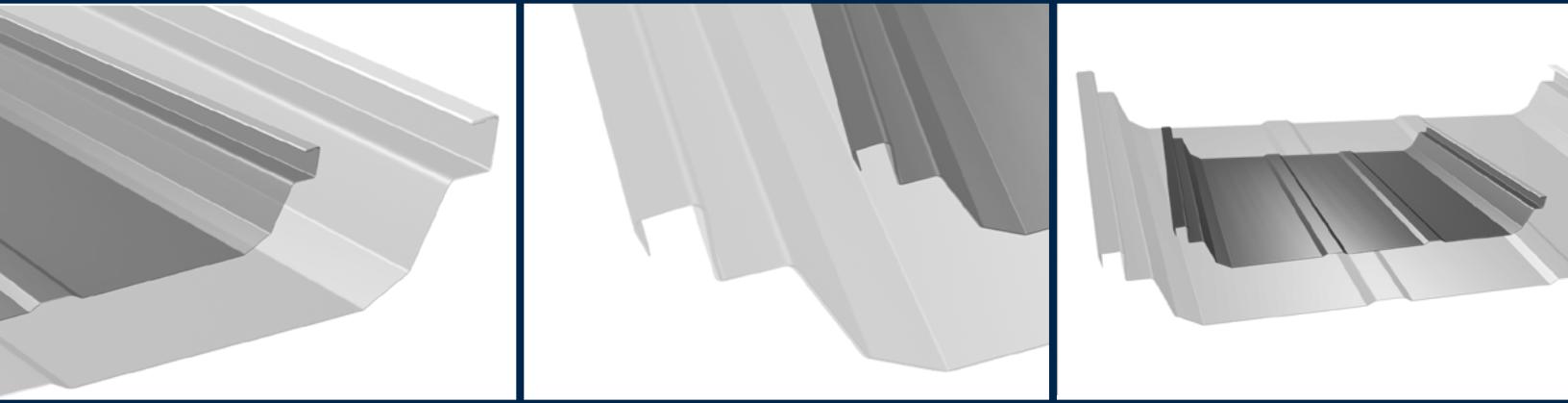




**WHIRLWINDSTEEL**  
BUILDINGS & COMPONENTS



## **TECHNICAL ERECTION MANUAL** SUPER SEAM PLUS

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Houston, TX 77075

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(713) 946 7140 Phone

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## **IMPORTANT NOTICE**

PLEASE READ THIS MANUAL COMPLETELY PRIOR TO BEGINNING INSTALLATION OF THE SUPER SEAM PLUS ROOFING SYSTEM.

IF THERE IS A CONFLICT BETWEEN PROJECT ERECTION DRAWINGS PROVIDED OR APPROVED BY WHIRLWIND STEEL BUILDINGS, INC AND DETAILS IN THIS MANUAL, PROJECT ERECTION DRAWINGS WILL TAKE PRECEDENCE.

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Descriptions and specifications contained herein were in effect at the time this publication was approved for printing. In a continuing effort to refine and improve products, Whirlwind reserves the right to discontinue products at any time or change specifications and/or designs without incurring obligation. To insure you have the latest information available, please inquire or visit our Web Site at [www.whirlwindsteel.com](http://www.whirlwindsteel.com)



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### FEATURES AND BENEFITS

#### 1. DESIGN INTEGRITY

Whirlwind's Super Seam Plus mechanically seamed system begins and ends in the high, reducing the risk of leakage at the rake that can occur when finishing in the low. The panel seam includes factory-applied mastic.

#### 2. FLOATING ROOF

The Super Seam Plus roof was designed to cope with the forces of expansion and contraction. This is accomplished by allowing the panels to freely move up and down the roof slope.

#### 3. SLIDING CLIPS

2" and 4" sliding clips are available, with the 2" version providing 1-1/4" movement in each direction while the 4" version provides for 2" of movement in each direction. Both clips are also available in high and low versions, which provides a 3/8" clearance or a 1-3/8" clearance, allowing for a variety of thermal spacer and insulation thickness combinations.

#### 4. UL 90 RATING

The Super Seam Plus roof system has 8 different UL 90 construction numbers, each of which is available with several options.

#### 5. FACTORY MUTUAL APPROVAL

The Super Seam Plus roof has been tested by Factory Mutual Research Corporation for wind uplift, fire, and hail damage under Standard 4471 achieving various ratings. Refer to page SSP-7 for summary information.

#### 6. FIRE RESISTANCE RATINGS

The roof system qualifies for use in several UL design assemblies and carries a UL "Class A" fire rating.

#### 7. SIMPLICITY

No troublesome batten cap is needed. The panels simply seam together forming a watertight seal.

#### 8. FLEXIBILITY

Whirlwind's Super Seam Plus roof system offers welcome flexibility to the erector. Wall covering can be erected before or after the roof is installed. Panel installation is an uninterrupted procedure.

#### 9. EASE OF INSTALLATION

The erector has the option to sheet each side of the roof separately or both sides simultaneously, which greatly increases the speed and convenience of erection. Being reversible end-for-end, sheets do not have to be special ordered for each side of the building. No field notching of panels at endlaps or ridge is required.

#### 10. FORGIVING SYSTEM

The Super Seam Plus design allows for the roof to be finished in the high when an out-of-square condition or other factors cause the roof to terminate up to 4" out of module.

#### 11. BUILDING LENGTH

Odd length footage building roofs can be terminated by field bending the panel or specially designed variable termination trim at the rake.

#### 12. PRE-PUNCHED PANELS AND COMPONENTS

Whirlwind's pre-punched system, combined with self-engaging back-up plates, assures panel module and speeds up roof installation.

#### 13. DURABILITY

Every unpainted panel is manufactured from acrylic coated galvalume, your assurance of the Whirlwind commitment to quality.

#### 14. COLORS AND FINISHES

Super Seam Plus is available in a wide variety of popular colors.

Vise-Grip® is a registered trademark of American Tool Companies, Inc. S-5!™ is a trademark of Metal Roof Innovations.

#### CAUTION

Application and design details are for illustration purpose only and may not be appropriate for all environmental conditions or building designs. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices.

## Read this First

## CAUTION

Application and design details are for illustration purposes only and may not be appropriate for all environmental conditions or building designs. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices.

## CAUTION

The use of any field seaming machine other than that provided by the manufacturer may damage the panels, void all warranties and will void all engineering data.

Low Floating System - with or without 3/8" thermal spacer. See Insulation/Thermal Spacer Selection Chart below.

High Floating System - with 3/8", 5/8" or 1" thermal spacer. See Insulation/Thermal Spacer Selection Chart below.

Thermal calculations should be performed for each project to ensure that the thermal movement of the roof is not greater than the floating clip's capacity. Various densities of blanket insulation may affect the installation and or the appearance of a metal roof system. The installer is responsible for selecting the proper clip and thermal spacer for their conditions.

INSULATION/ THERMAL SPACER SELECTION CHART

Insulation Thickness	Low System	High System	2" Hi-Thermal Systems
No Insulation	3/8" Thermal Spacer	High System Not Recommended	2" Hi-Thermal Systems Not Recommended
3" Insulation	Thermal Spacer Not Recommended	1" Thermal Spacer Recommended	2" Hi-Thermal Systems Not Recommended
4" Insulation	Thermal Spacer Not Recommended	5/8" Thermal Spacer Recommended	2" Hi-Thermal Systems Not Recommended
6" Insulation	Low System Not Recommended	3/8" Thermal Spacer Recommended	1" Hi-Thermal Spacer Recommended
8" Insulation	Low System Not Recommended	Thermal Spacer Not Recommended	5/8" Hi-Thermal Spacer Recommended
9" Insulation	Low System Not Recommended	High System Not Recommended	3/8" Hi-Thermal Spacer Recommended
10" Insulation	Low System Not Recommended	High System Not Recommended	Thermal Spacer Not Recommended

## NOTES:

1. As with all standing seam roof systems, sound attenuation (example: blanket insulation) is required between the panel and the substructure to prevent "roof rumble" during windy conditions. Some composite roof systems may require additional acoustical consideration to ensure that thermal vibration noises are isolated from the building interior. Contact your architect and/or engineer for proper acoustical design.
2. The following are examples of conditions that may cause condensation: (A) Project where outside winter temperatures below 40°F are anticipated and where average winter interior relative humidity of 45% or greater is expected. (B) Building usages with high humidity interiors, such as indoor swimming pools, textile manufacturing operations, food, paper or other wet-process industrial plants. (C) Construction elements that may release moisture after the roof is installed, such as interior concrete and masonry, plaster finishes, and fuel burning heaters. Manufacturer is not responsible for determining if condensation will be an issue on any particular application.

## THERMAL SPACER DISCLAIMER

The above thermal spacer chart is intended to be used as a general guideline only. Because of the various densities of insulation currently available, the manufacturer cannot guarantee that this chart will be accurate in all situations. Further, the manufacturer does not specifically require that the roofing contractor use thermal spacers with its Super Seam Plus® roof system. However, please review the following information:

- Although the manufacturer does not require a thermal spacer, the architect or building owner may.
- In certain environments, the compression of the fiberglass insulation, without a thermal spacer, may create a thermal break which can cause condensation to form on the purlins/joists.
- On uninsulated buildings, eliminating the thermal spacer: (1) will increase "roof rumble" and (2) you may encounter problems holding panel module.
- When a high clip is used without a thermal spacer: (1) you may encounter problems holding panel module and (2) foot traffic on the panel ribs may result in bent clips.
- Using a low clip with too much insulation or too thick a thermal spacer: (1) may cause "purlin read" (2) may cause difficulty in properly installing the panel side laps, and (3) you may encounter problems holding panel module.

# TECHNICAL ERECTION MANUAL SUPER SEAM PLUS

## ENGINEERING

### UL90 Construction Numbers



#### UNDERWRITERS LABORATORIES APPROVAL

Construction Number	Panel Width (In.)	Gauge	Clip Type	Clip Spacing	Substrate	UL-2218 Impact Resistance	UL-263 Fire Rating	UL-580 Rating
180C	24	24 min.	Sliding	5'-0"	Composite System	Class 4	Class A	Class 90
287	24	24 min.	Sliding	5'-0"	Open Framing	Class 4	Class A	Class 90
308A	24	24 min.	Sliding	5'-0"	Composite System	Class 4	Class A	Class 90
450	24	24 min.	Sliding	5'-0"	Open Framing	Class 4	Class A	Class 90
538	24	24 min.	Sliding	5'-0"	Open Framing	Class 4	Class A	Class 90
539	24	24 min.	Sliding	5'-0"	Composite System	Class 4	Class A	Class 90
540	24	24 min.	Sliding	5'-0"	Open Framing	Class 4	Class A	Class 90
165	24	24 min.	Sliding	5'-0"	Open Framing	Class 4	Class A	Class 90

#### NOTES:

1. Tests procedures are in accordance with Underwriters Laboratories Standard UL-580 under "Tests For Uplift Resistance of Roof Assemblies".
2. A detailed installation method is available for each Construction Number above and can be found in the UL Roofing Materials and Systems Directory. The panels must be installed in a certain manner to achieve the published results when installed over a Class A sub structure.
3. The panel qualifies for a Class A fire rating in compliance with Underwriters Laboratories Standard UL-263.
4. The panel system is listed under the following Fire Resistance Design Numbers: P225, P227, P230, P237, P265, P268, P508, P510, P512, P701, P711, P717, P720, P722, P726, P731, P734, P801, P815, and P819. Refer to the UL Fire Resistance Directory for specific construction methods and hourly ratings.
5. Construction Number 450 includes the use of a domed skylight.

#### FACTORY MUTUAL APPROVAL

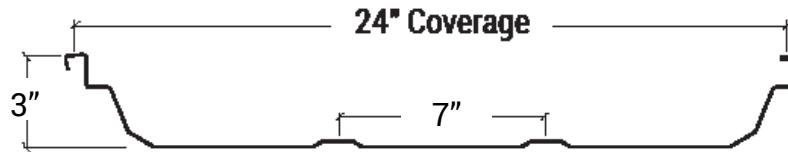
Panel Width (In.)	Gauge	Clip Type	Clip Spacing	Substrate	Hail Damage Rating	ASTM E108 Fire Rating	FM Windstorm Rating
24	24	**	5'-0"	Open Framing	Class 1 - SH	Class A	Class 1 - 60
24	22	**	5'-0"	Open Framing	Class 1 - SH	Class A	Class 1 - 75
24	22	**	4'-0"	Open Framing	Class 1 - SH	Class A	Class 1 - 105

\*\* Floating or Articulating

#### NOTES:

1. Tests procedures are in accordance with Factory Mutual Research Corporation (FMRC) Standard 4471.
2. A detailed test report is available for each product above. The panels must be installed in a specific manner to achieve the published results. Contact the manufacturer for more information.
3. FLORIDA BUILDING CODE PRODUCT APPROVAL Super Seam Plus Roofing System details and engineering load tables have been examined by the State of Florida and comply with the 2020 Florida Building Code Product Approval Number (FL#17700-R3).

## 24" Section Properties/Load Tables



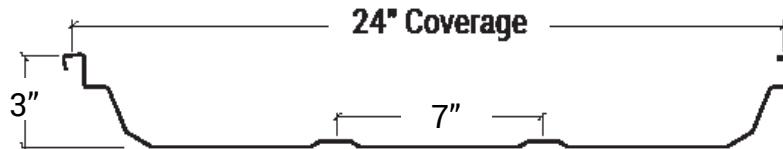
## SECTION PROPERTIES

Panel Gauge	Fy (KSI)	Weight (PSF)	NEGATIVE BENDING			POSITIVE BENDING		
			Ixe (IN. 4/FT.)	Sxe (IN. 3/FT.)	Maxo (KIP-IN.)	Ixe (IN. 4/FT.)	Sxe (IN. 3/FT.)	Maxo (KIP-IN.)
24	50	1.23	0.1507	0.0989	2.9619	0.3224	0.1308	3.9166
22	50	1.56	0.2059	0.1394	4.1741	0.4205	0.1709	5.1171

## NOTES:

1. All calculations for the properties of Super Seam Plus panels are calculated in accordance with the 2012 edition of the North American Specification For Design Of Cold-Formed Steel Structural Members.
2. Ixe is for deflection determination.
3. Sxe is for bending.
4. Maxo is allowable bending moment.
5. All values are for one foot of panel width.

The Engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended that the design professional have a copy of the most current version of the North American Specification for the Design of Cold-Formed Steel Structural Members published by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the Specification, the designer should reference the most current building code applicable to the project job site in order to determine environmental loads. If further information or guidance regarding cold-formed design practices is desired, please contact the manufacturer.



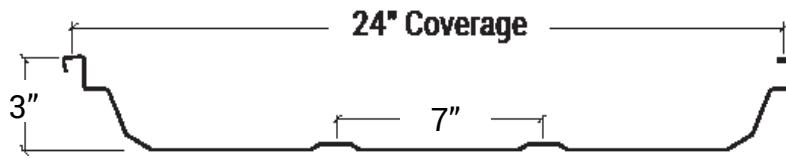
## ALLOWABLE UNIFORM LOADS IN POUNDS PER SQUARE FOOT

24 Gauge (Fy = 50 KSI)							
SPAN TYPE	LOAD TYPE	SPAN IN FEET					
		2.5	3.0	3.5	4.0	4.5	5.0
SINGLE	LIVE	204.0	170.0	145.7	127.5	113.3	102.0
2-SPAN	LIVE	204.0	170.0	145.7	123.4	97.5	79.0
3-SPAN	LIVE	204.0	170.0	145.7	127.5	113.3	98.7
4-SPAN	LIVE	204.0	170.0	145.7	127.5	113.3	92.2
22 Gauge (Fy = 50 KSI)							
SPAN TYPE	LOAD TYPE	SPAN IN FEET					
		2.5	3.0	3.5	4.0	4.5	5.0
SINGLE	LIVE	296.9	247.5	212.1	185.6	165.0	136.5
2-SPAN	LIVE	296.9	247.5	212.1	173.9	137.4	111.3
3-SPAN	LIVE	296.9	247.5	212.1	185.6	165.0	139.1
4-SPAN	LIVE	296.9	247.5	212.1	185.6	160.4	129.9

## NOTES:

1. Allowable loads are based on uniform span lengths and Fy = 50 ksi.
2. LIVE LOAD is limited by bending, shear, combined shear, and bending.
3. Above loads consider a maximum deflection ratio of L/180.
4. The weight of the panel has not been deducted from the allowable loads.
5. THE ABOVE LOADS ARE NOT FOR USE WHEN DESIGNING PANELS TO RESIST WIND UPLIFT.
6. Please contact manufacturer or manufacturer's website for most current allowable wind uplift loads.
7. The use of any field seaming equipment or accessories, including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
8. This material is subject to change without notice. Please contact Whirlwind for most current data.

The Engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended that the design professional have a copy of the most current version of the North American Specification for the Design of Cold-Formed Steel Structural Members published by the American Iron and Steel Institute to facilitate design. This specification contains the design criteria for cold-formed steel components. Along with the specification, the designer should reference the most current building code applicable to the project job site in order to determine environmental loads. If further information or guidance regarding cold-formed design practices is desired, please contact the manufacturer.

**General Description**


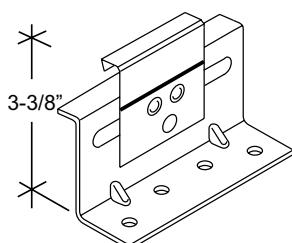
Coverage Width	24" with Minor Ribs - Pre-punched 6 holes
Minimum Slope	1/4: 12
Panel Attachment	Low, High Floating
Panel Substrate	Galvalume Clear Acrylic (standard)
Gauge	22 and 24 GA*
Finishes	Smooth with Minor Ribs
Coatings	Galvalume Clear Acrylic, SMP CERAM-A-STAR®

\* Minimum order or additional set-up fee required.

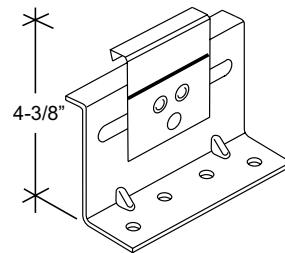
**CAUTION**

Diaphragm capabilities and purlin stability are not provided by Whirlwind's Super Seam Plus Roof system. Therefore, other bracing may be required to conform to A.I.S.C or A.I.S.I. Specifications.

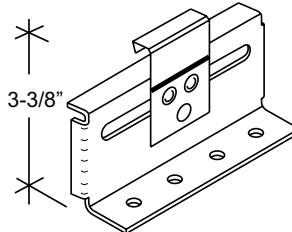
### Product Checklist



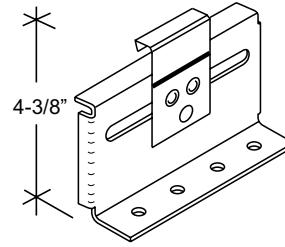
HW-2122 - 2" SLIDING CLIP, LOW FLOATING



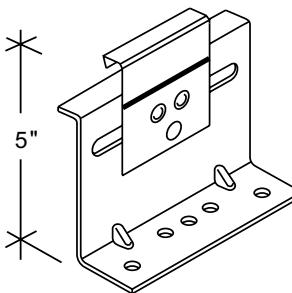
HW-2124 - 2" SLIDING CLIP, HIGH FLOATING



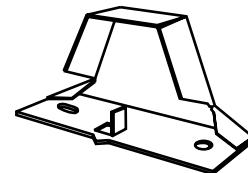
HW-2126 - 4" SLIDING CLIP, LOW



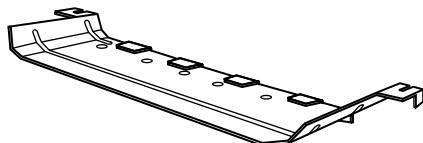
HW-2128 - 4" SLIDING CLIP, HIGH



HW-2129 - 2" STANDOFF, SLIDING CLIP (HI THERMAL)

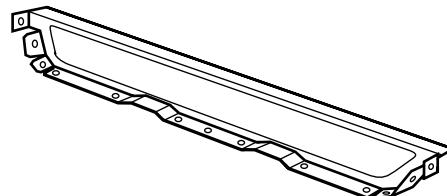


HW-426 - INSIDE CLOSURE FOR USE AT EAVE



For use at endlaps and at the ridge.  
Pre-punched  
16 Gauge prepainted

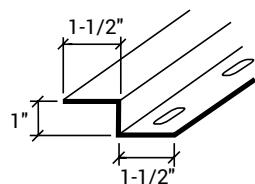
SS2BUP(24") - BACK-UP PLATE 24"



For use at ridge or high eave  
24 Gauge

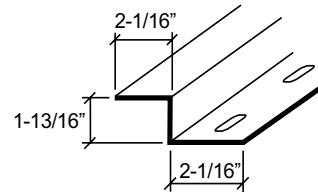
SS2ED (24") END DAM

## Product Checklist



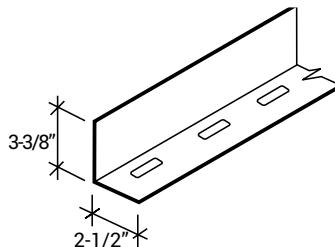
8'-0" length  
14 gauge painted  
Factory punched 12" O.C.  
For use with high clips

EP-501 (HW-7616) - EAVE PLATE, HIGH



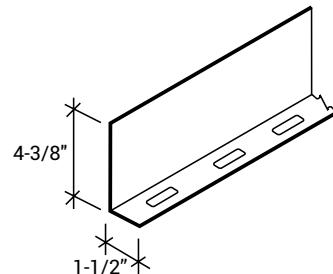
8'-0" length 2" standoff rake support  
14 gauge painted  
Use with Super Seam Plus roof system only  
Use with 2" Sliding hi-thermal clips only

HW-7661 - EAVE PLATE, 2" STANDOFF



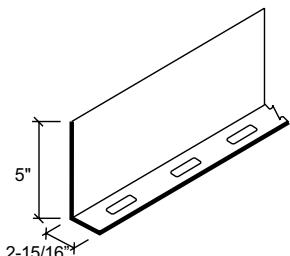
20'-0" length  
14 Gauge painted  
Factory slots  
For use with low clips

SS2RSLP (RED-OXIDE) - RAKE SUPPORT, LOW  
 SS2RSLG (GALVANIZED) - RAKE SUPPORT, LOW



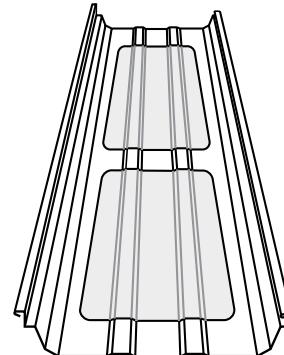
20'-0" length  
14 Gauge painted  
Factory slots  
For use with high clips

SS2RSLP (RED-OXIDE) - RAKE SUPPORT, HIGH  
 SS2RSLG (GALVANIZED) - RAKE SUPPORT, HIGH



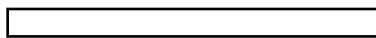
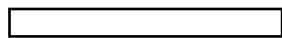
20'-0" length  
14 Gauge painted  
Use with Super Seam Plus roof system only  
Use with 2" sliding hi-thermal clips only

HW-7664 - RAKE SUPPORT, 2" STANDOFF



Super Seam Plus - 24"  
Insulated - with Stiffener  
Plate and 10 fasteners  
10'-3" long

LIGHT TRANSMITTING PANEL UL90 - REINFORCED  
 LIGHT TRANSMITTING PANEL UL90 - REINFORCED/UV RESISTANT



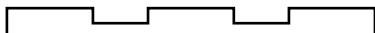
Used at the eave plate, eave strut, end  
dams, ridge caps and trim connections.

TAPE SEALER - 1" x 3/32" TAPE SEAL

Used at the end lap.

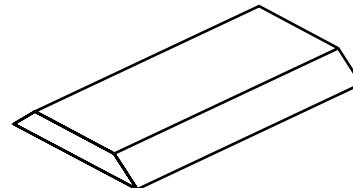
TAPE SEALER - 1-1/2" x 3/32" TAPE SEALER

## Product Checklist



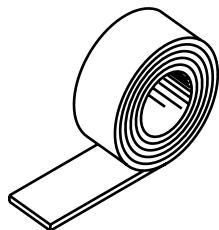
Used at valleys and roof curbs.

TRIPLE BEAD TAPE SEALER - 2-7/8" x 3/16"



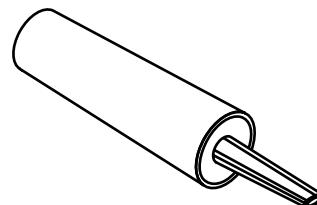
Used to fill void at minor ribs of the panel at the eave and valleys

TAPE SEALER-MINOR RIB PRE-CUT BEVELED  
1-3/8" x 1-7/32" x 4"



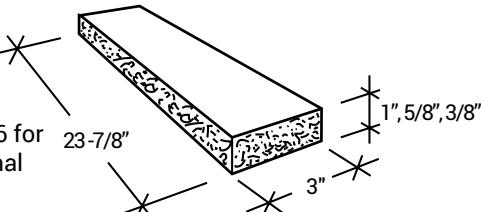
Used to hold insulation in place at the rake, eave, and at any insulation splices

DOUBLE FACED TAPE - 1-1/2" x 180' ROLLS



TUBE CAULKING

Refer to page SSP-6 for proper use of thermal spacers.

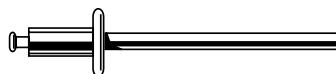


## THERMAL SPACER

- SSTS- 38
- SSTS- 58
- SSTS

Special application fastener  
For use on masonry

1/4" x 1-1/4" NAIL DRIVE MASONRY ANCHOR



Gutter strap to snow gutter  
Trim to trim connections

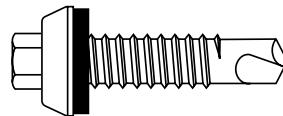
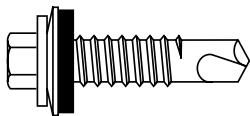
1/8" x 3/16" POP RIVET



Snow gutter to eave plate  
End Dam to back-up angle at hip condition

1/8" x 3/8" POP RIVET

## Product Checklist



Clip to purlin with up to 4" insulation thickness

Eave plate to eave strut

Inside closure to eave plate or eave strut

Mid-slope fixed plate to purlin

Light transmitting panel trim

**1/4 x 14 x 1-1/4" DRILLER 5/16" HEX WASHER HEAD WITH 5/8" O.D. WASHER FOR INSULATION OVER 4" THICKNESS**

**1/4 x 14 x 2" DRILLER 5/16" HEX WASHER HEAD WITH 5/8" O.D.**

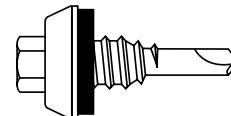
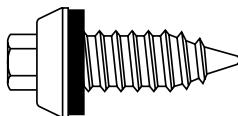
Panel to eave plate, eave strut, or valley plate

Rake angle to roof panel

End Dam

Endlap

**1/4 x 14 x 1-1/4" HTZ TEKS 2**



Use in place of Fasteners

1/4" x 14 x 1-1/4" LONG LIFE TEK 2

1/4" X 14 X 7/8" LONG LIFE S.D.S.

Ridge and other flashing to End Dam

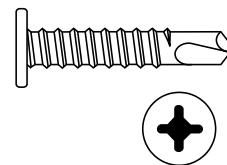
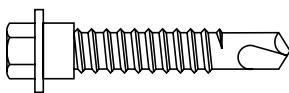
Gutter to panel

Gutter to strap

Trim to trim connections

**17 x 1" TYPE AB LONG LIFE 5/16"HEX WASHER HEAD WITH SEALING WASHER**

**1/4 x 14 x 7/8" LONG LIFE S.D.S. 5/16" HEX WASHER HEAD WITH SEALING WASHER**



Rake support to purlin

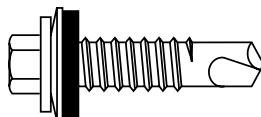
Floating eave plate to eave strut

Support plate to purlins at valley and hip conditions

Rake angle to purlins

**1/4 x 14 x 1-1/4" SHOULDER TEK 2 5/16" HEX WASHER HEAD, NO WASHER**

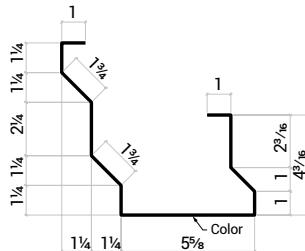
**12 x 1" #2 PANCAKE HEAD DRILLER**



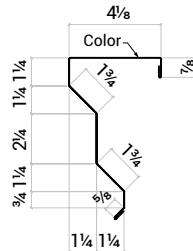
Hi-thermal Clip to purlin with up to 10" insulation thickness

**1/4 x 14 x 2" DRILLER 5/16"HEX WASHER HEAD WITH 5/8" O.D. WASHER**

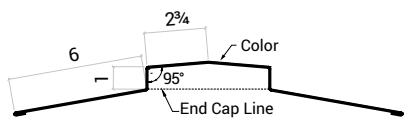
## Product Checklist



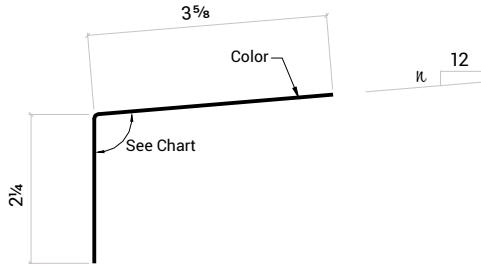
## GU-52 SHADOW GUTTER



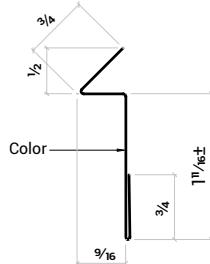
## RT-540 SHADOW RAKE



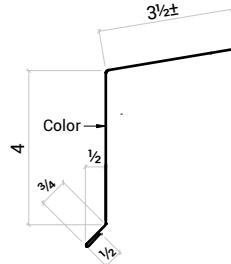
RC-51 RIDGE CAP



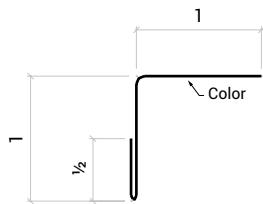
## GC-10 GUTTER COUNTER FLASH



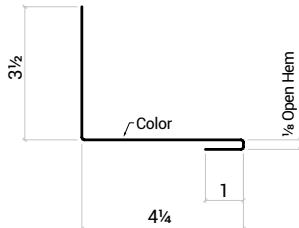
RS-501 RAKE SLIDE



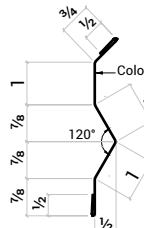
## □ ET-62 SIMPLE EAVE TRIM



#### **□ TT-622 PARAPET RAKE CLEAT**



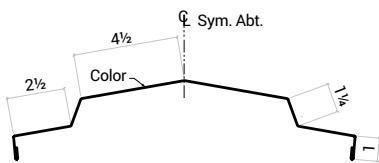
#### **□ TT-623 RAKE PARAPET FLASHING**



□ MT-601 COUNTER FLASH



**FL-254 PERFORATED VENT DRIP**



## **FL-300 VENTED RIDGE**

## Preparatory Requirements

1. Make sure a rake angle or an alternate structural flat surface has been installed on top of the purlins to accept the "Rake Support".
2. The walls do not have to be erected before the roof is installed. However, for the purpose of this manual, we have assumed that the wall panels have been installed. If the roof is installed before the walls the installer must note the required panel overhang at the eave and use the correct counter flash per the erection drawings.
3. All primary and secondary framing must be erected, plumbed, and squared with bolts tightened according to accepted building practices.
4. The substructure (eave to ridge) must be on plane with a tolerance of 1/4" in 20' and 3/8" in 40'.
5. Super Seam Plus can be erected on various types of construction. However, for the purpose of this manual, we have assumed that the roof will be installed on a new, pre-engineered metal building.
6. Super Seam Plus roof panels are furnished in 24" width.
7. It is critical that the purlins or joists at the ridge and endlaps be exactly located as detailed in this manual and that they are straight from rafter to rafter. Any mislocation or bowing of these members can cause the fasteners at the endlaps or end dams to foul the purlin or the back-up plate to foul the clip as the panels expand and contract.
8. Peak purlin spacing - 16" (from the centerline of the building) and 16" for a 9" continuous vent.
9. Read recommended erection practices on pages SSP-42 and SSP-43 before proceeding with roof installation.
10. Whirlwind recommends the use of a screw gun with a speed range of 0 - 2000 RPM to properly install all fasteners referenced in this manual. Tools rated to 4000 RPM should never be used for self-drilling fasteners typically supplied with metal building components.
11. Field cutting of the panels should be avoided where possible. If field cutting is required, the panels must be cut with nibblers, snips, or shears to prevent edge rusting. Do not cut the panels with saws, abrasive blades, grinders, or torches.

**NOTE**

It is the responsibility of the erector to install this roof using safe construction practices that are in compliance with OSHA regulations. Whirlwind is not responsible for the performance of this roof system if it is not installed in accordance with the instructions shown in this manual. Deviations from these instructions and details must be approved in writing by Whirlwind.

**CAUTION**

Diaphragm capabilities and purlin stability are not provided by Whirlwind's Super Seam Plus roof system. Therefore, other bracing may be required.

