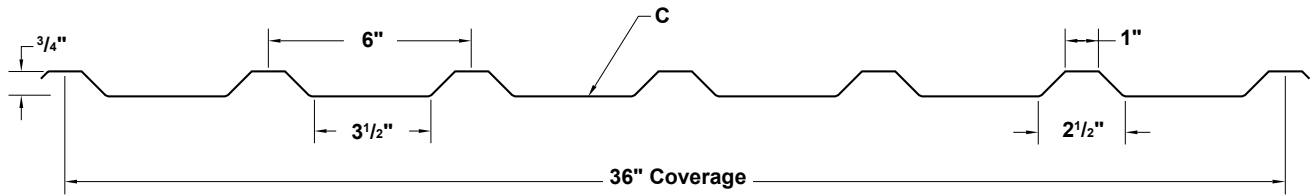


Product	Page No.
Panel Information	
U-Panel Profiles.....	PUP-2
Panel Overview	PUP-2
Flashing Profiles	
Eave (Direct Fasten).....	PUP-3
Cleat	PUP-3
Box Gutter	PUP-3
Box Gutter End.....	PUP-3
Universal Gutter/Downspout Strap.....	PUP-3
6" x 4" Downspout	PUP-3
6" x 4" 95° Elbow	PUP-3
Downspout Bracket	PUP-3
Valley	PUP-3
U-Panel Rake	PUP-3
U-Panel Sculptured Rake.....	PUP-3
Sculptured Rake End.....	PUP-3
Counter Flashing	PUP-3
Reglet Flashing.....	PUP-3
Sculptured High Side Eave.....	PUP-3
Peak	PUP-4
Pitch Break	PUP-4
U-Panel Rakewall	PUP-4
20" Ridge/Hip Cover.....	PUP-4
Universal Ridge Cover.....	PUP-4
Gravel Stop.....	PUP-4
U-Panel Inside Corner.....	PUP-4
U-Panel Outside Corner	PUP-4
Inside Corner	PUP-4
Outside Corner	PUP-4
Coping	PUP-4
1.5" Sill/Head.....	PUP-4
1.5" Sill to Soffit	PUP-4
Head Channel.....	PUP-4
Head Jamb Cover.....	PUP-4
U-Panel Jamb.....	PUP-5
1.25" Base	PUP-5
Accessory Profiles	
U-Panel Closures	PUP-5
Universal Closure	PUP-5
U-Panel Light Transmitting Panel.....	PUP-5
Tube Sealant	PUP-5
Tape Sealant.....	PUP-5
Rubber Roof Jack.....	PUP-5
Retro Roof Jack.....	PUP-5
Rubber Roof Flashing Kit	PUP-5
Touch-Up Paint.....	PUP-5
Continuous Ridge Vent.....	PUP-5
U-Panel Shear	PUP-5
Louver with Screen.....	PUP-5
Testing Information	
UL 580 Wind Uplift Information.....	PUP-6
Section Properties and General Information	PUP-7-8
Design/Installation Considerations	
Fastener Installation Technique.....	PUP-9
Condition of Substructure	PUP-9
Fastening Information.....	PUP-10

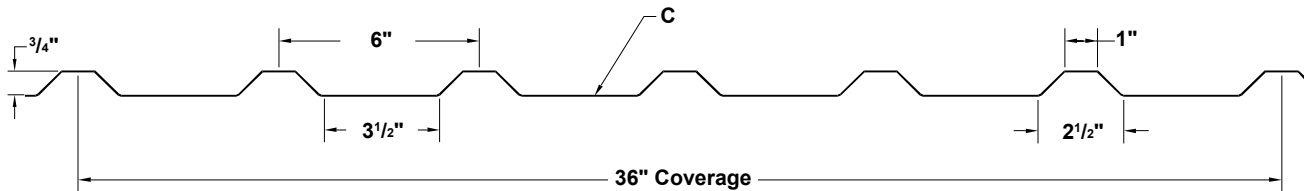
Product	Page No.
Detail Conditions	
Eave Detail	PUP-11
Box Gutter Detail	PUP-11
Valley Detail.....	PUP-12
Sculptured Rake Detail.....	PUP-12
Rakewall Detail.....	PUP-13
Endwall Detail.....	PUP-13
Sculptured High Side Eave Detail	PUP-14
Ridge/Hip Detail.....	PUP-14
Universal Ridge Detail	PUP-15
Gravel Stop Detail	PUP-15
Outside Corner Detail	PUP-16
Inside Corner Detail.....	PUP-16
Jamb Detail.....	PUP-17
Head Detail.....	PUP-17
Base Detail	PUP-18
Notes	
Notes	PUP-18

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

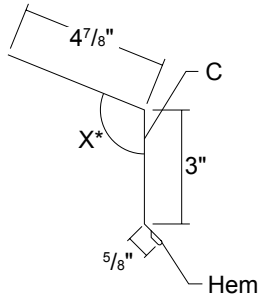
- ▶ *Acrylic Coated Galvalume® (ACG) / ASTM A-792 - AZ55
- ▶ Prepainted Galvalume / ASTM A-792 - AZ50
- ▶ MS Colorfast45®
- ▶ **Fluorocarbon (PVDF)

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

** Meets both Kynar 500 and Hylar 5000 specifications.

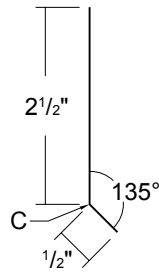
U-PANEL FLASHING PROFILES

EAVE (DIRECT FASTEN)



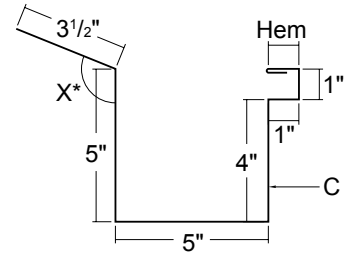
Length 10'-2" - *Specify Slope Angle

CLEAT



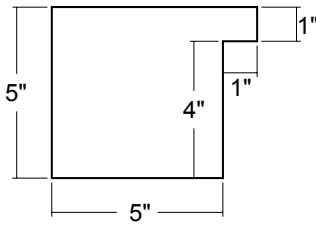
Length 10'-2"

BOX GUTTER

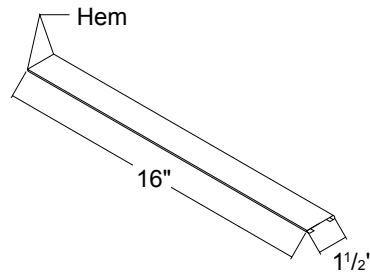


Length 10'-2", 20'-3" - *Specify Slope Angle

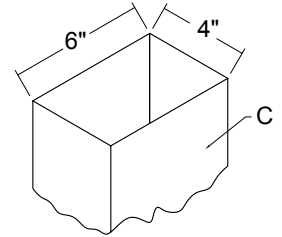
BOX GUTTER END



UNIVERSAL GUTTER/ DOWNSPOUT STRAP

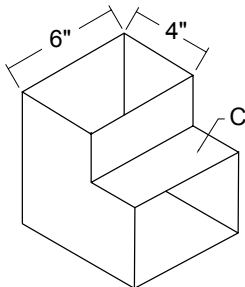


DOWNSPOUT 6" x 4"



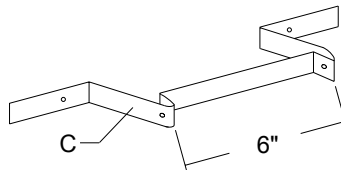
Length 10'-2", 20'-3"
(Also available 4" x 3 1/2")

95° ELBOW 6" x 4"



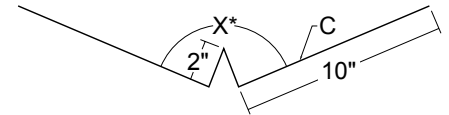
(Also available 4" x 3 1/2")

DOWNSPOUT BRACKET



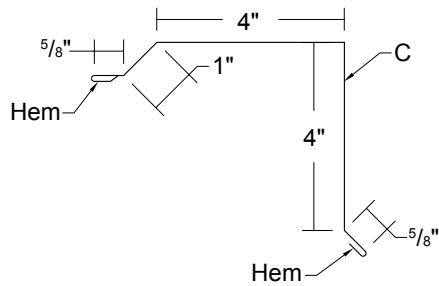
(Also available 4")

VALLEY



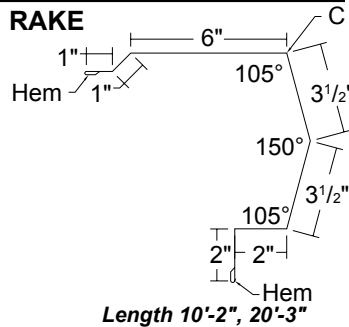
Length 10'-2", 20'-3" - *Specify Slope Angle

U-PANEL RAKE



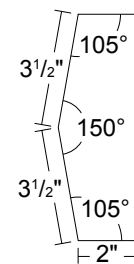
Length 10'-2", 20'-3"

U-PANEL SCULPTURED

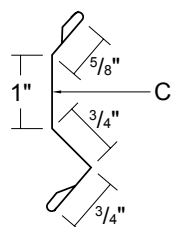


Length 10'-2", 20'-3"

SCULPTURED RAKE END

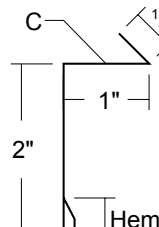


COUNTER FLASHING



Length 10'-2"

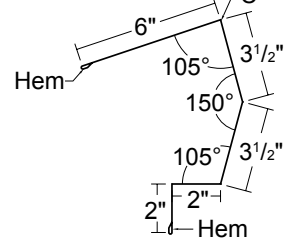
REGLET FLASHING



Length 10'-2"

SCULPTURED

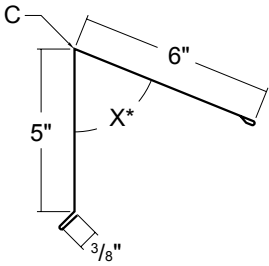
HIGH SIDE EAVE



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

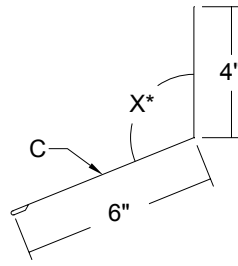
U-PANEL FLASHING PROFILES (CONT.)

