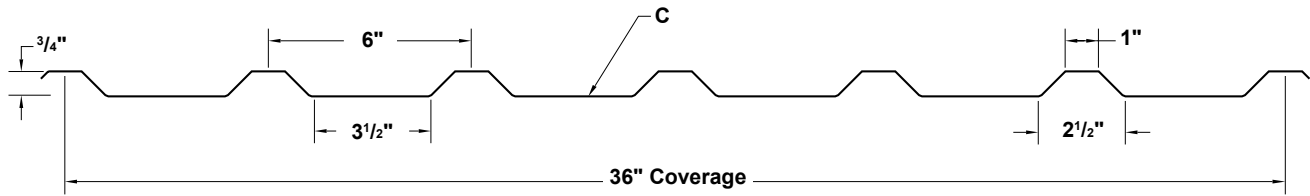


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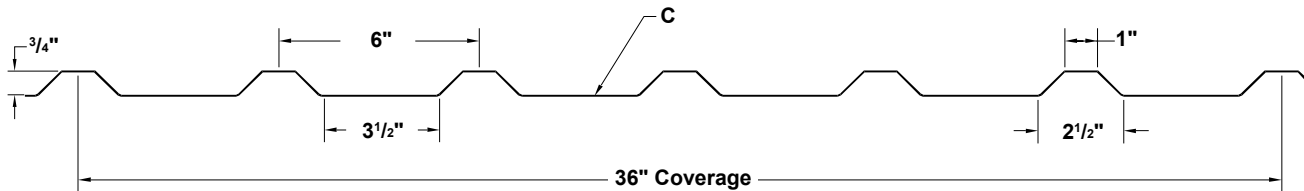
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# U-PANEL PANEL OVERVIEW

## U-PANEL PROFILE



## PBU-PANEL PROFILE



## SLOPE

The minimum recommended slope for any U-Panel and PBU-Panel roof 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" and rib height of 3/4".

## 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, UL 263, Texas Department of Insurance and ICC Evaluation Report

## 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 through PGI-14).

## MATERIALS

26 gauge steel: Grade 80 per ASTM A 792  
24 and 22 gauge steel: Grade 50 per ASTM A 792

## FINISH

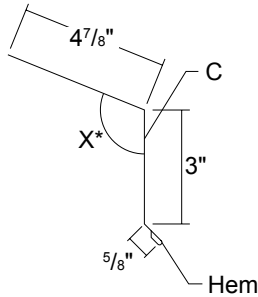
- ▶ \*Acrylic Coated Galvalume® (ACG), AZ55 per ASTM A 792
- ▶ Prepainted Galvalume®, AZ50 per ASTM A 792
- ▶ MS Colorfast45®
- ▶ \*\*PVDF

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

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

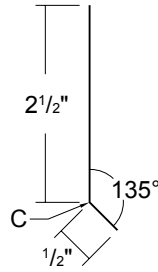
# U-PANEL FLASHING PROFILES

## EAVE (DIRECT FASTEN)



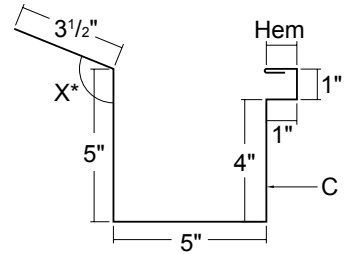
Length 10'-2" - \*Specify Slope Angle

## CLEAT



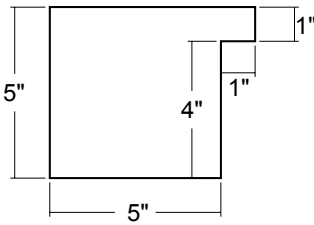
Length 10'-2"

## BOX GUTTER

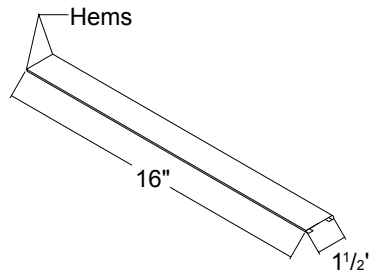


Lengths 10'-2" and 20'-3"  
\*Specify Slope Angle

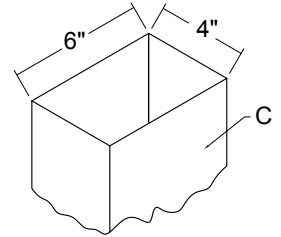
## BOX GUTTER END



## UNIVERSAL GUTTER/ DOWNSPOUT STRAP

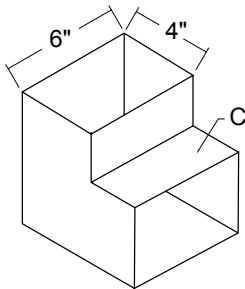


## 6" x 4" DOWNSPOUT



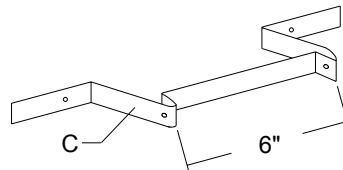
Lengths 10'-2" and 20'-3"  
(4" x 3 1/2" is also available)

## 6" x 4" 95° ELBOW



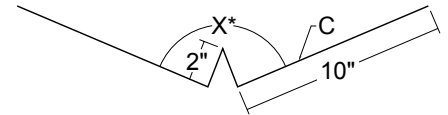
(4" x 3 1/2" is also available)

## DOWNSPOUT BRACKET



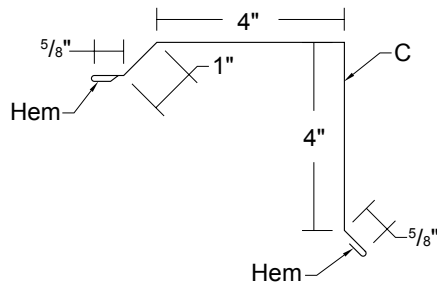
(4" is also available)

## VALLEY



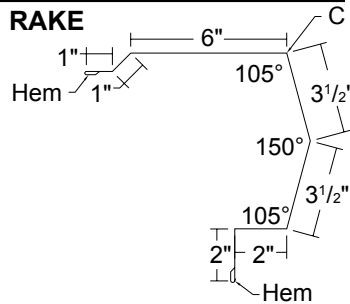
Lengths 10'-2" and 20'-3"  
\*Specify Slope Angle

## U-PANEL RAKE



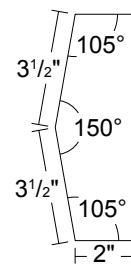
Lengths 10'-2" and 20'-3"

## U-PANEL SCULPTURED

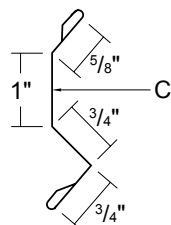


Lengths 10'-2" and 20'-3"

## SCULPTURED RAKE END

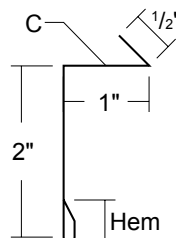


## COUNTER FLASHING



Length 10'-2"

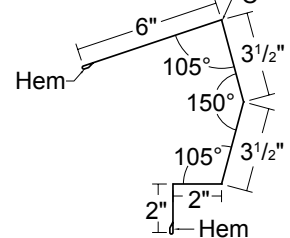
## REGLET FLASHING



Length 10'-2"

## SCULPTURED

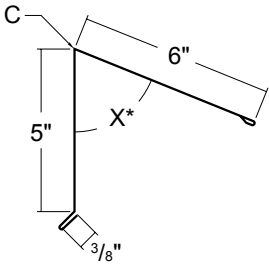
### HIGH SIDE EAVE



Lengths 10'-2" and 20'-3"

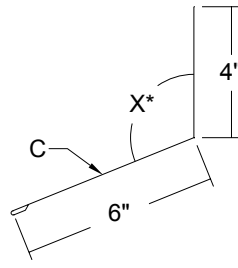
# U-PANEL FLASHING PROFILES (CONT.)

## PEAK



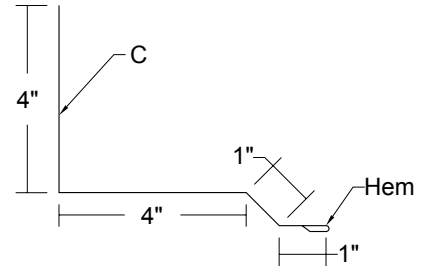
Lengths 10'-2" and 20'-3"  
\*Specify Slope Angle

## PITCH BREAK



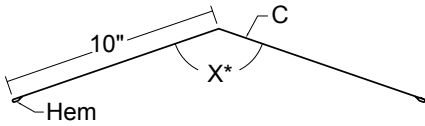
Length 10'-2" - \*Specify Slope Angle

## U-PANEL RAKEWALL



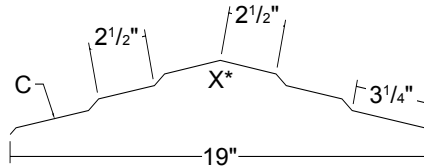
Length 10'-2"

## 20" RIDGE/HIP COVER



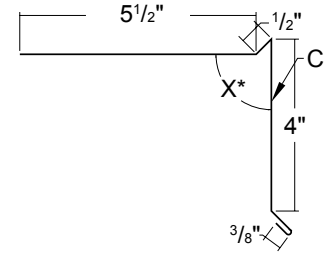
Lengths 10'-2" and 20'-3"  
\*Specify Slope Angle

## UNIVERSAL RIDGE COVER



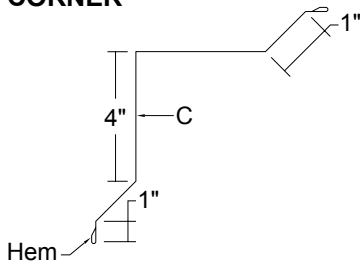
Length 10'-2" - \*Specify Slope Angle

## GRAVEL STOP



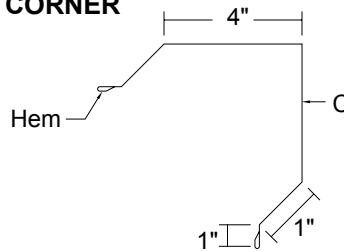
Lengths 10'-2" and 20'-3"

