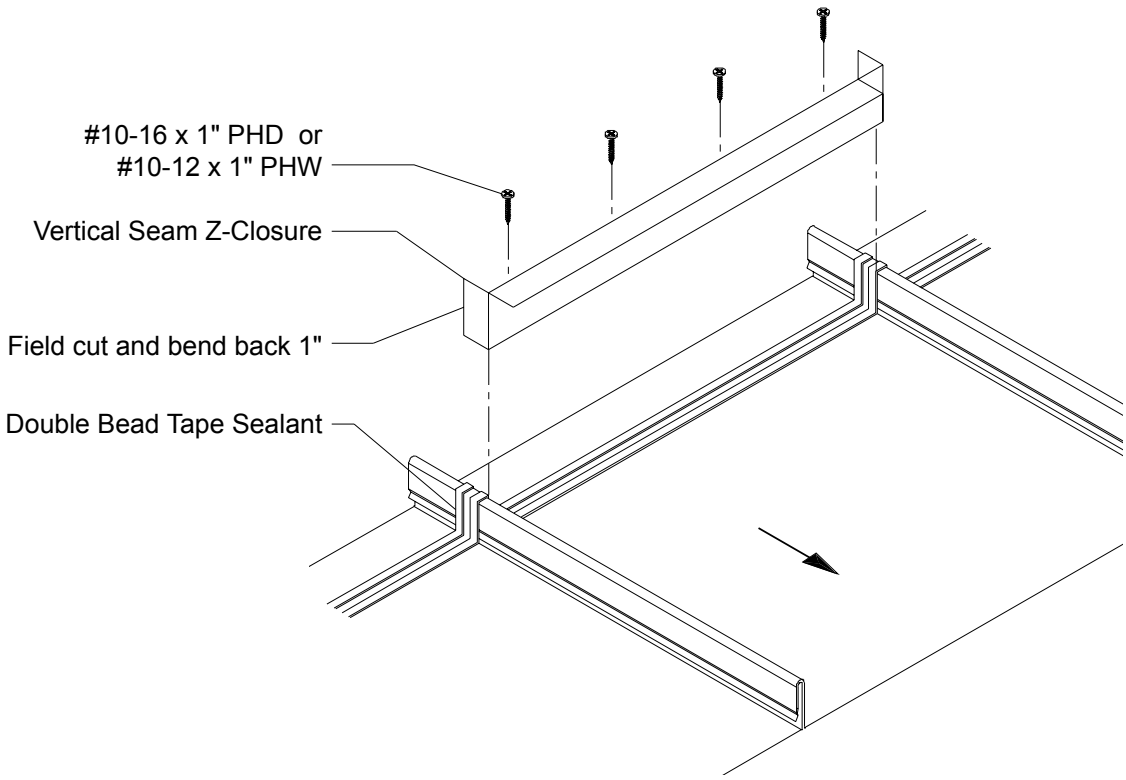
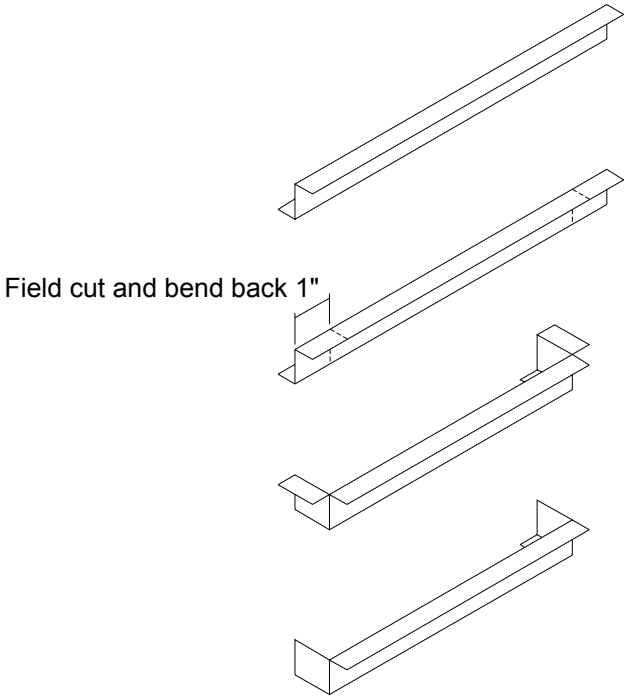
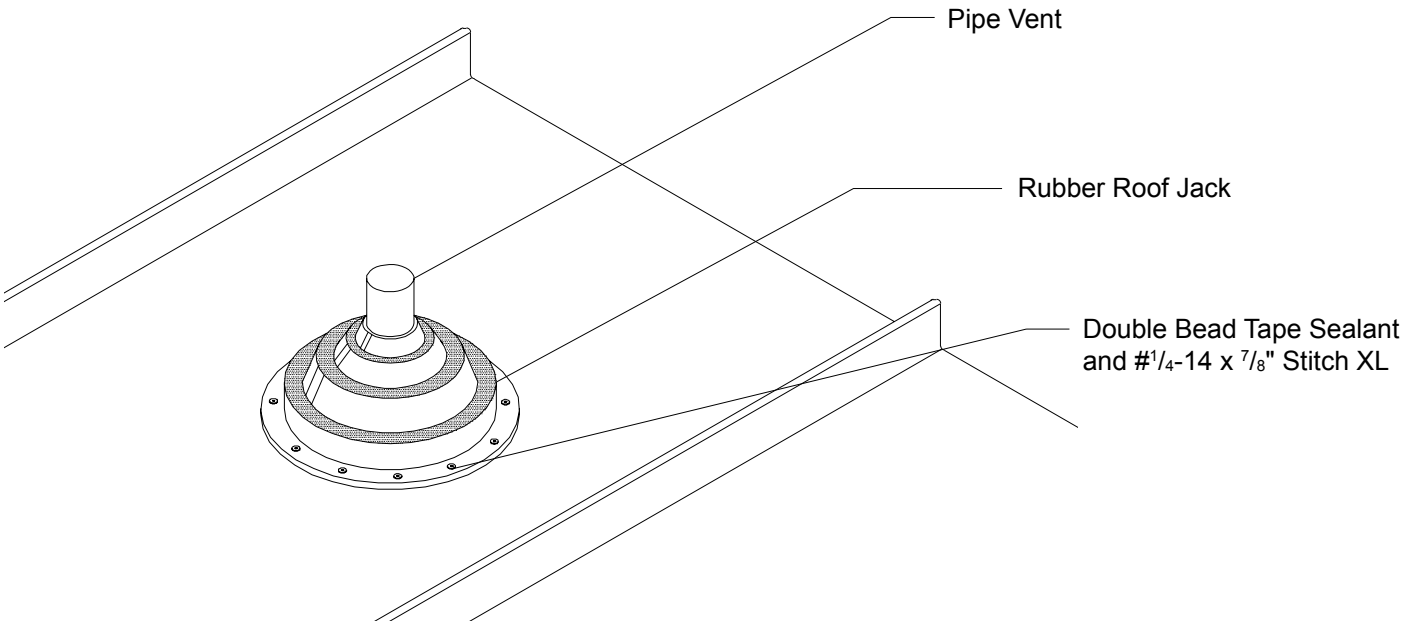
3:12 Slope Minimum