PEAK



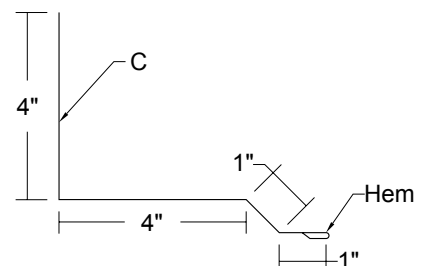
Length 10'-2", 20'-3" - *Specify Slope Angle

PITCH BREAK



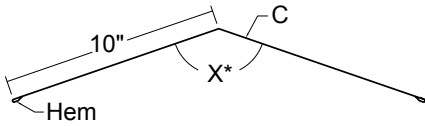
Length 10'-2" - *Specify Slope Angle

U-PANEL RAKEWALL



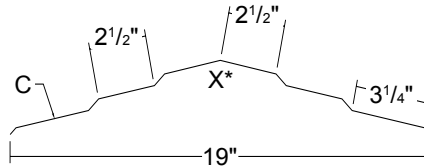
Length 10'-2"

20" RIDGE/HIP COVER



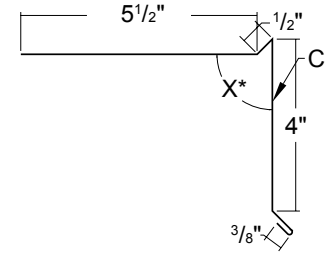
Length 10'-2", 20'-3" - *Specify Slope Angle

UNIVERSAL RIDGE COVER



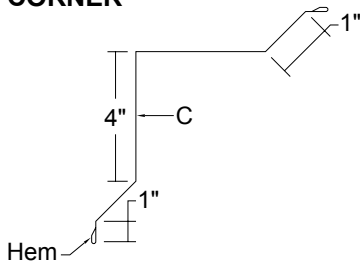
Length 10'-2" - *Specify Slope Angle

GRAVEL STOP



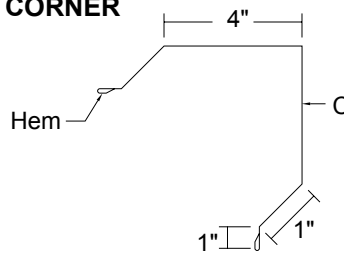
Length 10'-2", 20'-3"

U-PANEL INSIDE CORNER



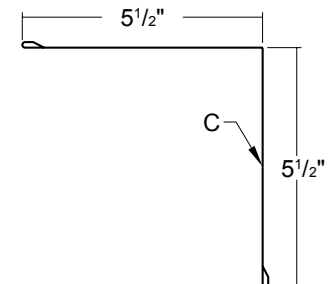
Length 10'-2", 14'-2", 20'-3"

U-PANEL OUTSIDE CORNER



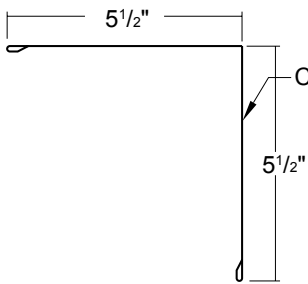
Length 10'-2", 14'-2", 20'-3"

INSIDE CORNER



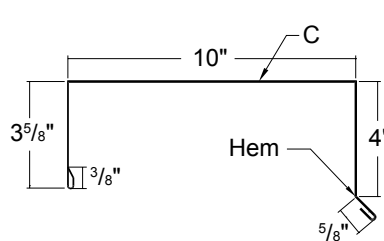
Length 10'-2", 20'-3"

OUTSIDE CORNER



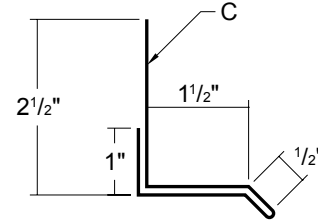
Length 10'-2", 20'-3"

COPING



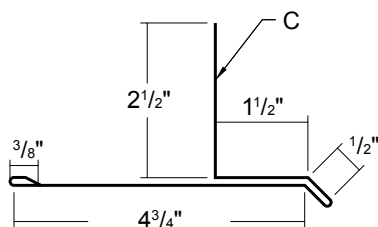
Length 10'-2", 20'-3"

1.5" SILL/HEAD



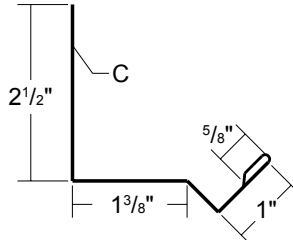
Length 10'-2"

1.5" SILL TO SOFFIT



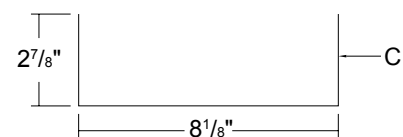
Length 10'-2"

HEAD CHANNEL



Length 10'-2"

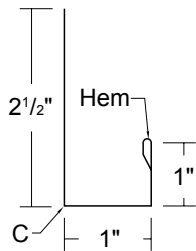
HEAD/JAMB COVER



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

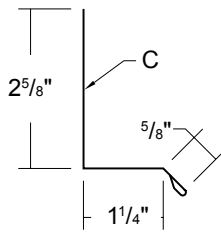
U-PANEL FLASHING PROFILES (CONT.) AND ACCESSORY PROFILES

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



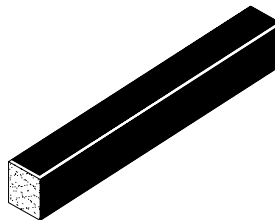
Outside Closure



Inside Closure

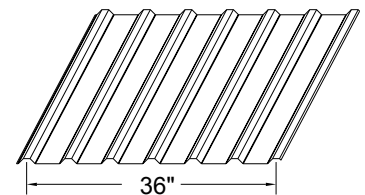
Polyethylene Foam

UNIVERSAL CLOSURE



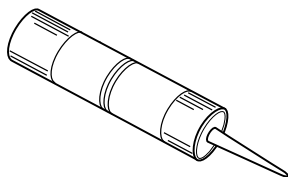
1" x 1 1/2" x 50' Polyethylene Foam
1" x 1 1/2" x 10' Polyethylene Foam

U-PANEL LIGHT TRANSMITTING PANEL



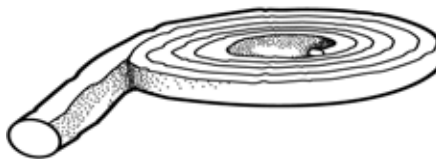
8 Ounce Fiberglass

TUBE SEALANT



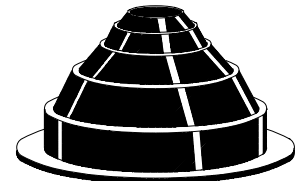
10.3 oz. Cartridge
Urethane

TAPE SEALANT



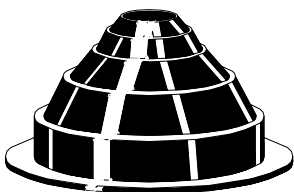
3/8" X 3/32" X 50'
Single Bead
Butyl - Gray

RUBBER ROOF JACK



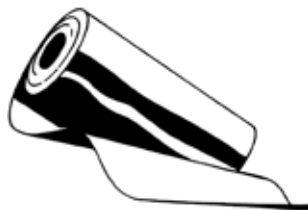
MINI (1/4" to 1/8" O.D. Pipe)
#2 (1 3/4" to 3" O.D. Pipe)
#4 (3" to 6" O.D. Pipe)
#6 (6" to 9" O.D. Pipe)
#8 (7" to 13" O.D. Pipe)

RETRO ROOF JACK



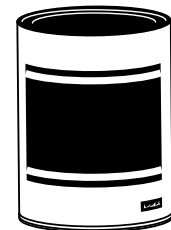
#801_{RETRO} (3/4" to 2 3/4" O.D. Pipe)
#802_{RETRO} (2" to 7 1/4" O.D. Pipe)
#803_{RETRO} (3 1/4" to 10" O.D. Pipe)

RUBBER ROOF FLASH KIT



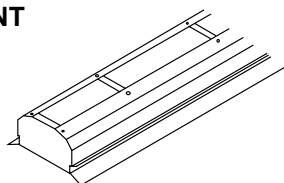
12" x 50'-0" Flash Kit
18" x 50'-0" Flash Kit

TOUCH-UP PAINT



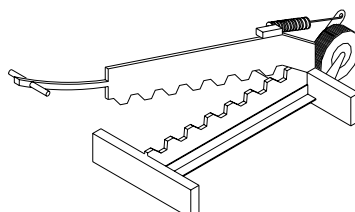
Available in pints
PVDF / MS Colorfast45

CONTINUOUS RIDGE VENT

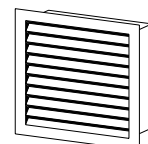


4" x 10', 9" x 10', 12" x 10'

