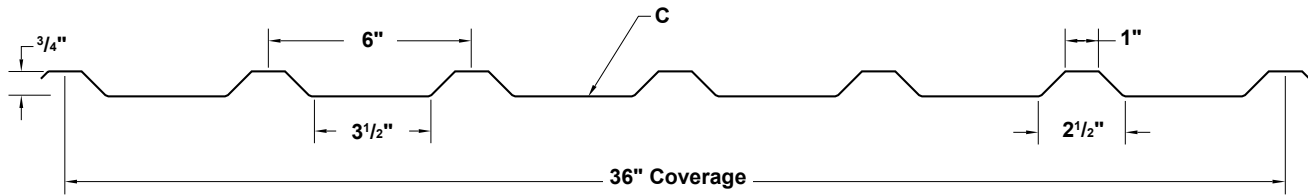


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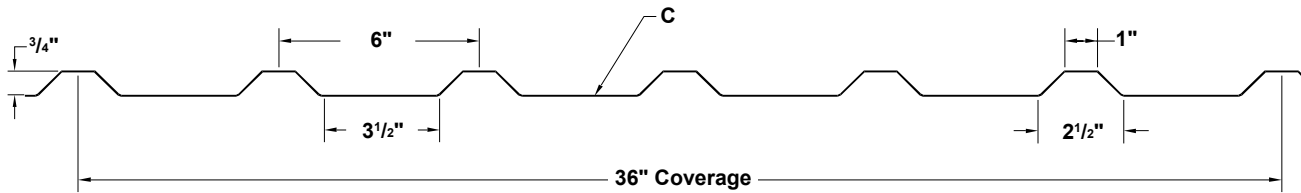
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# U-PANEL PANEL OVERVIEW

## U-PANEL PROFILE



## PBU-PANEL PROFILE



## SLOPE

The minimum recommended slope for any "U" and "PBU" roofing panel is 1:12. Metal Sales recommends that in all roof applications sealant be used on sidelaps.

## SUBSTRATE

U-Panel is designed to be utilized over open structural framing, but can easily be used with a solid substrate. The recommended substrate is 5/8" plywood with a 30 pound felt moisture barrier. To avoid panel distortion, use a properly aligned and uniform substructure. Note: PBU-Panel is recommended for roof applications.

## COVERAGE

Each panel has a coverage of 36".

## LENGTH

Lengths under 5'-0" are available with some cutting restrictions. Maximum recommended panel length is 45'-0". Longer panels require additional consideration in packaging, shipping, and erection. Please consult your Metal Sales branch for recommendations (see PGI-2 and PGI-3 for locations).

## AVAILABILITY

Panels are available in 26, 24, and 22 gauge. Minimum quantities may apply.

## APPLICATION

Commercial, Industrial, and Architectural panels.

## PERFORMANCE TEST

UL 580, UL 2218, UL 790, Texas Department of Insurance.

## FASTENING SYSTEM

Direct Fastened (exposed).

## FASTENERS

The fastener selection guide should be consulted for choosing proper fasteners for specific applications. Quantity and type of fastener must meet necessary loading and code requirements (see PGI-12-14).

## MATERIALS

Steel grade 50 per ASTM A-792  
Steel grade 80 per ASTM A-792 or ASTM A-653

## FINISH

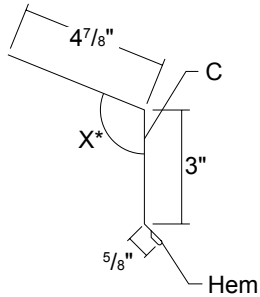
- ▶ \*Acrylic Coated Galvalume® (ACG) / ASTM A-792 - AZ55
- ▶ Prepainted Galvalume / ASTM A-792 - AZ50
- ▶ MS Colorfast45®
- ▶ \*\*Fluorocarbon (PVDF)

\* Differential appearance of Acrylic Coated Galvalume roofing materials is not a cause for rejection.

\*\* Meets both Kynar 500 and Hylar 5000 specifications.

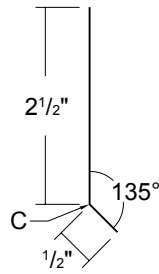
# U-PANEL FLASHING PROFILES

## EAVE (DIRECT FASTEN)



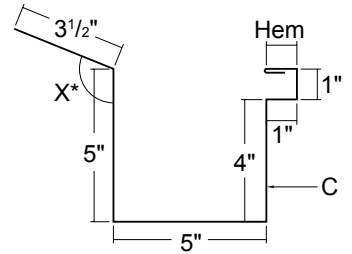
Length 10'-2" - \*Specify Slope Angle

## CLEAT



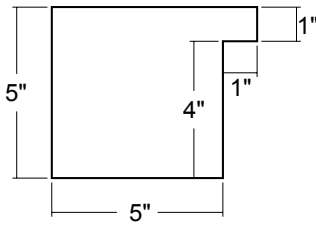
Length 10'-2"

## BOX GUTTER

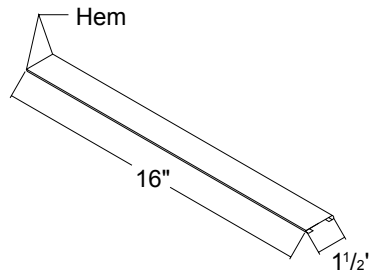


Length 10'-2", 20'-3" - \*Specify Slope Angle

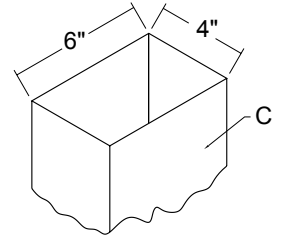
## BOX GUTTER END



## UNIVERSAL GUTTER/ DOWNSPOUT STRAP

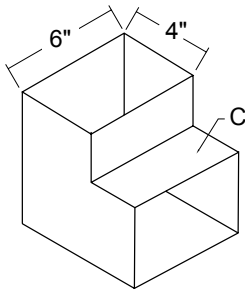


## DOWNSPOUT 6" x 4"



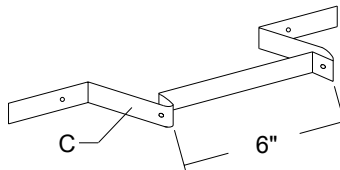
Length 10'-2", 20'-3"  
(Also available 4" x 3 1/2")

## 95° ELBOW 6" x 4"



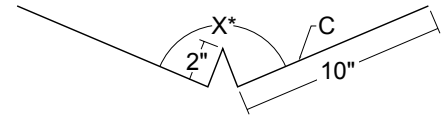
(Also available 4" x 3 1/2")

## DOWNSPOUT BRACKET



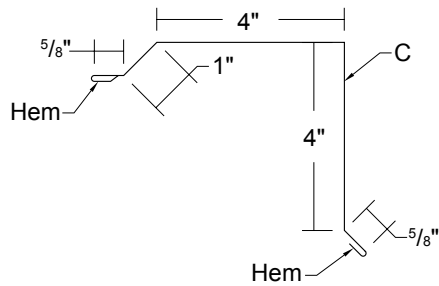
(Also available 4")

## VALLEY



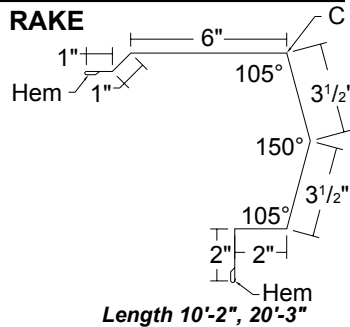
Length 10'-2", 20'-3" - \*Specify Slope Angle

## U-PANEL RAKE



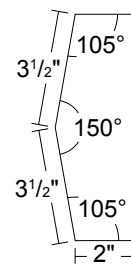
Length 10'-2", 20'-3"

## U-PANEL SCULPTURED

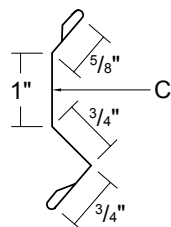


Length 10'-2", 20'-3"

## SCULPTURED RAKE END

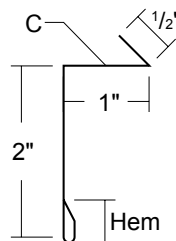


## COUNTER FLASHING



Length 10'-2"

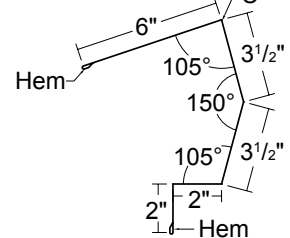
## REGLET FLASHING



Length 10'-2"

## SCULPTURED

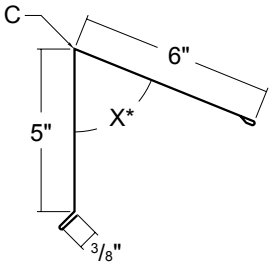
### HIGH SIDE EAVE



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

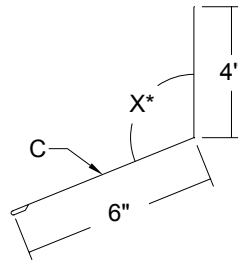
# U-PANEL FLASHING PROFILES (CONT.)

## PEAK



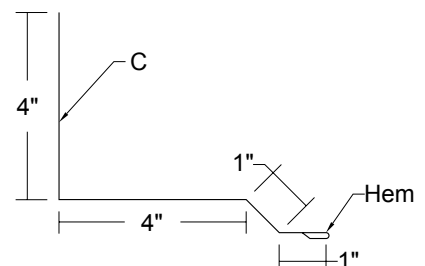
Length 10'-2", 20'-3" - \*Specify Slope Angle

## PITCH BREAK



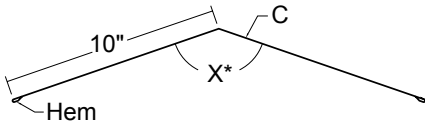
Length 10'-2" - \*Specify Slope Angle

## U-PANEL RAKEWALL



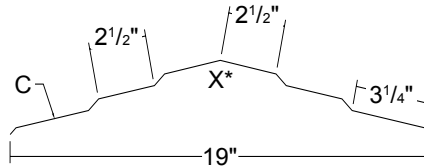
Length 10'-2"

## 20" RIDGE/HIP COVER



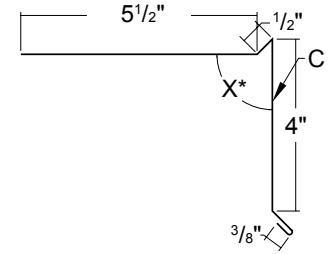
Length 10'-2", 20'-3" - \*Specify Slope Angle