## U-PANEL INSIDE CORNER



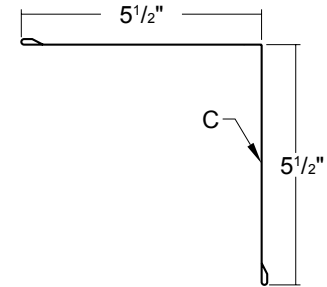
Lengths 10'-2", 14'-2" and 20'-3"

## U-PANEL OUTSIDE CORNER



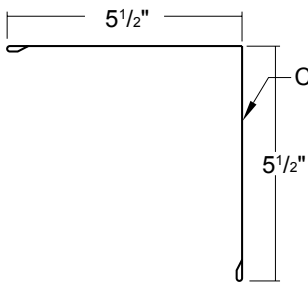
Lengths 10'-2", 14'-2" and 20'-3"

## INSIDE CORNER



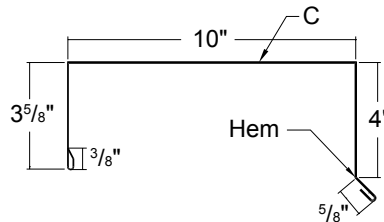
Lengths 10'-2" and 20'-3"

## OUTSIDE CORNER



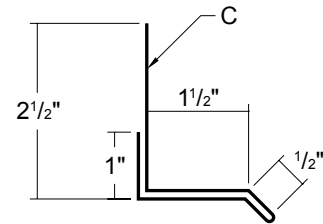
Lengths 10'-2" and 20'-3"

## COPING



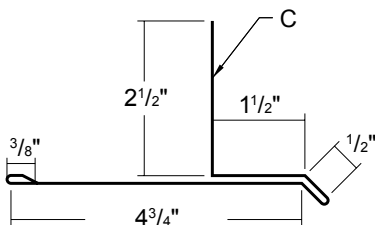
Lengths 10'-2" and 20'-3"

## 1.5" SILL/HEAD



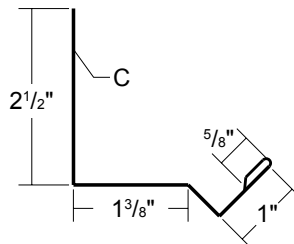
Length 10'-2"

## 1.5" SILL TO SOFFIT



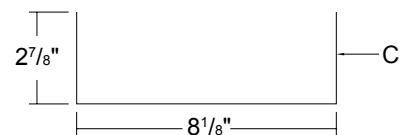
Length 10'-2"

## HEAD CHANNEL



Length 10'-2"

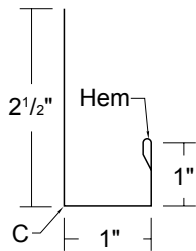
## HEAD/JAMB COVER



Lengths 10'-2" and 14'-2"

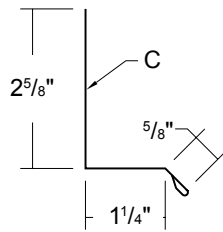
# U-PANEL FLASHING PROFILES (CONT.) AND ACCESSORY PROFILES

## U-PANEL JAMB



Lengths 7'-3", 10'-2" and 14'-2"

## 1 1/4" BASE



Length 10'-2"

C- Indicates color side of flashing.

## U-PANEL ACCESSORY PROFILES

### U-PANEL CLOSURES



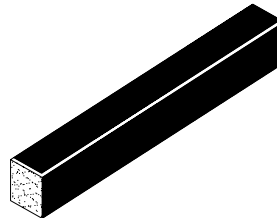
Inside Closure



Outside Closure

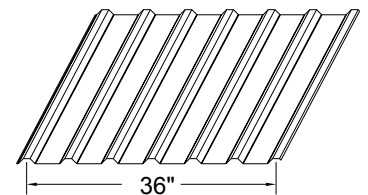
Polyethylene Foam

### UNIVERSAL CLOSURE



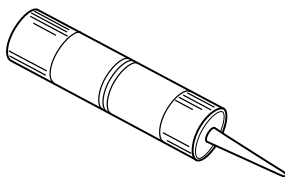
1" x 1 1/2" x 50' Polyethylene Foam  
1" x 1 1/2" x 10' Polyethylene Foam

### U-PANEL LIGHT TRANSMITTING PANEL



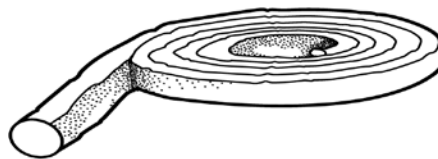
8 Ounce Fiberglass

### TUBE SEALANT



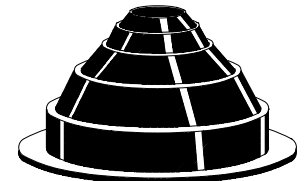
10.3 oz. Cartridge  
Urethane

### TAPE SEALANT



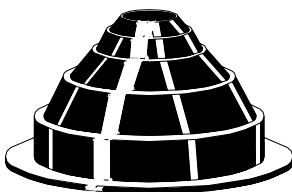
3/8" X 3/32" X 50'  
Single Bead Tape Sealant  
Butyl - Gray

### RUBBER ROOF JACK



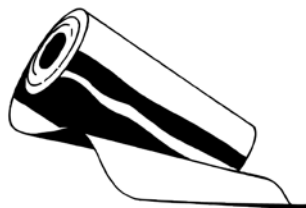
Mini (1/4" to 1 1/8" O.D. Pipe)  
#2 (1 3/4" to 3" O.D. Pipe)  
#4 (3" to 6" O.D. Pipe)  
#6 (6" to 9" O.D. Pipe)  
#8 (7" to 13" O.D. Pipe)

### RETRO ROOF JACK



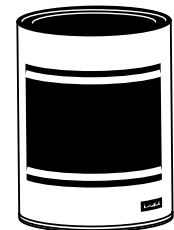
#801<sub>RETRO</sub> (3/4" to 2 3/4" O.D. Pipe)  
#802<sub>RETRO</sub> (2" to 7 1/4" O.D. Pipe)  
#803<sub>RETRO</sub> (3 1/4" to 10" O.D. Pipe)

### RUBBER ROOF FLASH KIT



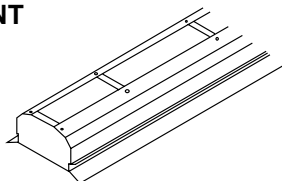
12" x 50'-0" Flash Kit  
18" x 50'-0" Flash Kit

### TOUCH-UP PAINT



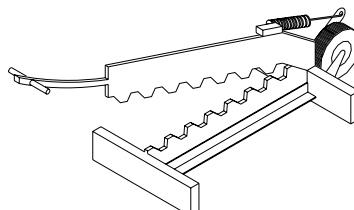
Available in 2 oz Bottles  
PVDF / MS Colorfast45®

### CONTINUOUS RIDGE VENT

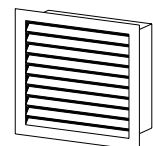


4" x 10', 9" x 10', 12" x 10'