**CAUTION**

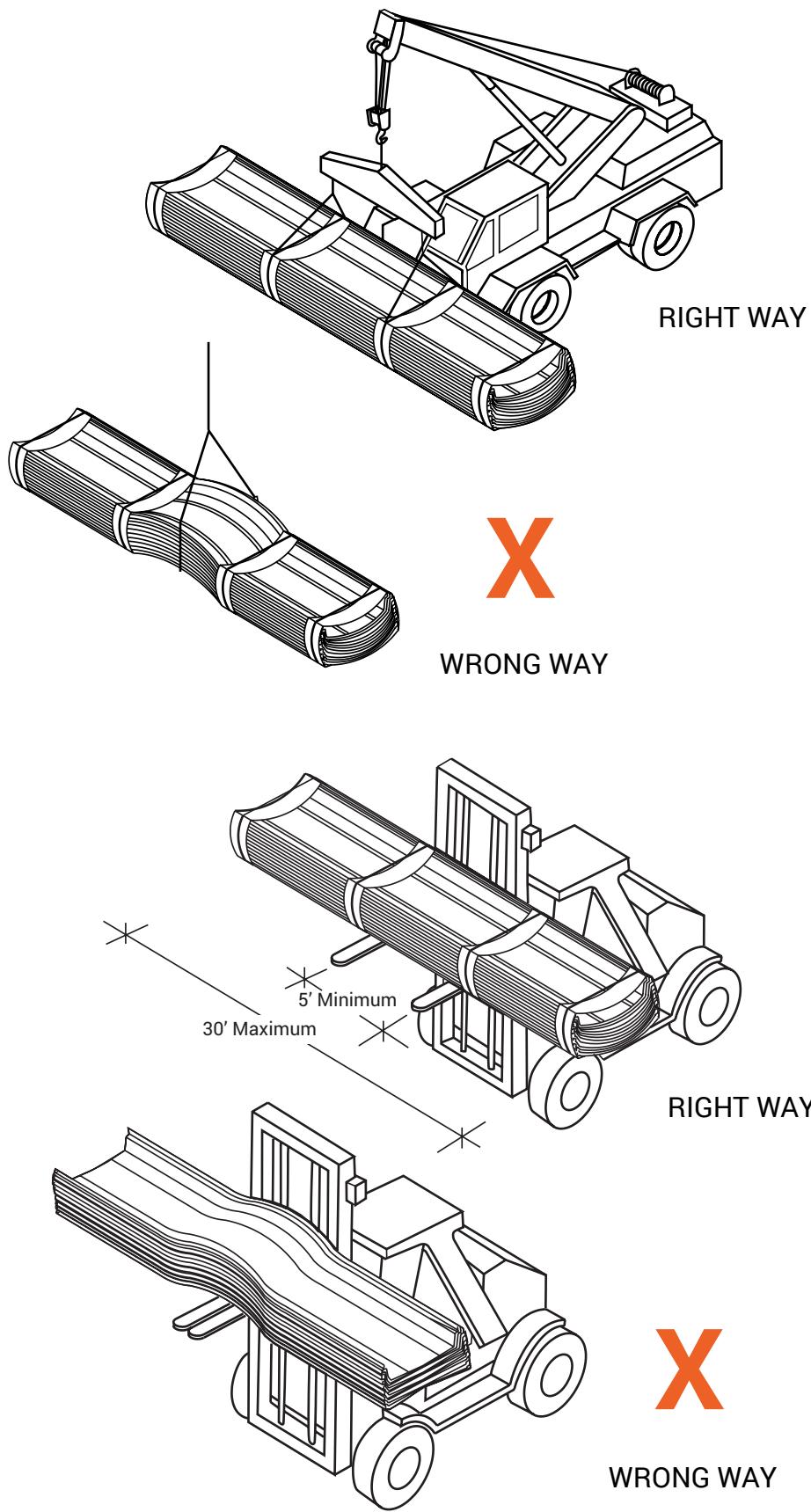
The minimum recommended slope for the roof system is 1/4 on 12. A slope of less than 1/4 on 12 could cause severe ponding and will void material warranties.

**CAUTION**

Application and design details are for illustration purposes only, and may not be appropriate for all environmental conditions or building designs. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices.

**WARNING**

Light transmitting panels are not designed or intended to bear the weight of any person walking, stepping, standing, or resting on them. WHIRLWIND DISCLAIMS ANY WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, that any person can safely walk, step, stand, or rest on or near these light transmitting panels or that they comply with any OSHA regulation.

**Unloading**

Spreader bar required on panels over 30 feet.

Upon receiving material, check shipment against shipping list for shortages and damages. The manufacturer will not be responsible for shortage or damage unless noted on the shipping list.

Each bundle should be lifted at its center of gravity. Where possible, bundles should remain banded until final placement on roof. If bundles must be opened, they should be retied before lifting.

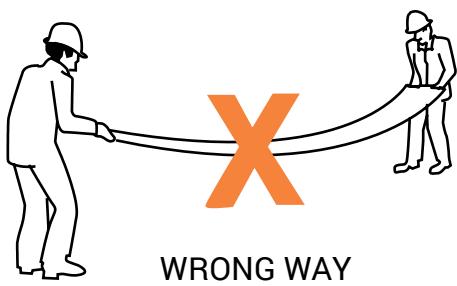
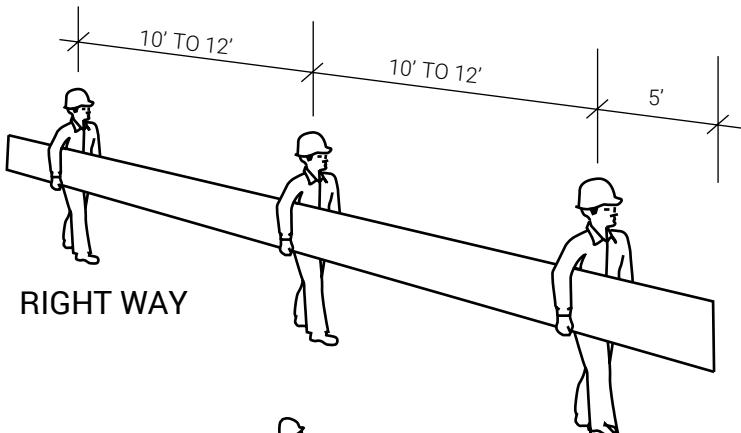
When lifting bundles with a crane, a spreader bar and nylon straps should be used. **NEVER USE WIRE ROPE OR CHAIN SLINGS. THEY WILL DAMAGE THE PANELS.**

When lifting bundles with a forklift, forks must be a minimum of five feet apart. Do not transport open bundles. Drive slowly when crossing rough terrain to prevent panel buckling.

**CAUTION**

Improper unloading and handling of bundles and crates may cause bodily injury or material damage. The manufacturer is not responsible for bodily injuries or material damages during unloading and storage.

## Handling & Panel Storage



Standing on one side of the panel, lift it by the seam. If the panel is over 10' long, lift it with two or more people on one side of the panel to prevent buckling.

Do not pick panels up by the ends.

### NOTE

Protective gloves should always be used while handling panels. OSHA safety regulations must be followed at all times.

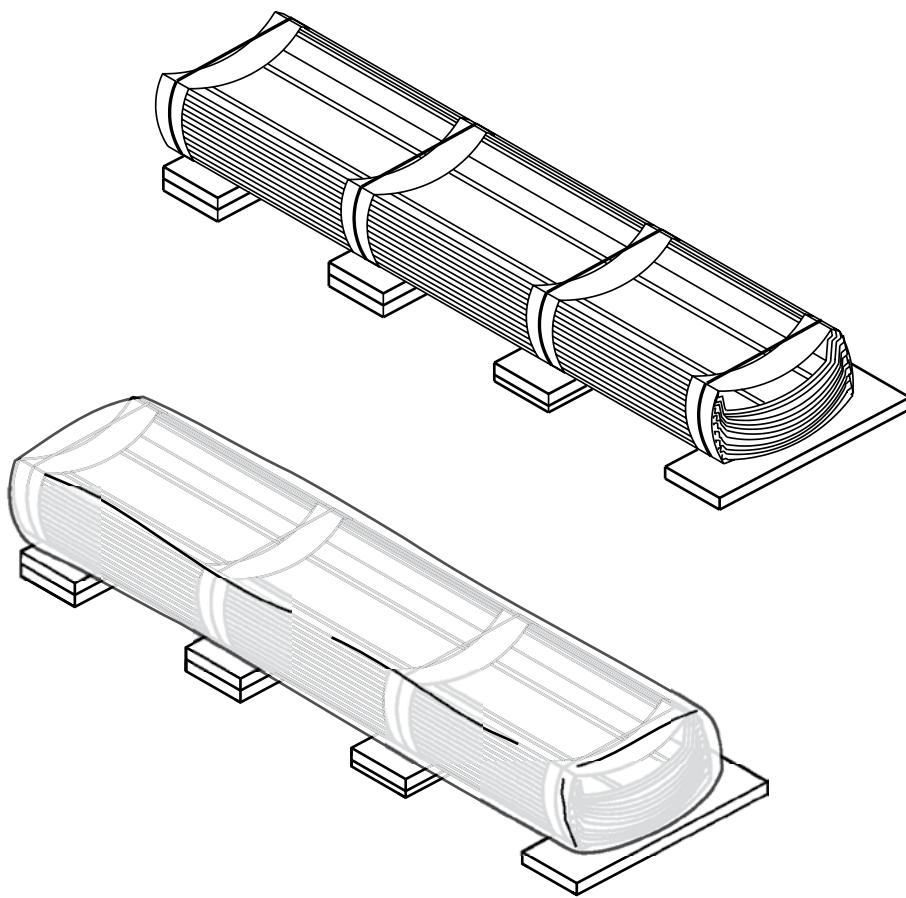
Store bundle sheets off the ground sufficiently high enough to allow air circulation beneath bundle and to prevent rising water from entering bundle. Slightly elevate one end of bundle. Prevent rain from entering bundle by covering with tarpaulin, making provision for air circulation between draped edges of tarpaulin and the ground. PROLONGED STORAGE OF SHEETS IN A BUNDLE IS NOT RECOMMENDED.

If conditions do not permit immediate erection, extra care should be taken to protect sheets from staining or water marks.

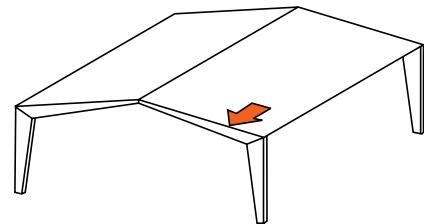
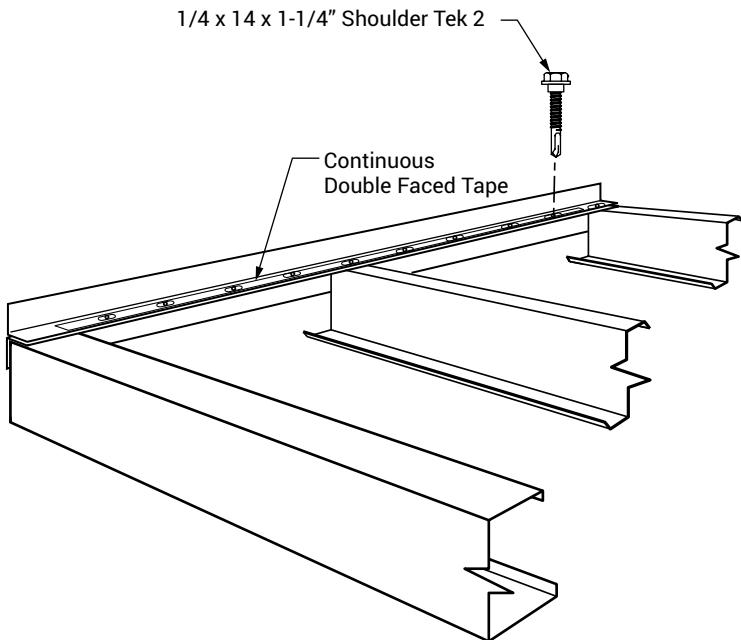
Check to see that moisture has not formed inside the bundles during shipment. If moisture is present, panels should be uncrated and wiped dry, then re-stacked and loosely covered so that air can circulate between the panels.

### BAND ONLY

This method is used on all orders, unless otherwise specified by customer. The panels are banded together, causing them to curl up. This enhances the strength of the bundles. Panels bundled in this manner may be handled by a forklift in lengths to 30'. The forklift should have at least 5' between forks. Lengths in excess of 30' must be lifted utilizing a spreader bar. Special care must be given during handling to avoid damage to the locking edges of the panels.



### Step 1 - Rake Support



Attach the rake support on top of the rake angle with the proper self-drilling fasteners on 2'-0" centers with a fastener in the first and last pre-punched slot. The vertical leg is to be installed square with the eave. Center fasteners in slots.

#### FASTENER REQUIREMENTS

#### FLOATING SYSTEM

Purlins - Fastener

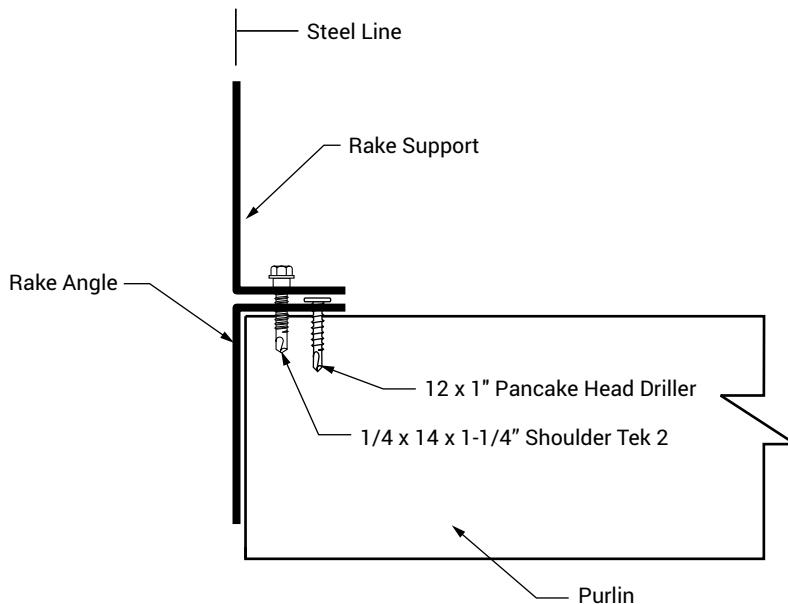
1/4 x 14 x 1-1/4" Shoulder Tek 2

Joist - Fastener

1/4 x 14 x 1-1/4" Shoulder Tek5

IT IS IMPORTANT THAT THE RAKE SUPPORT IS INSTALLED STRAIGHT AND SQUARE WITH THE EAVE AS IT CONTROLS THE ALIGNMENT OF THE ROOF SYSTEM.

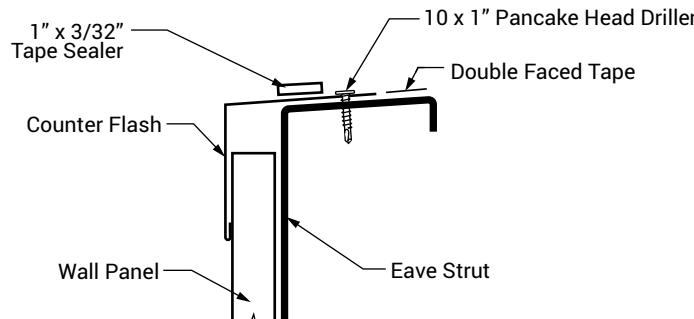
Install double faced tape continuously to the top of the horizontal leg of the rake support. This will help hold the insulation in place at the rake.



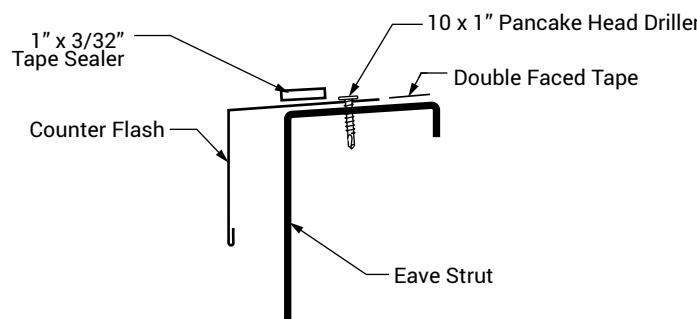
**CAUTION**  
(For Floating Systems Only)  
It is important that shoulder fasteners are installed through the CENTER of the slotted holes of the rake support to allow for expansion and contraction.

**CAUTION**  
ALL PRIMARY AND SECONDARY FRAMING SHOULD BE ERECTED, PLUMBED, AND BOLTS TIGHTENED PRIOR TO SHEETING.

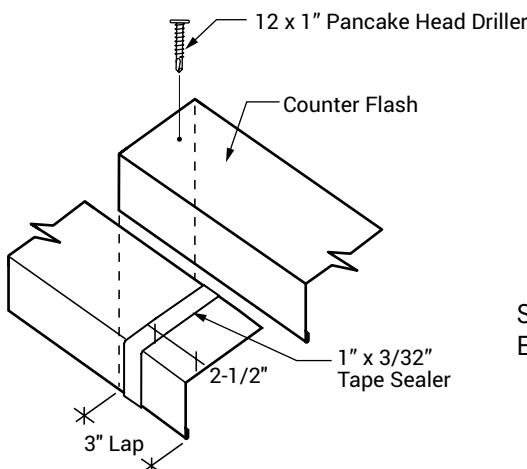
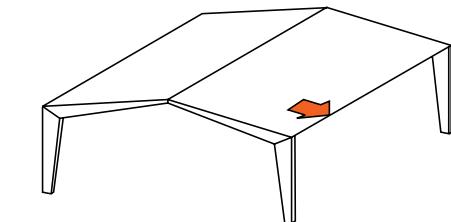
## Step 2 - Low System Eave



WALL PANEL INSTALLED BEFORE ROOF



WALL PANEL INSTALLED AFTER ROOF

STANDARD COUNTER FLASH  
ENDLAP DETAIL

## NOTE

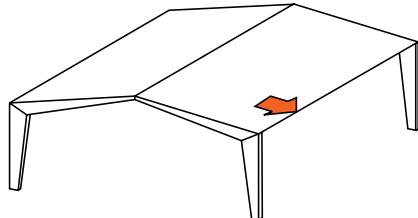
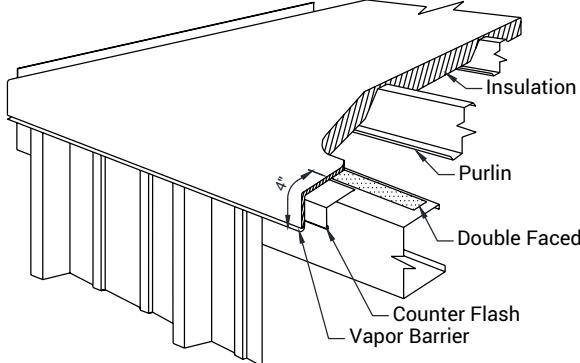
Prior to installation of the wall system make sure the webs of the eave struts are vertical and plumb along entire eave line

For applications in which the wall panels have already been erected, install standard counter flash to the eave strut with fastener 12 x 1" pancake head driller. Trim must be pulled tight to wall panels before fastening to eave strut. For applications in which the wall panels have not been erected, hold the counter flash away from the eave strut the depth of the wall panel. Use two fasteners per 10' piece.

For low systems lay 1" x 3/32" tape sealer on top of the counter flash.

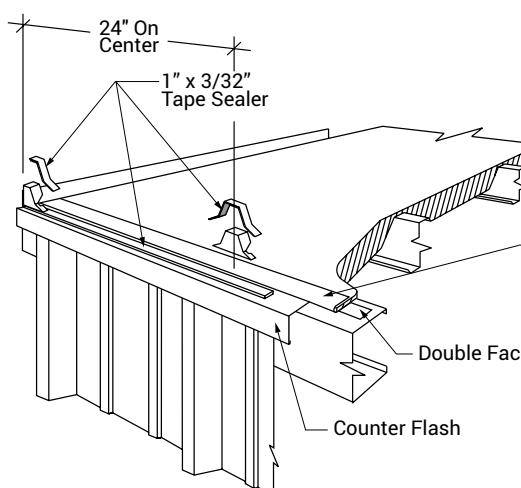
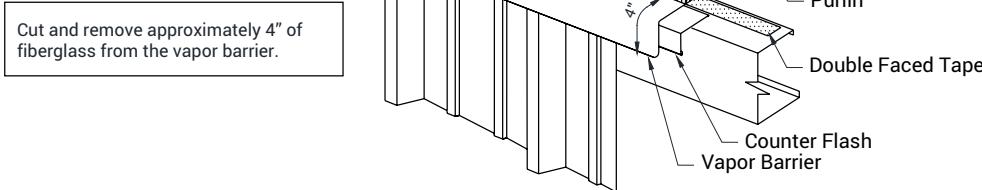
Install double faced tape along the length the top leg of the counter flash. Double faced tape must be up slope from 1" x 3/32" tape sealer.

Lap counter flash 3". Lay 1" x 3/32" tape sealer between the trim pieces, approximately 2 - 1/2" from the end of the bottom piece.

**Step 2A - Low System Eave /Metal Inside Closure**


Using fastener  $1/4$  -  $14$  x  $1-1/4$ " S.D.S. w/washer attach the first inside closure to the eave strut, locating the face of the inside closure with the steel line. **Note that the first inside closure must be field cut in half to fill the void under the partial rib.**

Locate additional closures on 24" centers from the first closure to maintain panel module, attaching each with fastener  $1/4$  -  $14$  x  $1-1/4$ " S.D.S. w/washer. Install two fasteners per closure. The first fastener should be installed through the slotted hole to allow for any adjustment that may be required. Place  $1$ " x  $3/32$ " tape sealer on the top and side of each closure to complete the seal at the eave. These may be pre-taped before installation. To maintain panel module, metal inside closures must be installed on 24" centers. Measure from tab to tab located on the metal inside closure.



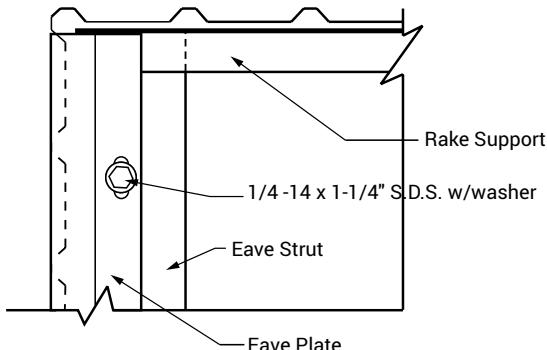
Fold the vapor barrier back over the insulation (up-slope).

Roll out insulation from eave to peak, laying the side of the insulation on top of the rake support. The first roll should be 3' wide. This will keep insulation side laps 1' from panel side laps. Allow approximately 4" of insulation to hang past the double faced tape (down slope) before sticking the insulation to the double faced tape. Cut and remove the fiberglass approximately 4" and fold the vapor barrier back over the insulation (up slope).

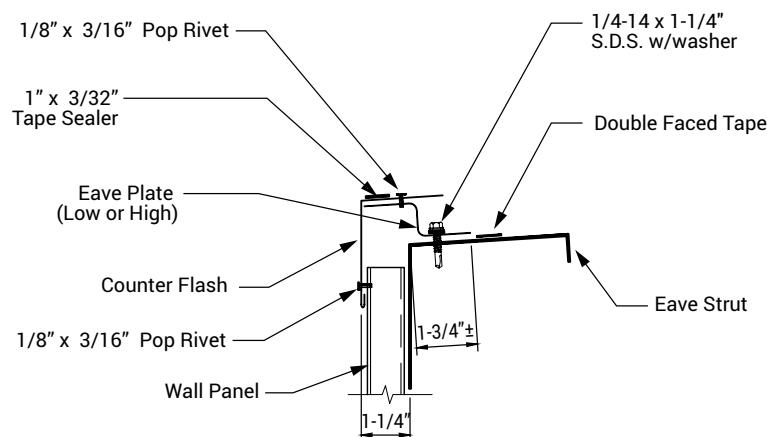
**CAUTION**

The fiberglass insulation must not interfere with the  $1$ " x  $3/32$ " tape sealer which provides a positive seal at the eave.

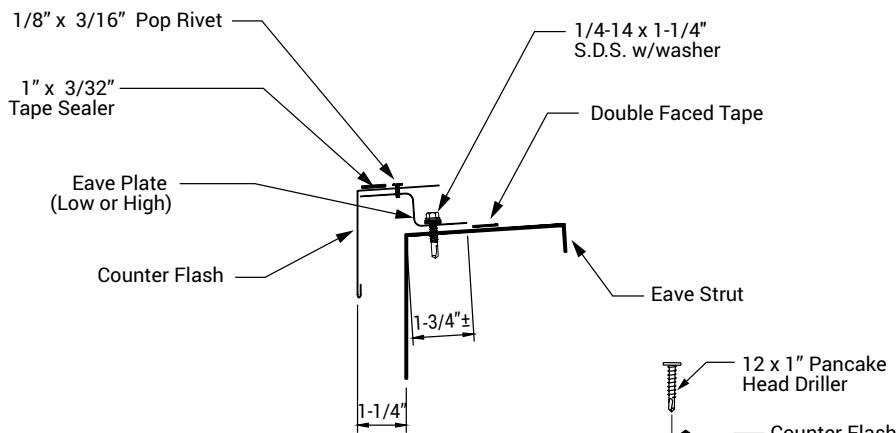
If the top elevation of the eave member is adjusted by 1" this step is not required.



**NOTE**  
Prior to installation of the wall system make sure the webs of the eave struts are vertical and plumb along entire eave line

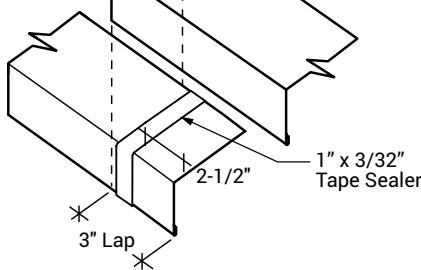


WALL PANEL INSTALLED BEFORE ROOF

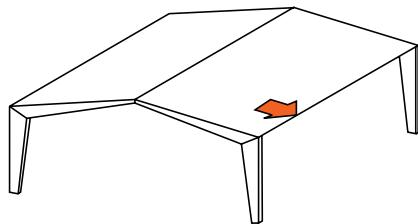


WALL PANEL INSTALLED AFTER ROOF

STANDARD COUNTER FLASH ENDLAP DETAIL



## Step 2B - High System Eave



WALL PANEL INSTALLED BEFORE ROOF

Install high eave plates flush with the face of the wall panel. Install fastener 1/4 - 14 x 1-1/4" S.D.S. w/washer in each pre-punched slot (12" on center) of the eave plate. The first eave plate will butt against the rake support. You may install all of the eave plates at this time.

Install counter flash by attaching to wall panel with fastener 1/8" x 3/16" pop rivet. Use three fasteners per 10' piece.

Lay 1" x 3/32" tape sealer across the top of the counter flash, flush with the outside edge. Install double faced tape along the length of the bottom leg of the eave plate

Wall panel installed after roof

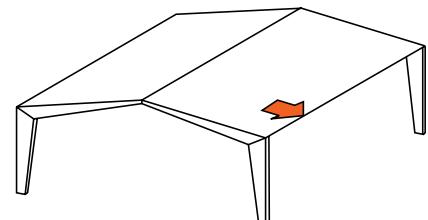
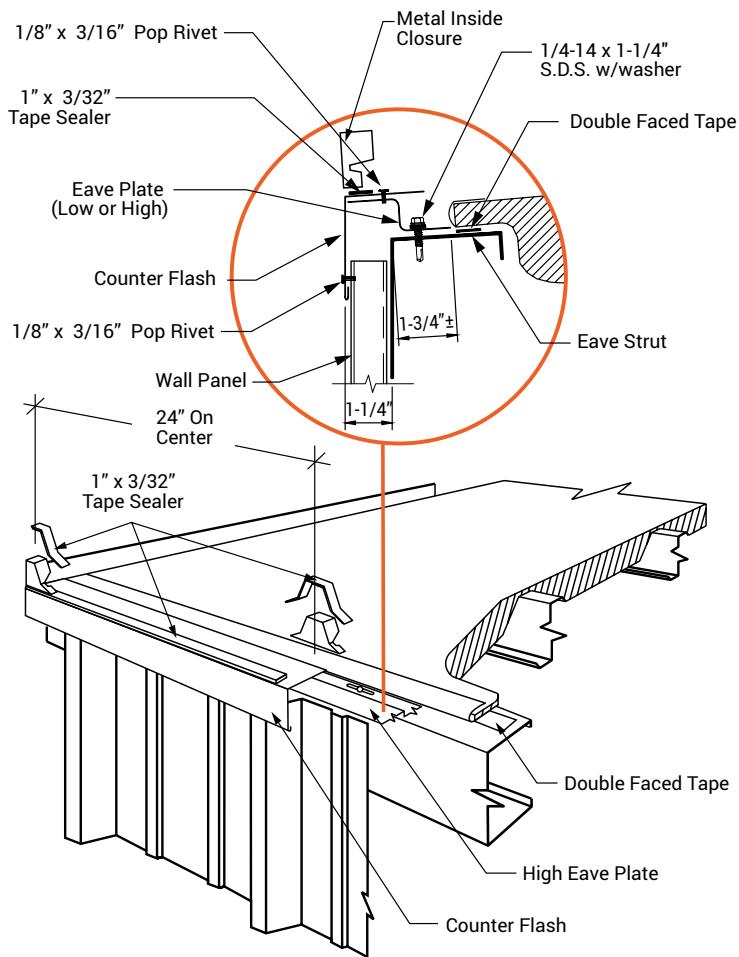
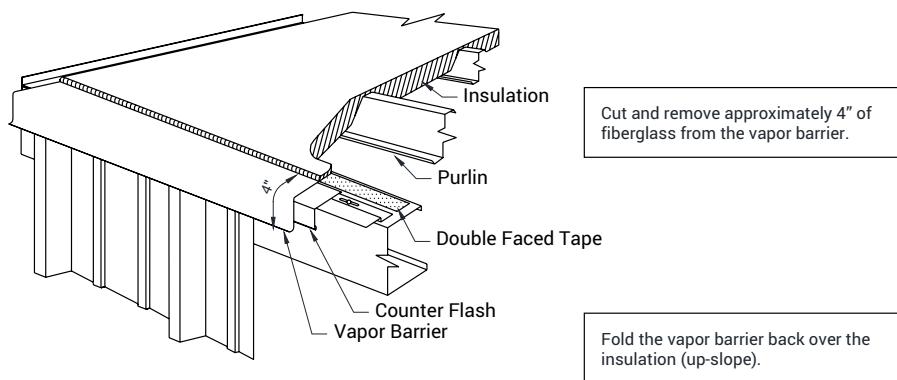
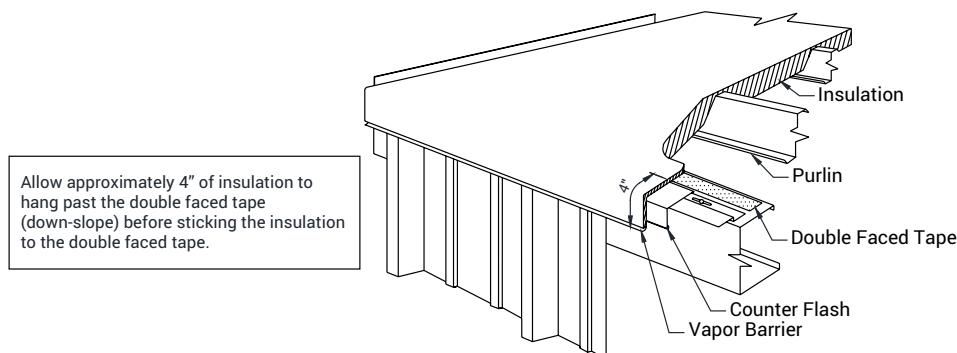
For applications in which the walls have not been erected, install the high eave plate top leg at the depth of the wall panel. Attach the counter flash to the top leg of the eave plate with two 1/8" x 3/16" pop rivet per 10' piece.

Install high eave plates flush with the outside of the counter flash. Install fastener 1/4-14 x 1-1/4" S.D.S. w/washer in each pre-punched slot (12" on center) of the eave plate. The first eave plate will butt against the rake support. You may install all of the eave plates at this time.

Lay 1" x 3/32" tape sealer across the top of the eave plates flush with the outside edge. Install double faced tape along the length of the bottom leg of the eave plate.

Trim laps

Lap counter flash 3". Lay 1" x 3/32" tape sealer between the trim pieces, approximately 2-1/2" from the end of the bottom piece.

