Metal Sales™

Installation Guide
VERTICAL SEAM

metalsales.us.com

12/8/2025

Important Information

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

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

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

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

Metal Sales reserves the right to modify, without notice, any details, recommendations or suggestions. Any questions you may have regarding proper installation of Vertical Seam Panels should be directed to your Metal Sales representative, (see pages 2 and 3).

Consult Metal Sales for any additional information not outlined in this manual.
This manual is designed to be utilized as a guide when installing Vertical Seam Panels.
It is the responsibility of the erector to ensure the safe installation of this product system.

SAFETY

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

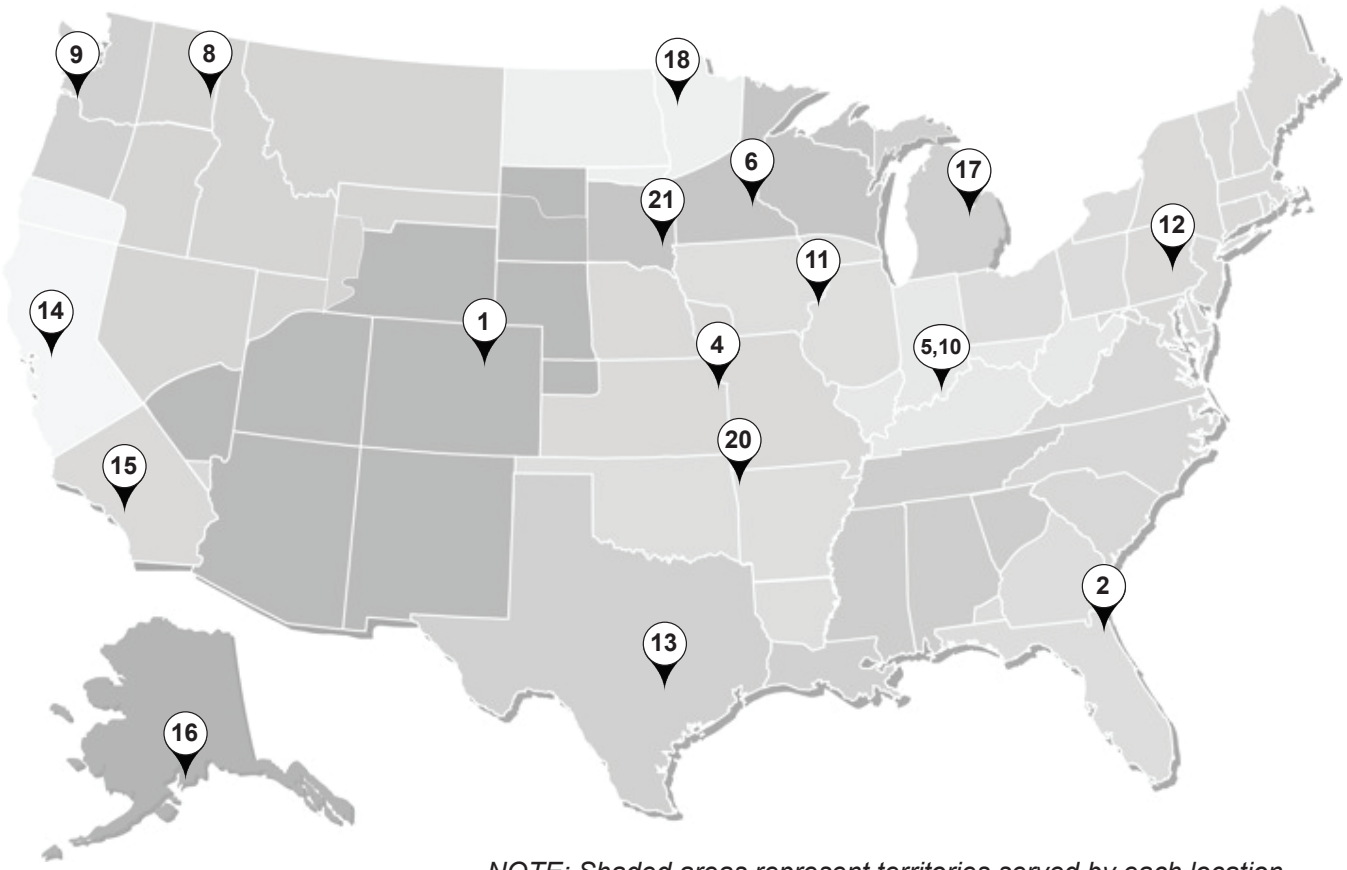
The installation of metal roof systems is a dangerous procedure and should be supervised by trained knowledgeable erectors. USE EXTREME CARE WHILE INSTALLING METAL PANELS. It is not possible for Metal Sales to be aware of all the possible job site situations that could cause an unsafe condition to exist.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

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

Provide required safety railing, netting, or safety lines for crew members.

Branch Territory Map

Metal Sales™



NOTE: Shaded areas represent territories served by each location.

VERTICAL SEAM Branch Locations

1. DENVER
7990 East I-25 Frontage Road
Longmont, CO 80504
303.702.5440
800.289.7663
800.289.1617 Fax

2. JACKSONVILLE
7110 Stuart Avenue
Jacksonville, FL 32254
904.783.3660
800.394.4419
904.783.9175 Fax
800.413.3292 Fax

4. INDEPENDENCE
1306 South Powell Road
Independence, MO 64057
816.796.0900
800.747.0012
816.796.0906 Fax

5. SELLERSBURG
7800 Highway 60
Sellersburg, IN 47172
812.246.1866
800.999.7777
812.246.0893 Fax
800.477.9318 Fax

6. ROGERS
22651 Industrial Boulevard
Rogers, MN 55374
763.428.8080
800.328.9316
763.428.8525 Fax
800.938.9119 Fax

8. SPOKANE
2727 East Trent Avenue
Spokane, WA 99202
509.536.6000
800.572.6565
509.534.4427 Fax

9. KELSO
2680 Coweeman Park Drive
Kelso, WA 98626
253.872.5750
800.431.3470
253.872.2008 Fax

10. NEW ALBANY
999 Park Place
New Albany, IN 47150
812.944.2733
812.944.1418 Fax

11. ROCK ISLAND
8111 West 29th Street
Rock Island, IL 61201
309.787.1200
800.747.1206
309.787.1833 Fax

12. DEER LAKE
29 Pinedale Industrial Road
Orwigsburg, PA 17961
570.366.2020
800.544.2577
570.366.1648 Fax
800.544.2574 Fax

13. TEMPLE
3838 North General Bruce Drive
Temple, TX 76501
254.791.6650
800.543.4415
254.791.6655 Fax
800.543.4473 Fax

14. WOODLAND
1326 Paddock Place
Woodland, CA 95776
530.668.5690
800.759.6019
530.668.0901 Fax

15. FONTANA
14213 Whittram Avenue
Fontana, CA 92335
909.829.8618
800.782.7953
909.829.9083 Fax

16. ANCHORAGE
4637 Old Seward Highway
Anchorage, AK 99503
907.646.7663
866.640.7663
907.646.7664 Fax

17. BAY CITY
5209 Mackinaw Road
Bay City, MI 48706
989.686.5879
888.777.7640
989.686.5870 Fax
888.777.0112 Fax

18. DETROIT LAKES
1435 Egret Avenue
Detroit Lakes, MN 56501
218.847.2988
888.594.1394
218.847.4835 Fax
888.594.1454 Fax

20. FORT SMITH
7510 Ball Road
Fort Smith, AR 72908
479.646.1176
877.452.3915
479.646.5204 Fax

21. SIOUX FALLS
2700 West 3rd Street, Suite 4
Sioux Falls, SD 57104
605.335.2745
888.299.0024

CORPORATE OFFICE

7800 Highway 60
Sellersburg, IN 47172
800.406.7387
800.944.6884 Fax

TECHNICAL SUPPORT

TECH SERVICES DEPT.
7800 Highway 60
Sellersburg, IN 47172
502.855.4300
800.406.7387
800.944.6884 Fax

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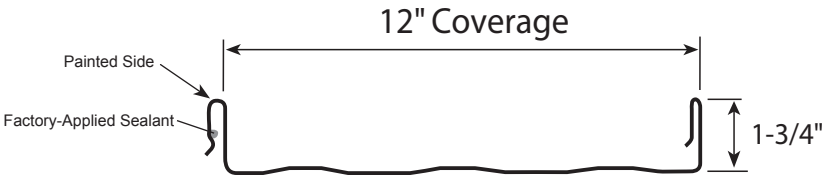
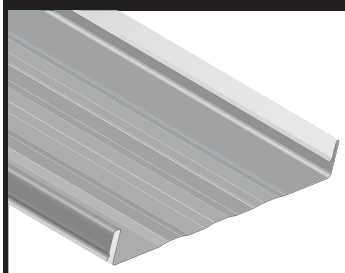
Striated — 12" Coverage



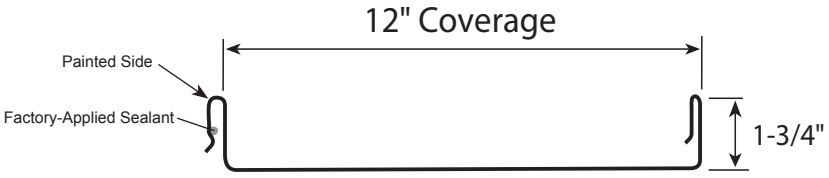
Profile



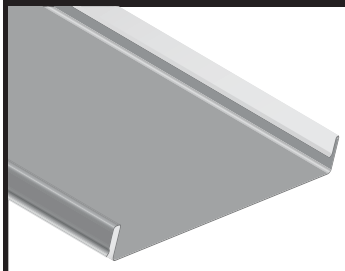
Product No.	Coverage	Gauge	Finish
2543941	12"	26	Acrylic-Coated Galvalume® (ACG)
25439XX	12"	26	MS Colorfast45 Painted
2743941	12"	24	Acrylic-Coated Galvalume® (ACG)
28439XX	12"	24	PVDF Painted
2943941	12"	22*	Acrylic-Coated Galvalume® (ACG)
30439XX	12"	22*	PVDF Painted

XX Represents color code designation. See Metal Sales color guides for color selection.
* Requires additional lead time.

Flat — 12"Coverage



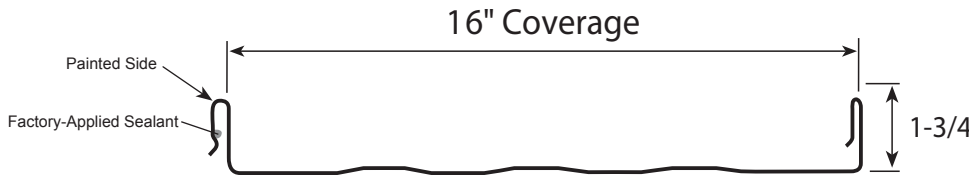
Profile



Product No.	Coverage	Gauge	Finish
2743841	12"	24	Acrylic-Coated Galvalume® (ACG)
28438XX	12"	24	PVDF Painted
2943841	12"	22*	Acrylic-Coated Galvalume® (ACG)
30438XX	12"	22*	PVDF Painted

XX Represents color code designation. See Metal Sales color guides for color selection.
* Requires additional lead time.

Striated — 16" Coverage

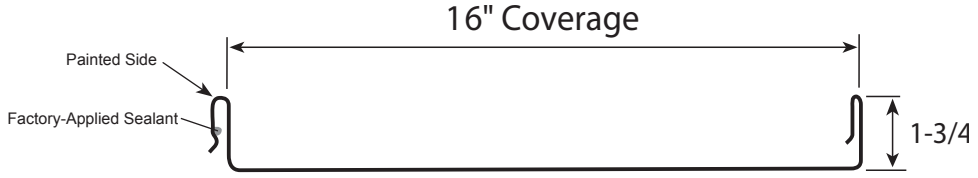


Profile

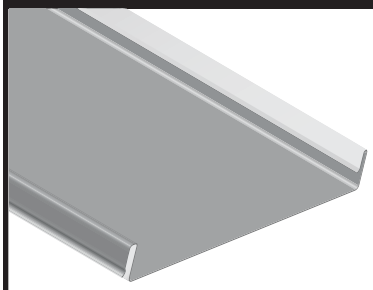
Product No.	Coverage	Gauge	Finish
2545941	16"	26	Acrylic-Coated Galvalume® (ACG)
25459XX	16"	26	MS Colorfast45 Painted
2745941	16"	24	Acrylic-Coated Galvalume® (ACG)
28459XX	16"	24	PVDF Painted
2945941	16"	22*	Acrylic-Coated Galvalume® (ACG)
30459XX	16"	22*	PVDF Painted

XX Represents color code designation. See Metal Sales color guides for color selection.
* Requires additional lead time.

Flat — 16" Coverage



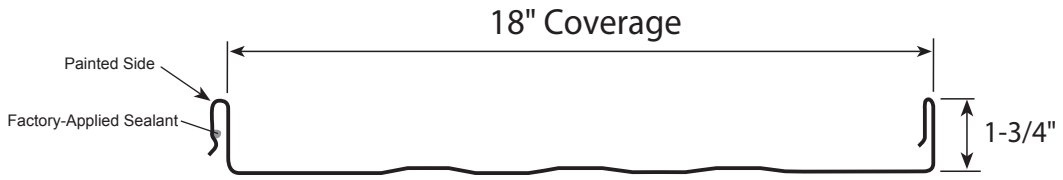
Profile



Product No.	Coverage	Gauge	Finish
2745641	16"	24	Acrylic-Coated Galvalume® (ACG)
28456XX	16"	24	PVDF Painted
2945041	16"	22*	Acrylic-Coated Galvalume® (ACG)
30450XX	16"	22*	PVDF Painted

XX Represents color code designation. See Metal Sales color guides for color selection.
* Requires additional lead time.

Striated — 18" Coverage



Profile

Product No.	Coverage	Gauge	Finish
2746241	18"	24	Acrylic-Coated Galvalume® (ACG)
28462XX	18"	24	PVDF Painted
2946241	18"	22*	Acrylic-Coated Galvalume® (ACG)
30462XX	18"	22*	PVDF Painted

XX Represents color code designation. See Metal Sales color guides for color selection.
* Requires additional lead time.

Panel Notes

PRICING

1. All square pricing is based on net coverage.
(12", 100 LF = 1 square; 16", 75 LF = 1 square; 18", 66.67 LF = 1 square)
2. For panel lengths shorter than 5'-0" a cutting charge may apply.
3. All panels will be invoiced by the lineal foot in U.S. dollars.
4. All prices F.O.B. See pages 2 and 3 for locations.
5. Flat Sheet pricing available on request.

PACKAGING

1. Panel pricing DOES NOT include packaging charges. Packaging cost will vary depending upon quantity and length of panels.
2. Special packaging is available, please inquire.

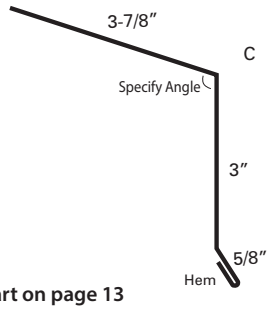
AVAILABILITY

1. 26 and 24 gauge Acrylic-Coated Galvalume® (ACG) and 26 and 24 gauge stocked colors, approximately 10 working days.
2. 26, 24 and 22 gauge non-stock colors (minimum order required), please inquire.
3. All other gauges and colors, please inquire.

NOTES

1. For panel lengths over 45'-0", please inquire. See page 3.
2. All panels have factory-applied sealant.
3. Oil canning is not a cause for rejection. Thicker gauges, narrower widths, and striations help minimize oil canning. Aflat, in plane, support surface also minimizes oil canning.
4. Finishes: a. MS Colorfast45®
   b. PVDF (meets Kynar 500/Hylar 5000 Spec)
5. Factory Rib Notching available at Denver, Deer Lake, and Woodland branches only.

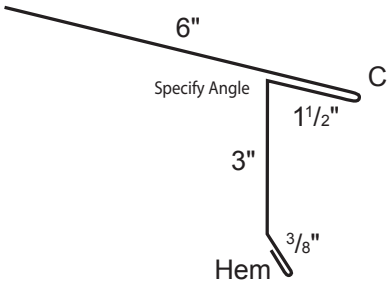
EAVE



* See chart on page 13

GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5506541	5.2 lbs	10'-2"
26	MS Colorfast45®	55065XX	5.2 lbs	10'-2"
24	ACG	5706541	6.3 lbs	10'-2"
24	PVDF	58065XX	6.3 lbs	10'-2"

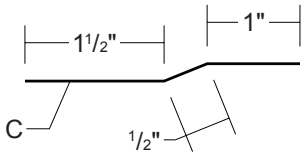
EXTENDED EAVE



* See chart on page 13

GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5507341	7.6 lbs	10'-2"
26	MS Colorfast45®	55073XX	7.6 lbs	10'-2"
24	ACG	5707341	9.5 lbs	10'-2"
24	PVDF	58073XX	9.5 lbs	10'-2"

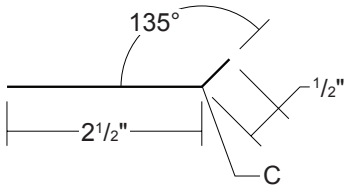
OFFSET CLEAT



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	Supplied in Various Colors	5506499	2.0 lbs	10'-2"
24	Supplied in Various Colors	5806499	2.4 lbs	10'-2"

***This flashing is hidden so color does not need to match panels.*

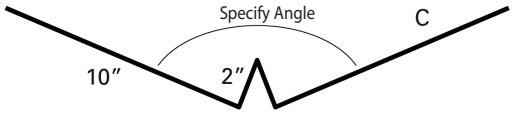
CLEAT



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	Supplied in Various Colors	5506099	2.0 lbs	10'-2"
24	Supplied in Various Colors	5806099	2.4 lbs	10'-2"

***This flashing is hidden so color does not need to match panels.*

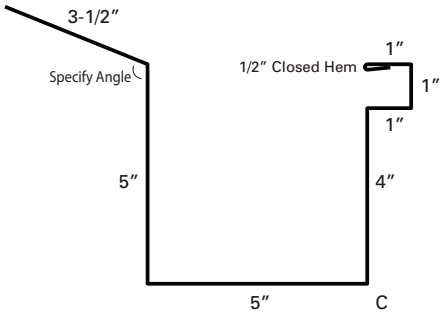
VALLEY



* See chart on page 13.

GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5301841	13.9 lbs	10'-2"
26	ACG	5502041	27.8 lbs	20'-3"
26	MS Colorfast45®	53018XX	13.9 lbs	10'-2"
26	MS Colorfast45®	55020XX	27.8 lbs	20'-3"
24	ACG	5701841	16.8 lbs	10'-2"
24	ACG	5702041	33.7 lbs	20'-3"
24	PVDF	58018XX	16.8 lbs	10'-2"
24	PVDF	58020XX	33.7 lbs	20'-3"

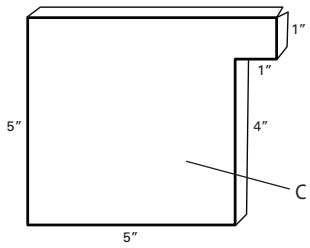
BOX GUTTER



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5507741	14.0 lbs	10'-2"
26	ACG	5507941	28.0 lbs	20'-3"
26	MS Colorfast45®	55077XX	14.0 lbs	10'-2"
26	MS Colorfast45®	55079XX	28.0 lbs	20'-3"
24	ACG	5707741	16.9 lbs	10'-2"
24	ACG	5707941	33.9 lbs	20'-3"
24	PVDF	58077XX	16.9 lbs	10'-2"
24	PVDF	58079XX	33.9 lbs	20'-3"

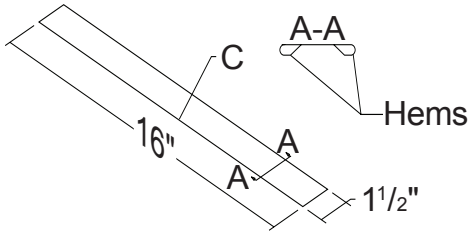
*** See chart on page 13.**

BOX GUTTER END



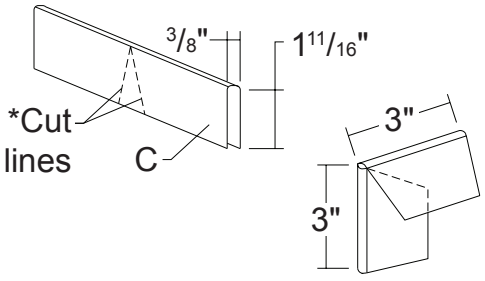
GAUGE	FINISH	PRODUCT NO.	WT
26	ACG	5508141(Left)	0.2 lbs
		5508241(Right)	
26	MS Colorfast45®	55081XX(Left)	0.2 lbs
		55082XX(Right)	
24	ACG	5708141(Left)	0.2 lbs
		5708241 (Right)	
24	PVDF	58081XX(Left)	0.2 lbs
		58082XX(Right)	

UNIVERSAL GUTTER/DS STRAP



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5509241	7.6 lbs	10'-2"
26	MS Colorfast45®	55092XX	7.6 lbs	10'-2"
24	ACG	5709241	9.5 lbs	10'-2"
24	PVDF	58092XX	9.5 lbs	10'-2"

RIB COVER

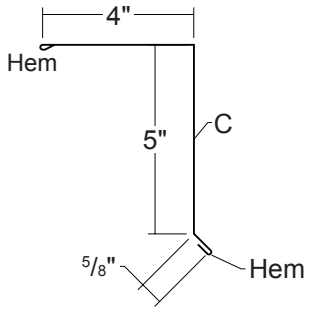


GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5570541	0.6 lbs	6"
26	MS Colorfast45®	55705XX	0.6 lbs	6"
24	ACG	5770541	0.6 lbs	6"
24	PVDF	58705XX	0.6 lbs	6"

***Field cutting and bending required.**

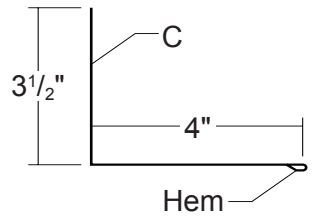
Flashing Profiles

RAKE



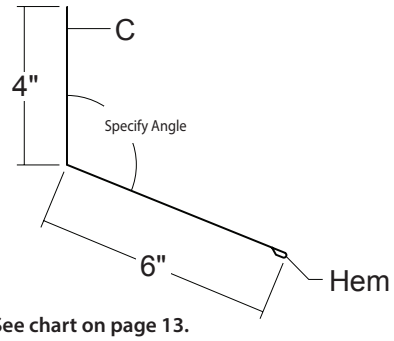
GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5503441	8.2 lbs	10'-2"
26	ACG	5503641	16.5 lbs	20'-3"
26	MS Colorfast45®	55034XX	8.2 lbs	10'-2"
26	MS Colorfast45®	55036XX	16.5 lbs	20'-3"
24	ACG	5703441	9.9 lbs	10'-2"
24	ACG	5703641	19.9 lbs	20'-3"
24	PVDF	58034XX	9.9 lbs	10'-2"
24	PVDF	58036XX	19.9 lbs	20'-3"

RAKEWALL



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5505641	6.9 lbs	10'-2"
26	MS Colorfast45®	55056XX	6.9 lbs	10'-2"
24	ACG	5705641	8.3 lbs	10'-2"
24	PVDF	58056XX	8.3 lbs	10'-2"

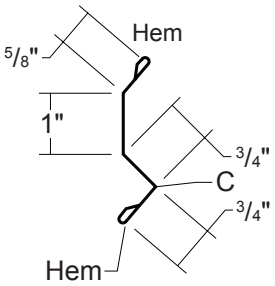
PITCH BREAK



* See chart on page 13.

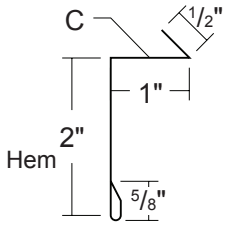
GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5504841	6.9 lbs	10'-2"
26	MS Colorfast45®	55048XX	6.9 lbs	10'-2"
24	ACG	5704841	8.3 lbs	10'-2"
24	PVDF	58048XX	8.3 lbs	10'-2"

COUNTER FLASHING



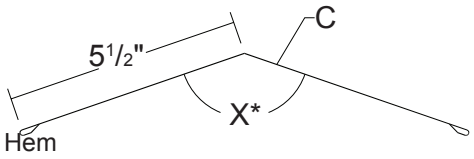
GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5505241	2.7 lbs	10'-2"
26	MS Colorfast45®	55052XX	2.7 lbs	10'-2"
24	ACG	5705241	3.3 lbs	10'-2"
24	PVDF	58052XX	3.3 lbs	10'-2"

REGLET FLASHING



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5505441	2.6 lbs	10'-2"
26	MS Colorfast45®	55054XX	2.6 lbs	10'-2"
24	ACG	5705441	3.2 lbs	10'-2"
24	PVDF	58054XX	3.2 lbs	10'-2"

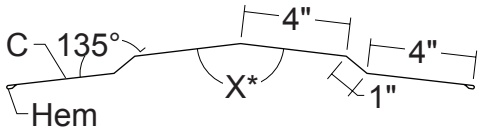
11" RIDGE/HIP COVER



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5500241	7.9 lbs	10'-2"
26	ACG	5500441	15.8 lbs	20'-3"
26	MS Colorfast45®	55002XX	7.9 lbs	10'-2"
26	MS Colorfast45®	55004XX	15.8 lbs	20'-3"
24	ACG	5700241	19.0 lbs	10'-2"
24	ACG	5700441	9.5 lbs	20'-3"
24	PVDF	58002XX	19.0 lbs	10'-2"
24	PVDF	58004XX	19.9 lbs	20'-3"

* See chart on page 13.

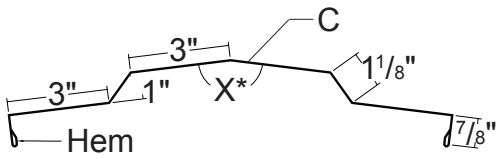
SSR RIDGE



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
24	ACG	5775141	15.2 lbs	10'-2"
24	ACG	5775341	30.4 lbs	20'-3"
24	PVDF	58751XX	15.2 lbs	10'-2"
24	PVDF	58753XX	30.4 lbs	20'-3"

* See chart on page 13.

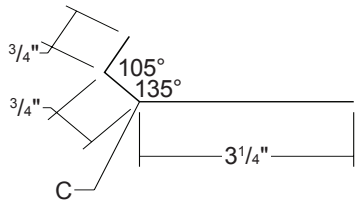
VENTED RIDGE COVER



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5501341	11.0 lbs	10'-2"
26	ACG	5501541	22.1 lbs	20'-3"
26	MS Colorfast45®	55013XX	11.0 lbs	10'-2"
26	MS Colorfast45®	55015XX	22.1 lbs	20'-3"
24	ACG	5701341	13.4 lbs	10'-2"
24	ACG	5701541	26.8 lbs	20'-3"
24	PVDF	58013XX	13.4 lbs	10'-2"
24	PVDF	58015XX	26.8 lbs	20'-3"

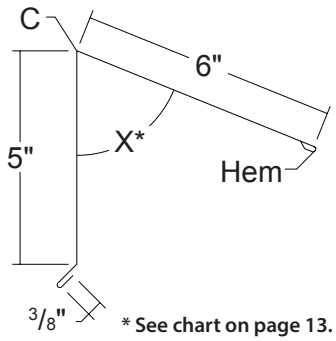
* See chart on page 13.

VENT DRIP



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5501741	2.7 lbs	10'-2"
26	MS Colorfast45®	55017XX	2.7 lbs	10'-2"
24	ACG	5701741	8.3 lbs	10'-2"
24	PVDF	58017XX	8.3 lbs	10'-2"

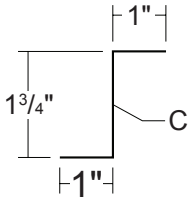
PEAK



* See chart on page 13.