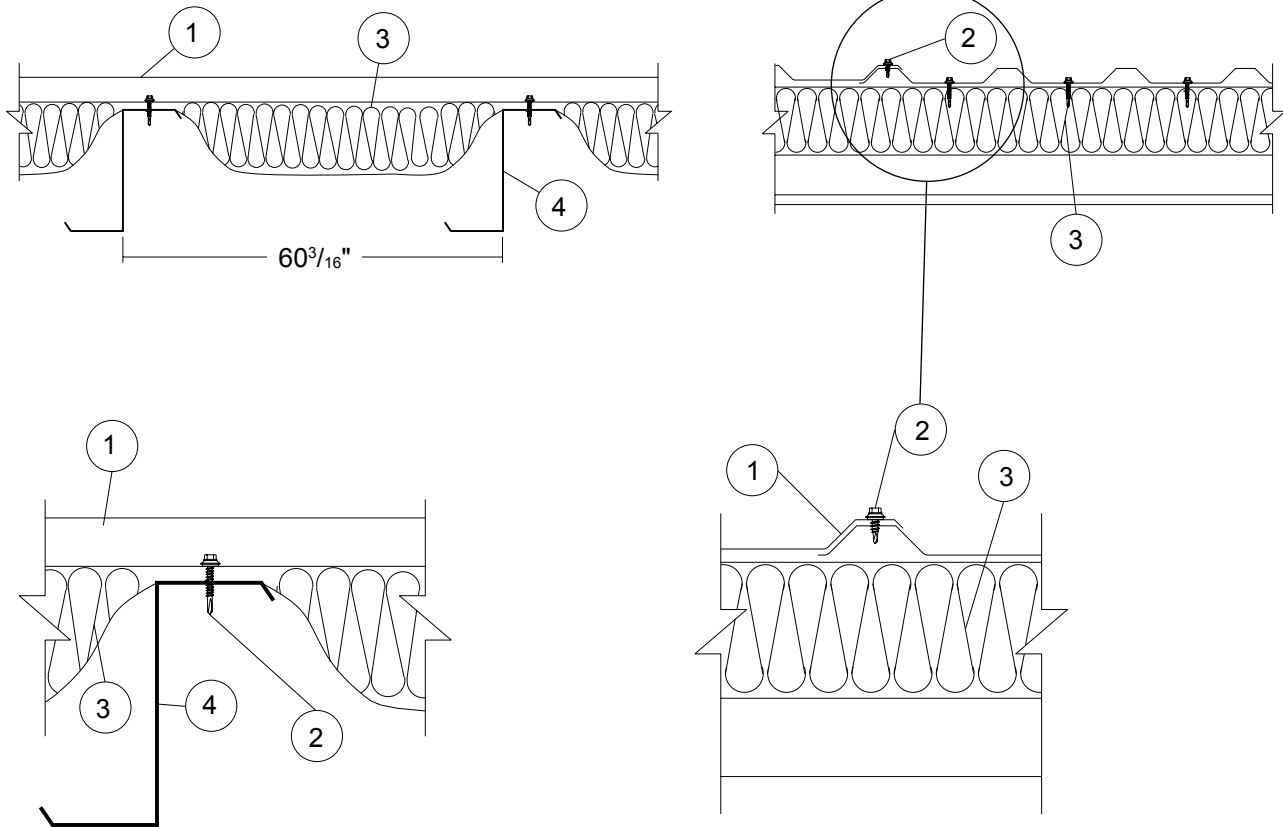
U-PANEL SHEAR



LOUVRE WITH SCREEN



3' x 3', 3' x 4'



U-PANEL

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

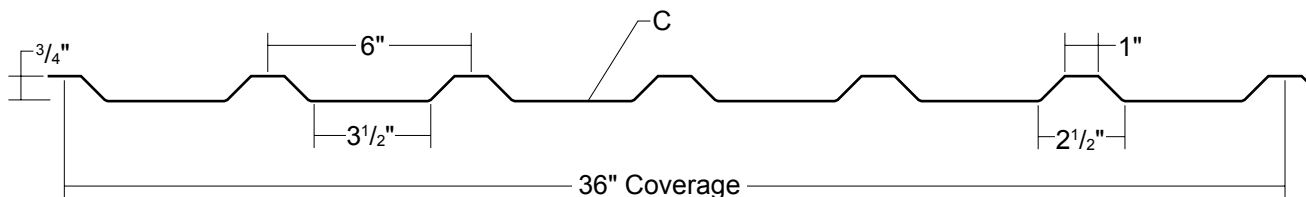
1. **Metal Roof Deck Panels*** No. 26 MSG min gauge coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 6 in. with lap beginning 1 in. from edge of purlin flange and extending across purlin. A bead of sealant may be used at panel end and side 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. ®

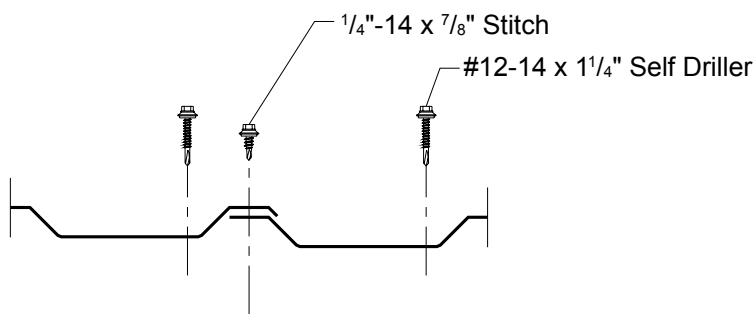
LISTED



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 ⁴ /ft	Sxx In ³ /ft	Ixx In ⁴ /ft	Sxx In ³ /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

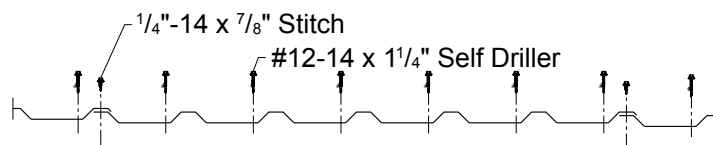
- Theoretical section properties have been calculated per AISI 2001 "Specification for the Design of Cold-formed Steel Structural Members." Ixx and Sxx are effective section properties for deflection and bending.
- Allowable load is calculated in accordance with AISI 2001 specifications considering bending, 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



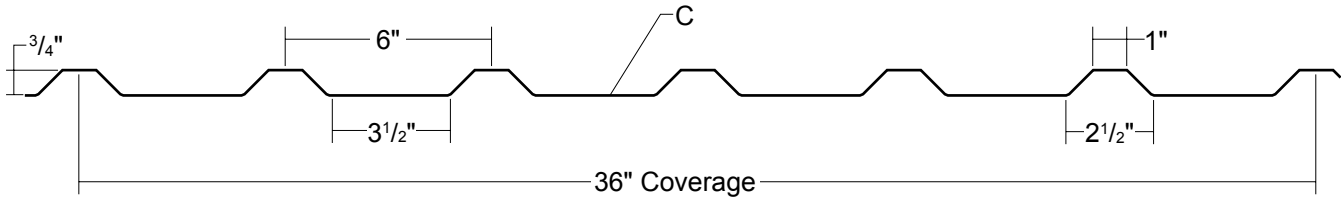
FASTENING PATTERN

Ends and Field of Panel



GENERAL INFORMATION

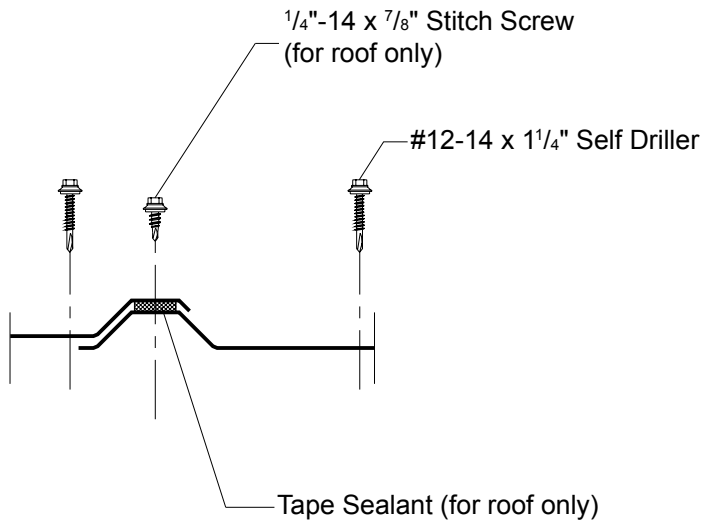
- Substructure**
 U-Panel is designed to be utilized over open structural framing, but can easily be used with a solid substrate. To avoid panel distortion, use a properly aligned and uniform substructure.
- Coverage**
 U-Panels are available in 3/4" rib height with a coverage width of 36".
- Length**
 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



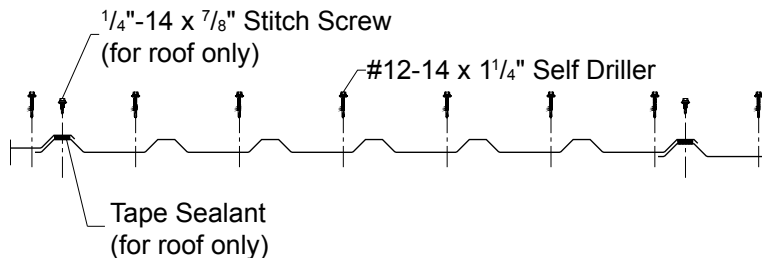
SECTION PROPERTIES								ALLOWABLE UNIFORM LOADS PSF (3 or More Equal Spans)											
Ga.	Width (in.)	Yield KSI	Weight PSF	Top in Compression		Bottom in Compression		Inward Load					Outward Load						
				Ixx In ⁴ /ft	Sxx In ³ /ft	Ixx In ⁴ /ft	Sxx In ³ /ft	2'	3'	4'	5'	6'	7'	2'	3'	4'	5'	6'	7'
26	36"	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



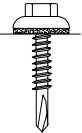
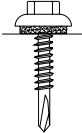
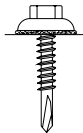
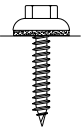
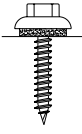
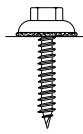
GENERAL INFORMATION

- 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.