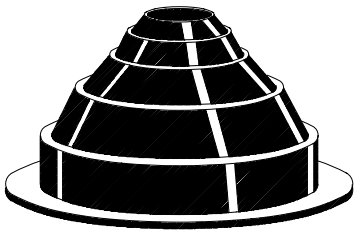




INSTALLATION NOTES

1. Place a row of Double Bead Tape Sealant across panel and over each rib approximately 4" from panel end. Before proceeding, make sure Z-Closure placement will accommodate flashing.
2. Field cut the Z-Closure 2" longer than the panel width. Snip the top and bottom leg of the Z-Closure and bend both sides back (as shown above).
3. Fasten through the Z-Closure, Tape Sealant, Vertical Seam panel, and substrate with (4) (#10-12 x 1" PHW for solid decking, or #10-16 x 1" PHD for open framing).
   Note: For open framing, the substrate will be the Back-up Channel shown in the details.
4. Apply a row of Double Bead Tape Sealant across the top of the Z-Closure filling any gaps or openings around the panel ribs. This will be fastened through when the flashing is installed.





#2 (1 3/4" TO 3" O.D. Pipe)
#4 (3" TO 6" O.D. Pipe)
#6 (6" TO 9" O.D. Pipe)
#8 (7" TO 13" O.D. Pipe)
Temp Range: -30° to +250°

GENERAL NOTES

Size and location of all roof penetrations should be an important consideration. Areas around roof vents or rooftop units may show that corrosive fumes are emmitted from a process within the building.

INSTALLATION NOTES

Note: The following procedures are for vent pipes 6" or less and not transmitting extremely hot or caustic materials. When installing vent pipes abide by the local plumbing codes.