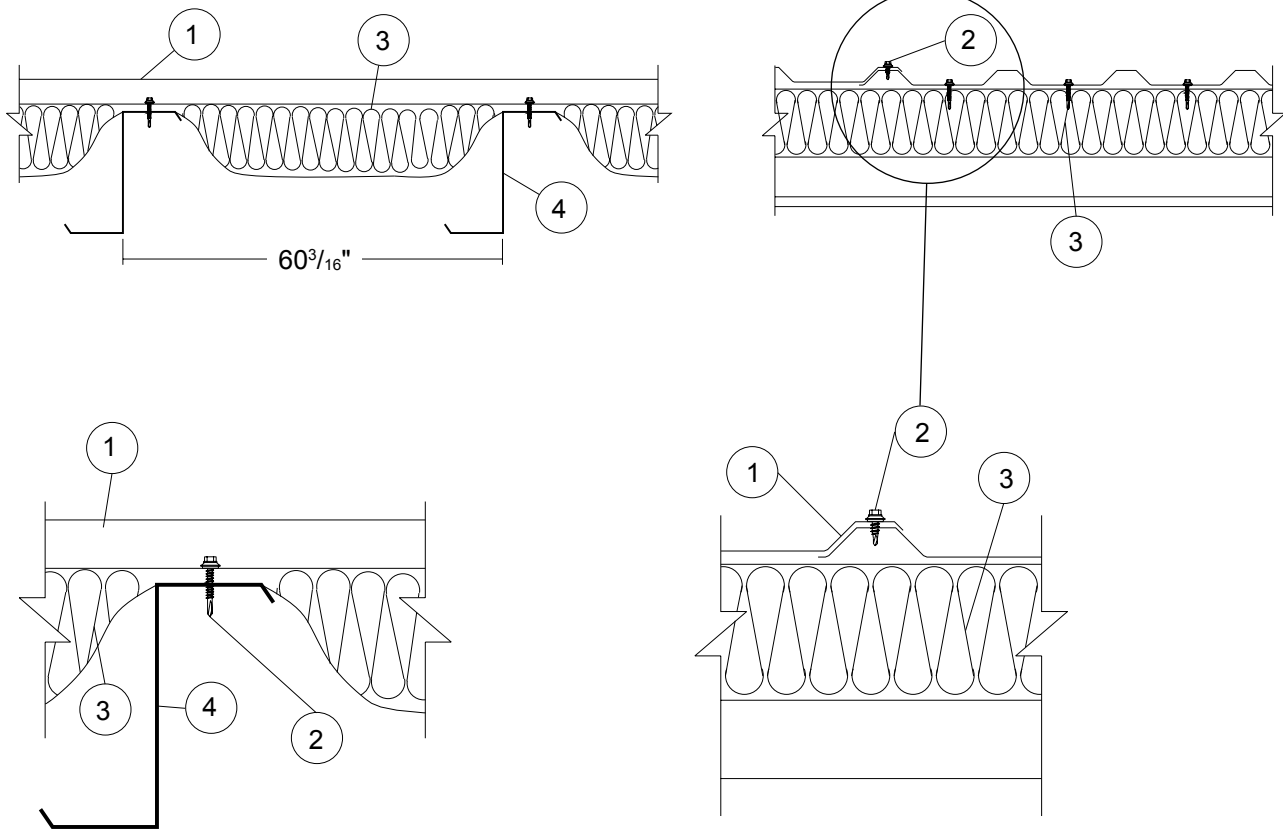
### U-PANEL SHEAR



### LOUVER 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.

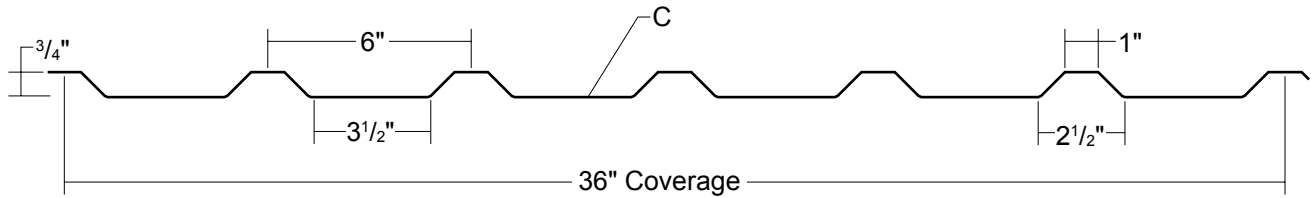
**4. Purlins** No. 16 MSG min gauge steel (55,000 psi min yield strength). Refer to General Information, Roof Deck Construction (Roofing Materials and Systems Directory) for Items not evaluated.

\*Bearing the UL Classification Mark



Underwriters Laboratories Inc. ®

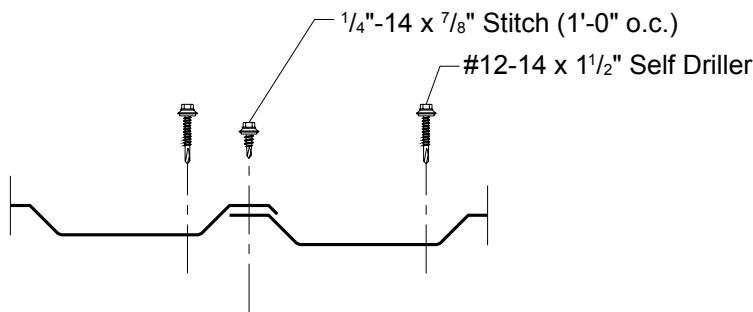
LISTED



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 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	0.81	0.0188	0.0349	0.0126	0.0297	201	91	52	30	17	11	234	106	59	30	17	11
24	36	50	1.05	0.0271	0.0517	0.0185	0.0461	259	118	67	39	23	14	288	131	75	39	23	14
22	36	50	1.38	0.0379	0.0736	0.0270	0.0673	375	171	97	51	30	19	400	186	100	51	30	19

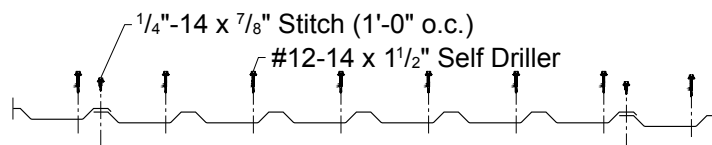
- Theoretical section properties have been calculated per AISI 2012 "Specifications for the Design of Cold-formed Steel Structural Members." Ixx and Sxx are effective section properties for deflection and bending.
- Allowable load is calculated in accordance with AISI 2012 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal span condition. Allowable load does not address web crippling, fasteners/support connection or load testing. 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**



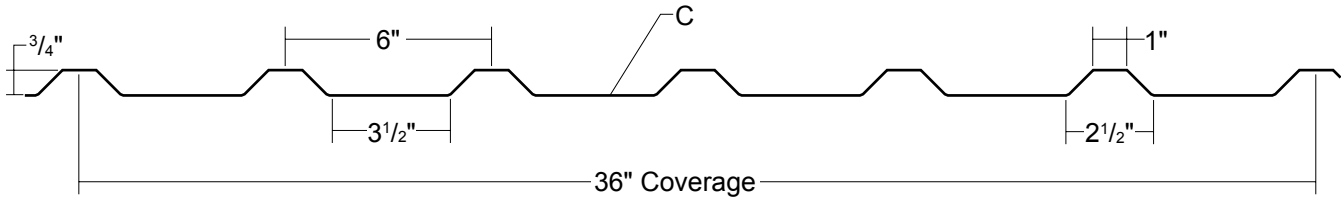
**FASTENING PATTERN**

**Ends and Field of Panel**



**GENERAL INFORMATION**

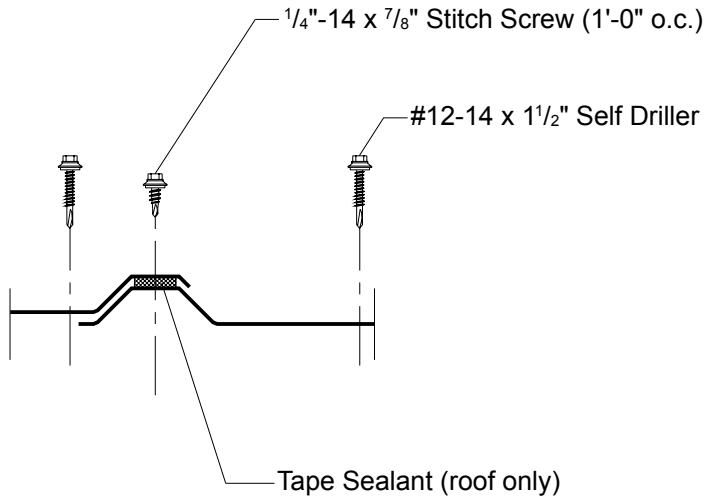
- Substructure**  
 U-Panel is designed to be utilized over open structural framing, but can easily be used with a solid substrate. To avoid panel distortion, use a properly aligned and uniform substructure.
- Coverage**  
 U-Panels are available in 3/4" rib height with a coverage width of 36".
- Length**  
 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® and PVDF (Kynar 500®)  
*Gauges:* 26ga and 24ga standard, 22ga optional



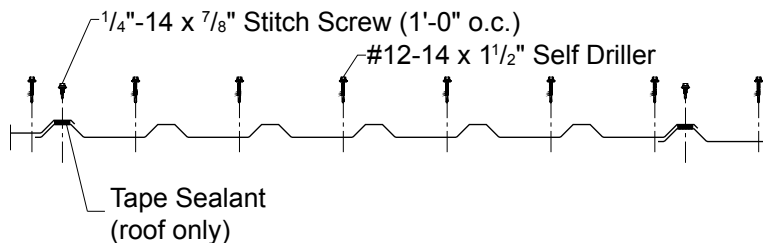
SECTION PROPERTIES								ALLOWABLE UNIFORM LOADS psf (3 or More Equal Spans)											
Ga	Width in	Yield ksi	Weight psf	Top in Compression		Bottom in Compression		Inward Load						Outward Load					
				Ixx in <sup>4</sup> /ft	Sxx in <sup>3</sup> /ft	Ixx in <sup>4</sup> /ft	Sxx in <sup>3</sup> /ft	2'	3'	4'	5'	6'	7'	2'	3'	4'	5'	6'	7'
26	36	80	0.83	0.0192	0.0356	0.0130	0.0314	213	96	55	30	18	11	240	109	59	30	18	11
24	36	50	1.08	0.0276	0.0526	0.0191	0.0486	274	124	70	40	23	14	294	134	76	40	23	14
22	36	50	1.42	0.0386	0.0746	0.0280	0.0680	381	173	98	52	30	19	400	189	102	52	30	19

- Theoretical section properties have been calculated per AISI 2012 "Specifications 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 2012 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal span condition. Allowable load does not address web crippling, fasteners/support connection or load testing. 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**


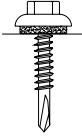
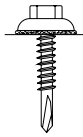
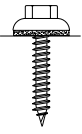
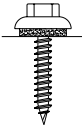
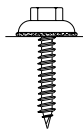
- Slope**  
The minimum recommended slope for PBU-Panel is 1:12. Metal Sales recommends that in all roof applications sealants be used on all sidelaps with stitch screw 1'-0" on center.
- Substructure**  
PBU-Panel is designed to be utilized over open structural framing, but can easily be used with a 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® and PVDF (Kynar 500®)  
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.
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.