	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.

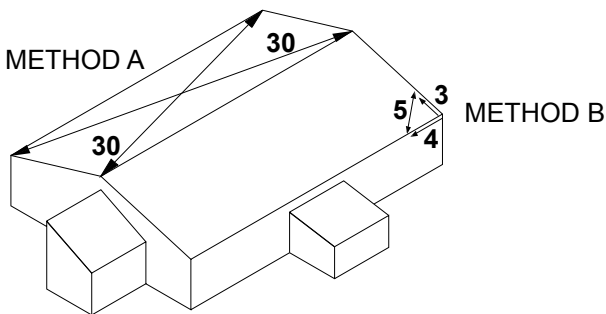
CONDITION OF SUBSTRUCTURE

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.

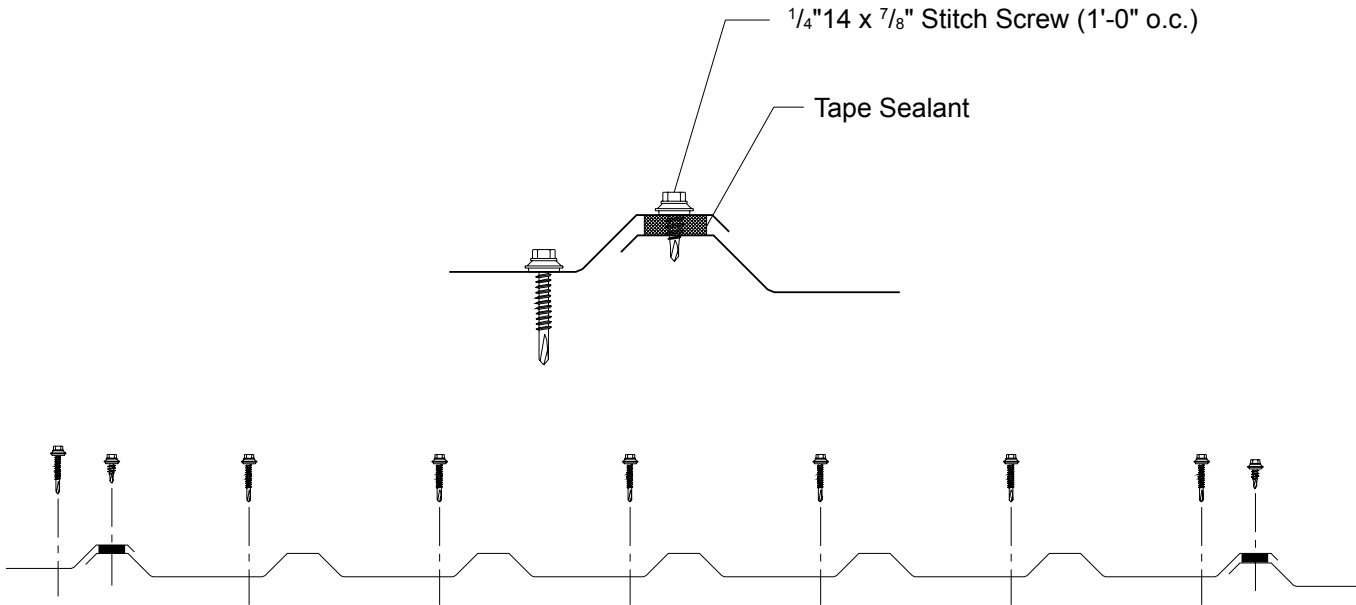
METHOD "A" - One method for checking the roof for squareness is to measure diagonally across one slope of the roof from similar points at the ridge and eave and obtain the same dimension.

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.



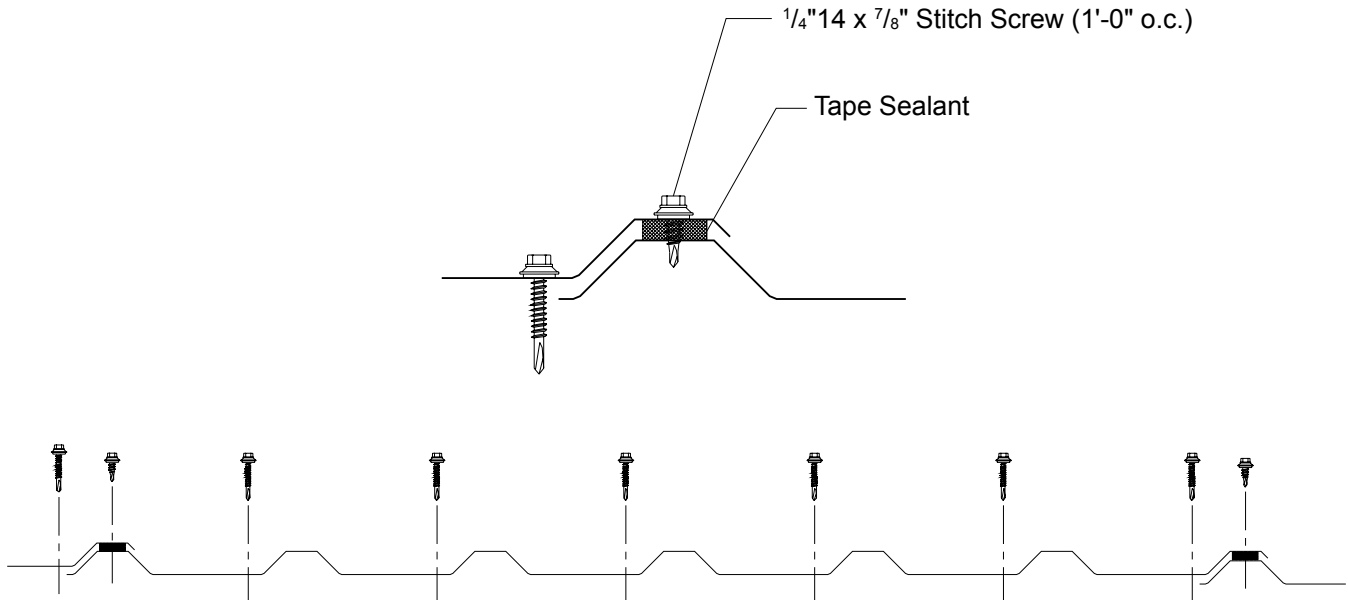
U-PANEL DESIGN / INSTALLATION CONSIDERATIONS (CONT.)