## UNIVERSAL RIDGE COVER



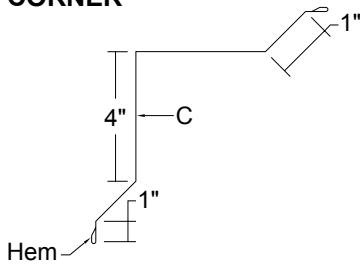
Length 10'-2" - \*Specify Slope Angle

## GRAVEL STOP



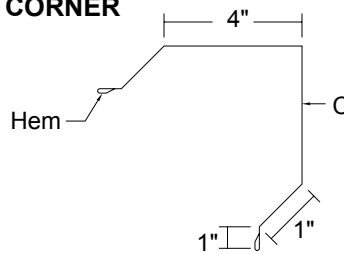
Length 10'-2", 20'-3"

## U-PANEL INSIDE CORNER



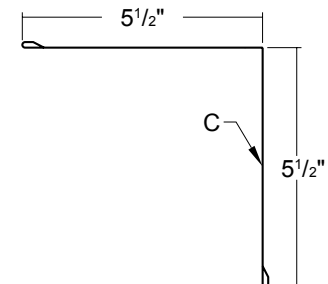
Length 10'-2", 14'-2", 20'-3"

## U-PANEL OUTSIDE CORNER



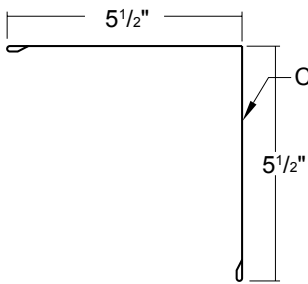
Length 10'-2", 14'-2", 20'-3"

## INSIDE CORNER



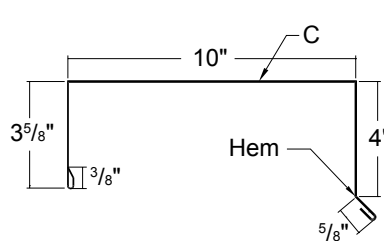
Length 10'-2", 20'-3"

## OUTSIDE CORNER



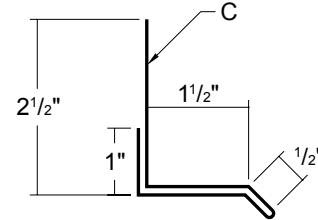
Length 10'-2", 20'-3"

## COPING



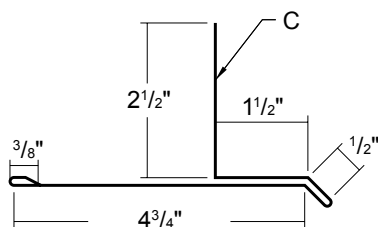
Length 10'-2", 20'-3"

## 1.5" SILL/HEAD



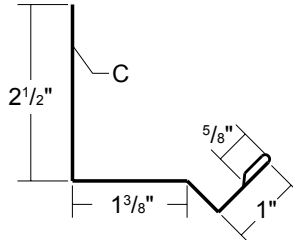
Length 10'-2"

## 1.5" SILL TO SOFFIT



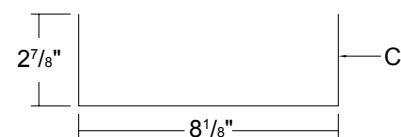
Length 10'-2"

## HEAD CHANNEL



Length 10'-2"

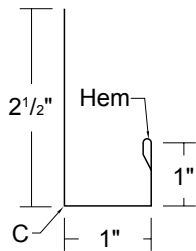
## HEAD/JAMB COVER



Length 10'-2", 14'-2"

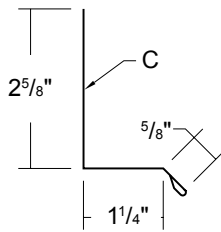
# U-PANEL FLASHING PROFILES (CONT.) AND ACCESSORY PROFILES

## U-PANEL JAMB



Length 7'-3", 10'-2", 14'-2"

## 1.25" BASE



Length 10'-2"

C- Indicates color side of flashing.

## U-PANEL ACCESSORY PROFILES

### U-PANEL CLOSURES



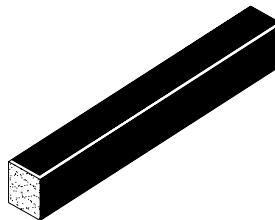
Outside Closure



Inside Closure

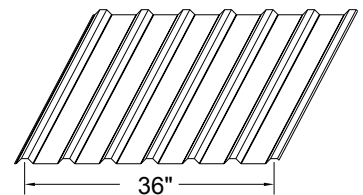
Polyethylene Foam

### UNIVERSAL CLOSURE



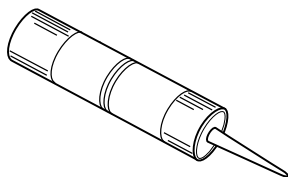
1" x 1 1/2" x 50' Polyethylene Foam  
1" x 1 1/2" x 10' Polyethylene Foam

### U-PANEL LIGHT TRANSMITTING PANEL



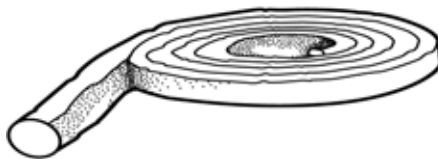
8 Ounce Fiberglass

### TUBE SEALANT



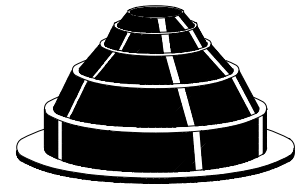
10.3 oz. Cartridge  
Urethane

### TAPE SEALANT



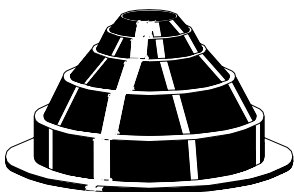
3/8" X 3/32" X 50'  
Single Bead  
Butyl - Gray

### RUBBER ROOF JACK



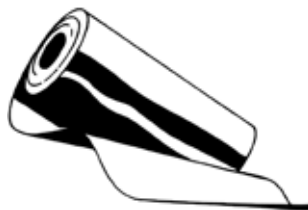
MINI (1/4" to 1/8" O.D. Pipe)  
#2 (1 3/4" to 3" O.D. Pipe)  
#4 (3" to 6" O.D. Pipe)  
#6 (6" to 9" O.D. Pipe)  
#8 (7" to 13" O.D. Pipe)

### RETRO ROOF JACK



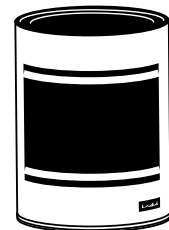
#801RETRO (3/4" to 2 3/4" O.D. Pipe)  
#802RETRO (2" to 7 1/4" O.D. Pipe)  
#803RETRO (3 1/4" to 10" O.D. Pipe)

### RUBBER ROOF FLASH KIT



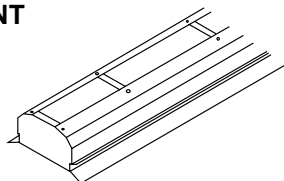
12" x 50'-0" Flash Kit  
18" x 50'-0" Flash Kit

### TOUCH-UP PAINT



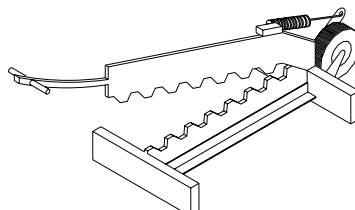
Available in pints  
PVDF / MS Colorfast45

### CONTINUOUS RIDGE VENT

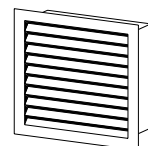


4" x 10', 9" x 10', 12" x 10'

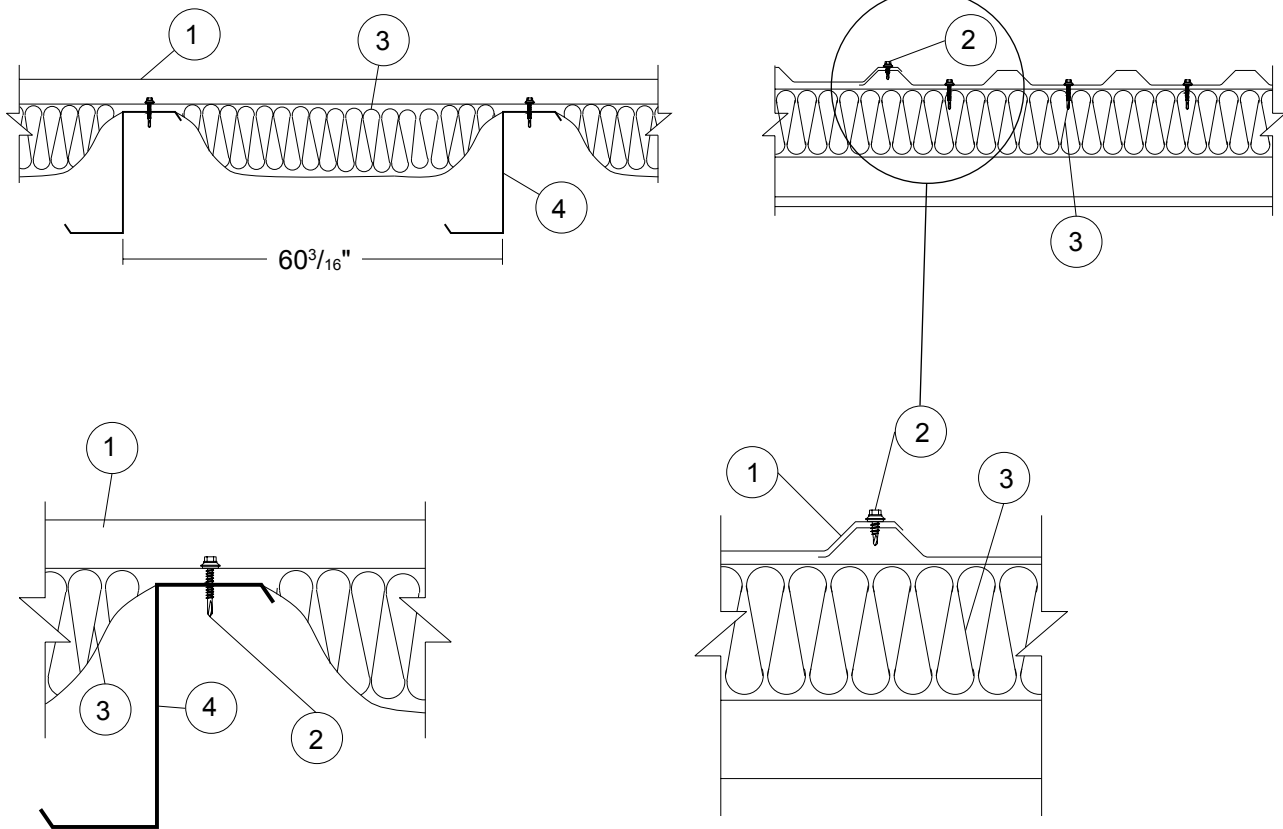
### U-PANEL SHEAR



### LOUVRE WITH SCREEN



3' x 3', 3' x 4'



