



www.marcometals.com

Installation Guide

MARCO METALS, LLC

“Premium roofing. Legendary service.”

Marco Metals, LLC is a family-owned and operated company with its origin in the small town of Chuckey, Tennessee. When John (bottom left) started the business in 1994, his goal was to provide contractors and the general public with quality metal roofing, vertical siding, and post-frame building products.

Combining a premium product with great service, John and his sons quickly grew the home-based retail business. By 1998, the company was a major manufacturer in northeast Tennessee and surrounding markets. In 2003, the company opened an outlet in Stuarts Draft, Virginia, to better serve the Shenandoah Valley and surrounding regions. In 2012, the decision was made to sell the Tennessee division and refocus on other markets. A manufacturing plant was opened in Harrisonburg, Virginia, to provide Virginia and areas of Maryland, West Virginia, and Pennsylvania with prompt, courteous service under the name of Marco Metals, LLC.

In the proceeding years, John's son Mark (bottom right) has taken over the family business and, following in his father's footsteps, is committed to our mission statement: "To provide our customers with the highest quality metal roofing and post-frame products at competitive prices, while demonstrating the Biblical standard of graciously serving our fellowman."

We confidently credit the success of our business to solid family ties and, most importantly, a deeply rooted Biblical foundation. We hold firm to our motto taken from Matthew 7:12 KJV, *"Therefore all*

things whatsoever ye would that men should do to you, do ye even so to them."

We at Marco Metals see this verse as a command to be fair and equitable in the service of our customers. Whether your business is large or small, we will treat you with the same courtesy and respect that we like to receive. Give us a try and see the difference these principles make in your next purchase.



Proud member of the:



The Marco Metals Tuff-Rib® Roofing Panel

Marco Metals Tuff-rib® panels are a strong, durable, economical, and attractive answer to the growing demand for metal roofing needs in the Eastern United States. Extremely versatile, they are suitable for homes and businesses as well as agricultural and utility buildings. Tuff-rib® panels give 36-inch coverage with $\frac{3}{4}$ inch ribs on 9 inch centers. An anti-siphoning channel provides protection from severe weather conditions. Both panels and trim are fabricated using state-of-the-art computerized equipment at our facility in Harrisonburg, Virginia to assure uniformity and consistency. Panels are roll-formed to the lengths specified by customers in either Acrylic-coated Galvalume® or any of our twenty one colors of painted Galvalume® in 29-gauge and 26-gauge high-tensile metal. We also offer Kynar® painted 26 gauge Tuff-rib panels in several colors. Your Marco Metals dealer will be happy to assist you in making the best choice for your particular roofing needs.

Marco Metals Tuff-rib® panels are fabricated from AZ-50 (painted) or AZ-55 (Acrylic-coated) Galvalume® grade 80 coil stock. The Acrylic finish is not only durable and cost effective, but also offers valuable reflectivity as well. The paint system used on painted products offers optimum exterior protection and superior resistance to corrosion and ultraviolet radiation while reflecting significant amounts of heat away from the building. Acrylic coated Galvalume® carries a 20-year limited finish warranty, while most painted metal carries a 40-year warranty.

Marco Metals stocks a complete line of fasteners, sealants, sliding door parts, and other accessories to meet the needs of the metal roofing contractor. A complete line

of in-stock flashings and trims are available in all colors. We will also fabricate whatever custom trims you may need to complete your project.

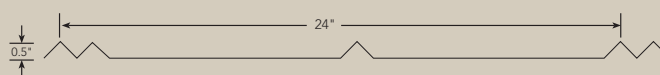
Material Handling

Be careful when handling metal panels and trim. Edges are sharp and proper safety equipment should be worn to prevent injury. Forklifts can damage the underside and edges of panels so extreme caution is necessary when using such equipment. Do not drag panels off the stack to remove; either lift or "roll" the panels off. Panels should be carried vertically by the panel edge. Panels over 20' long may require extra help to handle. Long panels can also be lifted with a forklift if lift straps are used to "roll" the panel or a spreader bar is used.

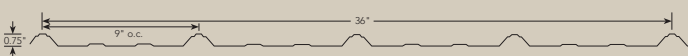
Material Storage

Paint and finishes of Marco Metals panels and trim are designed to withstand severe rain and wet weather conditions. Neither paint, galvanized, nor Galvalume® finishes, however, are designed to be in continuous contact with water for long periods of time. Irreparable damage will result if uninstalled panels or trim are allowed to remain wet in storage. Be sure to store material that will not be installed immediately in a dry location. Wet material should be air-dried and re-stacked if installation is not planned right away. DO NOT cover metal panels with plastic or tarps without leaving adequate ventilation (at least 12 inches) under the cover and metal stack. Neglecting this will result in significant collection of moisture between panels and void the paint warranty.