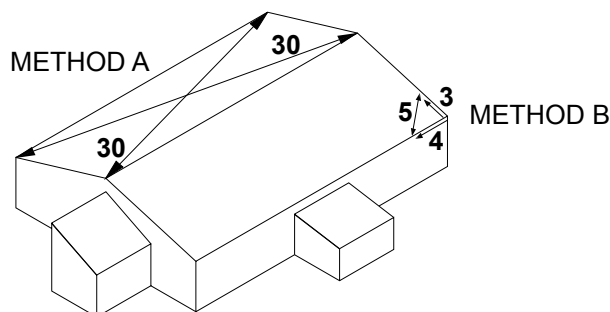
**CONDITION OF SUBSTRUCTURE**

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

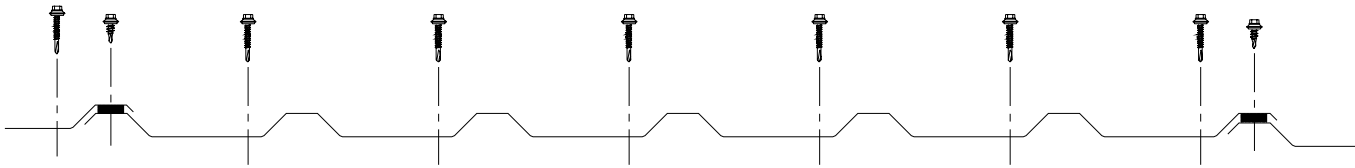
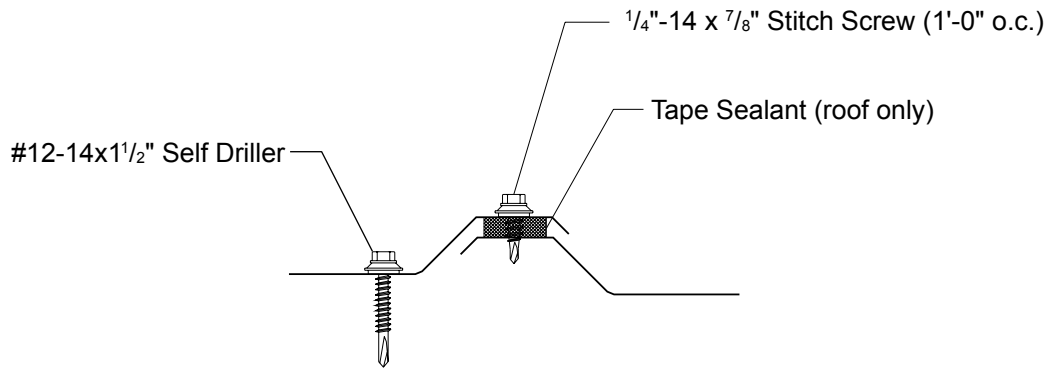
The installer should check the roof deck for squareness before installing U-Panel or PBU-Panel. Several methods can be used to verify squareness of the structure for proper installation of the panels.

**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.

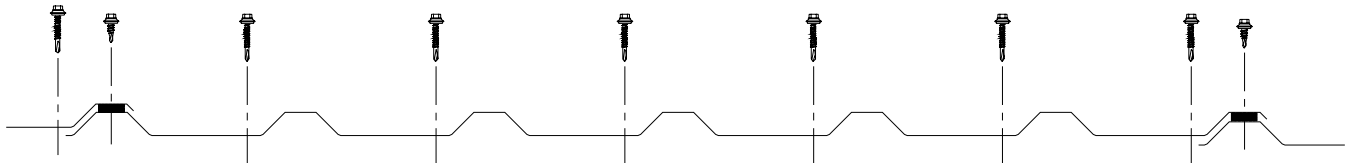
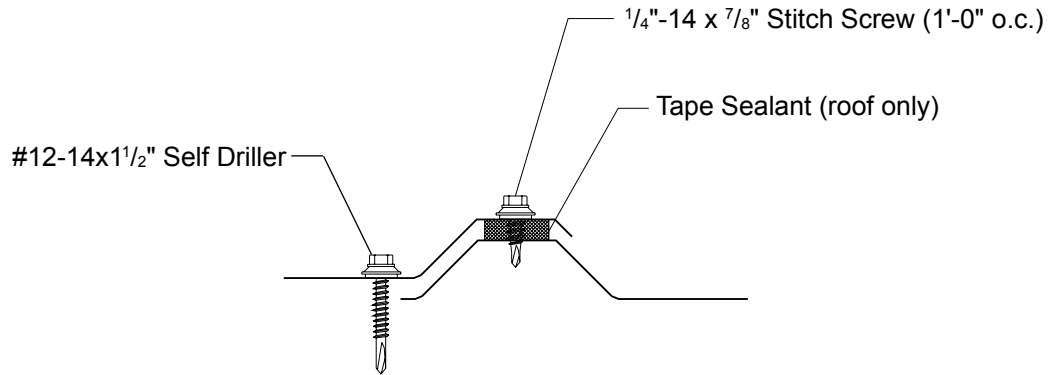


**U-PANEL FASTENING PATTERN**



**U-Panel Fastening Pattern**

**PBU-PANEL FASTENING PATTERN**

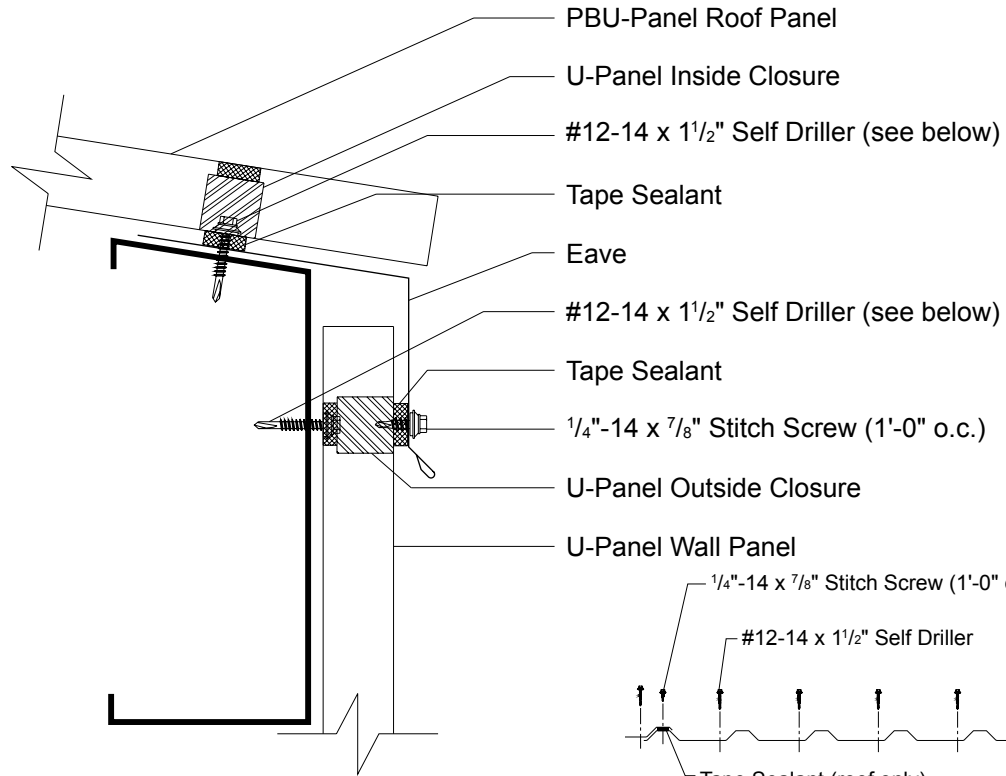


**PBU-Panel Fastening Pattern**

# U-PANEL

## EAVE DETAIL

1:12 Minimum  
Roof Slope

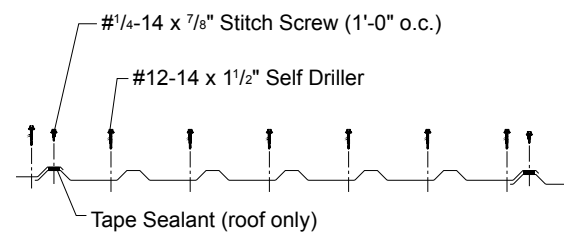
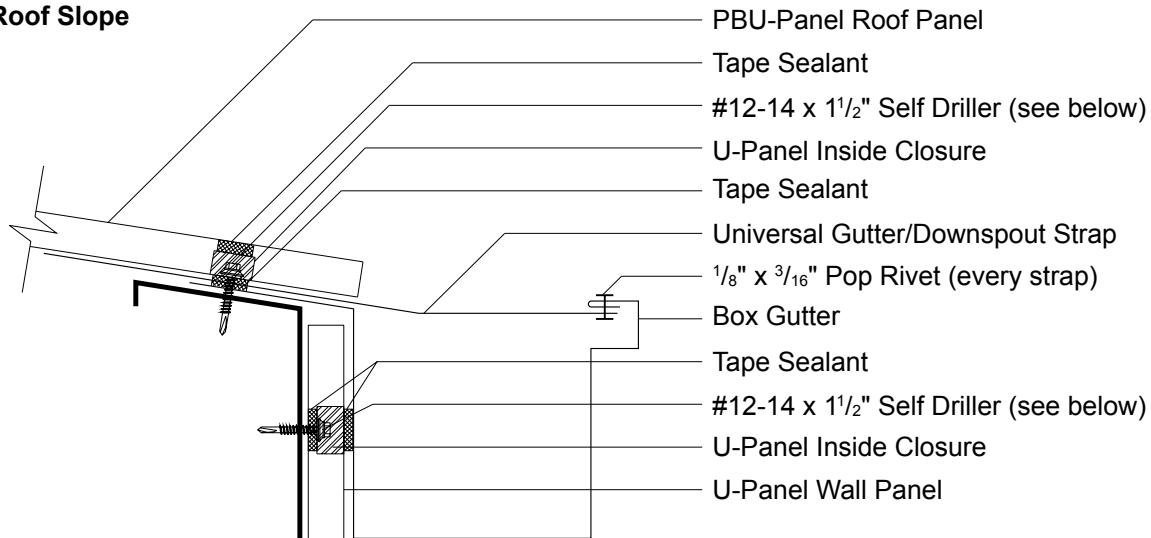