**Step 2C - High System Eave/Metal Inside Closure**


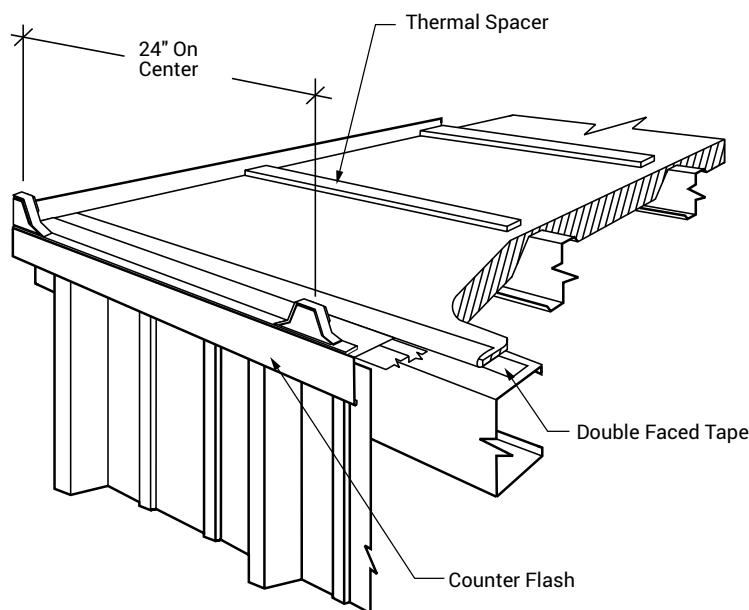
Using fastener 1/4 - 14 x 1-1/4" S.D.S. w/washer attach the first inside closure to the eave plate, locating the face of the inside closure with the down slope edge of the eave plate. Note that the first inside closure must be field cut in half to fill the void under the partial rib.

Locate additional closures on 24" centers from the first closure to maintain panel module, attaching each with fastener 1/4 - 14 x 1-1/4" S.D.S. w/washer. Install two fasteners per closure. The first fastener should be installed through the slotted hole to allow for any adjustment that may be required. Place 1" x 3/32" tape sealer on the top and side of each closure to complete the seal at the eave. These may be pre-taped before installation. Measure from tab to tab located on the metal inside closure.

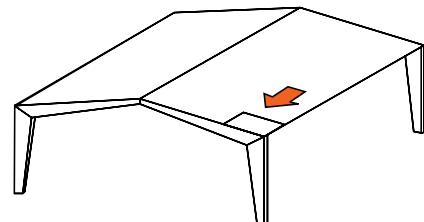
Roll out insulation from eave to peak, laying the side of the insulation on top of the rake support. The first roll should be 3' wide. This will keep insulation side laps 1' from panel side laps. Allow approximately 4" of insulation to hang past the double faced tape (down slope) before sticking the insulation to the double faced tape. Cut and remove the fiberglass approximately 4" and fold the vapor barrier back over the insulation (up slope).

**CAUTION**

The fiberglass insulation must not interfere with the 1" x 3/32" tape sealer which provides a positive seal at the eave.



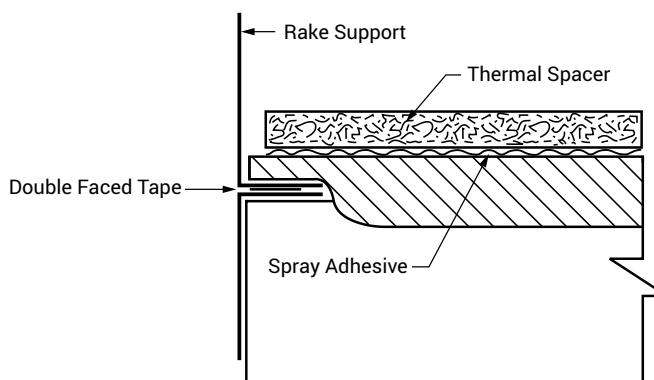
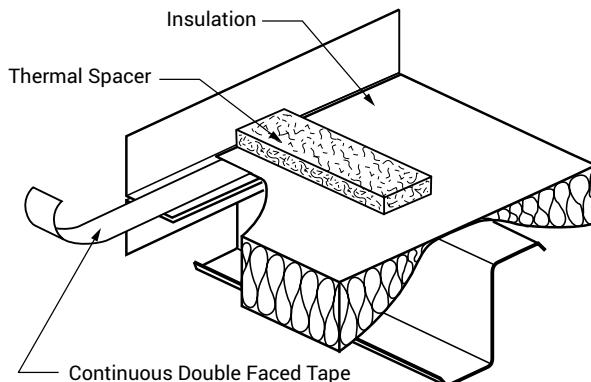
### Step 3 - Thermal Spacer (For High System Only)

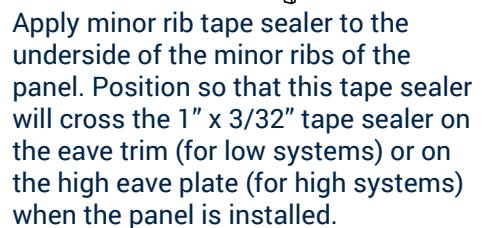
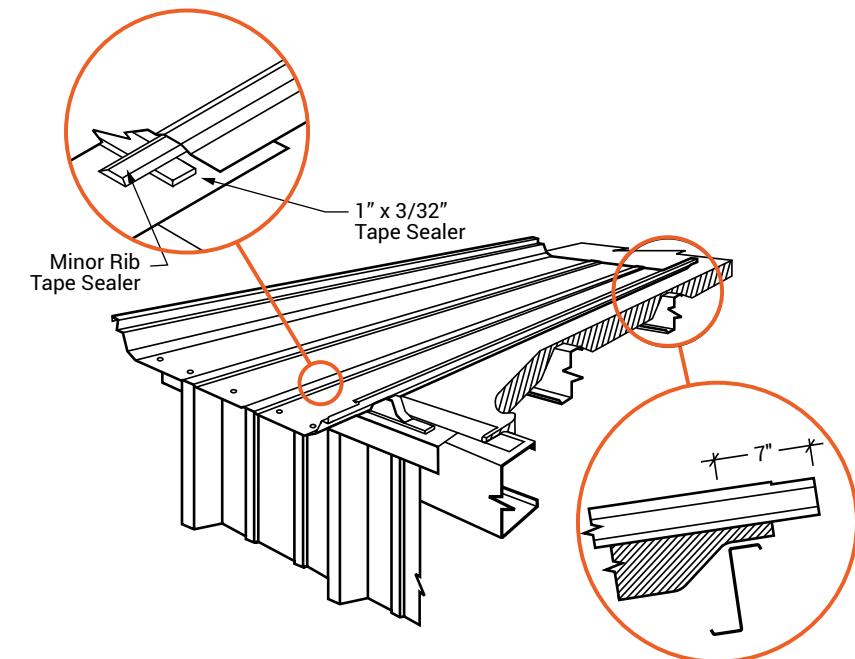


Position the thermal spacer on top of the insulation over each purlin and against the rake support prior to installing the roof panel.

Using spray adhesive, adhere the thermal spacer to the insulation. The thermal spacer increases the insulation capacity along the purlins.

See page SSP-6 for proper use of thermal spacers.

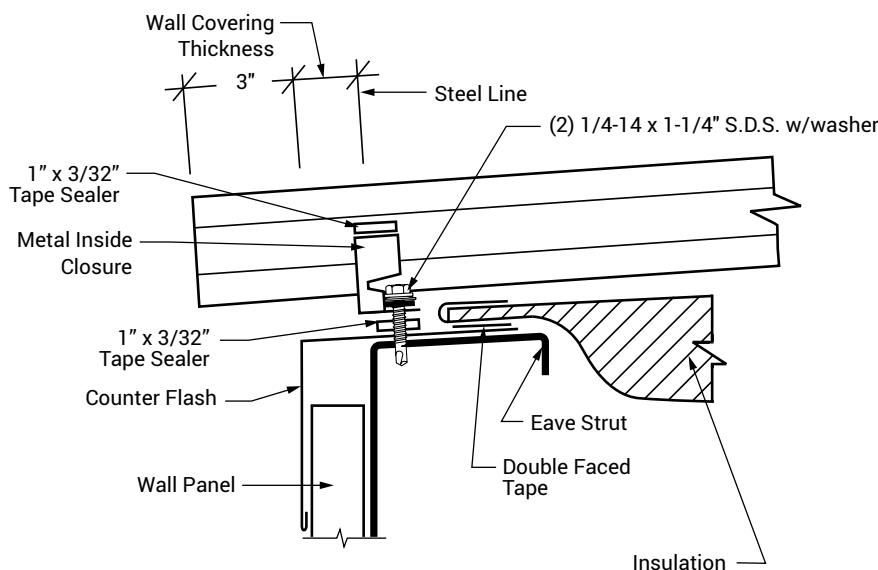


**Step 4 - First Panel**


Apply minor rib tape sealer to the underside of the minor ribs of the panel. Position so that this tape sealer will cross the 1" x 3/32" tape sealer on the eave trim (for low systems) or on the high eave plate (for high systems) when the panel is installed.

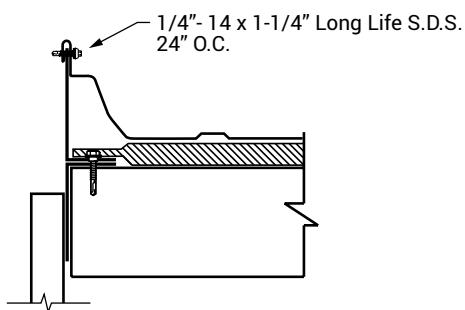
Position the panel so that it overhangs the eave strut by the thickness of the wall covering plus 3". The upper end of the panel must be 7" beyond the web of the purlin.

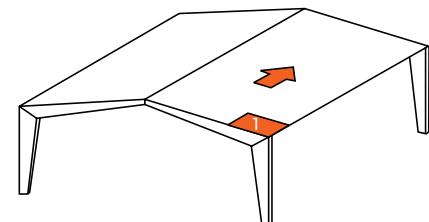
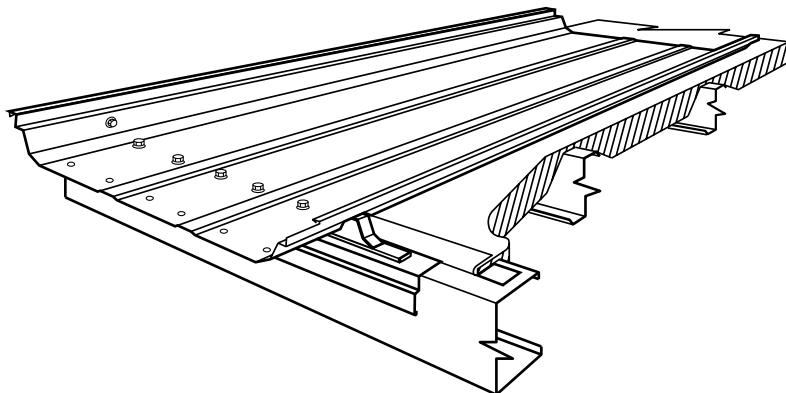
**The 7" dimension is the most critical dimension in the roof system and must be maintained over all other dimensions**



PRE-PUNCHED PANEL HOLES AT THE EAVE ARE INTENDED TO BE PART OF THE GUTTER OVERHANG AND WILL BE HIDDEN BY THE GUTTER. FOR A BUILDING WITH SCULPTURED EAVE TRIM, THE PRE-PUNCHED HOLES WILL BE USED TO ATTACH THE EAVE TRIM TO THE PANEL.

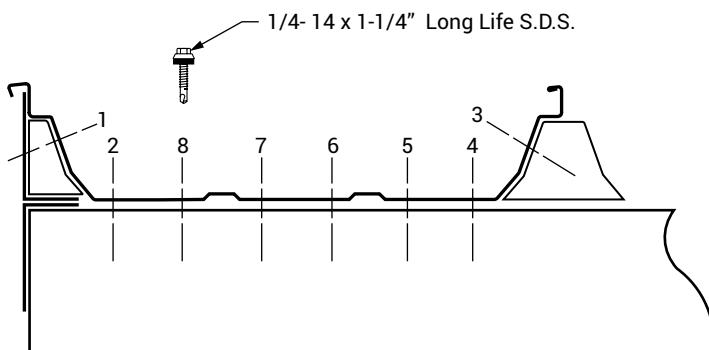
Lay the female lip of the panel over the rake support. Fasten the panel to the rake support with fastener 1/4-14 x 1-1/4" Long Life S.D.S. 24" O.C.



**Step 4 - First Panel (Continued)**


Attach the panel to the eave strut and metal inside closures with fastener 1/4- 14 x 1-1/4" Long Life S.D.S. eight fasteners are required at this location.

NOTE: IT IS ESSENTIAL THAT THE ERECTOR MAINTAIN A 24" MODULE AT THE EAVE, WITH THE PROPER INSTALLATION OF THE INSIDE CLOSURES AND BY INSTALLING FASTENERS IN THE PROPER SEQUENCE.


**NOTE**

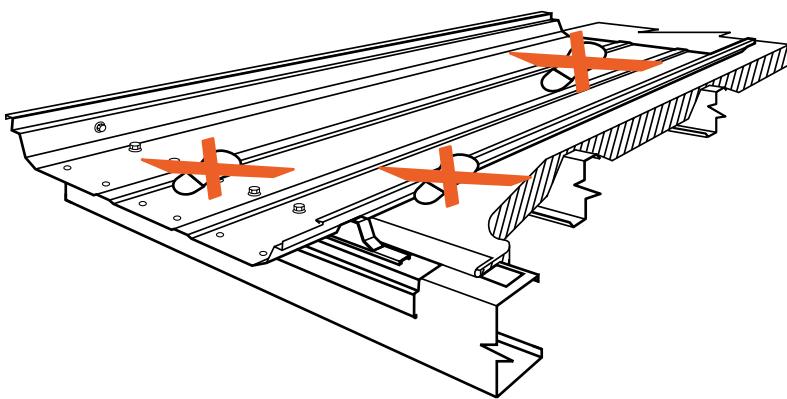
We recommend the installer pre-drill the holes for fastener 1 and 3 to prevent pushing the flange of the closure out of alignment.

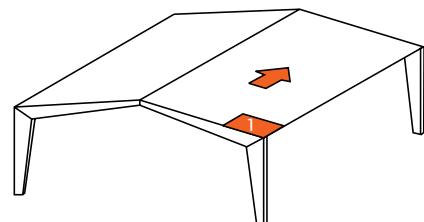
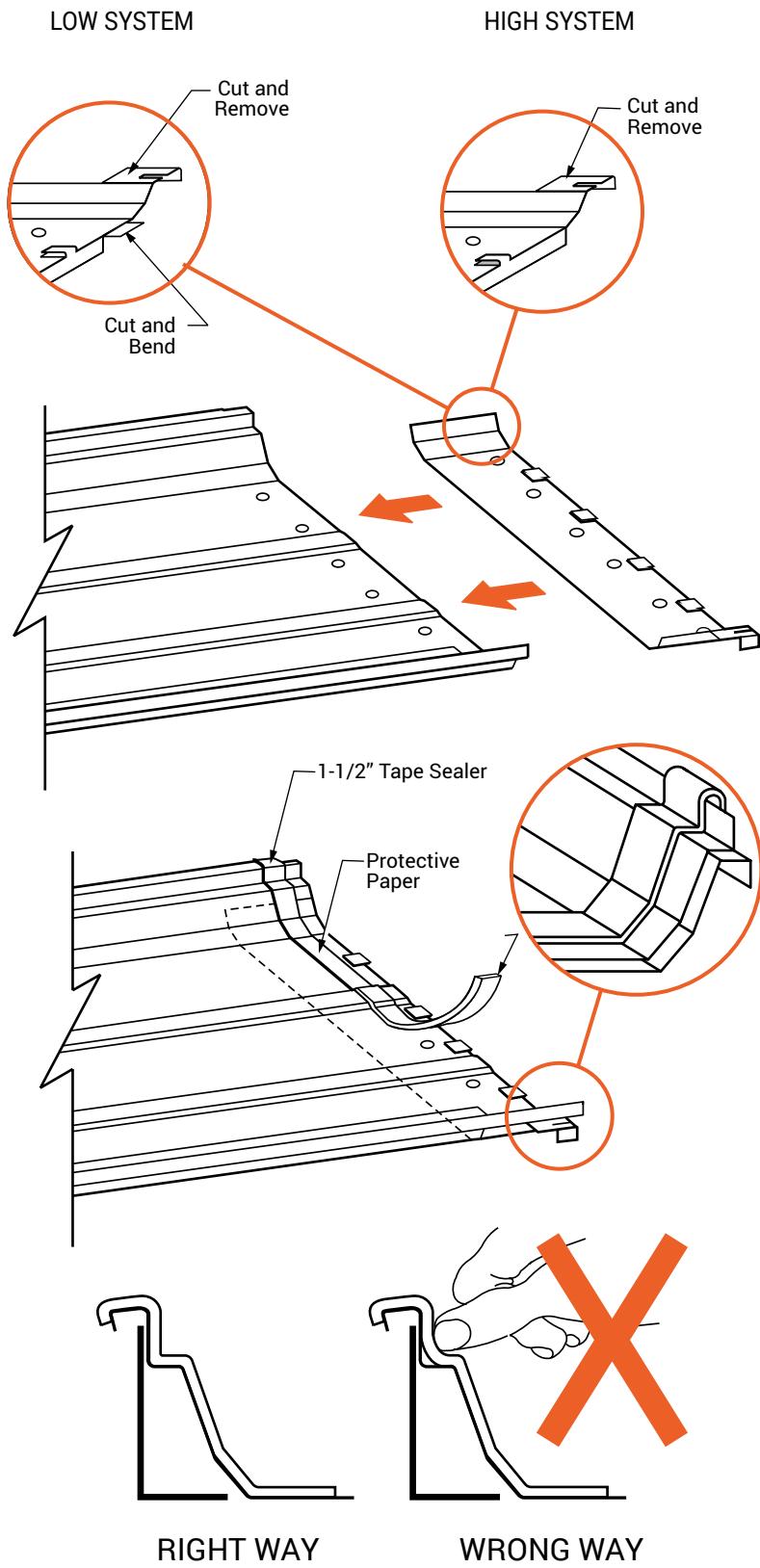
**CAUTION**

Do not, under any circumstance, step on the panel at the seam or at the panel ends until the adjacent side, end panels or eave fasteners are fully attached. The roof panel may not support the weight of a man at these locations and could affect panel module

**CAUTION**

The roof should be swept clean of any drill shavings at the end of each day to prevent rust.



**Step 5 - Back-Up Plate**

**NOTE**

All back-up plates on first panel run will require field modification to avoid fouling rake support.

Place 1-1/2" tape sealer over the entire width of the panel. It must be centered directly over the pre-punched holes, following the panel configuration.

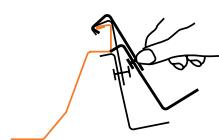
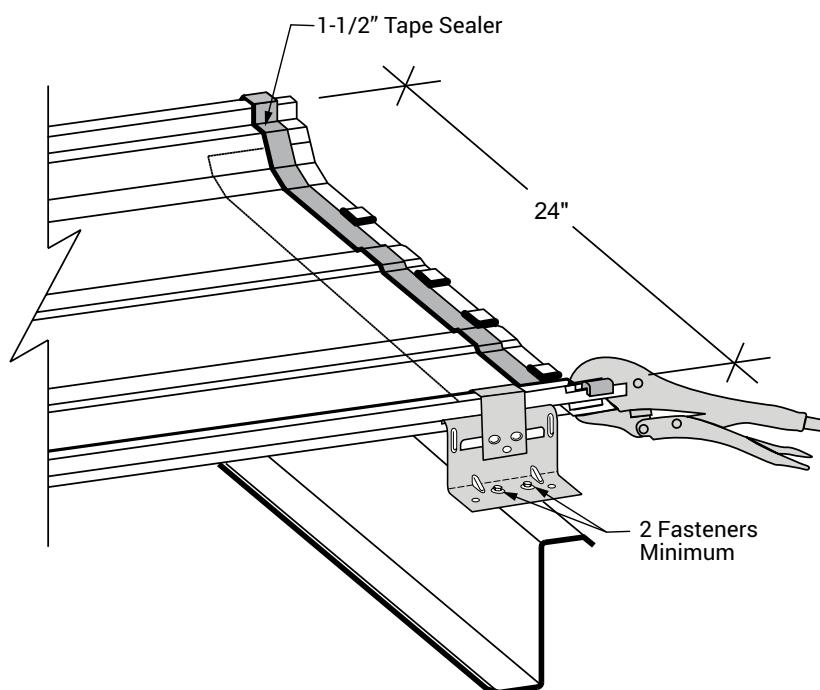
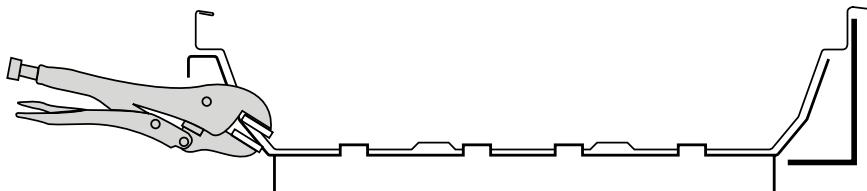
**NOTE**

Tape Sealer will be 1-1/2" x 3/32" depending on condition. See steps 7 and 15.

**CAUTION**

Forcing the tape sealer back into the corners will lessen the thickness of the tape sealer where it is needed most.

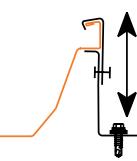
### Step 6 - Clip Installation



- Position the clip over the male leg of the panel as shown, and rotate clip downward.

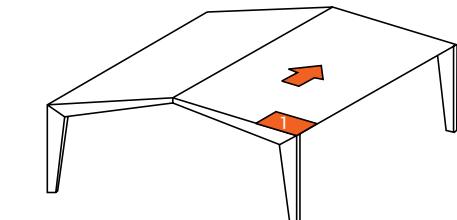


- With the upper clip firmly seated, position the base firmly against the purlin flange.



- When properly positioned, the vertical legs of the upper and lower sections of the clip will be 90° to the purlin flange pointed upward, as shown.

1/4 - 14 x 1-1/4" S.D.S. w/washer



Before installing the first clip, clamp the male side of the panel to the side of the back-up plate with a pair of vise grips. This will help maintain panel module at the endlaps.

Install a clip on the male leg of the panel at the endlap. This should be the first clip installed as it controls the 24" module for the remainder of the panel. Install clips on all remaining purlins.

#### FASTENER REQUIREMENTS

#### FLOATING SYSTEM

Purlins - Fastener

1/4 - 14 x 1-1/4" S.D.S. w/washer

Joist - Fastener

1/4 - 14 x 1" Tek 5 w/washer

(Two fasteners per clip)

#### CAUTION

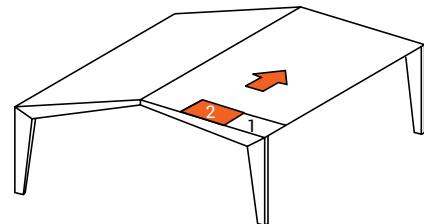
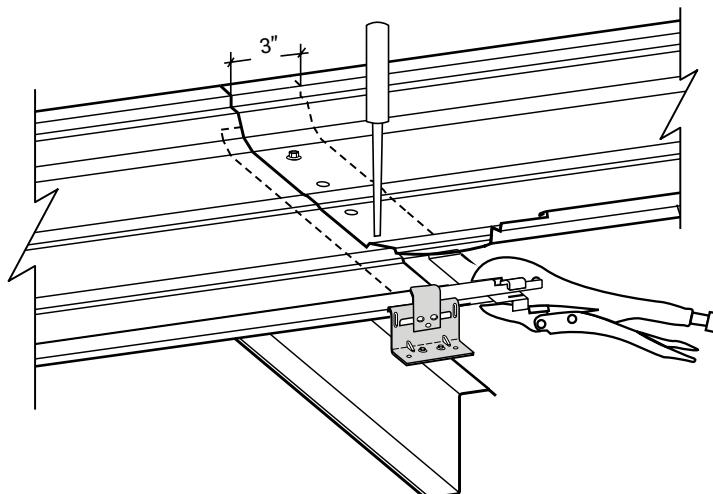
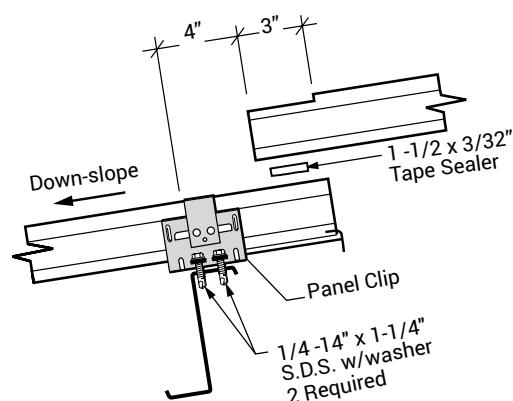
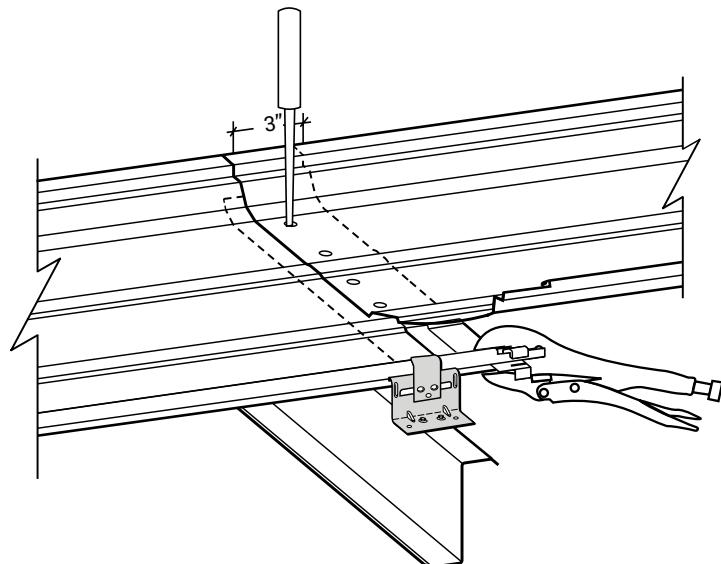
The panel clip has factory applied mastic in the upper lip. This mastic is compressed when the clip is rotated in place. If, for some reason, a clip must be removed, a new clip must be used.

#### IMPORTANT

As each clip is installed, maintain a 24" panel module.

#### NOTE

The floating clip is designed so it can only be properly seated when the upper portion of the clip (the tab) is centered on the base.

**Step 7 - Endlap - Panel**

**NOTE**

Step 7 applies only where more than one panel is used in a single slope.

Position female lip of upper panel over rake support, while holding male side of panel up away from the tape sealer. Using an awl, align the hole nearest the female side of the top panel with the corresponding hole in the lower panel and the back-up plate.

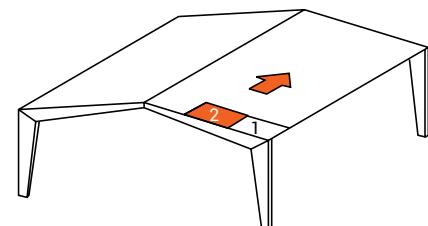
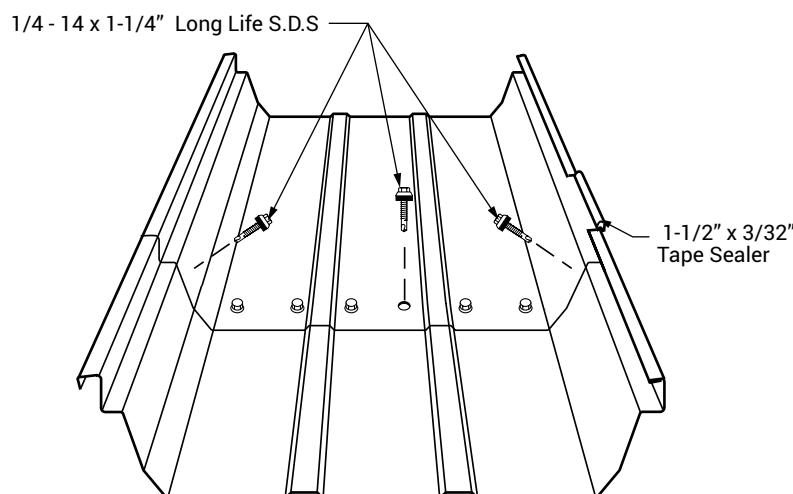
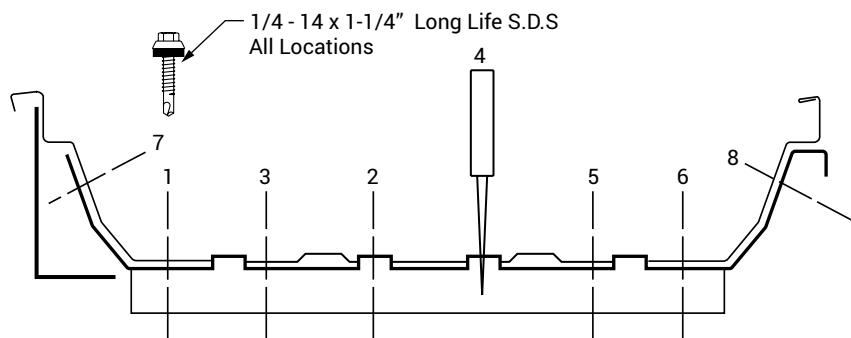
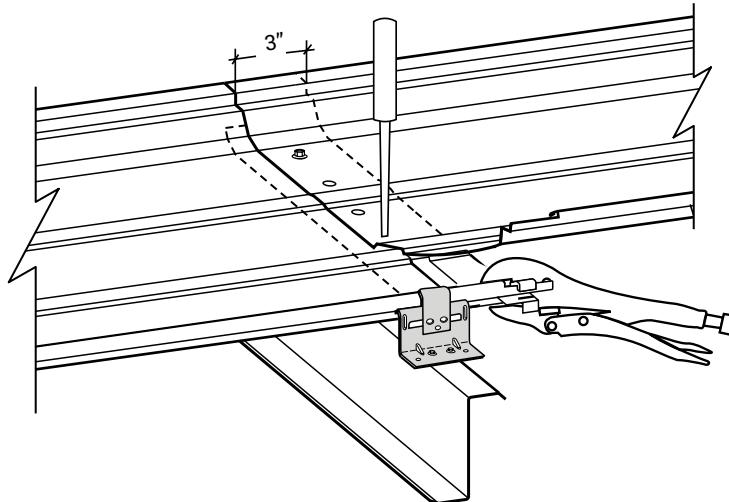
Once this is accomplished, rotate the male side of the upper panel down to rest on the vise grips.

Make sure the panel notches are aligned.

Remove awl and insert in the middle hole nearest the male leg. Install fastener 1/4 - 14 x 1-1/4" Long Life S.D.S. in the hole by the female leg.

**CAUTION**

The roof should be swept clean of any drill shavings at the end of each day to prevent rust.

**Step 8 - Standard Endlap**
**NOTE**

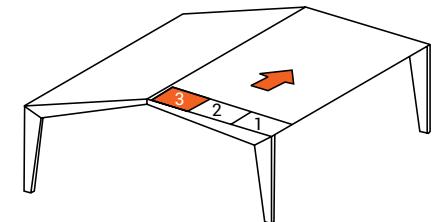
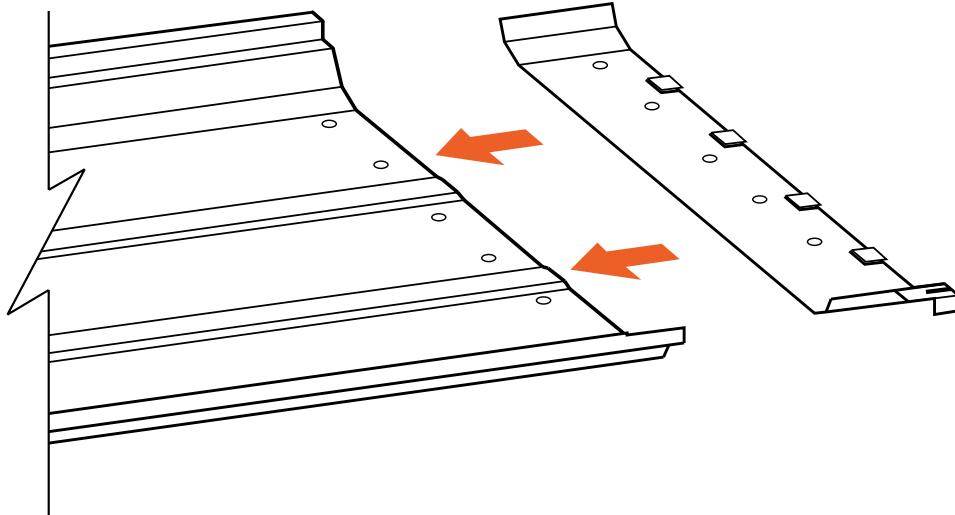
Step 8 applies only where more than one panel is used in a single slope.

All holes in the upper and lower panels and the back-up plate should now be aligned. Make sure that the panel notches are aligned.

Install fastener 1/4 - 14 x 1-1/4" Long Life S.D.S. in sequence 2 and 3. Remove vise grips and install remaining fasteners in sequence 4, 5, 6, 7, 8.

Apply 1- 1/2" x 3/32" tape sealer over the notched portion of these male legs.

Repeat the endlap procedures as required for each panel until the ridge or high eave is reached.