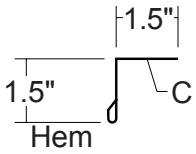
GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5502241	8.2 lbs	10'-2"
26	ACG	5502441	16.5 lbs	20'-3"
26	MS Colorfast45®	55022XX	8.2 lbs	10'-2"
26	MS Colorfast45®	55024XX	16.5 lbs	20'-3"
24	ACG	5702241	9.9 lbs	10'-2"
24	ACG	5702441	19.9 lbs	20'-3"
24	PVDF	58022XX	9.9 lbs	10'-2"
24	PVDF	58024XX	19.9 lbs	20'-3"

1-3/4" Z-CLOSURE



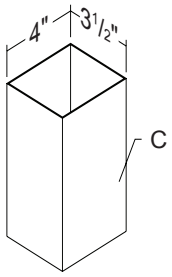
GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5570241	3.0 lbs	10'-2"
26	MS Colorfast45®	55702XX	3.0 lbs	10'-2"
24	ACG	5770241	4.1 lbs	10'-2"
24	PVDF	58702XX	4.1 lbs	10'-2"

SSR RAKE CLEAT



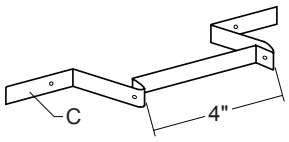
GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
24	ACG	5776741	2.0 lbs	10'-2"
24	PVDF	58767XX	2.0 lbs	10'-2"

3-1/2" X 4" DOWNSPOUT



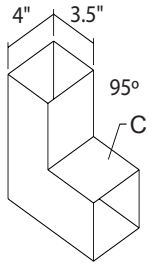
GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5509441	10.4 lbs	10'-2"
26	ACG	5509741	20.8 lbs	20'-3"
26	MS Colorfast45®	55094XX	10.4 lbs	10'-2"
26	MS Colorfast45®	55097XX	20.8 lbs	20'-3"
24	ACG	5709441	12.9 lbs	10'-2"
24	ACG	5709741	25.8 lbs	20'-3"
24	PVDF	58094XX	12.9 lbs	10'-2"
24	PVDF	58097XX	25.8 lbs	20'-3"

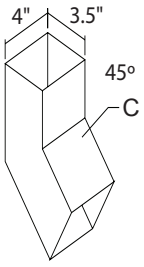
4" DOWNSPOUT BRACKET



GAUGE	FINISH	PRODUCT NO.	WT
26	ACG	5511041	0.1 lbs
26	MS Colorfast45®	55110XX	0.1 lbs
24	ACG	5711041	0.1 lbs
24	PVDF	58110XX	0.1 lbs

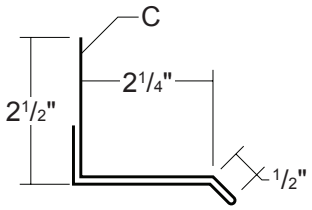
DOWNSPOUT ELBOWS





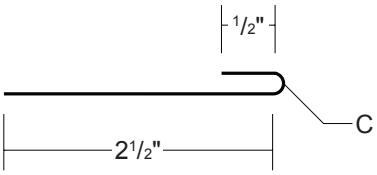
GAUGE	FINISH	PRODUCT NO.	WT	ANGLE
24	ACG	5710241	2.30 lbs	95°
24	PVDF	58102XX	2.30 lbs	95°
24	ACG	5710641	2.30 lbs	45°
24	PVDF	58106XX	2.30 lbs	45°

2.25" SILL/HEAD



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5511641	5.9 lbs	10'-2"
26	MS Colorfast45®	55116XX	5.9 lbs	10'-2"
24	ACG	5711641	7.1 lbs	10'-2"
24	PVDF	58116XX	7.1 lbs	10'-2"

STARTER



GAUGE	FINISH	PRODUCT NO.	WT	LENGTH
26	ACG	5506241	2.0 lbs	10'-2"
26	MS Colorfast45®	55062XX	2.0 lbs	10'-2"
24	ACG	5706241	2.4 lbs	10'-2"
24	PVDF	58062XX	2.4 lbs	10'-2"

Flashing Angle Chart

PROFILE/FLASHING	1/4":12	1/2":12	1:12	2:12	3:12	4:12	5:12	6:12	7:12	8:12
RIDGE SSR RIDGE VENTED RIDGE COVER	178°	175°	170°	161°	152°	143°	*135°	*127°	*119°	*113°
HIP VALLEY	178°	177°	173°	167°	160°	154°	148°	143°	138°	134°
EAVE EXTENDED EAVE	91°	92°	95°	99°	104°	108°	113°	117°	120°	124°
PEAK	89°	88°	85°	81°	76°	72°	*67°	*63°	*60°	*56°
PITCH BREAK HIGH SIDE PITCH BREAK	91°	92°	95°	99°	104°	108°	*113°	*117°	*120°	*124°
GUTTER DRIP BOX GUTTER	91°	92°	95°	99°	104°	108°	*113°	*117°	*120°	*124°

*** Standard trim dimensions may not fit properly when installed on steep angle roofs.**

VERTICAL SEAM CLIP

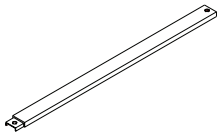
SIZE	FINISH	PRODUCT NO.	QTY/CARTON	WT/CARTON
1-3/4"	Galvanized	4923565	250 Pieces	37.5 lbs
1-3/4"	Stainless Steel*	4923570	250 Pieces	37.5 lbs

*** Special order part, not stocked.**

FLOATING RAKE ANGLE

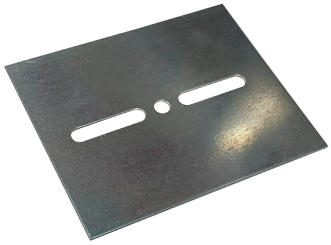
SIZE	FINISH	PRODUCT NO.	GAUGE	TYPE	WEIGHT
1-3/4"	Galvanized	4923805	16	Utility 10'-0"	7.4 lbs

BACK-UP CHANNEL



SIZE	FINISH	PRODUCT NO.	LENGTH	WEIGHT
3" x 3/8" x 16 Ga.	Galvanized	4923640	48"	2.0 lbs
3" x 3/8" x 16 Ga.	Galvanized	4923645	72"	4.0 lbs

FLAT BEARING PLATE



SIZE	FINISH	PRODUCT NO.	WEIGHT
4" x 5" x 20 Ga.	Galvanized	4923886	30.0 lbs

RUBBER ROOF JACK

TYPE	SIZE	BASE DIAMETER	PRODUCT NO.	WEIGHT
Rubber	#1 Flasher	1/4" - 2"	68501XX	3.0 lbs
Rubber	#2 Flasher	1 3/4" - 3 1/4"	68502XX	3.0 lbs
Rubber	#3 Flasher	1/4" - 5"	68503XX	3.0 lbs
Rubber	#4 Flasher	3" - 6 1/4"	68504XX	3.0 lbs
Rubber	#5 Flasher	4 1/4" - 7 1/2"	68505XX	5.0 lbs
Rubber	#6 Flasher	5" - 9"	68506XX	9.0 lbs
Rubber	#7 Flasher	6" - 11"	68507XX	11.0 lbs
Rubber	#8 Flasher	7" - 13"	68508XX	13.0 lbs
Rubber	#9 Flasher	10" - 19"	68509XX	13.0 lbs

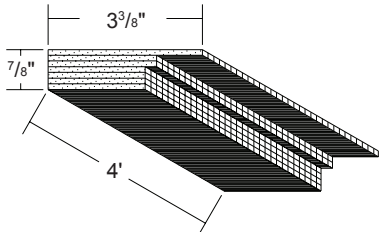
TUBE SEALANT

SIZE	COLOR	PRODUCT NO.	QTY/BOX	WT/BOX
10.3 oz Geocell 4600	Urethane White	6402830	30	19.3 lbs
10.3 oz Geocell 4600	Urethane Bronze	6402999	30	19.3 lbs
10.3 oz Geocell 4600	Urethane Gray	6402829	30	19.3 lbs
10.3 oz Geocell 4600	Acrylic Clear	6402800	30	19.3 lbs

DOUBLE BEAD TAPE SEALANT

SIZE	TYPE	PRODUCT NO.	QTY/BOX	WT/BOX
7/8" x 3/16" x 25'	Butyl	6403899	20 rolls	40.0 lbs
7/8" x 3/16" x 40"	Butyl	6403999	10 rolls	44.0 lbs

VENT MATERIAL



SIZE	TYPE	PRODUCT NO.	QTY/CARTON	WT/CARTON
3-3/8" x 7/8" x 4'	Black	6852406	24 Pieces	30.0 lbs

V-600T by Cor-A-Vent
For use on roof with a 3:12 or greater slope.

PROFILE VENT

PANEL WIDTH	LENGTH	PRODUCT NO.	TYPE
16"	2 Rolls 50'	6462118	Notched
18"	2 Rolls 50'	6462119	Notched

PROFILE VENT CLIP

HEIGHT	PROFILE	PRODUCT NO.	FINISH
1-3/4"	Vertical Seam	6541000	Black

TOUCH-UP PAINT

SIZE	APPLICATION	PRODUCT NO.	WEIGHT
Pint	MS Colorfast45	66004XX	1.6 lbs
Pint	PVDF	66010XX	1.6 lbs
2oz Bottle	PVDF	66005XX	0.1 lbs

TOUCH-UP PEN

SIZE	APPLICATION	PRODUCT NO.	WEIGHT
Pen	CF45/PVDF	66006XX	0.05 lbs

HEMMING TOOL

SIZE	TYPE	PRODUCT NO.	QTY	WEIGHT
20" wide	Zinc Plated	6560102	1	4.0 lbs

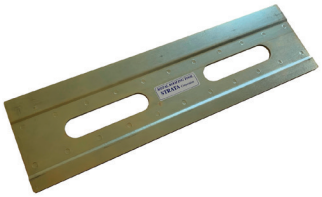
Used for bending lower end of the metal panel to engage Offset Cleat or Extended Eave flashings for concealed-fastened applications.

TURBO SHEARS

SIZE	TYPE	PRODUCT NO.	QTY	WEIGHT
Fits Standard Drills	Metal Cutting	6534599	1	2.3 lbs

- Turns your power drill into a heavy duty power shear
- Inserts into the chuck of a 14.4 volt or larger A/C or cordless drill
- Capacity to cut up to 18 gauge galvanized steel
- Navigates tight patterns and square cuts

DUAL BAR HEMMING TOOL



SIZE	TYPE	PRODUCT NO.	QTY	WEIGHT
20" wide	Zinc Plated	6531299	1	4.0 lbs

Used for bending lower end of the metal panel to engage Offset Cleat or Extended Eave flashings for concealed-fastened applications.

MS-HT HI-TEMP PEEL AND STICK UNDERLAYMENT

SIZE	TYPE	PRODUCT NO.	WT/CTN	COVERAGE
36" x 66.67'	Peel and Stick	4121200	44.0 lbs	2 Squares/Roll

POP RIVET

Product No.	Description	WT/250	Finish
8240901	1/8" x 3/16" Stainless Steel	0.75 lbs	Bare
82409XX	1/8" x 3/16" Stainless Steel	0.75 lbs	Painted
82402XX	1/8" x 3/8" Stainless Steel	0.75 lbs	Painted

PANCAKE HEAD WOOD SCREW

Product No.	Description	WT/250	Finish
8243100	#10-12 x 1" PH Wood Screw	1.90 lbs	Plated
8243500	#10-12 x 2" PH Wood Screw	3.70 lbs	Plated

PANCAKE HEAD DRILLER

Product No.	Description	WT/250	Finish
8242100	#10-16 x 1" Driller	1.90 lbs	Plated

WOOD SCREW XL

Product No.	Description	WT/250	Finish
8212300	#10-14 x 1 1/2" Wood Screw XL	3.75 lbs	Plated
82123XX	#10-14 x 1 1/2" Wood Screw XL	3.75 lbs	Painted

SELF DRILLER XL

SIZE	TYPE	FINISH	PRODUCT NO.	WT/250
#12-14 x 1"	Driller	XL	8235200	5.7 lbs
#12-14 x 1 1/4"	Driller	XL	8235300	6.0 lbs
#12-14 x 1 1/2"	Driller	XL	8235400	6.5 lbs
#12-14 x 2"	Driller	XL	8235500	7.0 lbs
1/4"-14 x 1 1/4"	Driller	XL	8251200	7.2 lbs
#12-14 x 1 1/4"	Driller	XL(Painted)	82353XX	6.0 lbs
#12-14 x 1 1/2"	Driller	XL(Painted)	82354XX	6.5 lbs
#12-14 x 2"	Driller	XL(Painted)	82355XX	7.0 lbs
1/4"-14 x 1 1/4"	Driller	XL(Painted)	82512XX	7.2 lbs

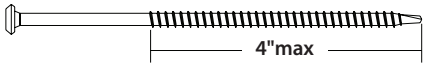
STITCH XL

SIZE	TYPE	FINISH	PRODUCT NO	WT/250
1/4"-14 x 7/8"	Stitch XL	Plated	8236800	5.25 lbs
1/4"-14 x 7/8"	Stitch XL	Painted	82368XX	5.25 lbs

SHOULDER SELF DRILLER

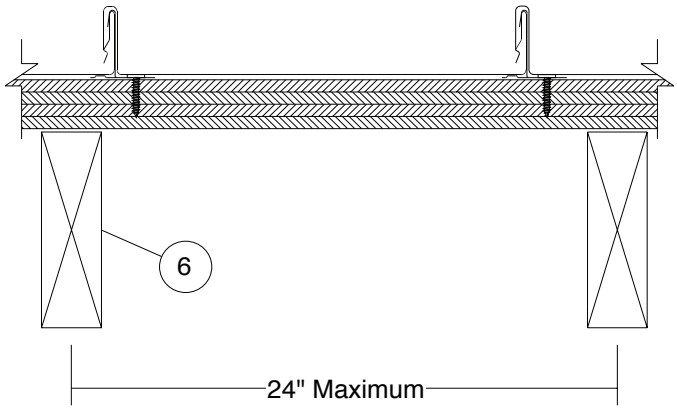
SIZE	TYPE	FINISH	PRODUCT NO.	WT/250
1/4"-14 x 1 1/4"	Driller	Plated	8281300	3.7 lbs

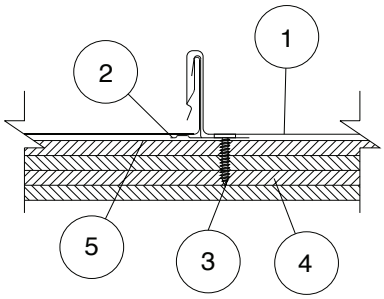
DECK SCREW



SIZE	TYPE	FINISH	PRODUCT NO.	WT/1000
#14-13 x 2"	Driller	Black	8242506	28.0 lbs
#14-13 x 4"	Driller	Black	8241706	84.0 lbs
#14-13 x 5"	Driller	Black	8241806	102.0 lbs
#14-13 x 6"	Driller	Black	8241906	120.0 lbs
#14-13 x 8"	Driller	Black	8242206	140.0 lbs

UL 580 Uplift Information





VERTICAL SEAM

Construction No. 436
February 27, 2001
Uplift - Class 90
Fire Not Investigated

1. Metal Roof Deck Panels* No. 24 MSG min coated steel. Max panel width 18 in., rib height 1-3/4 in. Panels continuous over two or more spans. Endlap for panels to be overlapped 6 in. A bead of sealant may be used at panel ends and side joints.
METAL SALES MFG CORP - “Vertical Seam”

2. Roof Deck Fasteners* - (Panel Clips) One piece assembly, 3-1/2 in. wide by 1-7/8 in high. Clip spacing to be 48 in. OC.
METAL SALES MFG CORP - “Vertical Seam Clip”

3. Fasteners - (Screws) Screws used to attach the panel clips to Substructure (Item 4) to be No. 10 by 1 in long Pancake head wood screws with a No. 2 Phillips head or 10x1 in., 1/4 in. Hex Head Woodgrip. Two screws per clip. Screws used to attach Substructure (Item 4) to wood trusses or joists (Item 6) to be No. 8 by 2 in. Bugle head screws. As an optional fastener, 2-1/2 in. long 8d common deformed shank nails may be used. Fasteners used at endlaps to be 14x1 in. Type AB or 10x1 in. woodgrip.

When light gauge structural steel joists are used, screws to be No. 12 by 1-5/8 in. long with a Phillips head. Spacing of screws to be 6 in. OC at plywood or OSB ends and 12 in. OC at interior joists.

4. Substructure (Plywood or OSB) Plywood decking or oriented strand board (OSB) to be a nom 5/8 in. thick, exposure sheathing span C-D, 40/20 plywood. (All butt joints to be sealed against leakage by using tape and/or caulking). In lieu of plywood, 1 in. tongue and groove decking may be used.

5. Moisture Barrier - (Optional) Any suitable membrane to protect Substructure (Item 4).

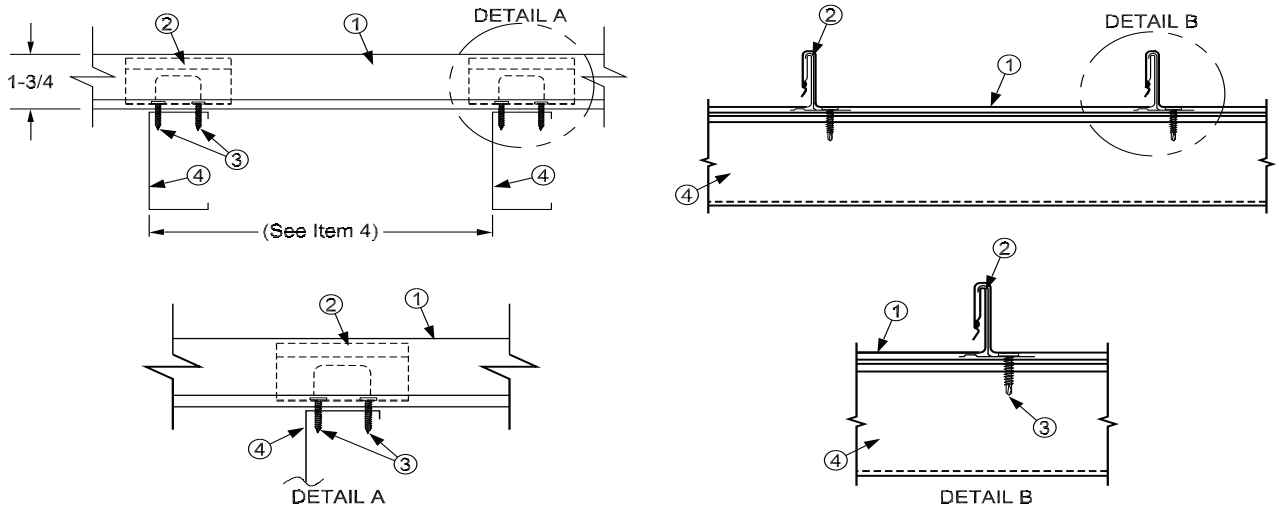
6. Joists Joists, spaced at 2 ft, 0 in. OC max (when tongue and groove decking is used, joist spacing may be 30 in. OC max), may be one of the following:
A. Nom 2 by 6 in. wood joists, No. 2 or better.
B. Nom 2 by 4 in wood when used on a top chord of a wood truss, No. 2 or better.
C. Light gauge structural steel framing with the member against the plywood to be a min No. 22 MSG coated steel.

Refer to General Information, Roof Deck Constructions, for Items Not Evaluated.
*Bearing the UL Classification Mark

Underwriters Laboratories Inc. ®

LISTED

UL 580 Uplift Information



VERTICAL SEAM

Construction No. 446
December 12, 2003
Uplift - Class 90
Fire Not Investigated

1. Metal Roof Deck Panels* - No. 24 MSG min coated steel. Max panel width 18 in., rib height 1-3/4 in. Panels continuous over 2 or more spans. No endlaps. A bead of sealant may be used at the panel ends and side joints.

2. Roof Deck Fasteners* - (Panel Clips) - One piece assembly, 3-1/2 in. wide by 1-7/8 in. high. Clip spacing to be 48 in. OC.

3. Panel Fasteners - (Screws) - Screws used to attach panel clips (Item 2) to purlins to be No. 10 by 1 in. long No. 3 self-drilling point, No. 2 Phillips Pancake head. Two screws per clip.

4. Purlins – No. 16 MSG min thickness steel (min yield 50 ksi) spaced 48 in. OC.

5. Insulation – (Optional)(not shown) – 3 in. thick vinyl faced blanket insulation. To be installed between metal panels (Item 1) and purlins (Item 4).

5A. Insulation – (Optional)(not shown) – 1/4 in. thick closed/microcellular polyethylene insulation with foil facing designated “Low-E Insulation™.” To be installed between metal panels (Item 1) and purlins (Item 4).

6. Batten Clips and Cap* -

A. Batten Clips* - Slipped over ribs formed by roof deck panels. One piece assembly formed to engage ribs of panels (Item 1) and Batten Cap (Item B) spaced 48 in. OC.

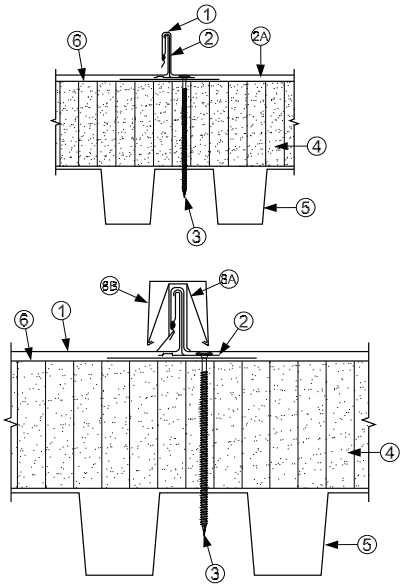
B. Batten Cap* - Slipped over batten clip (Item A), formed to snap over and engage Batten clip.

Refer to General Information, Roof Deck Constructions, for Items Not Evaluated.

Underwriters Laboratories Inc. ®

LISTED

UL 580 Uplift Information



VERTICAL SEAM

Construction No. 448
December 12, 2003
Uplift - Class 90
Fire Not Investigated

1. Metal Roof Deck Panels* - No. 24 MSG min coated steel. Max panel width 18 in., rib height 1-3/4 in. Panels continuous over three or more spans. Endlaps for panels to be overlapped 6 in. and to include back-up plate (Item 2B). A bead of sealant may be used at the panel ends and side joints.

2. Roof Deck Fasteners* - (Panel Clips) - One piece assembly, 3-1/2 in. wide by 1-7/8 in. high. Clip spacing to be 48 in. OC.

2A. Bearing Plate - (Optional) - To be used in lieu of plywood or OSB (Item 4A) with rigid insulation (Item 4). Bearing plates to be 16 MSG min coated steel. Located under each clip (Item 2) for support.

2B. Endlap Back-Up Plate - (not shown) - No. 16 MSG min coated steel, width of back-up plate to correspond to width of panel. Two 1 in. wide by 3/4 in. long tabs are used for sliding over end panels.

3. Panel Fasteners - (Screws) - Screws used to attach panel clips and bearing plates (Items 2 and 2A) through rigid insulation and into metal deck (Item 5). Screws to be No. 14 Truss head with No. 3 Phillips drive. Length to be a min of 1/2 in. longer than thickness of rigid insulation and metal deck. Two screws per clip. Fasteners used at endlaps to be one of the following: 14x1 in. Type AB self-tapper; 14x1-1/4 in. Hex washer head self-driller; 14x1 in. Type AB Phillips stainless steel self-tapper.

4. Rigid Insulation - (Optional) - Foamed plastic, max thickness 4 in. Density to be a min of 2 PCF.

4A. Plywood or OSB - (Optional)(not shown) - Min APA rated plywood, exposure sheathing span C-D 40/20, nom 1/2 in. thick, or Oriented Strand Board (OSB), nom 7/16 in. thick. 4x8 ft. Sheets to be installed on top of rigid insulation (Item 4) in lieu of bearing plates (Item 2A).

4B. Gypsum Board - (Optional) - Any 5/8 in. thick gypsum wallboard supplied in sheets 2x4 ft to 4x12 ft. Applied perpendicular to steel roof deck direction with adhesive. End joints to occur over crests of steel roof deck and be staggered 2 ft. in adjacent rows. The total cumulative thickness of the rigid board (Item 4) and the gypsum may not exceed 4 in.

5. Metal Deck - No.22 MSG min thickness coated steel. Min yield strength 33 KSI. Min depth 1-1/2 in. Max pitch 6 in.

6. Vapor Barrier - (Optional) – Installed on top of metal deck (Item 5) or on top of gypsum wallboard (Item 4B) if used. Min 6 mil plastic sheet.

6A. Bearing Plate - (Optional)(not shown) – Used to protect plywood or OSB (Item 4A). Installed under panels (Item 1).

7. Supports - (not shown) – Used to support metal deck, spaced per deck manufacturer's specifications.

8. Batten Clips and Cap* -

A. Batten Clips* - Slipped over ribs formed by roof deck panels. One piece assembly formed to engage ribs of panels (Item 1) and Batten Cap (Item B) spaced 48 in. OC.

B. Batten Cap* - Slipped over batten clip (Item A), formed to snap over and engage batten clip.

Refer to General Information, Roof Deck Constructions, for Items Not Evaluated.
*Bearing the UL Classification Mark

Underwriters Laboratories Inc. ®
LISTED

TESTING AND APPROVALS

- UL 2218 Impact Resistance - Class 4
- UL 790 Fire Resistance Rating - Class A, per building code
- UL 263 Fire Resistance Rating - per assembly
- ASTM E 283 Air Leakage - 0.035 cfm/ft^2 at 1.57 psf
- ASTM E 331 Water Penetration - none at 12 psf
- ASTM E 1680 Air Leakage - 0.0036 cfm/ft^2 at 6.24 psf
- ASTM E 1646 Water Penetration - none at 6.24 psf
- ASTM E 1592 Structural Performance
- UL 580 Uplift Resistance - Class 90 Constructions: #436, #446 and #448
- Texas Windstorm - Evaluation RC-412
- 2023 FBC Approvals - FL11560.7, FL11560.8 FL11560.9, FL14645.4 and FL14645.5
- Miami-Dade County, Florida - NOA 24-0212.04, expires 3/8/2029
- ICC Evaluation Report - ESR-2385

FASTENING INFORMATION

▶ Clips

1. Clip spacing is based upon the design loads, the spanning capacity of the panels, the fasteners and the support members.
2. Clips are 0.050" thick. G90 is standard, 304 stainless is optional. 2 fastener holes is standard, 3 holes is optional.
3. Clips can accommodate practically unlimited thermal movement.

▶ Fasteners

1. Overdriven fasteners will cause panel distortions.
2. Fasteners to wood and steel should extend 1/2" or more past the inside face of the support material.

Clip Fasteners and Concealed End Fasteners:
- Attaching to Wood:
  - #10-12 Pancake Head Wood Screw
- Attaching to Steel:
  - <18 ga: 1/4"-14 Deck Screw
  - >=18 ga, <=12 ga: #10-16 Pancake Head Driller
- Attaching to Concrete:
  - 3/16" or 1/4" TapCon, Phillips Flat Head

Exposed End Fasteners:
- Attaching to Wood:
  - #10-14 XL Wood Screw
- Attaching to Steel:
  - #12-14 XL Driller

Trim Fasteners:
- 1/4"-14 x 7/8" XL Stitch Screw
- 1/8" x 3/16" Pop Rivet

SECTION PROPERTIES

ALLOWABLE UNIFORM LOADS, psf For various clip spacings

Ga	Width in	Yield ksi	Weight psf	Top In Compression		Bottom In Compression		Inward Load						Outward Load					
				Ixx in^4/ft	Sxx in^3/ft	Ixx in^4/ft	Sxx in^3/ft	1.5'	2'	2.5'	3'	3.5'	4'	1.5'	2'	2.5'	3'	3.5'	4'
26	12	50	1.06	0.0783	0.0532	0.0370	0.0405	337	193	124	87	64	49	72	65	57	50	43	36
26	16	50	0.97	0.0617	0.0403	0.0278	0.0304	111	78	57	44	-	-	72	65	57	50	43	36
24	12	50	1.38	0.1120	0.0777	0.0525	0.0554	464	265	171	119	88	67	45	45	44	43	42	41
24	16	50	1.26	0.0885	0.0590	0.0398	0.0416	348	199	128	89	66	50	43	40	38	35	32	30
24	18	50	1.22	0.0807	0.0527	0.0353	0.0369	309	177	114	79	58	45	39	36	33	30	27	24
22	12	50	1.81	0.1534	0.1072	0.0763	0.0768	600	437	282	197	145	111	71	71	69	67	65	62
22	16	50	1.66	0.1230	0.0823	0.0578	0.0577	484	276	178	124	91	70	60	57	54	51	48	45
22	18	50	1.60	0.1113	0.0737	0.0513	0.0513	430	245	158	110	81	62	32	32	31	30	30	29

1. Theoretical section properties have been calculated per AISI 2016 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable loads are calculated in accordance with AISI 2016 specifications considering bending, shear, combined bending & shear, deflection and ASTM E 1592 uplift testing for 24 ga and 22 ga and UL 580 uplift testing for 26 ga. Allowable loads do not address web crippling, fasteners or support material. Allowable loads consider the three or more equal spans condition. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.

\- Indicates that no testing is available for the application.

RECEIVING MATERIAL

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

Metal Sales is not responsible for any damages or shortages unless they are documented in writing and presented to Metal Sales within 48 hours. A claim should be made against the carrier as soon as possible.

After receiving material:

- Check the condition of the material
- Review the shipment against the shipping list to ensure all materials are all accounted for
- If damages or shortages are discovered, it should be noted on the Bill of Lading at the time of delivery

GENERAL HANDLING

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

CAUTION

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

MECHANICAL HANDLING

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

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

Material Handling (cont.)

UNSTACKING MATERIAL

For panels over 5′-0″ in length at least two people on the ends of the panel are required. Additional help will be needed for every 10′-0″ in length beyond that.

Panels will arrive stacked vertically in a crate. If panels are moved out of the crate for staging, take care when unstacking to ensure panels are lifted up and not across other panels in the stack. Minimize handling of panels when unstacking and stacking to avoid damage. Be sure to wear appropriate safety equipment including clean gloves, as panel edges are sharp.

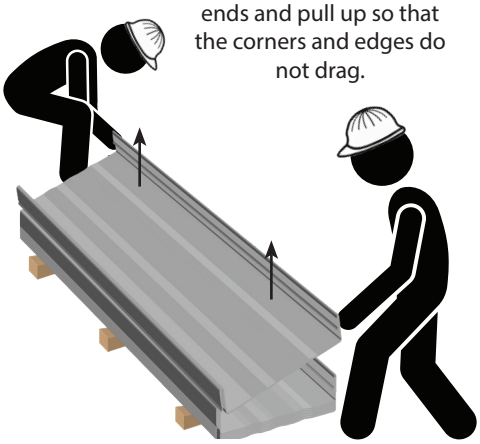
Inspect panels before lifting. Metal Sales is not responsible for damage created by unstacking panels incorrectly. Dragging or sliding the panels will cause the corners and edges to scratch the paint.

Defect claims must be reported upon inspection and *before* panels are handled or installed.

Restacking – Align bottom-side edge with the stack and lay panel onto the stack.

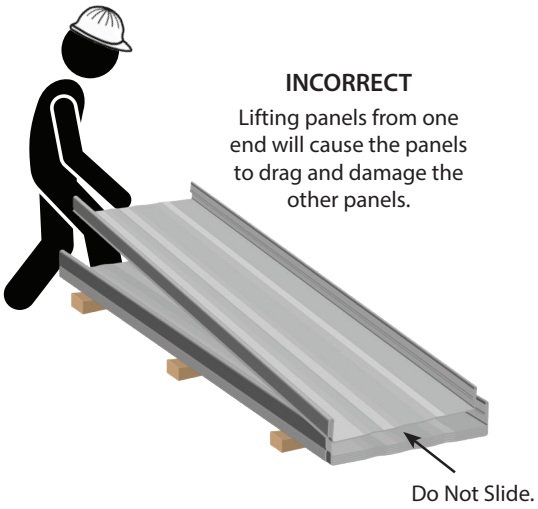
CORRECT

Lift the panels from the ends and pull up so that the corners and edges do not drag.



INCORRECT

Lifting panels from one end will cause the panels to drag and damage the other panels.