**PBU-Panel Fastening Pattern**

# U-PANEL

## BOX GUTTER DETAIL

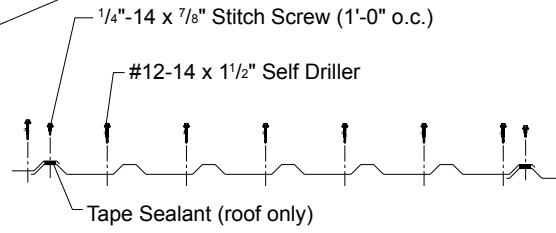
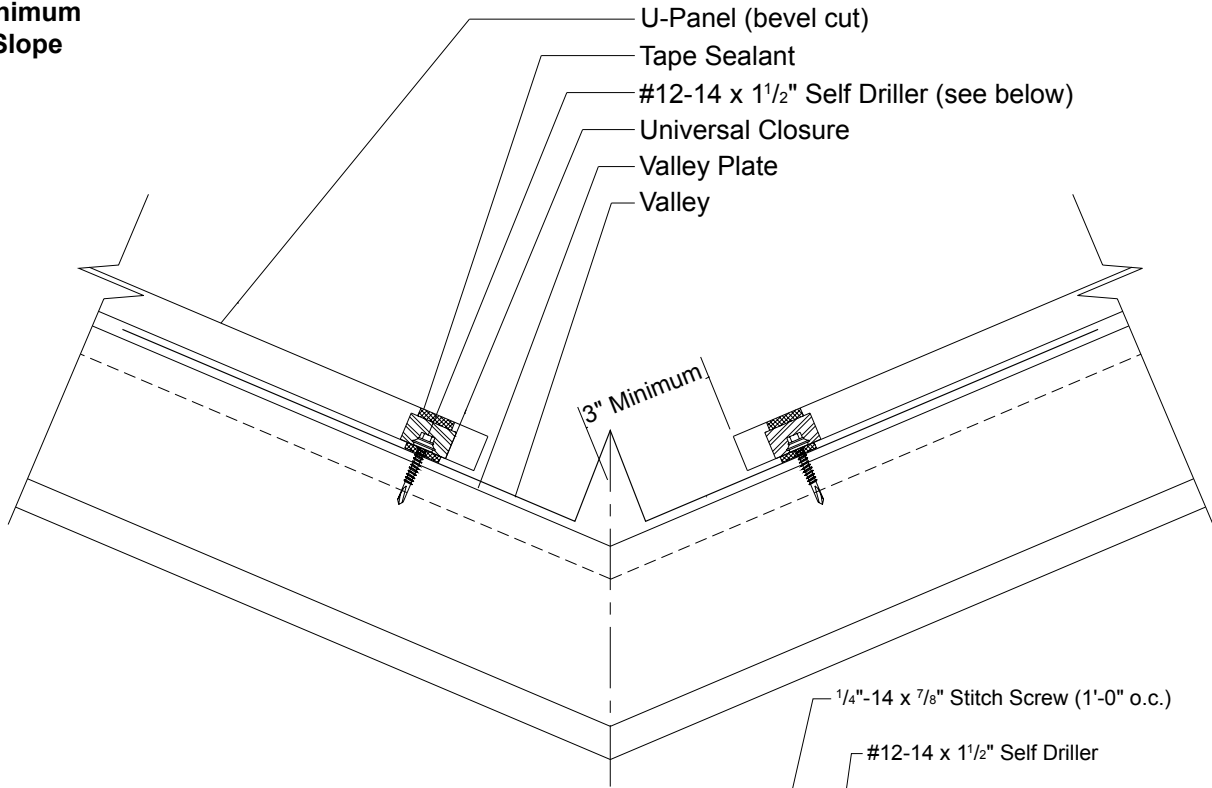
1:12 Minimum  
Roof Slope



**PBU-Panel Fastening Pattern**

# U-PANEL VALLEY DETAIL

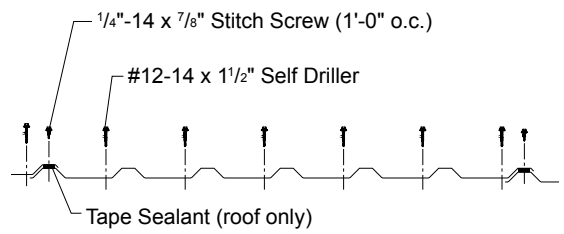
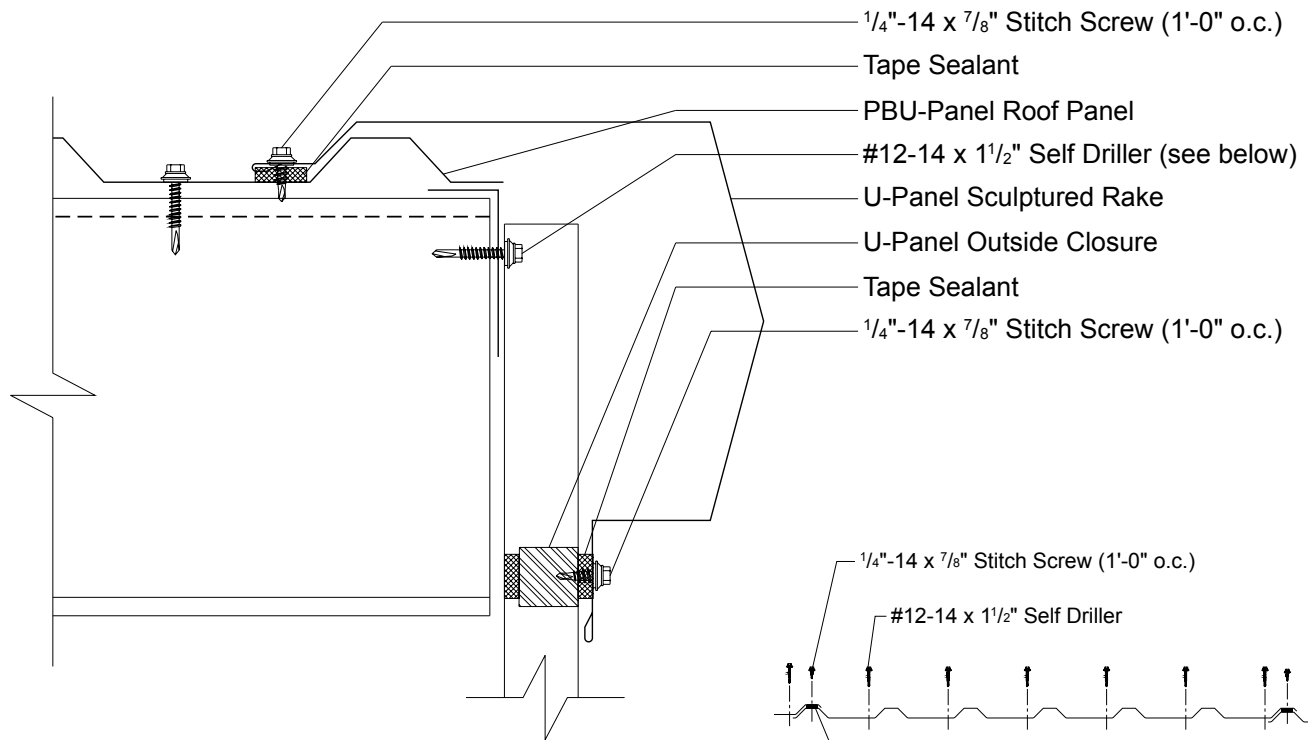
1:12 Minimum  
Roof Slope



**PBU-Panel Fastening Pattern**

# U-PANEL SCULPTURED RAKE DETAIL

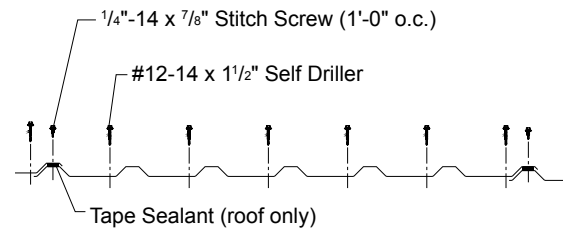
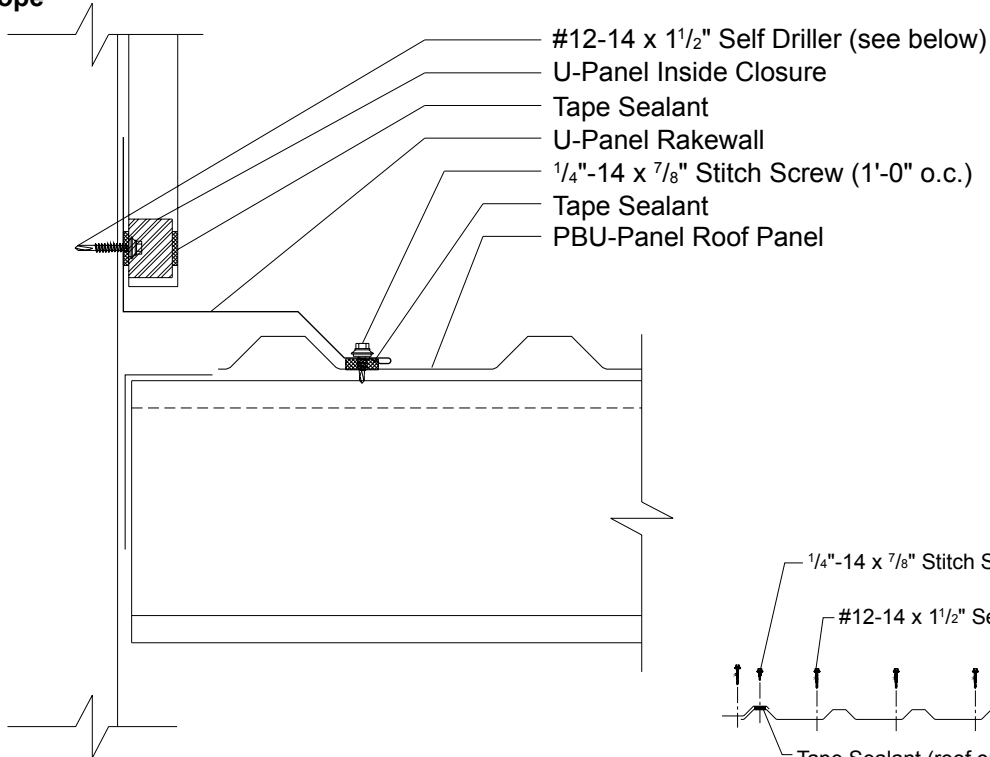
1:12 Minimum  
Roof Slope