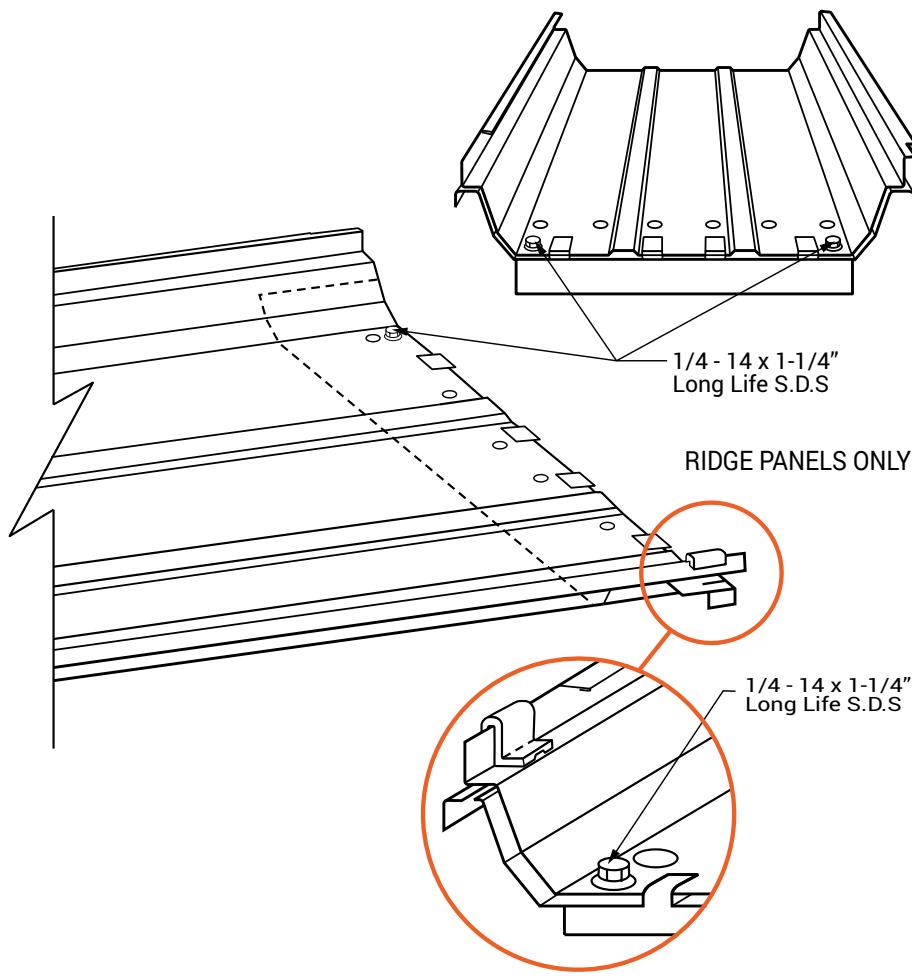
**Step 9 - Ridge Panel**


At the ridge, install a back-up plate as in Step 5. The back-up plate is necessary to maintain panel module.

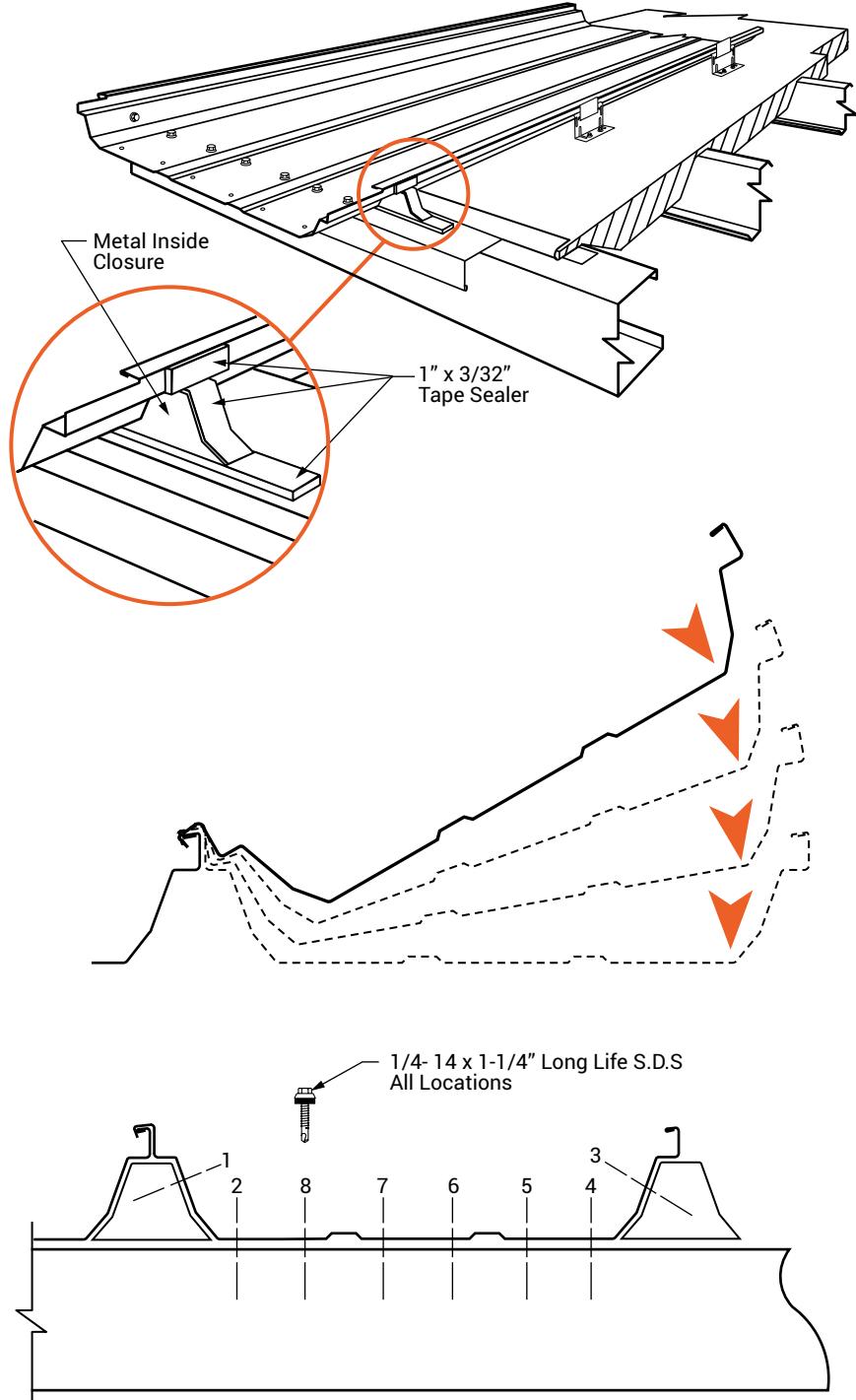
Temporarily fasten the panel to the back-up plate with fastener 1/4 - 14 x 1-1/4" Long Life S.D.S. in the pre-punched hole adjacent to each panel rib.

Install 1" x 3/32" tape sealer across the profile of the male leg at the ridge. This tape sealer will be centered 1-1/2" from end of panel, which is also in alignment with the pre-punched holes. **DO NOT INSTALL TAPE SEALER ACROSS PANEL AT RIDGE AT THIS TIME.**

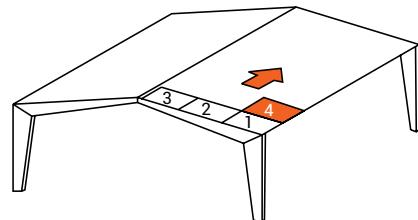
Install clips on ridge panel as in step 6.


**CAUTION**

Placing the tape sealer over the male leg of the panel is important. Without it, water could be driven behind the End Dam by a strong wind.

**Step 10 - Subsequent Runs Eave**


FASTENER SEQUENCE SUBSEQUENT RUNS - EAVE



Apply tape sealer to the male leg of the first panel run directly over the inside closure. This will prevent water infiltration through the end of the seam. Install the next run of insulation and another inside closure using fastener 1/4-14 x 1-1/4" Long Life S.D.S. The second run of roof is now ready to install.

Holding the male side of the next panel up, lay the female lip on top of the male leg of the adjacent panel and align it flush at the eave. Rotate the panel down, visually checking that the female lip is engaged onto the male leg of the adjacent panel along its entire length. IF THE PANEL MUST BE RAISED FOR FURTHER ALIGNMENT, CARE SHOULD BE TAKEN TO AVOID PULLING THE FACTORY APPLIED MASTIC FROM THE FEMALE LIP.

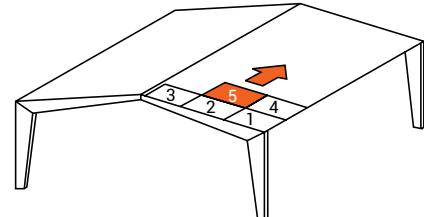
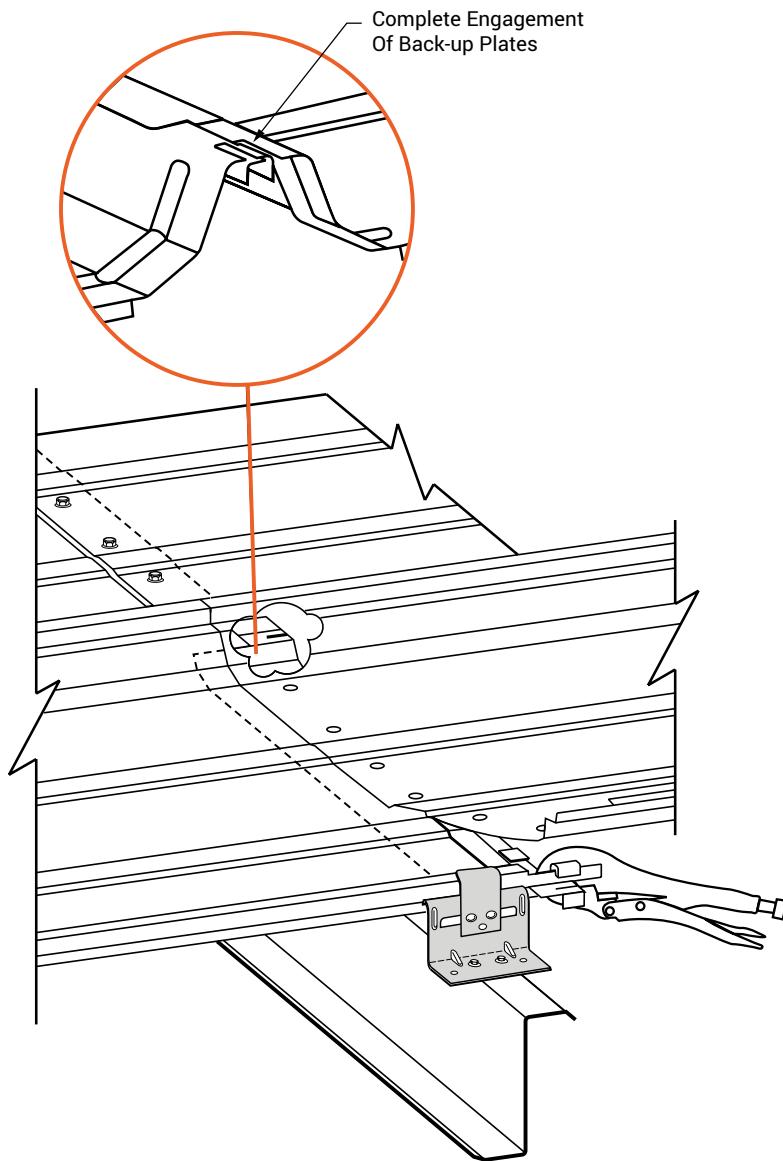
Install fastener 1/4 - 14 x 1-1/4" Long Life S.D.S. at eave in the recommended sequence. Eight fasteners are required at this location.

**CAUTION**

The roof should be swept clean of any drill shavings at the end of each day to prevent rust.

**NOTE**

Create your own custom template for holding the panel module. Contact Whirlwind Customer Service for details.

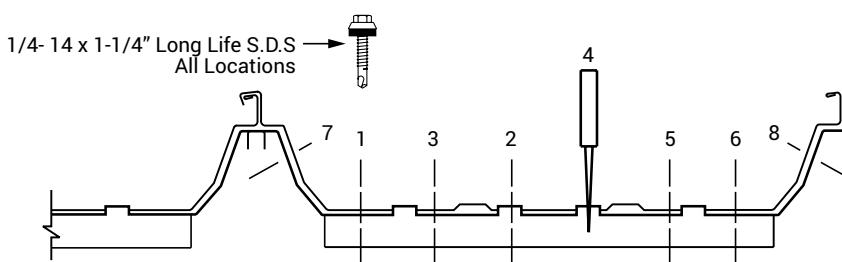
**Step 11 - Subsequent Runs Endlap**


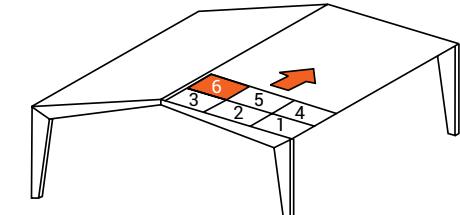
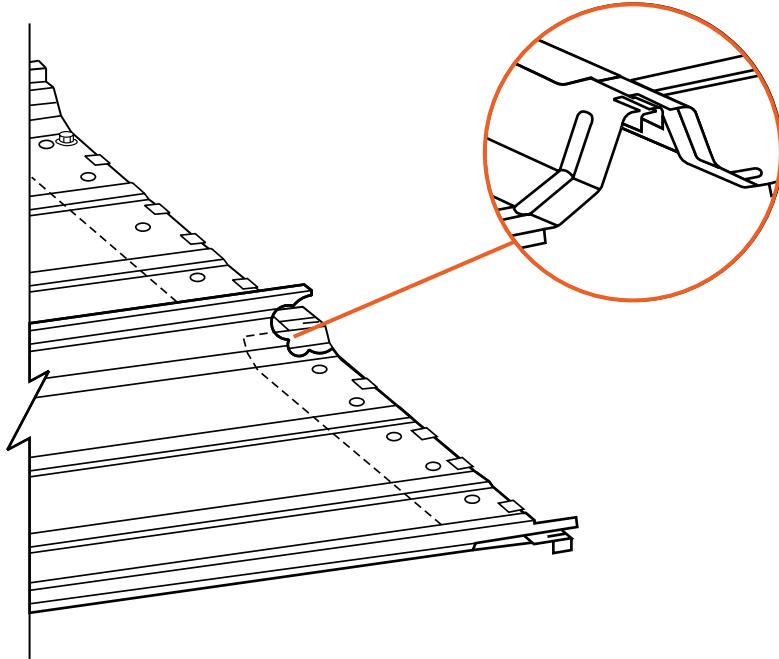
Install back-up plate and tape sealer as in Step 5. However, on this and all subsequent runs, care must be taken to engage the tab on the side of the back-up plate into the slot of the adjacent back-up plate. This procedure will assist in maintaining a 24" panel module.

Install clips as described in Step 6.

Install upper panel as described in Steps 7 & 8.

Repeat the endlap procedures as required for each panel until the ridge is reached.



**Step 12 - Subsequent Runs Ridge / End Dam**

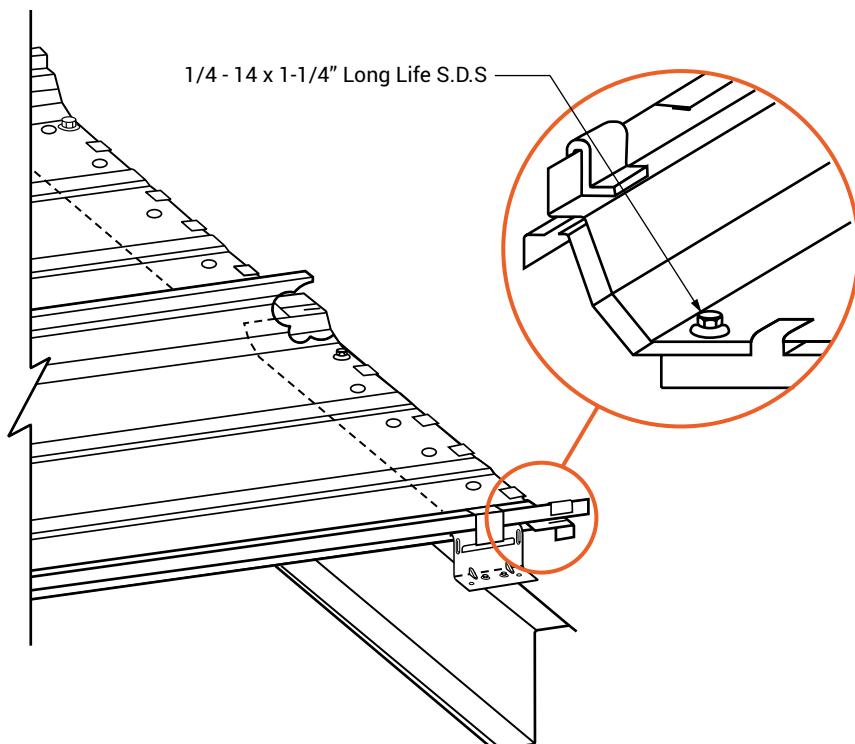
Install back-up plate, taking care to engage the tab on the side with the slot on the adjacent back-up plate.

Install temporary fastener 1/4 - 14 x 1-1/4" long life S.D.S. and 1" x 3/32" tape sealer as described in step 9.

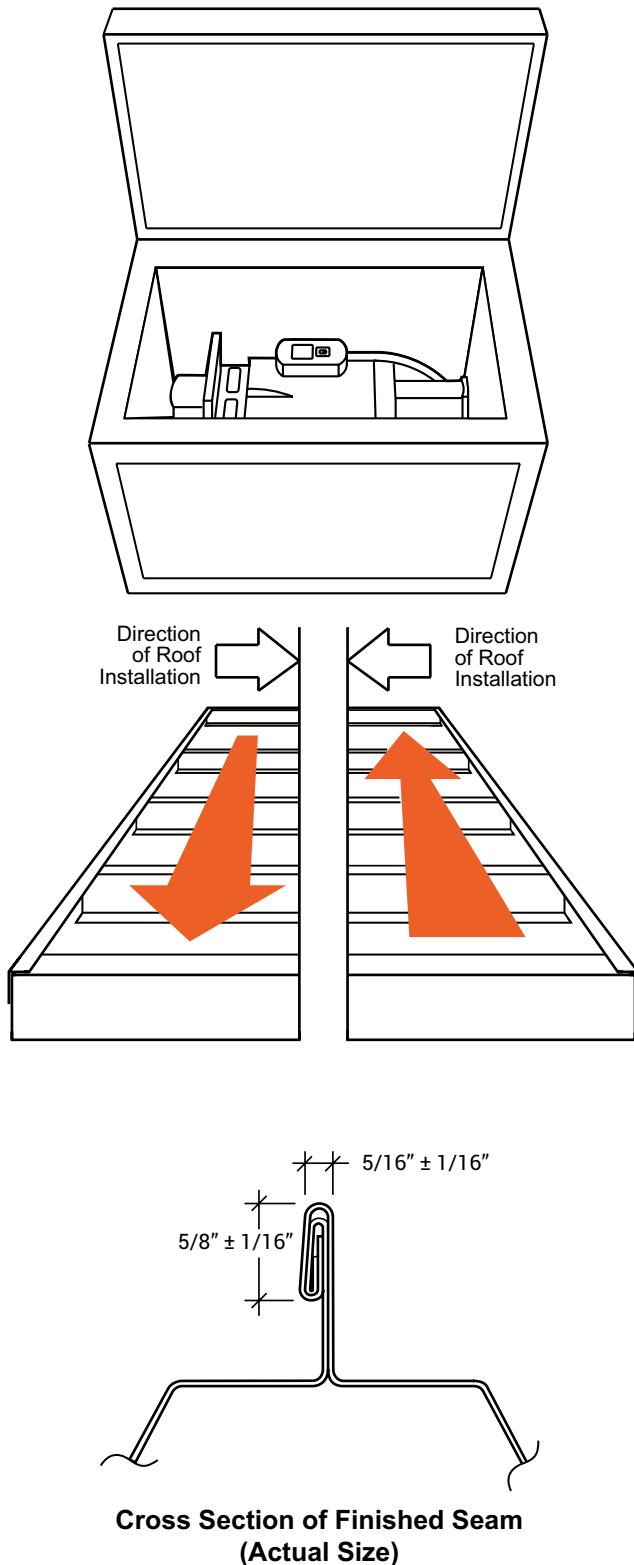
Install clips as described in step 6.

**Note:**

Installing tape sealer to the male leg is important. Without it, water could be driven behind the End Dam by a strong wind.



### Step 13 - Seaming Panel Side laps



The seamer comes in a specially designed box accompanied by a field manual and a hand seaming tool.

**READ THE SEAMER MANUAL THOROUGHLY BEFORE STARTING THE SEAMING OPERATION. FAILURE TO ADHERE TO THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY AND DAMAGE TO THE SEAMER AND/ OR PANELS. THE ERECTOR WILL BE HELD LIABLE FOR ANY COSTS INCURRED FOR REPLACEMENT OR REPAIR.**

#### PRE-SEAMING INFORMATION

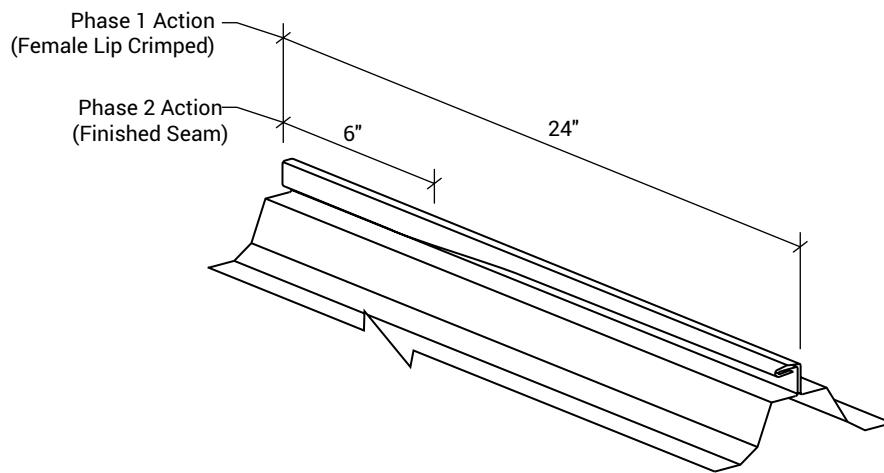
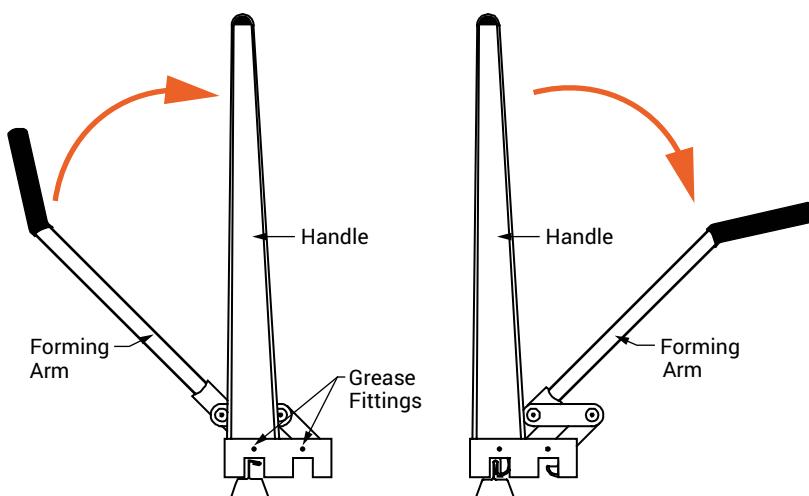
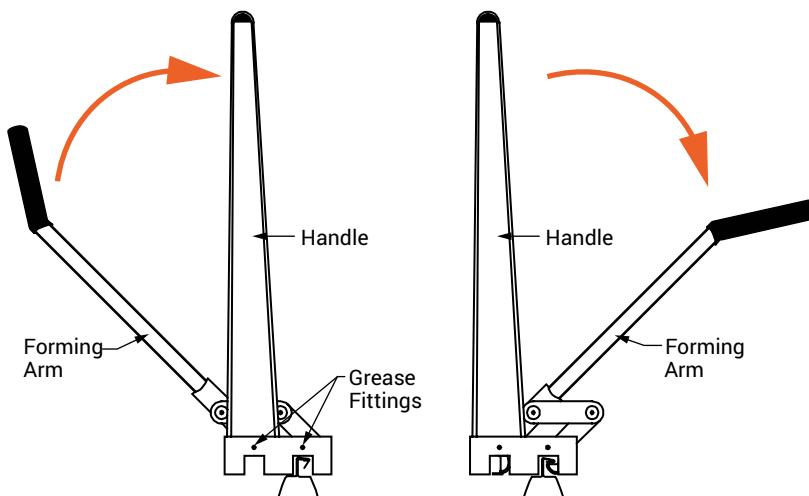
1. Locate seamer box. Assemble hand seaming tool.
2. Locate power source and check against power requirements in field manual.
3. Check seams for proper engagement.
4. Clean dirt, debris, and excess sealant from seams and panel surfaces to avoid interfering with the seaming operation.
5. Panels do not have to be seamed as they are installed. However, to prevent panel separation by a strong wind, panels should be seamed as soon as possible. **ALL PANELS SHOULD BE SEAMED AT THE END OF EACH DAY.**

#### SEAMING OPERATION

To determine the direction of the seaming process, stand at the eave and look up slope. If the roof is being installed from left to right, the seamer will run from ridge to eave. If the roof is being installed from right to left, the seamer will run from eave to ridge.

#### INSPECTION OF SEAM

A visual inspection of the seam should be made to determine if the seam is forming properly. Check seam against the cross section provided. IF THE SEAMER IS NOT PRODUCING A FINISHED SEAM IDENTICAL TO THE CROSS SECTION PICTURED, STOP AT ONCE AND CALL WHIRLWIND.

**Step 13 - Seaming Operation  
(Continued)**
**CAUTION**

It is critical that the panel seams are crimped and folded as shown before using the electric seamer. Failure to follow these guidelines will result in damaged seams.

To begin seaming with hand tool, set the hand tool on the seam making sure seam is in the PHASE 1 ACTION slot. Align the edge of the hand tool with the end of the panel. Rotate the forming arm under the handle to produce 6" of PHASE 1 seam. This should be done four times along the seam for a total of 24".

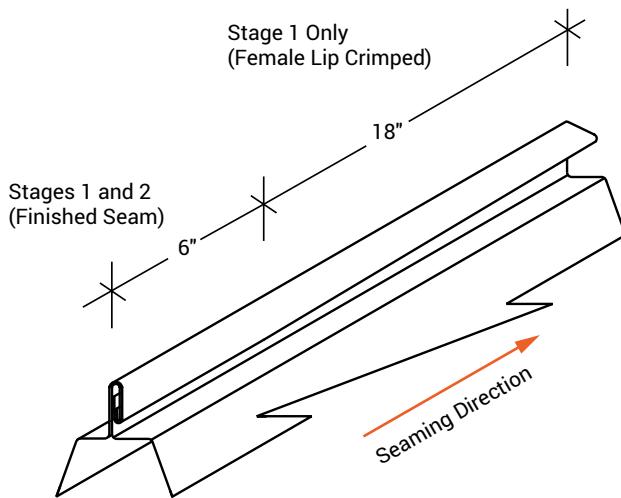
Return to the end of the panel to begin PHASE 2 ACTION. Set hand tool onto seam making sure seam is in the PHASE 2 ACTION slot. Align the edge of the hand tool with the end of the panel. Rotate the forming arm under the handle to produce 6" of finished PHASE 2 seam. This should be done once per rib. The relationship of this 6" of finished seam to the 24" of crimped seam is critical to the proper alignment of the rolls in the electric seamer.

The seam is now ready to accept the electric seamer.

**CAUTION**

Do not crimp panel seams at clips. Damage to seams during electric seaming will result.

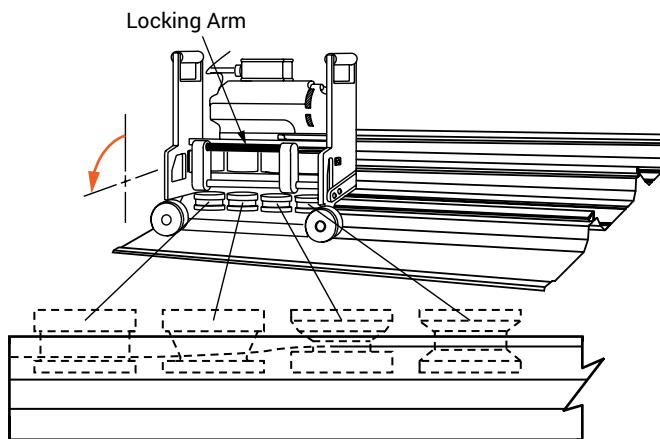
### Step 13 - Seaming Operation (Continued)



Set seamer on seam with the locking arm up and to open side of the seam. The rear wheels should be at the edge of the panel.

Check to see that the last roll of the seamer is on the finished portion of the seam and the other rolls are on the crimped portion of the seam. Push the locking arm down to engage the rolls and turn the seamer on.

Note: While seamer is running, walk in front of seamer applying foot pressure to top of panel seam while paying attention to end of panel run.



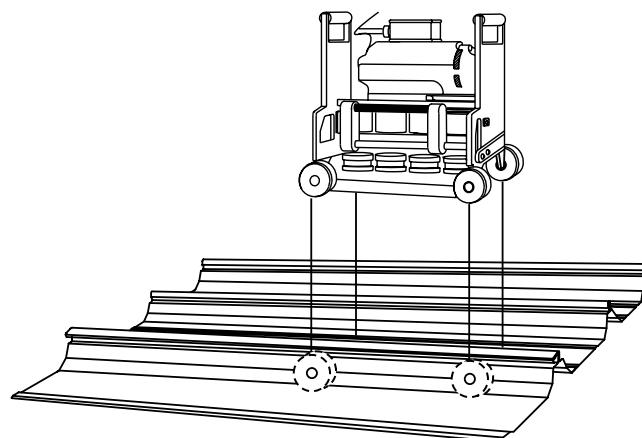
#### CAUTION

Seamer motor is equipped with 15 amp circuit breaker. Extension cord wire size must be 10 gauge and no longer than 200' from power source.

The manufacturer will not be responsible for motor damage if above instructions are not adhered to.

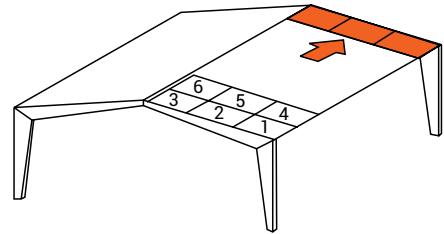
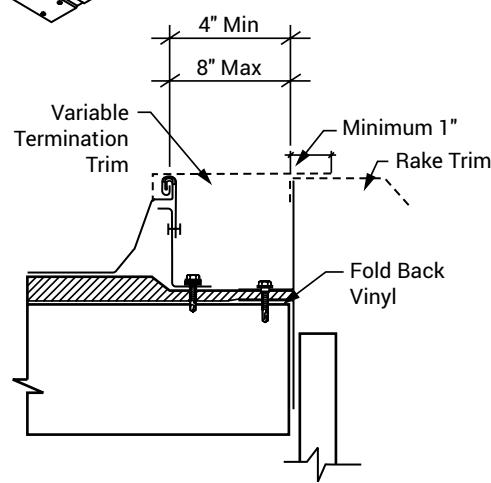
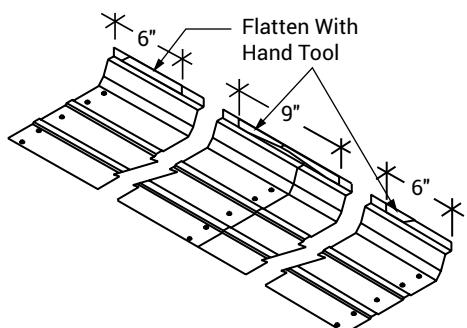
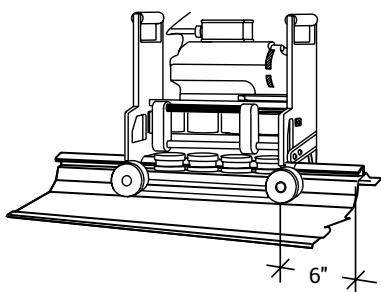
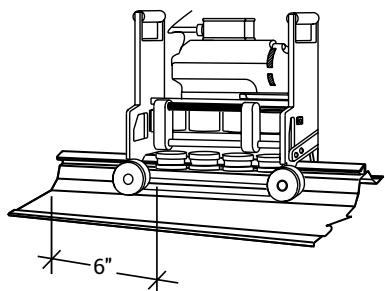
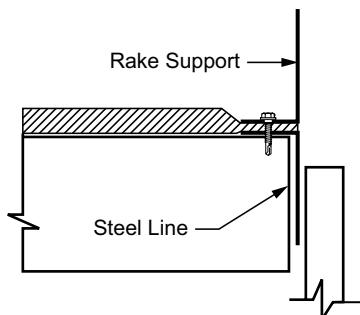
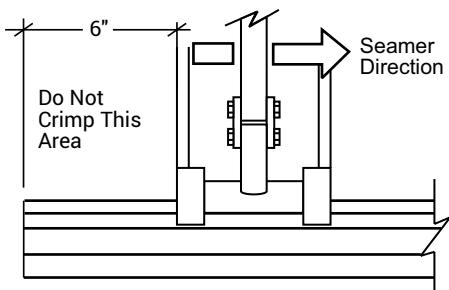
#### CAUTION

Seamer operation should be closely supervised at all times. A safety cable should be attached to the seamer.