**U-PANEL**

**Construction No. 39**  
 December 12, 2000  
 Uplift - Class 90  
 Fire Not Investigated

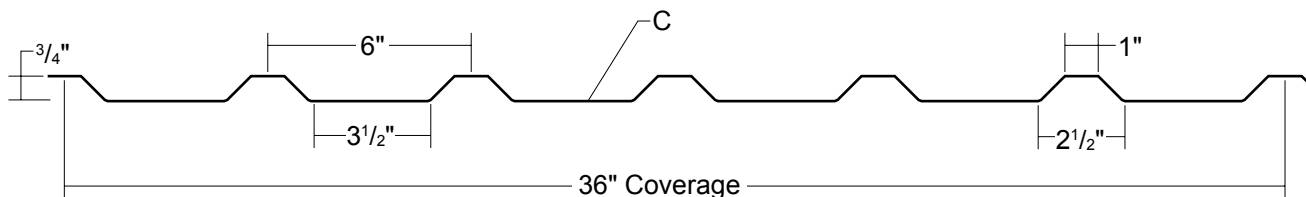
1. **Metal Roof Deck Panels\*** No. 26 MSG min gauge coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 6 in. with lap beginning 1 in. from edge of purlin flange and extending across purlin. A bead of sealant may be used at panel end and side laps.  
 METAL SALES MFG CORP - Type "U".
2. **Panel Fasteners** For panel to purlin and panel to panel connections to be No. 14 self-tapping, hex-head, plated steel or stainless steel screws with a separate 5/8 in. O.D. steel or aluminum washer and a separate neoprene sealing washer. Length: For panel to purlin fasteners to be 3/4 in. for insulation up to 3 in. and 1-1/4 in. for insulation over 3 in. For panel to panel fasteners to be 3/4 in. Spacing for panel to purlin fasteners to be 6 in. O.C. with fasteners located adjacent to the major ribs. Pilot holes: For panel to purlin fasteners to be 13/64 in. diam. For panel to panel fasteners to be 1/8 in. diam. At end laps spacing to be 6 in. O.C. with fasteners located adjacent to major ribs. Spacing for panel to panel fasteners to be 12 in. O.C. Pilot holes: For panel to purlin fasteners to be 13/64 in. diam. For panel to panel fasteners to be 1/8 in. diam.  
**As An Alternate Fastener** No. 12-14 self-drilling, self-tapping, 1/2 in. hex-washer head Type B steel or stainless steel screws with a neoprene sealing washer may be used. Length: For panel to purlin fasteners to be 1 in. for insulation up to 3 in. and 1-1/2 in. for insulation over 3 in. For panel to panel fasteners to be 1 in. Spacing to be the same.
3. **Insulation (Optional)** - Any compressible blanket insulation 4 in. max thickness before compression.
4. **Purlins** No. 16 MSG min gauge steel (55,000 psi min yield strength). Refer to General Information, Roof Deck Construction (Roofing Materials and Systems Directory) for Items not evaluated.

\*Bearing the UL Classification Mark



Underwriters Laboratories Inc. ®

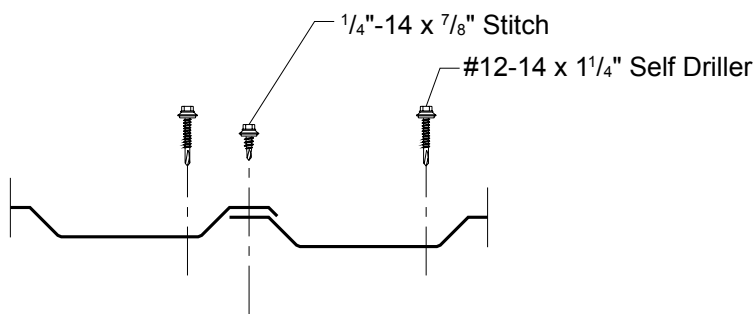
LISTED



SECTION PROPERTIES								ALLOWABLE UNIFORM LOADS PSF (3 or More Equal Spans)											
Ga.	Width (in.)	Yield KSI	Weight PSF	Top in Compression		Bottom in Compression		Inward (Stress / Deflection) Load						Outward Uplift (Stress) Load					
				Ixx In <sup>4</sup> /ft	Sxx In <sup>3</sup> /ft	Ixx In <sup>4</sup> /ft	Sxx In <sup>3</sup> /ft	2'	3'	4'	5'	6'	7'	2'	3'	4'	5'	6'	7'
26	36"	80	0.87	0.0183	0.0342	0.0123	0.0292	198	90	51	33	23	17	229	104	59	38	26	19
24	36"	50	1.13	0.0270	0.0515	0.0187	0.0462	259	118	67	43	30	22	228	116	69	46	32	24
22	36"	50	1.45	0.0367	0.0732	0.0267	0.0671	374	171	97	62	43	32	312	161	97	64	45	34

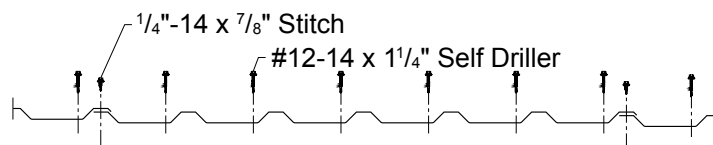
- Theoretical section properties have been calculated per AISI 2001 "Specification for the Design of Cold-formed Steel Structural Members." Ixx and Sxx are effective section properties for deflection and bending.
- Allowable load is calculated in accordance with AISI 2001 specifications considering bending, shear, combined bending and shear, deflection, and applicable testing when available. Allowable load considers the worst case of 3 and 4 equal span conditions. Allowable load does not address web crippling or fasteners/support connection and panel weight is not considered.
- Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
- Allowable loads do not include a 1/3 stress increase in uplift.

**ATTACHMENT DETAIL**



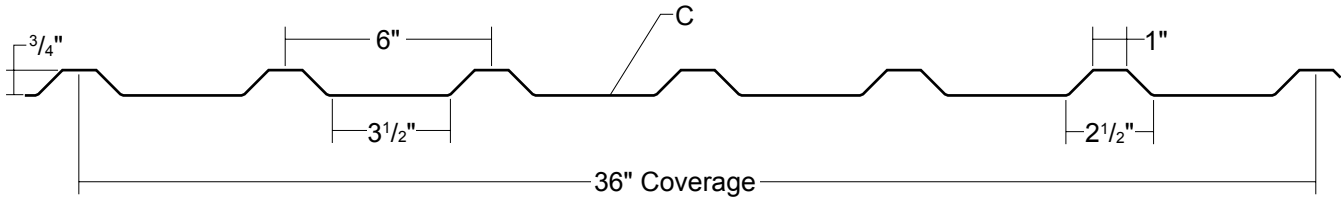
**FASTENING PATTERN**

**Ends and Field of Panel**



**GENERAL INFORMATION**

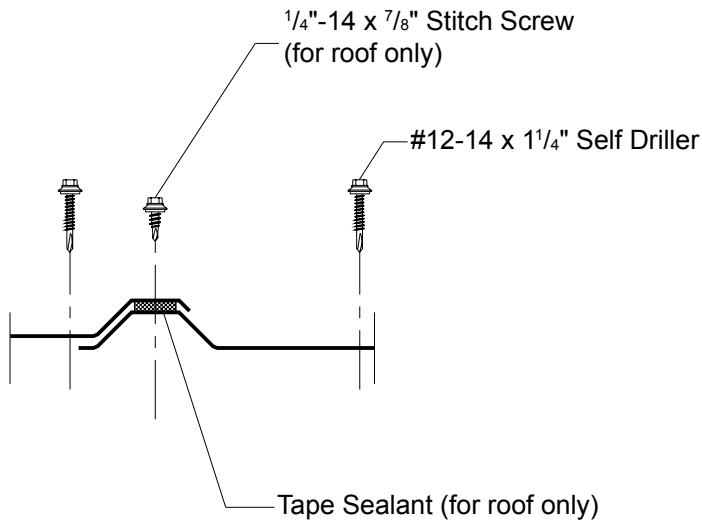
- Substructure**  
 U-Panel is designed to be utilized over open structural framing, but can easily be used with a solid substrate. To avoid panel distortion, use a properly aligned and uniform substructure.
- Coverage**  
 U-Panels are available in 3/4" rib height with a coverage width of 36".
- Length**  
 Minimum factory cut length is 5'-0". Maximum recommended panel length is 45'-0". Longer panels require additional consideration in packaging, shipping, and erection. Please consult Metal Sales for recommendations.
- Fasteners**  
 The fastener selection guide should be consulted for choosing the proper fastener for specific applications. Quantity and type of fastener must meet necessary loading and code requirements.  
*NOTE: All panels are subject to surface distortion due to improperly applied fasteners. Overdriven fasteners will cause stress and induce oil canning across the face of the panel at or near the point of attachment.*
- Availability**  
*Finishes: Acrylic Coated Galvalume®, MS Colorfast45®, or various Kynar 500 (PVDF) colors.*  
*Gauges: 26ga and 24ga standard, 22ga optional*



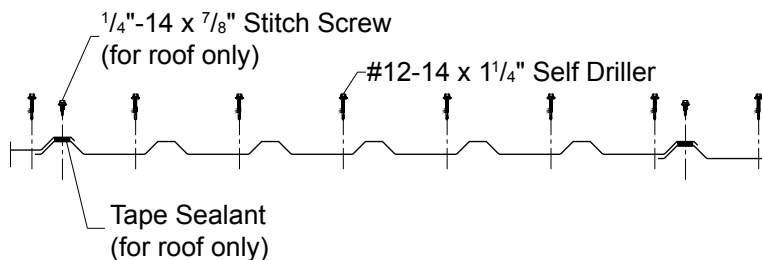
SECTION PROPERTIES								ALLOWABLE UNIFORM LOADS PSF (3 or More Equal Spans)											
Ga.	Width (in.)	Yield KSI	Weight PSF	Top in Compression		Bottom in Compression		Inward Load					Outward Load						
				Ixx In <sup>4</sup> /ft	Sxx In <sup>3</sup> /ft	Ixx In <sup>4</sup> /ft	Sxx In <sup>3</sup> /ft	2'	3'	4'	5'	6'	7'	2'	3'	4'	5'	6'	7'
26	36"	80	0.89	0.0187	0.0349	0.0130	0.0308	209	94	48	25	14	9	313	142	80	52	36	26
24	36"	50	1.15	0.0273	0.0524	0.0190	0.0482	272	123	70	36	21	13	392	178	101	65	45	33
22	36"	50	1.48	0.0367	0.0741	0.0267	0.0676	379	172	95	49	28	18	551	251	142	91	64	47

- Theoretical section properties have been calculated per AISI 2001 "Specification for the Design of Cold-formed Steel Structural Members." Ixx and Sxx are effective section properties for deflection and bending.
- Allowable load is calculated in accordance with AISI 2001 specifications considering bending, shear, combined bending and shear, deflection, and applicable testing when available. Allowable load considers the worst case of 3 and 4 equal span conditions. Allowable load does not address web crippling or fasteners/support connection and panel weight is not considered.
- Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
- Allowable loads do not include a 1/3 stress increase in uplift.

