



1.25" Corrugated Install Guide

2.5" Corrugated Install Guide

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

Metal Sales Manufacturing Corporation is not responsible for the performance of the roof system if it is not installed in accordance with the suggested instructions referenced in this installation guide or in the product overview. (See Product Manual or Product Technical Literature). If there is a conflict between this guide and the actual erection drawings, the erection drawings are to take precedence.

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

Metal Sales reserves the right to modify, without notice, any details, recommendations or suggestions. Any questions regarding proper installation of the roofing system should be directed to your Metal Sales representative, see pages 2 and 3.

Consult Metal Sales for any additional information not outlined in this Guide.

This manual is designed to be utilized as a guide when installing Corrugated Panel roofing systems. It is the responsibility of the erector to ensure the safe installation of this product system.

SAFETY

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

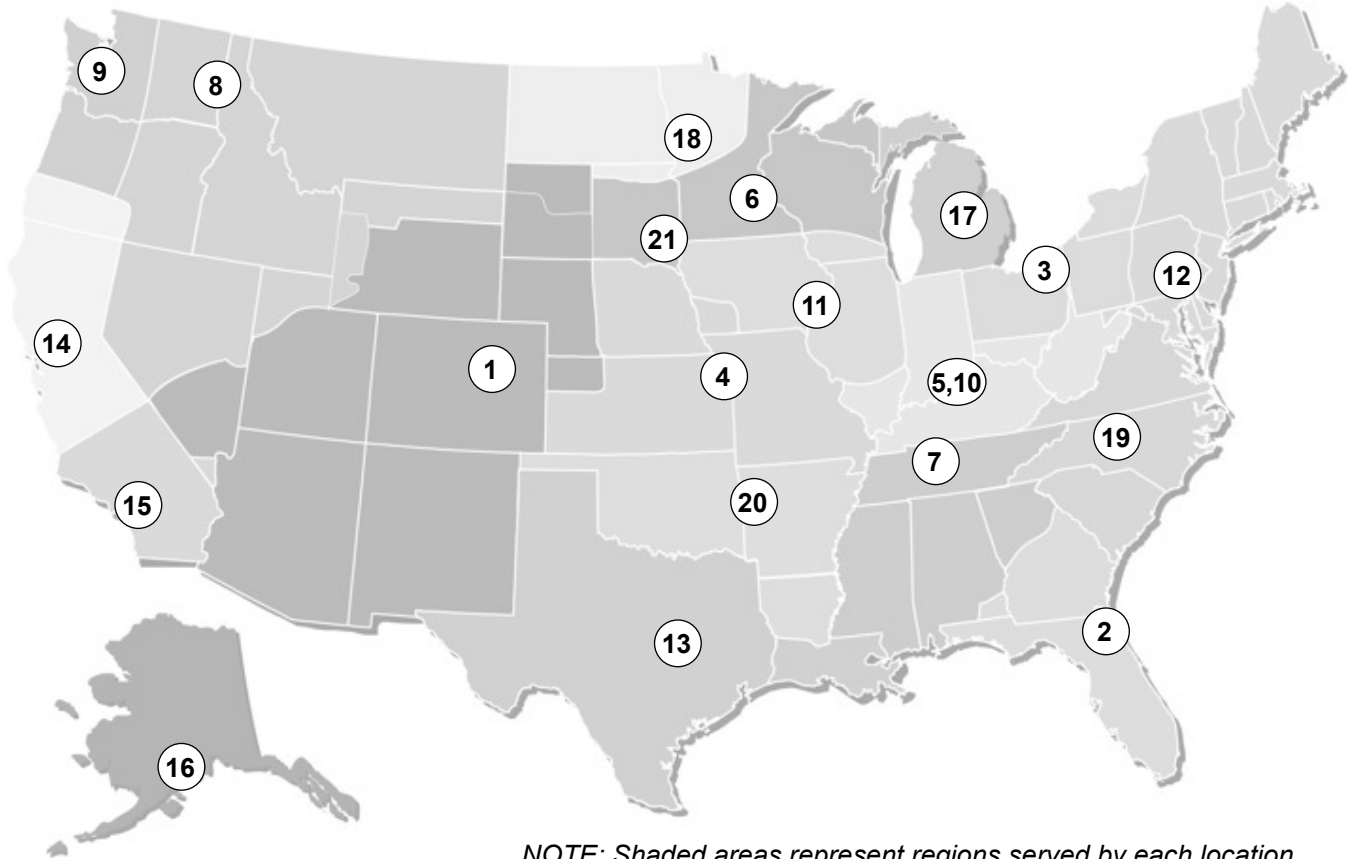
The installation of metal roof systems is a dangerous procedure and should be supervised by trained knowledgeable erectors. **USE EXTREME CARE WHILE INSTALLING ROOF PANELS.** It is not possible for Metal Sales to be aware of all the possible job site situations that could cause an unsafe condition to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

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

Provide required safety railing, netting or safety lines for crew members working on the roof.

Do not use the roof panel as a walking platform. The roof panels will not withstand the weight of a person standing at the edge of the panel.

Do not stand on the roof panel until the panels have been attached.



NOTE: Shaded areas represent regions served by each location.

For more than 50 years, Metal Sales Manufacturing Corporation has earned a reputation as the premier provider of innovative metal building components and accessories.

We've backed this reputation with the industry's largest professional sales and services team. We offer a full line of exceptional quality metal roof and wall panels for agricultural, commercial, architectural, industrial, and residential projects of every shape and size, new construction or retro-fit.

1.) DENVER BRANCH

7990 E. I-25 Frontage Road
Longmont, CO 80504
303.702.5440 Phone
800.289.7663 Toll Free
800.289.1617 Toll Free Fax

2.) JACKSONVILLE BRANCH

7110 Stuart Avenue
Jacksonville, FL 32254
904.783.3660 Phone
800.394.4419 Toll Free
904.783.9175 Fax
800.413.3292 Toll Free Fax

3.) JEFFERSON BRANCH

352 East Erie Street
Jefferson, OH 44047
440.319.3779 Phone
800.321.5833 Toll Free
440.576.9242 Fax
800.233.5719 Toll Free Fax

4.) INDEPENDENCE BRANCH

1306 South Powell Road
Independence, MO 64057
816.796.0900 Phone
800.747.0012 Toll Free
816.796.0906 Fax

5.) SELLERSBURG BRANCH

7800 State Road 60
Sellersburg, IN 47172
812.246.1866 Phone
800.999.7777 Toll Free
812.246.0893 Fax
800.477.9318 Toll Free Fax

6.) ROGERS BRANCH

22651 Industrial Boulevard
Rogers, MN 55374
763.428.8080 Phone
800.328.9316 Toll Free
763.428.8525 Fax
800.938.9119 Toll Free Fax

7.) NASHVILLE BRANCH

4314 Hurricane Creek Boulevard
Antioch, TN 37013
615.229.6570 Phone
800.251.8508 Toll Free
615.283.4283 Fax
800.419.4372 Toll Free Fax

8.) SPOKANE BRANCH

East 2727 Trent Avenue
Spokane, WA 99202
509.536.6000 Phone
800.572.6565 Toll Free
509.534.4427 Fax

9.) SEATTLE BRANCH

20213 84th Avenue, South
Kent, WA 98032
253.872.5750 Phone
800.431.3470 Toll Free (Outside WA)
800.742.7900 Toll Free (Inside WA)
253.872.2008 Fax

10.) NEW ALBANY BRANCH

999 Park Place
New Albany, IN 47150
812.944.2733 Phone
812.944.1418 Fax

11.) ROCK ISLAND BRANCH

8111 West 29th Street
Rock Island, IL 61201
309.787.1200 Phone
800.747.1206 Toll Free
309.787.1833 Fax

12.) DEER LAKE BRANCH

29 Pinedale Industrial Road
Orwigsburg, PA 17961
570.366.2020 Phone
800.544.2577 Toll Free
570.366.1648 Fax
800.544.2574 Toll Free Fax

13.) TEMPLE BRANCH

3838 North General Bruce Drive
Temple, TX 76501
254.791.6650 Phone
800.543.4415 Toll Free
254.791.6655 Fax
800.543.4473 Toll Free Fax

14.) WOODLAND BRANCH

1326 Paddock Place
Woodland, CA 95776
530.668.5690 Phone
800.759.6019 Toll Free
530.668.0901 Fax

15.) FONTANA BRANCH

14213 Whittram Avenue
Fontana, CA 92335
909.829.8618 Phone
800.782.7953 Toll Free
909.829.9083 Fax

16.) ANCHORAGE BRANCH

4637 Old Seward Highway
Anchorage, AK 99503
907.646.7663 Phone
866.640.7663 Toll Free
907.646.7664 Fax

17.) BAY CITY BRANCH

5209 Mackinaw Road
Bay City, MI 48706
989.686.5879 Phone
888.777.7640 Toll Free
989.686.5870 Fax
888.777.0112 Toll Free Fax

18.) DETROIT LAKES BRANCH

1435 Egret Avenue
Detroit Lakes, MN 56501
218.847.2988 Phone
888.594.1394 Toll Free
218.847.4835 Fax
888.594.1454 Toll Free Fax

19.) MOCKSVILLE BRANCH

188 Quality Drive
Mocksville, NC 27028
704.859.0550 Phone
800.228.6119 Toll Free
704.859.0157 Fax
800.228.7916 Toll Free Fax

20.) FORT SMITH BRANCH

7510 Ball Road
Fort Smith, AR 72908
479.646.1176 Phone
877.452.3915 Toll Free
479.646.5204 Fax

21.) SIOUX FALLS BRANCH

2700 West 3rd Street, Suite 4
Sioux Falls, SD 57104
605.335.2745 Phone
888.299.0024 Toll Free

TECHNICAL SUPPORT**TECHNICAL SERVICES**

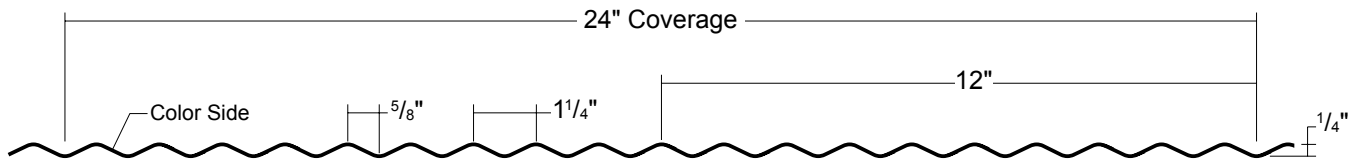
545 South 3rd Street, Suite 200
Louisville, KY 40202

502.855.4300 Phone
800.406.7387 Toll Free
502.855.4290 Fax

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PANEL PROFILE



SLOPE

The minimum recommended slope for any 1.25" Corrugated roof panel is 3:12.

SUBSTRATE

The recommended substrates are ⁵/₈" plywood with a 30 pound felt moisture barrier or open framing. To avoid panel distortion, use a properly aligned and uniform substructure.

COVERAGE

1.25" Corrugated is available in 24" width with a ¹/₂" rib height.

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 pages 2-3 for branch locations).

AVAILABILITY

26 Gauge standard. (Optional 29 Ga. Contact your local Metal Sales branch for availability)

APPLICATION

Architectural and Residential panel

PERFORMANCE TEST

UL 790, UL 263, UL 2218

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 page 12).

MATERIALS

Steel grade 50, per ASTM A 792

FINISH

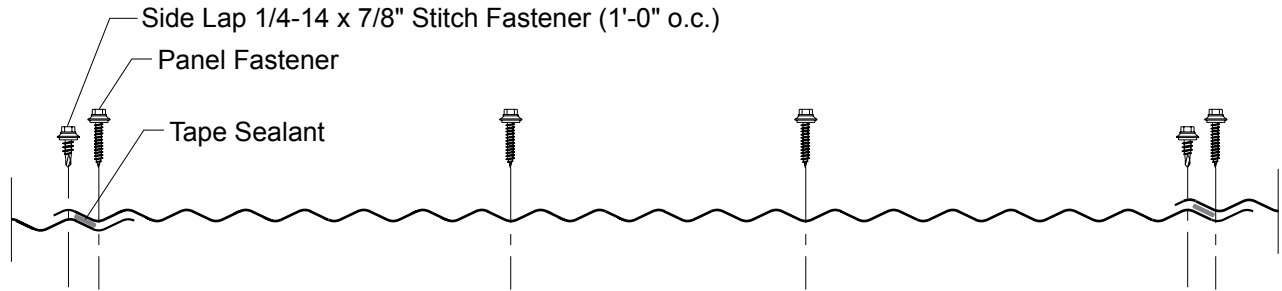
- ▶ *Acrylic Coated Galvalume® (ACG) / ASTM A 792 - AZ55
- ▶ Pre-painted Galvalume, MS Colorfast45® / ASTM A 792 - AZ50
- ▶ **PVDF

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

** Meets both Kynar 500 and Hylar 5000 specifications.

ROOF & WALL FASTENING PATTERN

Ends and Field of Panel



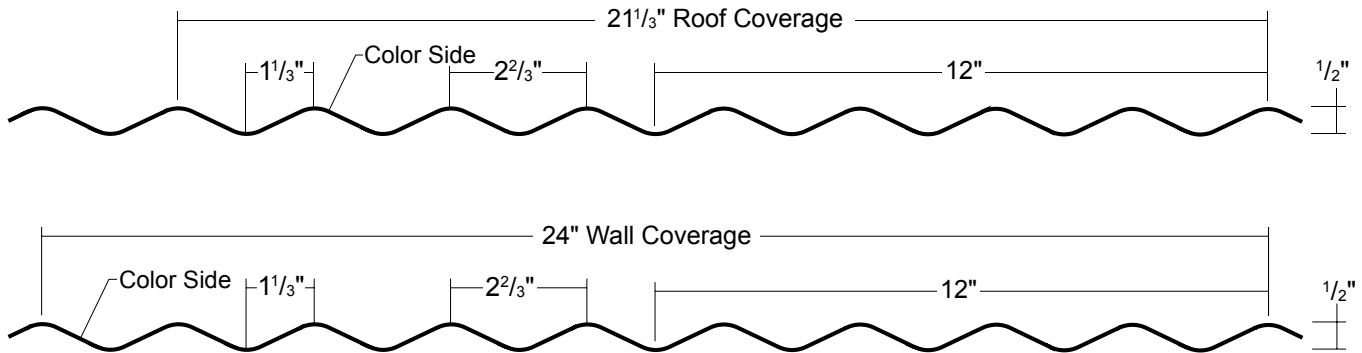
SECTION PROPERTIES

**ALLOWABLE UNIFORM LOADS, psf
For various fastener spacings**

Ga	Width in	Yield ksi	Weight psf	Top In Compression		Bottom In Compression		Inward Load						Outward Load					
				Ixx in ⁴ /ft	Sxx in ³ /ft	Ixx in ⁴ /ft	Sxx in ³ /ft												
								1'	1.25'	1.5'	1.75'	2'	2.5'	1'	1.25'	1.5'	1.75'	2'	2.5'
29	24	50	0.64	0.0010	0.0070	0.0010	0.0067	165	84	49	31	21	11	165	84	49	31	21	11
26	24	50	0.81	0.0015	0.0087	0.0015	0.0085	196	126	73	46	31	16	202	127	73	46	31	16

1. Theoretical section properties have been calculated per AISI 2007 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable load is calculated in accordance with AISI 2007 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material or load testing. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.