Stop seamer about one foot from ridge. Disengage locking arm and remove the electric seamer.

Finish seam with hand tool by first crimping the remaining portion of female lip. Then, using the second stage of the hand tool, fold and finish the seam. Repeat this procedure for all panels.

**Step 14 - Last Panel Run**


This roof system is designed to finish in the high on even footage buildings by using 24" panels on the last run.

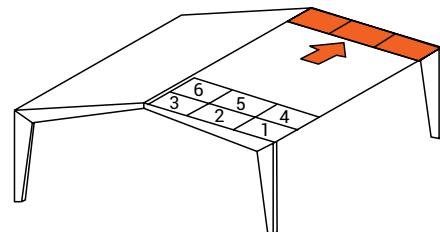
With insulation in place, install rake support along steel line.

**FINISHING ON MODULE**

If your roof is finishing on module, the male leg of the last panel run will need to be flattened before installation, with the exception of the first and the last 6" of each panel. This will allow for proper panel engagement at endlaps once panels are installed. Use the hand tool to flatten the male leg 6" from the starting end. (Refer to legend plate on seamer to determine the end that the seamer will start from.) With locking bar up, place seamer on male leg so that the last two rolls of the seamer are on the flattened portion of the seam. The first two rolls will be under the unflattened portion of the seam. Lower locking bar and run seamer to within 6" of the end of the panel. Raise locking bar and remove seamer. Repeat this procedure for all panels. Install panels as usual. Use hand tool to finish the unflattened portion of the male leg at the eave, ridge and endlaps.

**CAUTION**

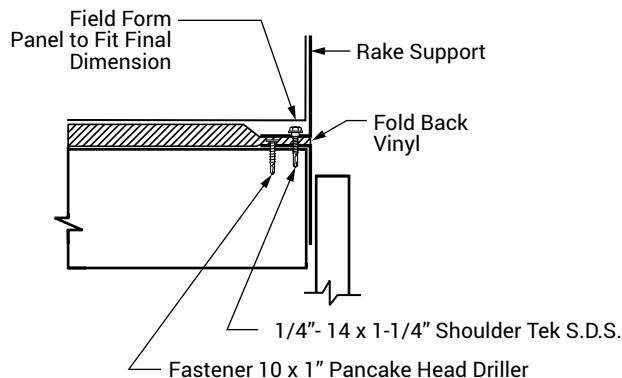
The seamer will not support itself while flattening the male leg on the last run. It must be supported during this operation.

**Step 14 - Last Panel Run (Optional)  
(Continued)**


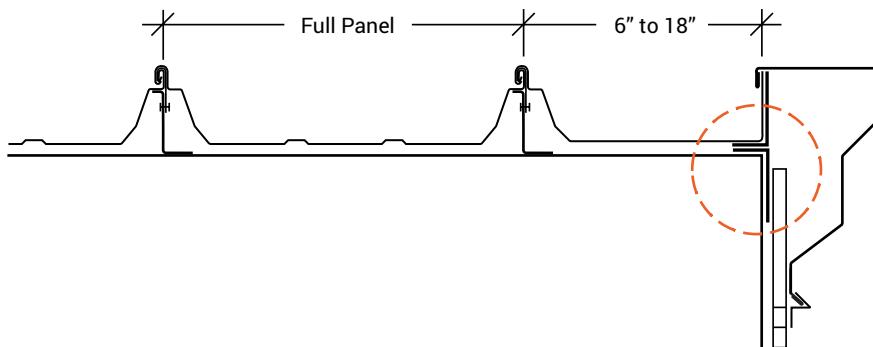
The roof is designed to finish in the high on even footage buildings. Odd length buildings and variations in erection practices may dictate that an alternate detail be used.

When terminating in an odd dimension, field cut and bend a 3" vertical leg on the panel.

After laying the last insulation run, install the field formed panel. Fasten the formed leg of the panel to the rake support with fasteners 1/4- 14 x 1-1/4" Long Life S.D.S 24" O.C.


**CAUTION**

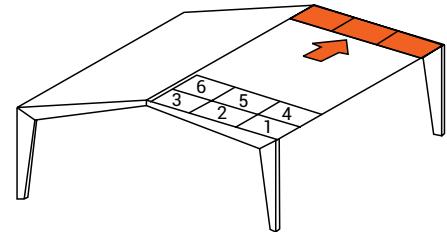
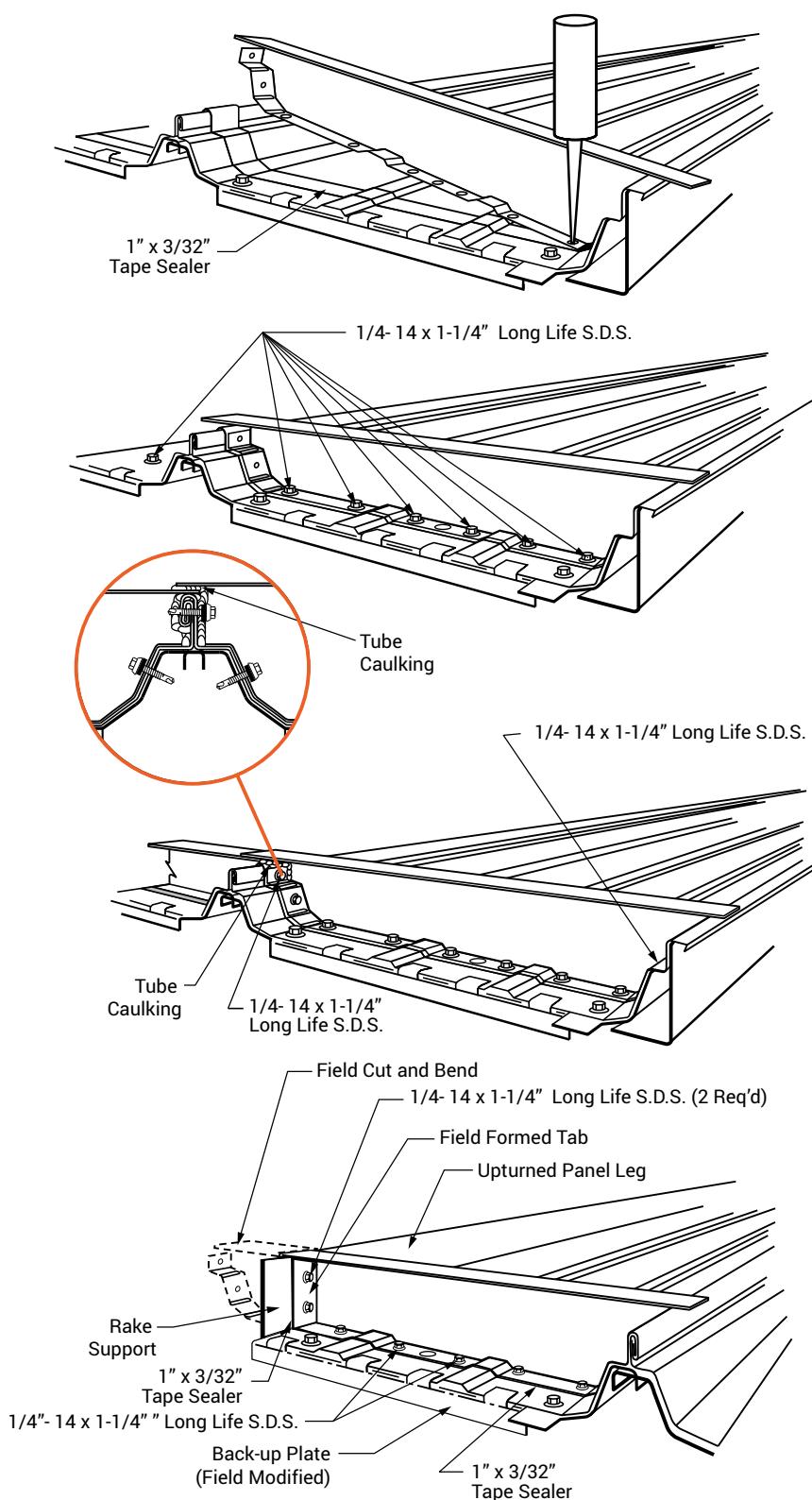
The roof should be swept clean of any drill shavings at the end of each day to prevent rust.



PARTIAL PANEL (6" TO 18" SPACE  
PANEL MUST BE FIELD FORMED)

At trim laps 1/8" x 3/16" pop rivet should be installed maximum 1" on center at vertical surfaces.

At trim laps 1/4 - 14 x 7/8" Long Life S.D.S. fasteners should be installed maximum 1" on center at horizontal surfaces.

**Step 15 - End Dam**


After all panel runs are installed and seamed, return to first panel run at the ridge. Install 1" x 3/32" tape sealer across full width of each panel, covering the pre-punched holes.

Rotate End Dam into position contacting the female side of the panel first. Using an awl, align the first hole on the female side of the End Dam with the corresponding hole in the panel and back-up plate. Remove the awl and install fastener 1/4-14 x 1-1/4" Long Life S.D.S. in this hole.

Push the other end of the End Dam into position and align the holes with the awl. Remove the awl and install fastener 1/4-14 x 1-1/4" Long Life S.D.S in all remaining holes except for the hole at the panel seam. DO NOT INSTALL THE PANEL SEAM FASTENER AT THIS TIME.

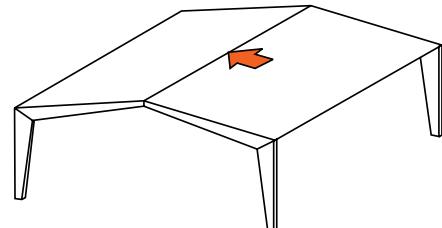
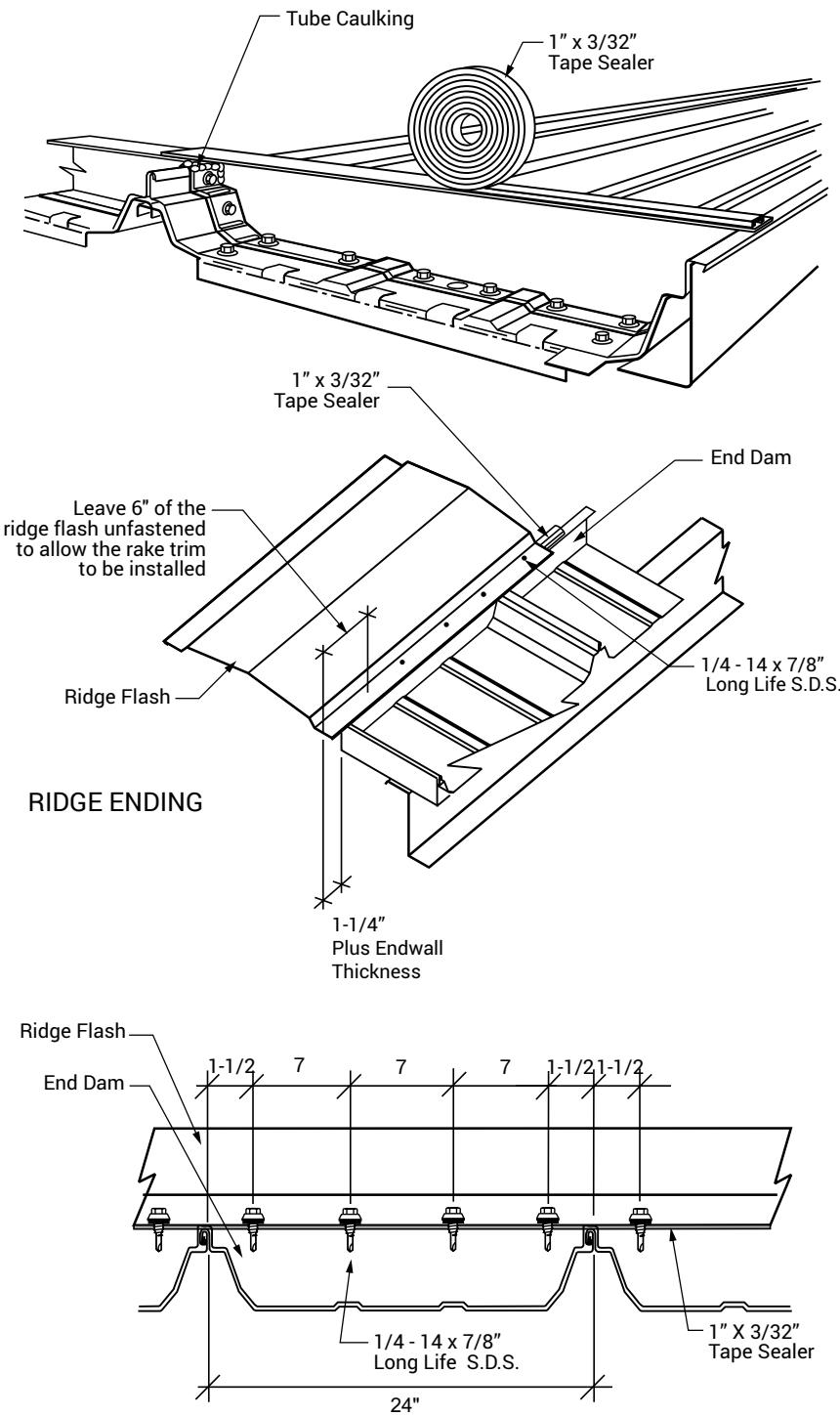
Install all End Dams on both sides of the ridge.

If the last panel run was field modified, the final End Dam on the last panel will require field modification as well. A tab should be formed on the end of the End Dam for attachment to the upturned leg of the roof panel (field formed). This tab should be attached to the panel with Fastener 1/4-14 x 1-1/4" Long Life S.D.S, two required.

Install Fastener 1/4-14 x 1-1/4" Long Life S.D.S. in remaining hole at the panel seam of all End Dams. The fastener installed in the top hole must go through the panel seam and the corresponding hole of the adjacent End Dam.

Use tube caulking to fill any voids around panel seam on up slope side of End Dam.

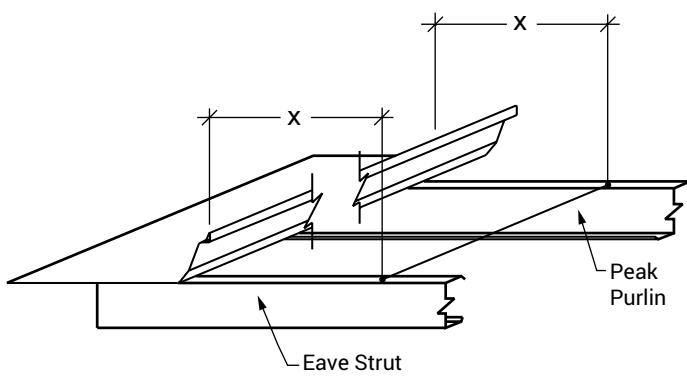
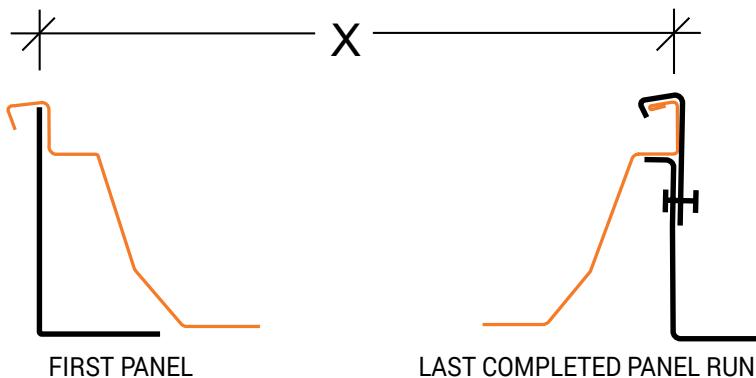
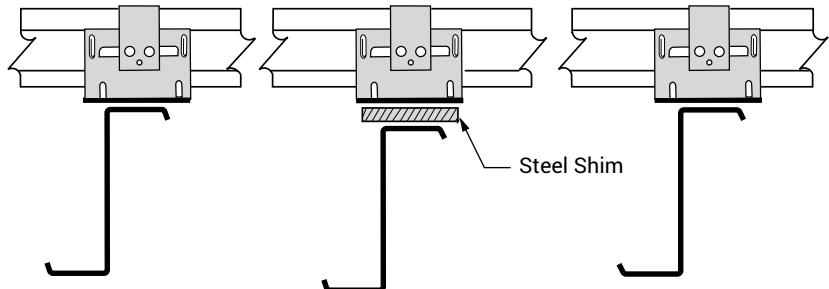
## Step 16 - Ridge End Dam/Flashing



Apply 1" x 3/32" tape sealer to the top of the End Dam.

Install the ridge flash starting and ending 1-1/4" plus wall thickness outside the steel line. Fasten the ridge flash to the end dams with fastener 1-1/4-14 x 7/8" long life S.D.S. install a fastener 1-1/2" from panel seam on both sides of panel. Install additional fasteners directly above minor ribs of panel. Four fasteners are required at each panel. Leave 6" unfastened on each end to allow for the rake trim to be installed later. DO NOT FASTEN THROUGH THE LOCK OF THE STANDING SEAM.

### Recommended Erection Practices



#### CORRECTING OUT-OF-PLANE SUBSTRUCTURE

Occasionally a purlin may be encountered that is lower (out-of-plane) than those adjacent to it. When a clip is attached to this purlin, it will go down further than those adjacent to it, distorting the seam. This can cause the next panel side lap to be difficult to snap together in this area. To compensate for this lower purlin, a steel shim may be placed under the clip to bring it up to the proper height (in plane). This shim should be no thicker than 1/4" if 1/4" is not enough, then structural modification will be necessary.

Avoid "stair-stepping" of the panels at the eave. This will cause problems engaging back-up plates at the endlap and ridge.

Any "stripped out" fasteners at the endlaps or End Dams should be immediately replaced with #17 x 1" Type AB fastener. Place a 1" long piece of 1" x 3/32" tape sealer over the "stripped out" hole before installing #17 x 1" Type AB fastener. This will allow the fastener threads to be coated with tape sealer and provide a good seal.

**NEVER ALLOW PANELS TO COME INTO CONTACT WITH LEAD, COPPER, GRAPHITE, GASOLINE, OR OTHER HARSH CHEMICALS AS THIS WILL VOID THE GALVALUME® WARRANTY.**

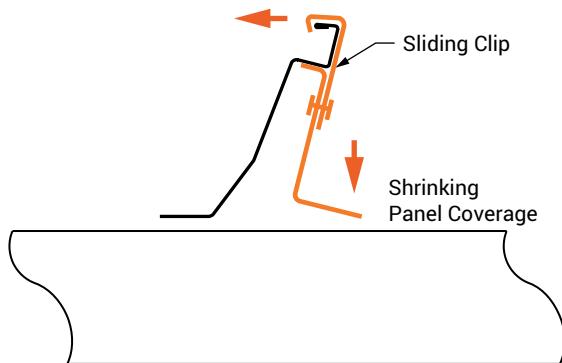
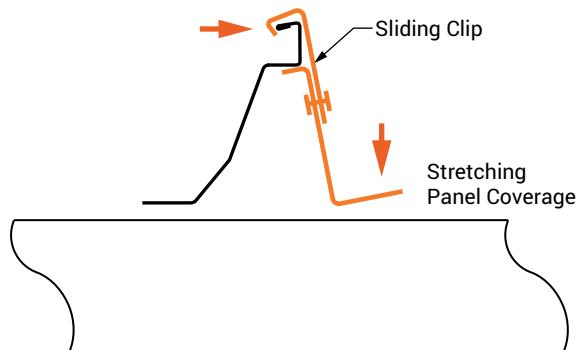
#### CHECK ROOF FOR PANEL ALIGNMENT

Check the roof every three or four runs for panel alignment as it is being erected. This can be accomplished by two different means.

1. Measure from the rake support to the seam of the last completed panel run. Take measurements at the ridge, eave, and all endlaps.
2. Attach a stringline to the eave plate and ridge purlin, running parallel to the rake support. The stringline should stay ahead of the work and can be moved across the roof as construction progresses. Measure from the stringline back to the last completed panel run. Take measurements at the ridge, eave, and all endlaps.

**Recommended Erection Practices  
(Continued)**
**ADJUSTING PANEL WIDTH FLOATING CLIP ONLY**

**NOTE**  
Do not adjust panel width more than 1/2" on any panel area.



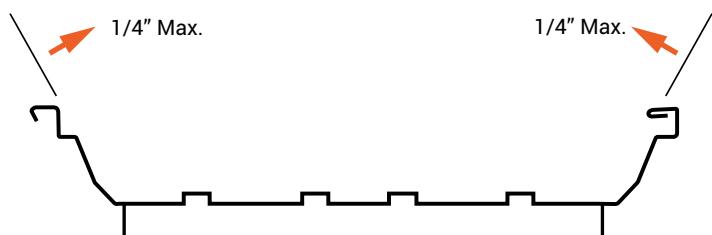
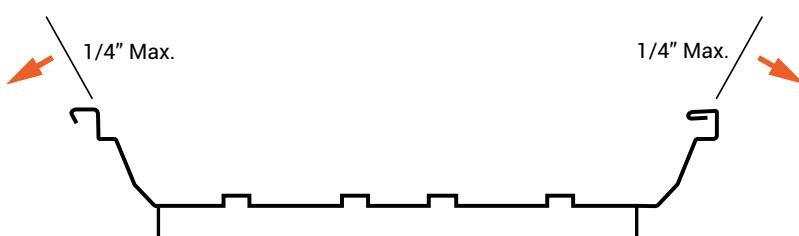
To stretch panel coverage, install a floating clip at the panel endlap or ridge with the base angled away from the panel. As the fastener is installed through the base of the clip and into the purlin, the clip base will rotate down to the purlin causing the top of the clip to move outward, stretching the panel coverage. Install the remainder of the clips as usual.

To shrink panel coverage, install a clip at the panel endlap or ridge with the base angled toward the panel. As the fastener is installed through the base of the clip and into the purlin, the clip base will rotate down to the purlin causing the top of the clip to move inward, shrinking panel coverage. Install the remainder of the clips as usual.

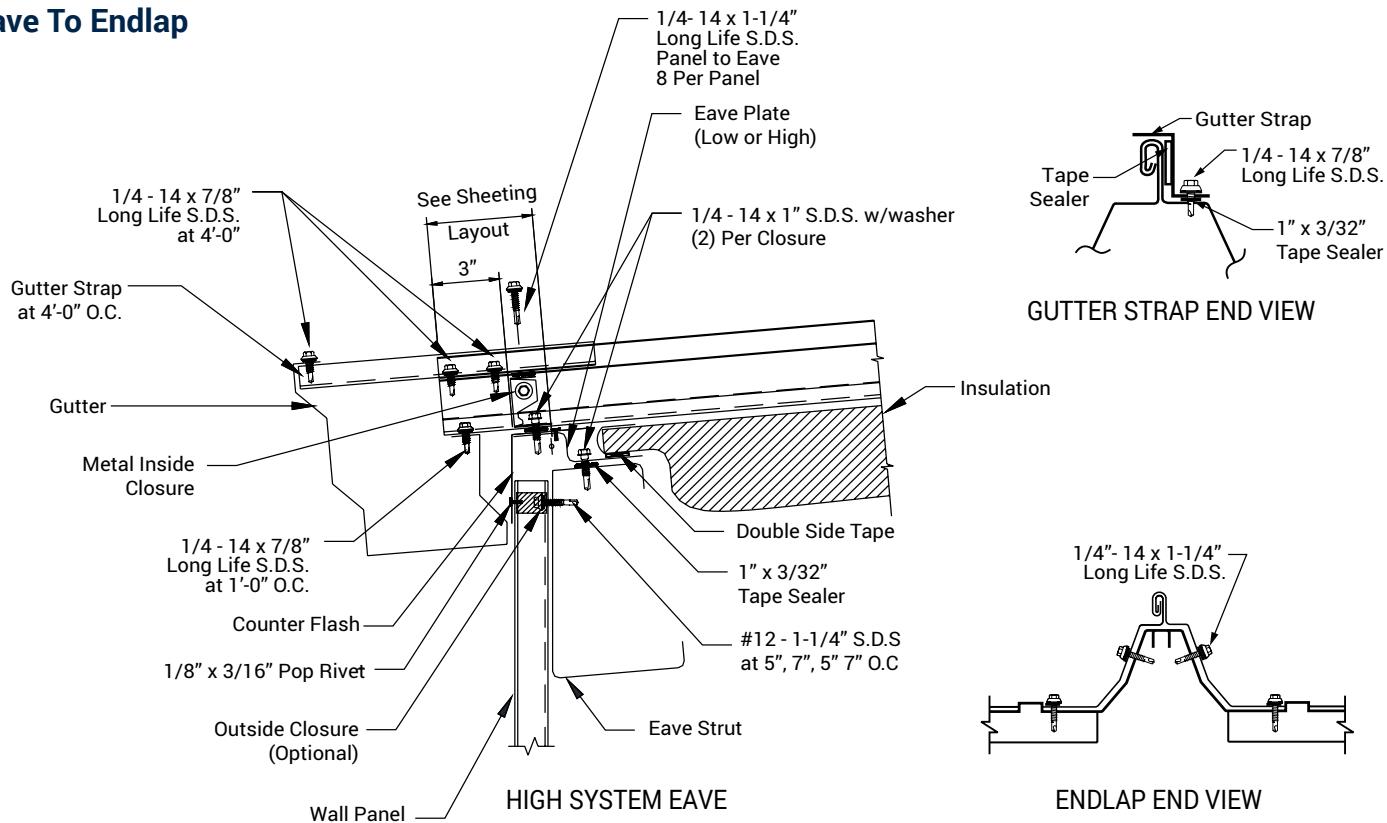
**FIXED AND FLOATING CLIPS**

To stretch panel coverage, bend the sides of the back-up plate out and install at endlap or ridge. Do not bend either side more than 1/4" install clips as usual.

To shrink panel coverage, bend the sides of the back-up plate in and install at endlap or ridge. Do not bend either side more than 1/4" install clips as usual.

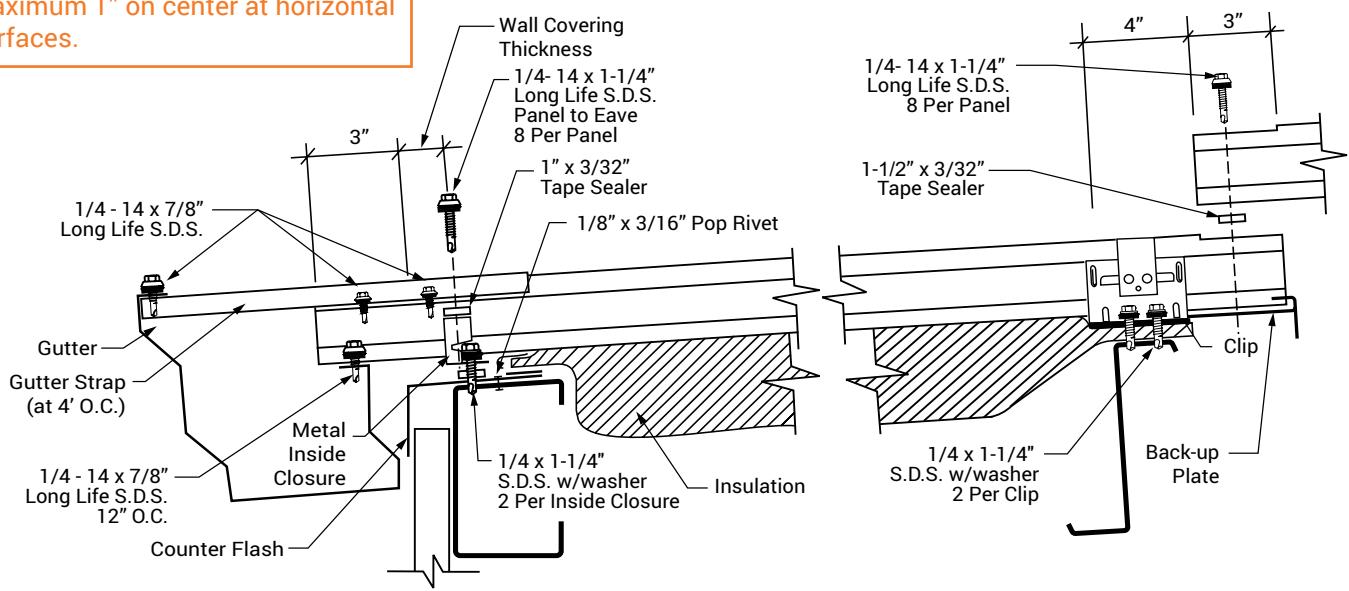


## Eave To Endlap



At trim laps  $1/8" \times 3/16"$  Pop Rivet should be installed maximum 1" on center at vertical surfaces.

At trim laps  $1/4 - 14 \times 7/8"$  Long Life S.D.S. fasteners should be installed maximum 1" on center at horizontal surfaces.