**PBU-Panel Fastening Pattern**

# U-PANEL RAKEWALL DETAIL

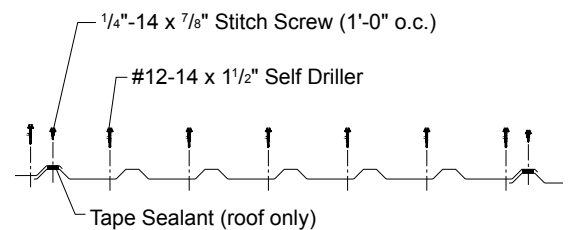
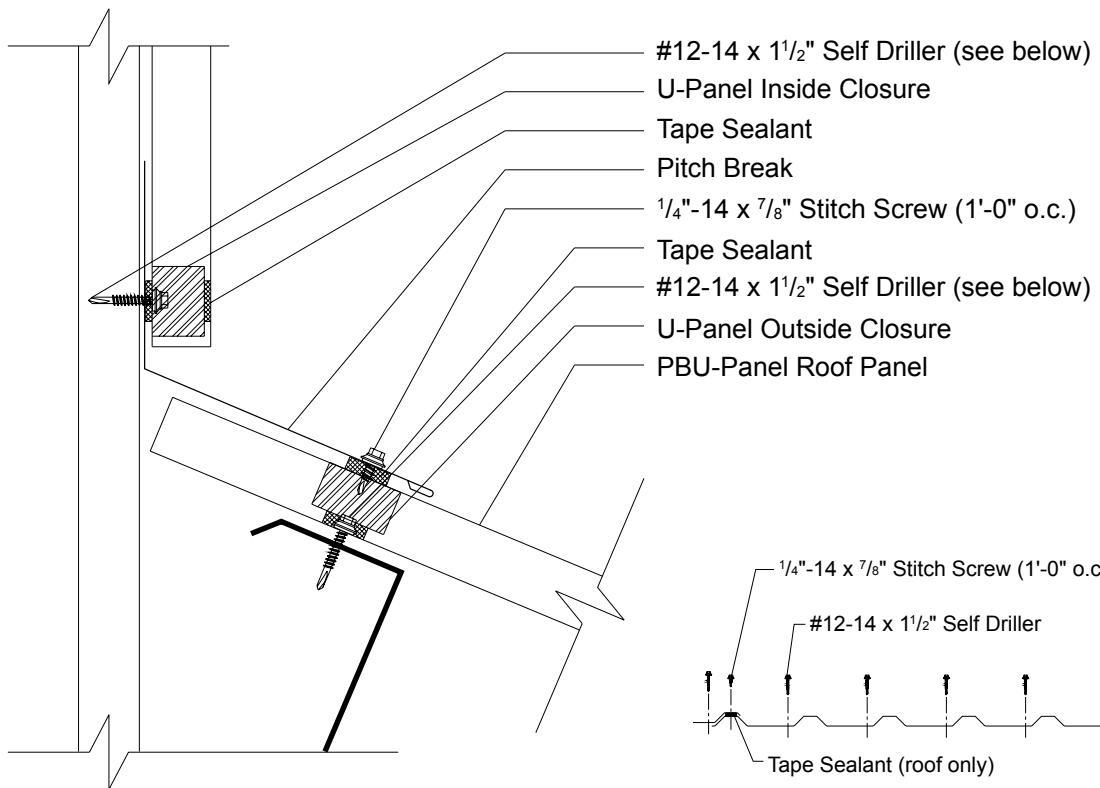
1:12 Minimum  
Roof Slope



**PBU-Panel Fastening Pattern**

# U-PANEL ENDWALL DETAIL

1:12 Minimum  
Roof Slope

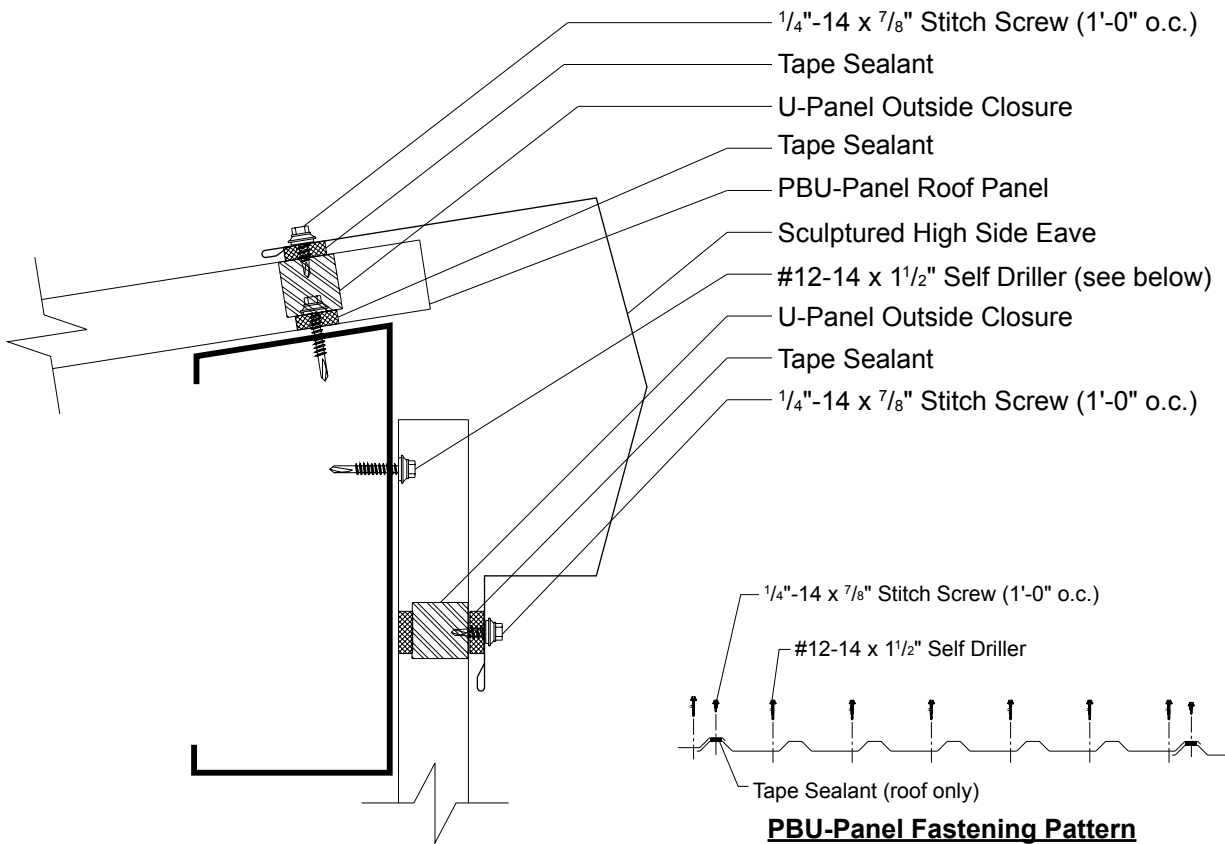


**PBU-Panel Fastening Pattern**

# U-PANEL

## SCULPTURED HIGH SIDE EAVE DETAIL

1:12 Minimum  
Roof Slope

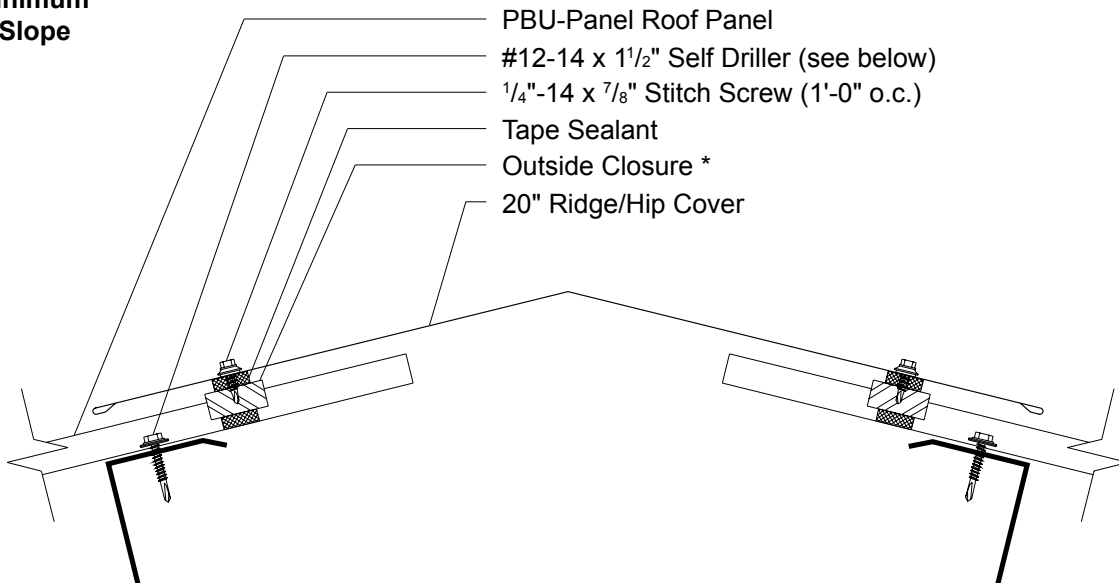


**PBU-Panel Fastening Pattern**

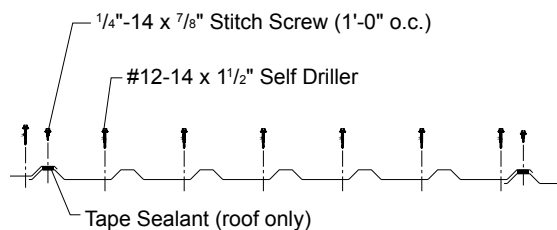
# U-PANEL

## RIDGE/HIP DETAIL

1:12 Minimum  
Roof Slope



\* For Ridge, use U-Panel Outside Closure.  
For Hip, use Universal Closure.