PANEL PROFILE



SLOPE

The minimum recommended slope for any 2.5" Corrugated roof panel is 3:12.

SUBSTRATE

The recommended substrates are ⁵/₈" plywood with a 30 pound felt moisture barrier or open framing. To avoid panel distortion, use a properly aligned and uniform substructure.

COVERAGE

2.5" Corrugated roof coverage is 21-1/3" wide with a 1/2" rib height.
2.5" Corrugated wall coverage is 24" wide with a 1/2" rib height.

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 pages 2-3 for branch locations).

AVAILABILITY

26 gauge standard. (Optional 24 ga. and 29 ga. Contact your local Metal Sales branch for availability)

APPLICATION

Architectural and Residential panel

PERFORMANCE TEST

UL 790, UL 263, UL 2218, Texas Windstorm Evaluation RC-159, 2010 FBC Approval FL14645.1, ICC Evaluation Report ESR-2385

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 page 12).

MATERIALS

Steel grade 50, per ASTM A 792

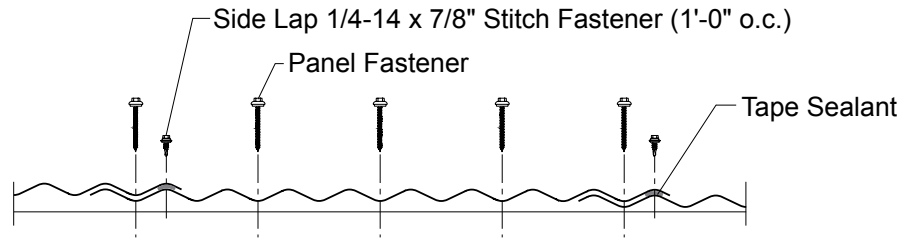
FINISH

- ▶ *Acrylic Coated Galvalume® (ACG) / ASTM A 792 - AZ55
- ▶ Pre-painted Galvalume, MS Colorfast45° / ASTM A 792 - AZ50
- ▶ **PVDF

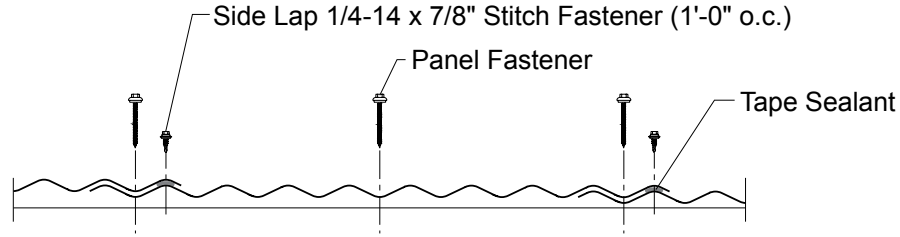
* Differential appearance of Acrylic Coated Galvalume roofing materials is not a cause for rejection.
** Meets both Kynar 500 and Hylar 5000 specifications.

ROOF FASTENING PATTERN

Ends of Panel



Field of Panel



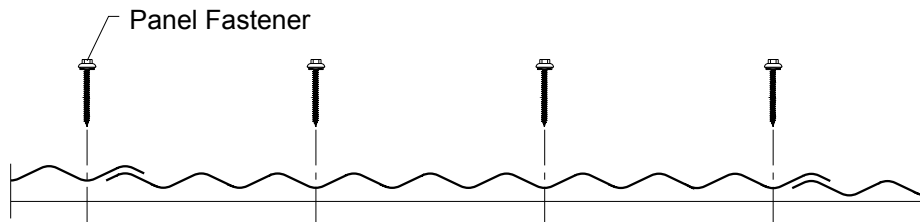
SECTION PROPERTIES

ALLOWABLE UNIFORM LOADS, psf
For various fastener spacings

Ga	Width in	Yield ksi	Weight psf	Top In Compression		Bottom In Compression		Inward Load						Outward Load					
				Ixx in ⁴ /ft	Sxx in ³ /ft	Ixx in ⁴ /ft	Sxx in ³ /ft	2'	2.5'	3'	3.5'	4'	4.5'	2'	2.5'	3'	3.5'	4'	4.5'
29	21.33	80	0.70	0.0056	0.0215	0.0056	0.0208	116	59	34	22	14	10	116	59	34	22	14	10
26	21.33	80	0.90	0.0073	0.0275	0.0073	0.0274	151	77	45	28	19	13	151	77	45	28	19	13
24	21.33	50	1.17	0.0096	0.0354	0.0096	0.0354	197	101	58	37	25	17	197	101	58	37	25	17

- Theoretical section properties have been calculated per AISI 2007 'North American 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 2007 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material 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 for wind.

WALL FASTENING PATTERN

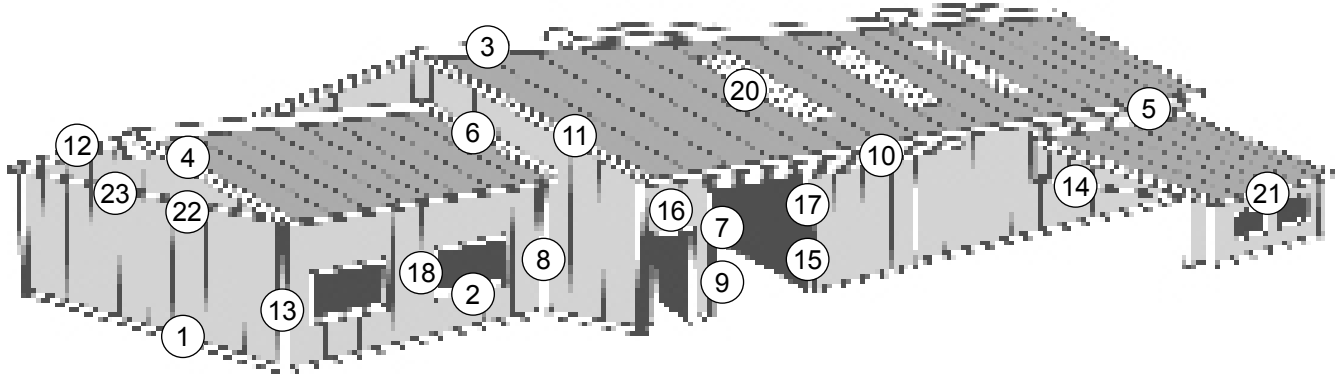


SECTION PROPERTIES

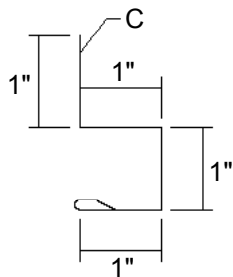
ALLOWABLE UNIFORM LOADS, psf
For various fastener spacings

Ga	Width in	Yield ksi	Weight psf	Top In Compression		Bottom In Compression		Inward Load						Outward Load					
				Ixx in ⁴ /ft	Sxx in ³ /ft	Ixx in ⁴ /ft	Sxx in ³ /ft	2'	2.5'	3'	3.5'	4'	4.5'	2'	2.5'	3'	3.5'	4'	4.5'
29	24	80	0.62	0.0050	0.0191	0.0050	0.0185	103	53	31	19	13	9	103	53	31	19	13	9
26	24	80	0.80	0.0065	0.0245	0.0065	0.0244	134	69	40	25	17	12	134	69	40	25	17	12
24	24	50	1.04	0.0085	0.0315	0.0085	0.0315	175	90	52	33	22	15	175	90	52	33	22	15

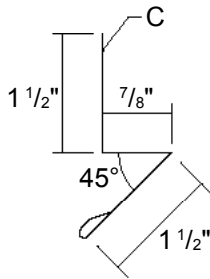
- Theoretical section properties have been calculated per AISI 2007 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
- Allowable load is calculated in accordance with AISI 2007 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material 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 for wind.