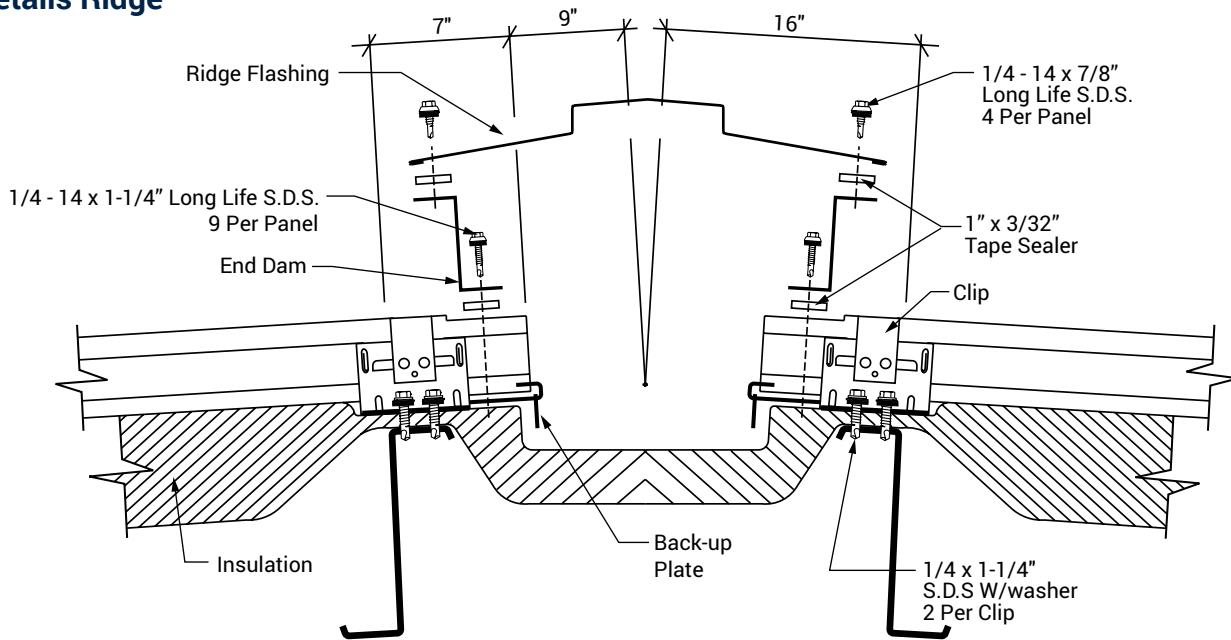


## NOTES

1. The above gutter should not be used in areas that experience snow loads of 20 PSF or higher.

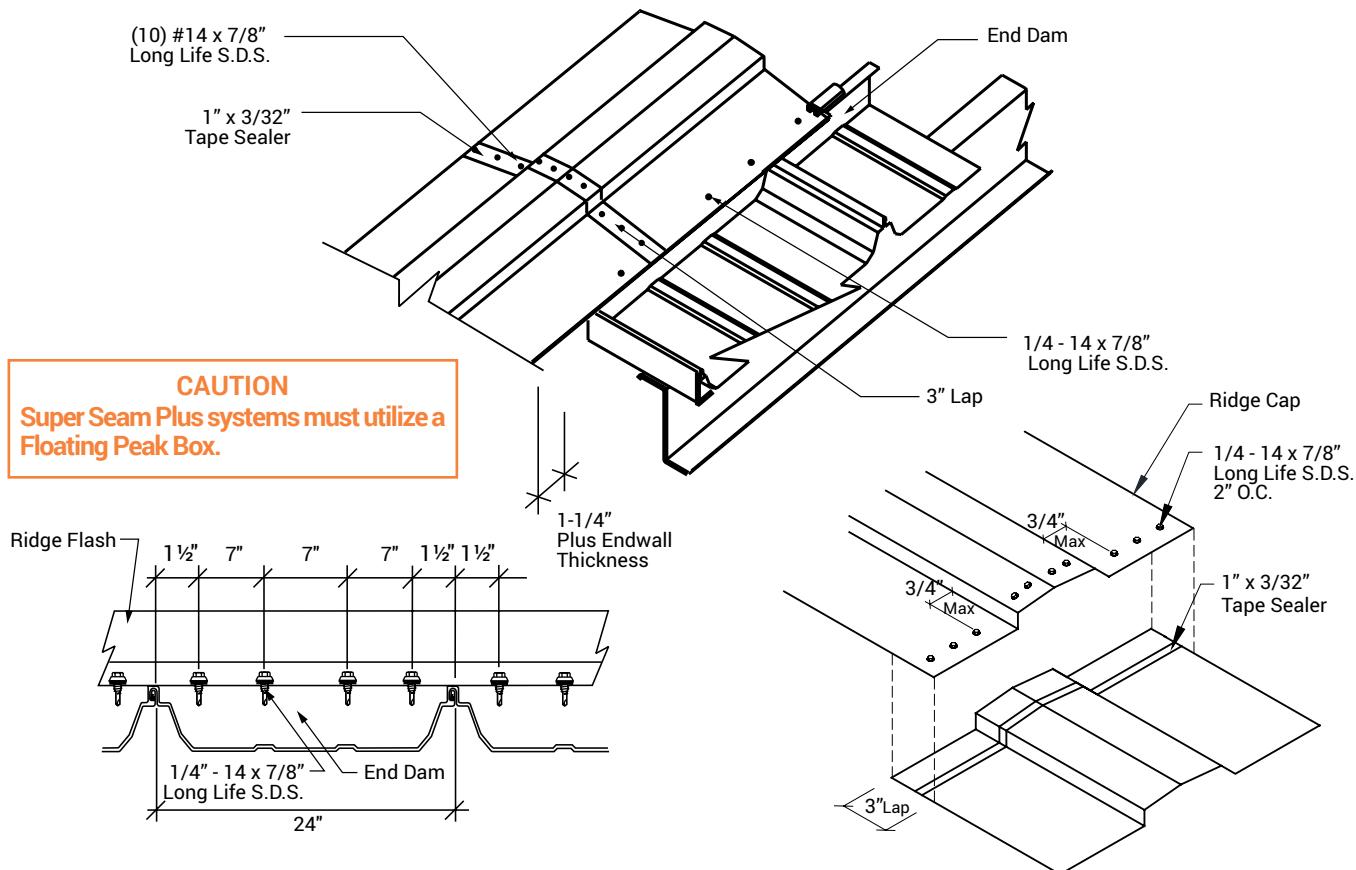
SEE PAGES SSP-13-14 FOR FASTENER SELECTION

## Trim Details Ridge



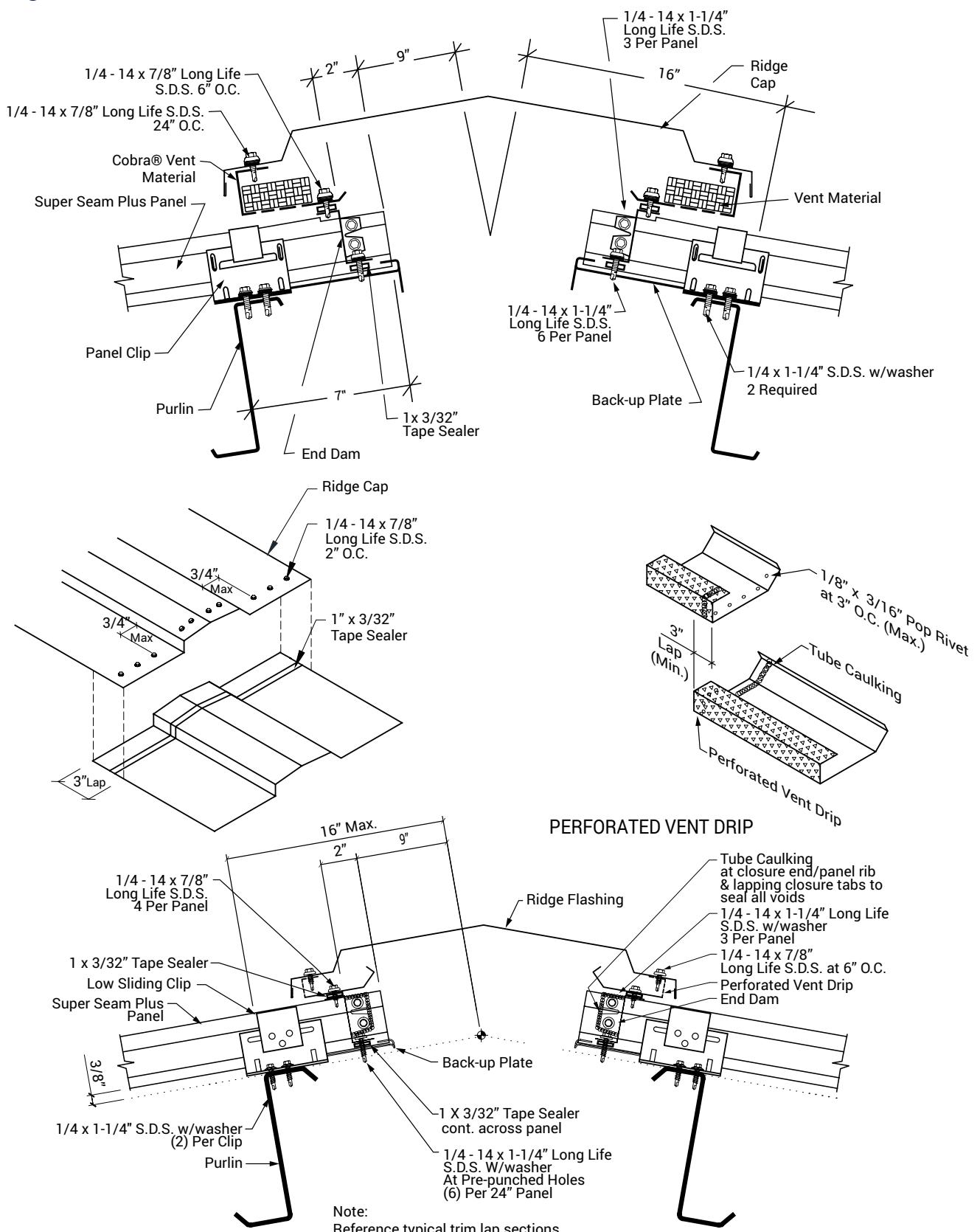
The 7" panel overhang at the purlin is critical to the proper installation of the roof. Regardless of the peak purlin spacing this dimension must be maintained. Adjust the width of the ridge cap to meet this requirement.

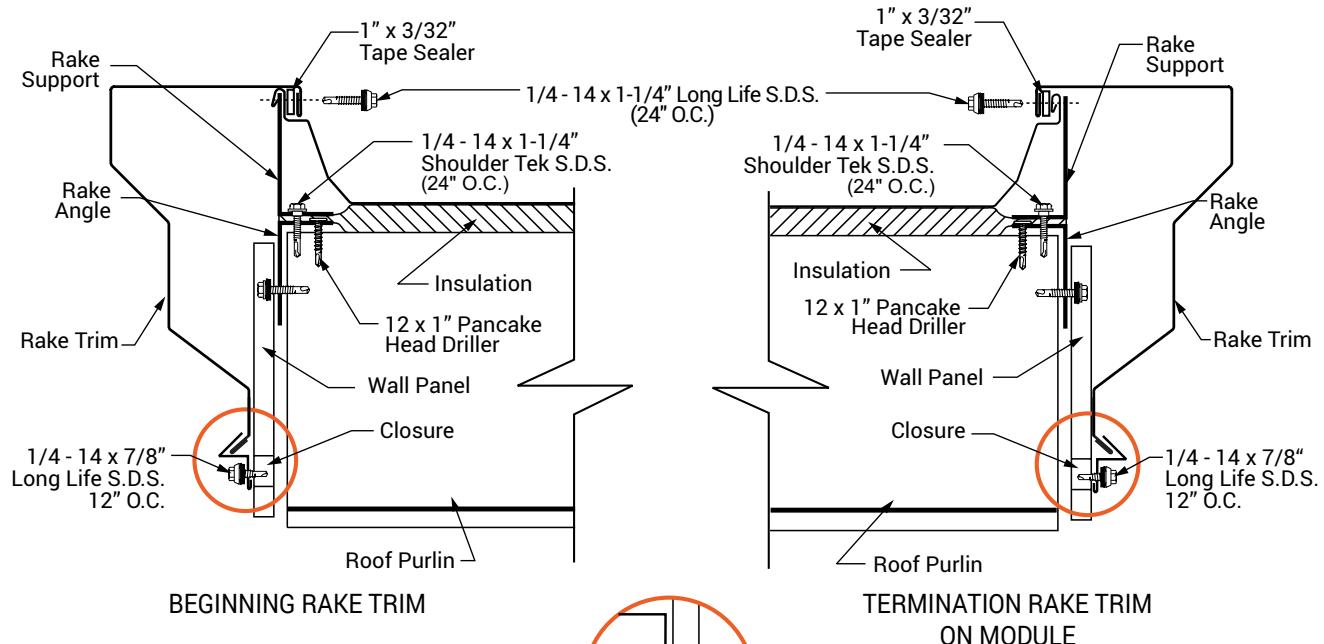
Install the ridge flashing starting and ending 1-1/4" plus endwall thickness outside the steel line. Install ridge flashing with 1/4-14 x 7/8" Long Life S.D.S. with washer. Install a fastener 1-1/2" from panel seam on both sides of panel. Install additional fasteners directly above minor ribs of panel. Four fasteners are required at each panel. Leave 6" unfastened on each end to allow for the rake trim to be installed later. **DO NOT FASTEN THROUGH THE LOCK OF THE STANDING SEAM.**



SEE PAGES SSP-13-14 FOR FASTENER SELECTION

### Vented Ridge

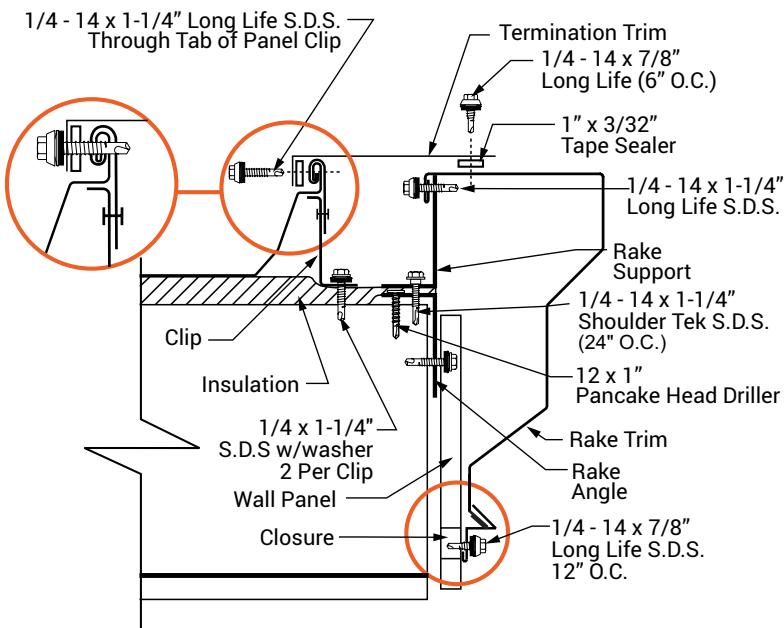
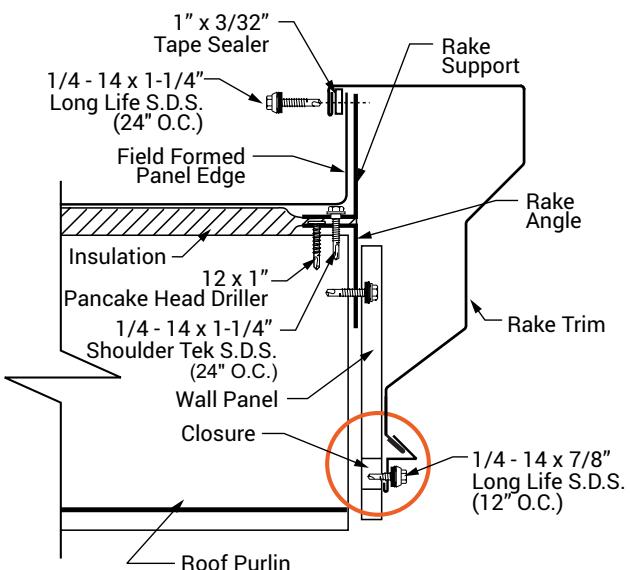


**Trim Details Rake**


At trim laps  $1/8" \times 3/16"$  Pop Rivet should be installed maximum 1" on center at vertical surfaces.

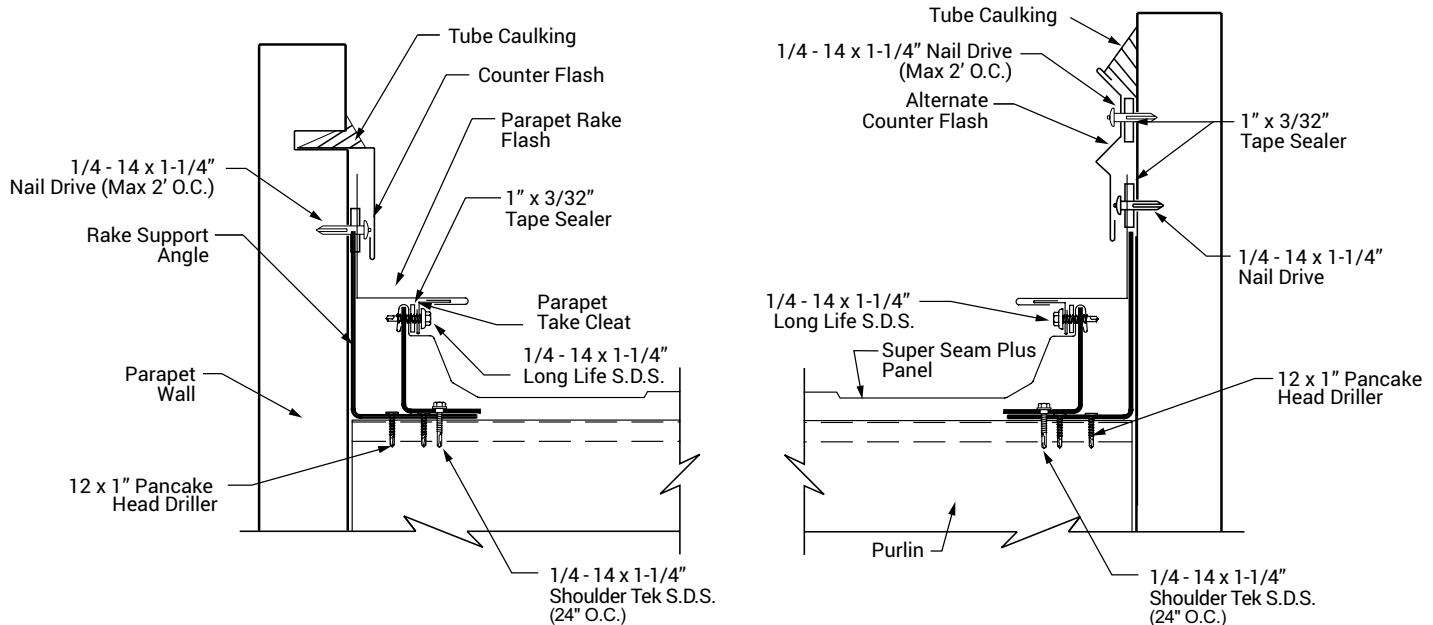


At trim laps  $1/4 - 14 \times 7/8"$  Long Life S.D.S. fasteners should be installed maximum 1" on center at horizontal surfaces.

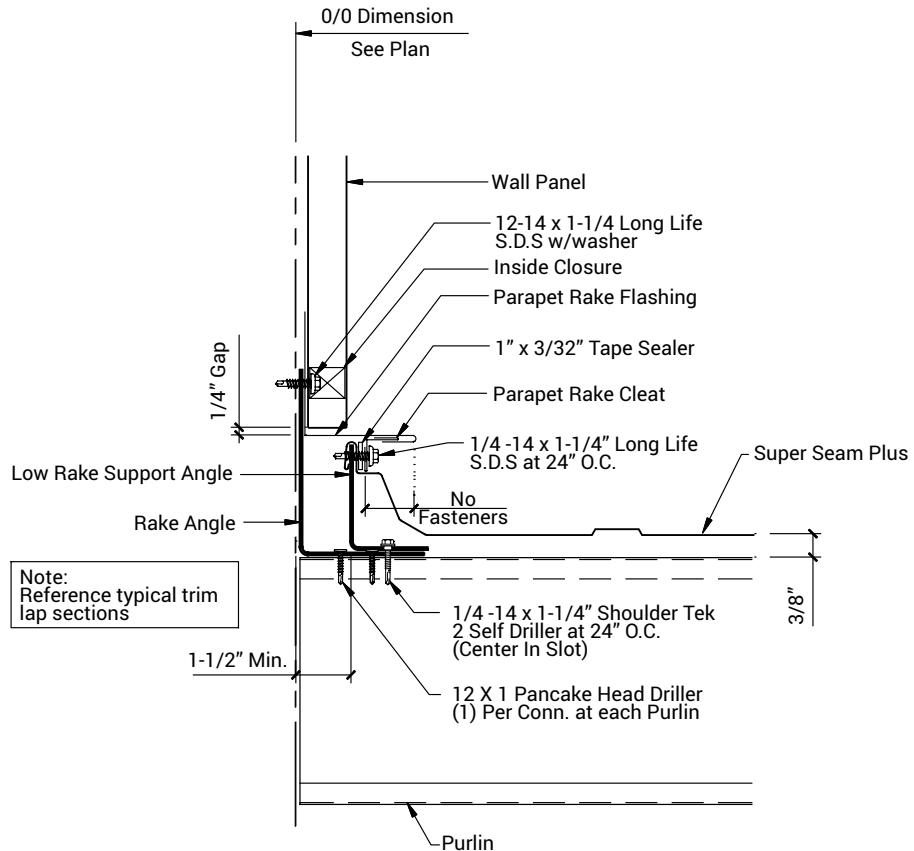
**RAKE SLIDE  
(FOR FLOATING SYSTEMS ONLY)**

**TERMINATION RAKE TRIM  
OFF MODULE**

**TERMINATION RAKE TRIM  
OFF MODULE (OPTIONAL)**

SEE PAGES SSP-13-14 FOR FASTENER SELECTION

### Trim Details Rake



BEGINNING PARAPET RAKE



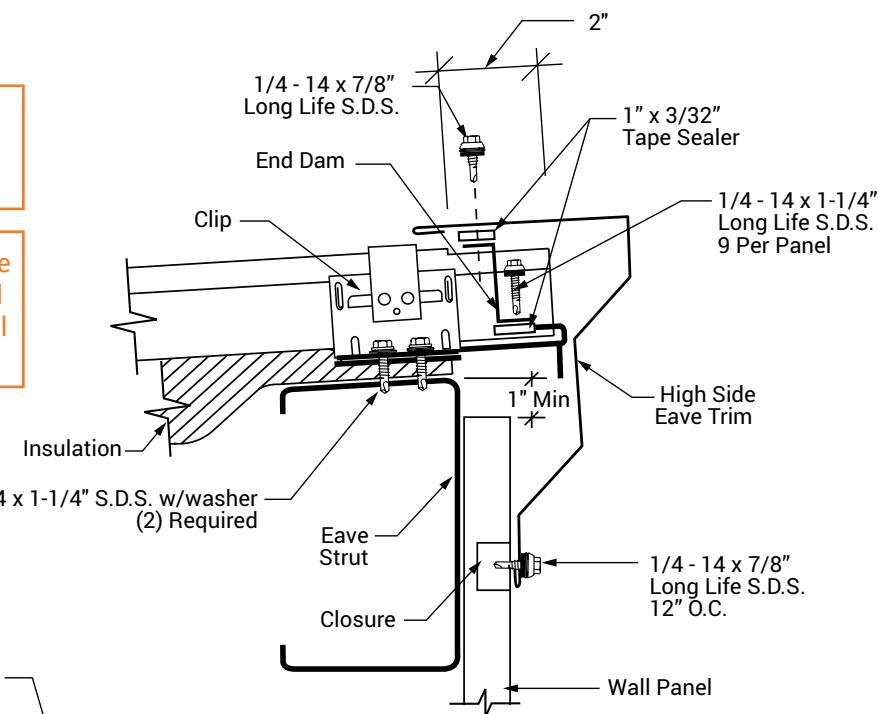
TERMINATION PARAPET RAKE

TERMINATION PARAPET RAKE  
(OPTIONAL)

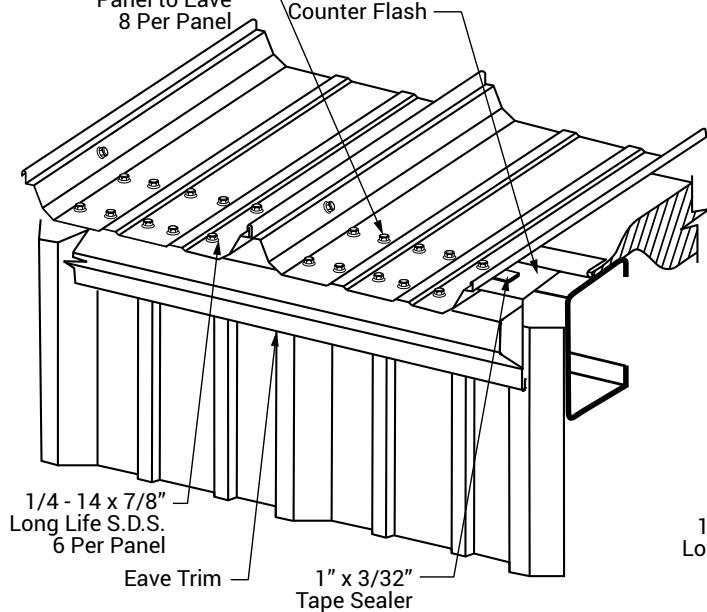
### Trim Details Eave

At trim laps  $1/8" \times 3/16"$  Pop Rivet should be installed maximum 1" on center at vertical surfaces.

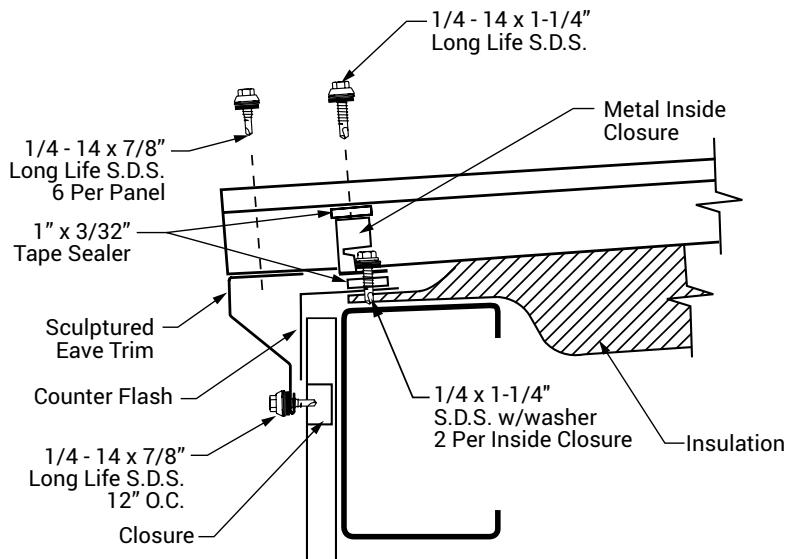
At trim laps  $1/4 - 14 \times 7/8"$  Long Life S.D.S. fasteners should be installed maximum 1" on center at horizontal surfaces.



HIGH EAVE



LOW EAVE WITH SCULPTURED EAVE TRIM



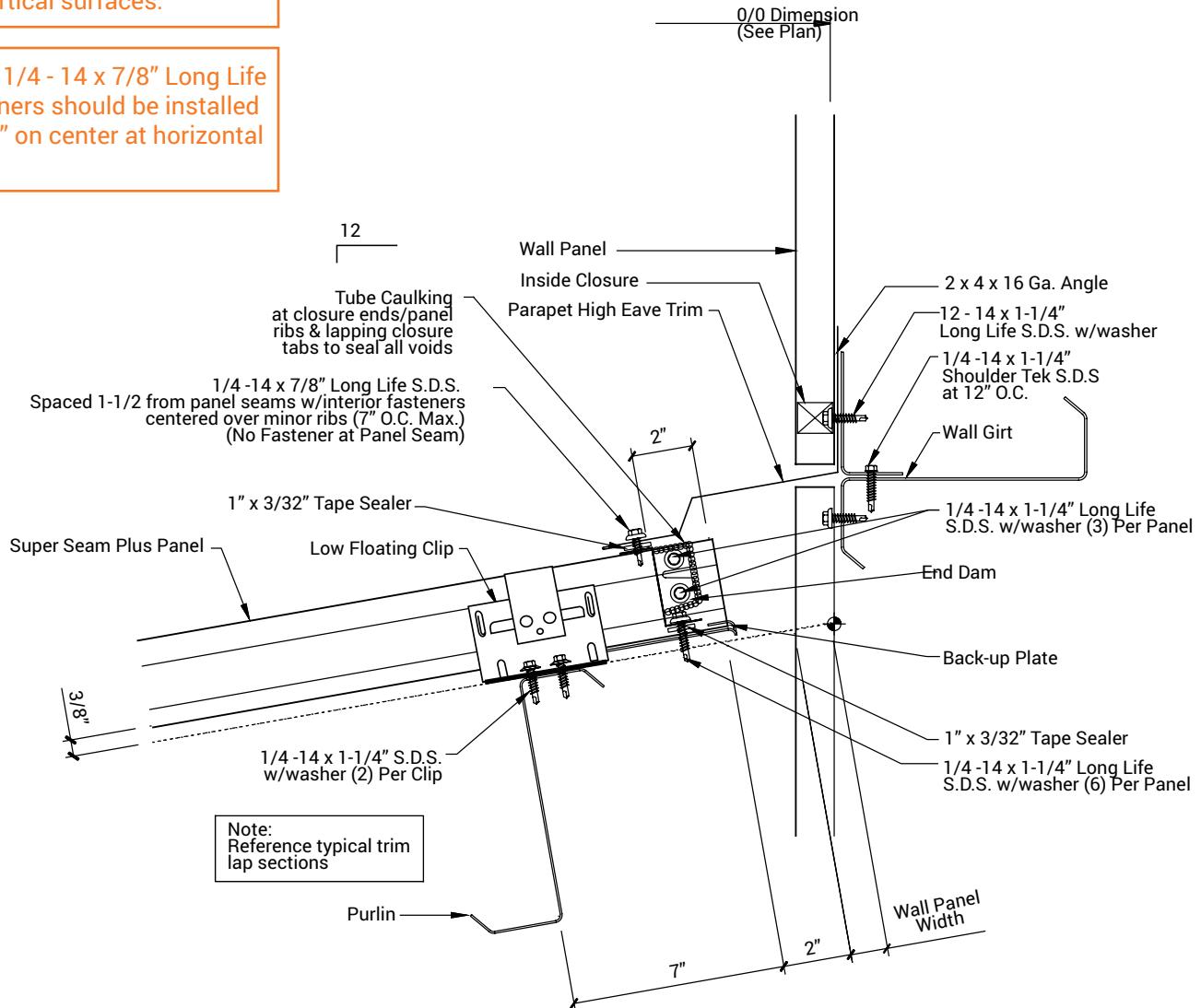
### NOTES

1. This optional sculptured eave trim is available. However, under certain conditions it may induce staining of wall panels.
2. Place the  $1/4 - 14 \times 7/8"$  Long Life S.D.S. through the pre-punched holes in the roof panel.

## Trim Details Rake - High Eave Parapet

At trim laps 1/8" x 3/16" Pop Rivet should be installed maximum 1" on center at vertical surfaces.

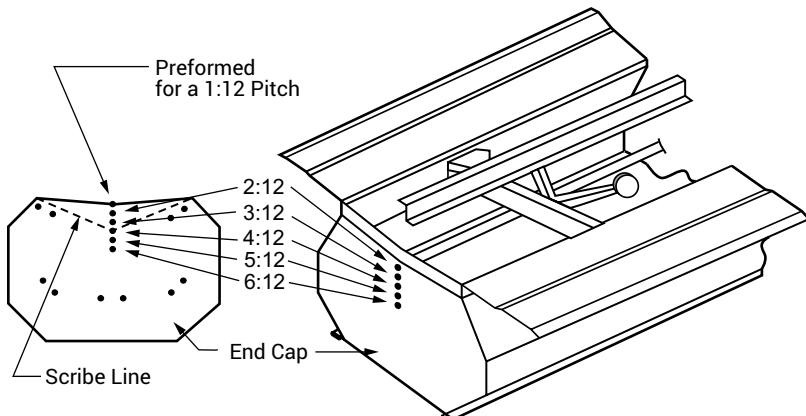
At trim laps 1/4 - 14 x 7/8" Long Life S.D.S. fasteners should be installed maximum 1" on center at horizontal surfaces.



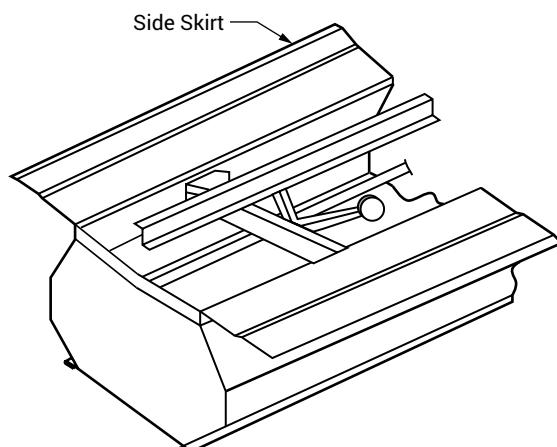
## – NOTES

1. High side purlin is 9" down slope.

### Ridge Ventilator Installation

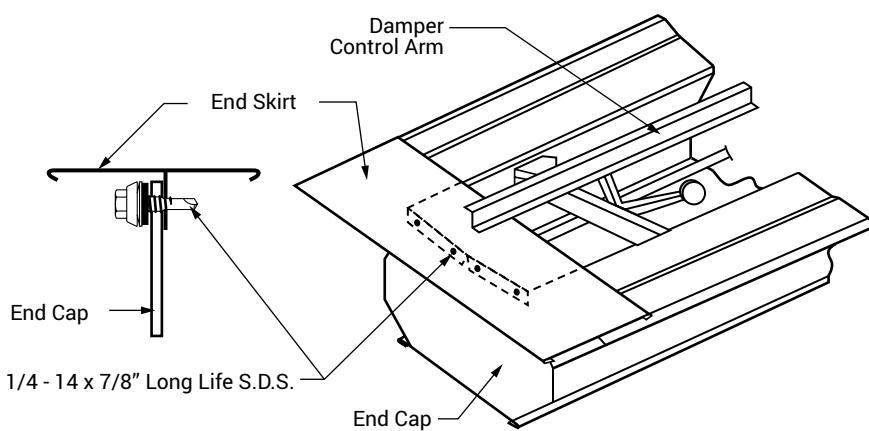

**NOTE**

Whirlwind does not recommend the use of a ridge ventilator on standing seam roof systems. Sidewall or endwall exhaust fans or other ventilating methods should be considered. These details are for your convenience only. Only a 9" ridge ventilator can be used with this SSR system. Do not use ridge ventilators on any roof over 200' in width or with a slope less than 1:12 or greater than 6:12.



Turn ventilator over and place gently on its top. Note that the end cap is preformed for a 1:12 roof pitch. The five bench mark dots represent 2:12, 3:12, 4:12, 5:12 and 6:12 roof pitches. Draw a line between indicated corners and the appropriate dot for the roof pitch. Cut and remove that portion of the end cap. On 5:12 and 6:12 roof pitches see vent manufacturer's special instructions for the installation of the vent skirt. The end cap is now ready to receive the end skirt.

Position end skirt onto end cap. Be sure the down-turned angle of the end skirt is inside of and up against the end cap. Attach end skirt to ventilator end cap with fastener 1/4 - 14 x 7/8" Long Life S.D.S. in four places.