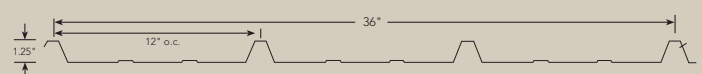
5-V Panel



Tuff-Rib® Panel



R-Panel



Trimming and Cutting Steel Panels

The best device for cutting steel panels *across the profile* is a good-quality offset hand snips, a nibbler or a power shear.

Use of circular or reciprocating saws to cut metal panels is not recommended and will void the paint warranty. If you do use a saw, cut with the bottom side up to prevent hot shavings from contacting the painted side. Be sure other panels are protected from hot shavings.

To *cut panels lengthwise*: Note carefully where the panel is to be cut, and using a straight-edge, score deeply down the length of the panel with a sharp-pointed utility knife. Folding the panel along the score mark, and bending back again if necessary, should produce a clean break in the panel. Snips or shears may also be used.

Cutting holes in the metal panel is done by drilling a starter hole big enough to accommodate the cutting tool to be used.

Pre-drilling metal panels before installation is a common practice, but doing so while in the stack can result in burrs that leave scratches in the painted surface of the panel below. Should such scratches be exposed and rust they are not covered by the paint warranty.

Metal filings from cutting or the installation of screws, if left on the panel, can cause rust spots to form. Care should be taken to brush all such particles from the roof surface daily to maintain paint integrity.

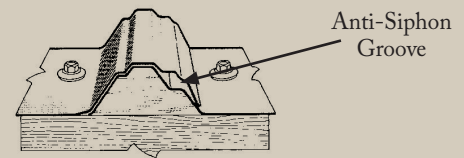
CAUTION! - Clean all metal shavings and particles off the roof to avoid unsightly rust stains.

INSTALLATION OF PANELS

Roof Pitch

Marco Metals roofing panels require adequate pitch to ensure proper water drainage. Stitch screws and butyl tape are optional for side laps when the pitch is 4/12 or greater. Stitch screws and butyl tape are recommended on side laps when the pitch is less than 4/12. As a general principle, the lower the pitch the more necessary that screws and tape be used on the side-laps. Consult your dealer for recommendations for your particular roof. Tuff-rib panels come equipped with an

anti-siphon groove at the side lap that must be kept free of caulk, tape and other debris for it to function properly.



Roof Preparation

Oil-canning is a wave-like, rippled appearance extending up the length of the panel after it has been installed on the roof. Some oil-canning is common with any metal roof but careful storage, handling and roof preparation will keep it to a minimum. Any irregularities in the roof, including uneven plywood joints, warped plywood, uneven trusses, poor application of underlayment, the use of button caps with felt paper, etc., can promote oil-canning or dimpling. Careless storage and handling can also contribute to oil-canning. **Care should be taken to provide a flat, uniform surface on which to attach the panels.**

Synthetic underlayment should be used over solid decking rather than tar paper. Button cap nails will show through the metal and should be avoided in favor of staples for fastening underlayment. Tuff-rib panels may be installed directly over shingles if a synthetic underlayment is placed between the metal and the shingles or *Steel-Shield®* is applied to the back of the metal. Screws must be long enough to penetrate completely through the metal, shingles and the roof deck. **WARNING:** Installing Tuff-rib directly over shingles greatly increases the chance of oil-canning and dimples in the metal.

Battens may also be used for installation over shingles. They should be fastened according to the appropriate building code. **Battens must be installed to support the entire width and length of ridge, eave, hip, valley, and gable-end trims.**

For solid decking, at least 15/32" structural plywood or 5/8" OSB supported on rafters at a maximum of 24" on center is required.

WARNING! - Direct contact between any lumber pressure treated with copper, and Tuff-rib panels must be avoided in order to prevent potential corrosion.

Roof Application

Panel installation should begin at the gable end of the roof opposite the prevailing rain-bearing wind (this will provide added assurance against wind-driven rain being forced under the laps). Measure one panel width in from the roof edge. At this point chalk a line from ridge to eave. Place the leading edge of the first panel along this line. It is extremely important that this panel be laid square to the eave and ridge so that the remaining panels will line up square on the roof frame. It is wise to have a person at the eave and at the ridge to ensure that the proper panel coverage is being maintained across the roof. Also be sure that the panels are properly side-lapped.