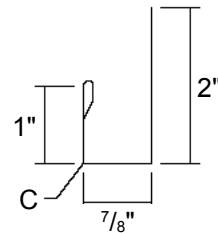
1. BASE MOLDING



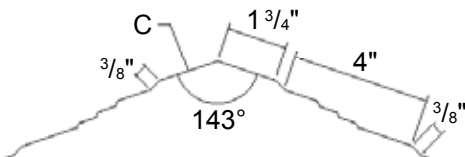
1. ANGLE BASE



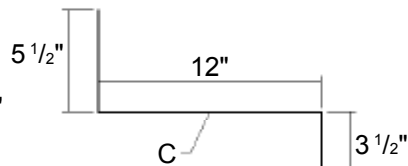
2. J-CHANNEL



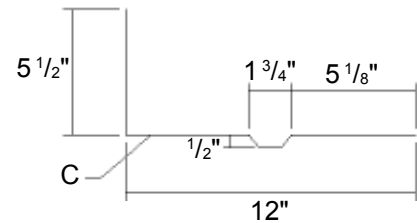
3. 14" UNIVERSAL RIDGE



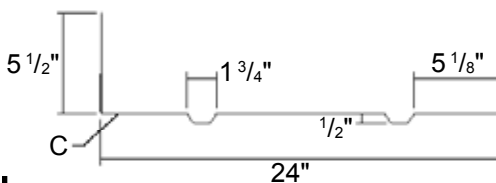
4. SOFFIT



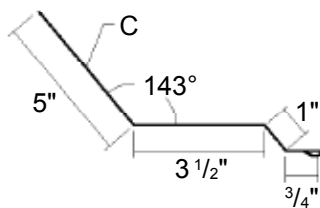
4. 12" SOFFIT



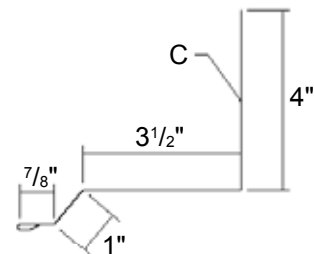
4. 24" SOFFIT



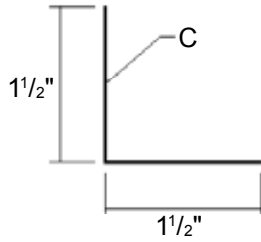
5. UNIVERSAL ENDWALL



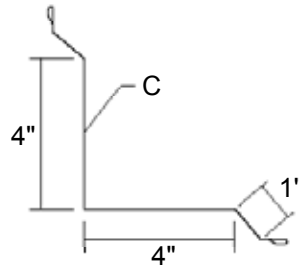
6. UNIVERSAL SIDEWALL



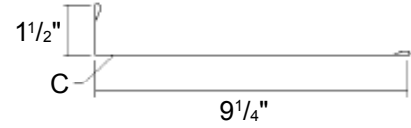
7. MINI ANGLE



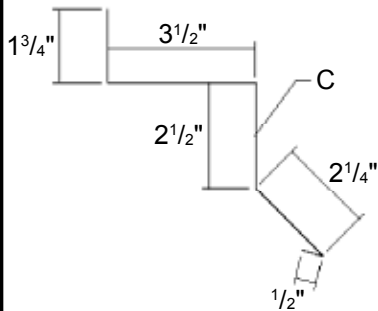
8. INSIDE CORNER



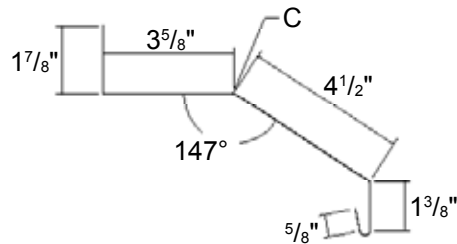
9. POST TRIM



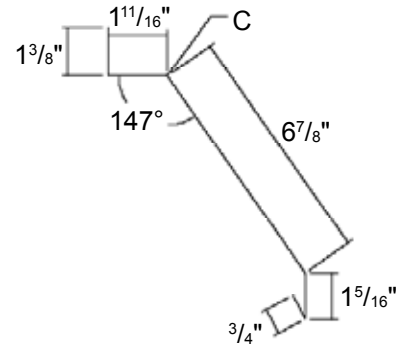
10. NATIONAL TRACK COVER



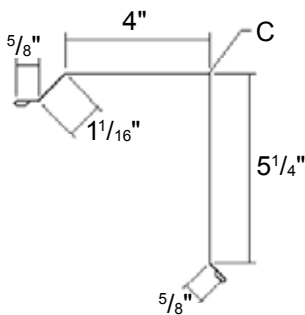
10. TOP MOUNT TRACK COVER



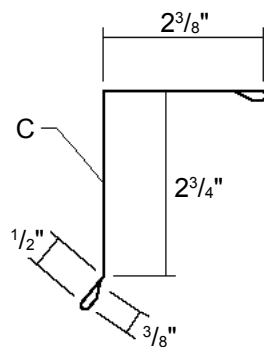
10. CANNONBALL TRACK COVER



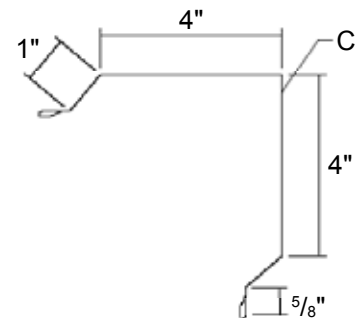
11. GABLE TRIM



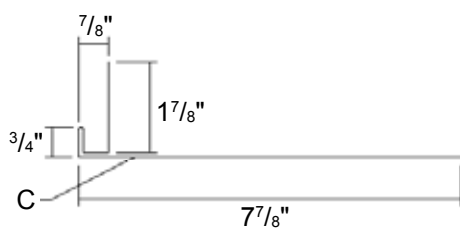
12. RAKE TRIM



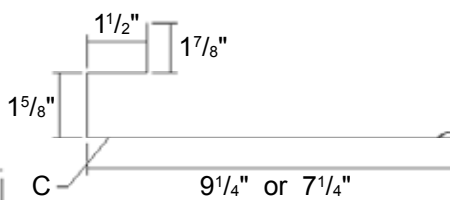
13. OUTSIDE CORNER



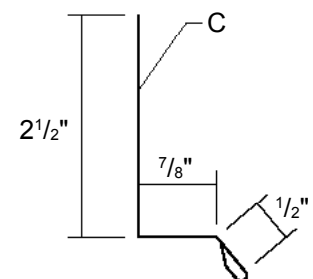
14. OVERHEAD DOOR TRIM



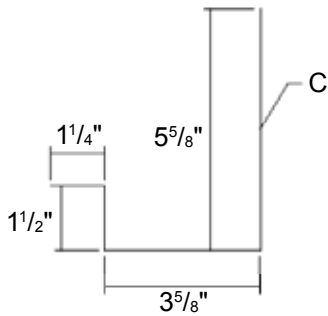
15. DOOR JAMB



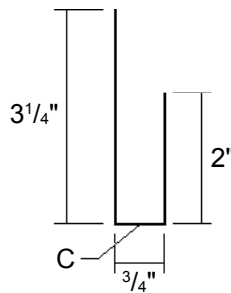
16. DRIP CAP



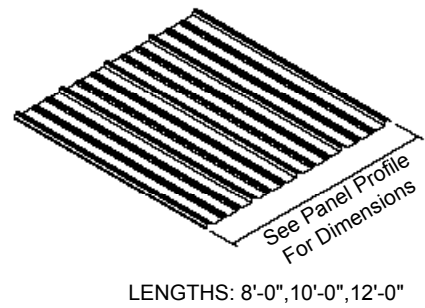
17 - DOOR POST TRIM



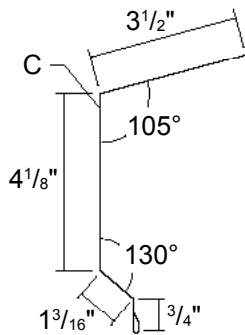
18 - FRAMING CLOSURE



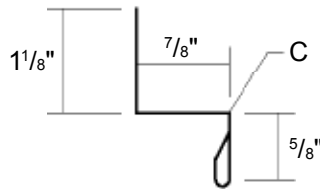
20 - TRANSLUCENT PANEL



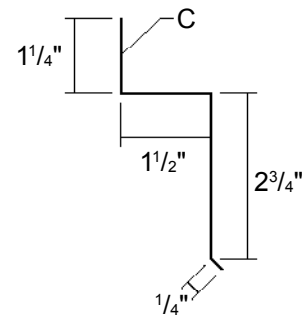
21 - EAVE MOLDING



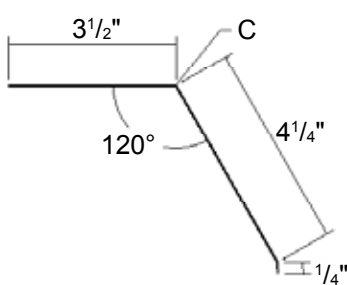
22 - DOUBLE ANGLE



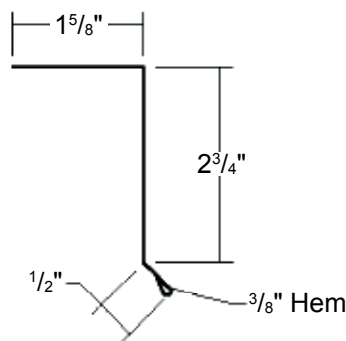
23 - WIDE Z-METAL



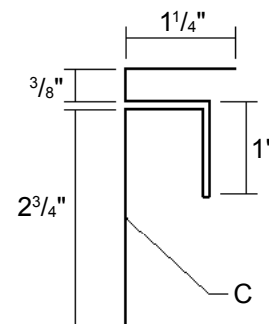
24 - UNIVERSAL GAMBREL



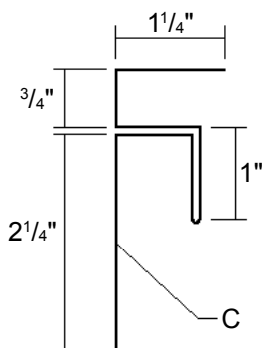
25 - RAKE / EAVE TRIM

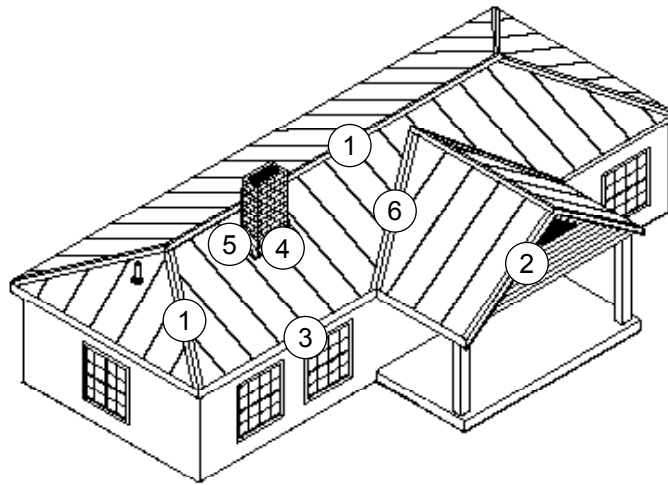


26 - 3/8" F & J-CHANNEL

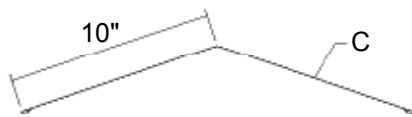


26 - 3/4" F & J-CHANNEL

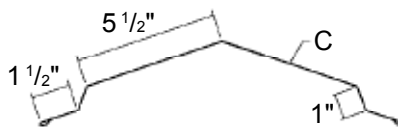




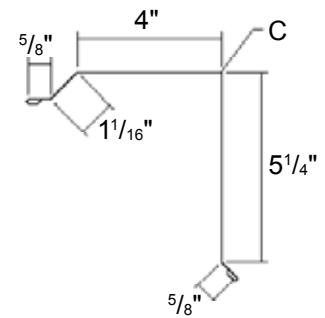
1 - RIDGE / HIP COVER



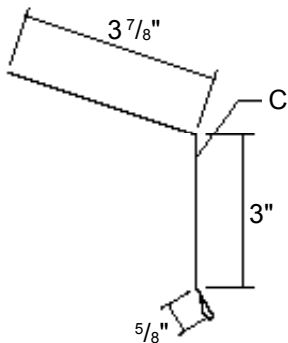
1 - 13" STEP RIDGE / HIP COVER



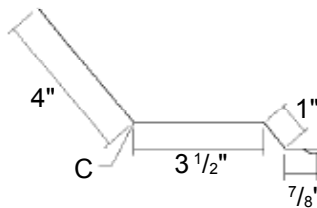
2 - GABLE TRIM



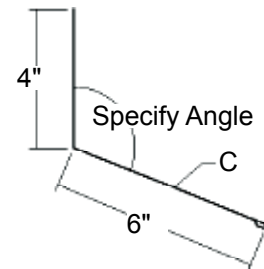
3 - EAVE



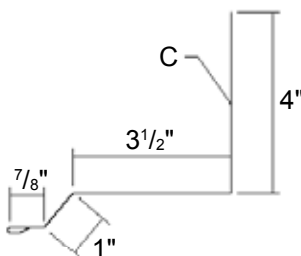
4 - UNIVERSAL ENDWALL



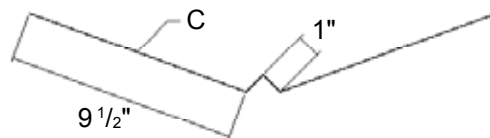
4 - PITCH BREAK



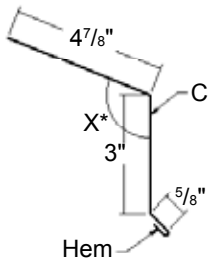
5 - UNIVERSAL SIDEWALL



6 - VALLEY

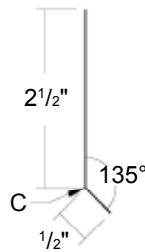


EAVE



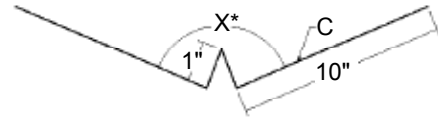
Length 10'-2" - *Specify Slope Angle

CLEAT



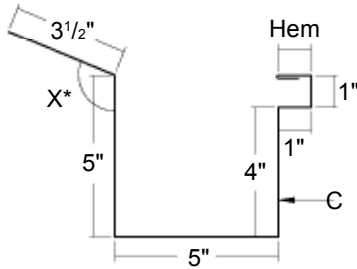
Length 10'-2"

VALLEY



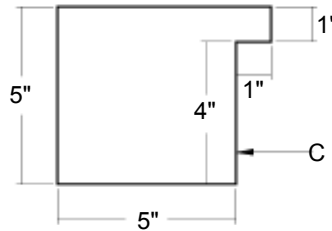
Length 10'-2", 20'-3"
*Specify Slope Angle

BOX GUTTER END

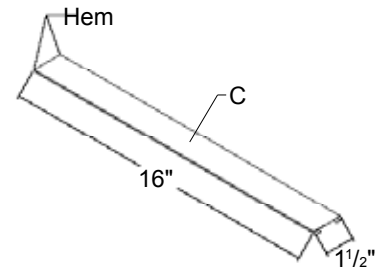


Length 10'-2", 20'-3" *Specify Slope Angle

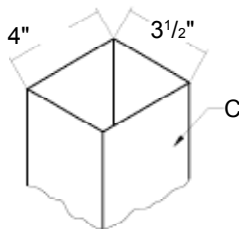
BOX GUTTER END



**UNIVERSAL GUTTER/
DOWNSPOUT STRAP**

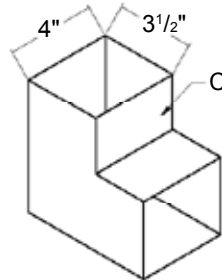


DOWNSPOUT 4" x 3 1/2"



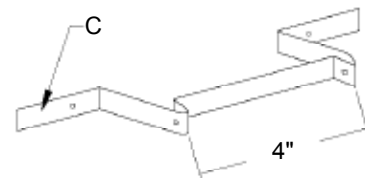
Length 10'-2", 20'-3"
(Also available 6" x 4")

95° ELBOW 4" x 3 1/2"



(Also available 6" x 4")

DOWNSPOUT BRACKET



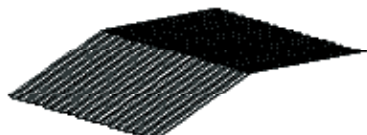
(Also available 6")

RAKE

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

FORMED RIDGE

1.25" CORRUGATED

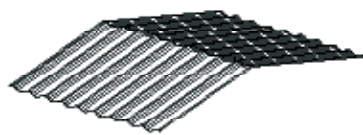


RAKEWALL

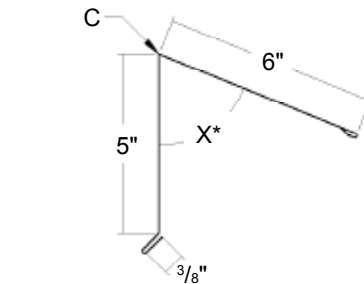
Length 10'-2"

FORMED RIDGE

2.5" CORRUGATED

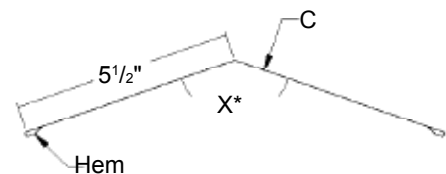


PEAK



Length 10'-2"

11" RIDGE/HIP COVER



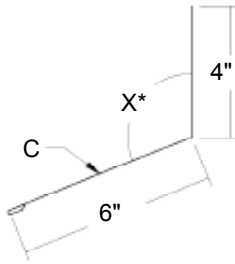
Length 10'-2", 20'-3" - *Specify Slope Angle

1.25" Corrugated
2.50" Corrugated

FLASHING PROFILES

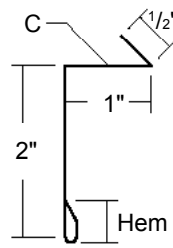


PITCH BREAK



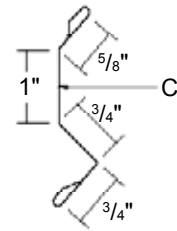
Length 10'-2" - *Specify Slope Angle

REGLET FLASHING



Length 10'-2"

COUNTER FLASHING

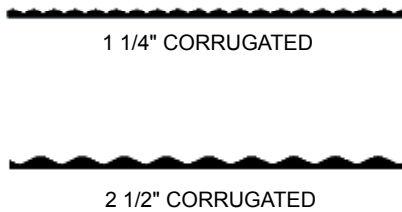


Length 10'-2"

1.25" Corrugated
2.50" Corrugated

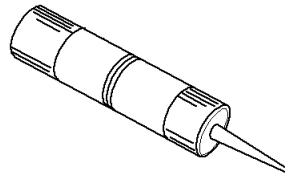
ACCESSORIES

CORRUGATED CLOSURES



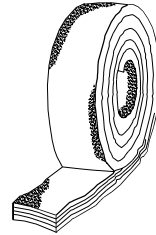
1" x 2'-0"
Polyethylene Foam

TUBE SEALANT



10.3 oz. Cartridge Urethane

TAPE SEALANT



Single Bead Sealant
3/8" Bead x 50' Butyl - Grey

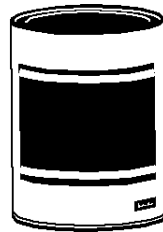
RUBBER ROOF JACK

Round or Square



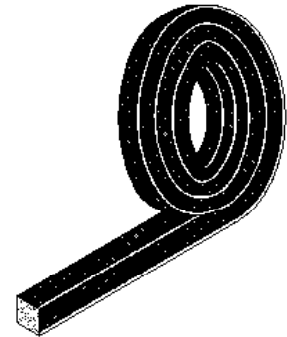
Mini (1/4" to 1 1/8" O.D. Pipe)
#2 (1 3/4" to 3" O.D. Pipe)
#4 (3" to 6" O.D. Pipe)
#6 (6" to 9" O.D. Pipe)
#8 (7" to 13" O.D. Pipe)

TOUCH-UP PAINT



Available in pints
MS Colorfast45 or PVDF

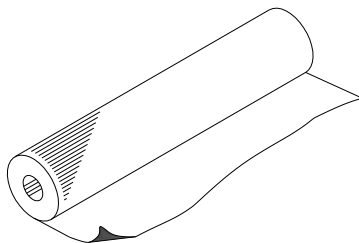
UNIVERSAL CLOSURE



1" x 1-1/2" x 50'-0"
1" x 1-1/2" x 10'-0"

ms-HT UNDERLAYMENT

High-Temperature Underlayment



C- Indicates color side of flashing.