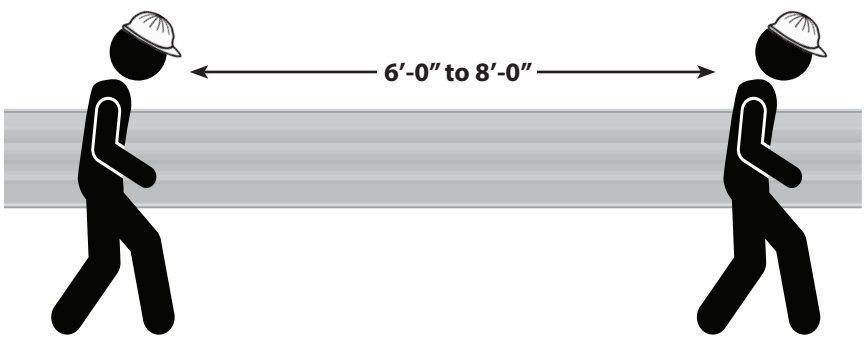


TRANSPORTING MATERIAL

Handling of individual panels should be done carefully and properly to avoid bending or damaging. Panels should be carried by grasping the edge so that the panel is vertical to the ground.

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

The panel should not be carried horizontal to the ground as this could cause the panel to buckle or bend in the center.



GENERAL

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

Bundled sheets should be stored high enough off of the ground to allow for air circulation and prevent contact with accumulating water. Elevate one end of the bundle to allow any moisture to run off the panels. Metal Sales recommends covering the bundle with a tarp. Do not use tight fitting plastic-type tarps as panel bundle covers. While they may provide protection from heavy downpours, they can also retard necessary ventilation and trap heat and moisture that may accelerate metal corrosion. If panels are to be stored in possible bad weather, we suggest they be stored inside. Extended storage of panels in a bundle is not recommended.

Under no circumstances should the panels be stored near or come in contact with salt water, corrosive chemicals, ash or fumes generated or released inside the building or nearby plants, foundries, plating works, kilns, fertilizer and wet or green lumber.

RECOMMENDED TOOLS

CUTTING TOOLS
Tin Snips
Electric Metal Shears
Turbo-Shears
Circular Saw

FASTENING
Nut Drivers or magnetic hex drivers
Screw Gun with adjustable torque

SAFETY
Gloves
Safety Googles
Ear Protection
Safety Harness and Fall Protection

MEASURING/MARKING
Tape Measure
Speed Square
Chalk Line
Marker or Scribe

GENERAL
Hammer
Utility knife
Caulking gun
Hand seamer
Ladder and/or scaffolding
Laser Level
Panel Lifters or Suction Cups
Deburring Tool
Tool Belt

CONDITION OF SUBSTRUCTURE

Metal Sales' panels are designed to be installed over open framing and/or directly over a wood substrate with synthetic building wrap. Always check with local building codes prior to all installations for any additional requirements that may be specific to your area.

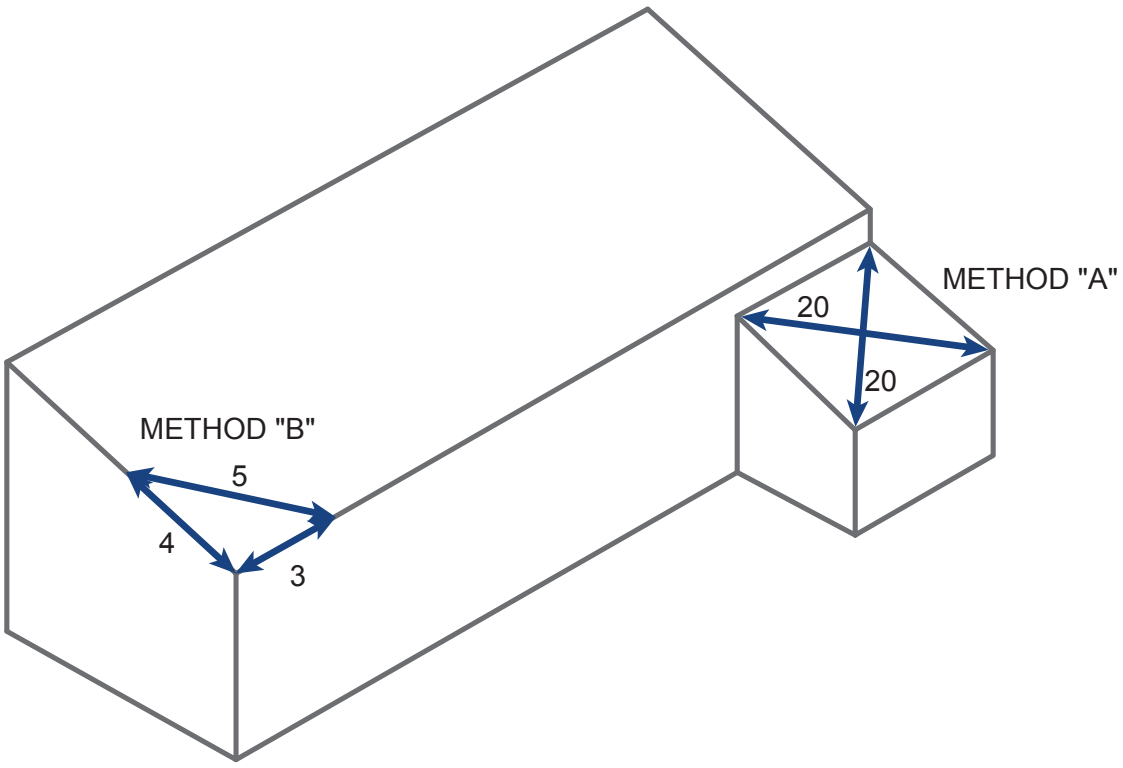
Galvalume panels should not be in contact with, or subject to, water runoff from copper, lead or uncoated steel materials. NOTE: Condensate water from air conditioning units typically contains dissolved copper. This condensate should be discharged through a plastic pipe extended beyond the edge of the roof.

The roof should be inspected for any trapped moisture or structural damage such as bowing or sagging members and warped or loose sheathing. Also make sure there are no nails or fasteners protruding from the wall framing or wood substrate which could damage the panels and impede the installation process. These areas must be repaired prior to installing new metal wall panels. Panel distortion may occur if not applied over properly aligned and uniform substructure.

Whether installing over new or existing roof, the installer should check the sheathing for squareness before installing panels. Several methods can be used to verify squareness of the structure for proper installation of the panels.

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

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

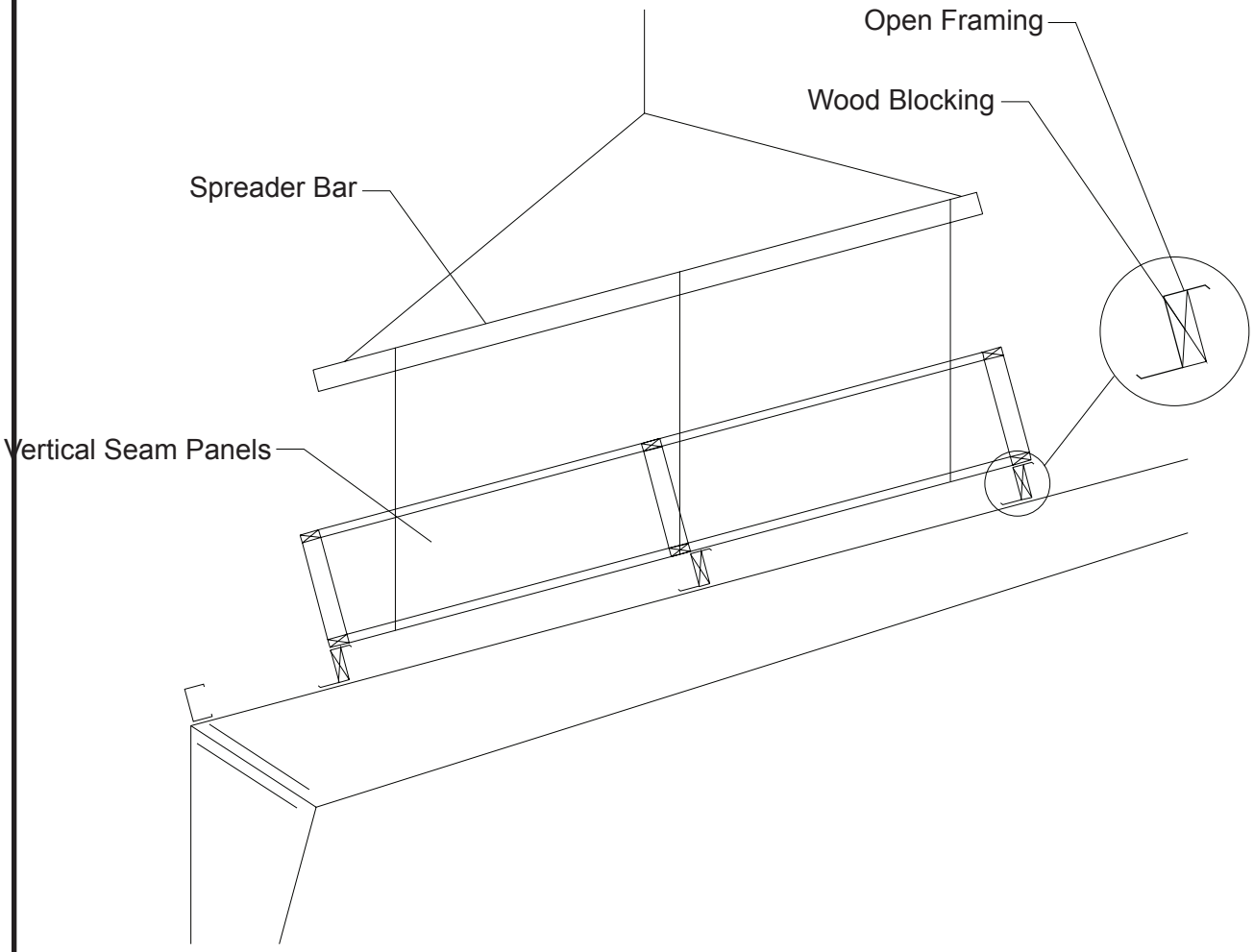


Roof Storage

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

When lifting packaged sheets, make certain they are adequately supported. Panels less than 20'-0" in length can normally be lifted with a forklift; however, when lifting panels in excess of 20'-0", it is recommended that a spreader bar and slings be used. As a rule, when lifting, no more than $^1/_3$ of the length of the panel should be left unsupported.

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



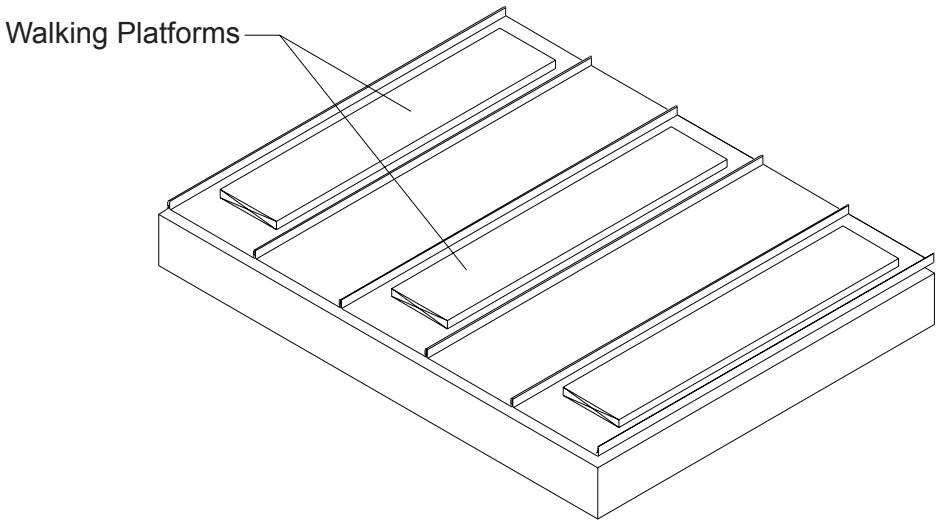
Foot Traffic

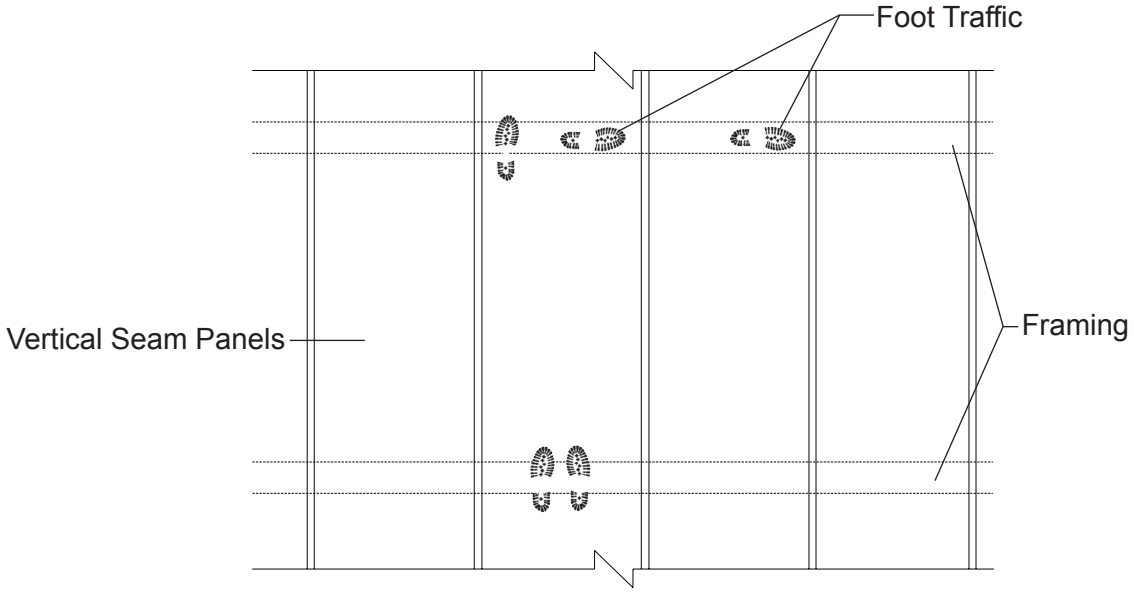
Care of metal panels and flashings must be exercised throughout erection. Foot traffic can cause distortion of panel and damage to finish. Traffic over the installed system must be kept to an absolute minimum. If continuous foot traffic is necessary for maintenance over certain areas of the roof, then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

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

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

OVER OPEN FRAMING





Field Cutting and Touch-Up

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

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

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

CAUTION

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

TOUCH-UP PAINT

All painted panels and flashings have a factory-applied, baked-on finish. Handling and installing panels may result in some small scratches or nicks to the paint finish. Touch-up paint is available in matching colors from Metal Sales. It is recommended to use as little touch-up paint ans possible, with none being the best solution. If a scratch is significant enough to need touch-up, consideration should be given to replacing the panel or trim part. Touch-up paint does not have the superior chalk and fade resistance of the factory applied paint finish and will normally discolor at an accelerated rate, becoming visually objectionalbe in a few years. If touch-up paint will be applied, use a small brush to apply touch-up paint to those areas that are in need of repair. Aerosol paint should not be used because of the overspray that may occur.

SPRAY PAINT

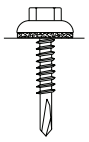
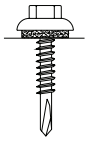
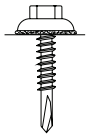
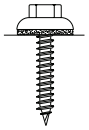
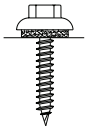
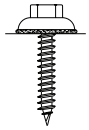
TOUCH-UP PAINT

NOTE

Touch-up Paint does not carry a warranty.
If a scratch is big enough to require touch-up paint then the panel should be replaced.

Design/Installation Considerations

Recommended Tool Type - Use depth locating nose or adjustable clutch on screw gun to prevent overdrilling and strip out.
Do not use impact tools or runners.
Seating the washer - Apply sufficient torque to seat the washer - do not overdrive the fastener.

	CORRECT Sealing material slightly visible at edge of metal washer. Assembly is watertight.	**TOO LOOSE** Sealing material is not visible; not enough compression to seal properly.	**TOO TIGHT** Metal washer deformed; sealing material pressed beyond washer edge.
SELF DRILLER			
WOODSCREW			

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

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

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

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

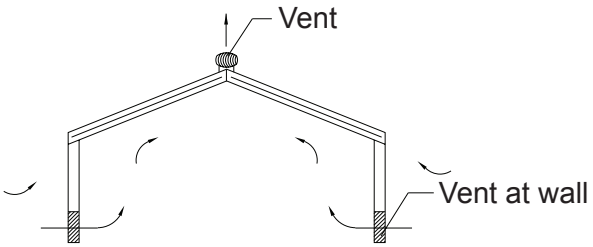
VENTILATION

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

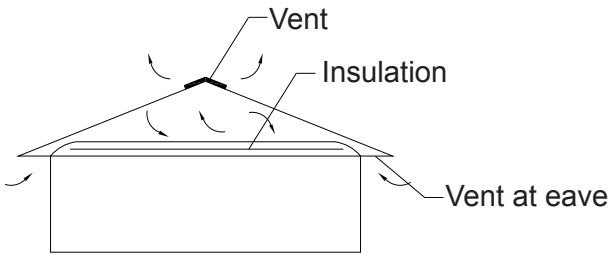
Condensation occurs when moisture laden air comes in contact with a surface temperature equal to or below the dew point of the air. This phenomenon creates problems that are not unique with metal buildings; these problems are common to all types of construction.

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

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



TYPICAL METAL BUILDING (NO ATTIC)

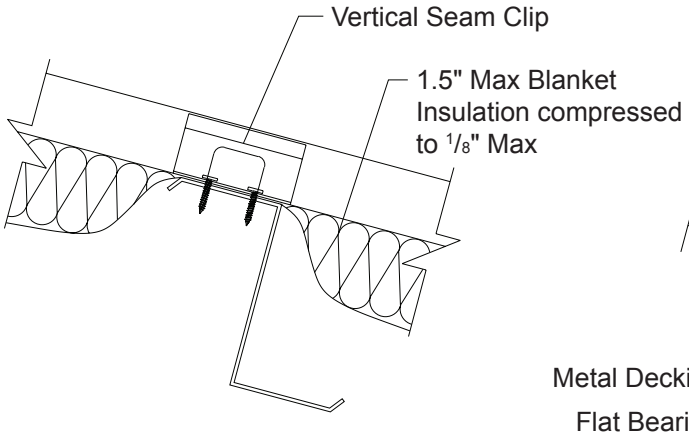


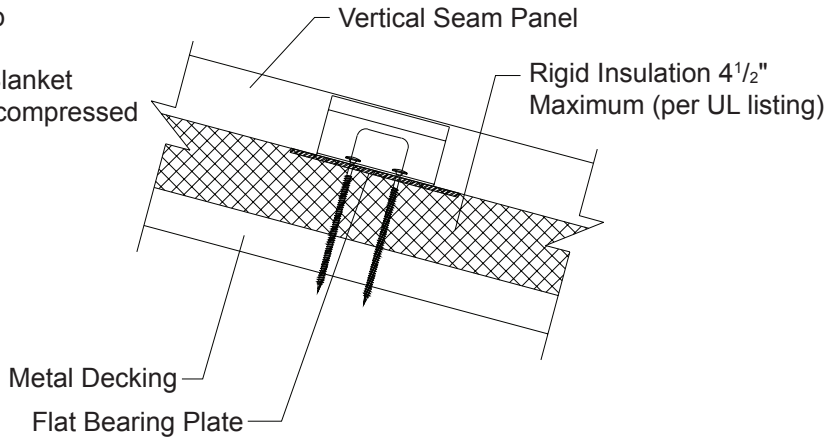
BUILDING WITH ATTIC OR RETROFITTED

INSULATION

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

Typically, panels are installed over solid decking but can be installed over open framing or metal decking (shown below) with many different types of insulation. Blanket, rigid and reflective insulation are just a few. Maximum thickness for blanket insulation is 1.5 inches. Please contact your insulation supplier for specific recommendations on type of insulation, vapor barriers and installation procedures.





CAUTION

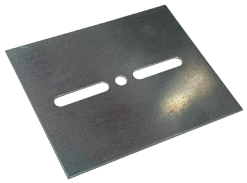
Use extreme care when working next to insulation. The insulation will provide a false sense of security by hiding the view of the ground below the insulation.

SELECTION OF SYSTEM COMPONENTS

Vertical Seam UL-90 Panel Clip - Clips are placed along the underlap rib of each panel prior to installing adjacent panels. Design wind uplift must be considered for proper clip spacing.

NOTE:
Surface of wood purlins must be 2" wide or more.
2 Fasteners are required for every clip attachment.

UL-90 CLIP



FLAT BEARING PLATE

The following chart should be used to determine proper fasteners required for clip installation on the selected applications (see page 14 for other available fasteners). Fasteners must extend past the inside face of the support material by 1/2".

APPLICATION	INSTALLATION REQUIREMENTS		CLIP SPACING**	TYPE OF FASTENER	FASTENERS REQUIRED
CLIPS OVER PURLINS (16 GA. MIN)	UL-90	24 GAUGE	4'-0" O.C.	#10 X 1" PANCAKE HEAD DRILLER	2
	UL-90	22 GAUGE	4'-0" O.C.	#10 X 1" PANCAKE HEAD DRILLER	2
	UL-90	22 GAUGE	5'-0" O.C.***	#10 X 1" PANCAKE HEAD DRILLER	2
CLIPS OVER $^{5}/_{8}$" WOOD DECK	UL-90	24 GAUGE	4'-0" O.C.	#10 X 1" PANCAKE HEAD WOOD	2
	UL-90	22 GAUGE	4'-0" O.C.	#10 X 1" PANCAKE HEAD WOOD	2
CLIPS OVER FLAT BEARING PLATE RIGID INSULATION METAL DECK	UL-90	24 GAUGE	4'-0" O.C.	#14-13 DECK SCREWS*	2
	UL-90	22 GAUGE	4'-0" O.C.	#14-13 DECK SCREWS*	2

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

PANEL LENGTH

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

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

SUPPORT MATERIAL

Types - Solid sheathing and open framing arrangements may be used to support Vertical Seam panels.

Common solid sheathing used to support Vertical Seam panels includes: plywood (in thicknesses of 15/32", 19/32" and 23/32") and OSB (in thicknesses of 7/16", 19/32" and 23/32").

Common open framing used to support Vertical Seam panels inlcudes: wood purlins on the side (sizes of 1x and 2x) and steel purlins with flange at least 2" wide (in thicknesses of 18 ga, 16 ga, 14 ga and 12 ga).

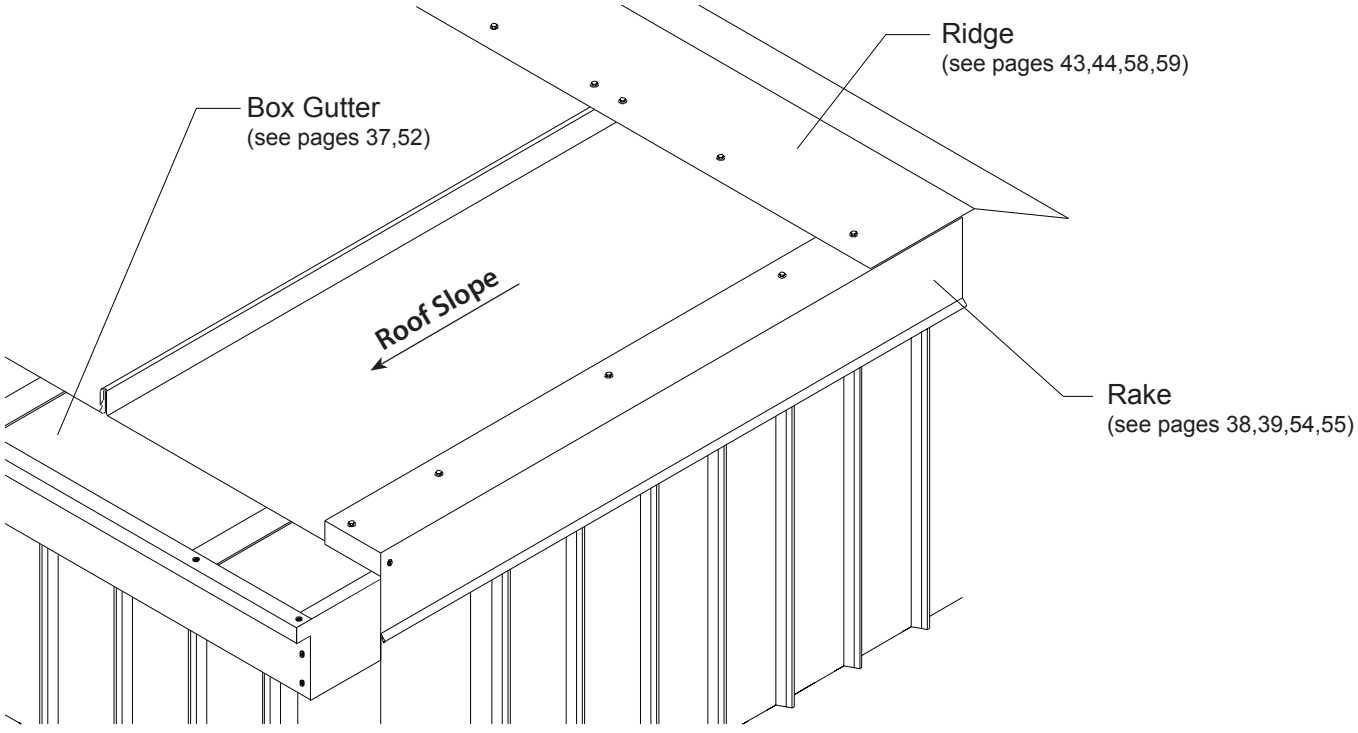
NOTE: 1x or 2x wood purlins on edge can **not** be used as a substrate. Two fasteners per clip are required and the holes in the clip are too far apart to be properly be installed.

Installation Procedure Overview

The following procedures (pages 35 to 64) are presented as a general guide for installing Vertical Seam panels, flashings and accessories on a typical building or residence. Details are shown for installing Vertical Seam and related flashings over solid decking and over open framing. For other applications please contact Metal Sales.

The installation procedures will include the following conditions:

DETAIL	DETAIL DESCRIPTION	PAGES
1	Floating Rake Angle	33, 48
2	Panel, installed from left to right (looking from eave to peak)	33-34, 48-49
3	Panel Clip	34, 49
4	Eave	35, 50
5	Extended Eave	36, 51
6	Box Gutter	37, 52
7	Valley	42, 53
8	Rake	38-39, 54-55
9	Rake Parapet (Rakewall)	40-41, 56-57
10	Ridge / Hip	43, 58
11	Vented Ridge	44, 59
12	Peak	45
13	Highside Parapet (Endwall)	46, 60
14	Eave Transition	47
15	Z-Closure	61
16	Panel Hemming	62
17	Roof Penetration	63

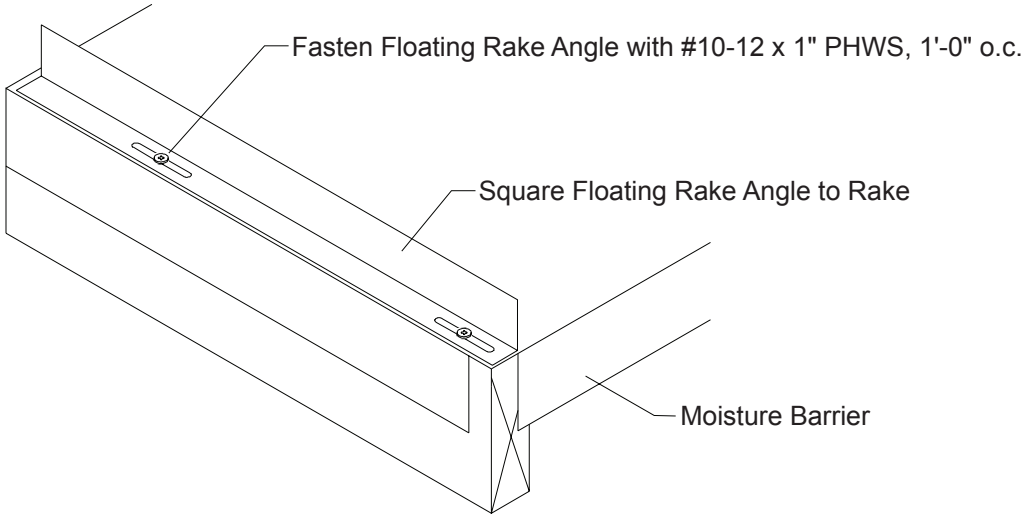


Installation of Panel over Decking

STEP 1

INSTALLING FLOATING RAKE ANGLE

1. Install Floating Rake Angle at all rake and rake parapet conditions. Square Floating Rake Angle to rake condition. **It is critical that Floating Rake Angle be square to building as this will control alignment of panels (see page 25 to check building square).**
2. Fasten to decking with #10-12 x 1" Pancake Head Wood Screws, 1'-0" o.c. **Do not over tighten screws for it is imperative that the Floating Rake Angle be free to slide.**
3. If two or more Floating Rake Angles are required, butt ends. **Do not overlap Floating Rake Angles.**

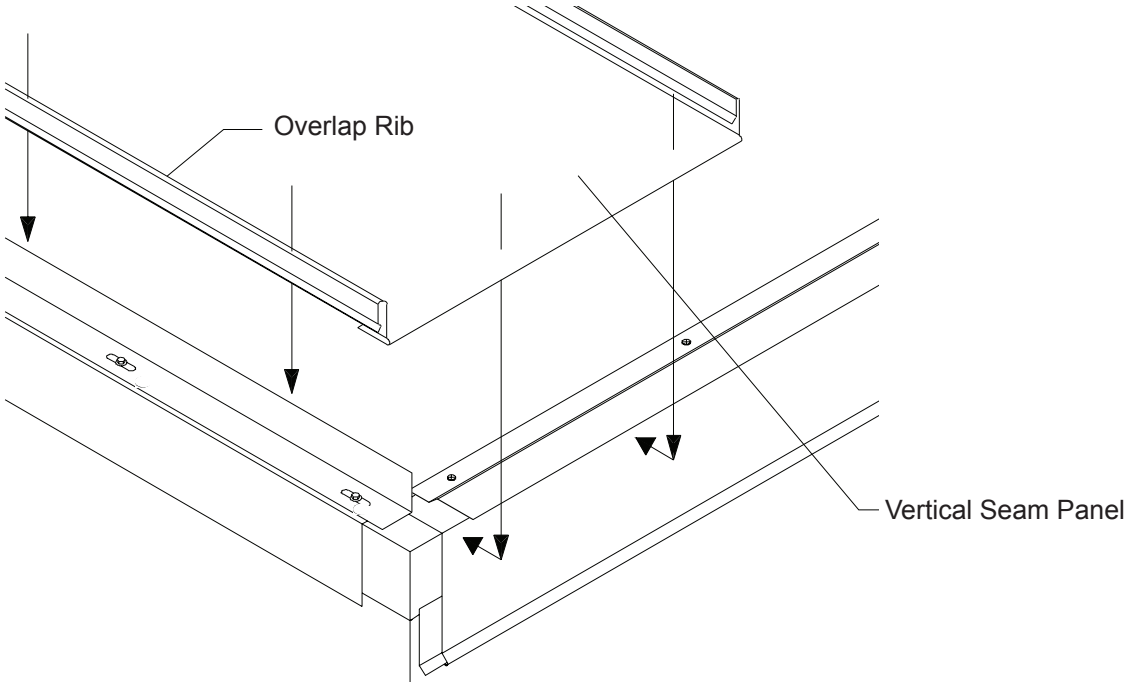


STEP 2

INSTALLING FIRST PANEL

Note: Moisture Barriers, Eave, Gutter and Valley flashings must first be installed before panel installation can begin (see pages 35 to 38). Vertical Seam panels are most commonly installed from left to right when looking upslope.