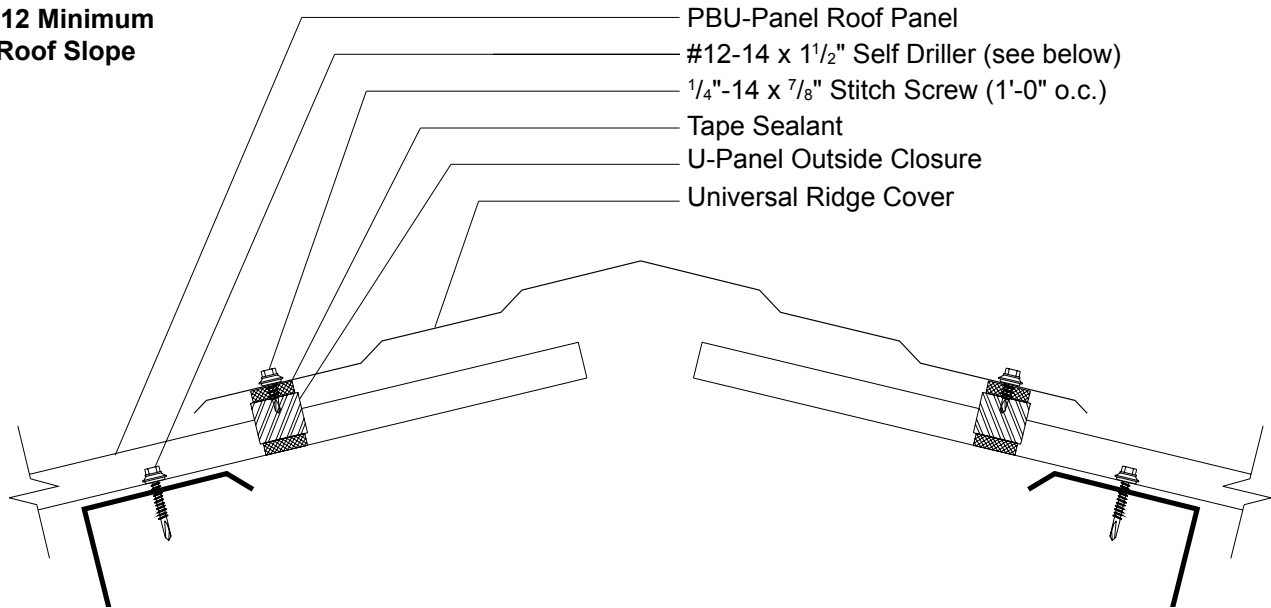


**PBU-Panel Fastening Pattern**

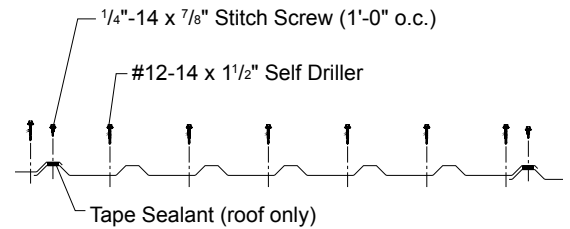
# U-PANEL

## UNIVERSAL RIDGE DETAIL

1:12 Minimum  
Roof Slope



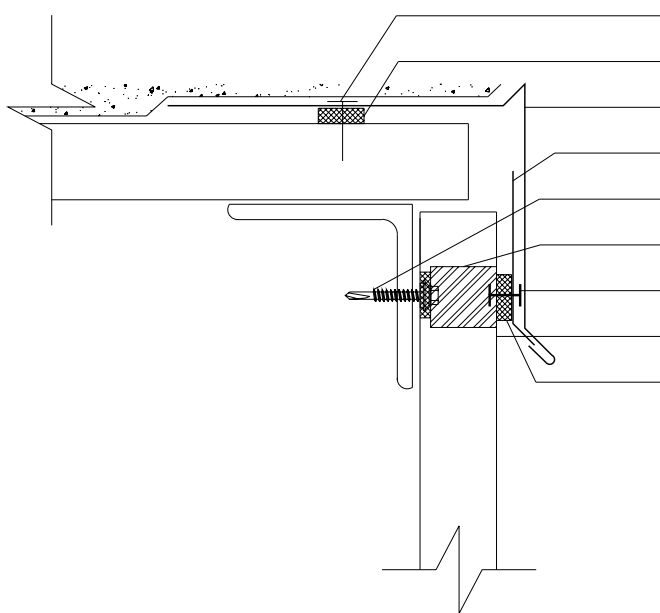
- PBU-Panel Roof Panel
- #12-14 x 1 1/2" Self Driller (see below)
- 1/4"-14 x 7/8" Stitch Screw (1'-0" o.c.)
- Tape Sealant
- U-Panel Outside Closure
- Universal Ridge Cover



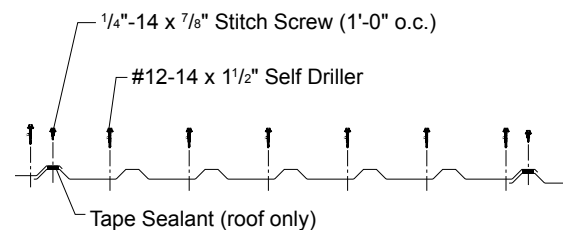
**PBU-Panel Fastening Pattern**

# U-PANEL

## GRAVEL STOP DETAIL

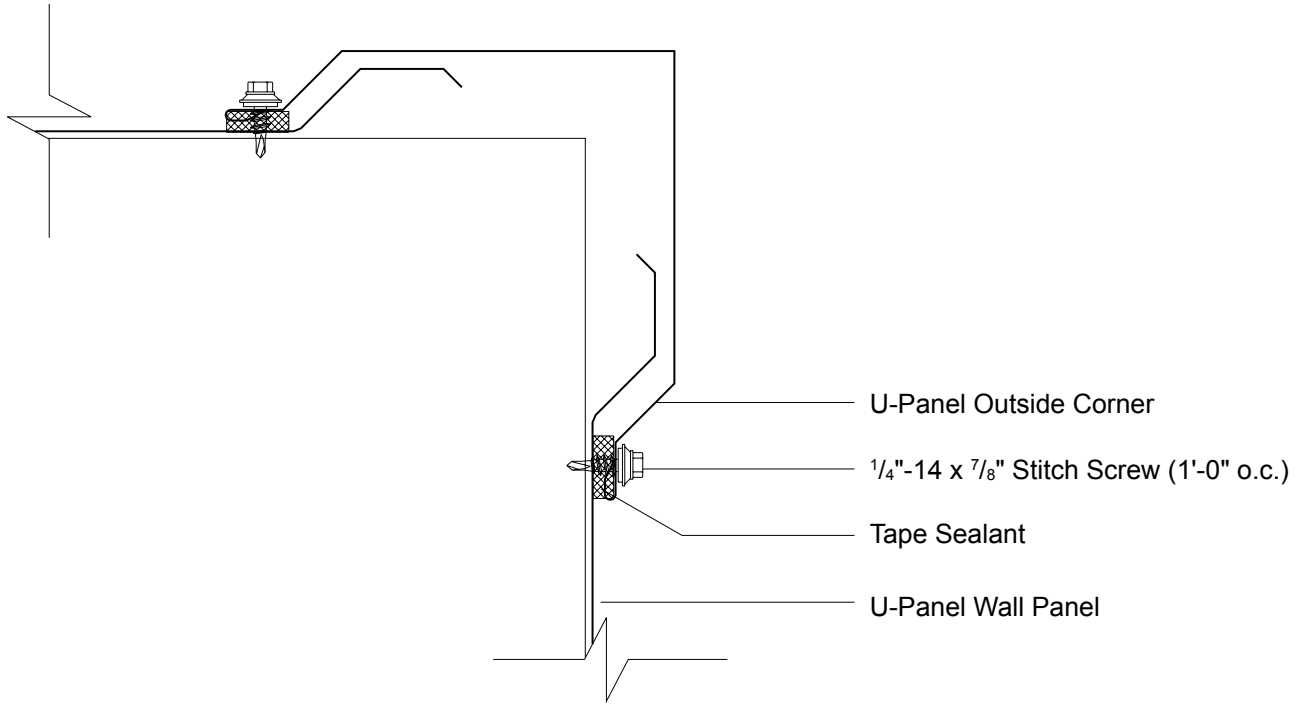


- Fastener (by others)
- Tape Sealant
- Gravel Stop
- Cleat
- #12-14 x 1 1/2" Self Driller (see below)
- U-Panel Outside Closure
- 1/8" x 3/16" Pop Rivet (1'-0" o.c.)
- U-Panel Wall Panel
- Tape Sealant