In applications where end-lapping is necessary, the upper panel should lap over the lower panel by a minimum of 6 inches. Lower pitches require a greater amount of panel overlap. All end-lap applications should use two horizontal rows of butyl tape across the panel and proper fastening to provide a maximum water seal.

An overhang of 1.5 inches on the eave is recommended to provide a drip edge. The open panel ribs at the eave can be sealed with *inside closures*.

Ventilation

Metal panels exposed to air will experience condensation of moisture under certain conditions. To avoid this, installation of plastic coated insulation or some other product to keep moist air from contacting the bottom of the panel is helpful. Drip Stop® also works well to absorb condensation and prevent dripping. As with any other type of roof, adequate ventilation through the attic cavity below is essential for proper function and long service life.

Fastening

Specially-washered 1 ½" screws applied through the *flat* of the Tuff-rib panel are the recommended method for attaching roofing panels. Marco Metals carries wood screws in 5 different lengths: 1", 1 ½", 2", and 2 ½" (3" may be special ordered). Self-tapping screws are available for fastening to steel substrates. 1 ½" screws are the best all-purpose size

but make sure that the screw shank will penetrate at least 1" into the substrate. **2 ½" screws are necessary for attaching ridge caps and endwall/transition flashing.**

Screws can be placed on the overlap side of each rib for the interior rows. *See Figure 1a.* Screws should be placed on both sides of each rib at eave and endlaps. *See Figure 1b.* Butyl tape with stitch screws can be used to fasten side laps on pitches below 3/12 if care is taken that butyl tape does not block the anti-siphon groove of Tuff-rib panels. Butyl tape with stitch screws are recommended for all R-panel side laps. **DO NOT OVERDRIVE SCREWS.** *See Figure 2* for proper screw installation.

Figure 1a



Figure 1b

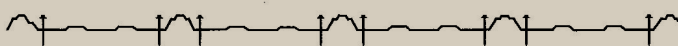
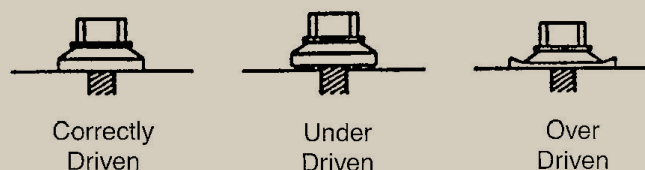


Figure 2



Fastening of **polycarbonate skylight panels** is a bit different. Temperature change causes significant expansion and contraction, therefore allowance must be made for thermal movement. **Pre-drill** holes to allow for expansion and contraction by making them at least 5/64" larger than the screw threads. Special screws with larger washers are available for this application. Drill holes through the top of the rib for roofing and through the flat for walls. Be careful **NOT** to stress the panel by tightening screws too tight. Do not use any caulk with acetone or diethyl ether as a curing agent because this will cause the panel to harden and crack very quickly. We stock caulk compatible with polycarbonate skylight panels. Butyl tape is a good choice at end laps provided the tape is not exposed to sunlight. Do not screw metal and polycarbonate panels together. Screws

must be placed above and below, or beside overlaps because the metal and plastic do not expand and contract at the same rate and need opportunity to move past each other.

Ordering Roof Panels and Screws

Care should be taken to order panels of the correct length (We will cut to the inch) to minimize cutting after purchase. Panel lengths should fall 1-2 inches past the eave to allow a sufficient drip edge. When a roof transition is involved, panels of the upper portion should be ordered short to allow proper placement of the transition flashing (see diagram on pg. 11).

Two ways to figure the amount of screws needed for 2' on-center spacing is to multiply the total linear feet of panel by 2.4 or to figure 70 screws per 100 square feet of roof covered.

Example: your order is 1250' of Tuff-rib roofing to be installed on purlins placed 2' on-center.

1250 x 2.4 = 3000 screws 3000 ÷ 250 = 12 bags

Example: Your order is for a roof of 4162 square feet with rows of screws spaced 2' on center.

4162 ÷ 100 = 41.62 square. 41.62 x 70 = 2913 screws
2913 ÷ 250 = 11.66 or 12 bags

Please confirm all estimates with your Marco Metals dealer when you place your order.

Ordering and Applying Trim

The most common flashing for metal roofing is the *ridge cap*, which is used at the peak of a roof. *Drip edge* is used at the eave and is often applied above *fascia* trim. When roof pitch exceeds 5/12, the slope of the roof should be mentioned when ordering *ridge cap*, *endwall*, and *drip edge*.