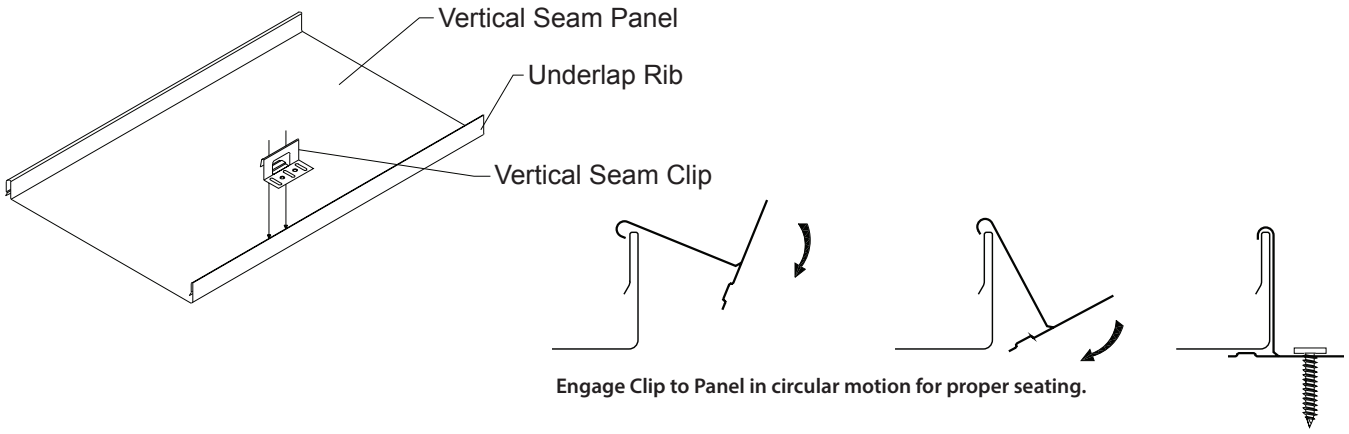
1. Field notch and hem the Vertical Seam panel (as shown on page 62). Apply a single bead of Tube Sealant inside the open hem of the Vertical Seam panel.
2. Position the first panel so overlap rib is on top of the Floating Rake Angle. Slide the panel toward the peak of the roof engaging the Vertical Seam panel and the Offset Cleat. Offset Cleat must be fully engaged into the Vertical Seam panel. Additional overhang must be considered if using wall panels.



STEP 3

INSTALLING VERTICAL SEAM CLIP

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

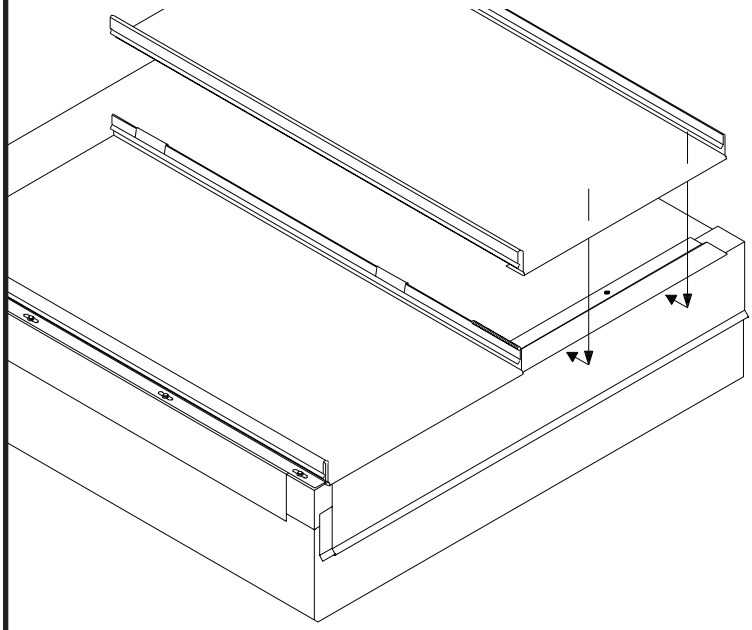


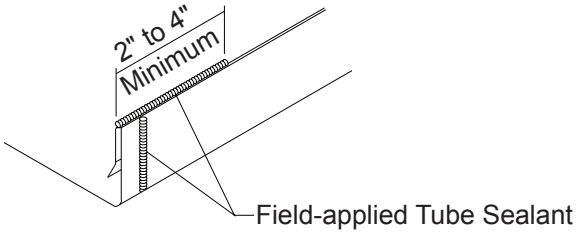
Engage Clip to Panel in circular motion for proper seating.

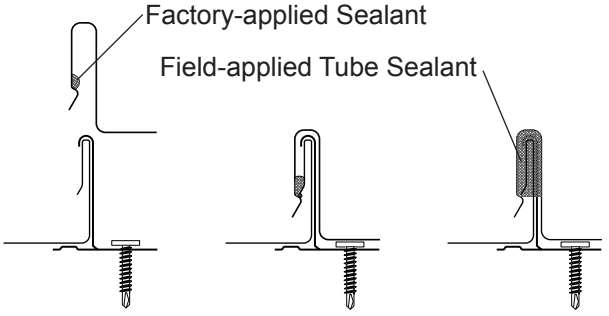
STEP 4

INSTALLING SECOND PANEL

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

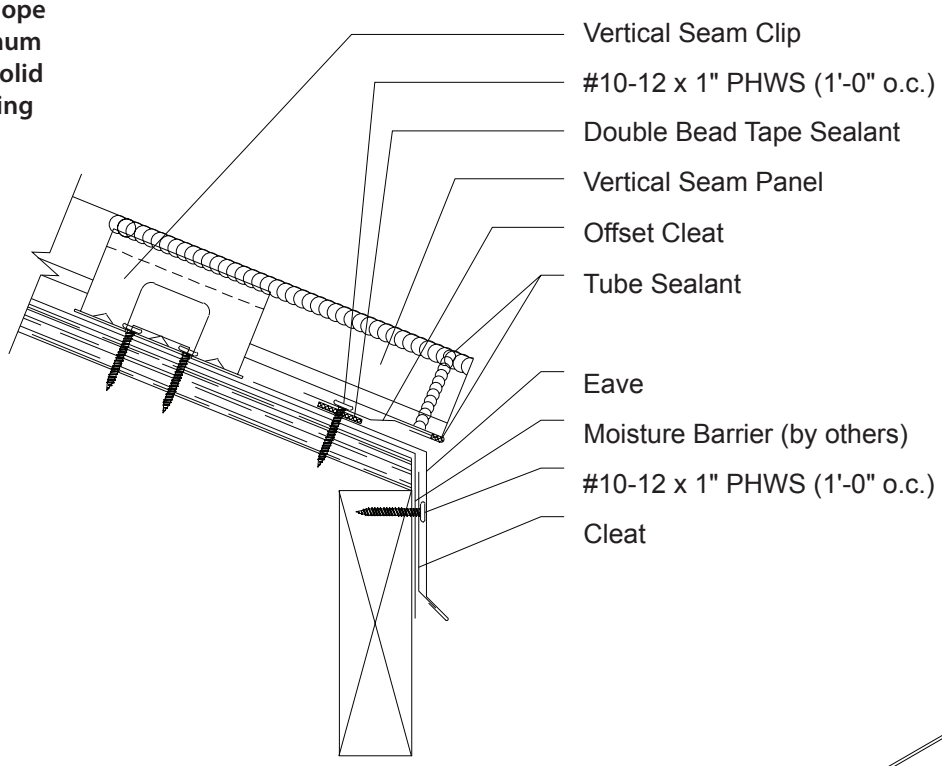






Eave with Offset over Decking

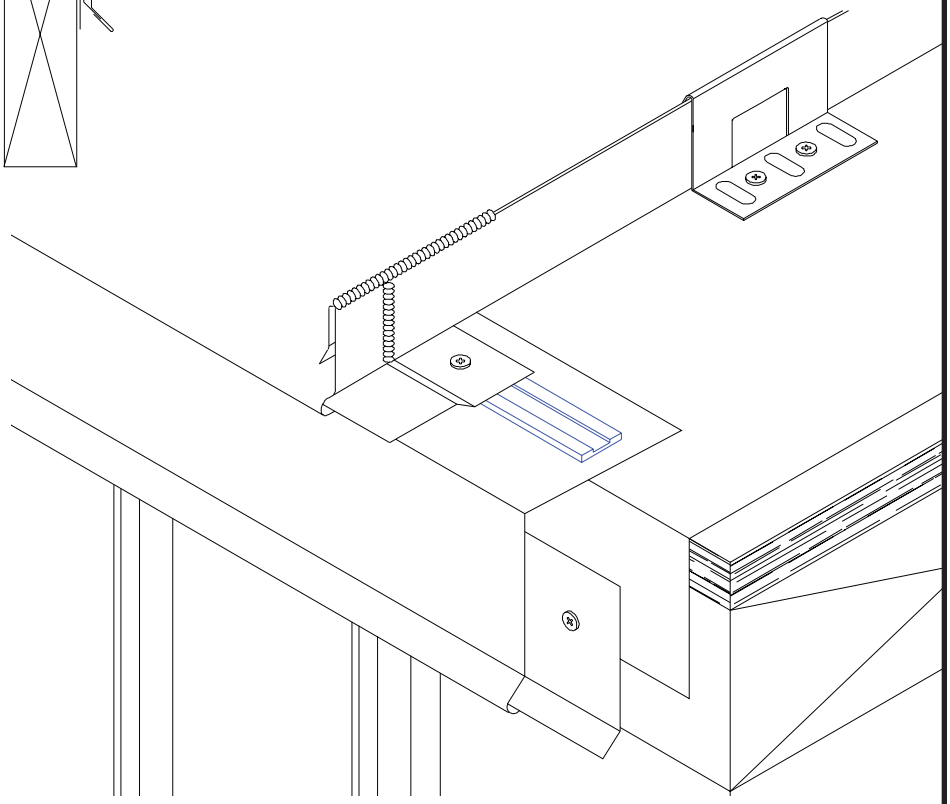
1:12 Slope Minimum over Solid Decking



Note:
The high end of the panels must be direct fastened to secure the panels to the decking.

Note:
Panel ribs must be field notched and the flat part of the panel must be field hemmed to accept Offset Cleat (see page 62).

Note:
Fill exposed end of ribs with tube sealant (See Page 34, Step 4)



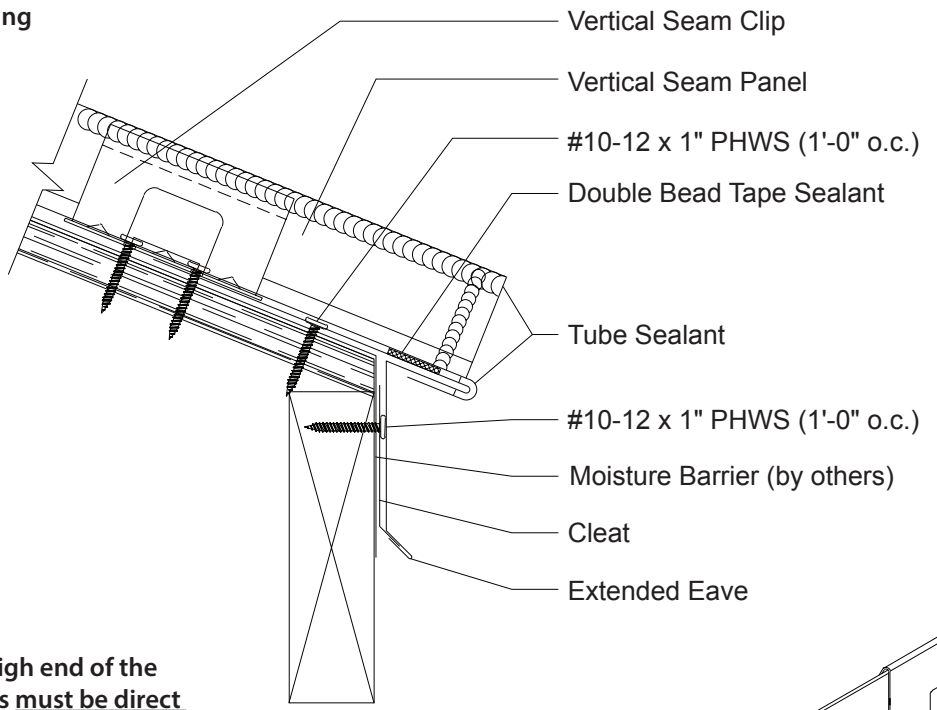
INSTALLATION NOTES

All Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows proper Eave attachment.
2. Install Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the decking and fasten with #10-12 x 1" Pancake Head Wood Screws, 4'-0" o.c. to hold the Eave Flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant on the bottom leg of the Offset Cleat and fasten to decking with #10-12 x 1" Pancake Head Wood Screw through top of Eave flashing and into decking, 1'-0" o.c. Make sure Offset Cleat is lined up to properly accommodate hemmed panel.
4. Install panel by engaging field-hemmed end of panel (see page 62) to Offset Cleat (see pages 33 and 34 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with $^{1}/_{8}$" Pop Rivets spaced $2^{1}/_{2}$" o.c.

Extended Eave Over Decking

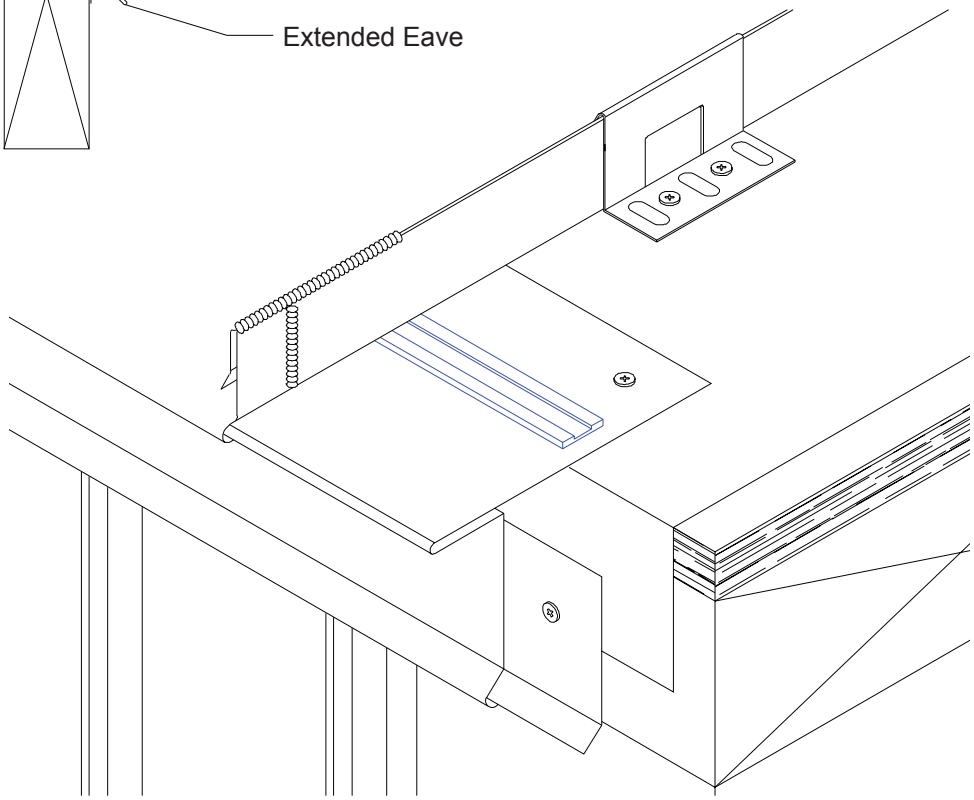
1:12 Slope Minimum over Solid Decking



Note:
The high end of the panels must be direct fastened to secure the panels to the decking.

Note:
Panel ribs must be field notched and the flat part of the panel must be field hemmed to accept Offset Cleat (see page 62).

Note:
Fill exposed end of ribs with tube sealant (See Page 34, Step 4)



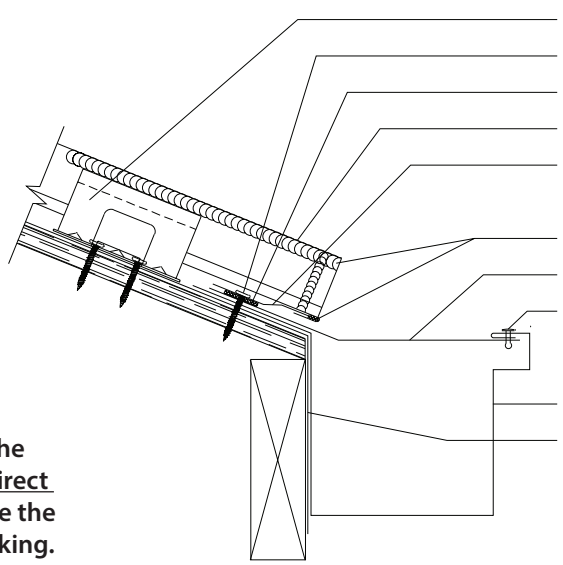
INSTALLATION NOTES

All Extended Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows for proper Extended Eave attachment.
2. Install Extended Eave flashing by sliding open hem onto Cleat and resting Extended Eave flashing back against decking. Fasten to decking with #10-12 x 1" Pancake Head Wood Screw, 1'-0" o.c.
3. Apply a row of Double Bead of Tape Sealant to extended leg of the Extended Eave flashing.
4. Install panel by engaging field-hemmed end of panel (see page 62) to Extended Eave (see pages 33 and 34 for panel install).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with $^{1}/_{8}$" Pop Rivets spaced $2^{1}/_{2}$" o.c.

Box Gutter over Decking

1:12 Slope Minimum over Solid Decking

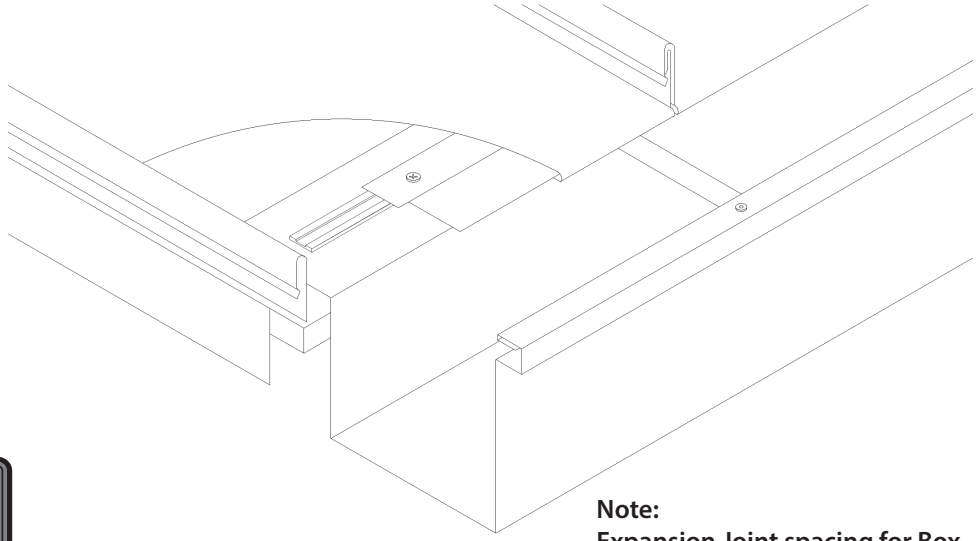


Note:
The high end of the panels must be direct fastened to secure the panels to the decking.

Note:
Panel ribs must be field notched and the flat part of the panel must be field hemmed to accept Offset Cleat (see page 62).

Note:
Fill exposed end of ribs with tube sealant (See Page 34, Step 4)

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



Note:
Expansion Joint spacing for Box Gutter should be no more than 50'. Downspout spacing should be no more than 50'.

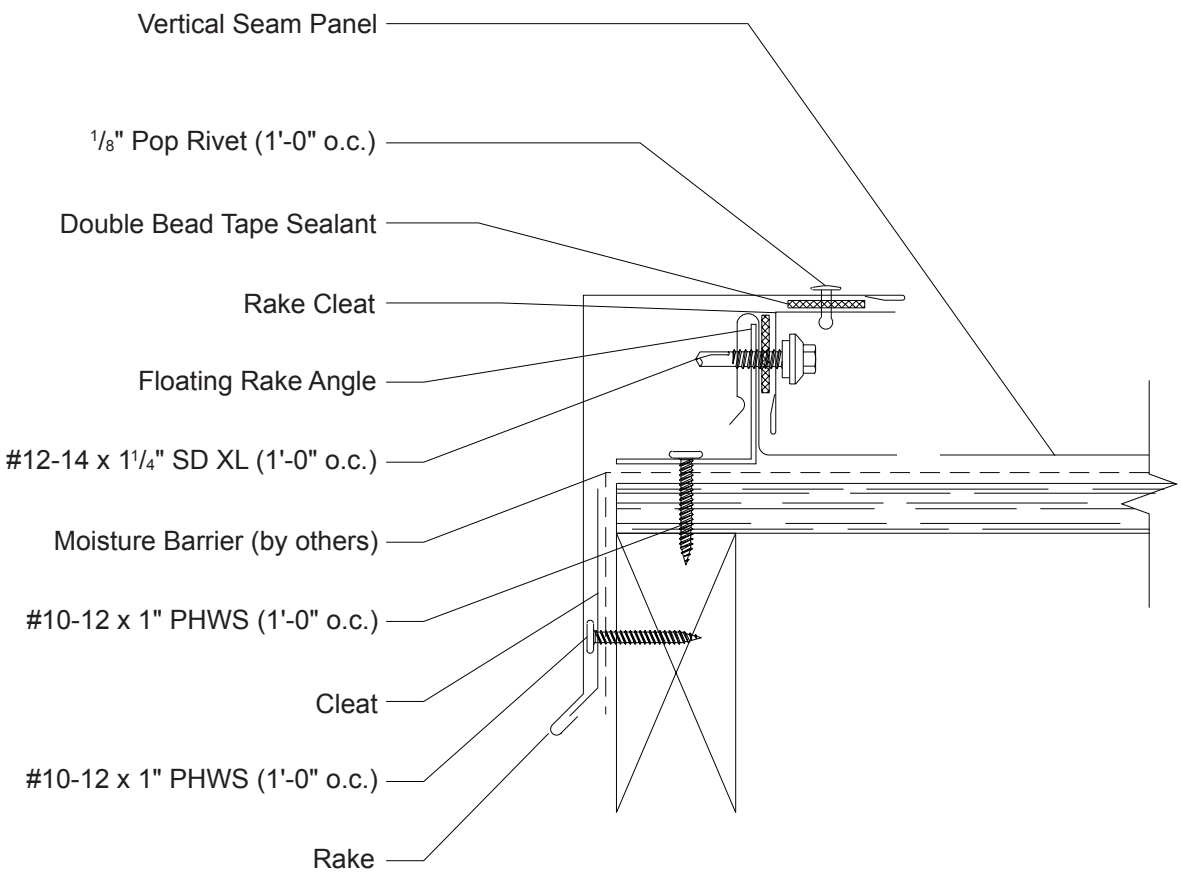
INSTALLATION NOTES

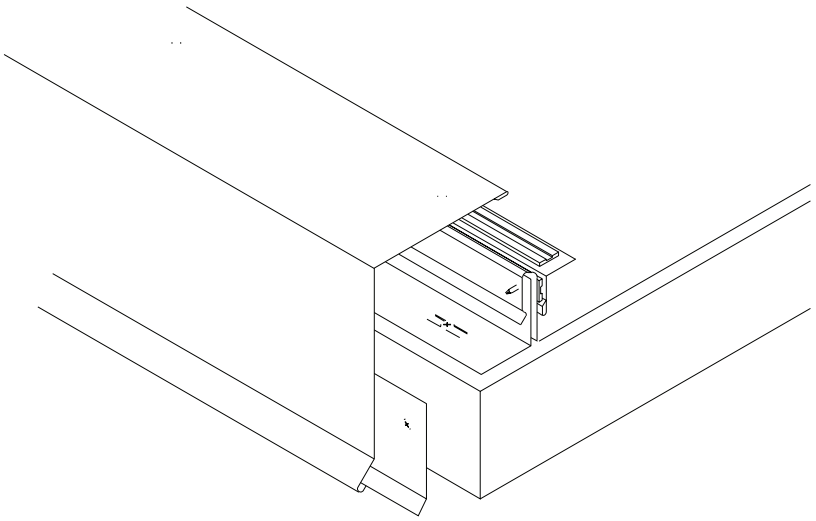
All Box Gutter flashing must be installed prior to panel installation.

1. Install Box Gutter flashing back against decking. To hold Box Gutter flashing in place, fasten to decking with #10-12 x 1" Pancake Head Wood Screw, 4'-0" o.c.
2. Install Universal Gutter/Downspout Straps every 3'-0" of gutter length to decking with #10-12 x 1" Pancake Head Wood Screw and fasten to Box Gutter with (1) 1/8" Pop Rivet per strap.
3. Apply a row of Double Bead of Tape Sealant to bottom leg of Offset Cleat, position on back leg of Box Gutter and fasten to decking with #10-12 x 1" Pancake Head Wood Screw, 1'-0" o.c.
4. Install panel by engaging field-hemmed end of panel (see page 62) to Offset Cleat (see pages 33 and 34 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.
6. Note: Size and gauge of Box Gutter must be designed to applicable governing building code.

VERTICAL SEAM Rake (On Module) over Decking

1:12 Slope Minimum over Solid Decking





Note:
<u>Do not overtighten</u> Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

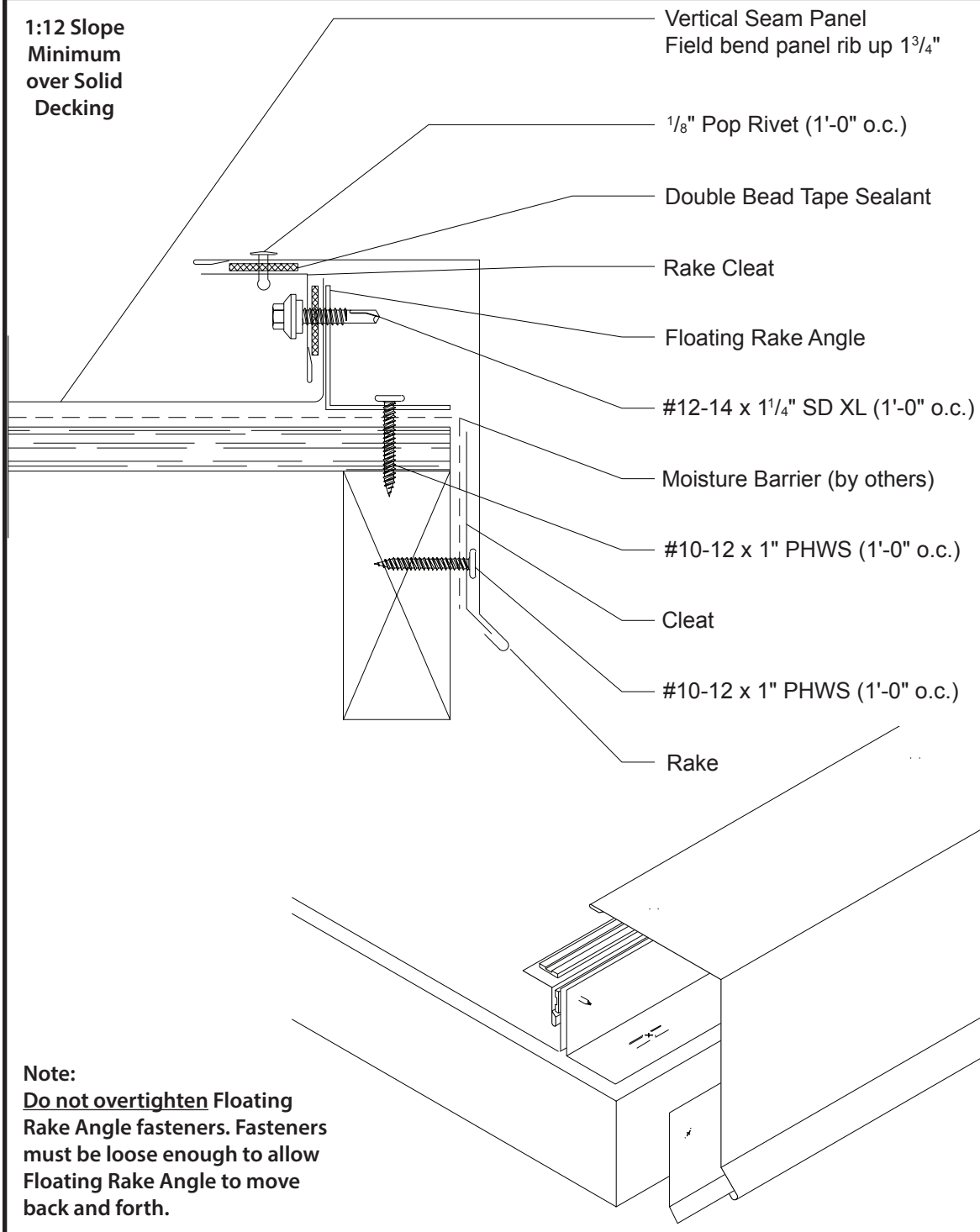
INSTALLATION NOTES

Vertical Seam panels and Floating Rake Angles must be installed prior to Rake installation (see page 33).