**ATTACHMENT DETAIL**



**FASTENING PATTERN**



**GENERAL INFORMATION**


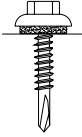
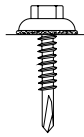
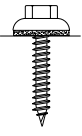
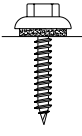
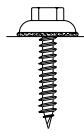
- Slope**  
The minimum recommended slope for PBU-Panel is 1:12. Metal Sales recommends that in all roof applications sealants be used on all sidelaps with stitch screw 1'-0" on center.
- Substructure**  
PBU-Panel is designed to be utilized over open structural framing, but can easily be used with a solid substrate. To avoid panel distortion, use a properly aligned and uniform substructure.
- Coverage**  
PBU-Panel are available in 3/4" rib height with a coverage width of 36".
- Length**  
Minimum factory cut length is 5'-0". Maximum recommended panel length is 45'-0". Longer panels require additional consideration in packaging, shipping, and erection. Please consult Metal Sales for recommendations.
- Fasteners**  
The fastener selection guide should be consulted for choosing the proper fastener for specific applications. Quantity and type of fastener must meet necessary loading and code requirements.  
*NOTE: All panels are subject to surface distortion due to improperly applied fasteners. Overdriven fasteners will cause stress and induce oil canning across the face of the panel at or near the point of attachment.*
- Availability**  
*Finishes:* Acrylic Coated Galvalume®, MS Colorfast45®, or various Kynar 500 (PVDF) colors.  
*Gauges:* 26 ga and 24 ga standard, 22 ga optional



**FASTENER INSTALLATION TECHNIQUE**

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

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

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

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

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

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

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

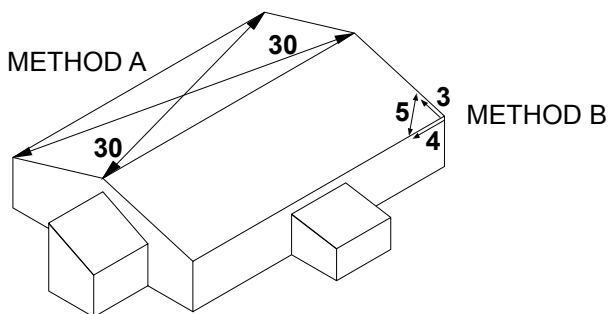
**CONDITION OF SUBSTRUCTURE**

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

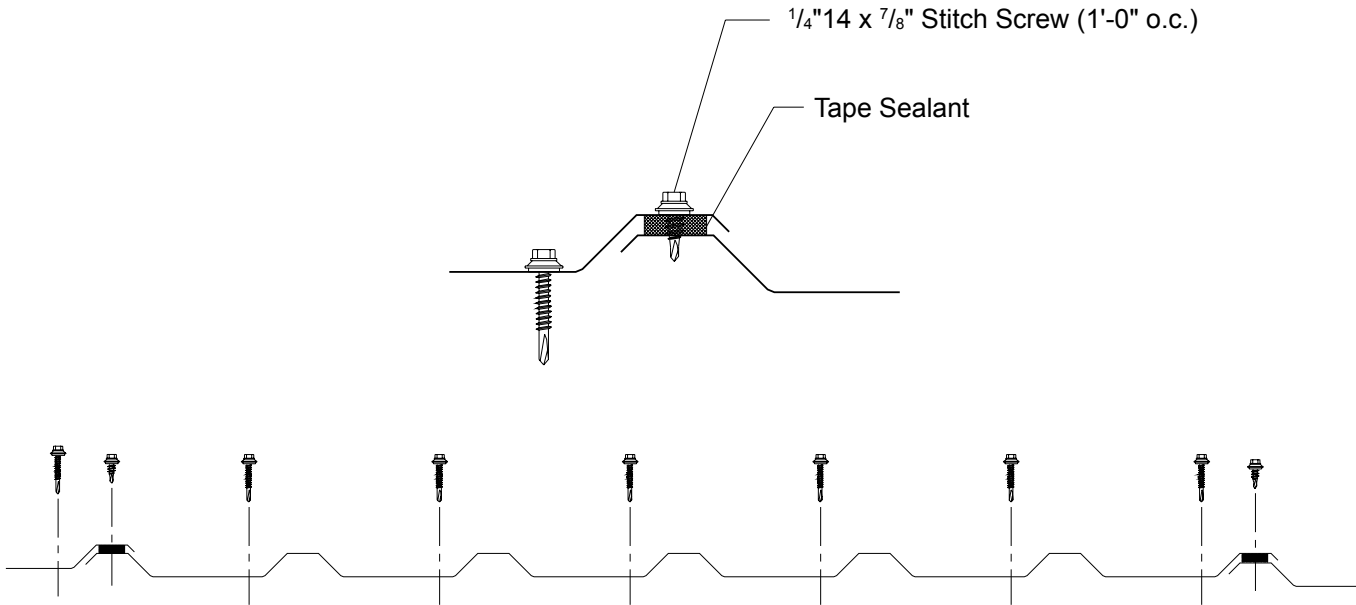
The installer should check the roof deck for squareness before installing "U"/"PBU"-Panels. Several methods can be used to verify squareness of the structure for proper installation of the panels.