1. Determine the size and length of the vent pipe to be raised.
2. Take the appropriate measurements for the vent location and mark them on the Vertical Seam panel. The vent pipe must extend through the flat of the roof panel. If the vent pipe extension cannot be raised directly into the flat of the new roof panel, elbows should be used to offset the pipe. Cut the panel to fit the vent pipe properly.
3. Use a light gauge angle to secure and plumb the vent pipe to the framing system.
4. Flash the vent pipe with a Rubber Roof Jack or similar pipe flashing.
5. Apply Tube Sealant between the panel and the base of the Rubber Roof Jack as well as the top where the boot meets the pipe.
6. Attach the base of the Rubber Roof Jack to the panel using #1/4-14 x 7/8" Stitch XL fasteners.

Though factory applied pre-painted finishes are very durable and will last many years, eventually it may be desirable to thoroughly clean or repaint them.

Dirt pickup may cause apparent discoloration of the paint when it has been exposed in some dirt laded atmospheres for long periods of time. In areas of strong sunlight, slight chalking may cause some change in appearance. A good cleaning will often restore the appearance of these buildings and render repainting unnecessary. An occasional light cleaning will help maintain a good appearance.

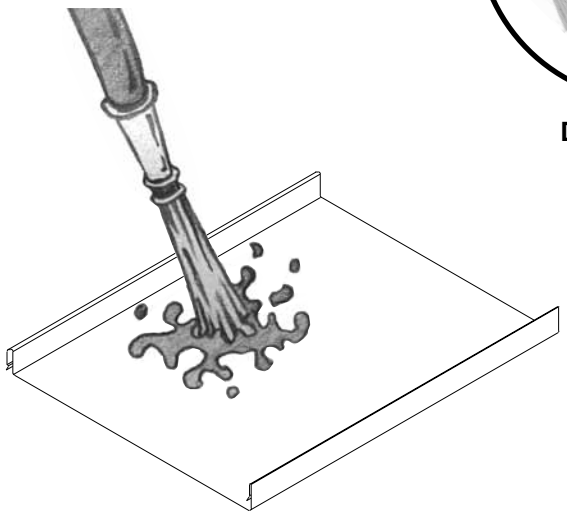
In many cases, simply washing the building with plain water using a hose or pressure sprayer will be adequate. In areas where heavy dirt deposits dull the surface, a cloth or soft bristle brush and solution of water and detergent ($^1/_3$ cup of laundry detergent per gallon of water for example) may be used. This should be followed by an adequate rinse of water. Do not use wire brushes, abrasives, or cleaning tools which will abrade the coating surface.

Mildew may occur in areas subject to high humidity but is not normally a problem due to the high inherent mildew resistance of the baked finish that is used. However, mildew can grow on dirt and spore deposits in some cases. To remove mildew along with the dirt, the following solution is recommended.

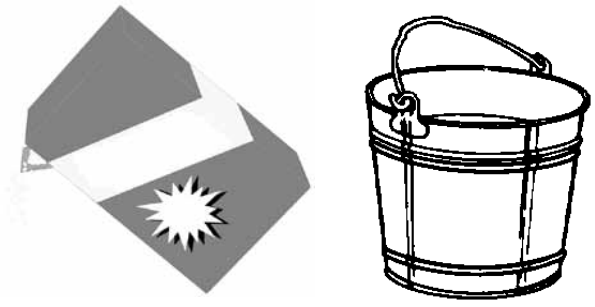
- $^1/_3$ cup detergent (Tide® or equivalent)
- $^2/_3$ cup trisodium phosphate (Solex® or equivalent)
- 1 quart of 5% sodium hypochlorite solution (Clorox® or equivalent)
- 3 quarts of water

Strong solvents and abrasive type cleaners should be avoided. Most organic solvents are flammable and toxic and must be handled accordingly. When using a solvent, consult maintenance professionals and label instructions for proper handling and disposal of washings. If required, a mild solvent such as mineral spirits can be used to remove caulking compounds, oil, grease, tars, wax, and similar substances. Use a cloth dampened with mineral spirits and apply only to areas which are contaminated. Follow up the use of this mild solvent with detergent cleaning and rinsing.

DO NOT USE A WIRE BRUSH



HOSE OR PRESSURE SPRAY FOR ADEQUATE CLEANING



USE MILD DETERGENT AND WATER FOR HEAVY DIRT DEPOSITS