U-PANEL FASTENING PATTERN



U-Panel Fastening Pattern

PBU-PANEL FASTENING PATTERN

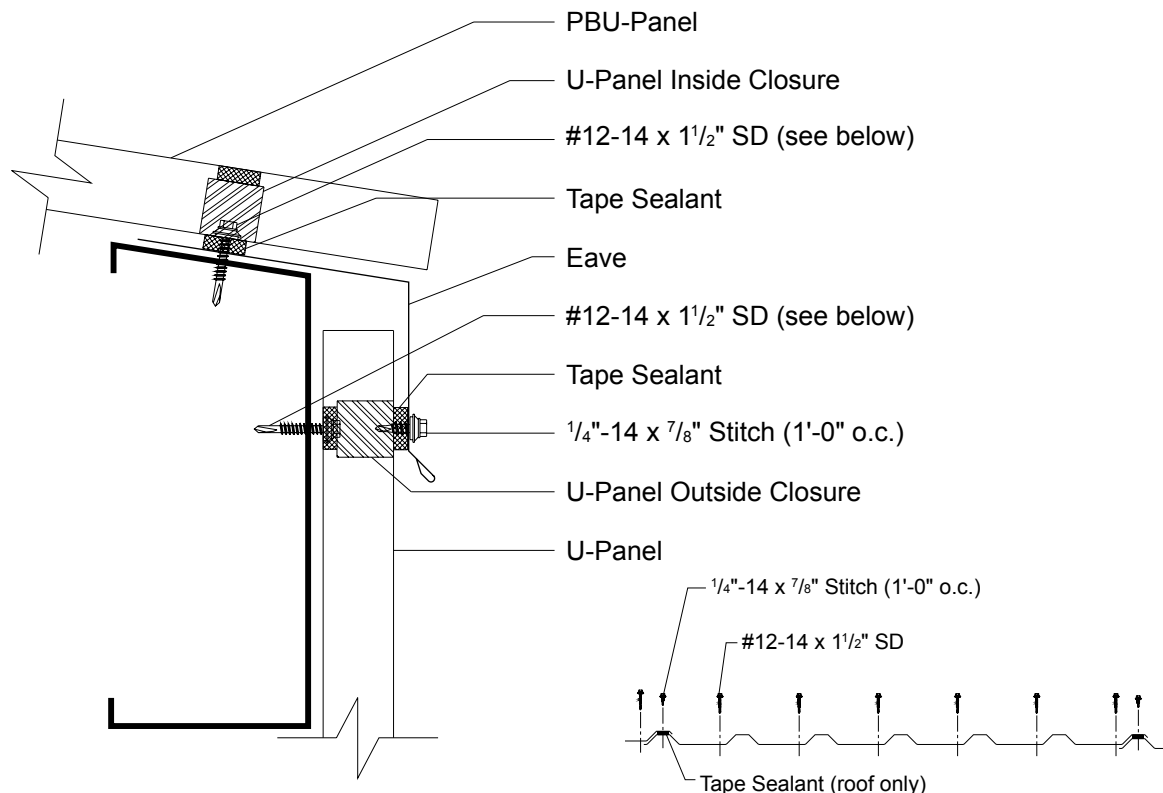


PBU-Panel Fastening Pattern - Ends & UL Class 90

U-PANEL

EAVE DETAIL

1:12 Slope
Minimum

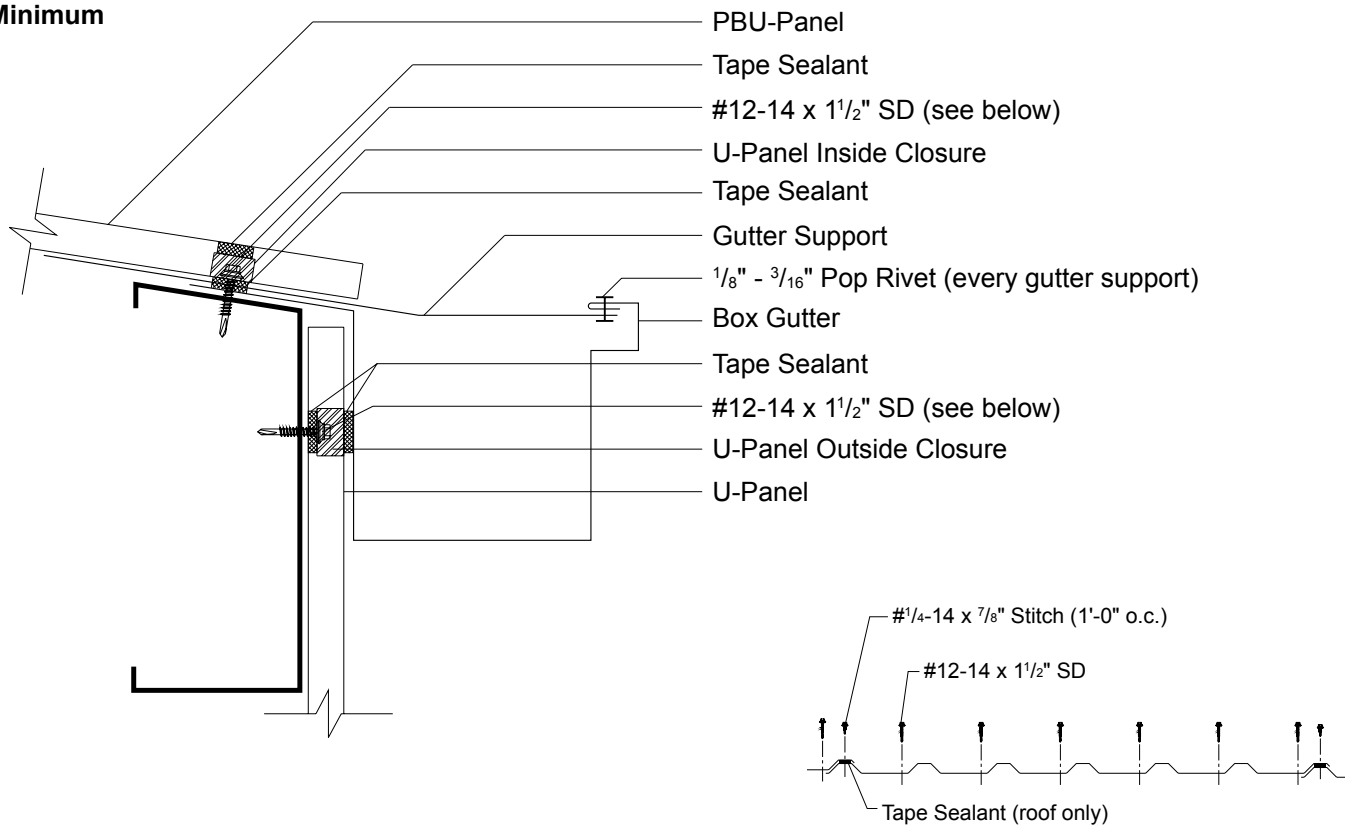


PBU-Panel Fastening Pattern

U-PANEL

BOX GUTTER DETAIL

1:12 Slope
Minimum

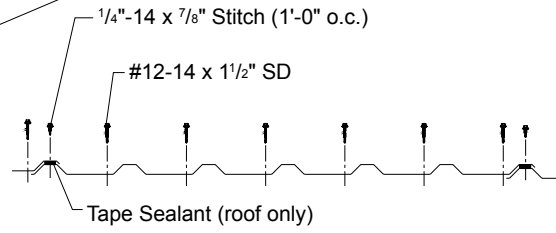
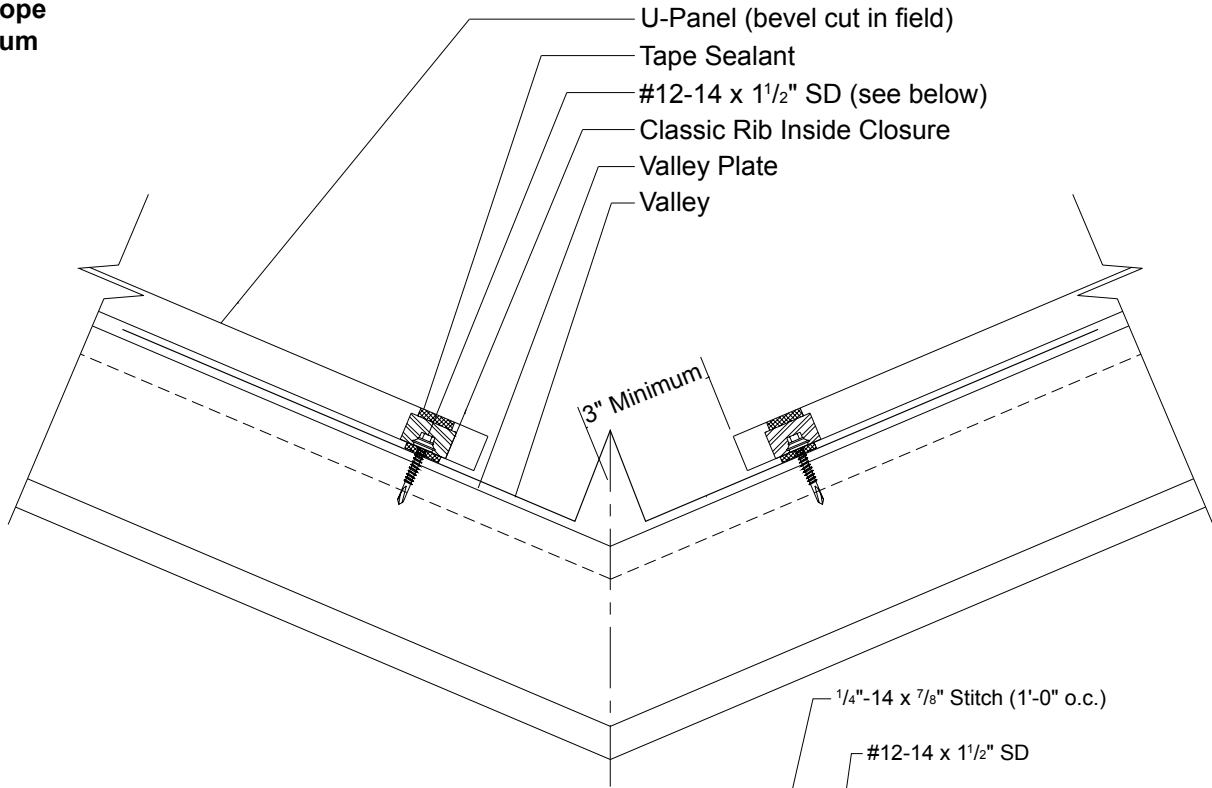


PBU-Panel Fastening Pattern

U-PANEL

VALLEY DETAIL

1:12 Slope
Minimum

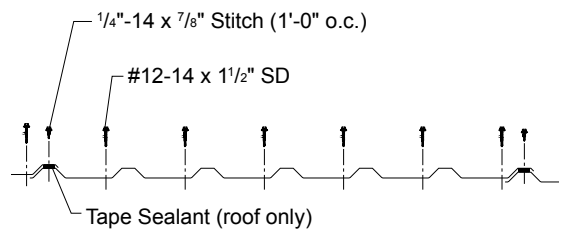
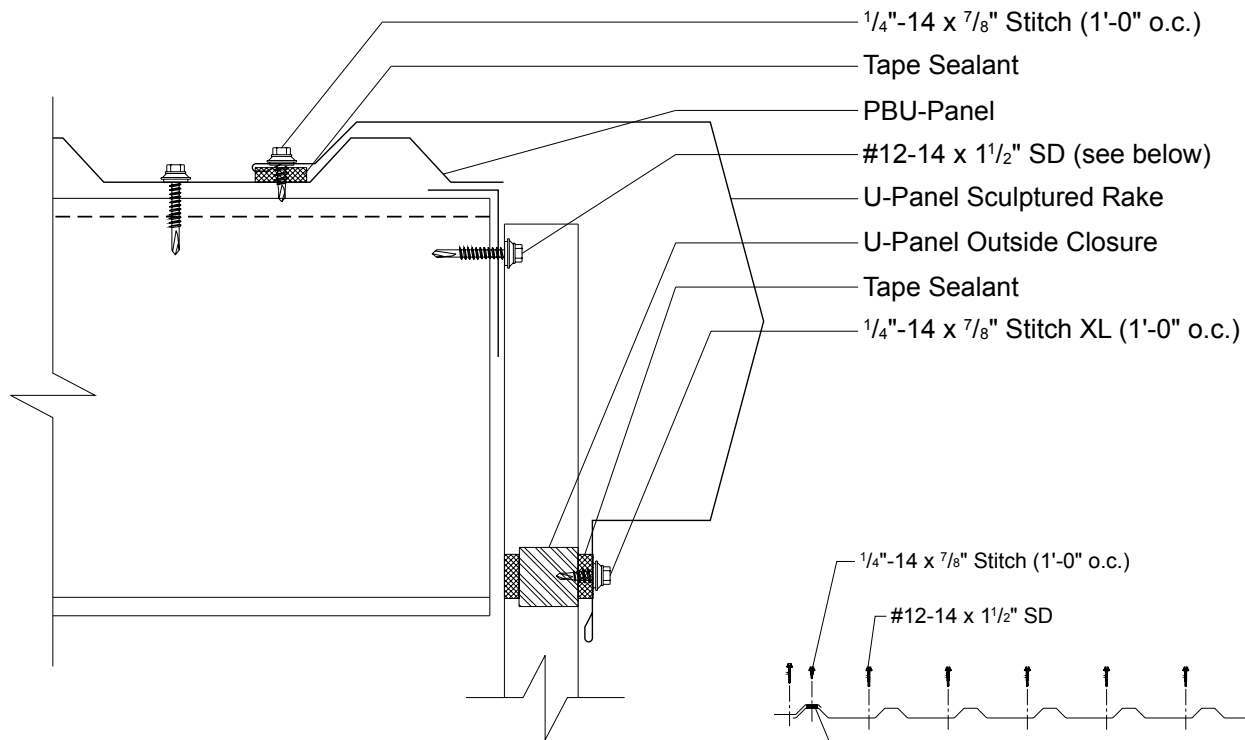