POP RIVET	SIZE	TYPE	FINISH	APPLICATION
	1/8" x 3/16"	A	Unpainted	Flashing to Panel, Flashing to Flashing
	1/8" x 3/16"	A	Painted	Flashing to Panel, Flashing to Flashing

PANCAKE HEAD WOODSCREW	SIZE	TYPE	FINISH	APPLICATION
	#10-12 x 1"	A	Plated	Panel or Flashing to wood substructure

WOODSCREW	SIZE	TYPE	FINISH	APPLICATION
	#10-14 x 1"	A	Painted	Panel or Flashing to wood substructure
	#10-14 x 1 1/2"	A	Painted	
	#10-14 x 2"	A	Painted	

STITCH SCREW	SIZE	TYPE	FINISH	APPLICATION
	1/4 - 14 x 7/8"	Stitch	Painted	Flashing to Panel, Flashing to Flashing, Panel Sidelap

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.
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.

GENERAL

Metal Sales' panels are designed to be installed over open framing and/or directly over a wood substrate (minimum 5/8") with 30# felt moisture barrier (or an Ice and Water Shield when required by Local Building Codes).

Always check with local building codes prior to all installations for any additional requirements that may be specific to your area.

Galvanized and Galvalume panels should not be in contact with, or subject to, water runoff from copper, lead, or uncoated steel materials.

Condensate water from air conditioning units typically contains dissolved copper. This condensate should be discharged through a plastic pipe extended beyond the edge of the roof.

CONDITION OF SUBSTRUCTURE

The roof should be inspected for any trapped moisture or structural damage such as bowing or sagging rafters and warped or loose roof purlins or solid decking. These areas should be repaired prior to installing new metal panels.

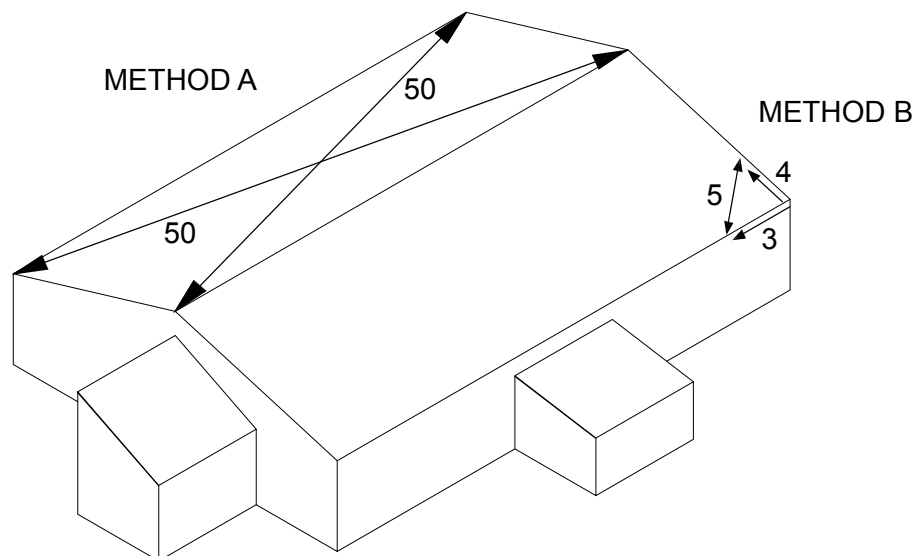
Prior to installation, make sure there are no nails or fasteners protruding from the roof framing or wood substrate which could damage the panels and impede the installation process.

When installed, panel distortion may occur if not applied over properly aligned and uniform substructure.

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

METHOD "A" - One method for checking the roof for squareness is to measure diagonally across one 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). 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.



RECEIVING MATERIAL

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

After receiving material, check the condition of the material, and review the shipment against the shipping list to ensure all materials are accounted for. If damages or shortages are discovered, it should be noted on the Bill of Lading at the time of delivery. A claim should be made against the carrier as soon as possible. Metal Sales is not responsible for any damages or shortages unless they are documented in writing and presented to Metal Sales within 48 hours.

GENERAL HANDLING

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

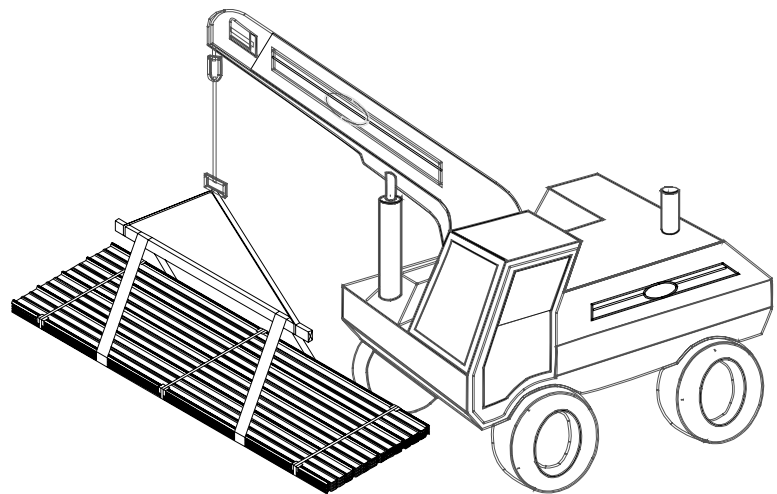
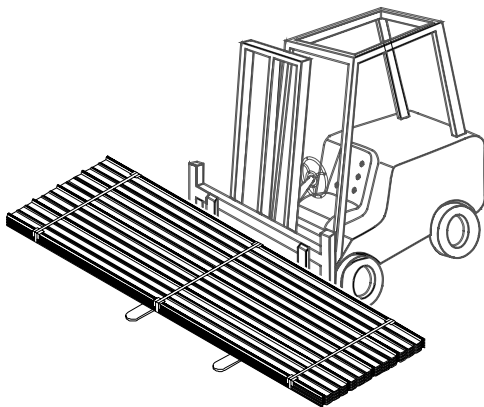
CAUTION

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

MECHANICAL HANDLING

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

Crane - A crane should be used when lifting panels with lengths greater than 20'-0". Please be sure to utilize a spreader bar to ensure the even distribution of the weight to the pick up points. As a rule when lifting panels, no more than $\frac{1}{3}$ of the length of the panel should be left unsupported. Never use wire rope because this will damage the panels.

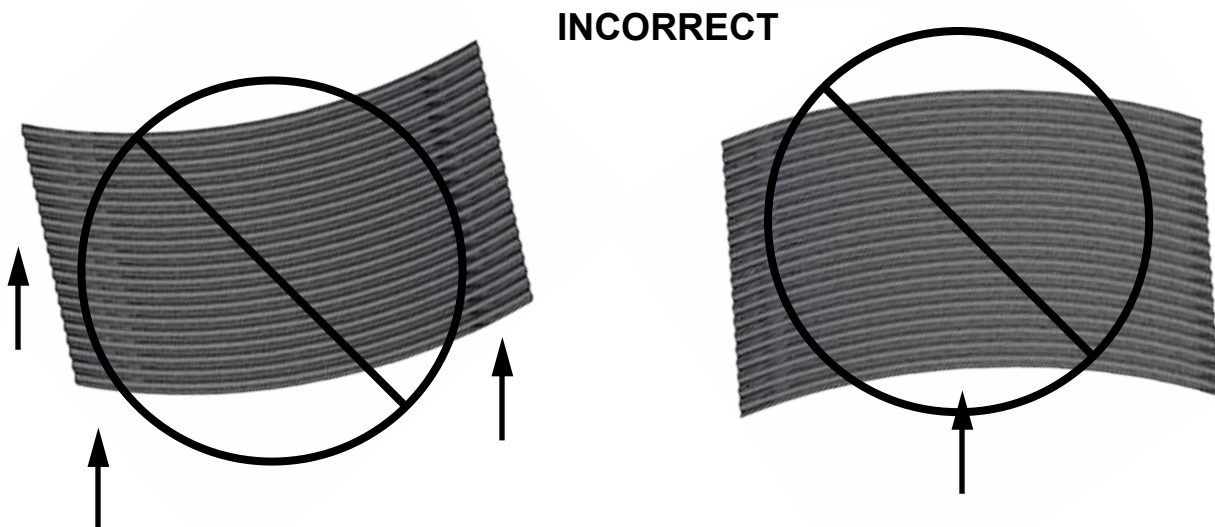
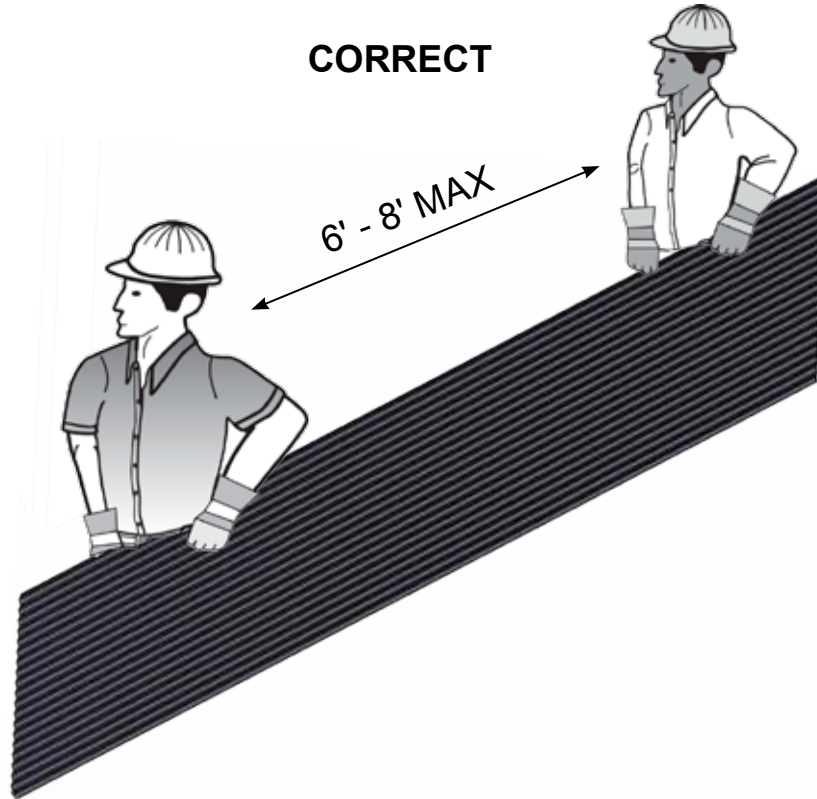


MANUAL HANDLING

When handling painted steel, care should be taken to prevent scratching of material. Clean gloves should be worn at all times to prevent a reaction with salts found on bare skin. Installers should wear rubber sole shoes to keep from scuffing material while walking on the roof.

Handling of individual panels should be done carefully and properly to avoid bending or damaging. Panels should be carried by grasping the edge of the panel so that the panel is vertical to the ground. The panel should not be carried horizontal to the ground as this could cause the panel to buckle or bend in the center.