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

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

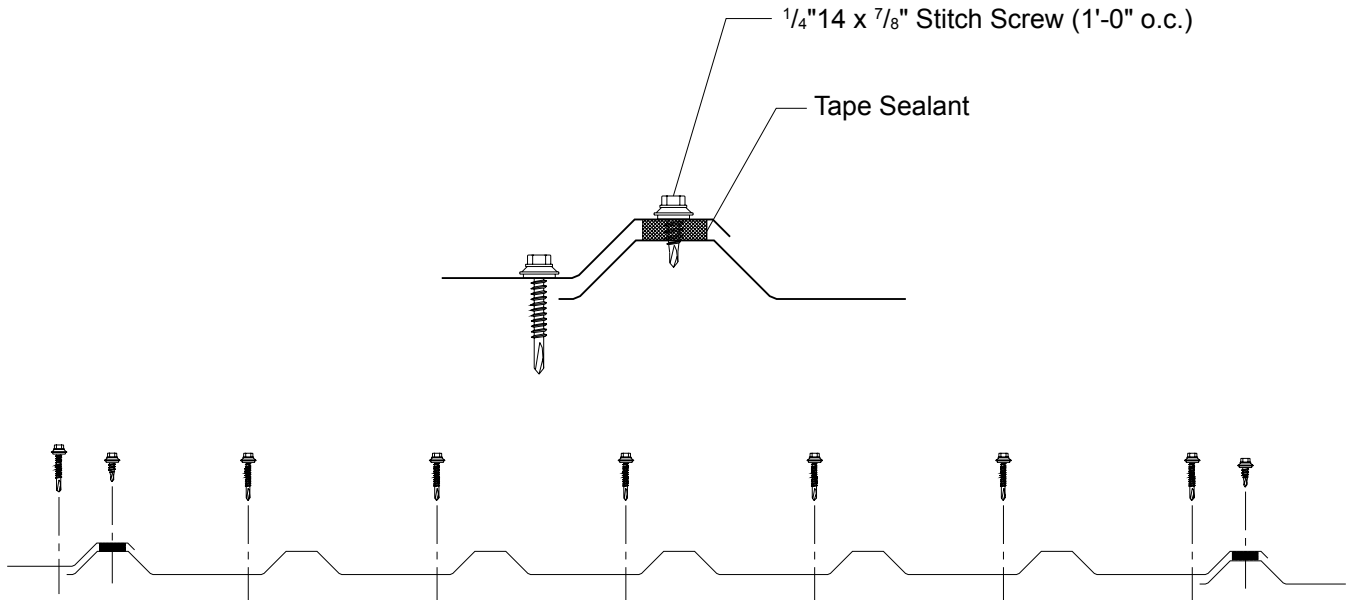


**U-PANEL FASTENING PATTERN**



**U-Panel Fastening Pattern**

**PBU-PANEL FASTENING PATTERN**

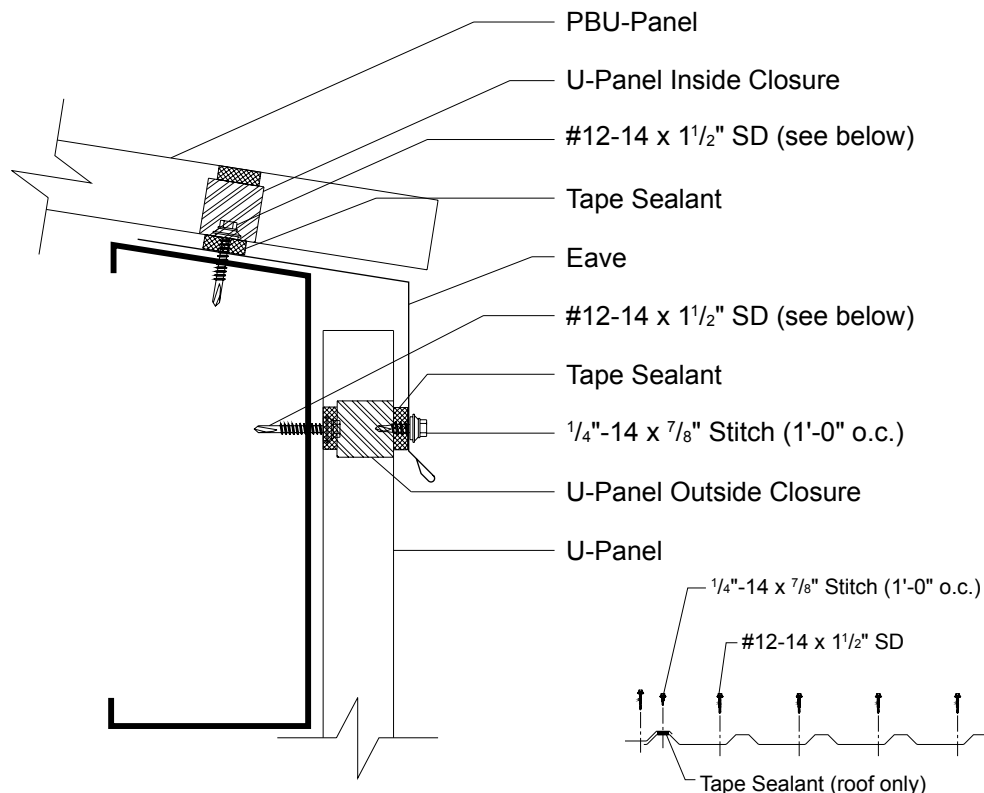


**PBU-Panel Fastening Pattern - Ends & UL Class 90**

# U-PANEL

## EAVE DETAIL

1:12 Slope  
Minimum

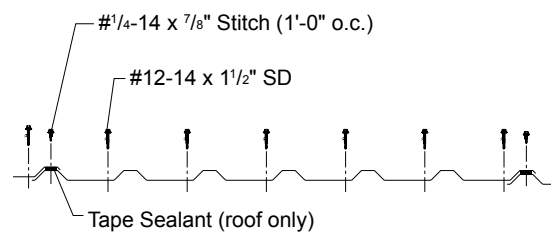
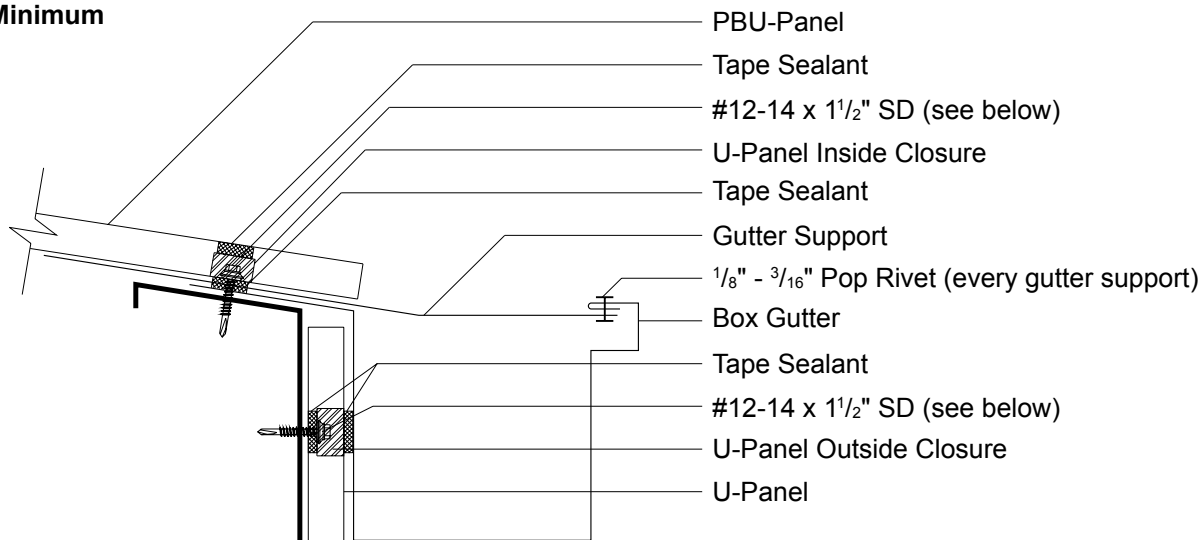


**PBU-Panel Fastening Pattern**

# U-PANEL

## BOX GUTTER DETAIL

1:12 Slope  
Minimum

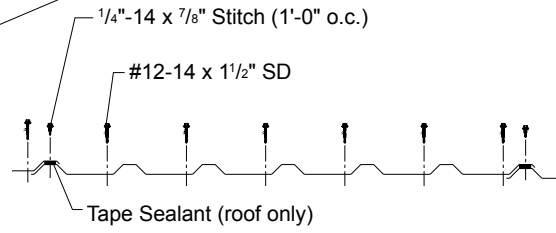
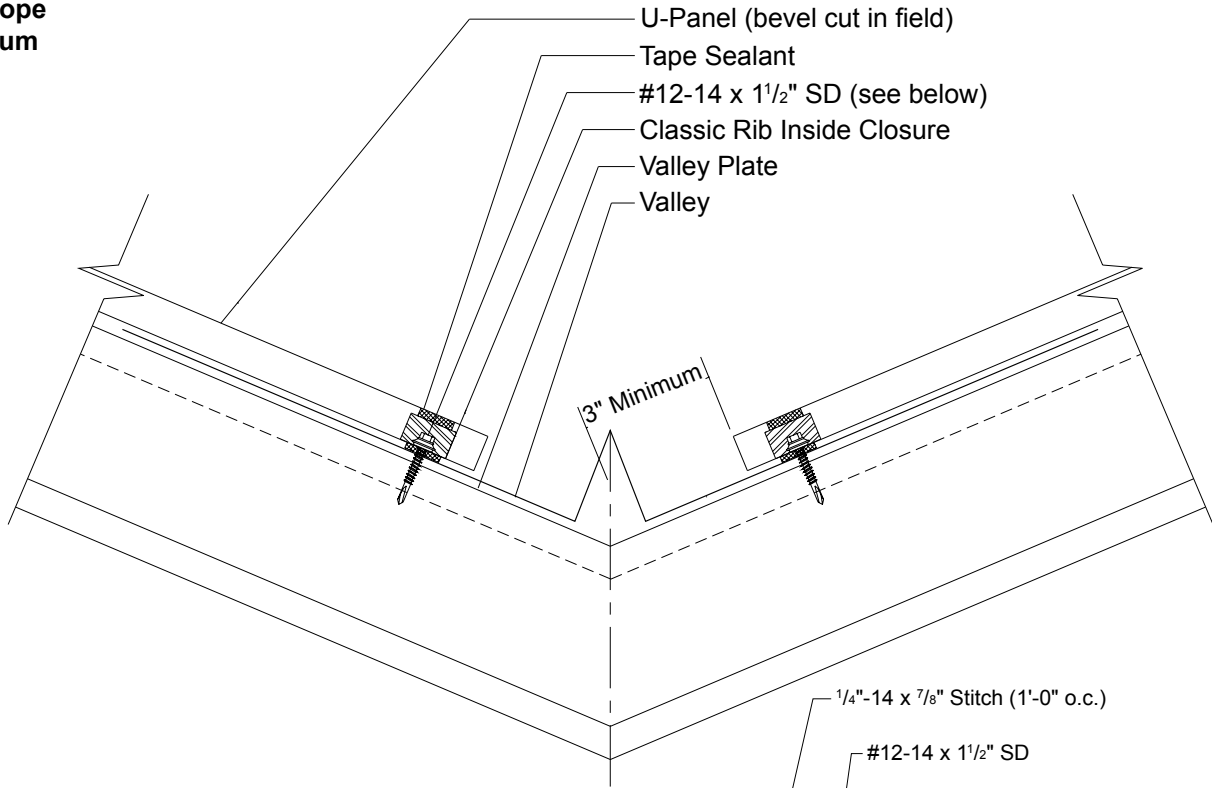


**PBU-Panel Fastening Pattern**

# U-PANEL

## VALLEY DETAIL

1:12 Slope  
Minimum

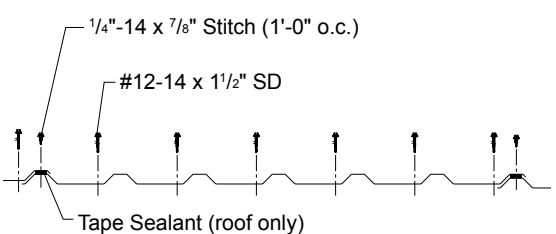
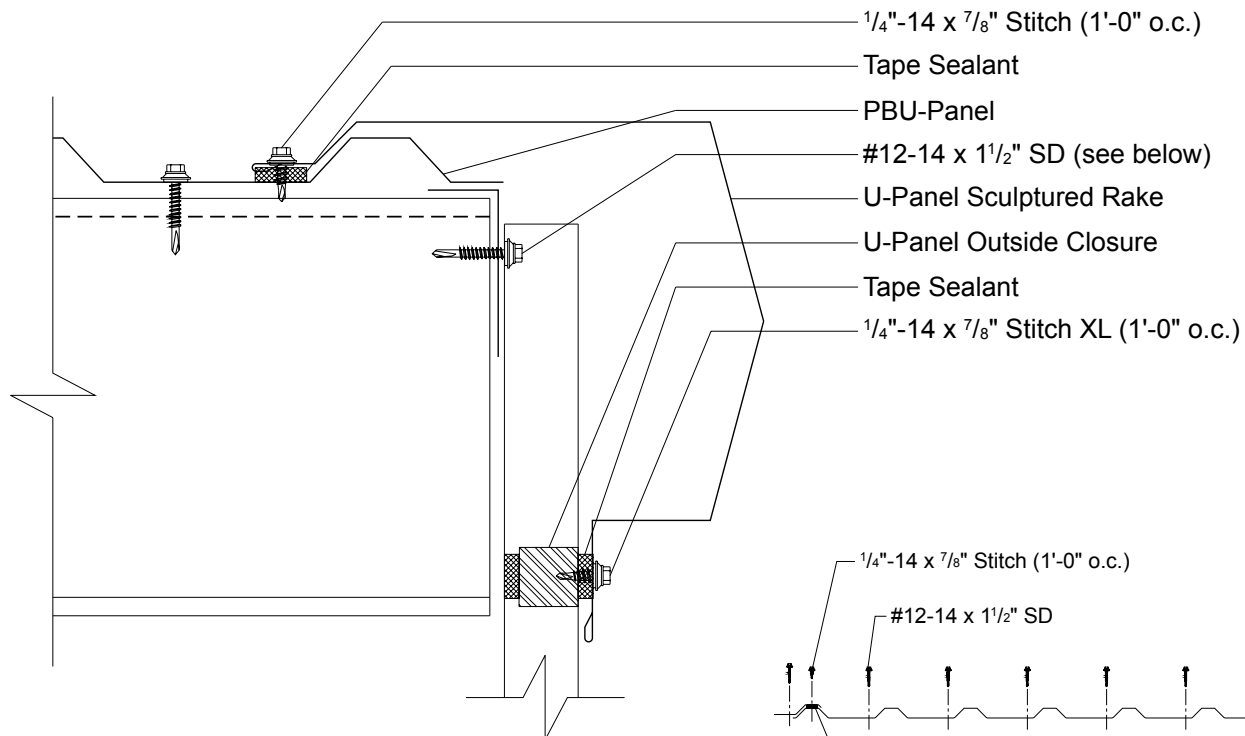