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

VERTICAL SEAM Rake (Off Module) Over Decking

1:12 Slope Minimum over Solid Decking



Note:
<u>Do not overtighten</u> Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

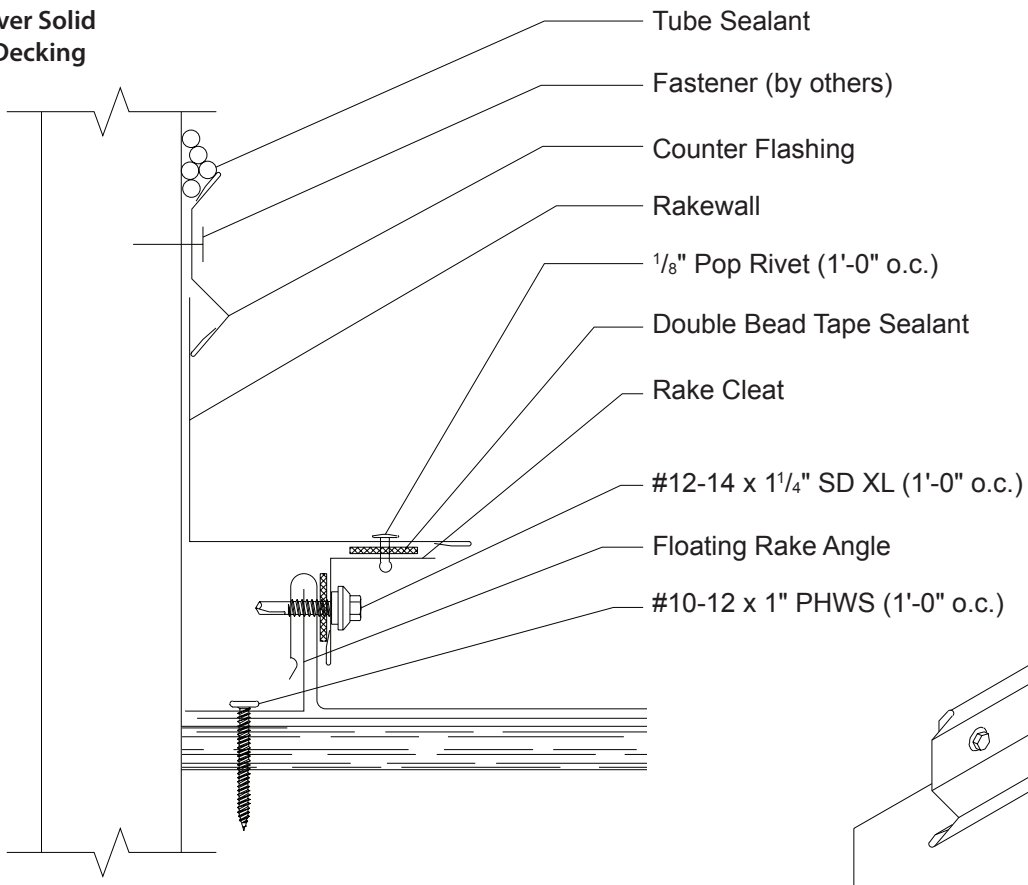
INSTALLATION NOTES

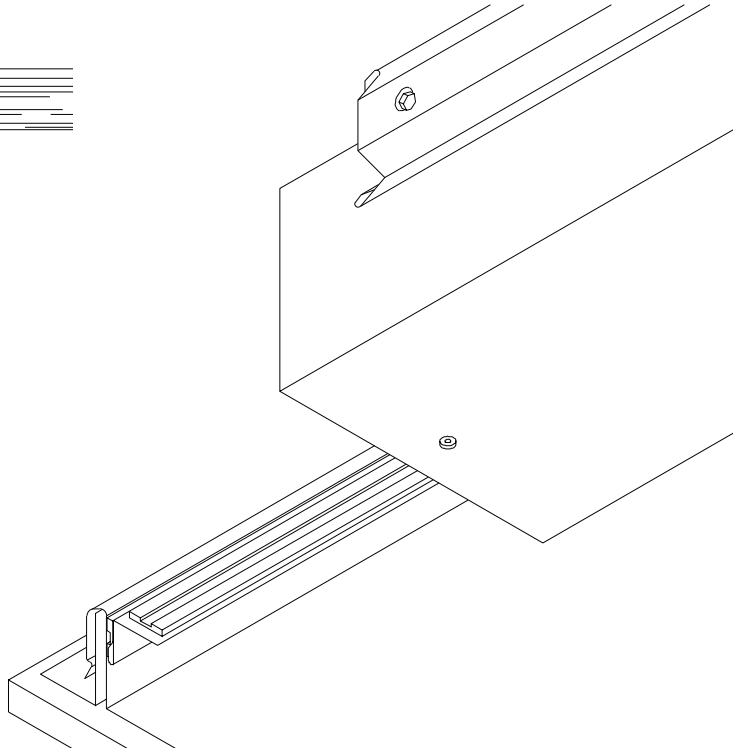
Vertical Seam panels and Floating Rake Angles must be installed prior to Rake installation (see page 33).

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

Rake Parapet (On Module) over Decking

1:12 Slope Minimum over Solid Decking





Note:
<u>Do not overtighten</u> Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

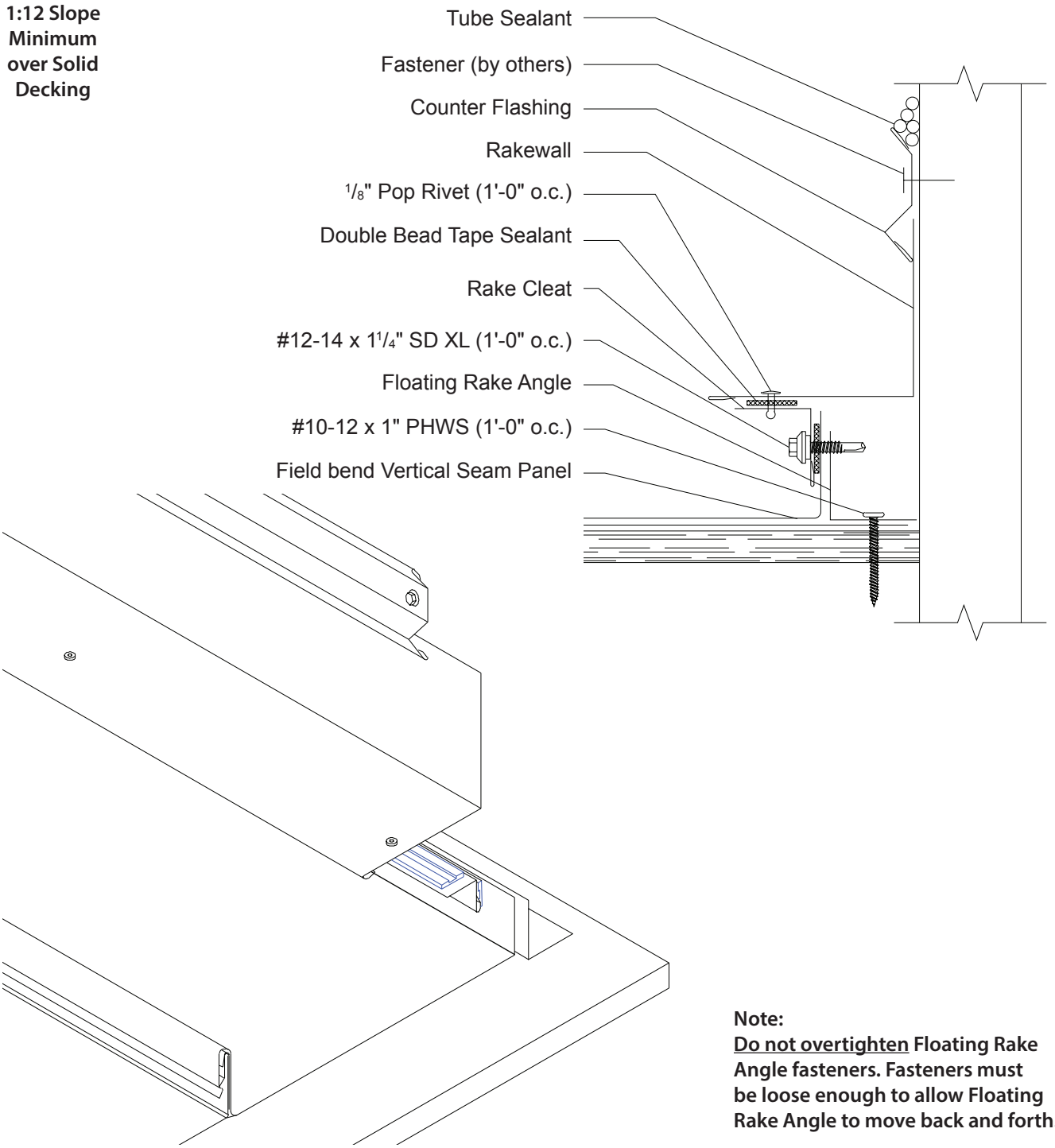
INSTALLATION NOTES

Vertical Seam panels and Floating Rake Angles must be installed prior to Rakewall installation (see page 33).

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

Rake Parapet (Off Module) Over Decking

1:12 Slope Minimum over Solid Decking



Note:
<u>Do not overtighten</u> Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

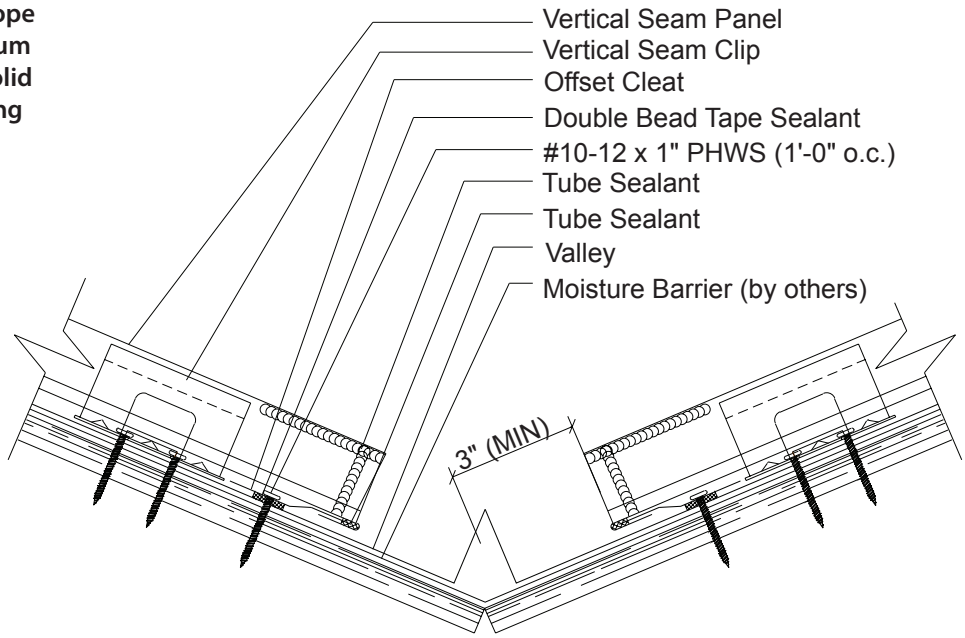
INSTALLATION NOTES

Vertical Seam panels and Floating Rake Angles must be installed prior to Rakewall installation (see page 33).

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

Valley Over Decking

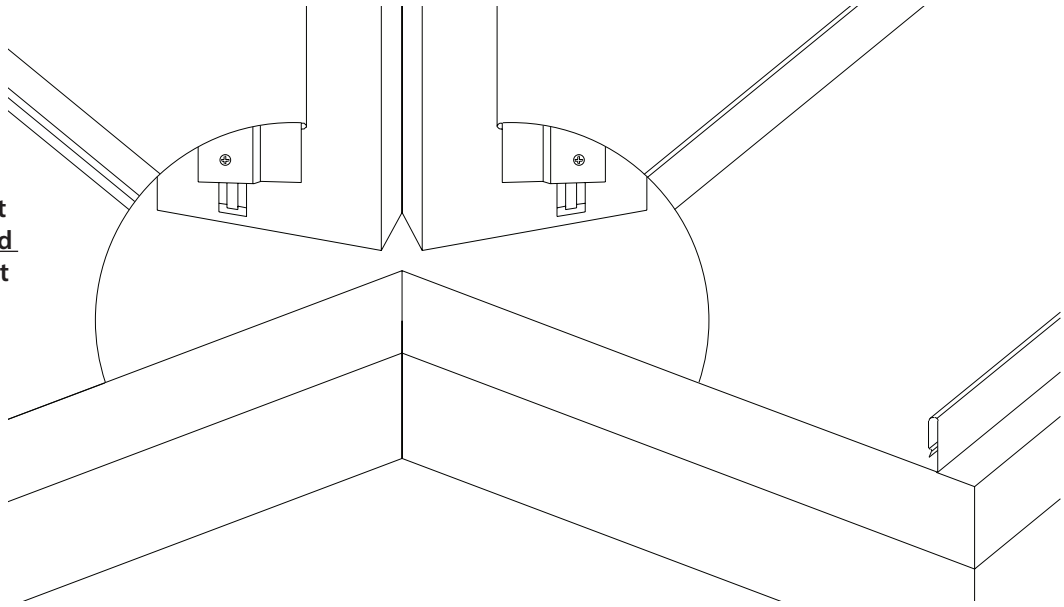
1:12 Slope Minimum over Solid Decking



Note:
The high end of the panels must be direct fastened to secure the panels to the decking.

Note:
Panel ribs must be field notched and the flat part of the panel must be field hemmed to accept Offset Cleat (see page 62).

Note:
Fill exposed end of ribs with tube sealant (See Page 34, Step 4)



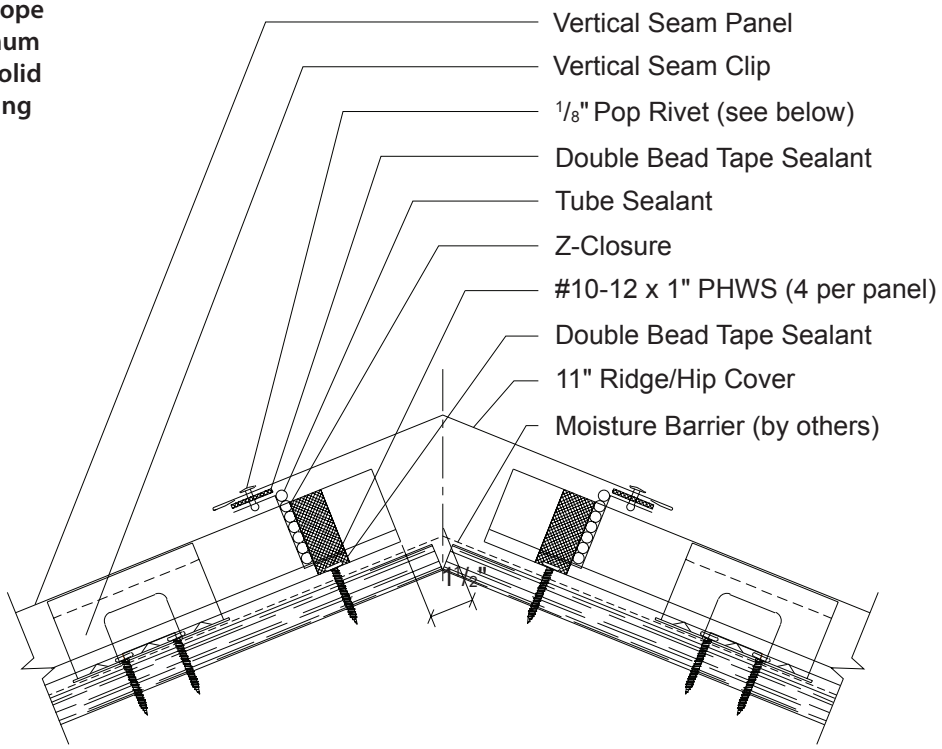
INSTALLATION NOTES

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

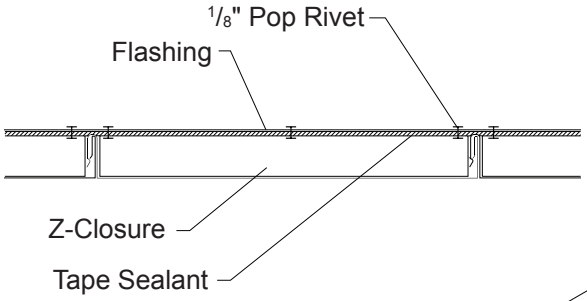
1. Install Valley flashing on decking. To hold Valley flashing in place, fasten to decking with #10-12 x 1" Pancake Head Wood Screw, 4'-0" o.c.
2. Apply a row of Double Bead Tape Sealant across both sides of Valley flashing approximately 5" from center of valley.
3. Properly align and install Offset Cleat on both sides of Valley flashing to accommodate panel hem and fasten to decking with #10-12 x 1" Pancake Head Wood Screw, 1'-0" o.c.
4. Install panel by engaging field-hemmed end of panel (see page 58) to Offset Cleat (see pages 33 and 34 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2", placing a bead of Tube Sealant between the flashings and securing with (2) $^{1}/_{8}$" Pop Rivets in the 2" water diverter.

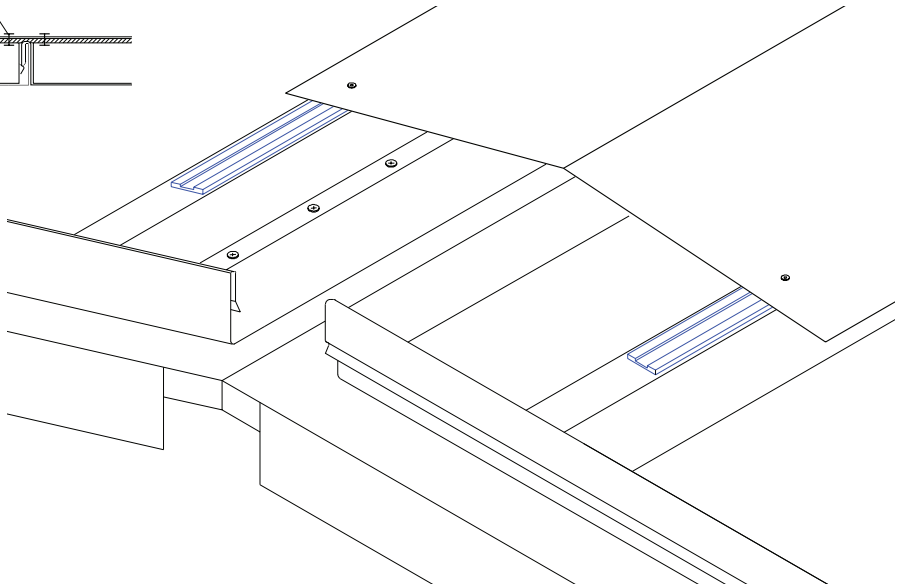
11" Ridge/Hip over Decking

1:12 Slope Minimum over Solid Decking



Note:
The low end of the panels must not be direct fastened to the decking.





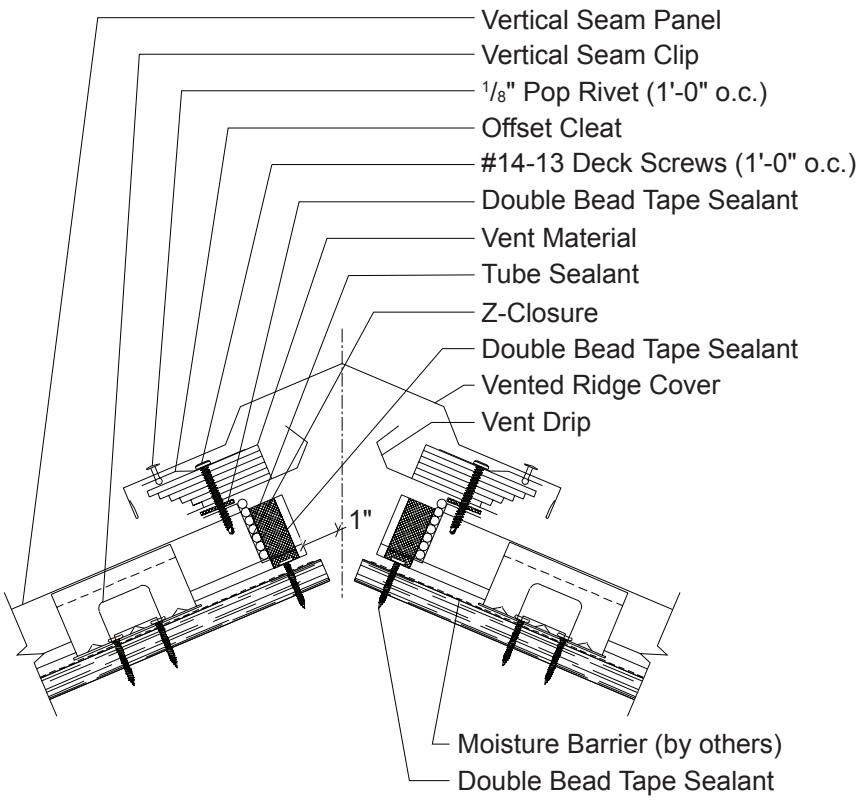
CAUTION
Additional screws and pop rivets may be required for high snow / wind loading and steep slopes.

INSTALLATION NOTES

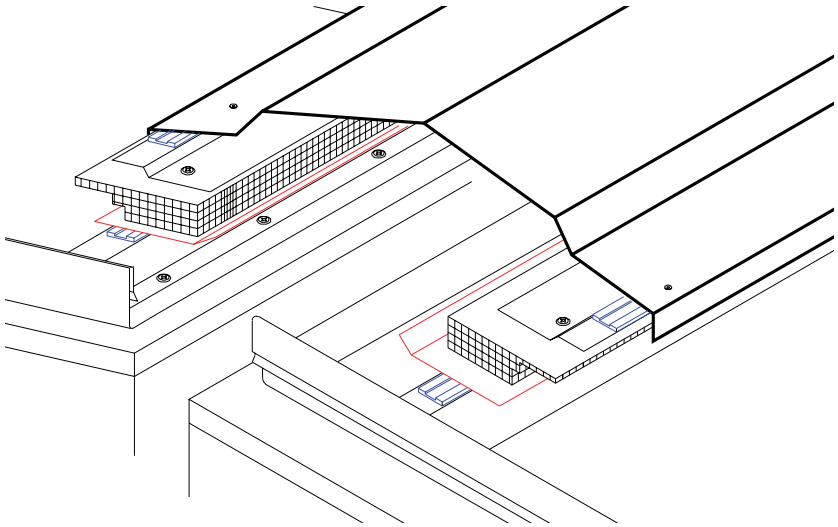
1. Once panels have been installed, field cut the Z-Closure (see page 61) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure location will accommodate 11" Ridge/Hip cover.
3. Install field cut Z-Closure (see page 61).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" Pancake Head Wood Screws per panel.
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Position and install 11" Ridge/Hip Cover flashing to Z-Closure with 1/8" Pop Rivets (as shown).
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Vented Ridge Over Decking

1:12 Slope Minimum over Solid Decking



Note:
The low end of the panels must not be direct fastened to the decking.



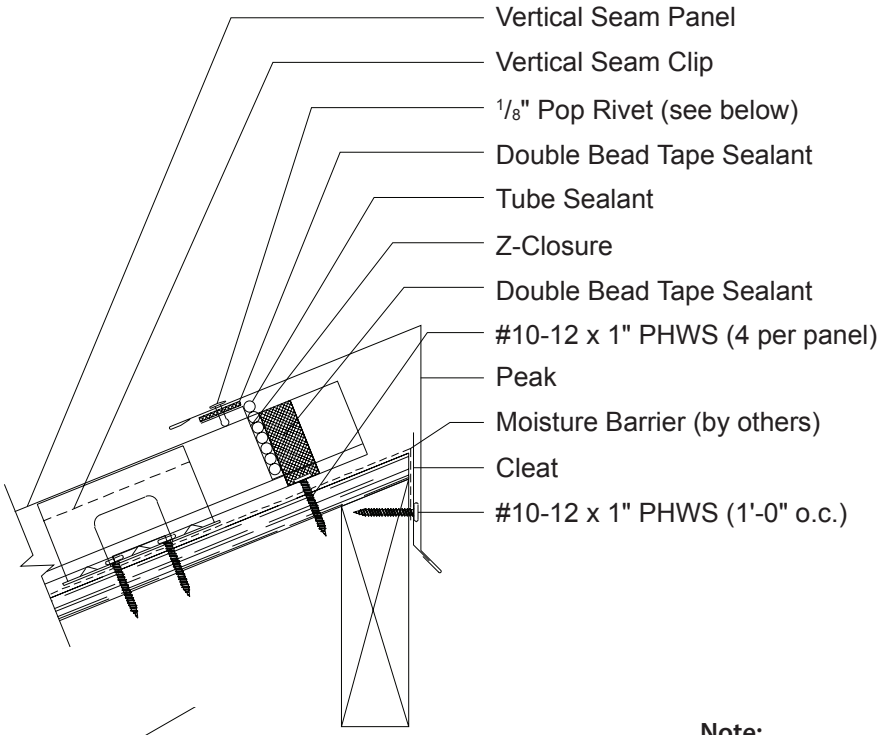
CAUTION
Additional screws and pop rivets may be required for high snow / wind loading and steep slopes.

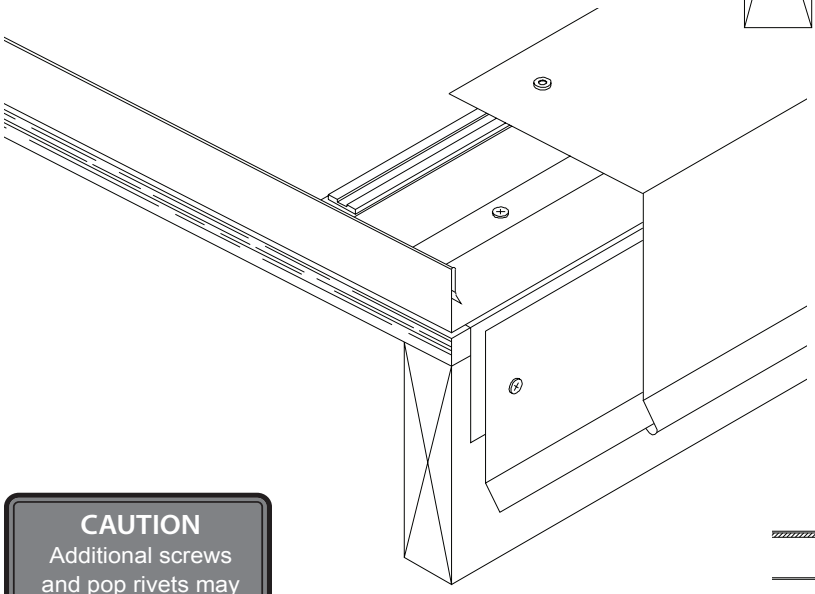
INSTALLATION NOTES

1. Once panels have been installed, field cut the Z-Closure (see page 61) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding, make sure Z-Closure location will accommodate Vented Ridge cover.
3. Install field-cut Z-Closure (see page 61).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" Pancake Head Wood Screws per panel.
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Install Vent Drip, Vent Material and Offset Cleat, as shown above with #14-13 Deck Screws, 1'-0" o.c. and apply a row of Double Bead Tape Sealant to the top leg of the Offset Cleat.
7. Install Vented Ridge Cover to Offset Cleat with 1/8" Pop Rivets, 1'-0" o.c.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

VERTICAL SEAM Peak over Decking

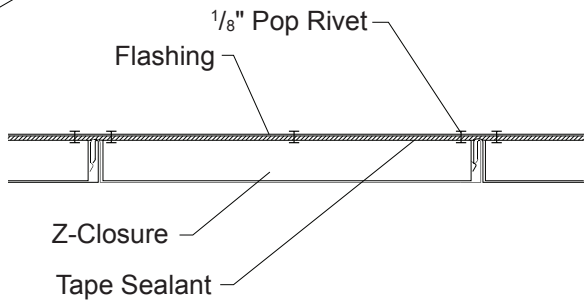
1:12 Slope Minimum over Solid Decking





Note:
The low end of the panels must not be direct fastened to the decking.

CAUTION
Additional screws and pop rivets may be required for high snow / wind loading and steep slopes.