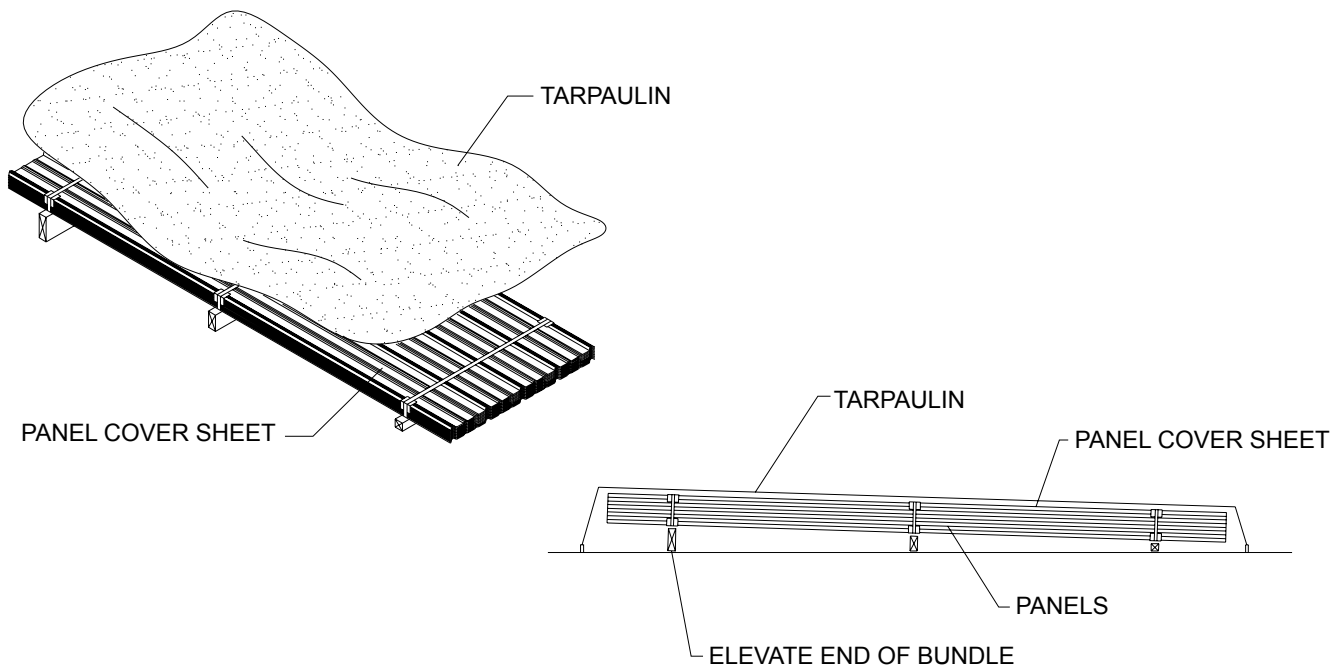
Normally, individual panels can be handled by people placed every 6'-0" to 8'-0" along the length of the panel.



GENERAL

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

Bundled sheets should be stored high enough off of the ground to allow for air circulation and prevent contact with accumulating water. Elevate one end of the bundle to allow any moisture to run off the panels. Metal Sales recommends covering the bundle with a tarpaulin. Do not use tight fitting plastic-type tarpaulins as panel bundle covers. While they may provide protection from heavy downpours, they can also retard necessary ventilation and trap heat and moisture that may accelerate metal corrosion. If panels are to be stored in possible bad weather, we suggest they be stored inside. Extended storage of panels in a bundle is not recommended. **Under no circumstances should the panels be stored near or come in contact with salt water, corrosive chemicals, ash, or fumes generated or released inside the building or nearby plants, foundries, plating works, kilns, fertilizer, and wet or green lumber.**



FOOT TRAFFIC

Care of metal panels and flashings must be exercised throughout erection. Foot traffic can cause distortion of panel and damage to finish. Traffic over the installed system must be kept to an absolute minimum. Installers should wear rubber sole shoes to keep from scuffing material while walking on the roof.

When walking on the roof panels is unavoidable, walk only in the flats of the panel. Walking on the ribs can cause damage to the panels.

REQUIRED TOOLS

Standard required tools for field installation include:

- Screw Guns
- Magnetic Bits
- Metal Nibbler or Shear
- Tin Snips (Right, Left and Center)
- Tape Measure
- Hammer
- Chalk Line
- Drill with bits
- Pop Rivet Tool
- Safety Goggles
- Gloves
- Ear Plugs
- Fall Protection

FIELD CUTTING

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

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

When cutting metal panels and flashings, goggles must be worn for eye protection.

CAUTION

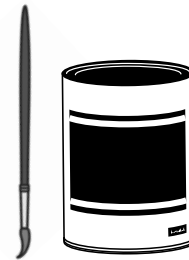
All product surfaces should be free of debris at all times. Installed surfaces should be wiped clean at the end of each work period. Never cut panels over metal surfaces. Metal shavings will rust on the surface, voiding the warranty.

TOUCH-UP PAINT

All painted panels and flashings have a factory applied baked on finish. Handling and installing panels may result in some small scratches or nicks to the paint finish. Touch-up paint is available in matching colors from Metal Sales. It is recommended that a small brush be used to apply touch-up paint to those areas that are in need of repair. Touch-up paint does not have the superior chalk and fade resistance of the factory applied paint finish and will normally discolor at an accelerated rate. Aerosol paint should not be used because of the over-spray that may occur.



SPRAY PAINT



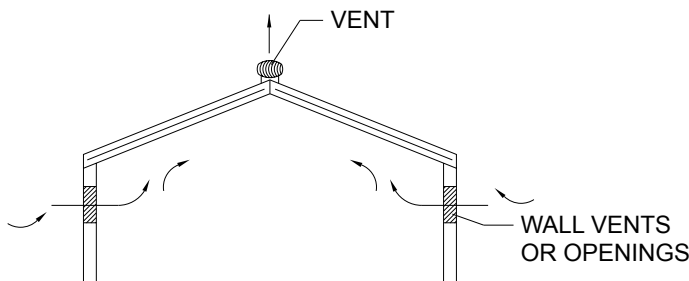
TOUCH-UP PAINT

VENTILATION

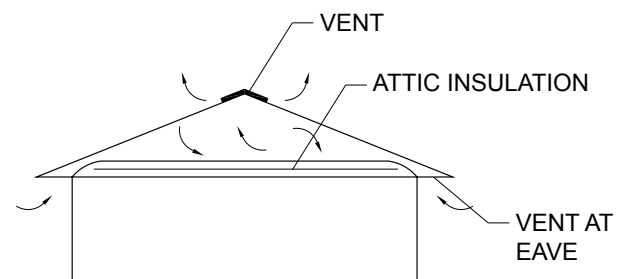
Proper design and installation of vapor barriers and ventilation systems are important to prevent condensation and the resulting problems of moisture damage and loss of insulation efficiency.

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

The underside of the metal roof on a typical metal building (no attic) should be protected from condensation by insulating with a faced insulation. This should reduce the potential of condensation forming on the underside of the panels. On buildings that have an attic space or are being retrofitted with a metal roofing system, vents should be placed at both the eave and peak of the roof in order to prevent a buildup of moisture (humidity) in the attic space.



Building without Attic



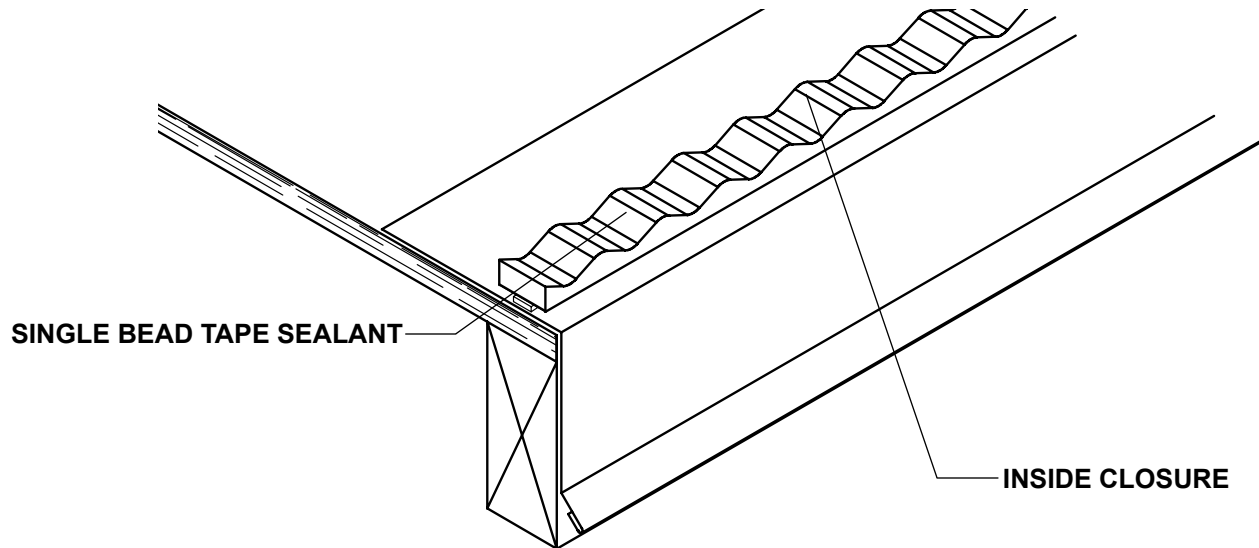
Building with Attic

NOTE: -Eave, Gutter and Valley Flashings must first be installed before panel installation can begin.
-Panels can be installed going from either left to right or right to left, looking from eave to peak.

INSTALLING INSIDE CLOSURES

STEP 1

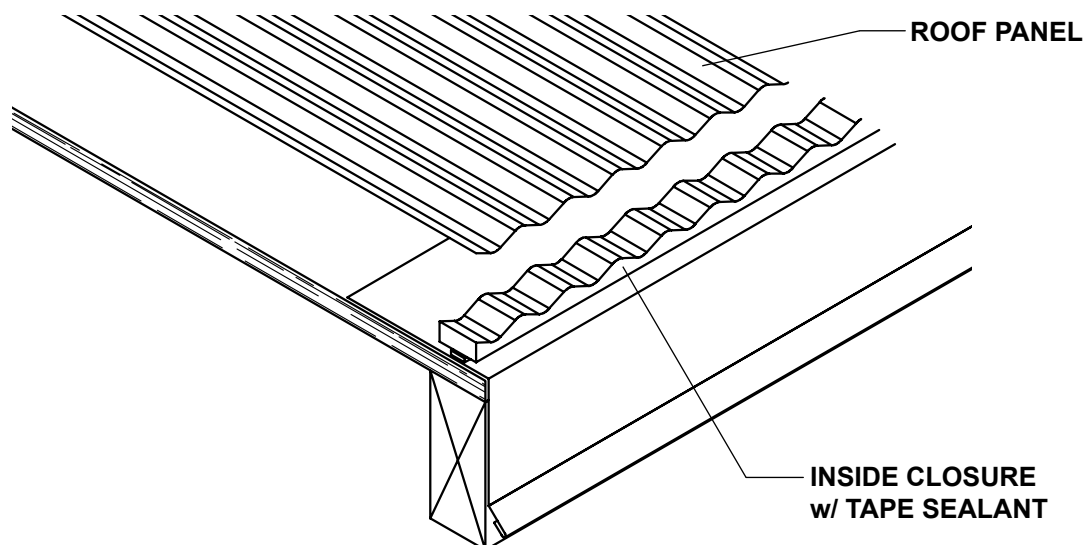
1. Apply a row of Tape Sealant across the top leg of the Eave Flashing along the width of the building.
2. Align and place Inside Closures over the Single Bead Tape Sealant. It is critical that Inside Closures are square to building as this will control the alignment of the panels. (See page 11 to check building square).
3. Apply a row of Tape Sealant across the top of the Inside Closure (Not shown for clarity).



INSTALLING FIRST PANEL

STEP 2

1. Install the first panel over the Inside Closure to allow for desired overhang. Make sure the panel is square to the eave and rake.
2. Fasten through panel, closure, and sealants into decking with appropriate amount of fasteners to meet local building code. (See fastening patterns on page 7). Fasteners must penetrate closure and Tape Sealant.
3. After securing panel at eave, repeat the fastening pattern at the appropriate spacing to meet local building codes.