**PBU-Panel Fastening Pattern**

# U-PANEL

## SCULPTURED RAKE DETAIL

1:12 Slope  
Minimum

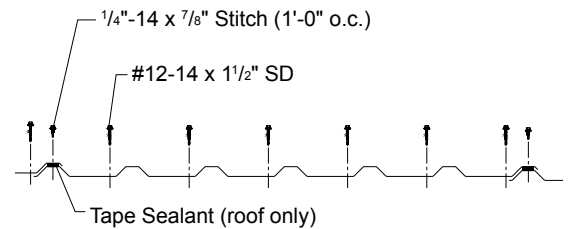
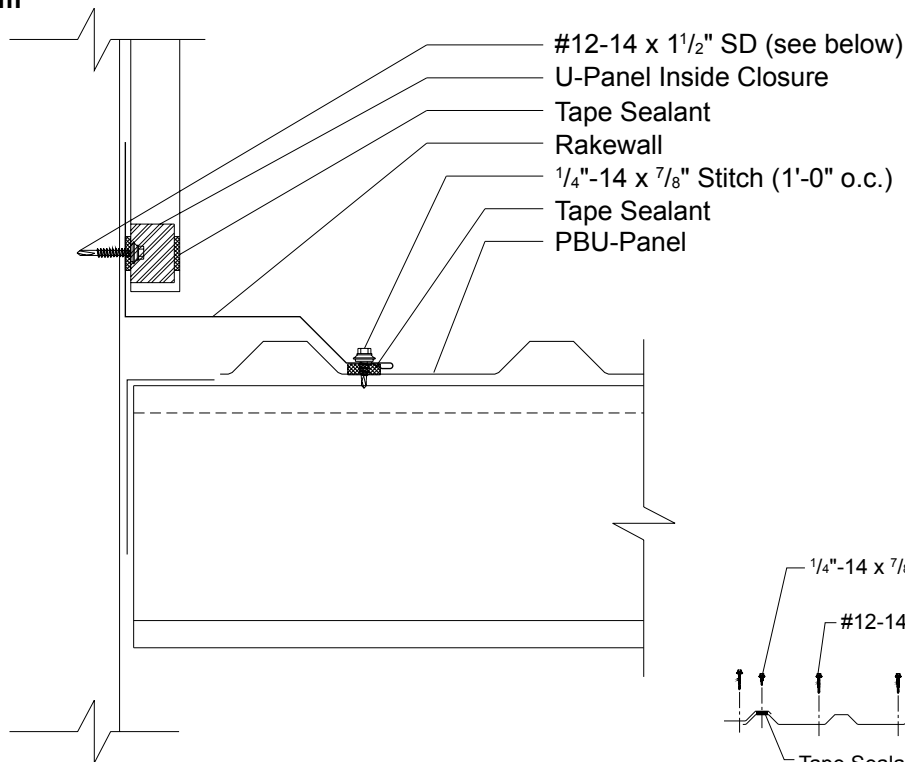


**PBU-Panel Fastening Pattern**

# U-PANEL

## RAKEWALL DETAIL

1:12 Slope  
Minimum

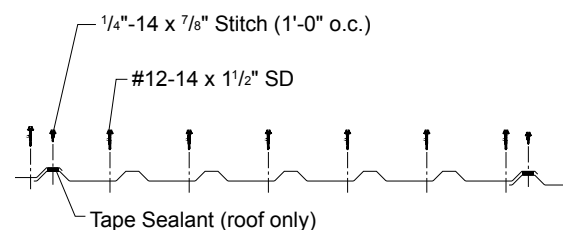
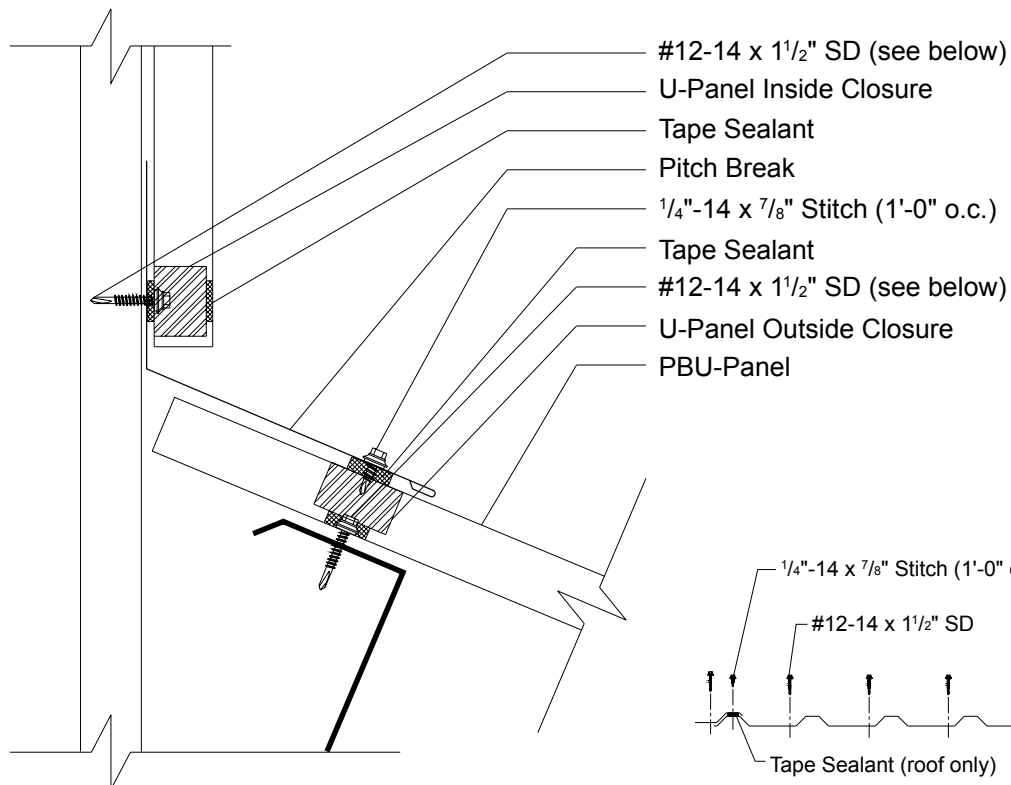


**PBU-Panel Fastening Pattern**

# U-PANEL

## ENDWALL DETAIL

1:12 Slope  
Minimum

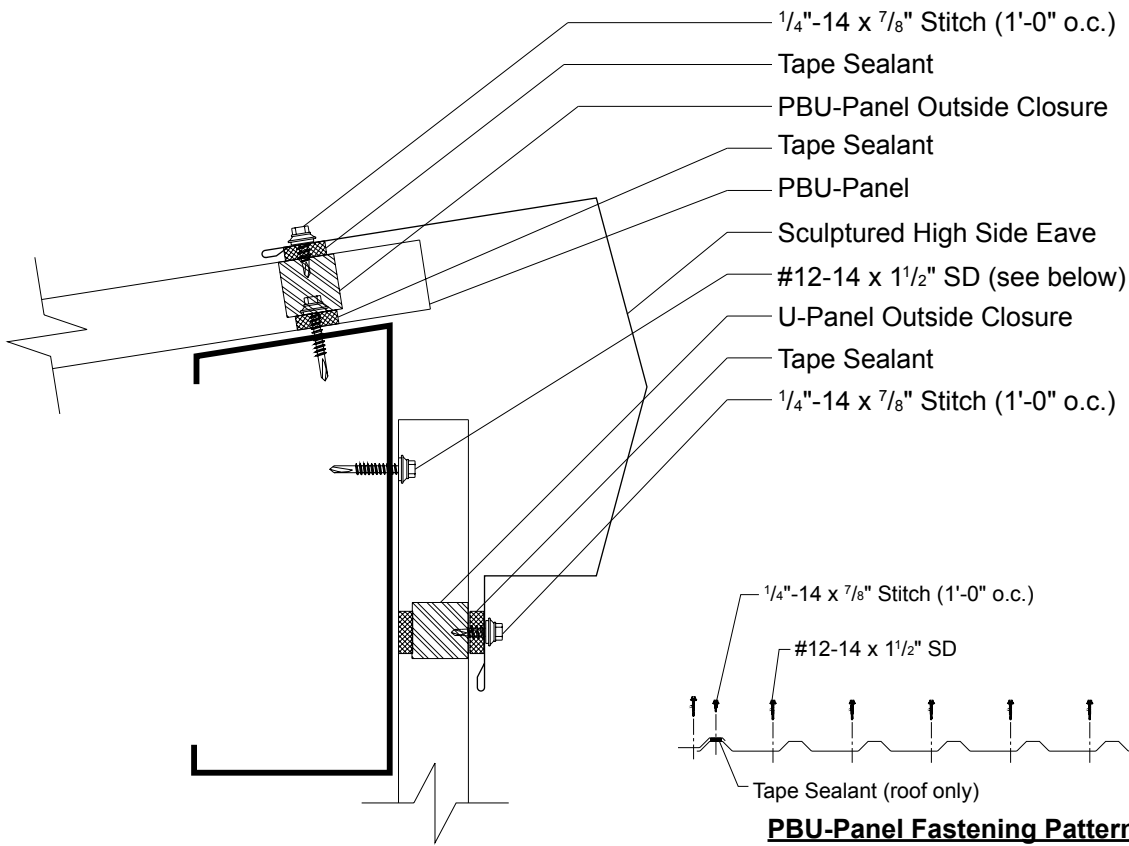


**PBU-Panel Fastening Pattern**

# U-PANEL

## SCULPTURED HIGH SIDE EAVE DETAIL

1:12 Slope  
Minimum

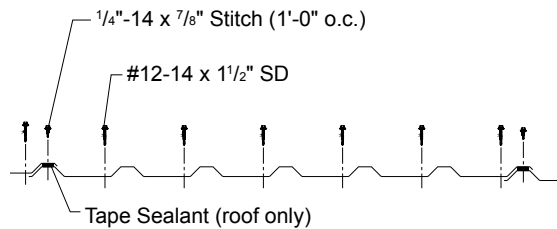
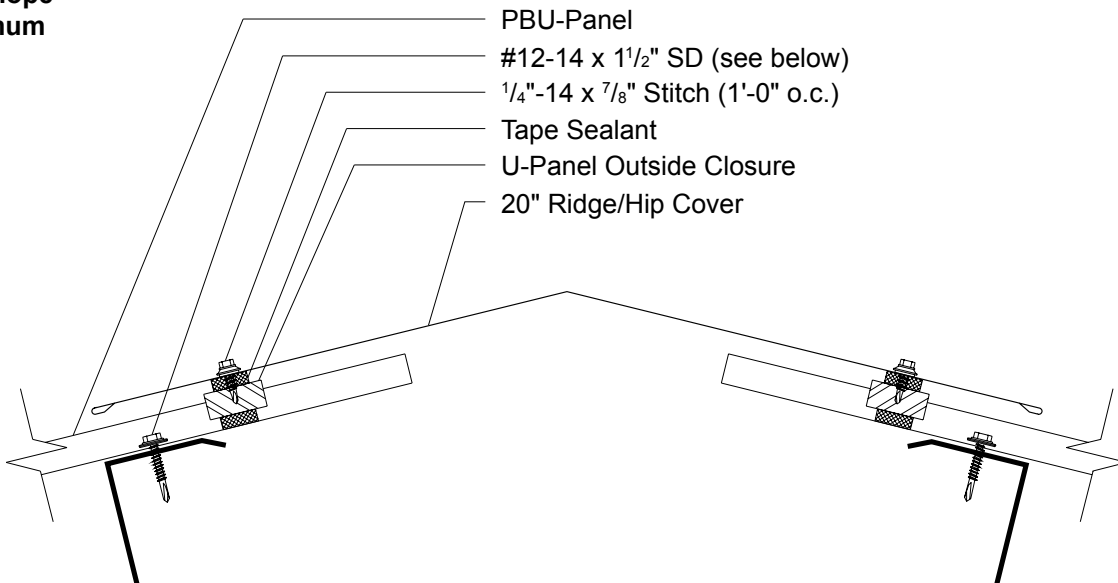