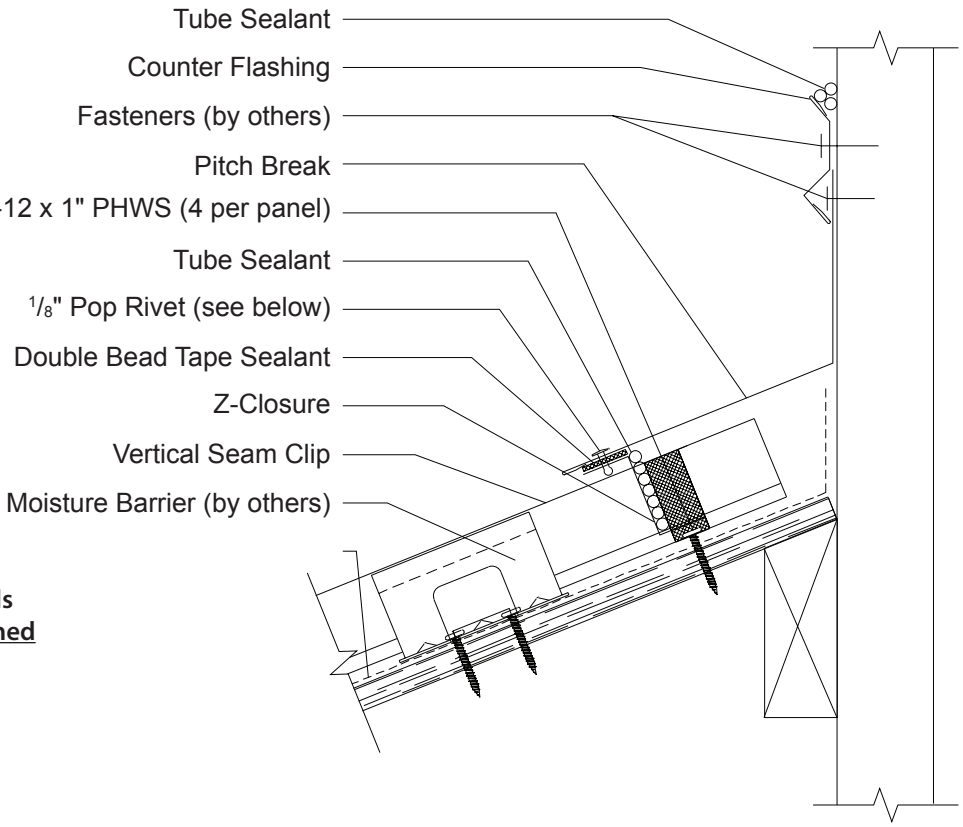


INSTALLATION NOTES

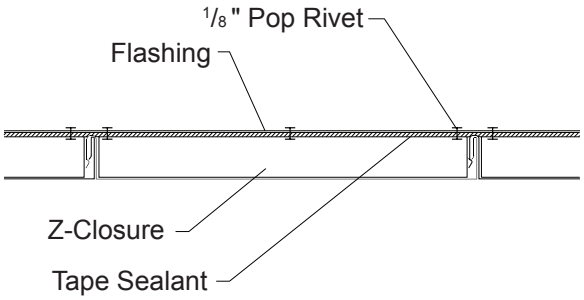
1. Once panels have been installed, field cut the Z-Closure (see page 61) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding, make sure Z-Closure location will accommodate Vented Ridge cover.
3. Install field-cut Z-Closure (see page 61).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" Pancake Head Wood Screws per panel.
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Position and install Cleat to the wall with the appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Peak attachment.
7. Install Peak flashing by sliding the open hem onto the Cleat and then attaching to the Z-Closure with Pop Rivets, at the spacing shown above.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Highside Parapet Over Decking

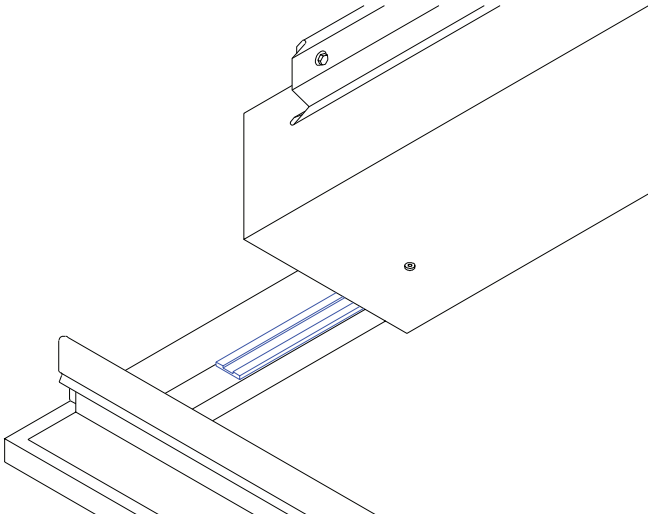
1:12 Slope Minimum over Solid Decking



Note:
The low end of the panels must not be direct fastened to the decking.



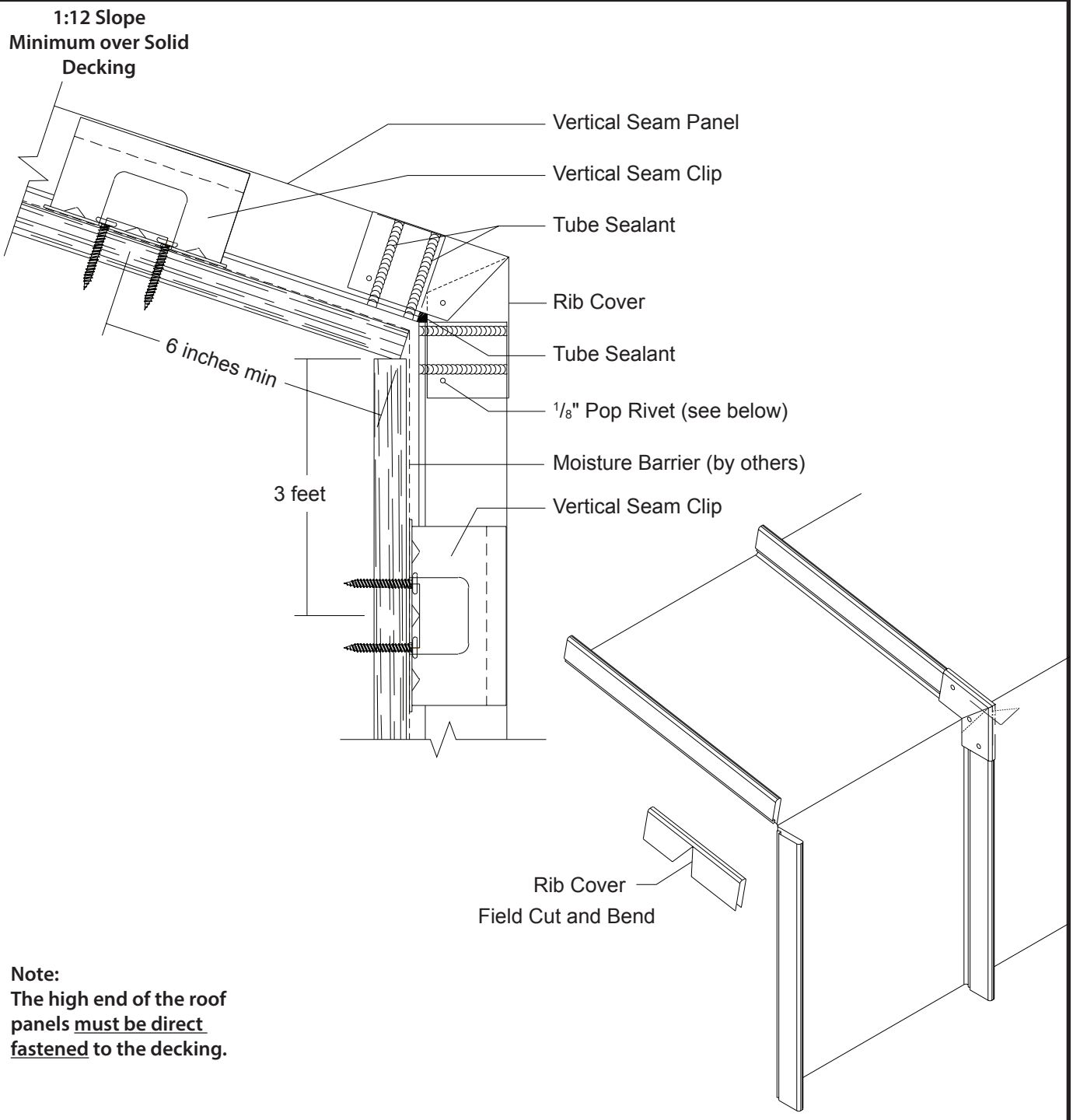
CAUTION
Additional screws and pop rivets may be required for high snow / wind loading and steep slopes.



INSTALLATION NOTES

1. Once panels have been installed, field cut the Z-Closure (see page 61) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure location will accommodate Pitch Break flashing.
3. Install field-cut Z-Closure (see page 61).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" Pancake Head Wood Screws per panel.
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs. Position and install Pitch Break flashing to Z-Closure with 1/8" Pop Rivets (as shown).
6. Fasten vertical leg of Pitch Break to the parapet wall with the appropriate fastener, 1'-0" o.c.
7. Install Counter Flashing, Reglet or wall panel and fasten to parapet wall with appropriate fastener, 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Eave Transition over Decking



Note:
The high end of the roof panels must be direct fastened to the decking.

INSTALLATION NOTES

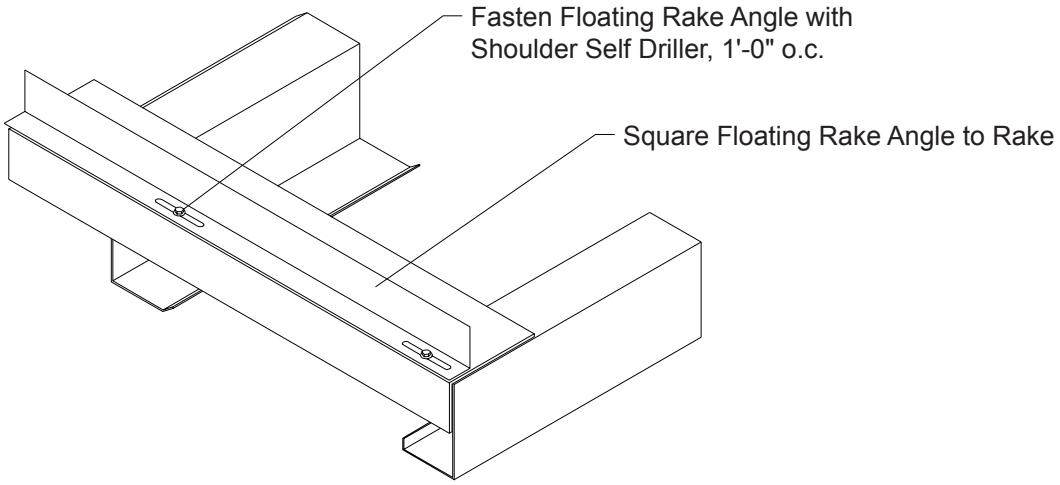
1. ms-HT underlayment is recommended shingled up the wall and at least one run on the roof.
2. Cut panel ribs square across the width of the panel at the proper location along the length and bend the panel flat at the cut ribs.
3. Install panel with a Vertical Seam clip on the roof section of within 6" of the eave. In the wall section, install Vertical Seam clip 3' from the roof to permit thermal expansion of the roof panels. Use Panel Starter (not shown) at the bottom end of the wall panels by cutting a slot at the bottom of the panel ribs and inserting the panel flat into the Panel Starter hem.
4. For long roof panels, a gap between the panel and the top of the wall may be required to allow for thermal contraction of the roof panel.
5. Cut the Rib Cover and bend as shown so that it fits on the panel ribs across the transition and has room for 1/8" Pop Rivets. The roof legs of the Rib Cover must overlap the wall legs of the Rib Cover.
6. Prior to installing the Rib Cover, apply Tube Sealant as shown across panel ribs and at the base of each side of the ribs.
7. Install 1/8" Pop Rivets on each side of the Rib Cover to the roof panel rib, the wall panel rib and at the Rib Cover leg lap.

Installation of Panel Over Open Framing

STEP 1

INSTALLING FLOATING RAKE ANGLE

1. Install Floating Rake Angle at all rake and rake parapet conditions. Square Floating Rake Angle to rake condition. **It is critical that Floating Rake Angle be square to building as this will control alignment of panels (see page 33 to check building square).**
2. Fasten to framing with 1/4"-14 x 1 1/4" Shoulder Self Driller screws, 1'-0" o.c. **Do not over tighten screws for it is imperative that the Vertical Seam roof system be allowed to float.**
3. If two or more Floating Rake Angles are required, butt ends. **Do not overlap Floating Rake Angles.**

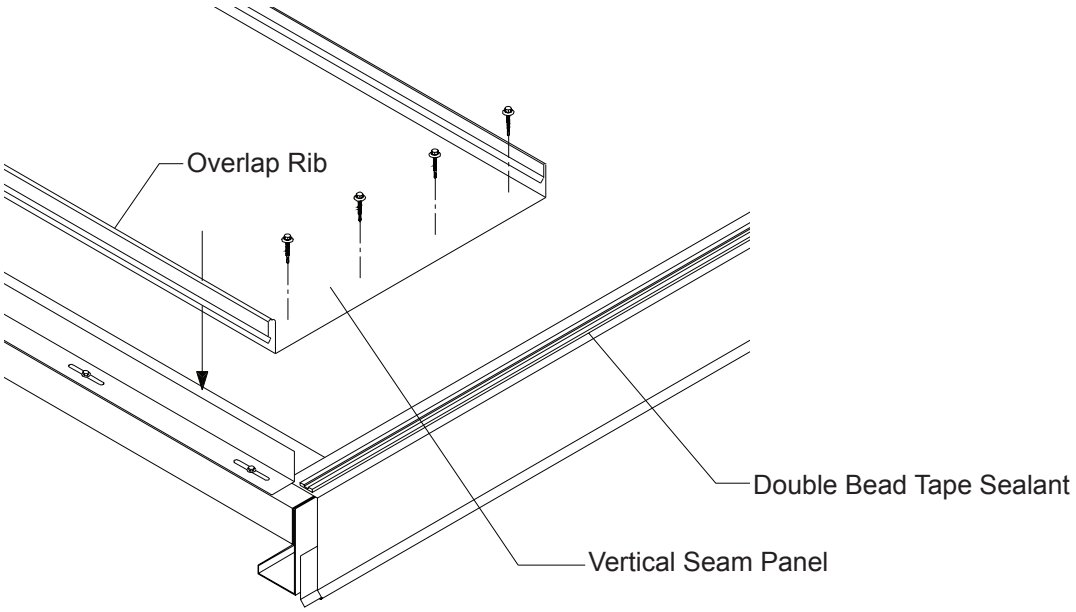


STEP 2

INSTALLING FIRST PANEL

Note: Insulation, Eave, Box Gutter and Valley flashings must first be installed before panel installation can begin (see pages 50 to 53). Vertical Seam panels must be installed going from left to right when looking from eave to peak.

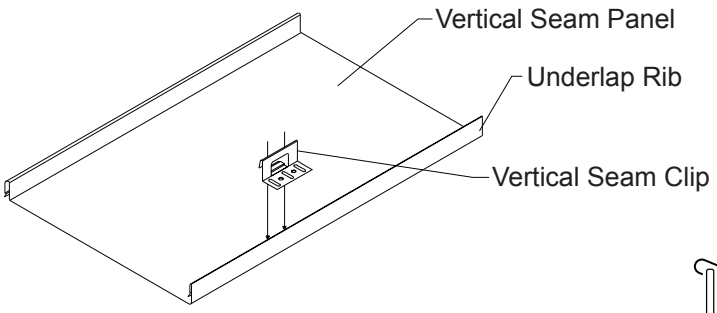
1. Apply a row of Double Bead Tape Sealant along the top segment of the Eave, Extended Eave or Box Gutter flashing.
2. Install the first panel so that the overlap rib is on top of the Floating Rake Angle and has the proper overhang. Make sure that the panel is square to the eave and rake.
3. Fasten Vertical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

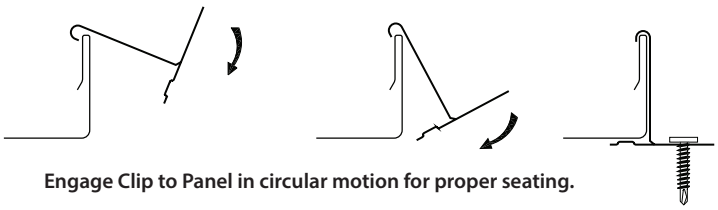


STEP 3

INSTALLING VERTICAL SEAM CLIP

1. Once the first panel has been installed, roll the first clip into lock position over the underlap rib of the panel (see below).
2. Fasten the Vertical Seam clip to the framing with the proper type and number of fasteners. If a fastener strips out, remove the clip and reposition it so the fastener can drill a new hole at least $^3/_8$" from the stripped hole or install an oversized fastener into the stripped hole. Failure to do so will impact the system to resist the applied loads.
3. Repeat steps 1 and 2 to install clips along the underlap rib of the panel from eave to peak at every framing member. For certain building codes and state or county specifications, special clip spacing may be required. Please contact Metal Sales for specific clip and fastener spacing.



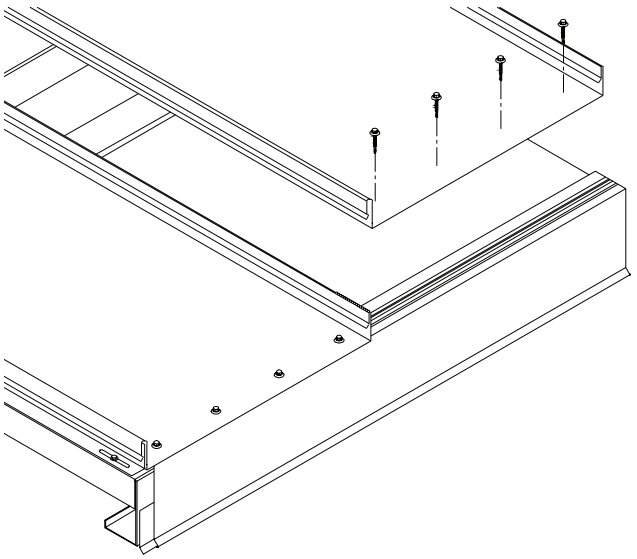


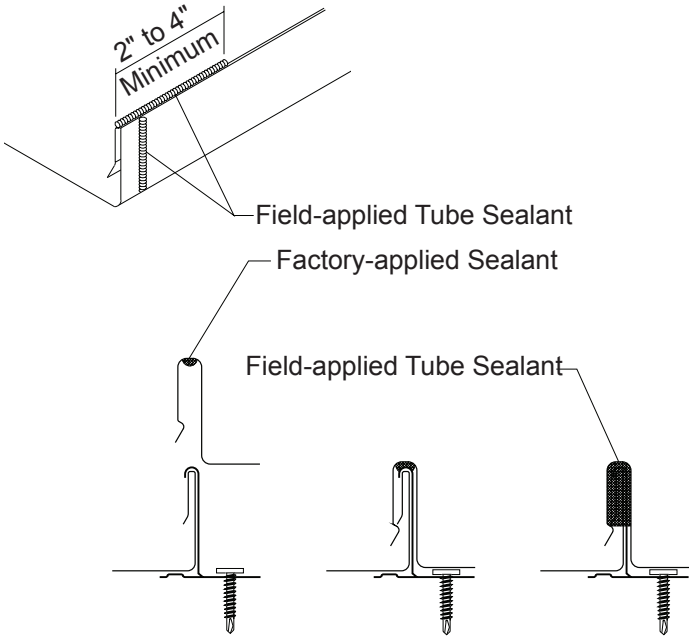
Engage Clip to Panel in circular motion for proper seating.

STEP 4

INSTALLING SECOND PANEL

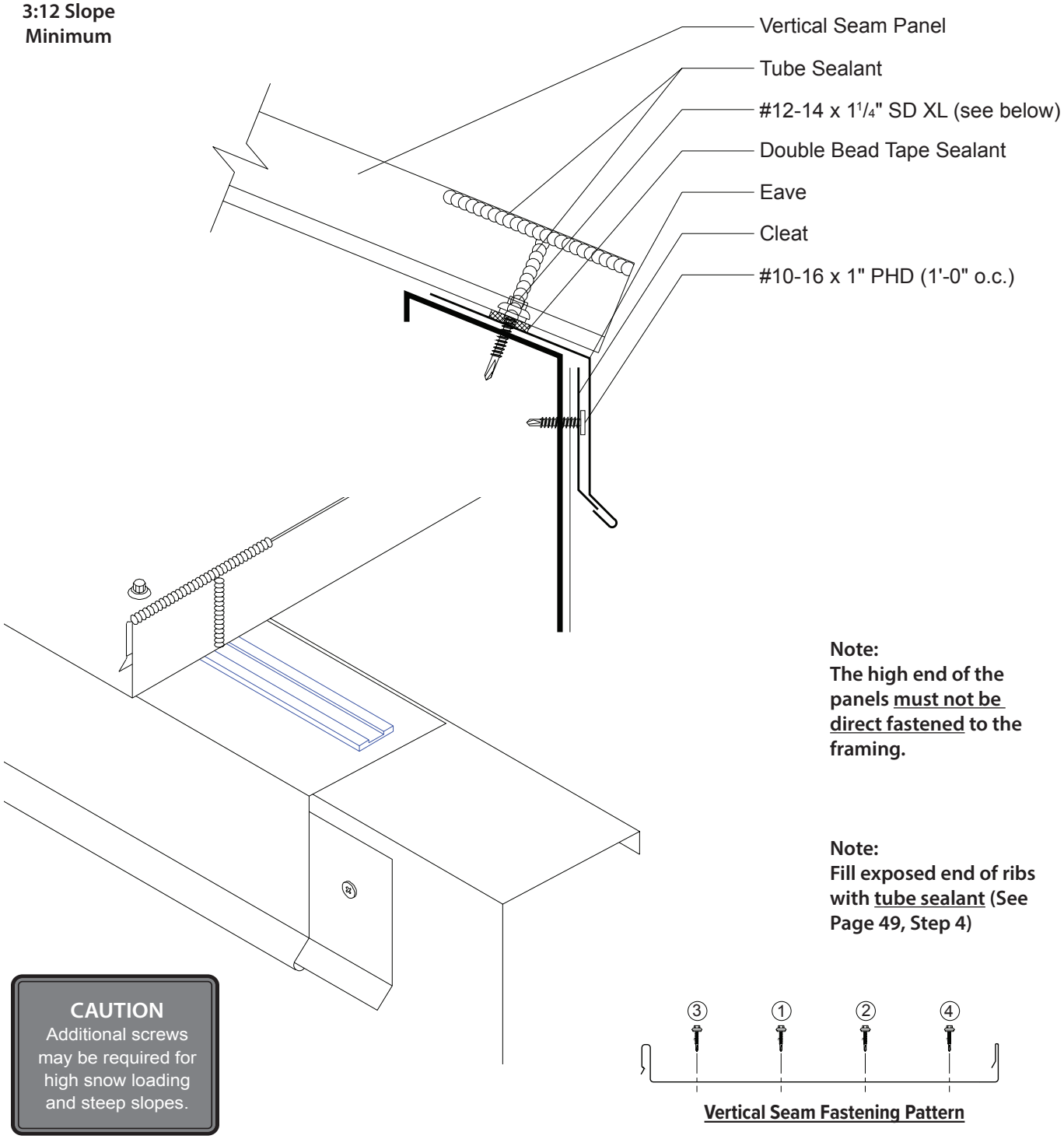
1. Prior to installing the second Vertical Seam panel, Tube Sealant must be placed on the underlap rib of the first panel (see below).
2. Snap the second panel in place making sure panel ends at eave are properly aligned. **It is critical that panels only be snapped in one direction.**
3. Fasten Vertical Seam panel with (4) #12-14 x $1^1/_4$" Self Driller XL per panel through the Double Bead Tape Sealant, flashing and into the framing, as shown below.
4. Repeat steps 2 and 3 for remaining panels.
5. Make sure all panels are properly snapped into place. Also clean any debris and excess sealant before continuing to the next section of the roof.
6. Once installation is complete, fill the end of each panel rib with Tube Sealant (as shown below).





Eave Over Open Framing

3:12 Slope Minimum



Note:
The high end of the panels must not be direct fastened to the framing.

Note:
Fill exposed end of ribs with tube sealant (See Page 49, Step 4)

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

Vertical Seam Fastening Pattern

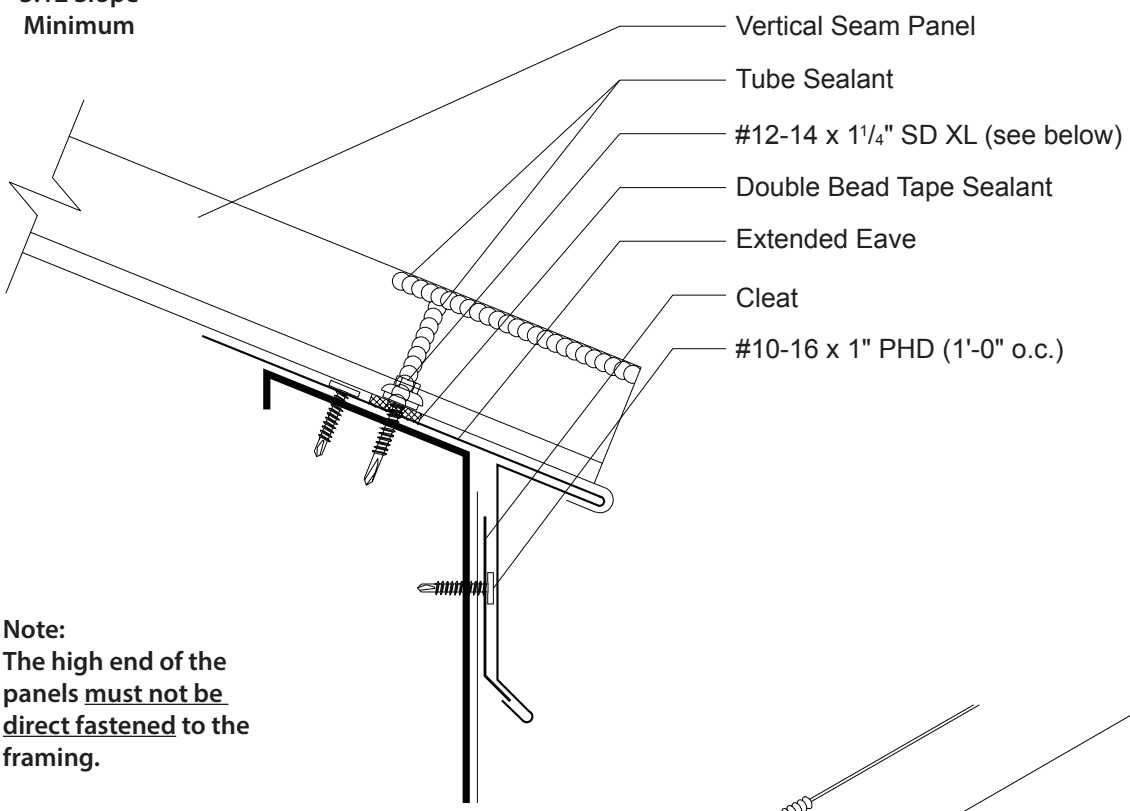
INSTALLATION NOTES

All Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows proper Eave attachment.
2. Install Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the framing and fasten with #10-16 x 1" Pancake Head Driller, 4'-0" o.c. to hold the Eave flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant along the top leg of the Eave flashing about 2" from the end.
4. Install panel by fastening through with #12-14 x 1¼" Self Driller XL screws (see pages 48 and 49 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with ⅛" Pop Rivets spaced 2½" o.c.

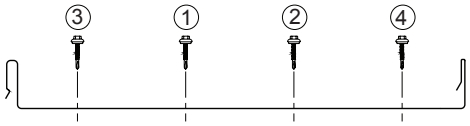
Extended Eave Over Open Framing

3:12 Slope Minimum



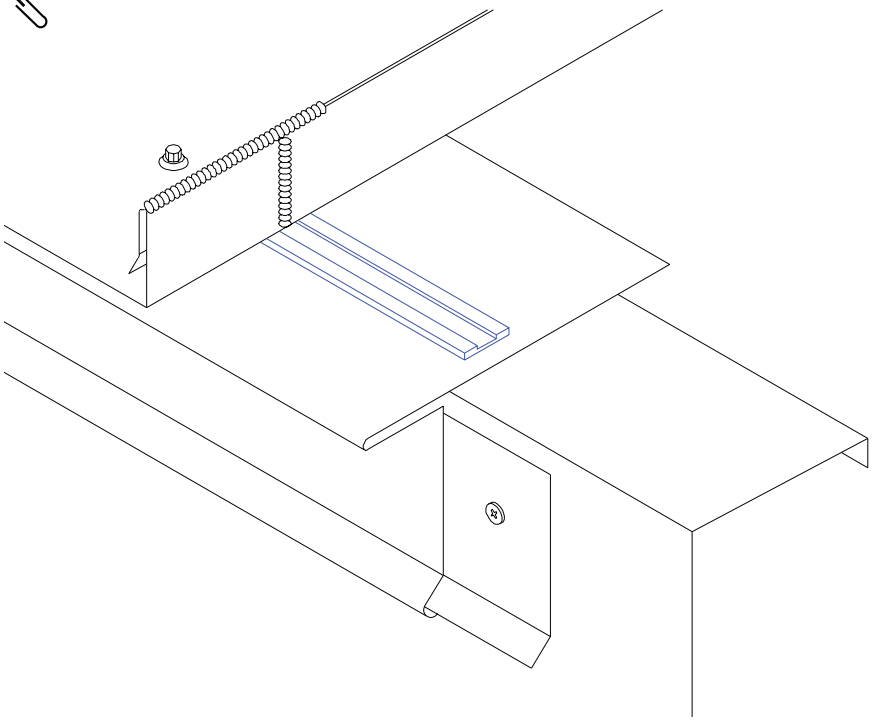
Note:
The high end of the panels must not be direct fastened to the framing.