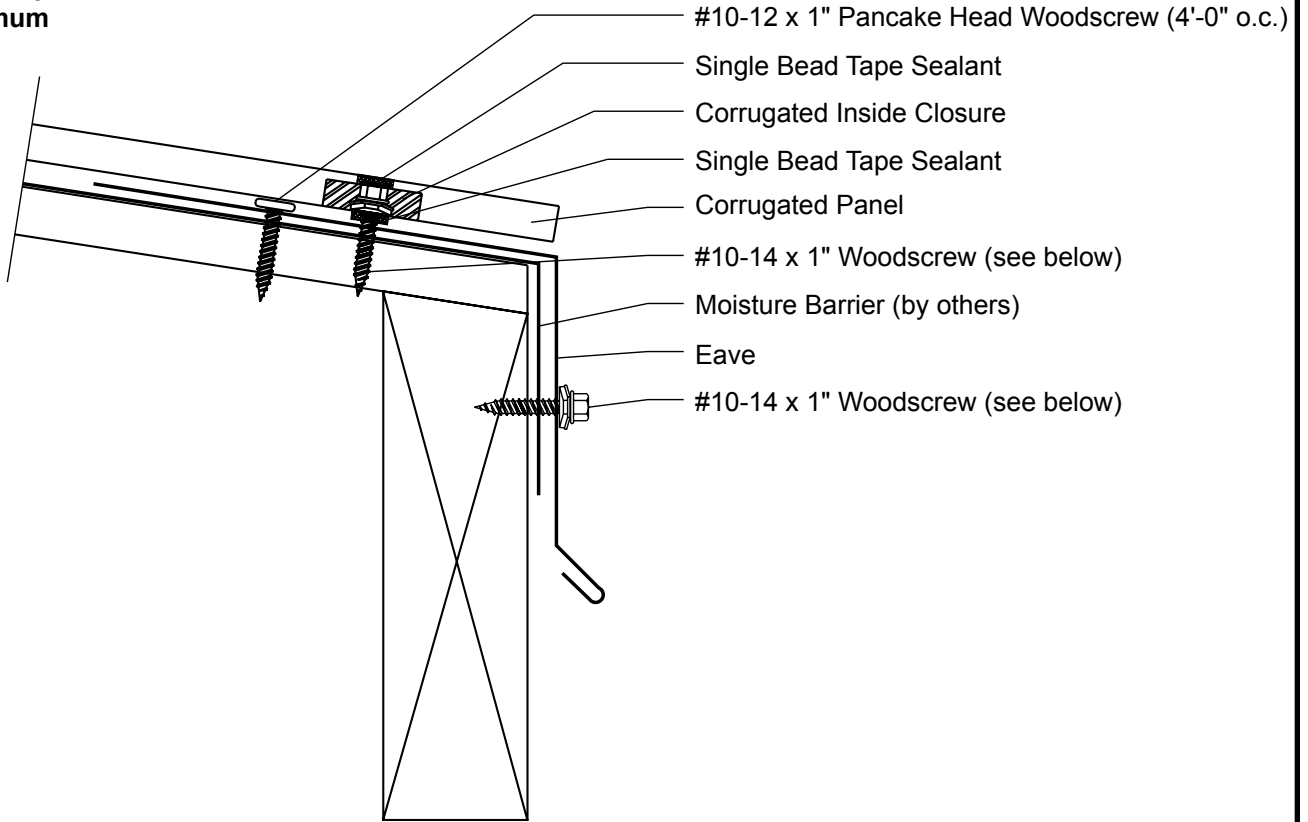


1.25" Corrugated
2.50" Corrugated

EAVE DETAIL



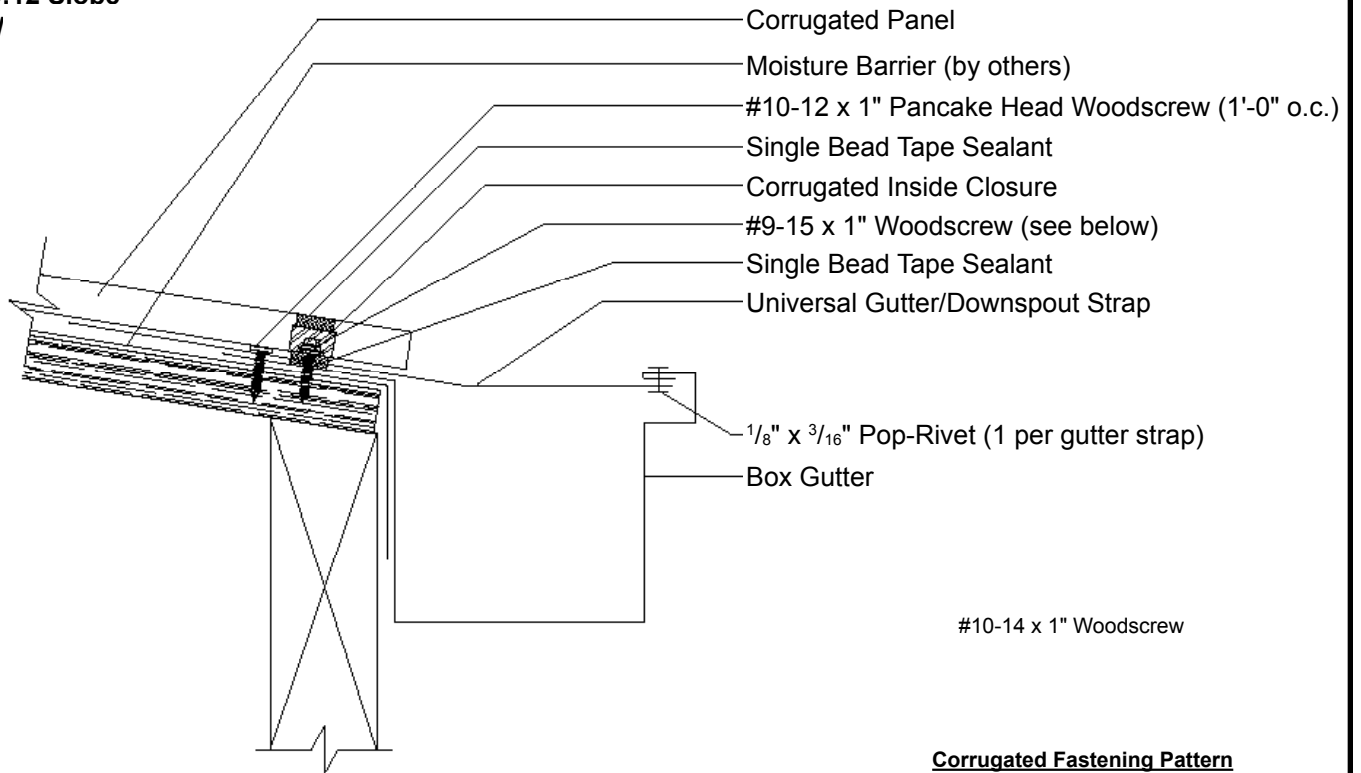
3:12 Slope
Minimum



1.25" Corrugated
2.50" Corrugated

BOX GUTTER DETAIL

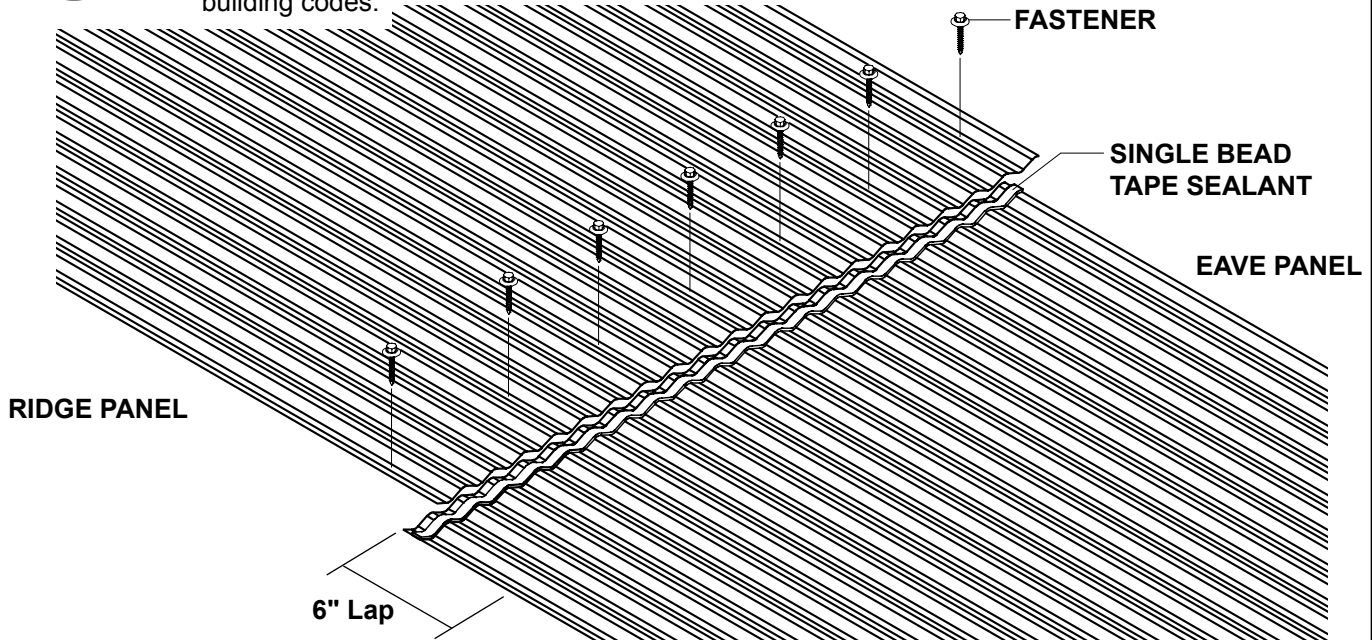
3:12 Slope
N



INSTALLING SECOND PANEL

STEP 3

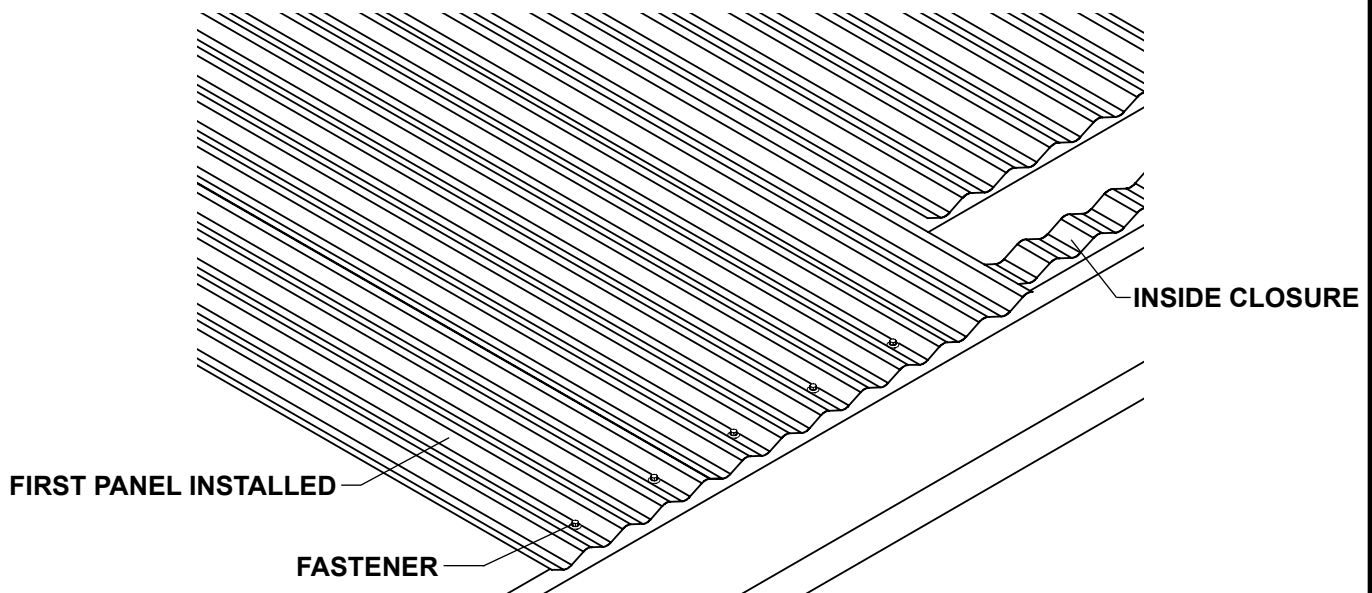
1. Apply a row of Tape Sealant across and over the ribs of the first panel about 3" from panel end.
2. Install the second panel over the first panel and Tape Sealant with a 6" Endlap. Fasten through both panels and Tape Sealant into support with appropriate amount of fasteners to meet local building code. (See fastening patterns on page 7). Fasteners must penetrate Tape Sealant.
3. After securing panel at eave, repeat the fastening pattern at the appropriate spacing to meet local building codes.



INSTALLING SECOND EAVE PANEL

STEP 4

1. Place the lapping seam of the second panel on top of previously installed panel so that panel ends are flush at eave (See below).
2. Fasten through panel, closure, and Tape Sealant into support with appropriate amount of fasteners to meet local building code. (See fastening patterns on page 7). Fasteners must penetrate closure and Tape Sealant.
3. After securing panel at eave, repeat the fastening pattern at the appropriate spacing to meet local building codes.