**PBU-Panel Fastening Pattern**

# U-PANEL

## RIDGE/HIP DETAIL

1:12 Slope  
Minimum

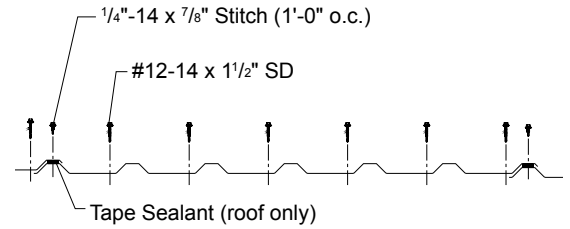
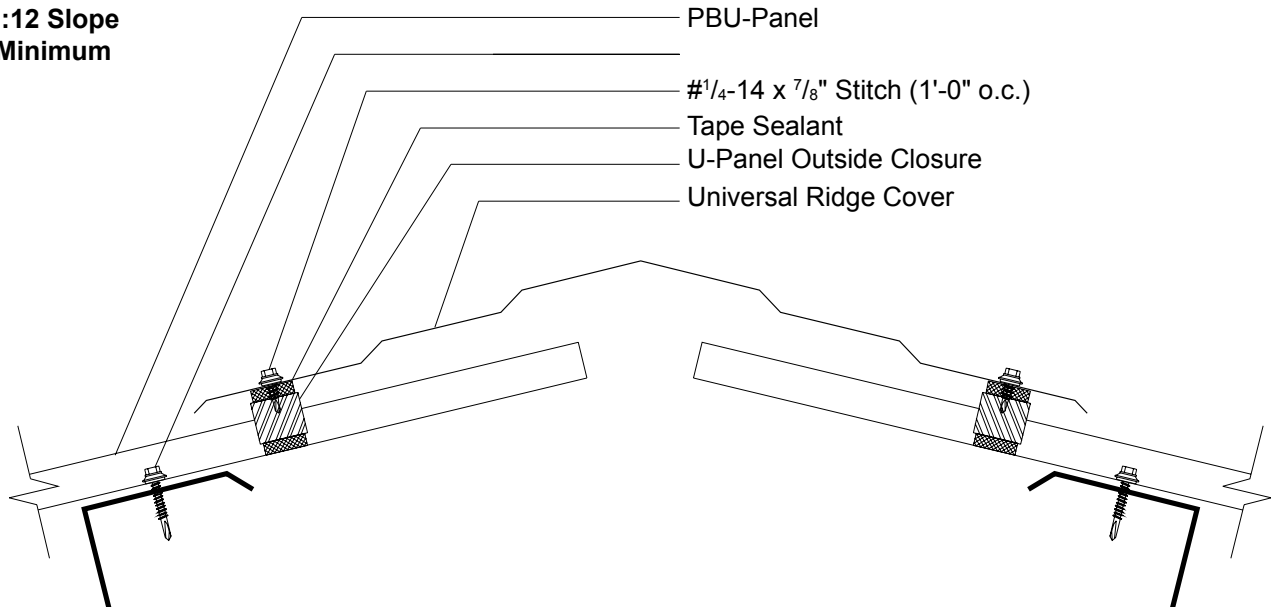


**PBU-Panel Fastening Pattern**

# U-PANEL

## UNIVERSAL RIDGE DETAIL

1:12 Slope  
Minimum

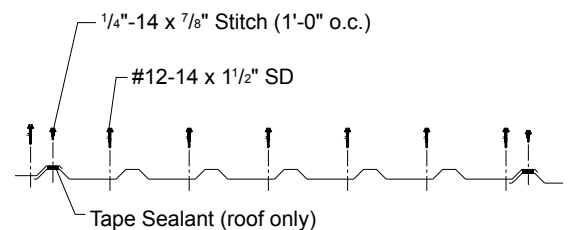
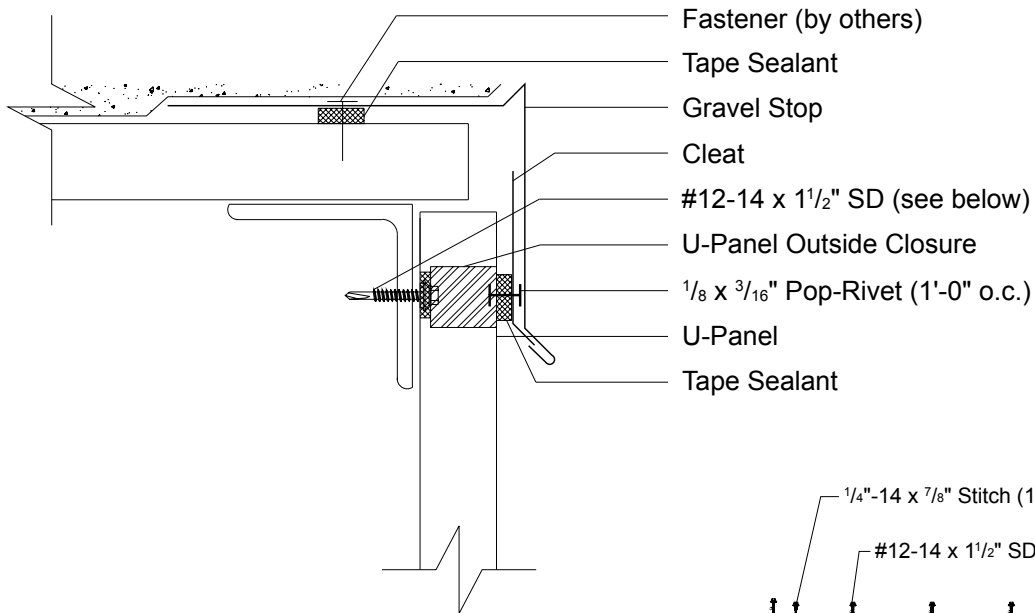