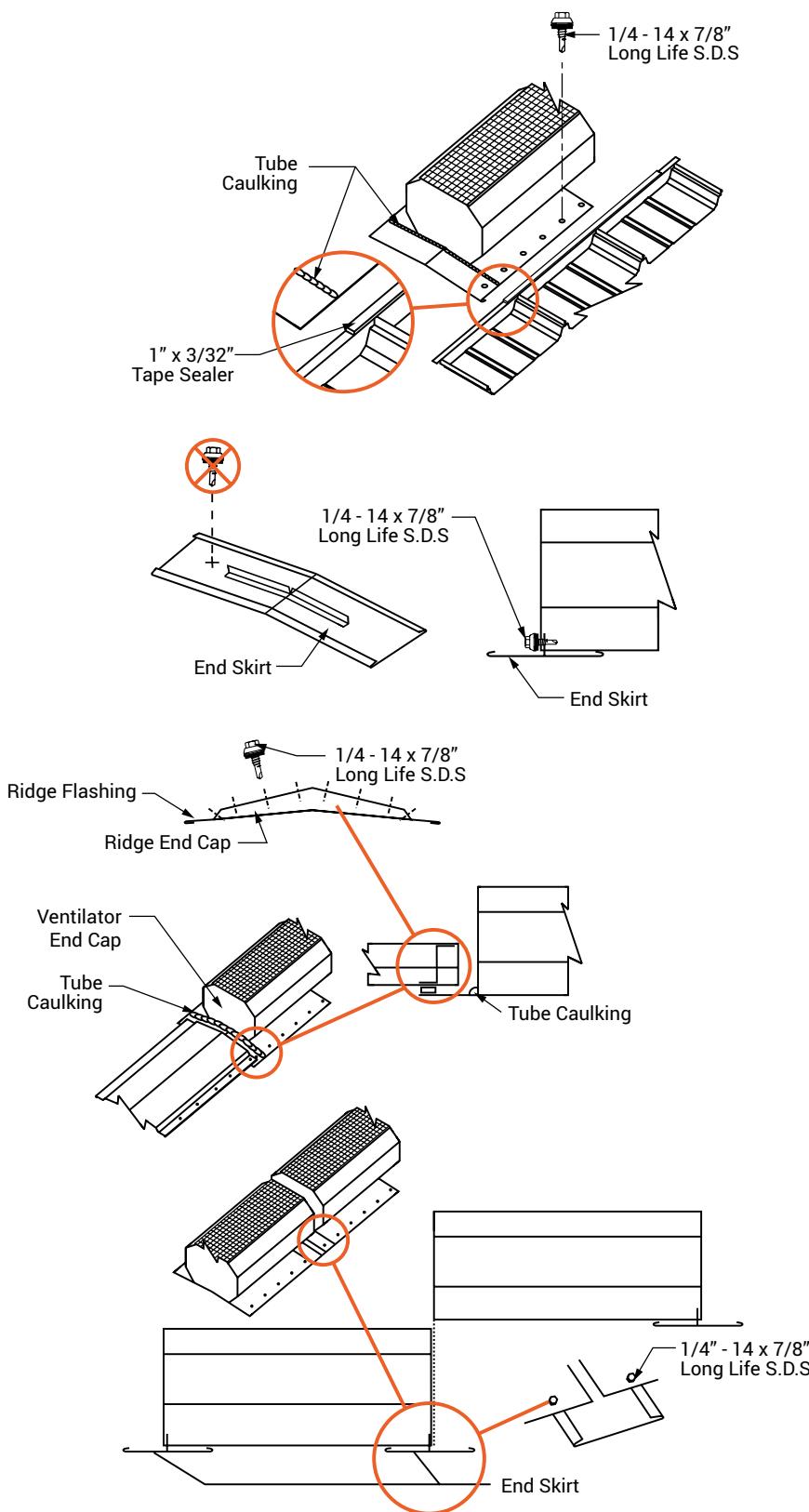
### Ridge Ventilator Installation (Continued)

Apply 1" x 3/32" tape sealer to top of End Dams. Install ventilator making sure to center in opening. Attach ventilator to End Dams with fastener 1/4 - 14 x 7/8" Long Life S.D.S on 6" centers. Use caulking to seal between the outside of the ventilator and the end skirt.

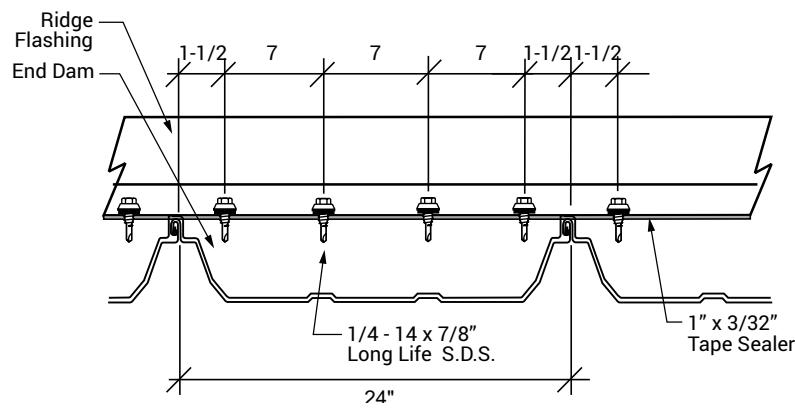
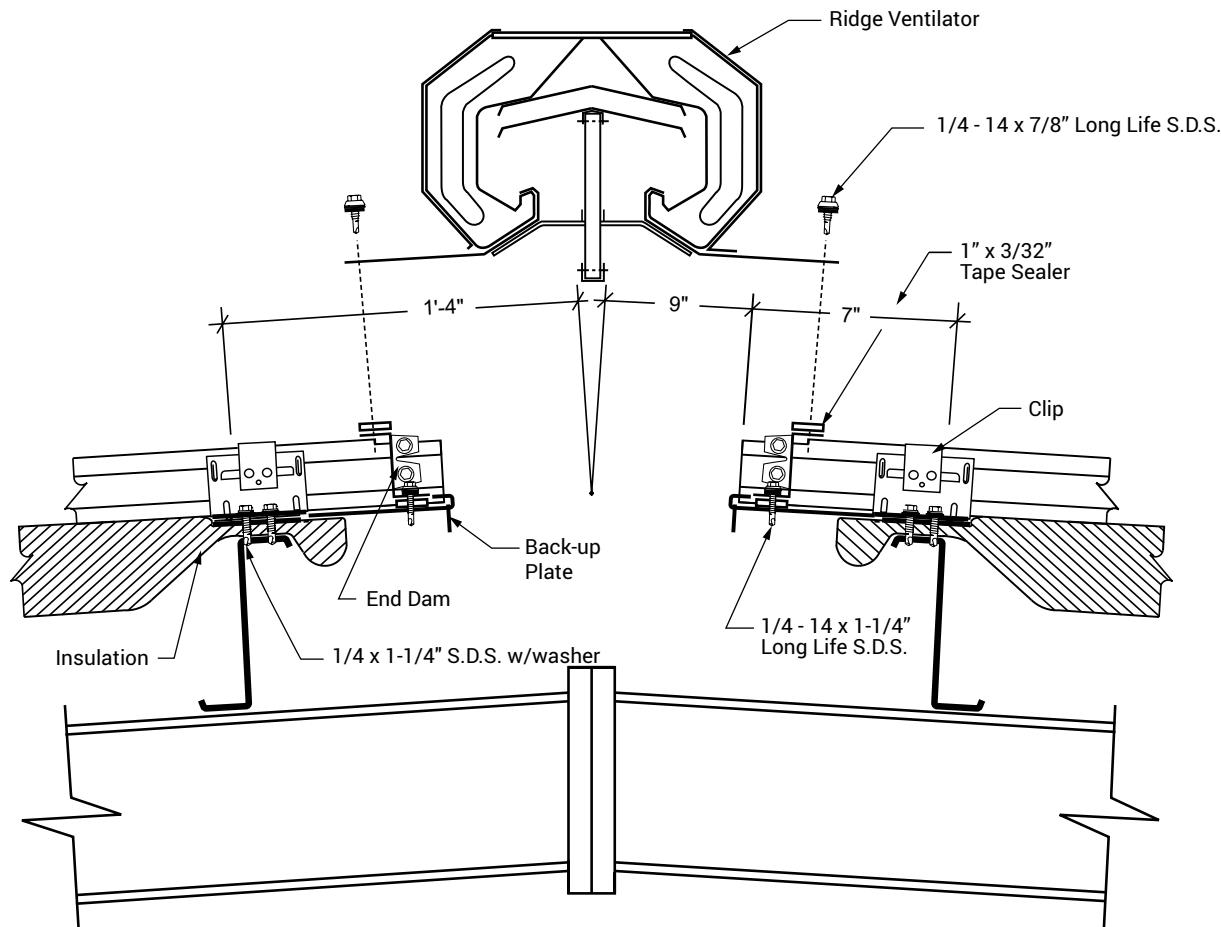
Install the ridge flashing as in Step 16 except for those pieces on either side of ventilator. These will lay on top of, and seal to, the ventilator end skirt with a ridge end cap. Use 1" x 3/32" tape sealer to seal the ridge end cap to the ridge flashing and the end skirt. Use fastener 1/4 - 14 x 7/8" Long Life S.D.S. to install the end cap. Six fasteners are required to tie the end cap to the ventilator end skirt. Eight fasteners are required to tie the end cap to the ridge flashing.

For continuous ventilators, install end skirts on both ends of the first ventilator and one end of all following ventilators. Attach ventilator to End Dams as outlined above. Install an additional fastener 1/4 - 14 x 7/8" Long Life S.D.S. through the corner of the side skirt and into the end skirt.

Do not connect more than 3 vents to the same linkage.



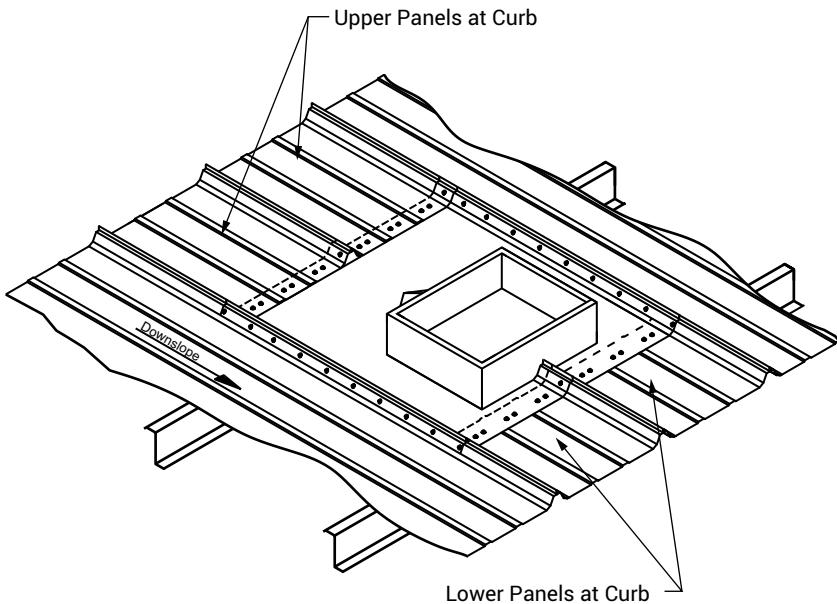
## Ridge Ventilator



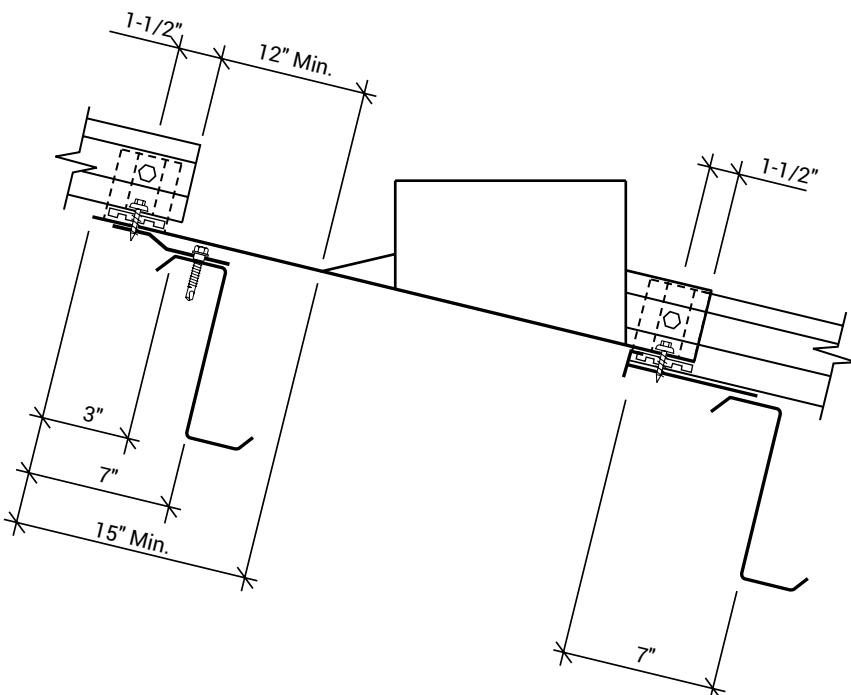
### NOTES

1. Only 9" ridge ventilators can be used with this SSR system.
2. Do not use ridge ventilators on any roof over 200' in width or with a slope less than 1:12 or greater than 6:12.

## Roof Curb Installation



ROOF CURB CROSS SECTION



The manufacturer recommends that only one-piece .080 aluminum curbs be used on its standing seam roof systems. The curb flange is constructed to match the configuration of the panel. The side flange extends to the next natural seam in the roof panel and conforms to the seam configuration. Cap strips, furnished by the curb manufacturer, secure the curb to the roof panels. The roof curb is installed under the roof panels on the up slope end and on top of the roof panels on the down slope end. Support framing should be installed before curb installation. Back-up plates (for the roof panels at the down slope end of the curb), a floating eave plate (for the up slope end of the curb), long-life fasteners and Triple Bead tape sealer must be ordered for each curb.

These curbs may be installed as the roof is being installed or after the roof has been installed. Since the curb sides are an integral part of the roof seam, the curb must align with the roof panel seams. If the curb can be shifted up to 12" to either side, the curb can be pre-ordered and be installed with the roof panels or installed after the roof is in place. If the curb placement is critical, install the curb support framing at the desired location and roof over it. Measure the panel rib locations in reference to the required curb opening and order the roof curb for each location. The curbs can then be installed in each location, ensuring an exact fit.

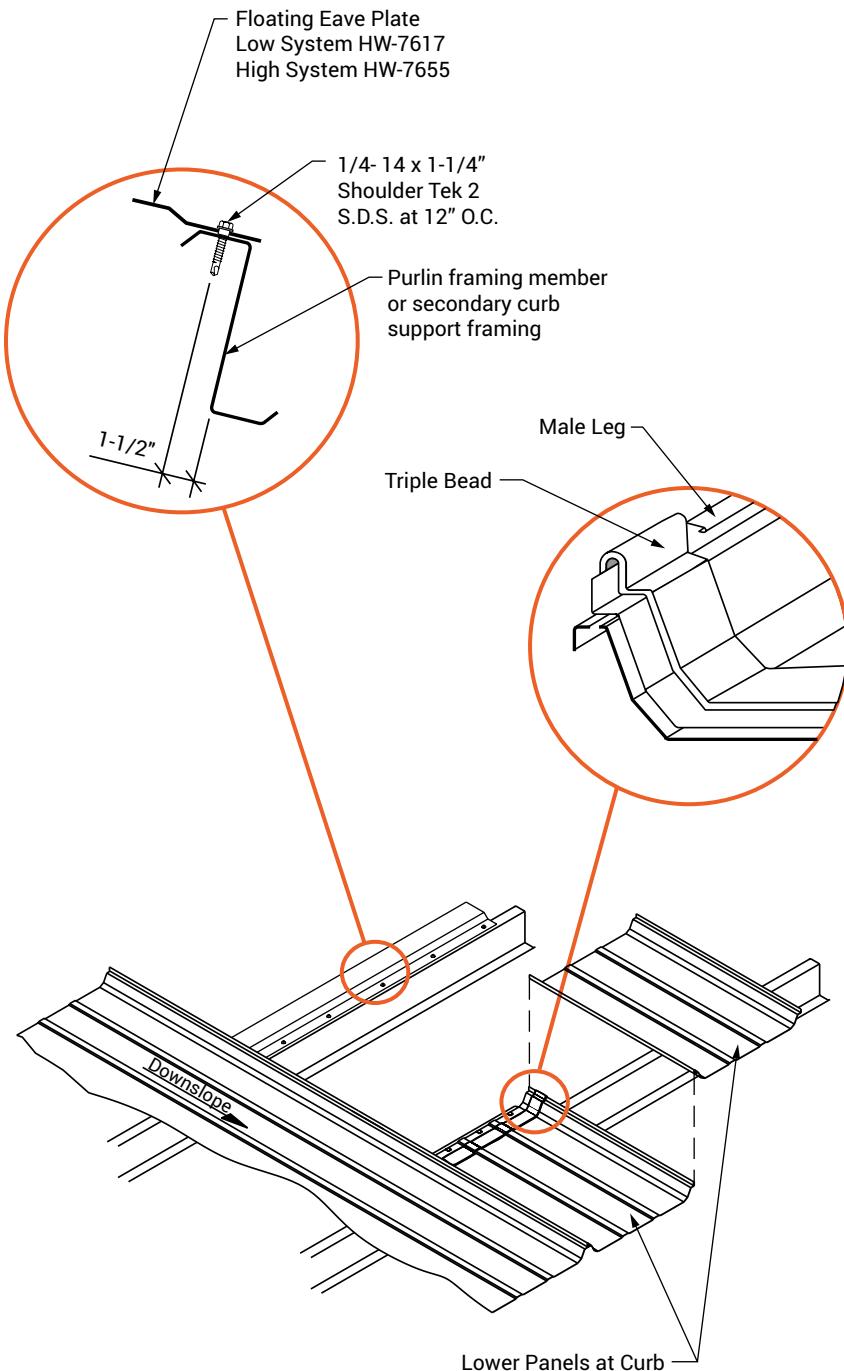
### ATTENTION

All curbs must be installed over support framing, supplied by the metal building manufacturer or the curb supplier. Support framing must be properly located to provide "endlap" conditions at the up slope and down slope ends of the curb. Refer to Roof Curb Cross Section for critical dimensions.

### WARNING

It is the user's responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal, and OSHA regulations and laws, including but not limited to guarding roof openings with plywood, fixed standard railings, or other acceptable safety controls that prevent fall-through.

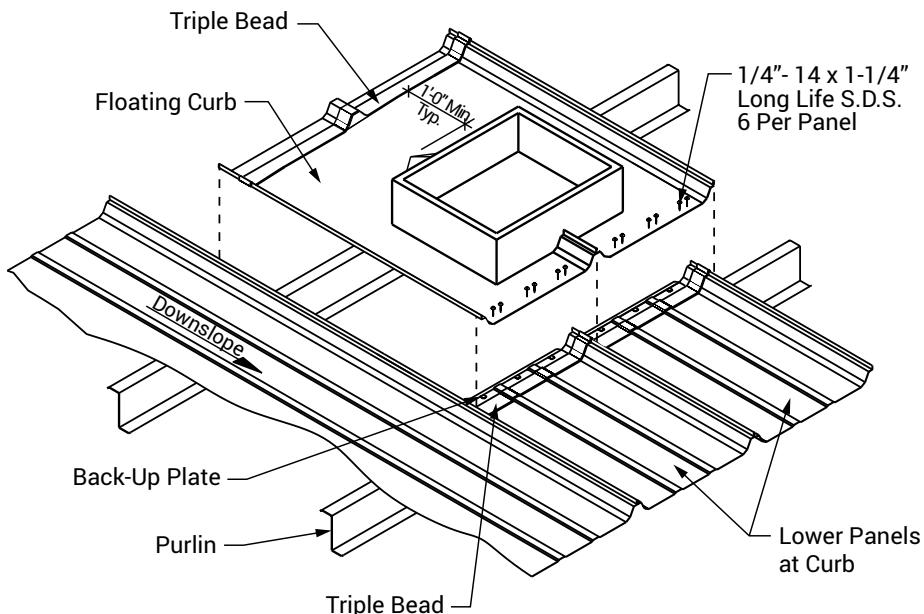
### Installing Curb With Roof



Install curb support framing at curb location. Install full length roof panels up to curb location. Install lower panels at down slope end of curb. If the lower panels are field cut to length, you must (1) cut the down slope end, leaving a factory cut at the curb end or (2) if the curb end of the panel is field cut, notch the male leg as it is done in the factory. Place Triple Bead tape sealer across the full width of each panel as it is installed. To determine how far down on the panel to place the tape sealer, temporarily lay the curb in place and mark the down slope edge of the curb on the first panel. This will give you a reference point as to how far down slope to place the tape sealer. It is critical that the tape sealer be installed across each panel individually so that the tape sealer can be placed over the male leg. This will provide a seal in the panel seam when the next panel is installed. Install back-up plates onto each of the lower panels.

#### WARNING

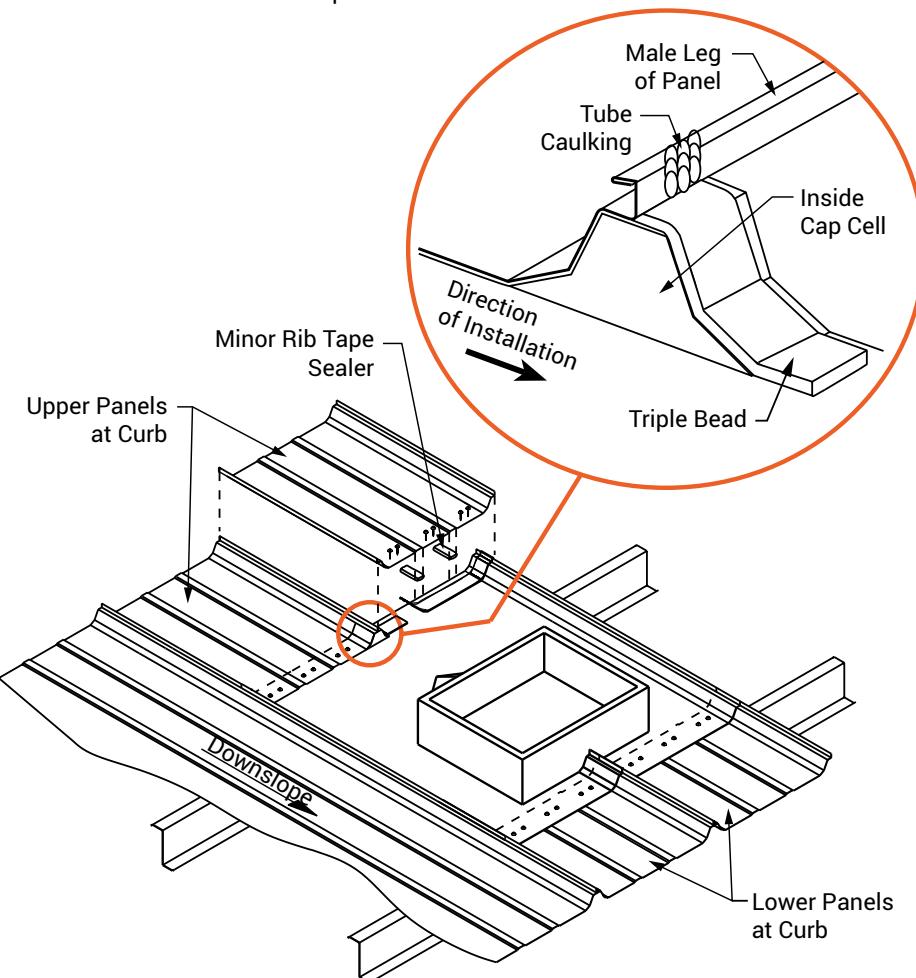
It is the user's responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal, and OSHA regulations and laws, including but not limited to guarding roof openings with plywood, fixed standard railings, or other acceptable safety controls that prevent fall-through.

**Installing Curb With Roof  
(Continued)**


Install the roof curb on top of the lower roof panels and the curb support framing. Do not attach the curb to the support framing as this may prevent the curb from floating with the roof. Fasten the down slope end of the roof curb to the lower roof panels and back-up plates with fastener 1/4 - 14 x 1-1/4" Long Life S.D.S. as at a standard endlap. This will require six fasteners in the pan of the panel and one in each trapezoid for a total of eight fasteners per panel. Fasteners must go through the Triple Bead.

**WARNING**

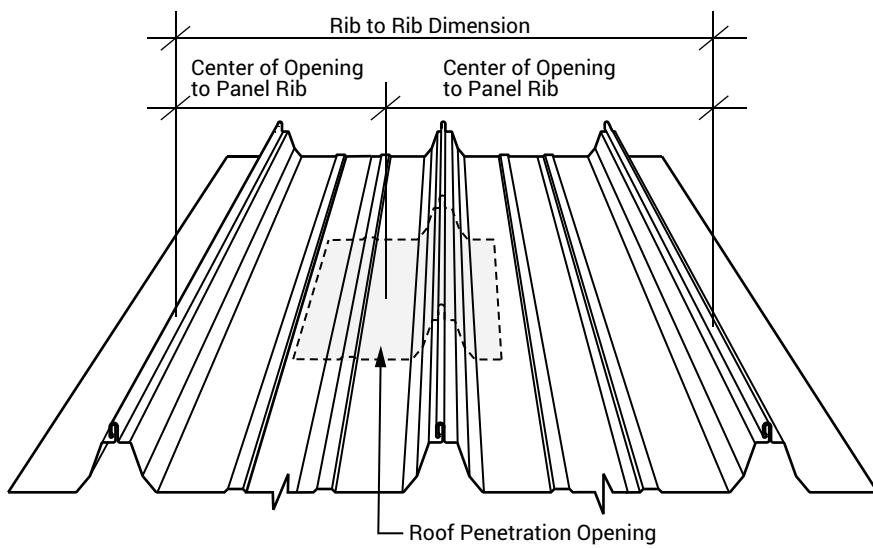
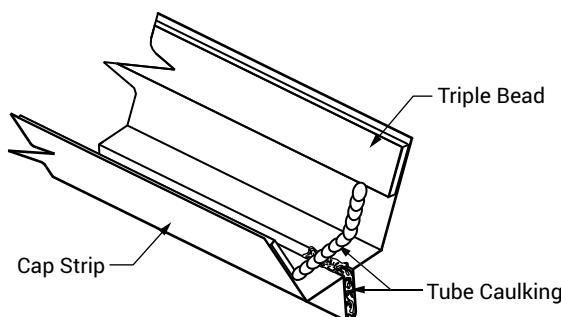
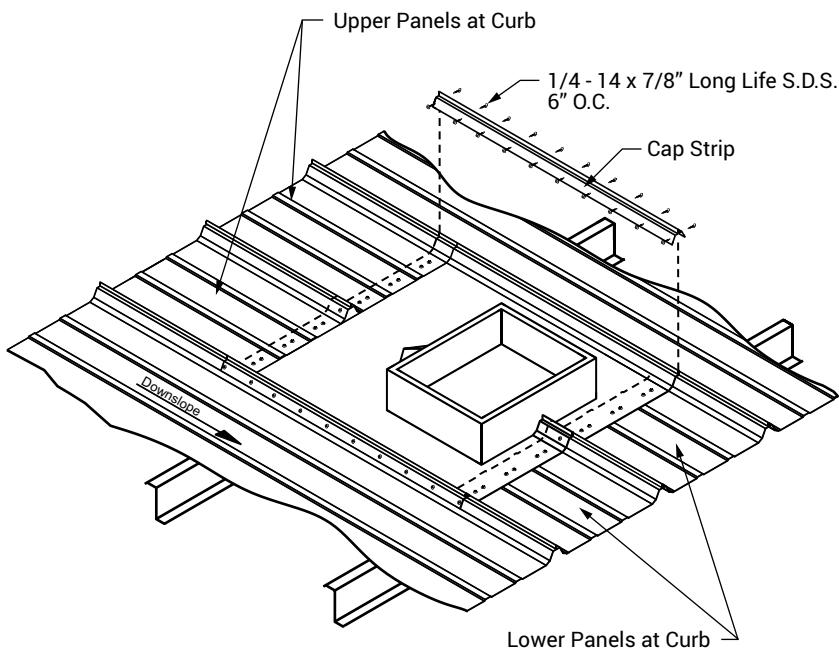
It is the user's responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal and OSHA regulations and laws, including but not limited to guarding roof openings with plywood, fixed standard railings, or other acceptable safety controls that prevent fall-through.



Install Triple Bead across the width of the up slope end of the roof curb. Use the down slope end of the inside cap cell, which is welded to the roof curb, as a guide for placement of the tape sealer.

Apply minor rib tape sealer to the underside of the minor ribs on the down slope end of the upper panels. Install the upper panels with fastener 1/4 - 14 x 1-1/4" Long Life S.D.S as a standard endlap. This will require six fasteners in the pan of the panel and one in each trapezoid for a total of eight fasteners per panel. Fasteners must go through the Triple Bead tape sealer. The down slope edge of these panels should be flush with the down slope edge of the inside cap cell. Apply tube caulking to the male leg of all panels directly over the inside cap cell. This will prevent water infiltration through the end of the panel seam.

### Installing Curb With Roof (Continued)



After all upper panels have been installed, install full length panel at side of curb. This panel will engage the male leg of the adjacent upper and lower panels. The female leg of this full length panel will overlap the leg of the roof curb.

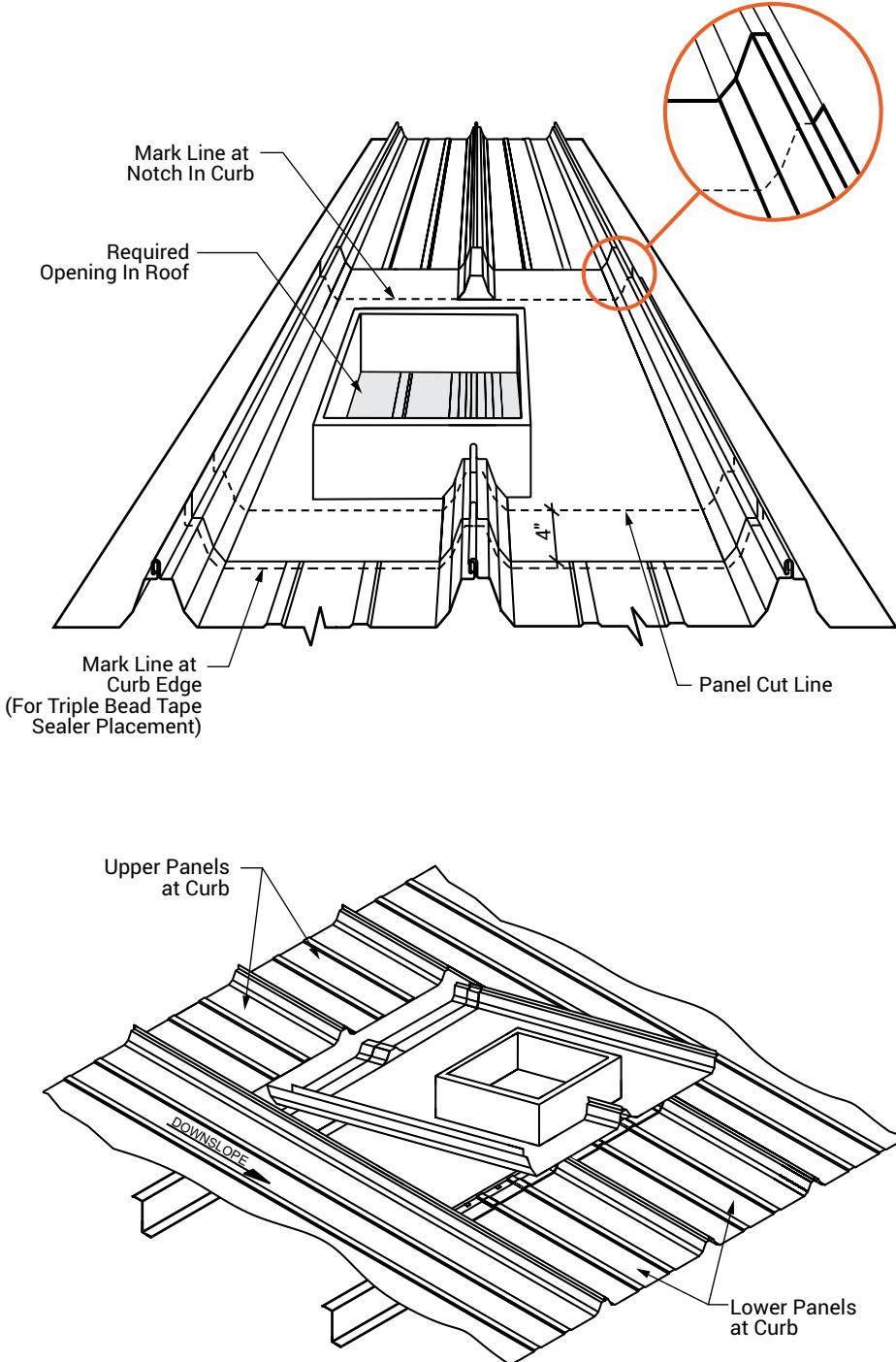
Cap strips will be installed, full length, along both sides of the curb to seal the curb to the roof panels. Turn the cap strips upside down and install Triple Bead to both sides and along the full length of the cap strip. Lower edge of tape sealer should be flush with the lower edge of the cap strip. Apply a generous bead of urethane sealant at both ends of the seam portion of the cap strip. Install each cap strip over the curb/roof panel side lap with the lower end of the cap strip even with the lower end of the curb. Force the cap strip down tightly to the curb/roof panel side lap and fasten both sides with fastener 1/4 - 14 x 7/8" Long Life S.D.S. At 6" on center.

Installing curb with after roof installation

When curbs must be installed in an exact location, the curb support framing can be installed before beginning the roof. When a curb is to be added after the roof is installed, the curb framing must be installed from below the roof after the roof panels have been cut for installation of the curb.

After roof is installed, identify the exact location for the curb. Measure from the center of the required opening to the nearest panel rib in each direction. Also, determine how many panels will be affected by the curb (minimum clearance between vertical wall of curb opening and panel rib is 6") and measure from center of rib of first panel affected to center of rib of last panel affected (if 24" panel module was not held during roof installation, this dimension will be critical). This information will be required to fabricate the curb so that it will fit the location exactly.