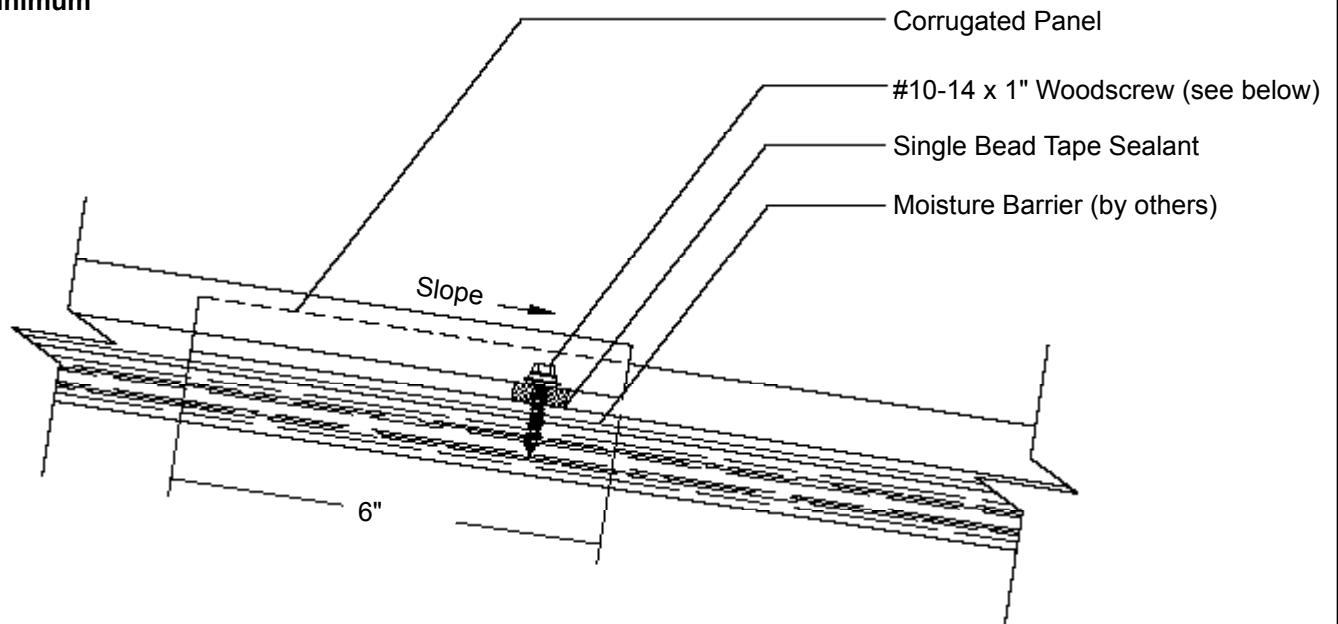


1.25" Corrugated
2.50" Corrugated

ENDLAP DETAIL



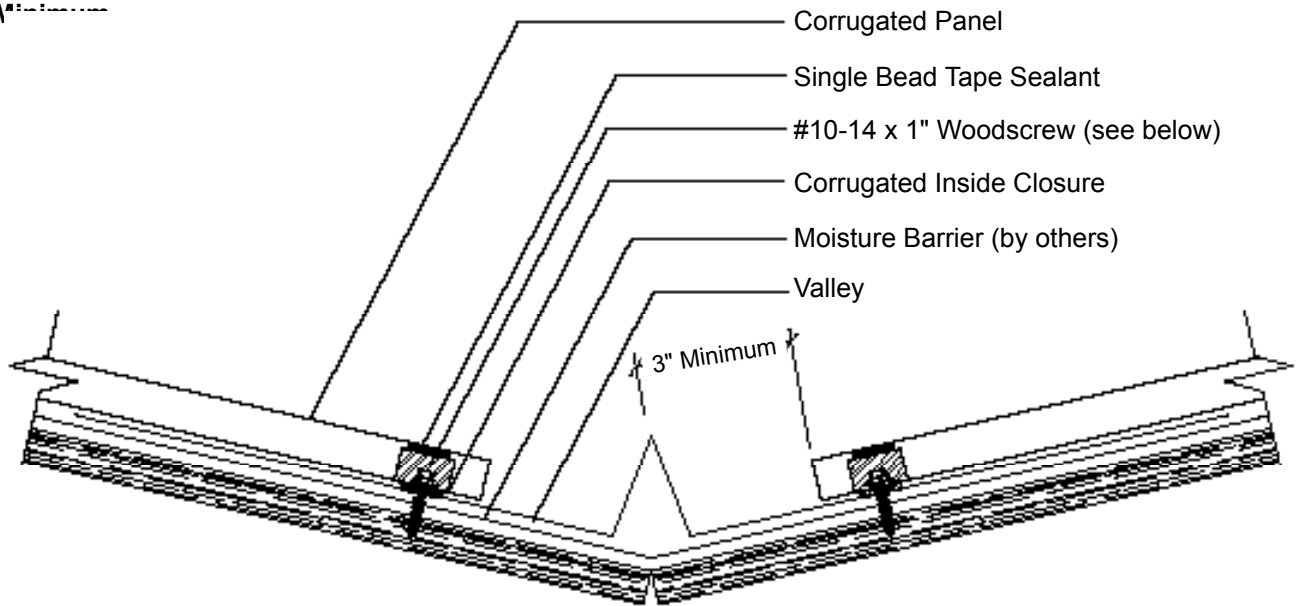
3:12 Slope
Minimum



1.25" Corrugated
2.50" Corrugated

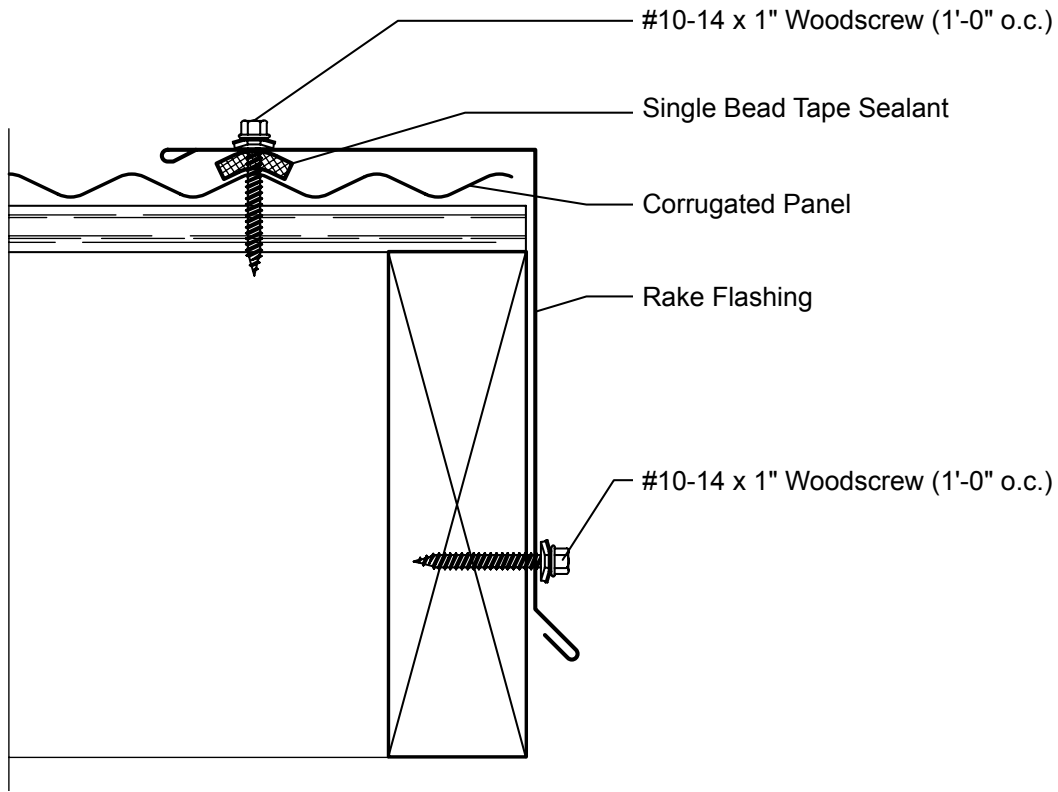
VALLEY DETAIL

3:12 Slope
Minimum



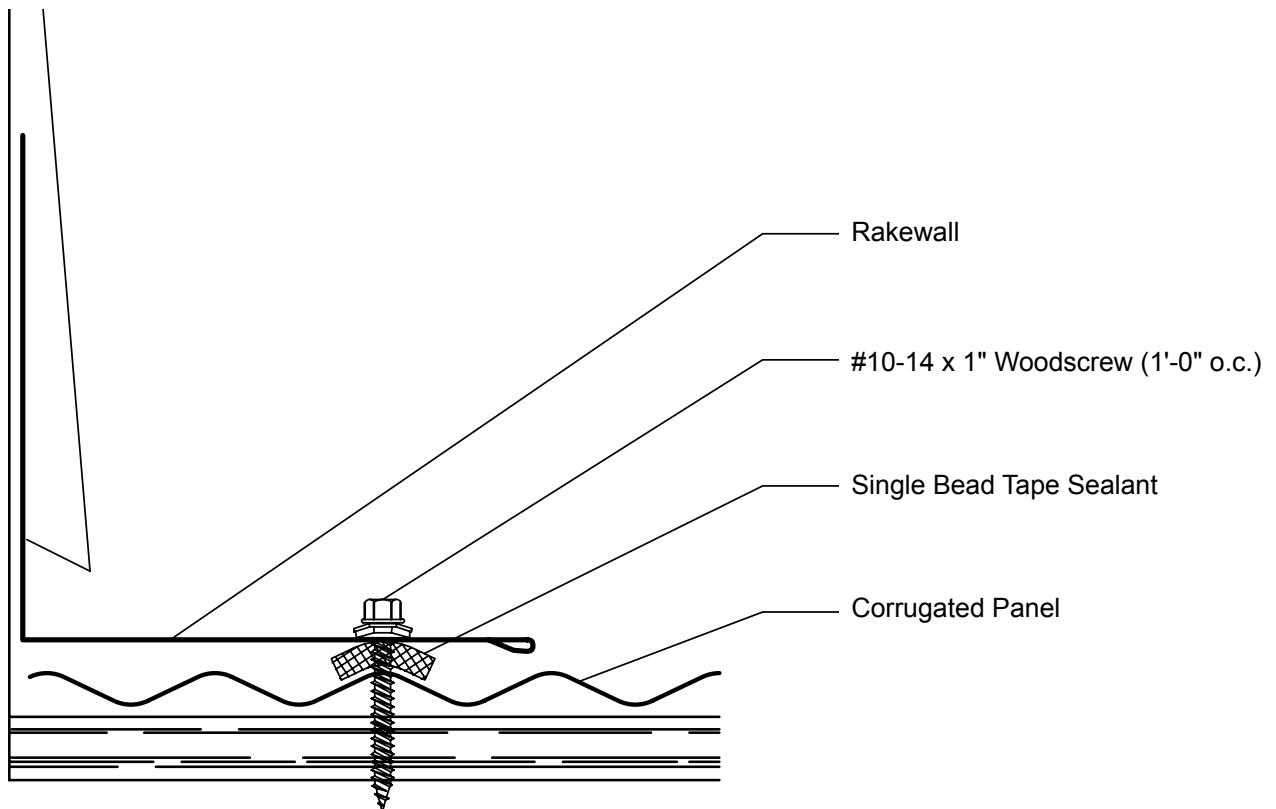
1.25" Corrugated
2.50" Corrugated

RAKE DETAIL



5V-CRIMP

RAKEWALL DETAIL

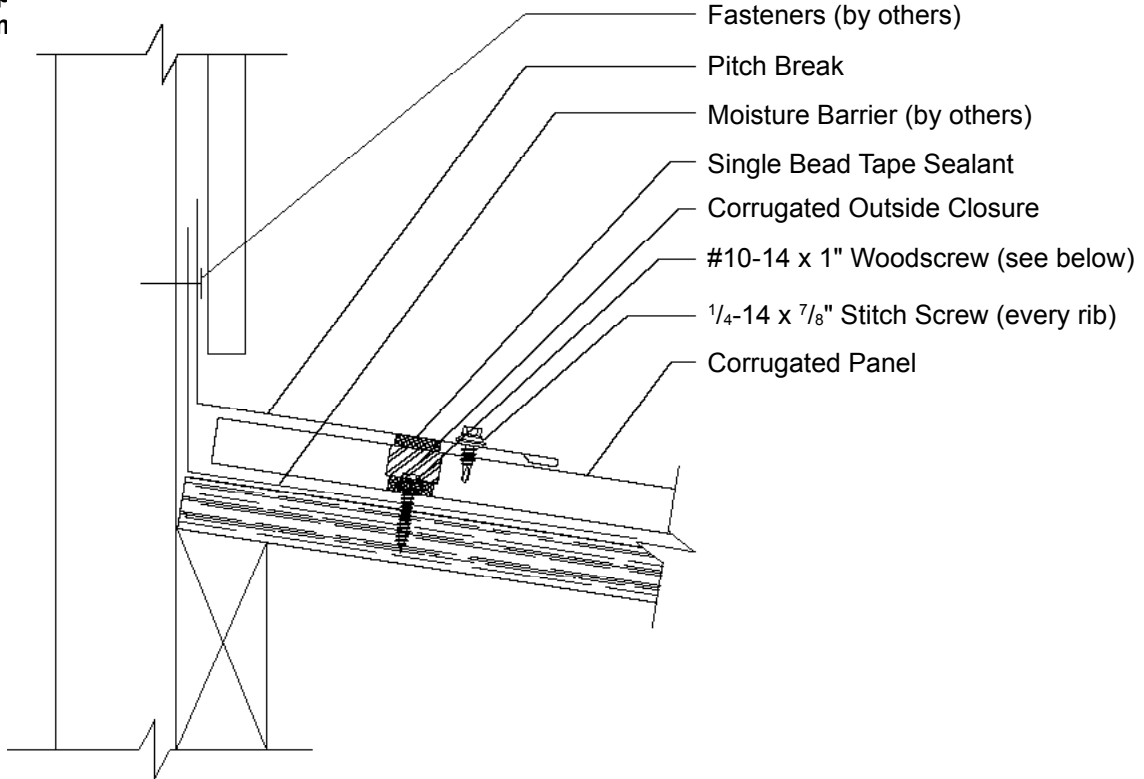


1.25" Corrugated
2.50" Corrugated

ENDWALL DETAIL



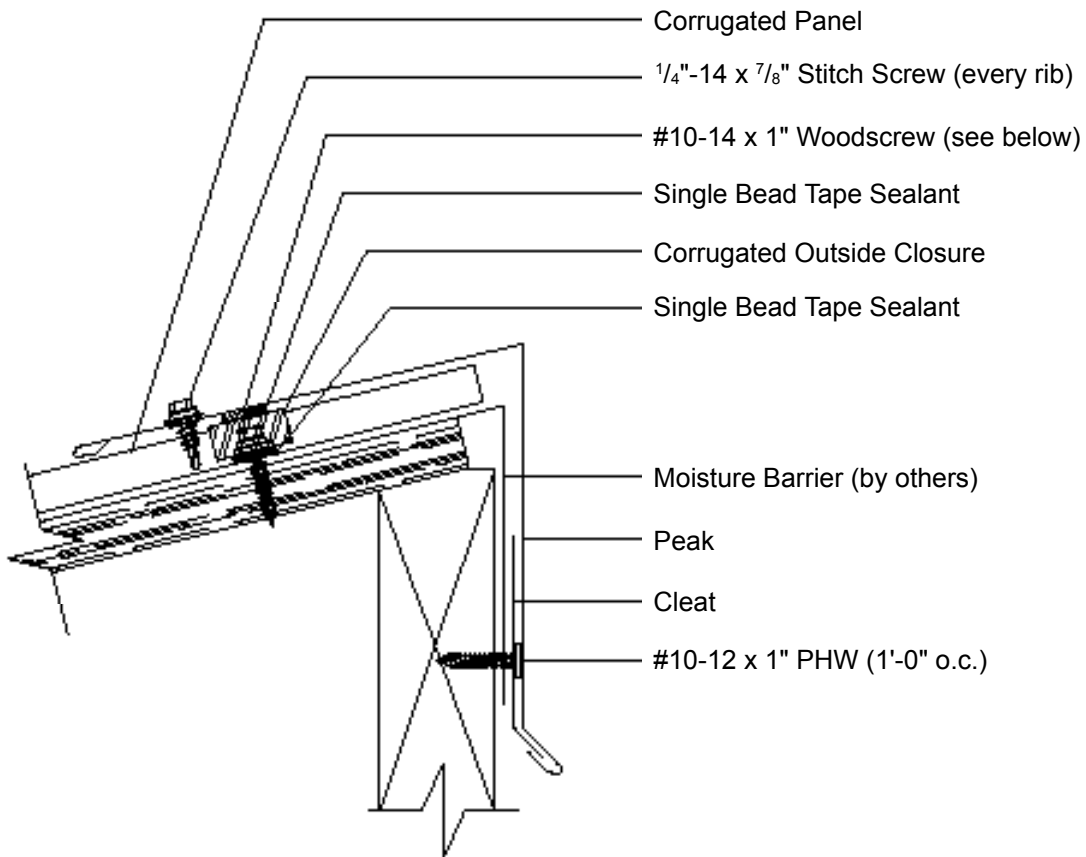
3:12 Slope
Minimum



5V-CRIMP

PEAK DETAIL

3:12 S
Minim

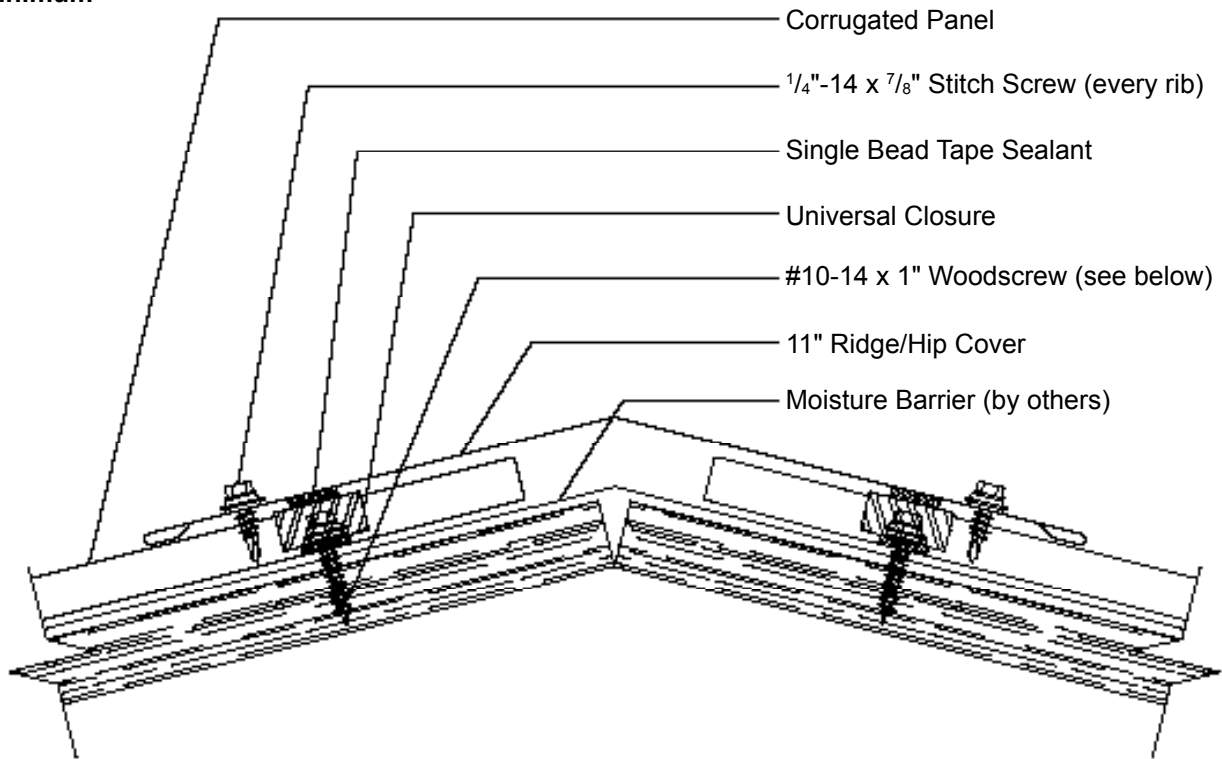


1.25" Corrugated
2.50" Corrugated

HIP DETAIL



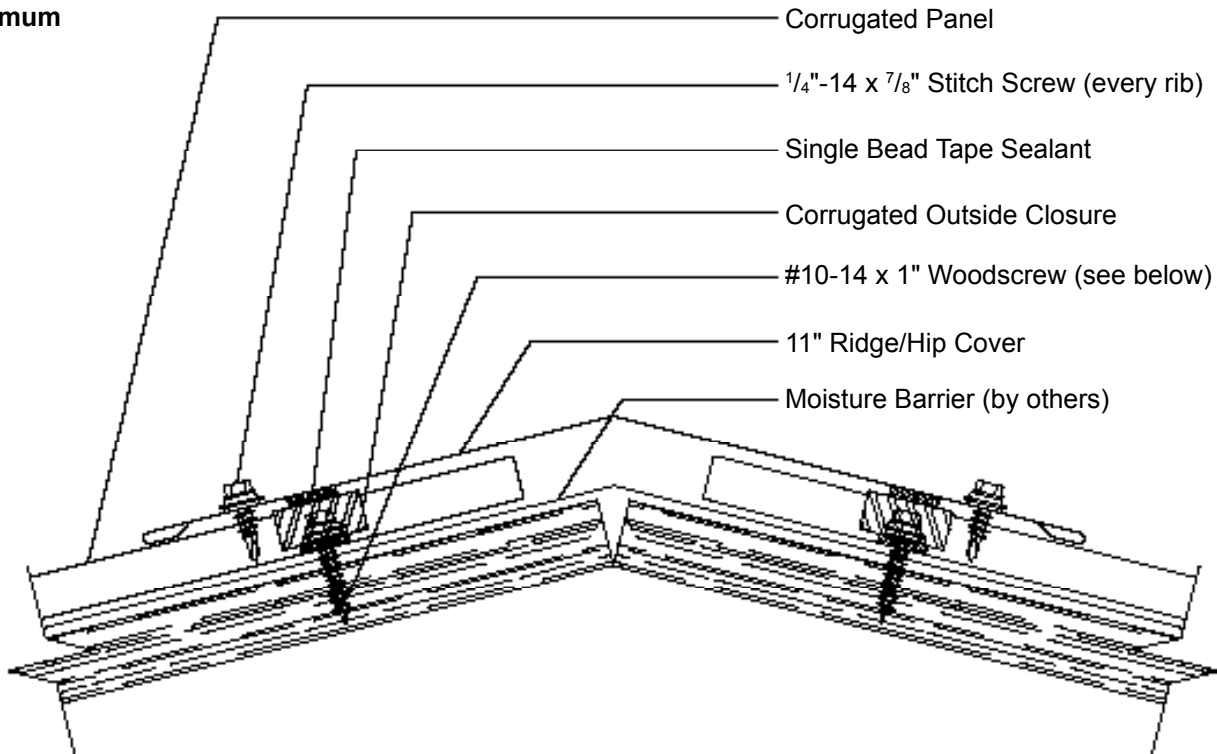
3:12 Slope
Minimum



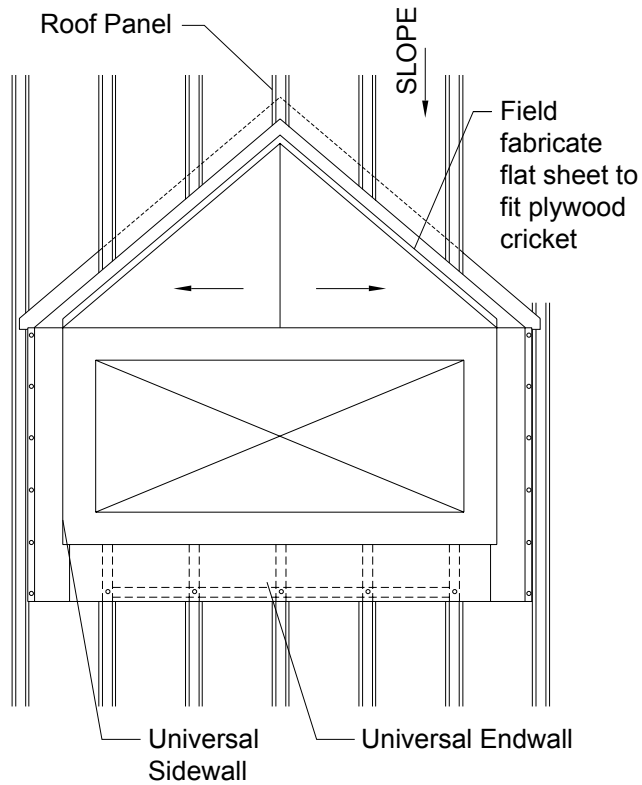
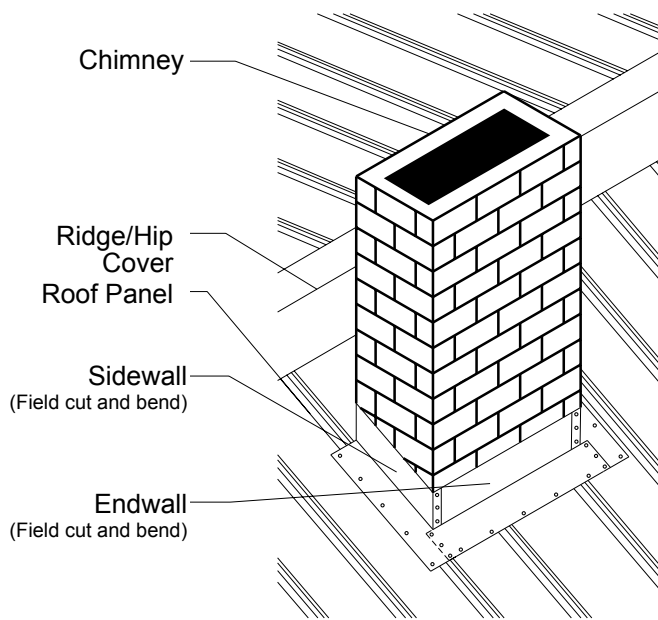
5V-CRIMP

RIDGE DETAIL

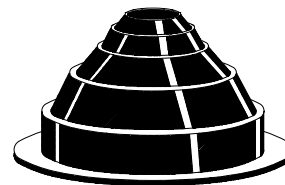
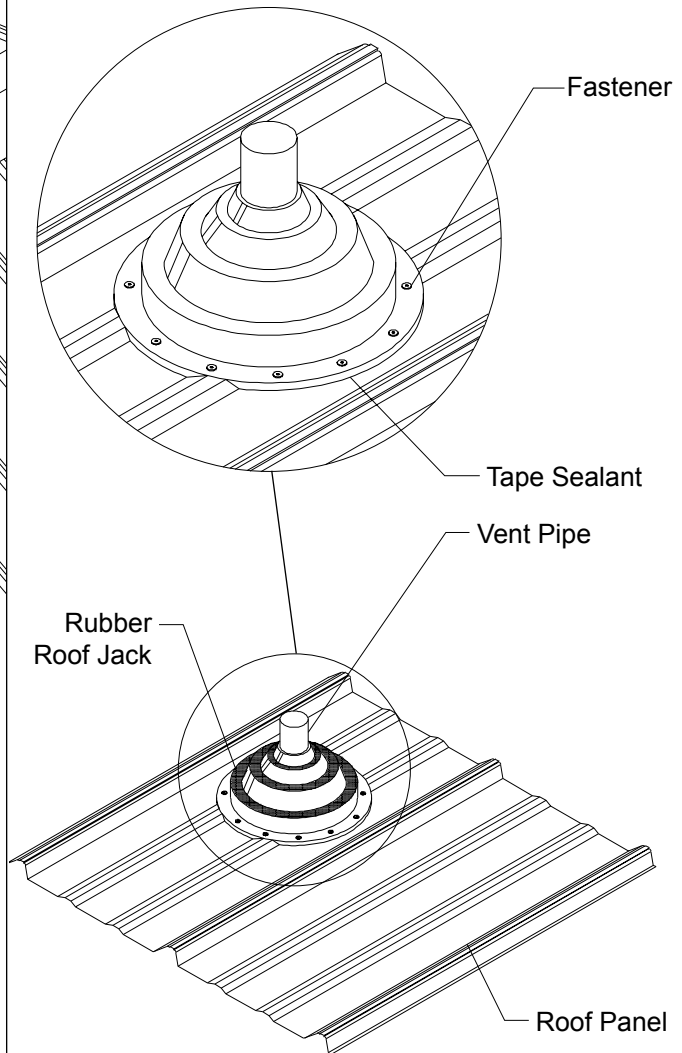
3:12 Slope
Minimum



CHIMNEY / CRICKET DETAIL



ROOF PENETRATION DETAIL



AVAILABLE SIZES

- 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)

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

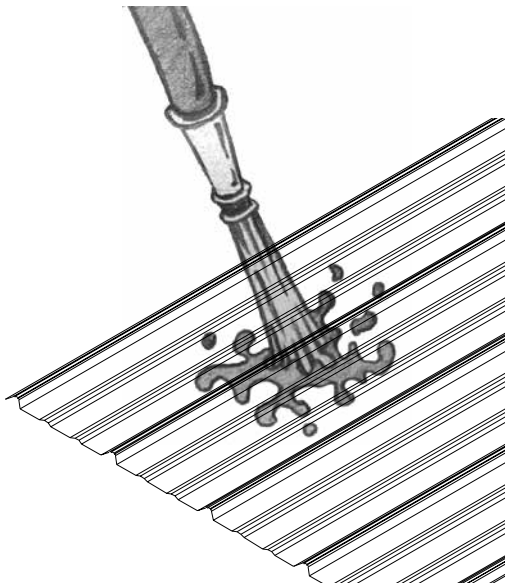