**PBU-Panel Fastening Pattern**

# U-PANEL

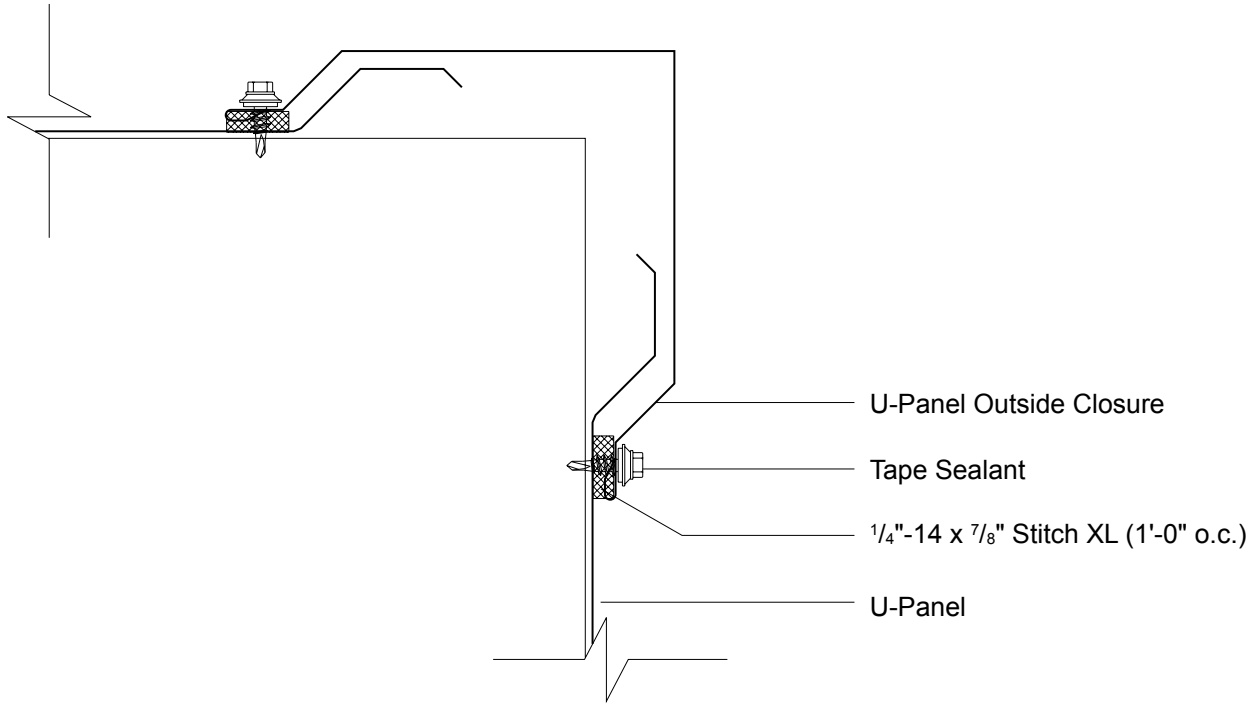
## GRAVEL STOP DETAIL

1:12 Slope  
Minimum

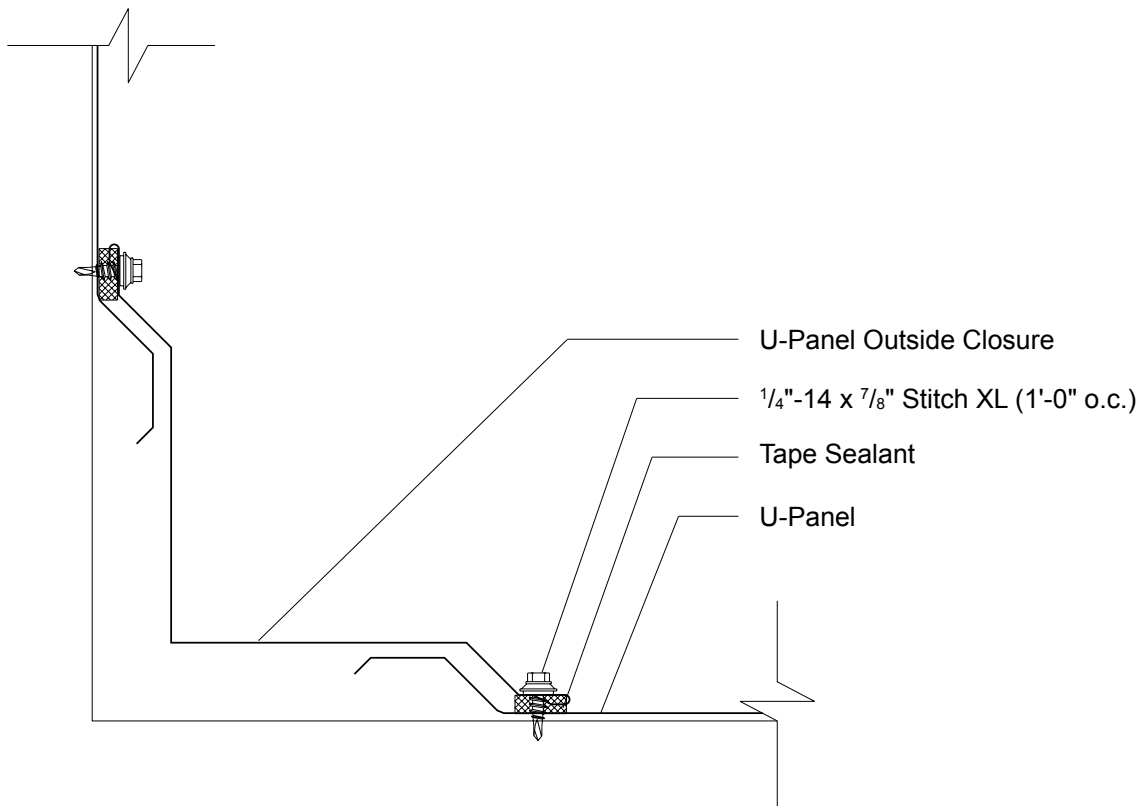


**PBU-Panel Fastening Pattern**

# U-PANEL OUTSIDE CORNER DETAIL

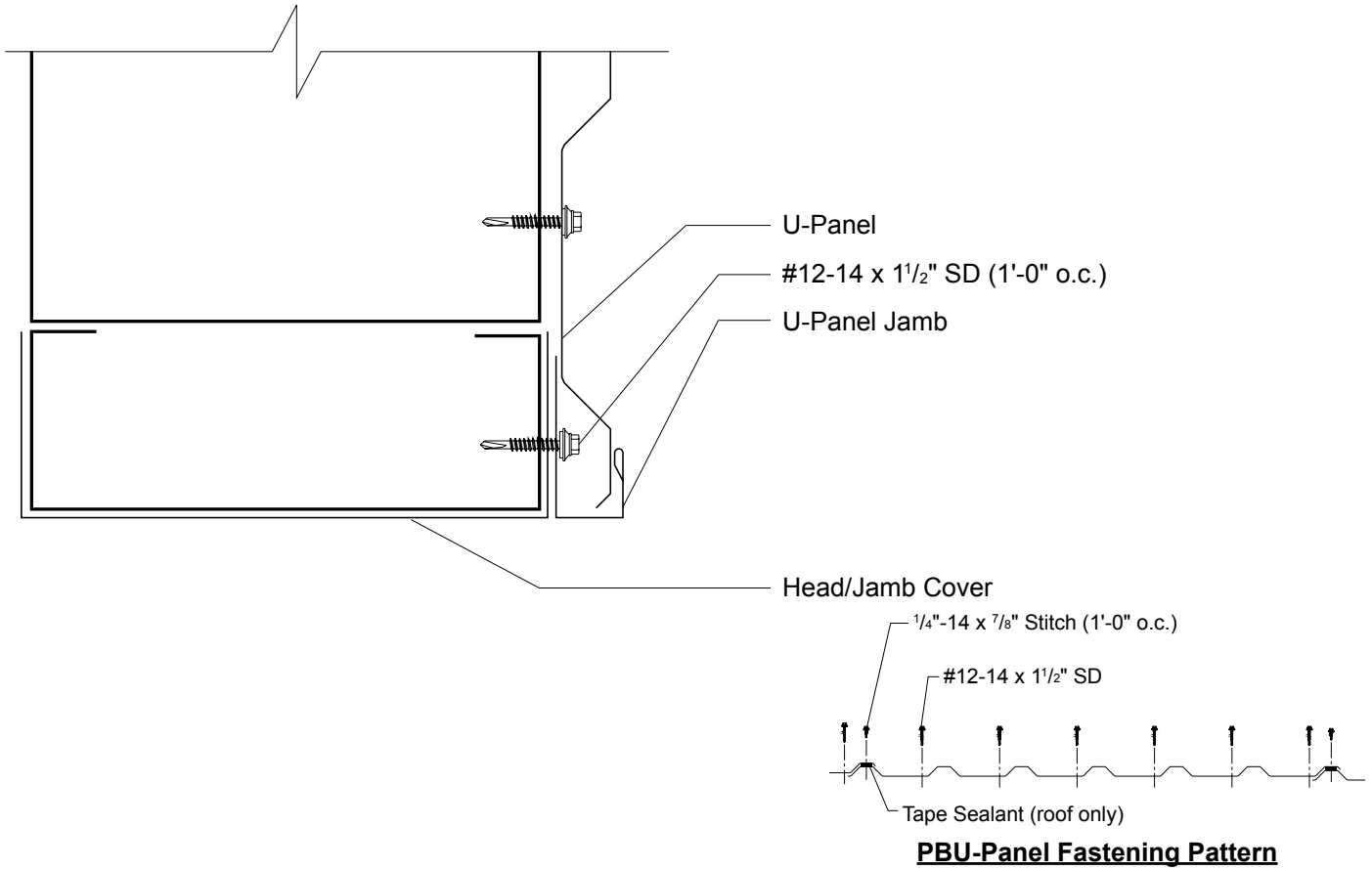


# U-PANEL INSIDE CORNER DETAIL

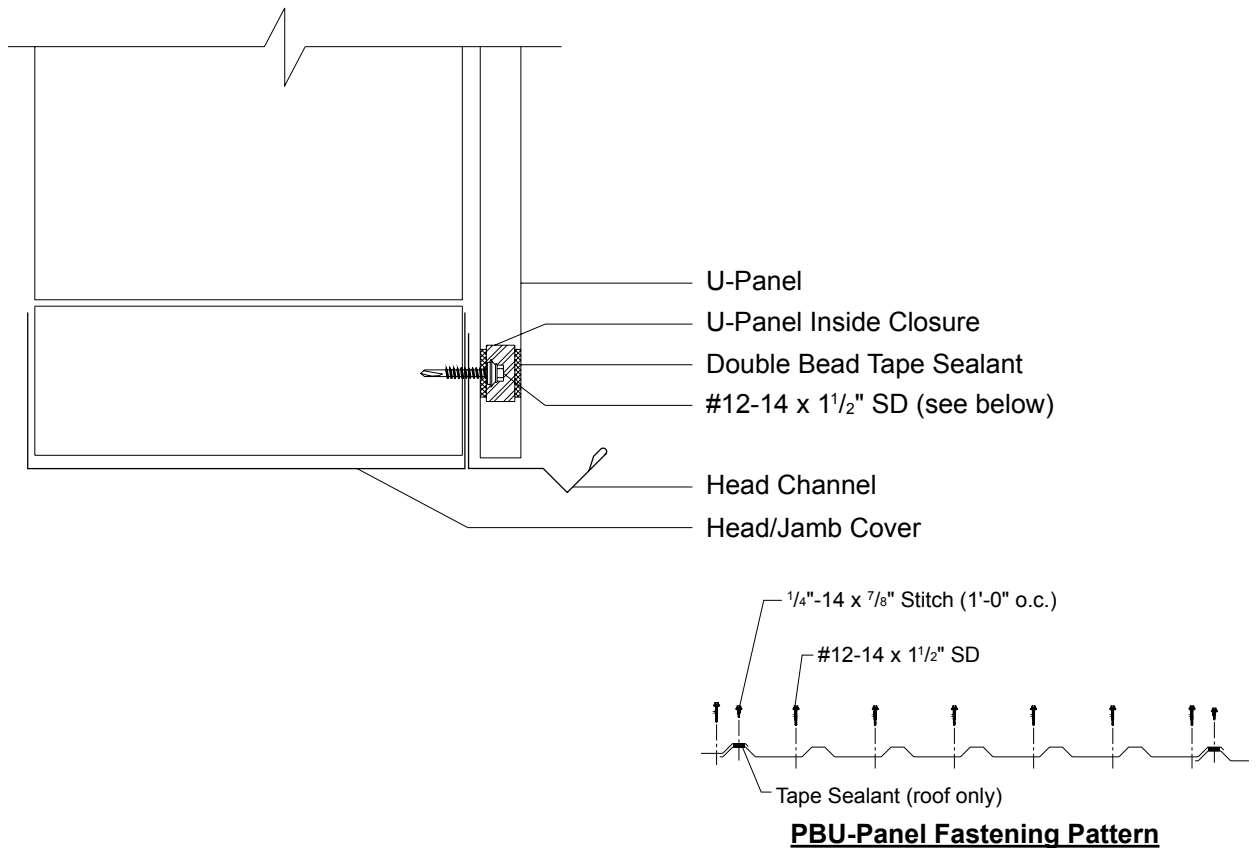




**U-PANEL JAMB DETAIL**

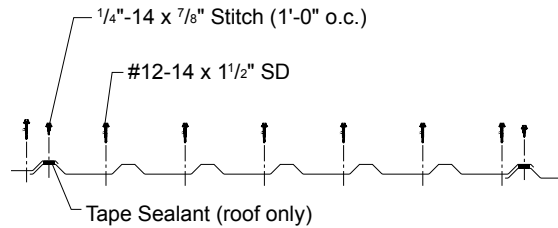
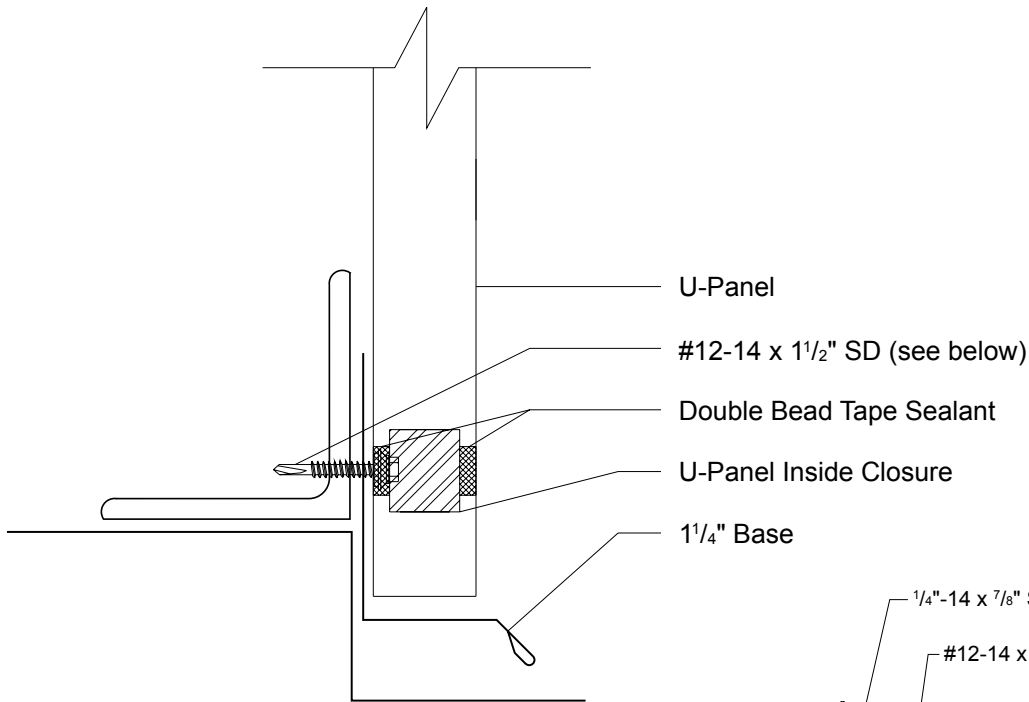


**U-PANEL HEAD DETAIL**



# U-PANEL

## BASE DETAIL



**PBU-Panel Fastening Pattern**

# U-PANEL

## NOTES