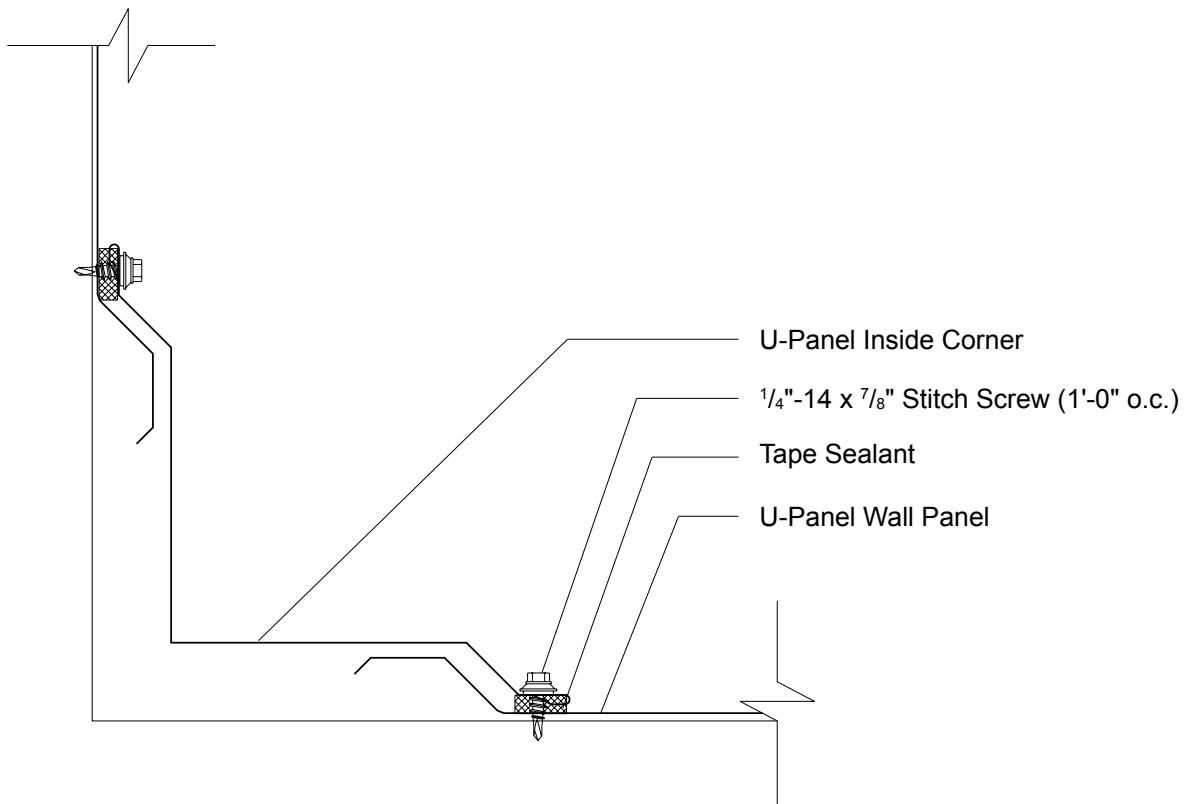


**U-Panel Fastening Pattern**

## U-PANEL OUTSIDE CORNER DETAIL



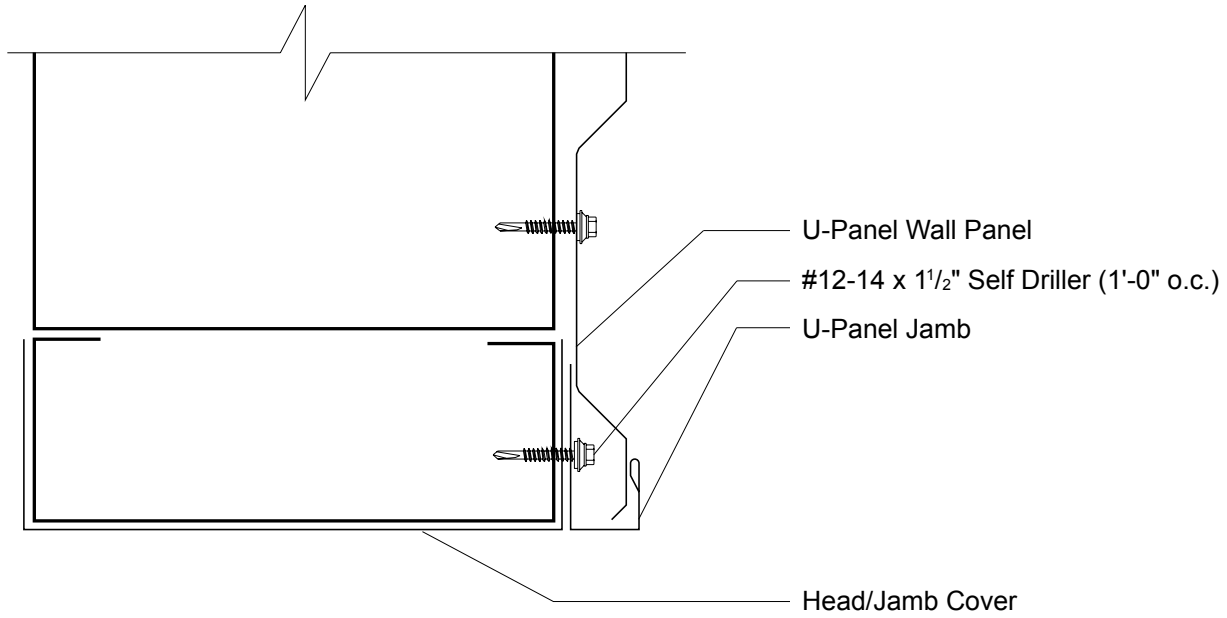
## U-PANEL INSIDE CORNER DETAIL





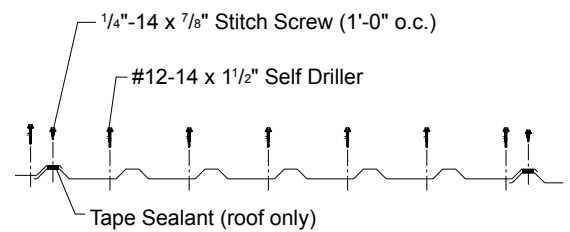
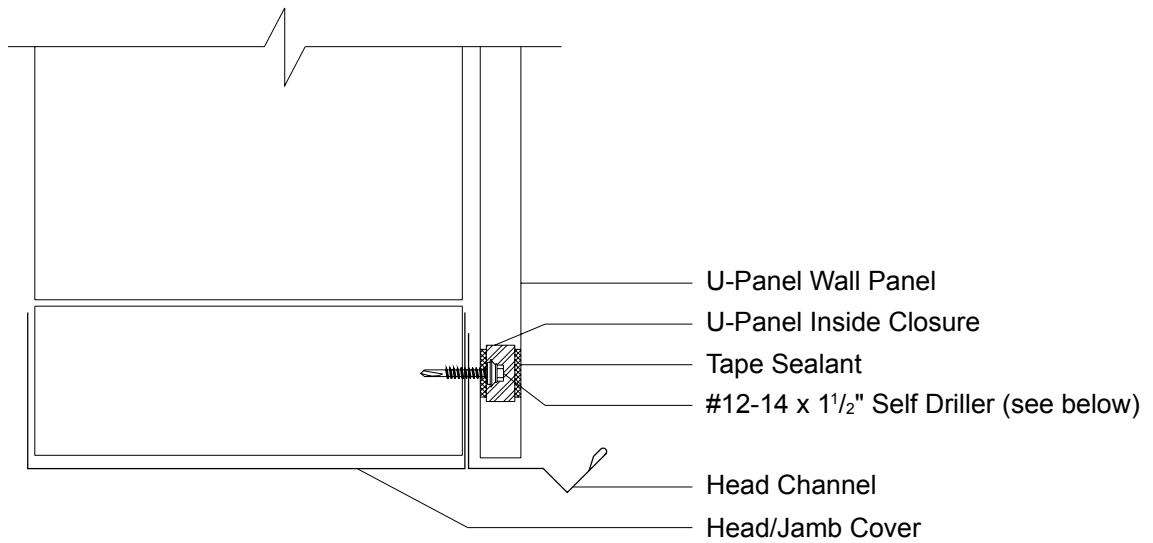
# U-PANEL

## JAMB DETAIL



# U-PANEL

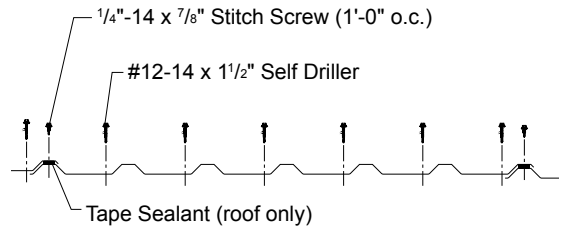
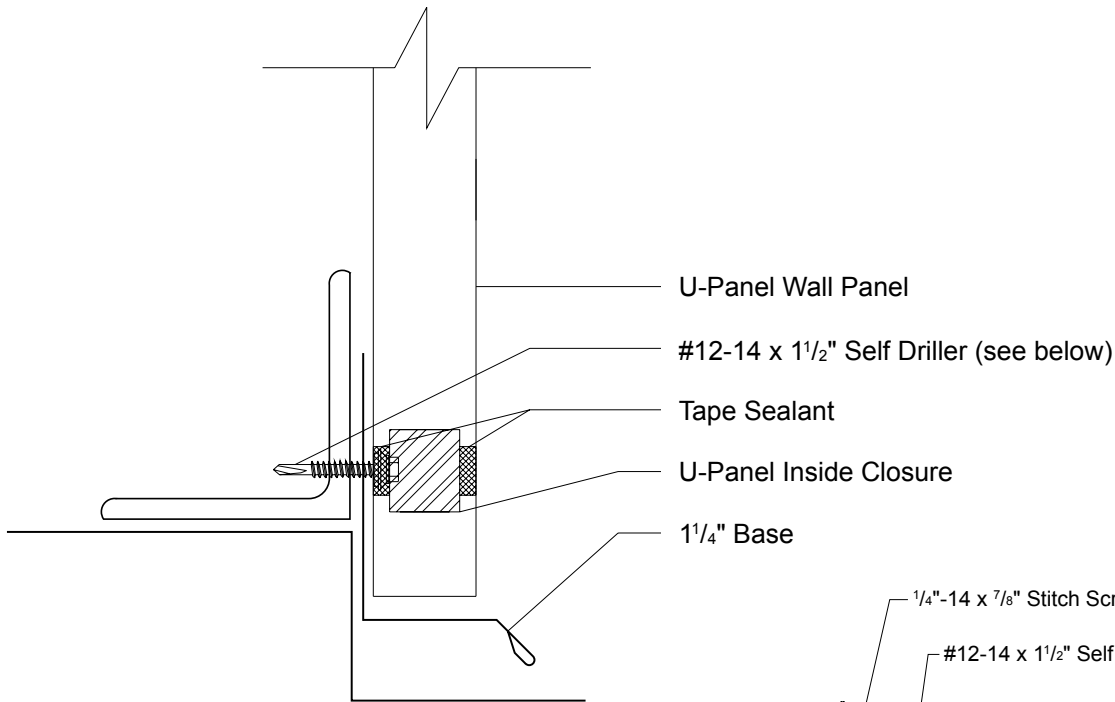
## HEAD DETAIL



**U-Panel Fastening Pattern**

# U-PANEL

## BASE DETAIL



**U-Panel Fastening Pattern**

# U-PANEL

## NOTES