At the gable edge, the use of *rake & gable* or *outside corner* trim adds to the appearance of the structure and protects the fly-rafter. *Sidewall* flashing is used where the *side* of the panel butts up against an adjacent wall. For both *gable* and *sidewall* trim the installer should be careful to seal between the flashing and the roof panel with *butyl tape* before fastening. *Endwall* flashing is used where the *top* of a roof slope meets a vertical wall. *Transition* flashing

is used where two different roof pitches meet along the length of the roof. Both slopes should be mentioned when ordering *transition* flashing, upper pitch first (ie. lower roof at 4/12 and upper at 10/12 would be ordered "10/12 to 4/12 transition). *Valley* flashing is used at the intersection of two perpendicular roof planes and should be sealed between the flashing and the roof panel with a row of butyl tape and *expanding foam closure*.

To prevent penetration of water, insects, and debris, *outside closures* should be inserted between the *ridge cap* or *endwall/transition* and the top end of the panel. *Inside closures* are used for the same reason over *drip edge* or the top of *transition* flashing. For *endwall*, *transition* and *ridge*, screws are applied through the trim, closure, and rib in at least every other rib of the panels. 2 ½ inch screws should be used for attaching ridge caps. Various types of *vented ridge closures* are available if needed.

Marco Metals Policies

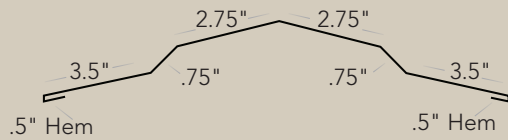
Warrantied Products: A 40-year paint warranty applies to most material (excluding liner panel) manufactured from painted coil stock, and a 20-year "no rust" warranty on Acrylic coated material. Copies of these warranties can be provided on request. Ask for details.

Indemnity: All prices and designs are subject to change without notice.

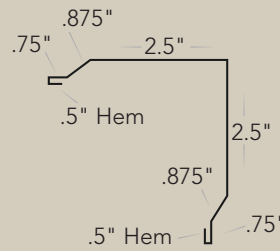
Disclaimer: While we have made every attempt at accuracy in this manual, we are not responsible for typographic, printing, or technical errors.

Oil Canning: A repeating, wave-like appearance in the length of a panel is a common, and often unavoidable, phenomenon in metal panels that have large, flat areas within the panel. It is therefore not a defect, nor a cause for rejection. See pg. 3 for details on how to minimize oil-canning.

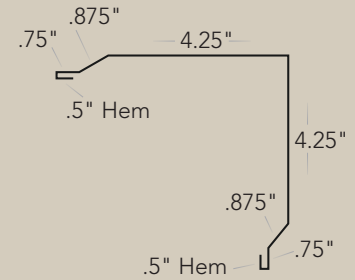
Return Policy: Once produced all panel, custom trims, and flat sheet orders are considered property of the customer and are non-refundable. Standard trims and accessories are refundable providing they are returned in clean, resalable condition. Restocking fees will apply to any items at the discretion of Marco Metals.