Note:
Fill exposed end of ribs with tube sealant (See Page 53, Step 4)



Vertical Seam Fastening Pattern

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



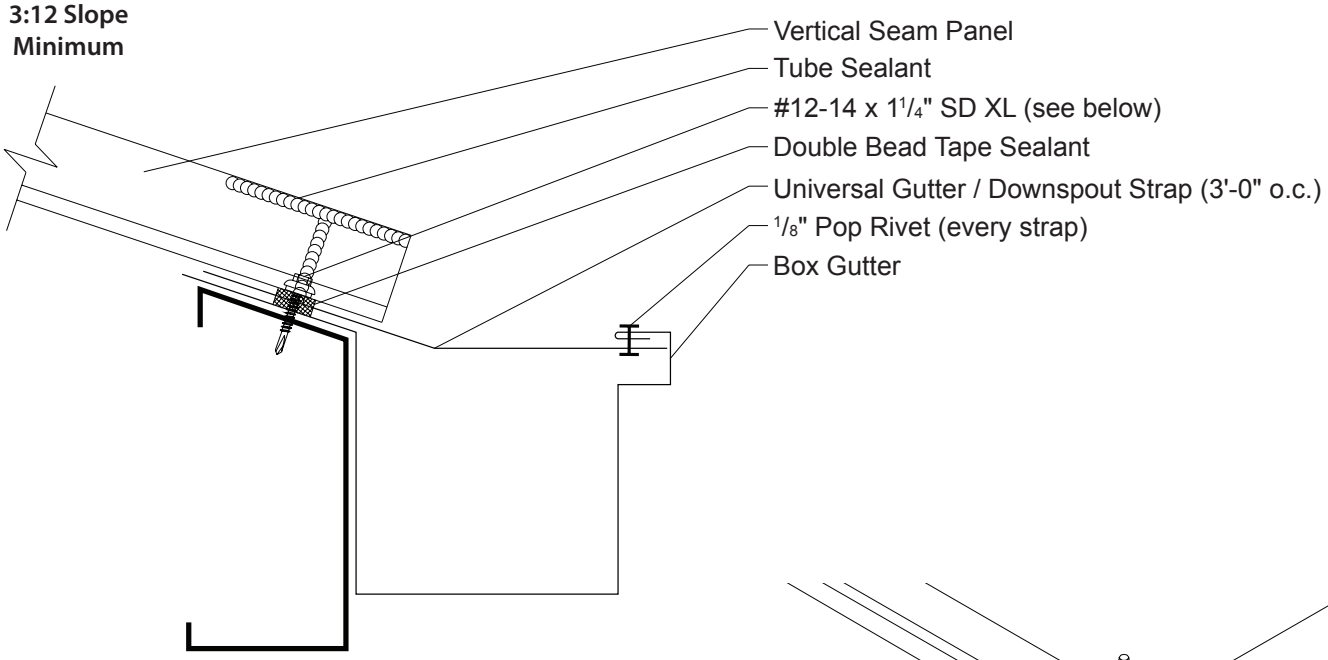
INSTALLATION NOTES

All Extended Eave flashings must be installed prior to panel installation.

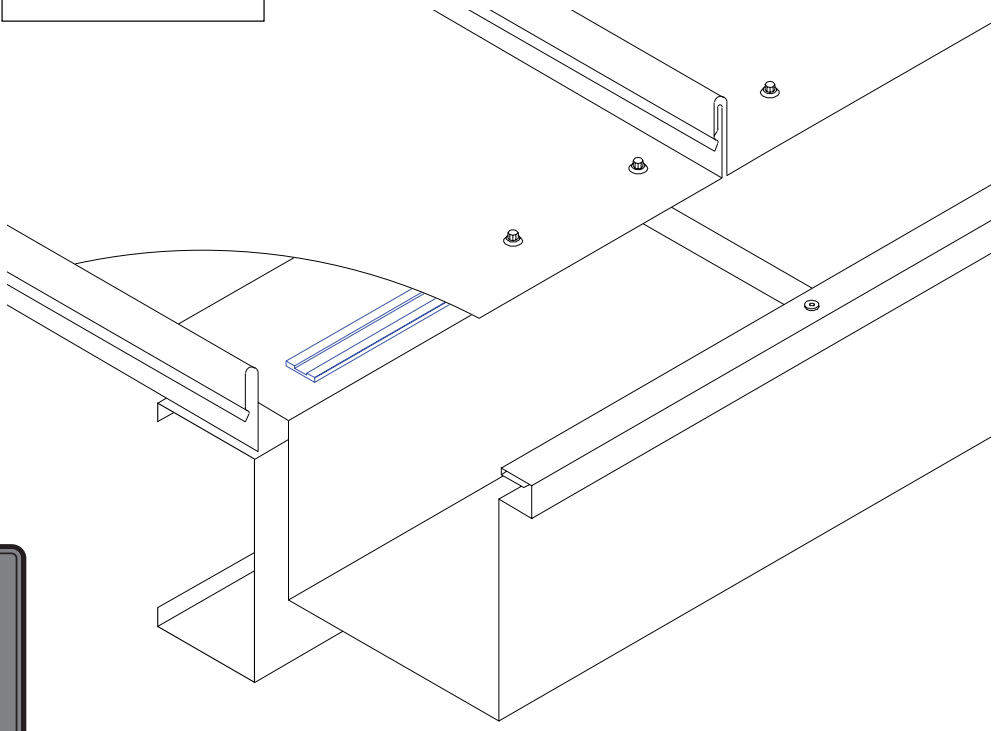
1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows for proper Extended Eave attachment.
2. Install Extended Eave flashing by sliding open hem onto Cleat and resting Extended Eave flashing back against framing. Fasten to framing with #10-16 x 1" Pancake Head Driller, 4'-0" o.c. to hold Extended Eave flashing in place during installation.
3. Apply a row of Double Bead of Tape Sealant to the Extended Eave flashing.
4. Install panel by fastening through with #12-14 x 1¼" Self Drillers XL Screws (see pages 48 and 49 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with ⅛" Pop Rivets spaced 2½" o.c.

Box Gutter Over Open Framing

3:12 Slope Minimum



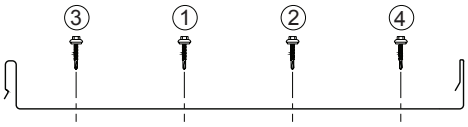
Note:
The high end of the panels must not be direct fastened to the framing.



Note:
Fill exposed end of ribs with tube sealant (See Page 53, Step 4)

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

Note:
Expansion Joint spacing for Box Gutter should be no more than 50'. Down Spout spacing should be no more than 50'.



Vertical Seam Fastening Pattern

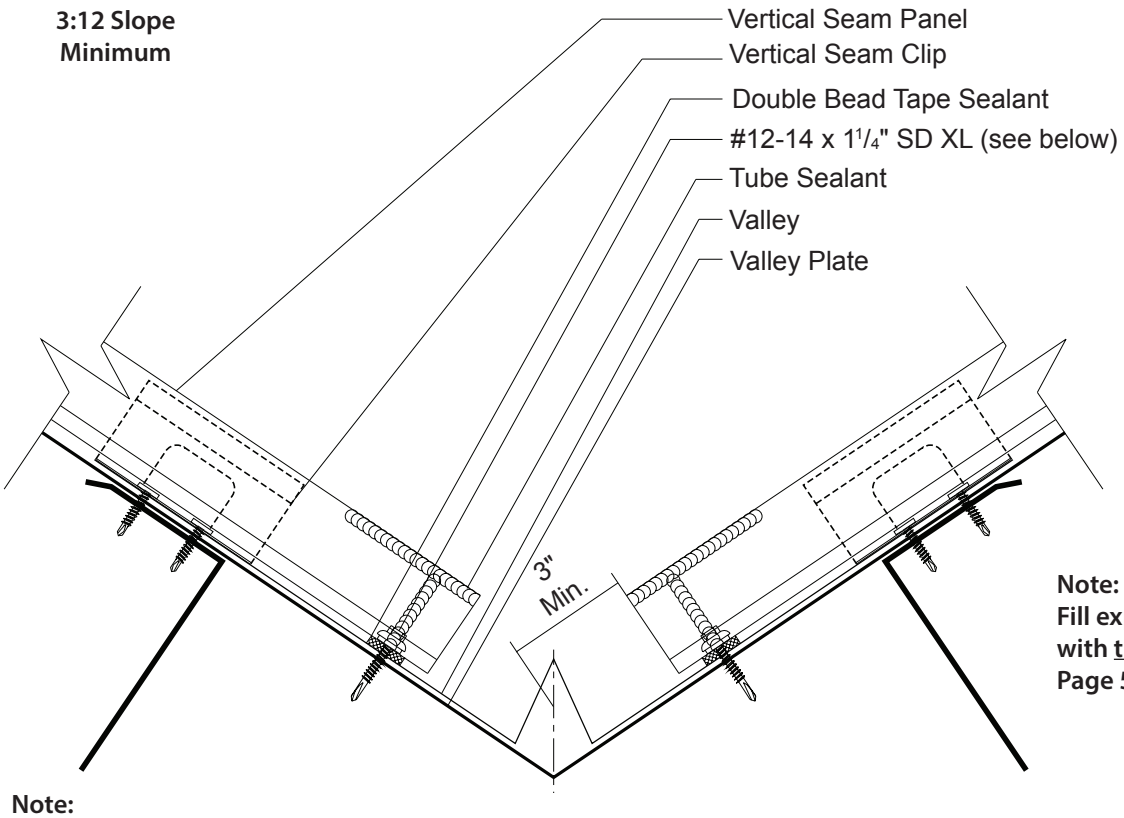
INSTALLATION NOTES

All Box Gutter flashings must be installed prior to panel installation.

1. Install Box Gutter flashing against the eave framing. To hold Box Gutter flashing in place, fasten to framing with #10-16 x 1" Pancake Head Drillers, 4'-0" o.c.
2. Install Universal Gutter/Downspout Straps every 3'-0" of gutter length to framing with #10-16 x 1" Pancake Head Drillers and fasten to Box Gutter with (1) ⅛" Pop Rivet per strap.
3. Install panel by fastening through with #12-14 x 1¼" Self Driller XL screws (see pages 48 and 49 for panel installation).
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with ⅛" Pop Rivets spaced 2½" o.c.

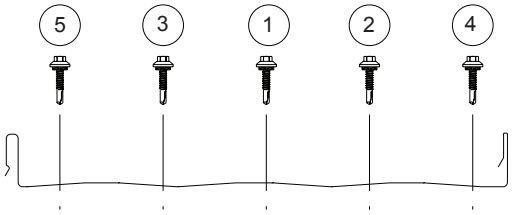
Valley Over Open Framing

3:12 Slope Minimum



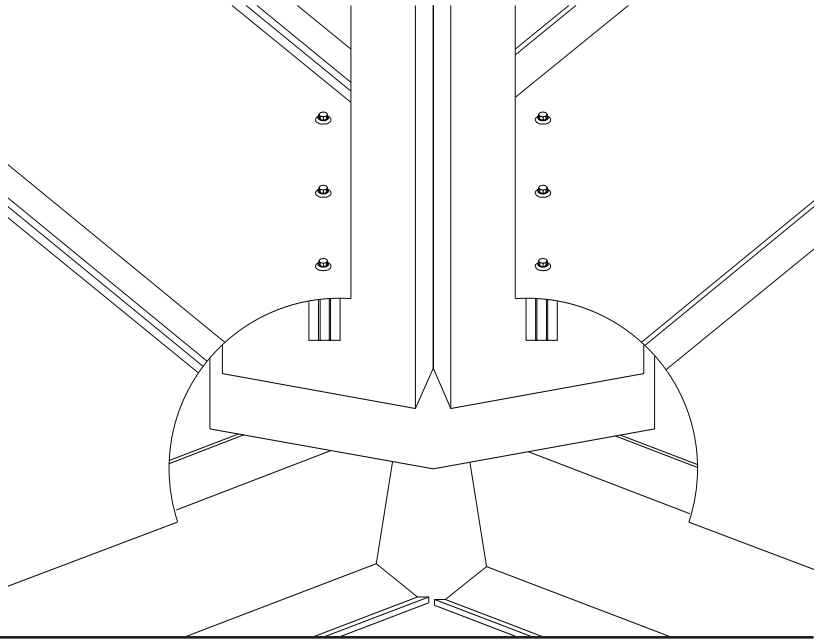
Note:
Fill exposed end of ribs with tube sealant (See Page 53, Step 4)

Note:
The high end of the panels must not be direct fastened to the framing.



Vertical Seam Fastening Pattern

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



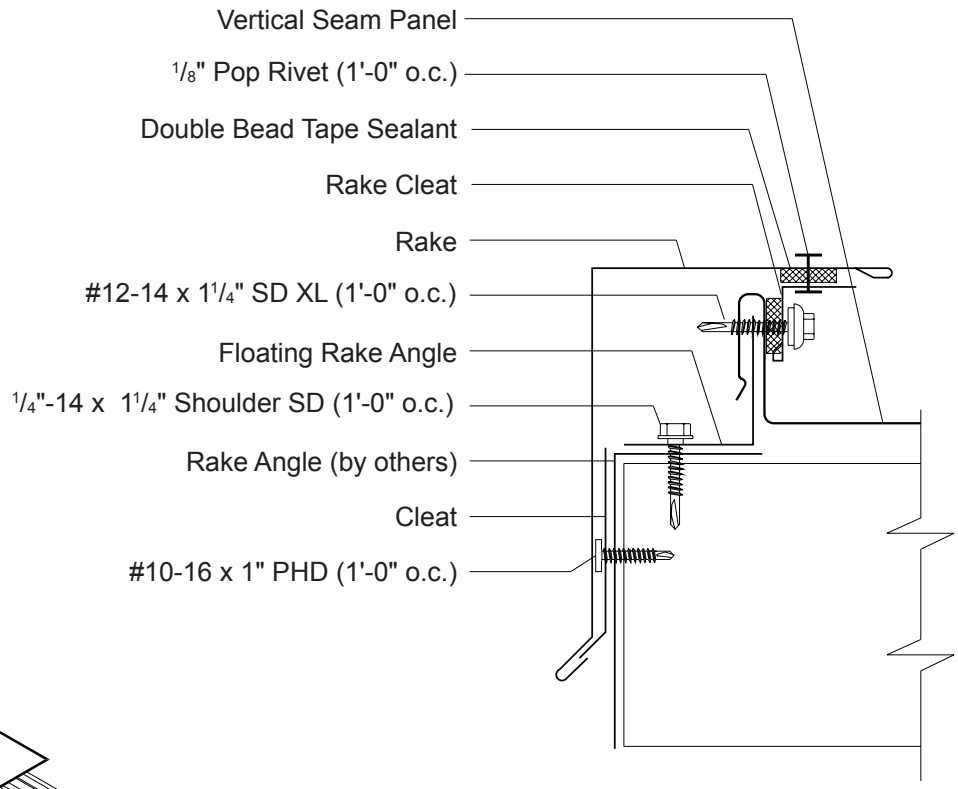
INSTALLATION NOTES

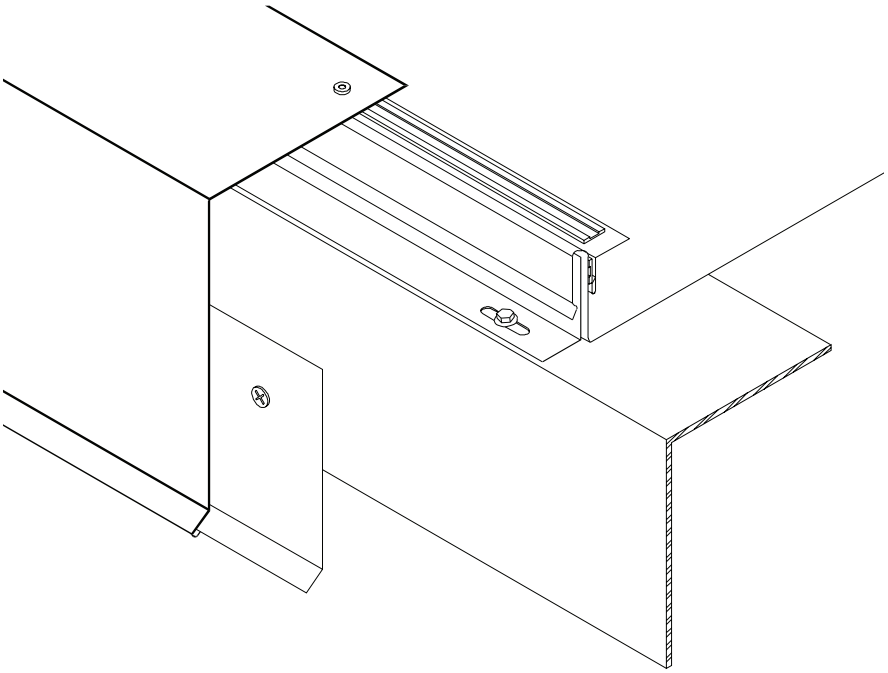
All Valley flashings must be installed prior to panel installation. If two or more Valley flashings are required, Valley flashing must be installed working from eave to peak.

1. Install Valley flashing back against framing and fasten with #10-16 x 1" Pancake Head Driller, 4'-0" o.c. to hold flashing place during installation.
2. Apply a row of Double Bead Tape Sealant across both sides of Valley flashing about 3" from the center of the valley.
3. Field cut the Vertical Seam panel to the appropriate angle and install over the Valley flashing, with (5) #12-14 x 1¼" Self Driller XL screws, as shown above (see pages 48 and 49 for panel installation).
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with (2) ⅛" Pop Rivets in the 2" water diverter.

Rake (On Module) Over Open Framing

3:12 Slope Minimum





Note:
<u>Do not overtighten</u> Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

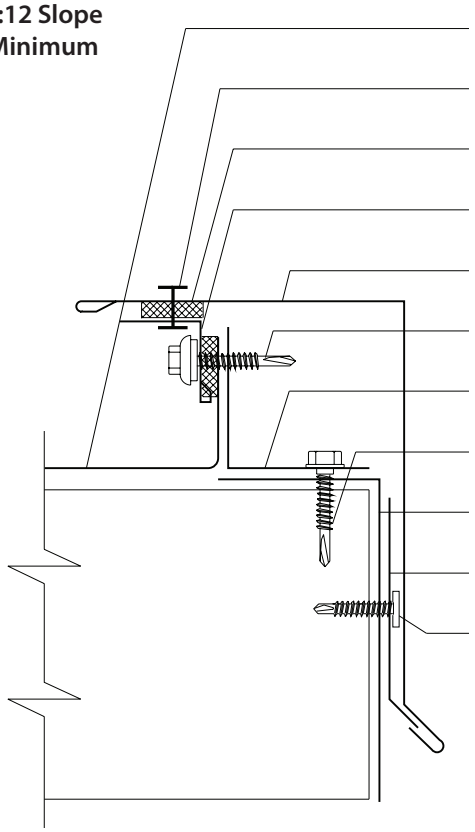
INSTALLATION NOTES

Vertical Seam panels and Floating Rake Angles must be installed prior to Rake installation (see pages 48 and 49).

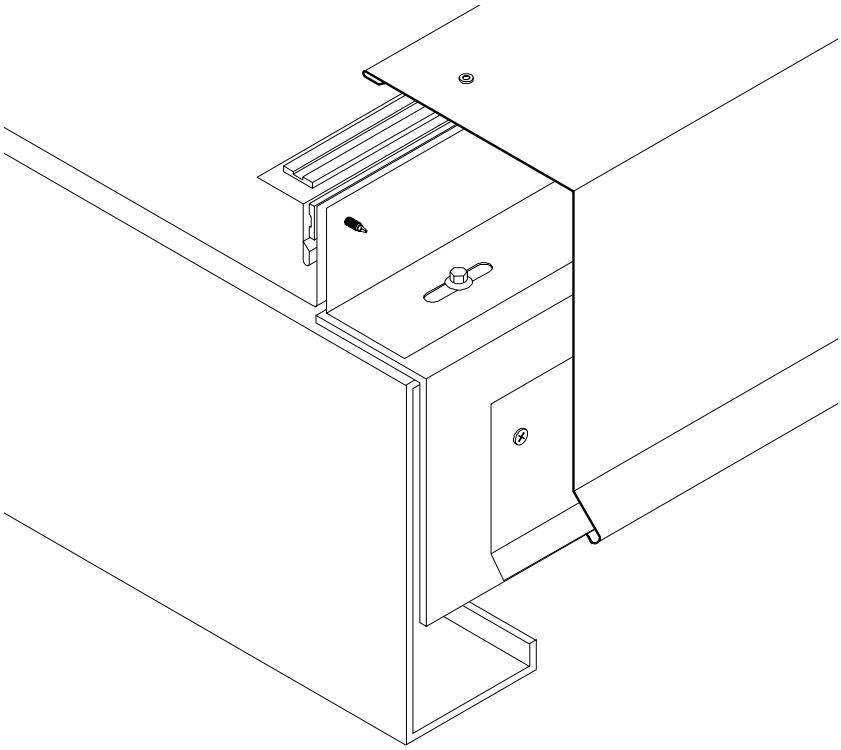
1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
2. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self-Driller XL, 1'-0" o.c.
3. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure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

Rake (Off Module) Over Open Framing

3:12 Slope Minimum



- Vertical Seam Panel
- 1/8" Pop Rivet (1'-0" o.c.)
- Double Bead Tape Sealant
- Rake Cleat
- Rake
- #12-14 x 1 1/4" SD XL (1'-0" o.c.)
- Floating Rake Angle
- 1/4"-14 x 1 1/4" Shoulder SD (1'-0" o.c.)
- Rake Angle (by others)
- Cleat
- #10-16 x 1" PHD (1'-0" o.c.)



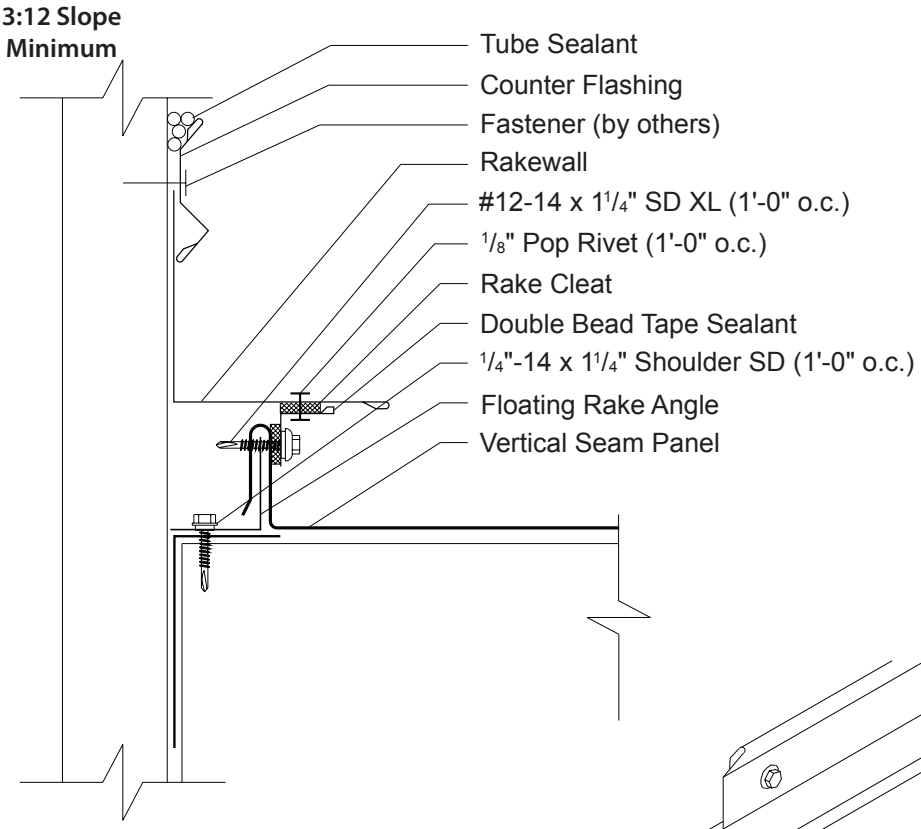
Note:
<u>Do not overtighten</u> Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

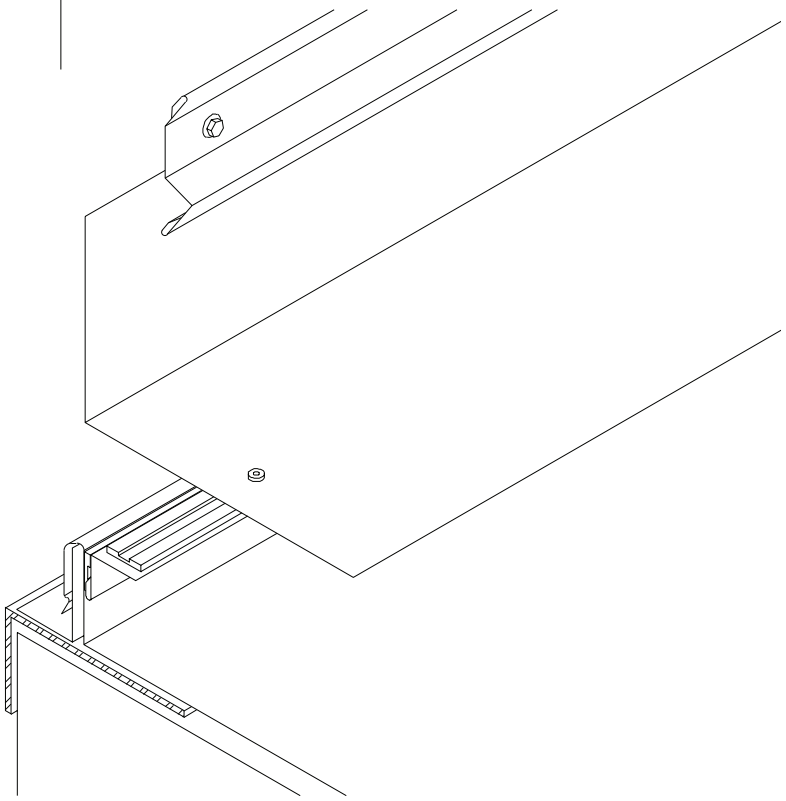
INSTALLATION NOTES

Vertical Seam panels and Floating Rake Angles must be installed prior to Rake installation (see pages 48 and 49).

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

Rake Parapet (On Module) Over Open Framing





Note:
<u>Do not overtighten</u> Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

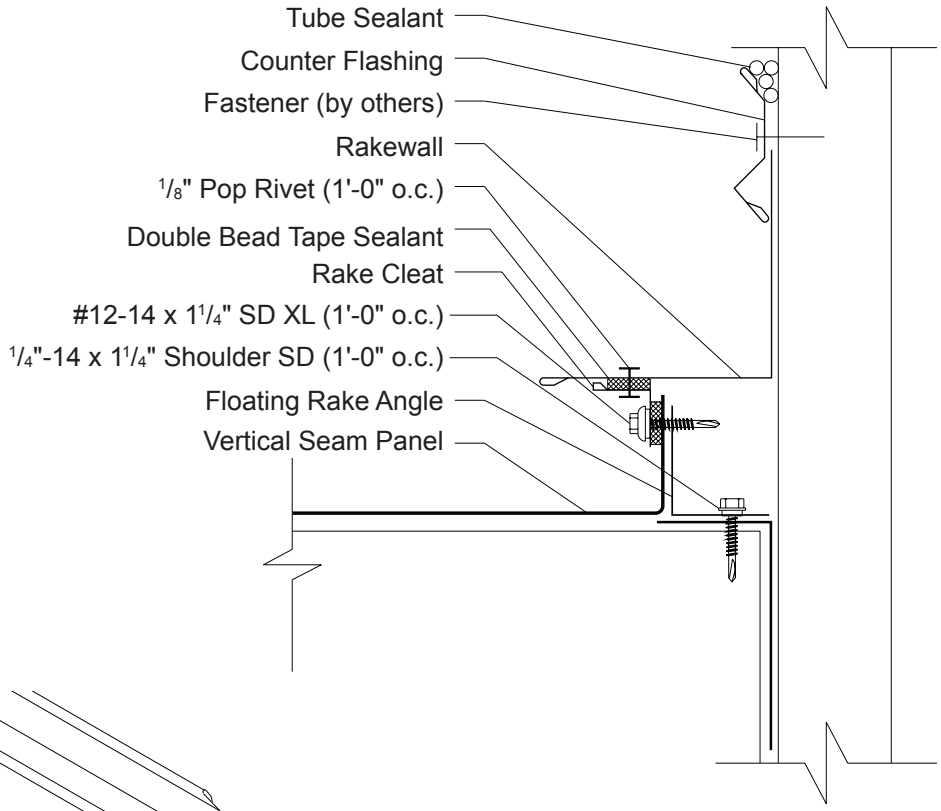
INSTALLATION NOTES

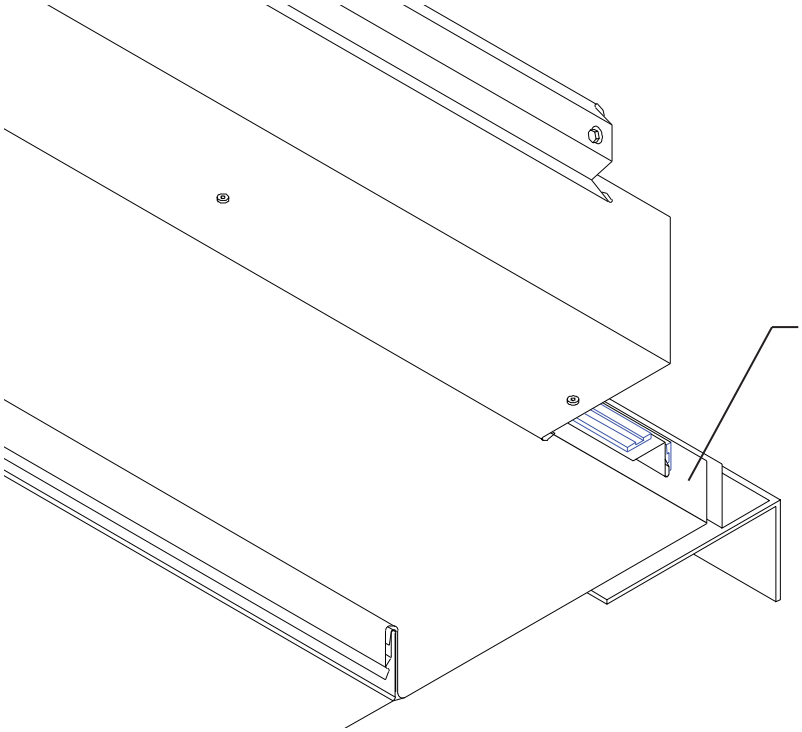
Vertical Seam panels and Floating Rake Angles must be installed prior to Rakewall installation (see pages 48 and 49).