PBU-Panel Fastening Pattern

U-PANEL

SCULPTURED RAKE DETAIL

1:12 Slope
Minimum

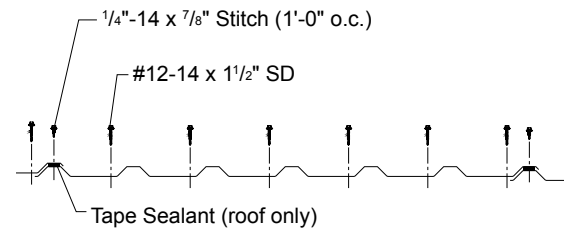
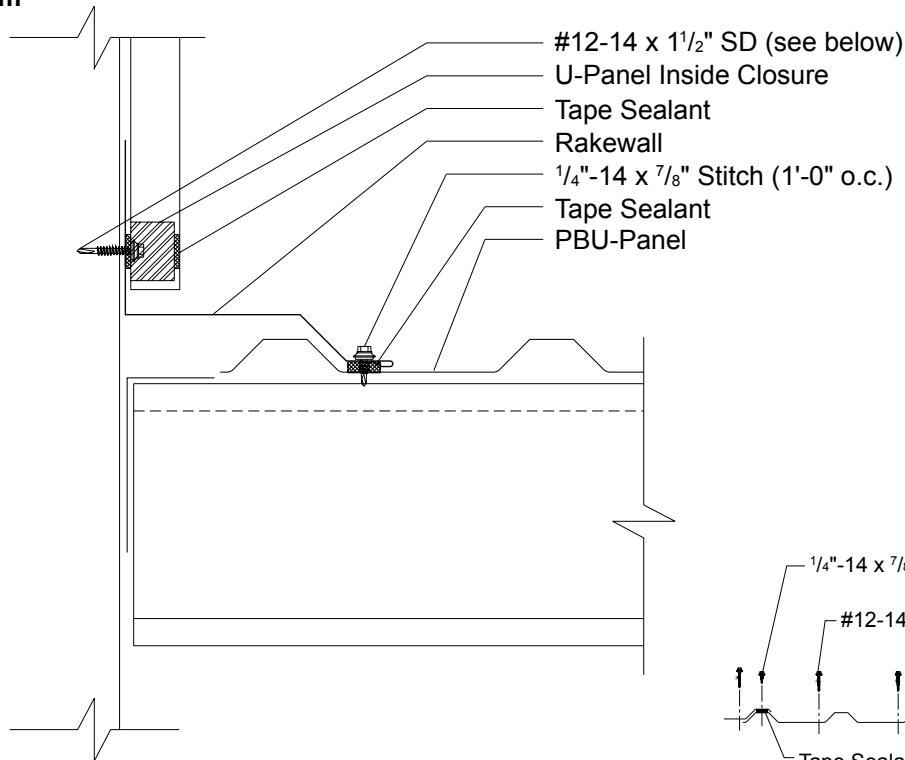


PBU-Panel Fastening Pattern

U-PANEL

RAKEWALL DETAIL

1:12 Slope
Minimum

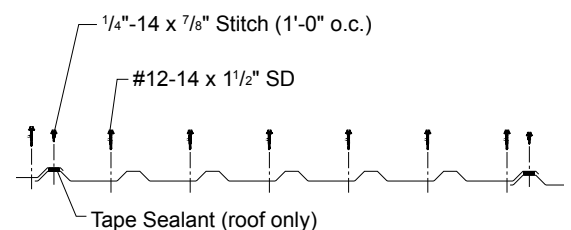
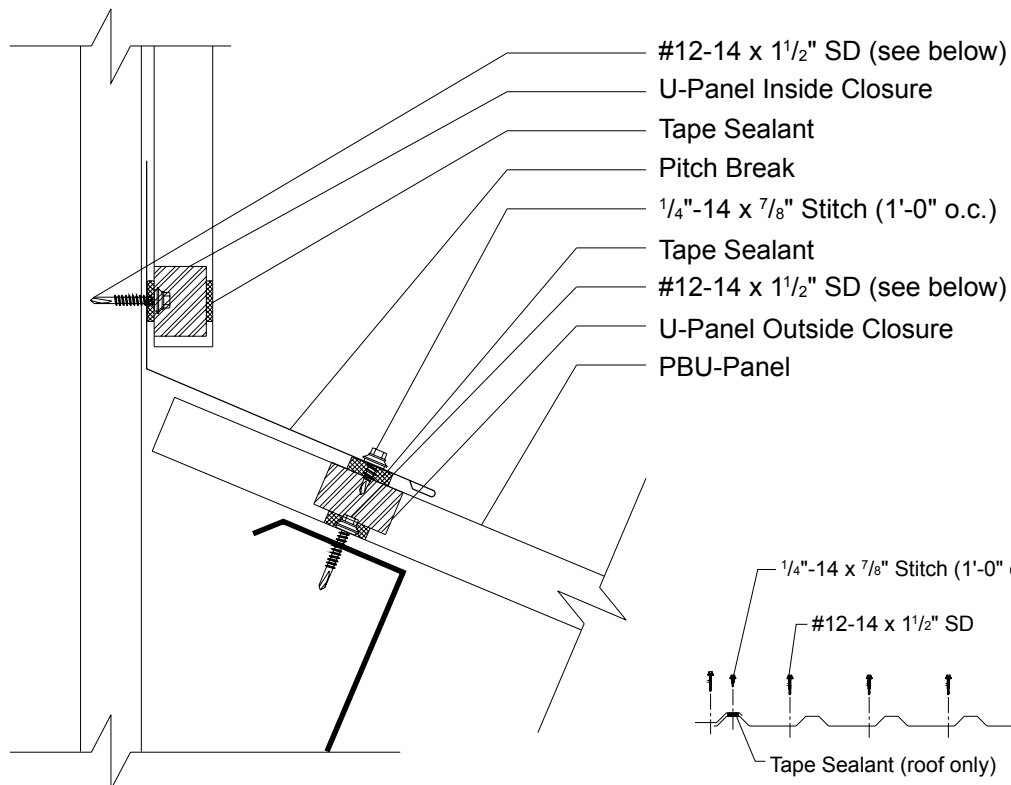


PBU-Panel Fastening Pattern

U-PANEL

ENDWALL DETAIL

1:12 Slope
Minimum

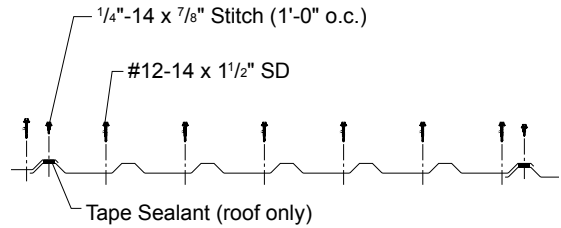
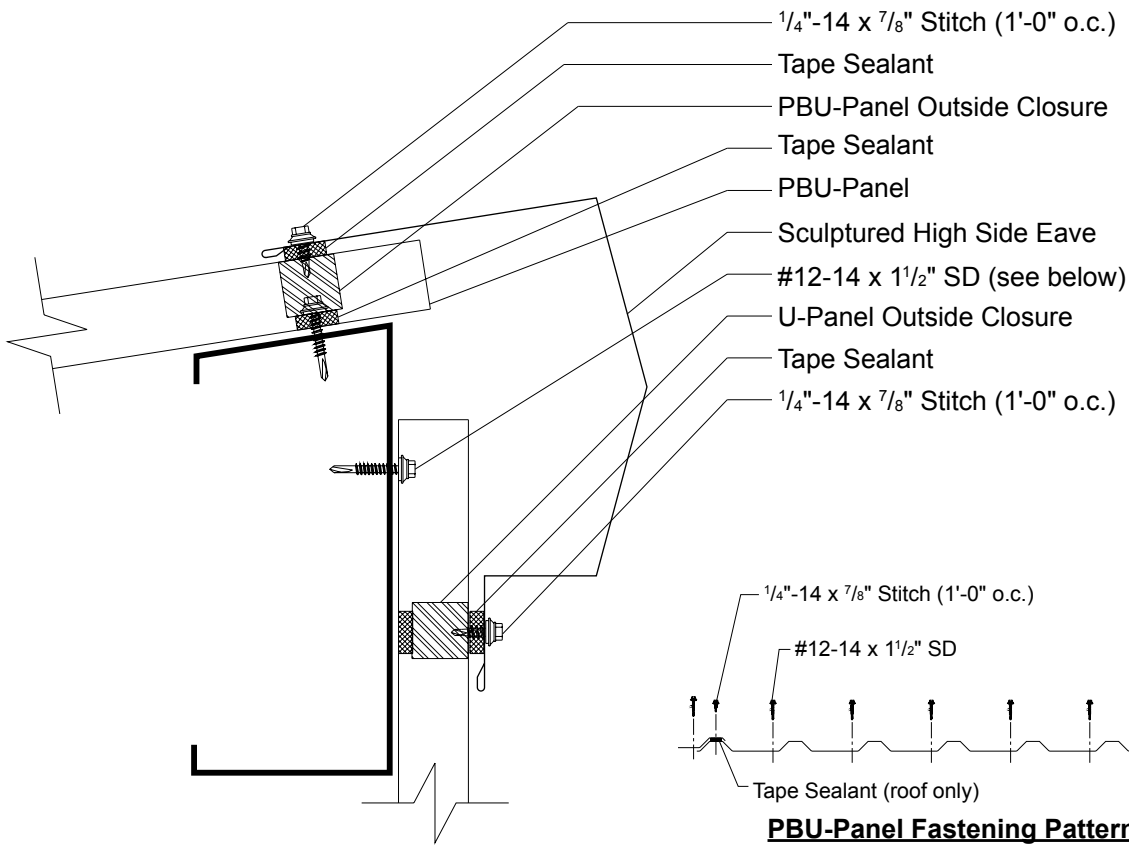