### Installing Curb After Roof Installation (Continued)



Once curb is ready to be installed, lay curb on roof and align opening in the curb with the exact location the opening is required in the roof. At the up slope end of the roof curb, the roof panels will be cut on a line even with the beginning of the notch at the vertical leg on each side of the roof curb. Secondly, trace a line along the down slope edge of the roof curb. The roof panels will be cut on a line 4" up slope from this line.

Cut roof panels from rib of first panel affected by curb, to rib of last panel affected, along the top and bottom cut lines previously marked.

At the down slope end of the roof opening, install back-up plates onto the ends of the cut roof panels and Triple Bead across the full width of these roof panels. The down slope edge of the tape sealer should be on the line previously traced along the down-slope edge of the roof curb. The up slope edge of the tape sealer will be approximately 1-1/2" from the end of the cut panel.

Apply Triple Bead across the full width of the up slope end of the roof curb. The down slope edge of the tape sealer will align with the down slope edge of the inside cap cells welded to the roof curb.

Install the roof curb under the roof panels at the up slope end and on top of the panels at the down slope end. This will require that you lift the roof panels up slightly at the up slope end to allow the upper flange of the roof curb to slide under the panels. Spray some soapy water on the tape sealer to prevent it from sticking to the roof panels until you have the curb completely in place.

#### WARNING

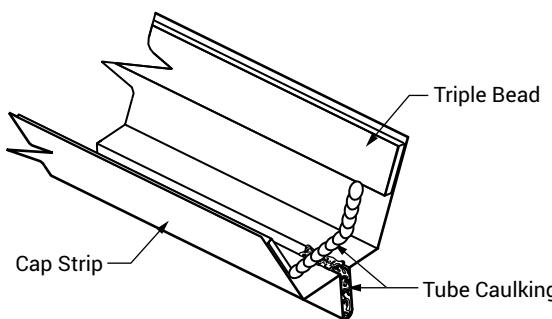
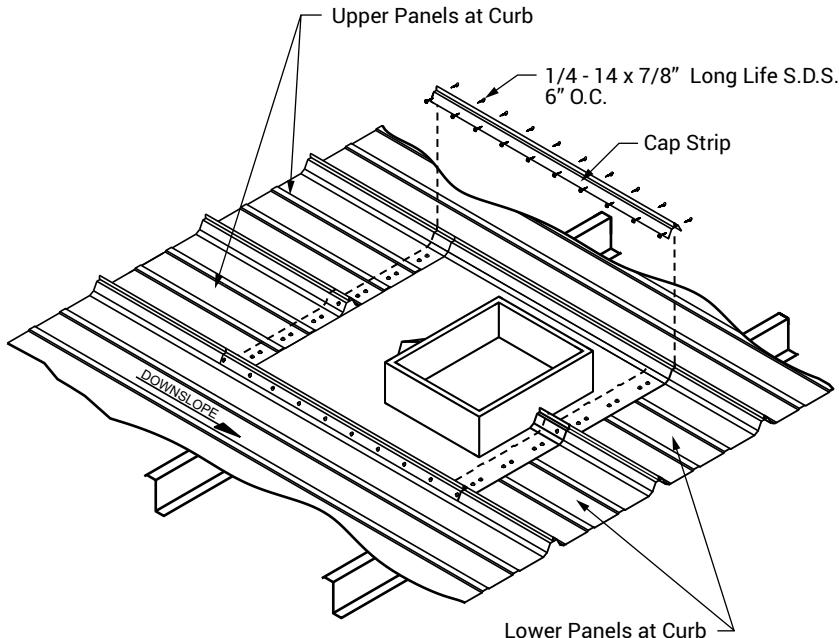
It is the user's responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal, and OSHA regulations and laws, including but not limited to guarding roof openings with plywood, fixed standard railings, or other acceptable safety controls that prevent fall-through.

### Installing Curb After Roof Installation (Continued)

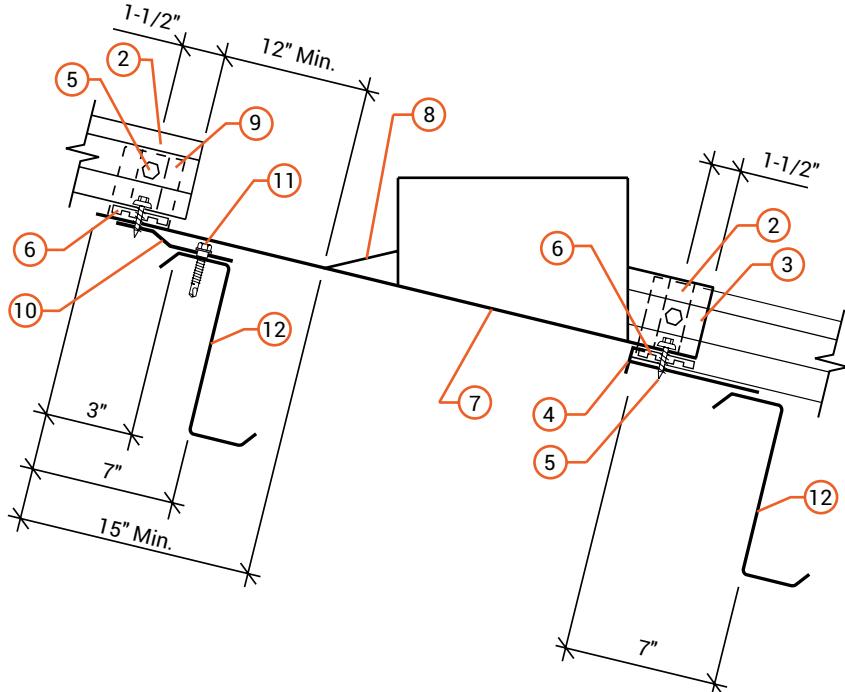
Cap strips will be installed, full length, along both sides of the curb to seal the curb to the roof panels. Turn the cap strips upside down and install Triple Bead to both sides and along the full length of the cap strip. Lower edge of tape sealer should be flush with the lower edge of the cap strip. Apply a generous bead of urethane sealant at both ends of the seam portion of the cap strip. Install each cap strip over the curb/roof panel side lap with the lower end of the cap strip even with the lower end of the curb. Force the cap strip down tightly to the curb/roof panel side lap and fasten both sides with fastener 1/4 - 14 x 7/8" Long Life S.D.S. at 6" on center.

#### WARNING

It is the user's responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal, and OSHA regulations and laws, including but not limited to guarding roof openings with plywood, fixed standard railings, or other acceptable safety controls that prevent fall-through.



### Roof Curb Cross Section



1. Super Seam Plus Panel
2. Tube Caulk
3. Outside Cap Cell
4. Back-up Plate
5. Fastener 1/4- 14 x 1-1/4" Long Life S.D.S.
6. Triple Bead
7. Roof Curb
8. Water Diverter
9. Inside Cap Cell
10. Floating Eave Plate
11. 1/4"- 14 x 1-1/4" Shoulder Tek 2
12. Purlin Framing Member or Secondary Curb Support Framing.

#### CAUTION

The above curb type and installation instructions must be used for curbs to be included in a weathertightness warranty.

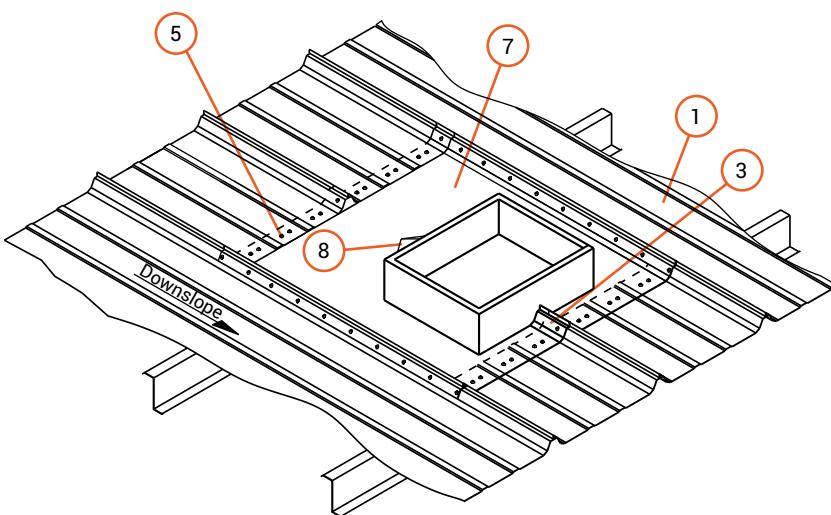
#### ATTENTION

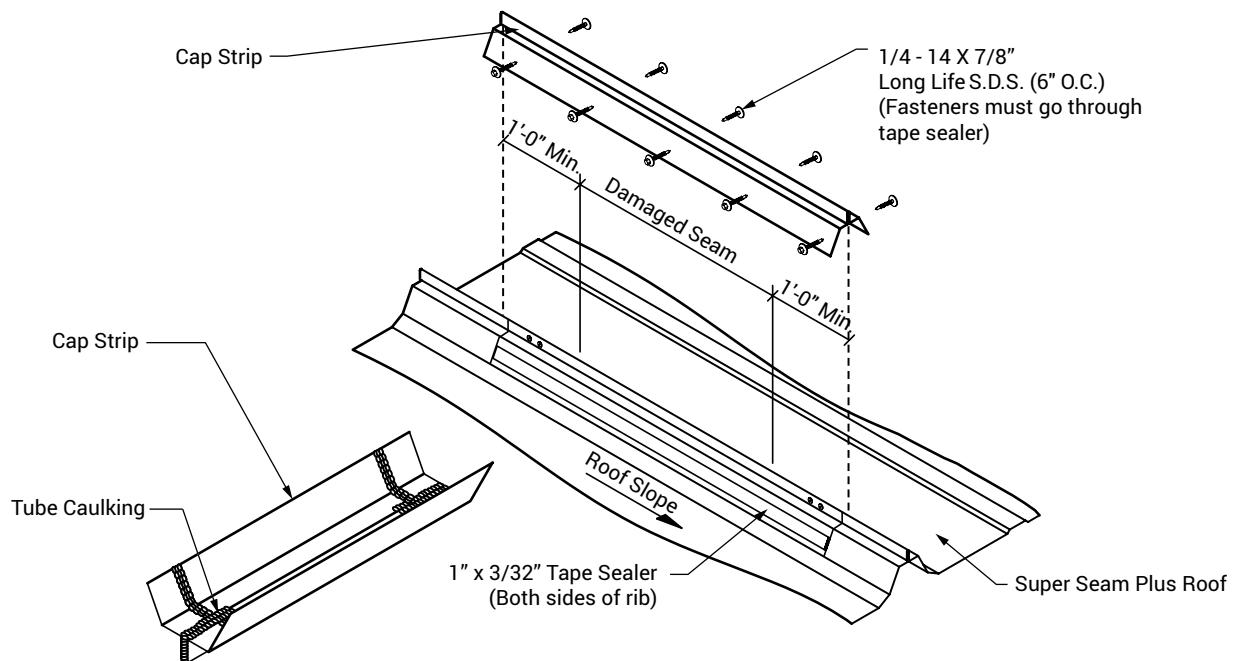
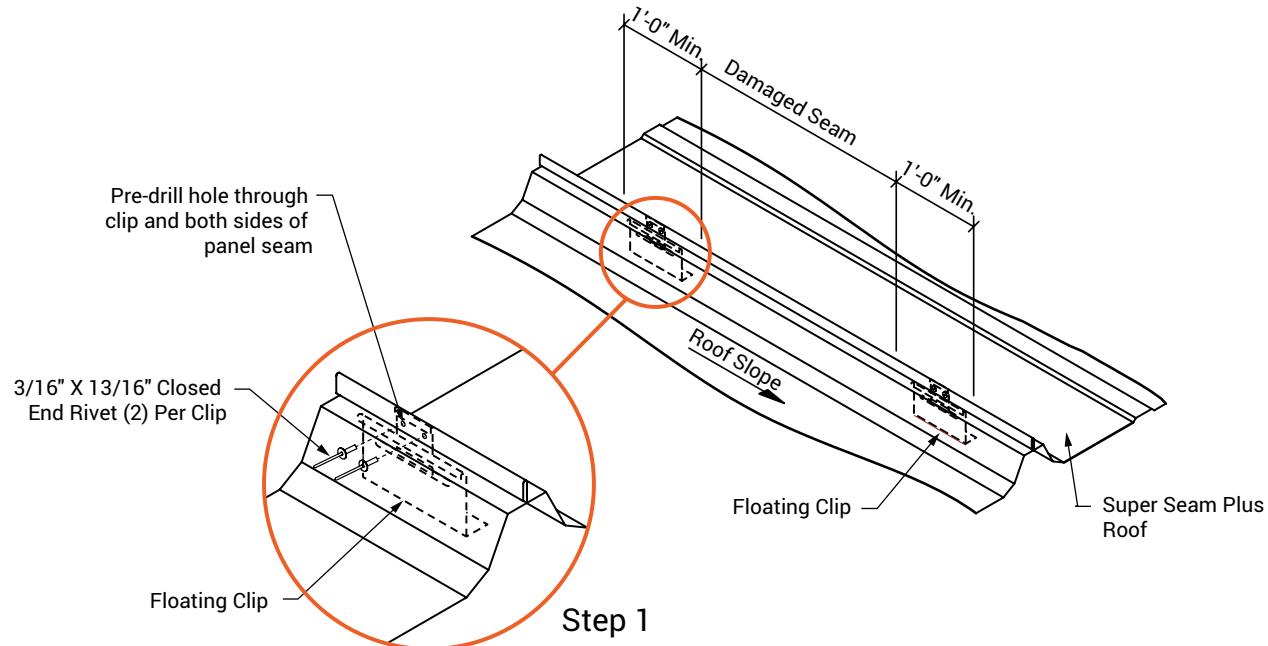
All curbs must be installed over support framing, supplied by the metal building manufacturer, or the curb supplier. Support framing must be properly located to provide "endlap" conditions at the up slope and down slope ends of the curb. Refer to Roof Curb Cross Section for critical dimensions.

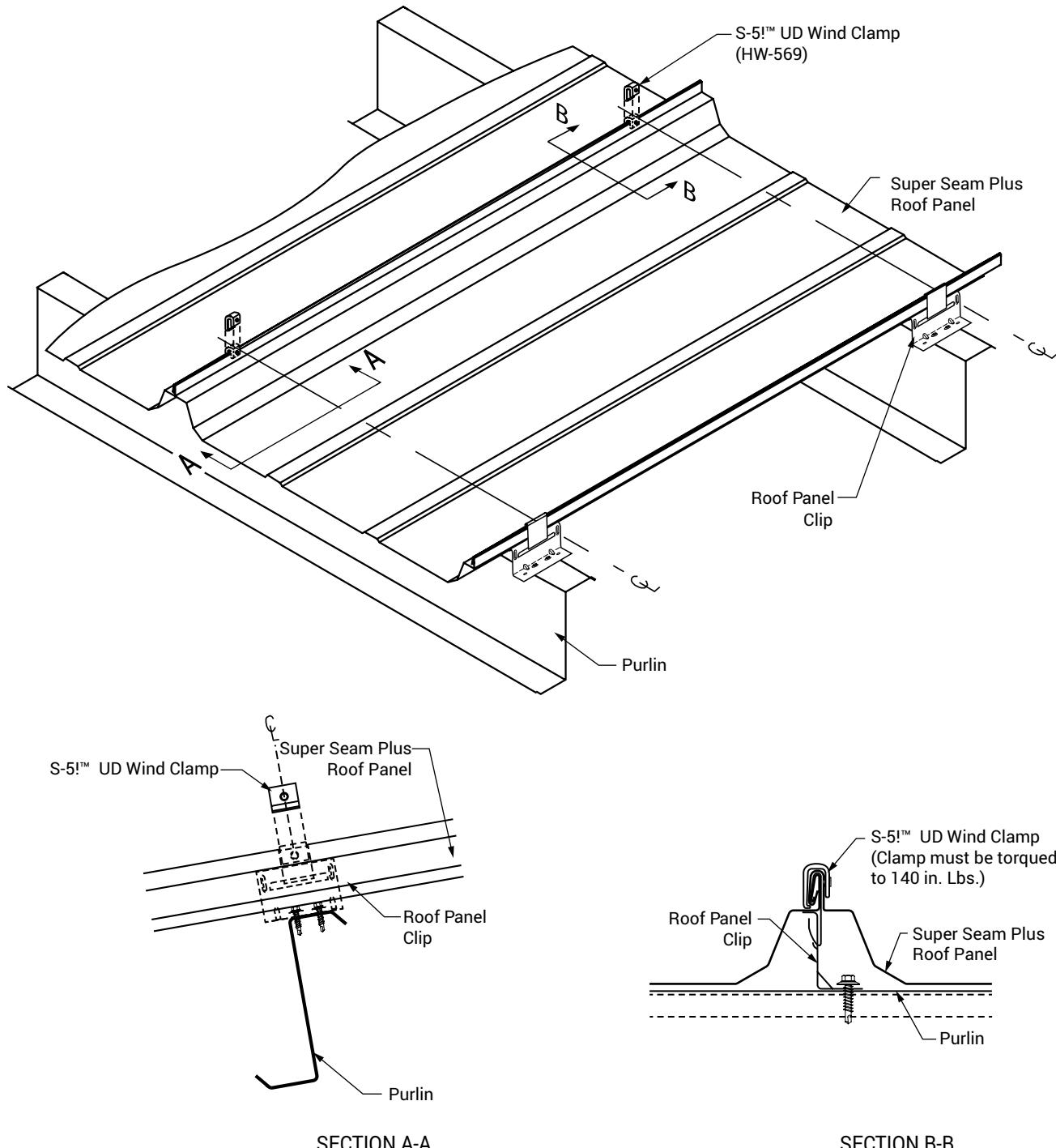
#### WARNING

It is the user's responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal, and OSHA regulations and laws, including but not limited to guarding roof openings with plywood, fixed standard railings, or other acceptable safety controls that prevent fall-through.

ROOF CURB ISOMETRIC

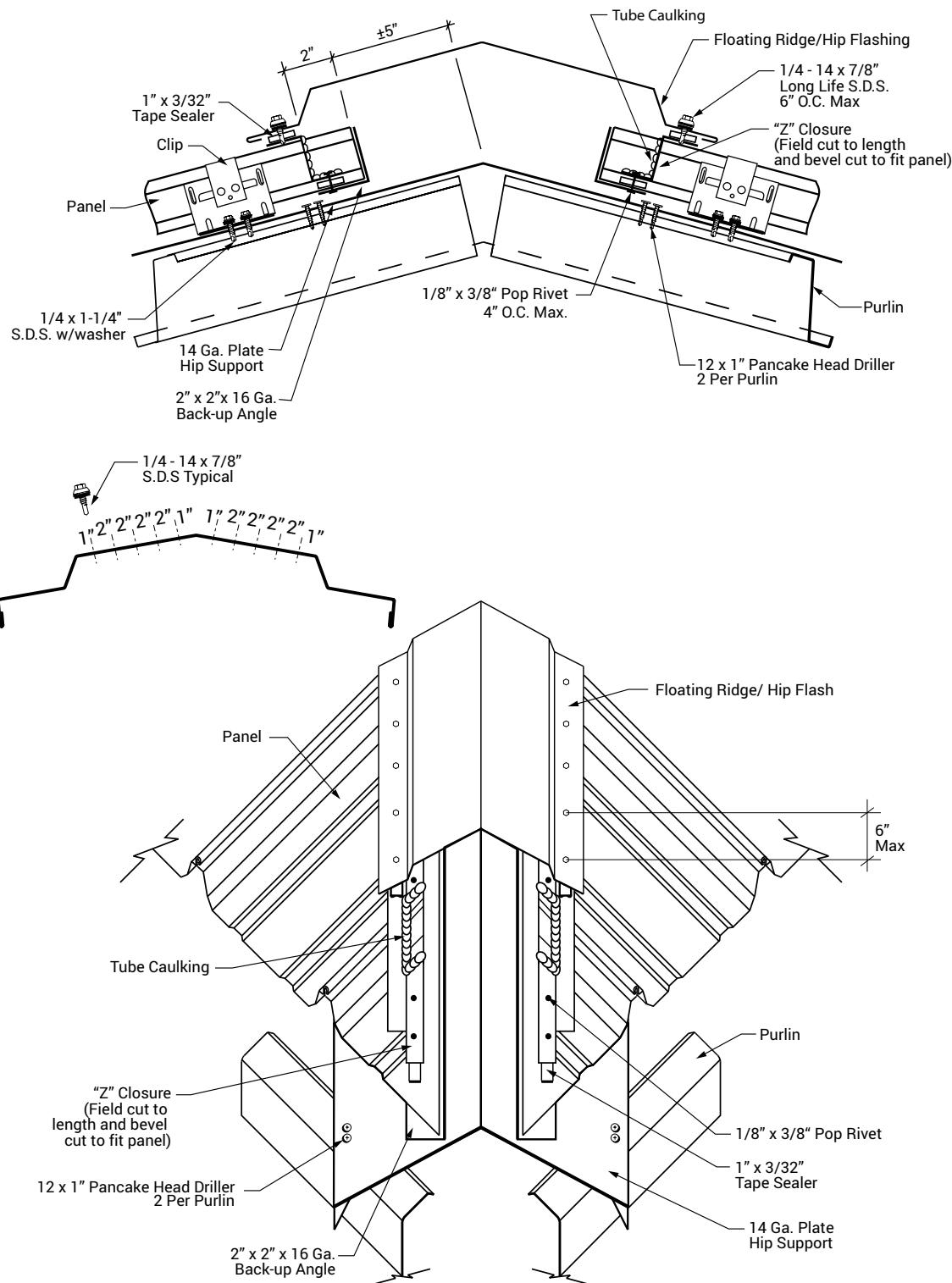


**Super Seam Repair Cap Installation**


**S-5! Super Seam Plus Wind Clamp Installation Location**

**NOTES**

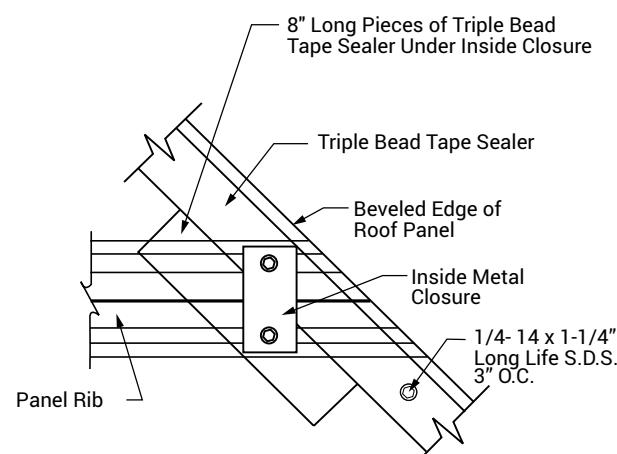
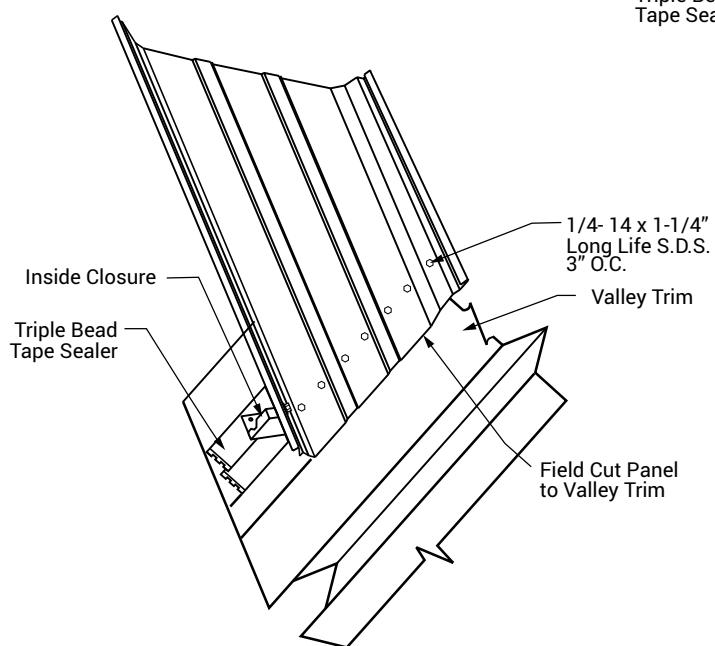
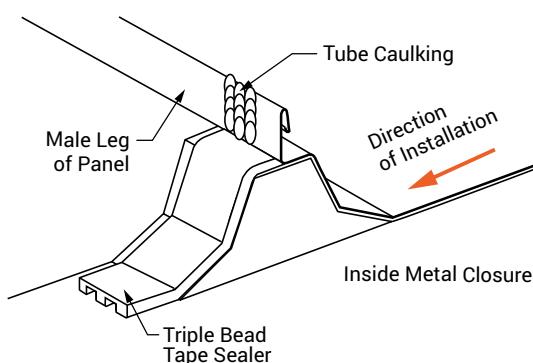
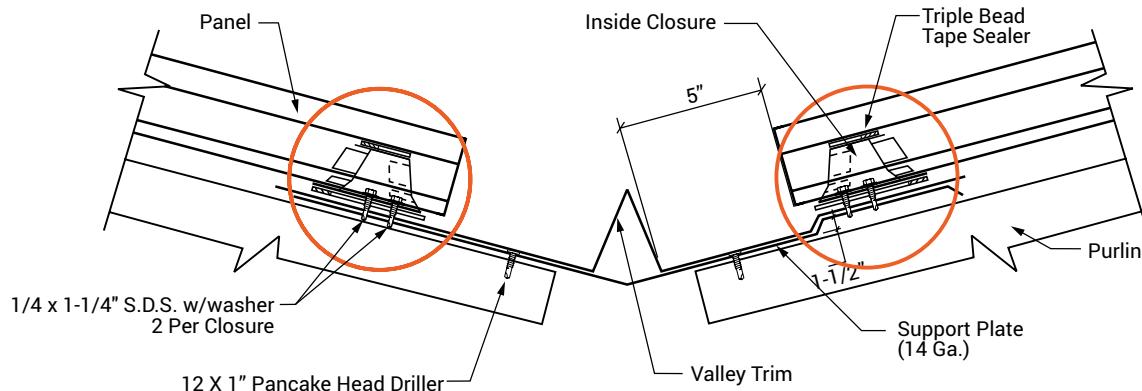
1. Torque set screw to 140 in-Lbs.
2. Application zone and feasibility of wind clamps must be determined by a Registered Professional Engineer.

## Trim Details Hip

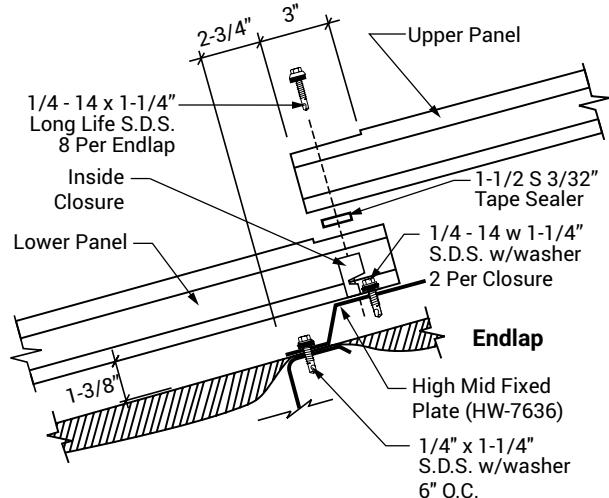
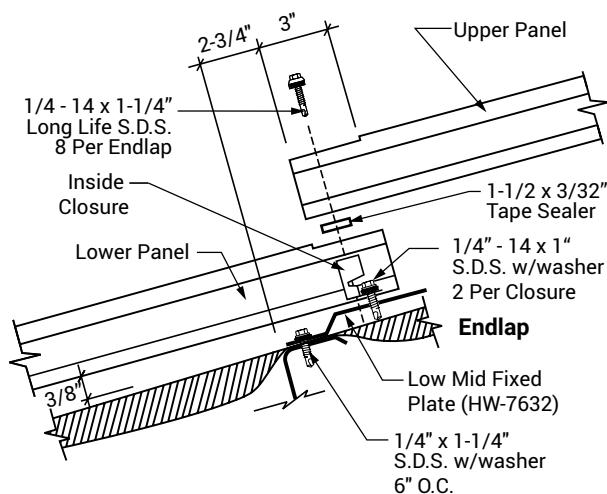


## CAUTION

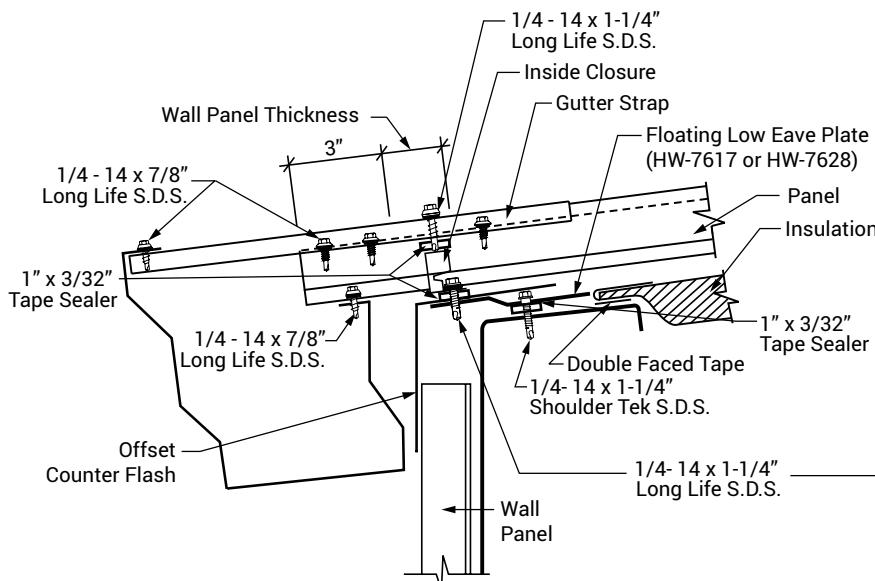
All trapezoidal panels are extremely difficult to install at hips and valleys in a weathertight manner. The use of these details should only be attempted by installation crews that are highly experienced. In order to assure weathertightness, Whirlwind recommends one of its vertical leg standing seam systems for use on roofs that require hips and valleys.

**Trim Details Valley**

**CAUTION**

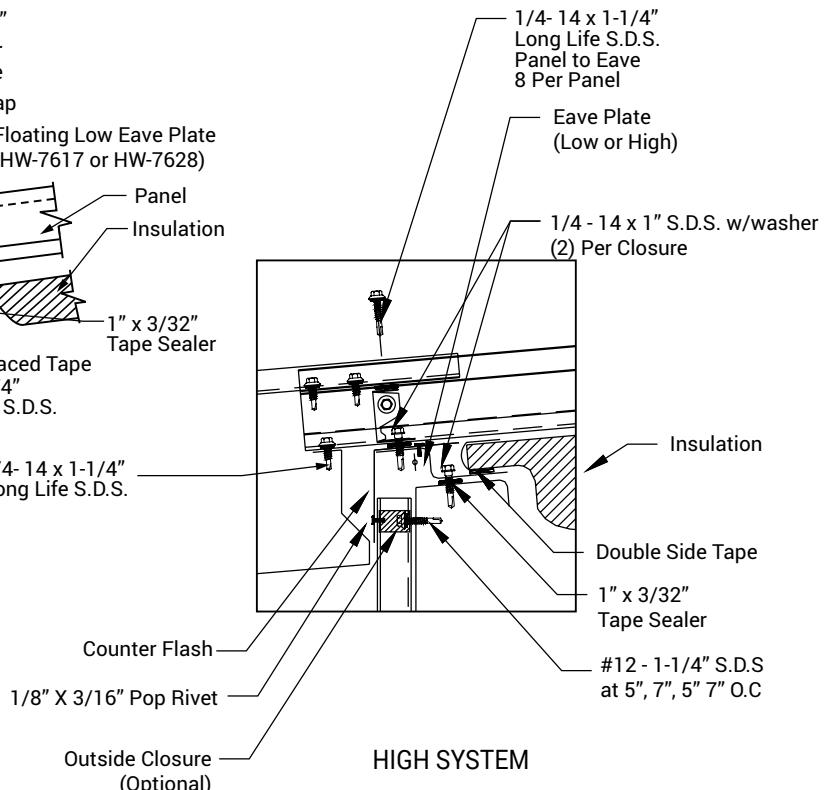
All trapezoidal panels are extremely difficult to install at hips and valleys in a weathertight manner. The use of these details should only be attempted by installation crews that are highly experienced. In order to assure weathertightness, Whirlwind recommends one of it's vertical leg standing seam systems for use on roofs that require hips and valleys.

**Mid Slope Fixed Condition**


LOW SYSTEM



HIGH SYSTEM



LOW SYSTEM

HIGH SYSTEM

**NOTES**

1. This special detail is for use when a panel run exceeds the thermal movement capabilities of the panel clip. Please refer to page SSP-5.
2. A positive panel attachment is made at the mid-point in the panel run allowing for thermal movement to the eave and ridge.
3. The standard floating ridge condition must be used in conjunction with this special eave detail.
4. The floating eave plate must be used to allow for panel movement at the eave.
5. Floating clips have a maximum movement of 1-1/4" in each direction. Thermal calculations must be performed for each project to ensure that the thermal movement of the roof will not exceed the design of the clips and slot in the floating eave plate.



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