Dirt pickup may cause apparent discoloration of the paint when it has been exposed in some dirt-laden environments for long periods of time. In areas of strong sunlight, slight chalking may cause some change in appearance. A good cleaning will often restore the appearance of these buildings and render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

In many cases, simply washing the building with plain water using a hose or pressure sprayer will be adequate. In areas where heavy dirt deposits dull the surface, a cloth or soft bristle brush and solution of water and detergent ($\frac{1}{3}$ cup of laundry detergent per gallon of water for example) may be used. This should be followed by an adequate rinse of water. Do not use wire brushes, abrasives, or cleaning tools which will damage the coating surface.

Mildew may occur in areas subject to high humidity but is not normally a problem due to the high inherent mildew resistance of the baked finish that is used. To remove mildew along with the dirt, the following solution is recommended.

- $\frac{1}{3}$ cup detergent (Tide® or equivalent)
- $\frac{2}{3}$ cup trisodium phosphate (Solex® or equivalent)
- 1 quart of 5% sodium hypochlorite solution (Clorox® or equivalent)
- 3 quarts of water

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



**HOSE OR PRESSURE SPRAY
FOR ADEQUATE CLEANING**



**DO NOT USE A
WIRE BRUSH**



**USE MILD DETERGENT AND WATER
FOR HEAVY DIRT DEPOSITS**