PBU-Panel Fastening Pattern

U-PANEL

SCULPTURED HIGH SIDE EAVE DETAIL

1:12 Slope
Minimum

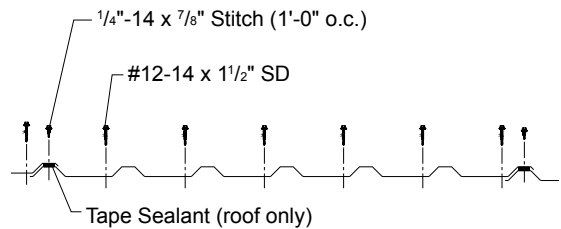
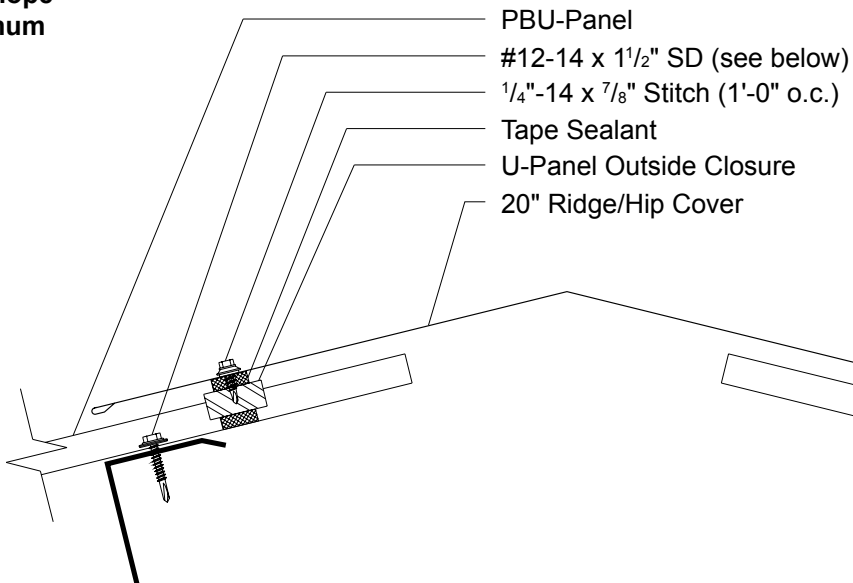


PBU-Panel Fastening Pattern

U-PANEL

RIDGE/HIP DETAIL

1:12 Slope
Minimum

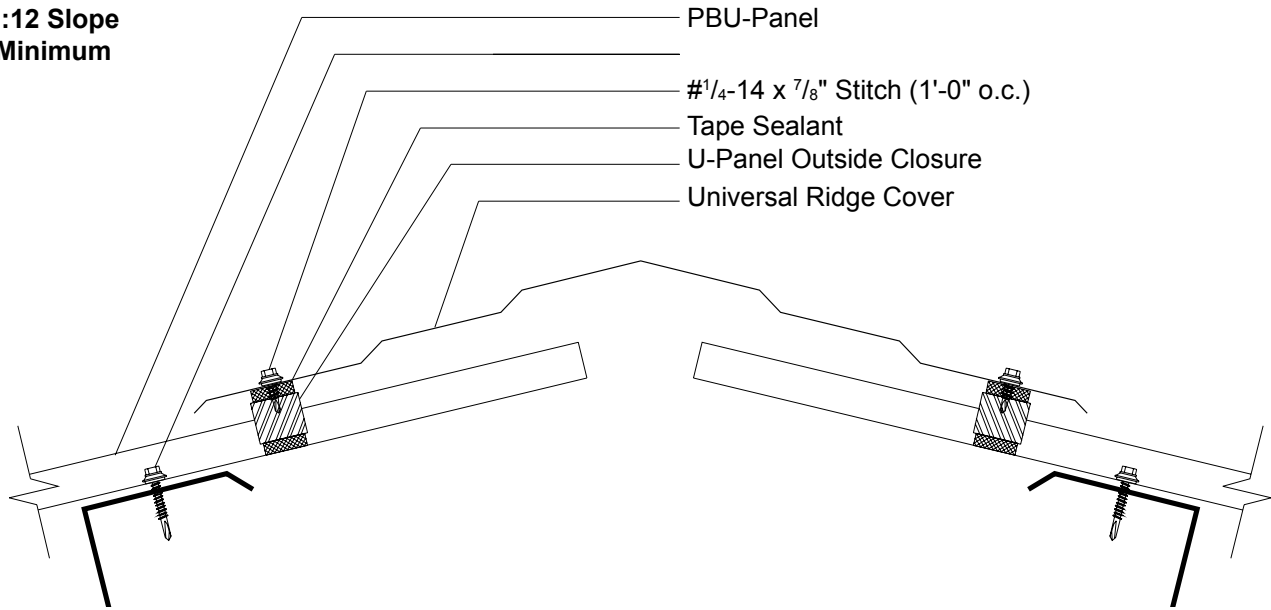


PBU-Panel Fastening Pattern

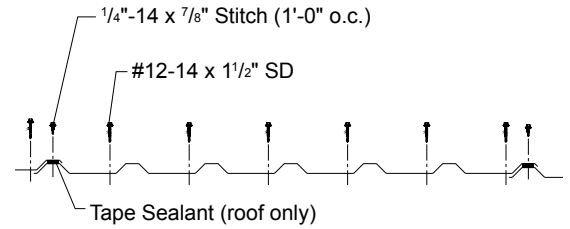
U-PANEL

UNIVERSAL RIDGE DETAIL

1:12 Slope
Minimum



- PBU-Panel
- #1/4-14 x 7/8" Stitch (1'-0" o.c.)
- Tape Sealant
- U-Panel Outside Closure
- Universal Ridge Cover