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

Rake Parapet (Off Module) Over Open Framing

3:12 Slope Minimum





Note:
<u>Do not overtighten</u> Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

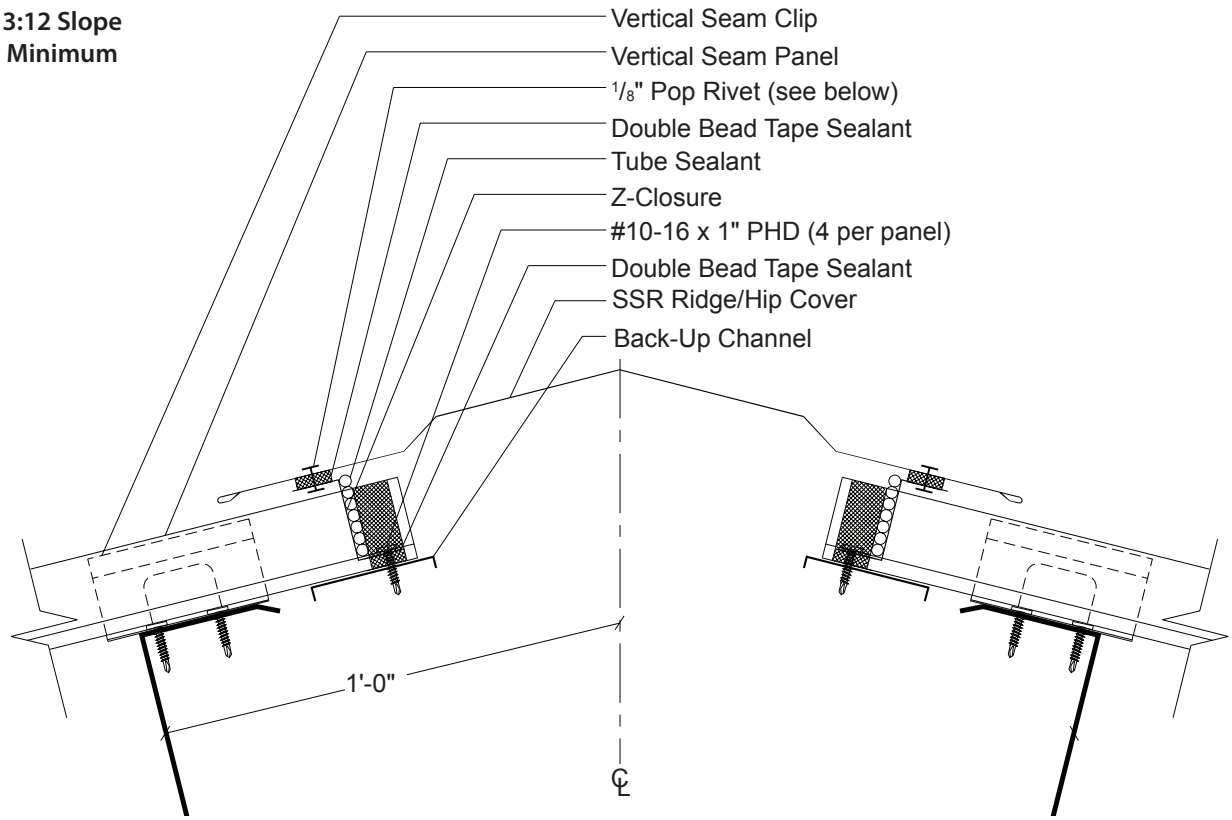
INSTALLATION NOTES

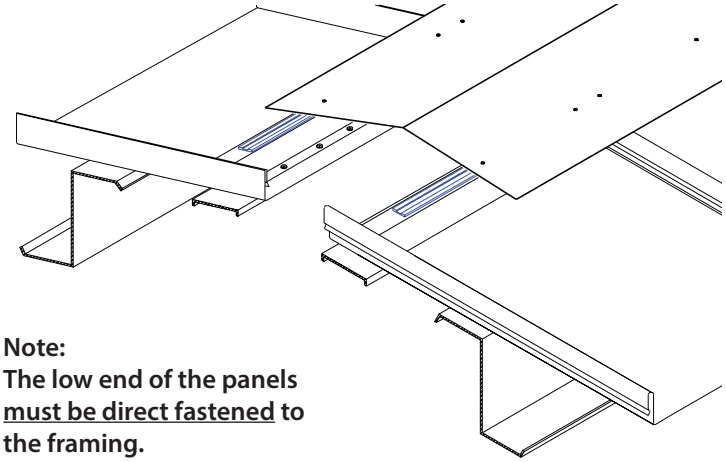
Vertical Seam panels must be installed prior to Rake installation (see pages 48 and 49).

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

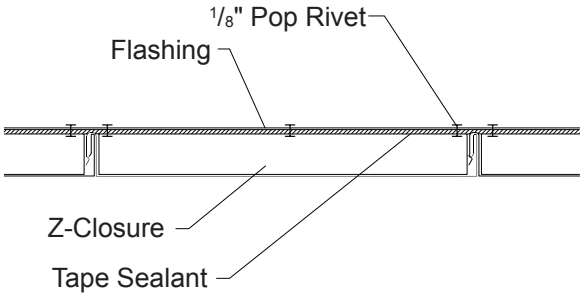
SSR Ridge/Hip Over Open Framing

3:12 Slope Minimum





Note:
The low end of the panels must be direct fastened to the framing.

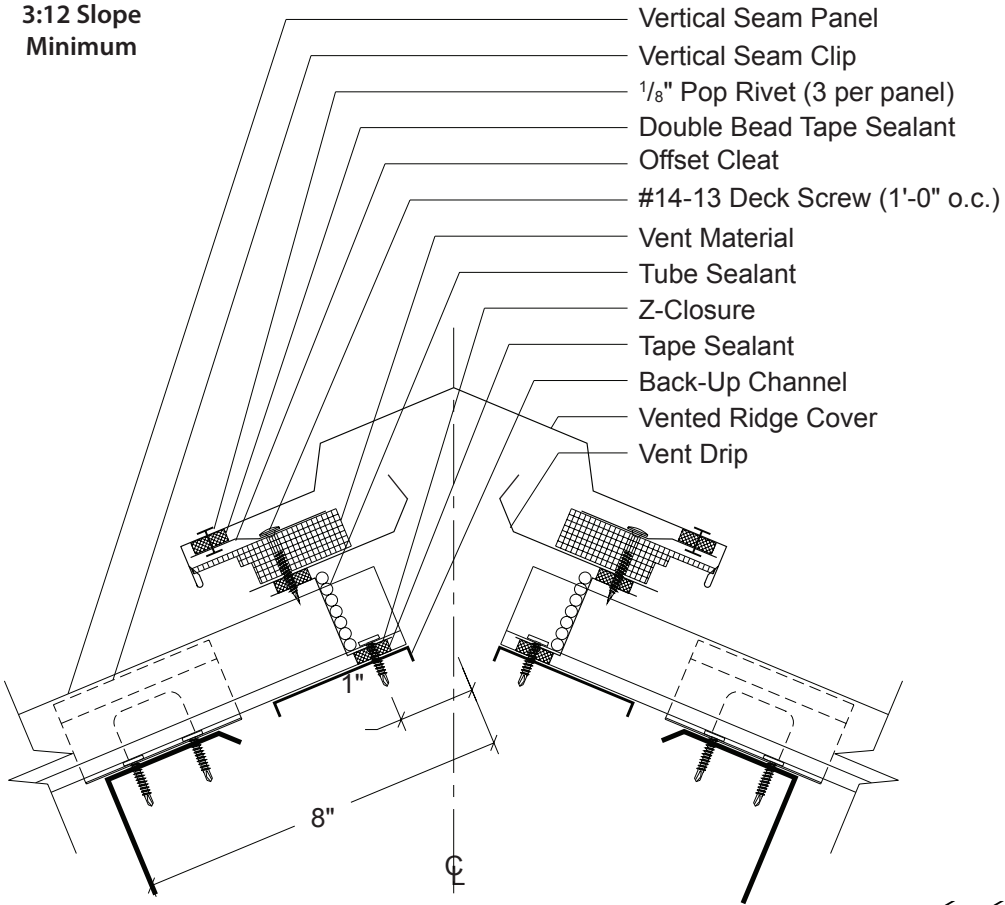


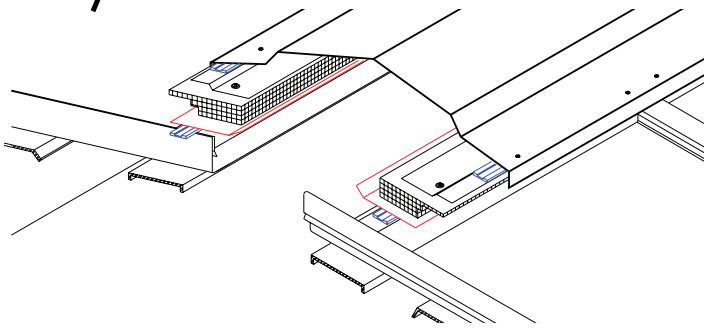
INSTALLATION NOTES

1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Locate Back-Up Channel to allow proper installation of Ridge/Hip assembly. Use C-Clamps to hold Back-Up Channel in place.
2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approximately 2" from panel end on both sides of Ridge/Hip.
3. Install Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure location will accommodate SSR Ridge/Hip Cover (see page 61).
4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure, Double Bead Tape Sealant, Vertical Seam panel and into Back-Up Channel with (4) #10-16 x 1" PHD per panel. C-Clamps may be removed once Z-Closures have been fastened.
5. Once all Z-Closures have been installed, place a row of Double Bead Tape Sealant across top of the Z-Closure on both sides of the Ridge/Hip. Tube Sealant must be used to fill any and all gaps left around the Z-Closures.
6. Install SSR Ridge/Hip Cover and secure to top leg of Z-Closure with 1/8" Pop Rivets as shown above.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Vented Ridge Over Open Framing

3:12 Slope Minimum





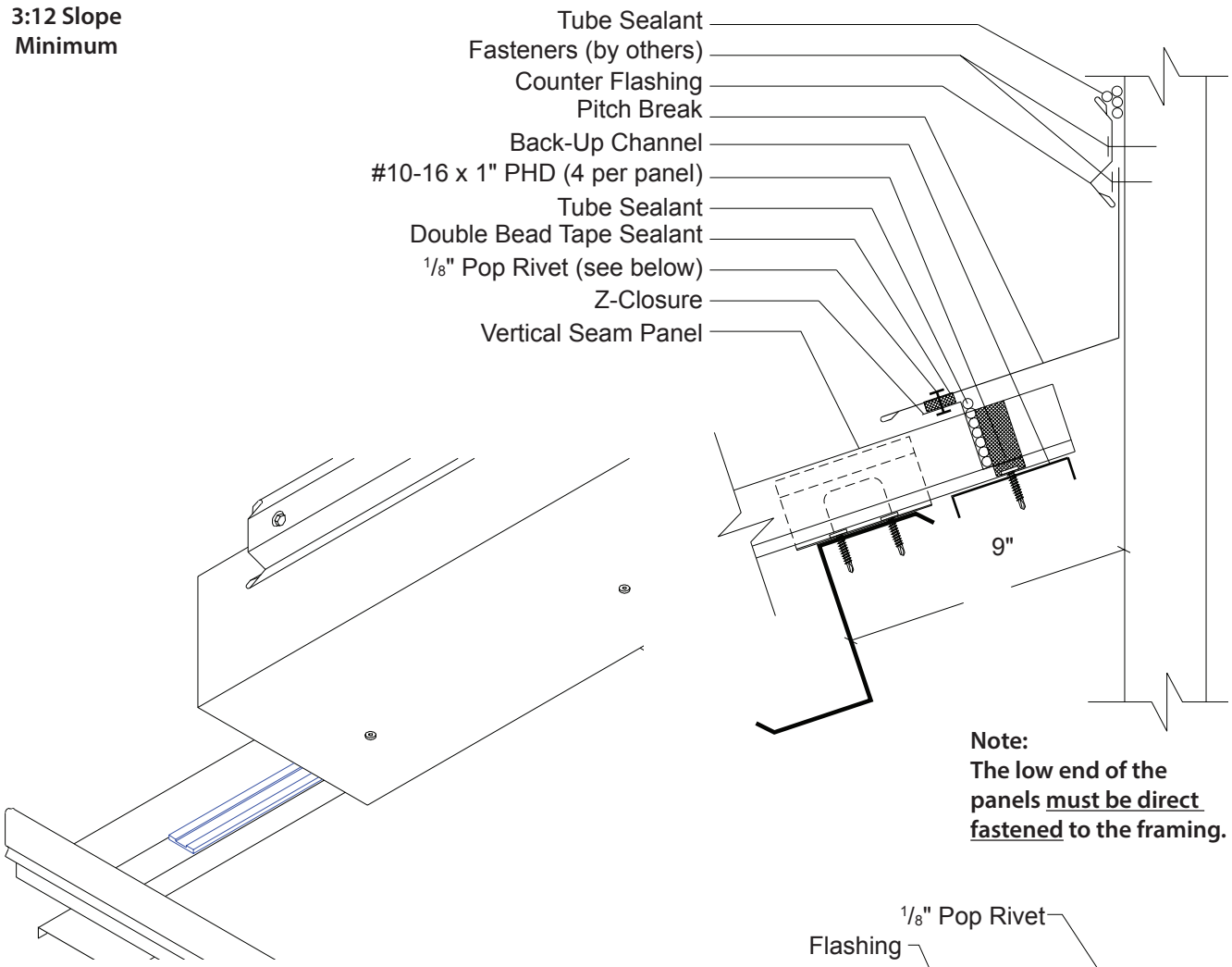
Note:
The low end of the panels must be direct fastened to the framing.

INSTALLATION NOTES

1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Locate Back-Up Channel to allow proper installation of Vented Ridge assembly. Use C-Clamps to hold Back-Up Channel in place.
2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approximately 2” from panel end on both sides of ridge.
3. Install Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure location will accommodate Vented Ridge Cover (see page 61).
4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure, Double Bead Tape Sealant, Vertical Seam panel and into Back-Up Channel with (4) #10-16 x 1” PHD per panel. C-Clamps may be removed once Z-Closures have been fastened.
5. Once all Z-Closures have been installed, place a row of Double Bead Tape Sealant across top of the Z-Closure on both sides of the ridge. Tube Sealant must be used to fill any and all gaps left around the Z-Closures.
6. Install Vent Drip, Vent Material and Offset Cleat and fasten to top leg of Z-Closure with #14-13 Deck Screws, 1’-0” o.c.
7. Apply a row of Double Bead Tape Sealant across outer leg of Offset Cleat.
8. Install Vented Ridge Cover and secure to outer leg of Offset Cleat with 1/8" Pop Rivets as shown above.
9. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2” placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

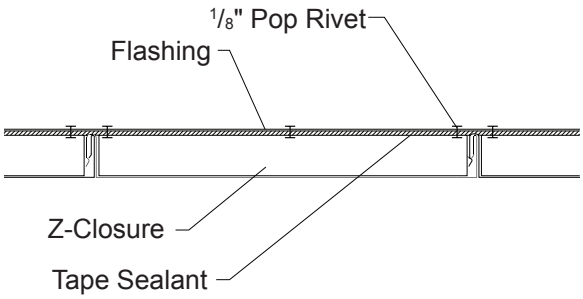
Highside Parapet Over Open Framing

3:12 Slope Minimum



Note:
The low end of the panels must be direct fastened to the framing.

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

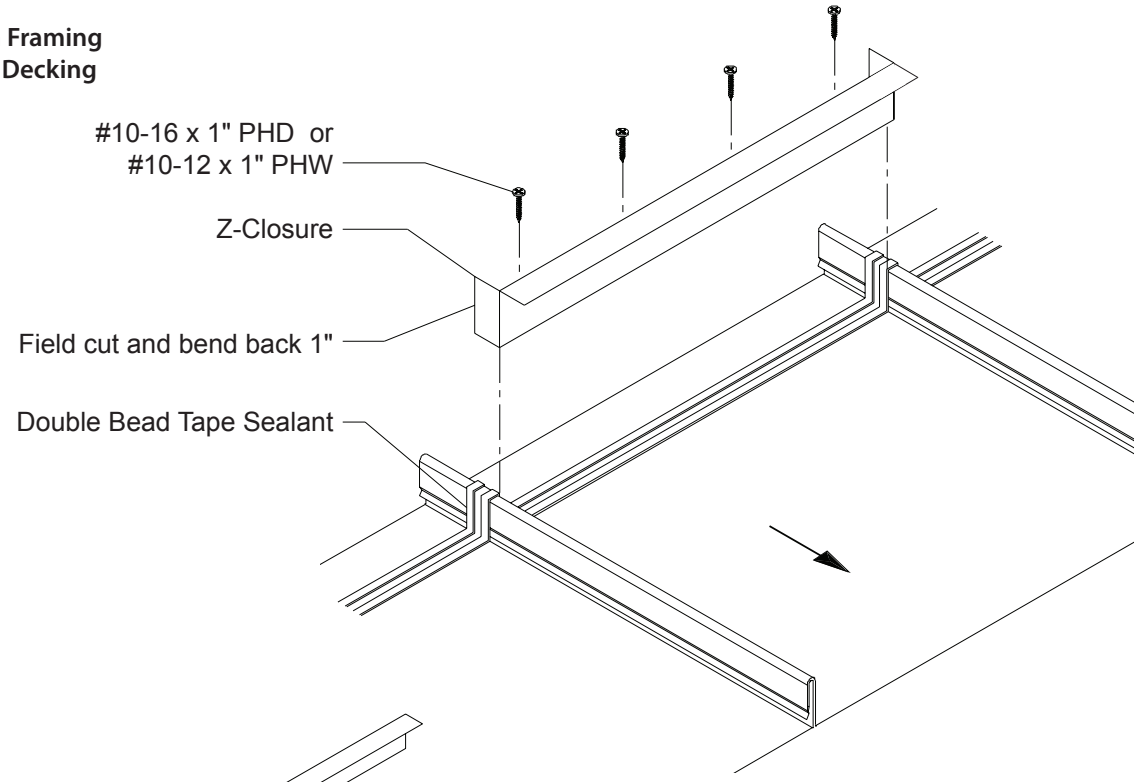


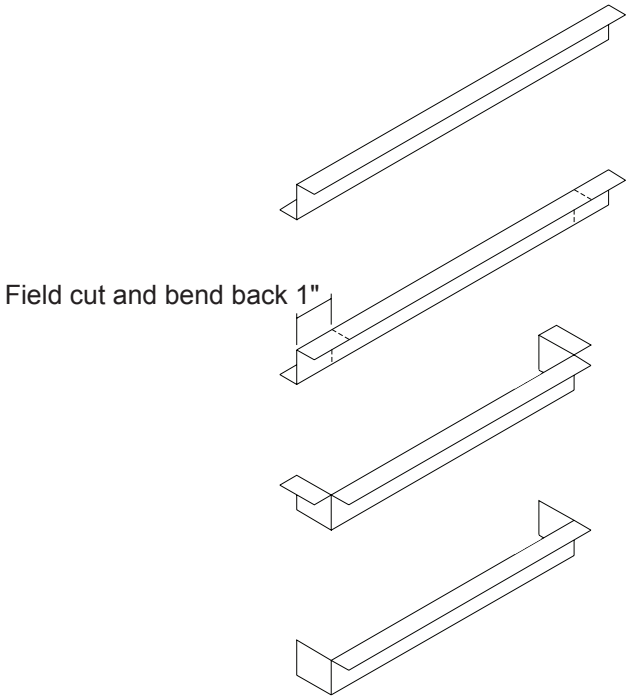
INSTALLATION NOTES

1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Locate Back-Up Channel to allow proper installation of Endwall assembly. Use C-Clamps to hold Back-Up Channel in place.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end.
3. Install field-cut Z-Closure over Double Bead Tape Sealant. Before continuing, make sure Z-Closure location will accommodate Pitch Break flashing (see page 61).
4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure, and into Back-Up Channel with (4) #10-16 x 1" Pancake Head Drillers per panel. C-Clamps may be removed once Z-Closures have been fastened.
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings or openings around panel ribs. Position and install Pitch Break flashing to Z-Closure with 1/8" Pop Rivets as shown.
6. Fasten vertical leg of Pitch Break to the parapet wall with the appropriate fastener, 1'-0" o.c.
7. Install Counter Flashing, Reglet or wall panel and fasten to parapet wall with appropriate fastener, 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

VERTICAL SEAM Z-Closure Installation

Minimum Slope:
3:12 over Open Framing
1:12 over Solid Decking





INSTALLATION NOTES

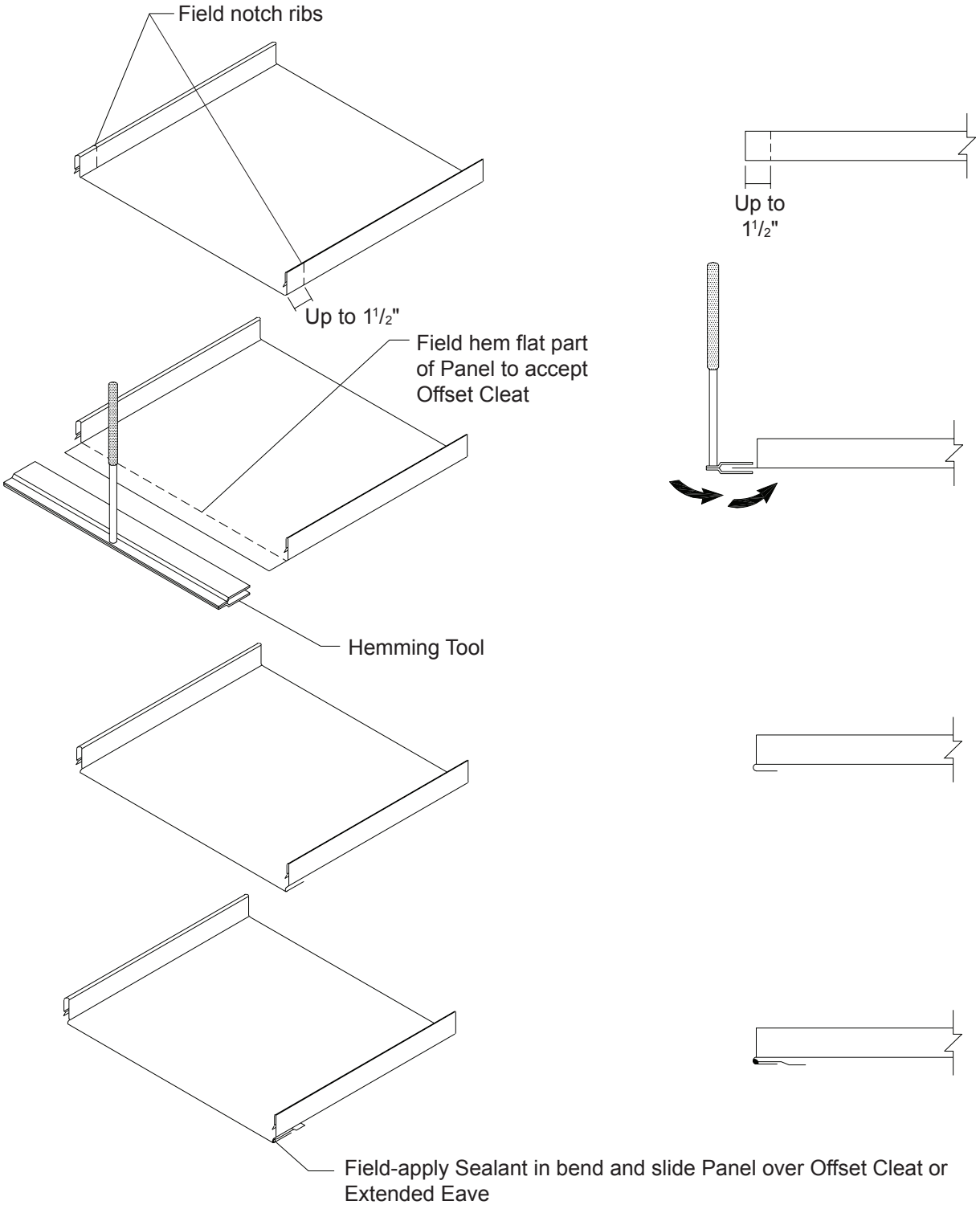
1. Place a row of Double Bead Tape Sealant across panel and over each rib approximately 4" from panel end. Before proceeding, make sure Z-Closure placement will accommodate flashing.
2. Field cut the Z-Closure 2" longer than the clear width between ribs. Snip the top and bottom leg of the Z-Closure and bend both sides back, as shown above.
3. Fasten through the Z-Closure, Tape Sealant, Vertical Seam panel and support material with (4) #10-12 x 1" PHWS per panel for solid decking or (4) #10-16 x 1" PHD per panel for open framing.

Note: For open framing, the support is a Back-Up Channel as shown in the details.

4. Apply a row of Double Bead Tape Sealant across the top of the Z-Closure filling any gaps or openings around the panel ribs with Tube Sealant.This will be fastened through when the flashing is installed.

Eave Panel Notching and Hemming

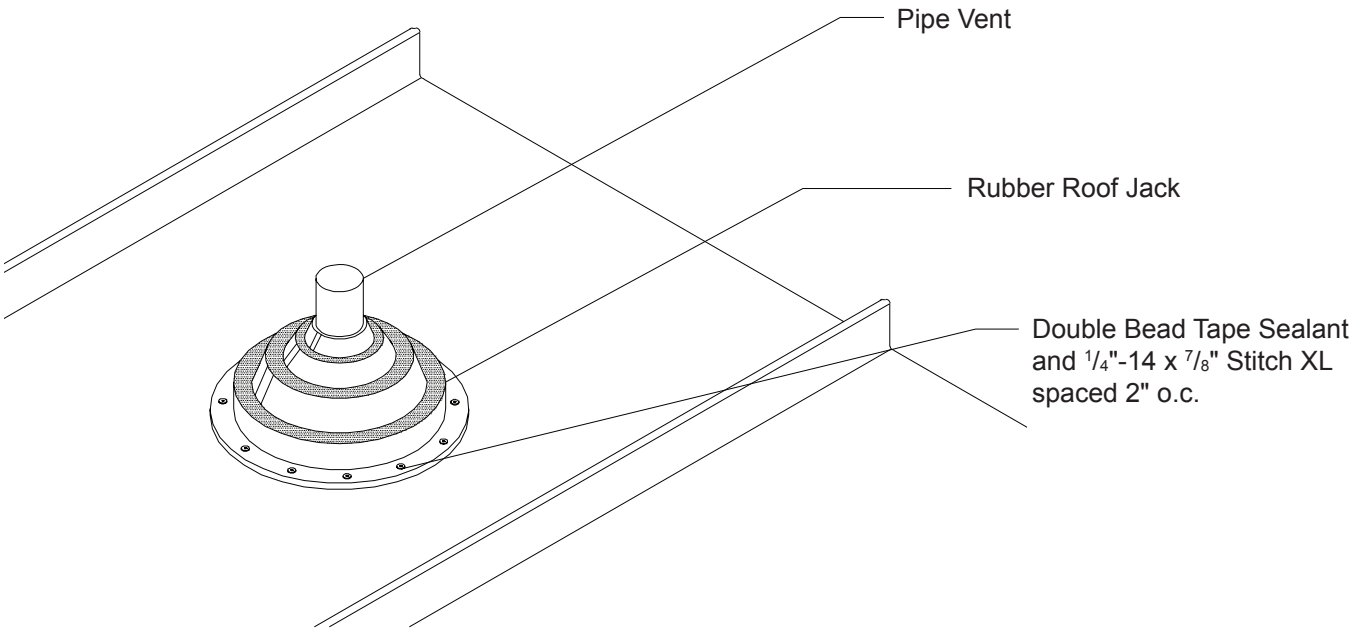
Panels must be field notched and hemmed when using an Offset Cleat or Extended Eave.



FIELD HEMMING STEPS

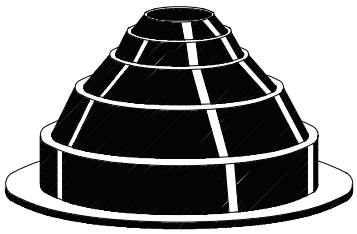
1. Field notch underlap and overlap ribs of panel up to 1 1/2" from end of panel.
2. Place the hemming tool onto the protruding pan of the panel and bend down to form an open hem.
3. Place a continuous bead of Tube Sealant inside the open hem.
4. Engage Offset Cleat or Extended Eave into open hem at the end of the panel to start panel installation.

Roof Penetration Installation



Note:
For Panel installed over sheathing, <u>cut the hole in the sheathing larger than the Roof Jack base</u>. The Roof Jack fasteners must attach to the panel but not the sheathing.

Note:
<u>Plan the installation</u> of the panels so that the penetrations are in the the flat of the panels if possible.



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

Note:
<u>Provide framing for pipe</u>. The intent is for the pipe vent to be supported below the roof deck to resist sliding snow. Framing on top of the panels may be also be necessary.

GENERAL NOTES

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

INSTALLATION NOTES

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

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

Care and Maintenance

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

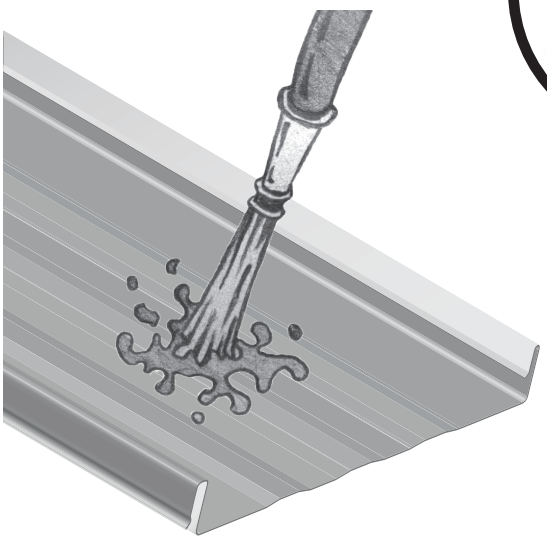
Dirt pickup may cause apparent discoloration of the paint when it has been exposed in some dirt laded atmospheres for long periods of time. In areas of strong sunlight, slight chalking may cause some change in appearance. A good cleaning will often restore the appearance of these buildings and render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

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

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

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

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



HOSE OR PRESSURE SPRAY
FOR ADEQUATE CLEANING

DO NOT USE A
WIRE BRUSH

USE MILD DETERGENT AND WATER
FOR HEAVY DIRT DEPOSITS

Notes