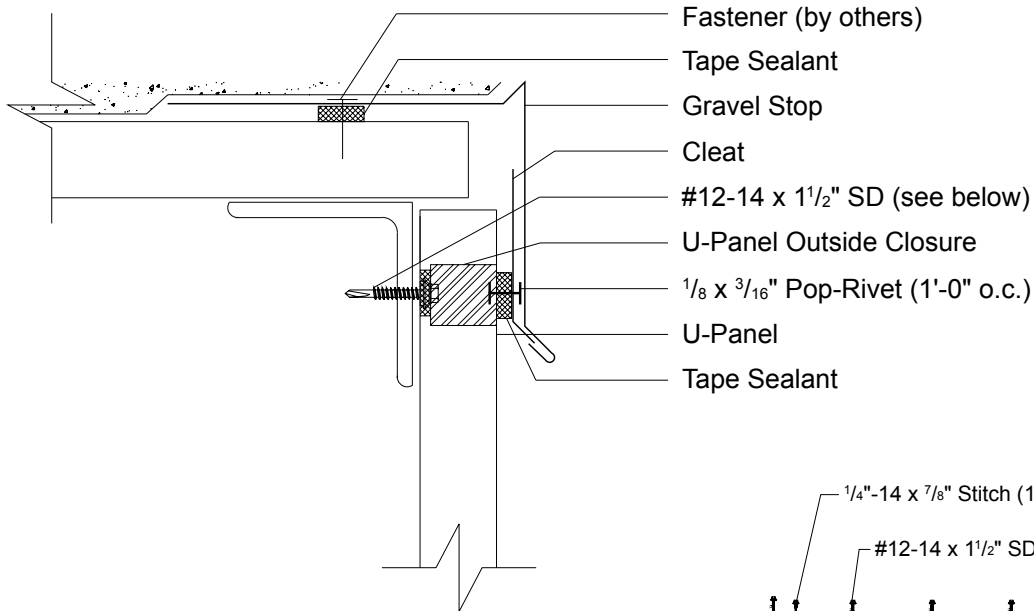


PBU-Panel Fastening Pattern

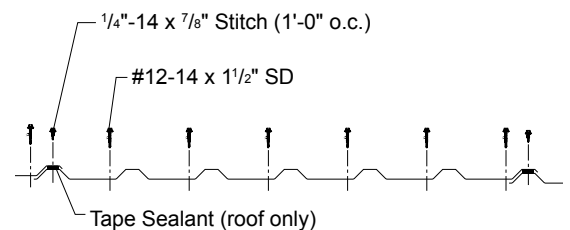
U-PANEL

GRAVEL STOP DETAIL

1:12 Slope
Minimum

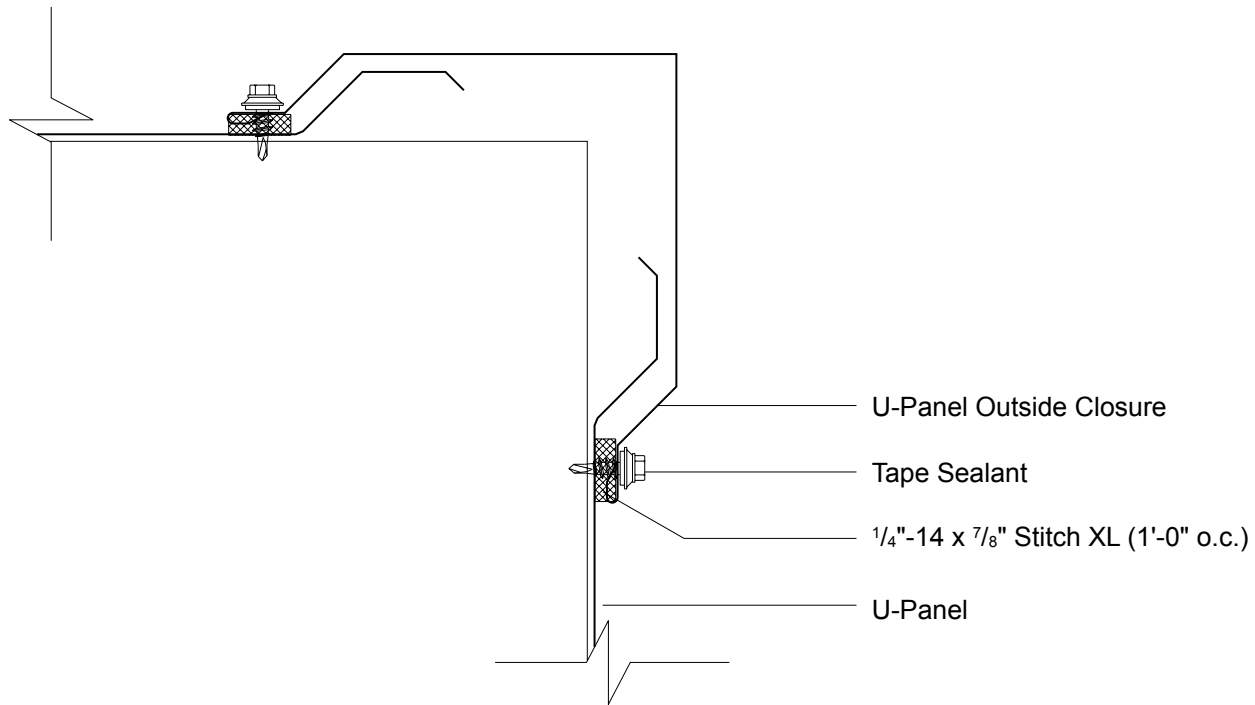


- Fastener (by others)
- Tape Sealant
- Gravel Stop
- Cleat
- #12-14 x 1 1/2" SD (see below)
- U-Panel Outside Closure
- 1/8 x 3/16" Pop-Rivet (1'-0" o.c.)
- U-Panel
- Tape Sealant

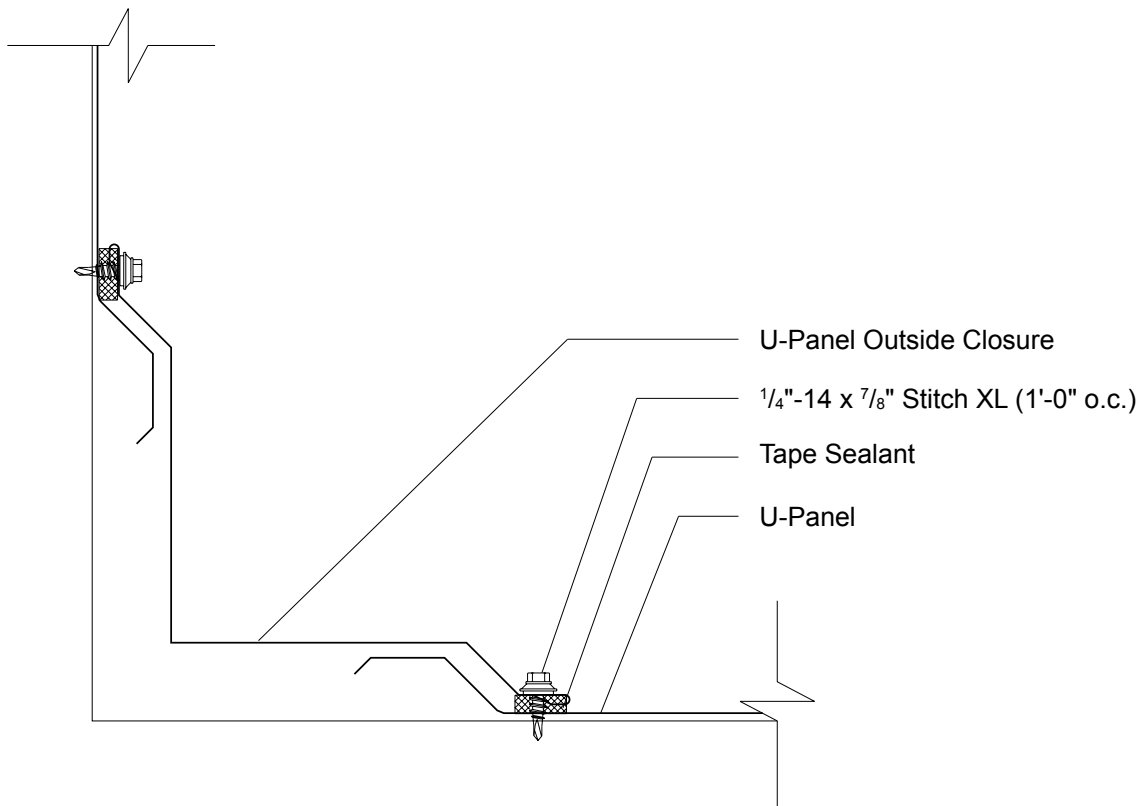


PBU-Panel Fastening Pattern

U-PANEL OUTSIDE CORNER DETAIL

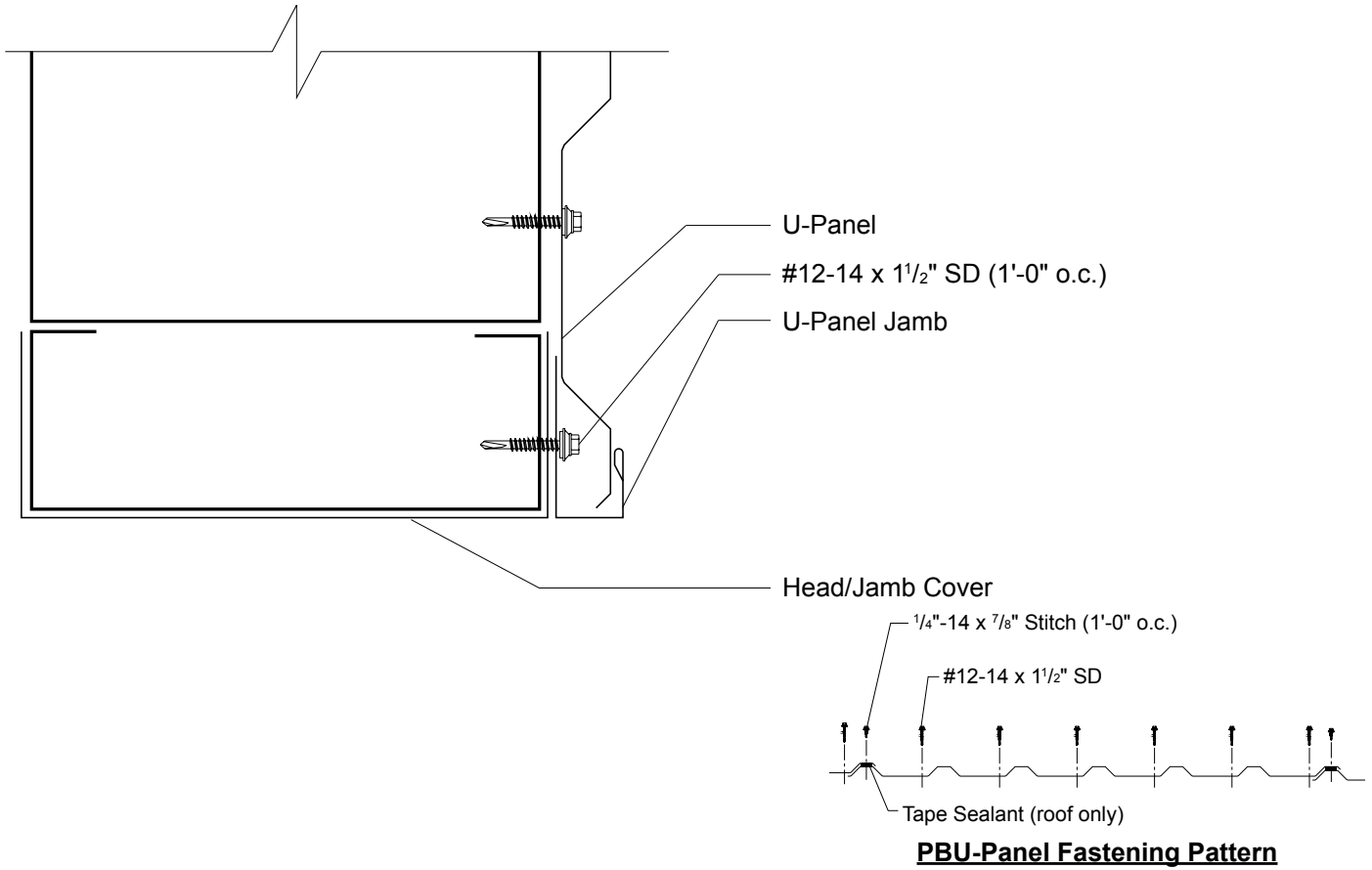


U-PANEL INSIDE CORNER DETAIL



U-PANEL

JAMB DETAIL



U-PANEL

HEAD DETAIL