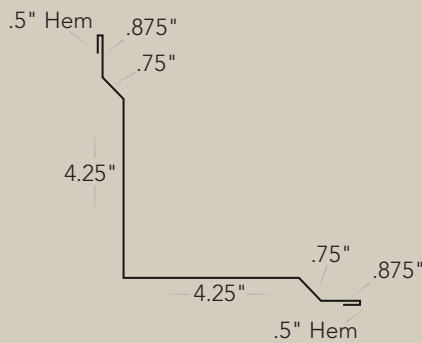
Ridge Cap
#T-RC



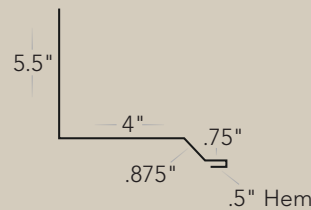
Narrow Outside
Corner
#T-OCN



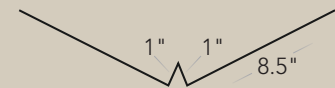
Wide Outside
Corner
#T-OCW



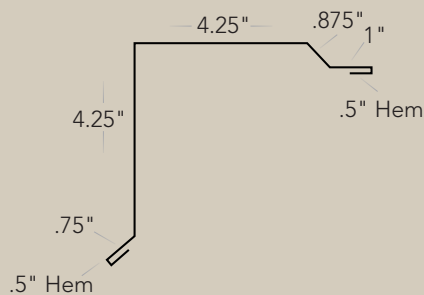
Inside Corner
#T-IC



Sidewall
#T-SW



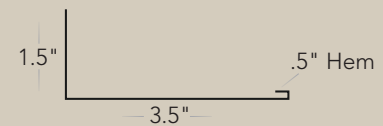
W Valley
#T-WV



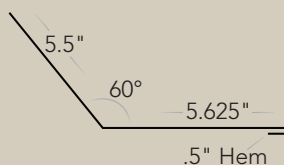
Rake & Gable
#T-RNG



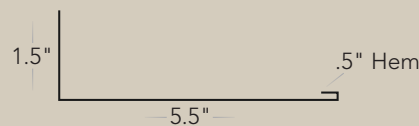
1.5" Angle
#T-1.15A



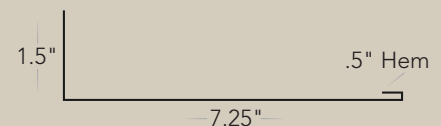
3.5" Angle
#T-3.5A



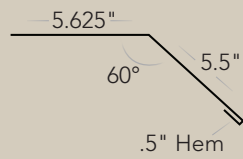
Endwall/Transition
#T-EW



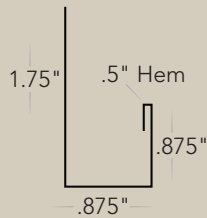
5.5" Angle
#T-5.5A



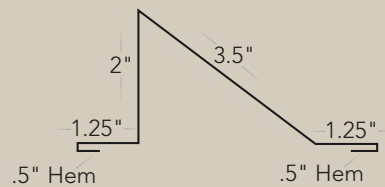
7.5" Angle
#T-7.5A



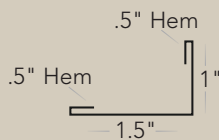
Gambrel Flashing
#T-GF



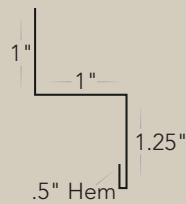
J-Channel
#T-JC



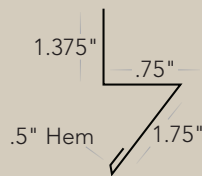
Carolina Snow
Guard
#T-CSG



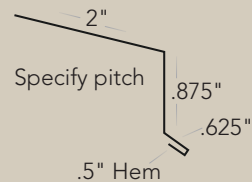
Snow Guard
#T-SG



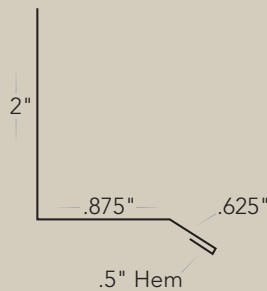
Wainscoat
Trim
#T-WT



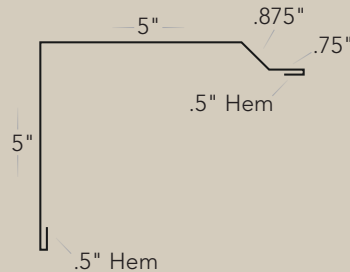
Rat Guard
#T-RG



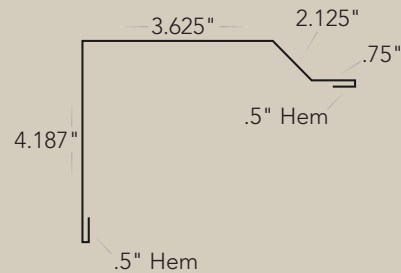
Drip Edge
#T-DE



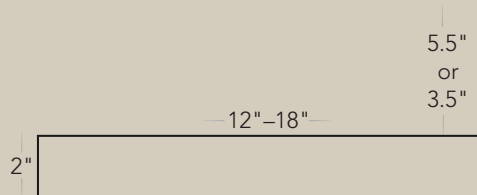
Drip Flashing
#T-DF



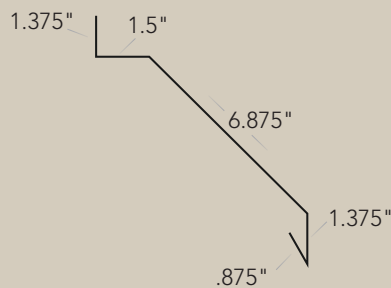
Wide Sliding
Door
#T-SD10



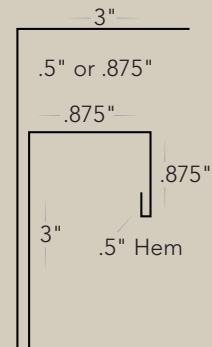
Narrow Sliding
Door
#T-SD5



Soffit Trim
#T-ST

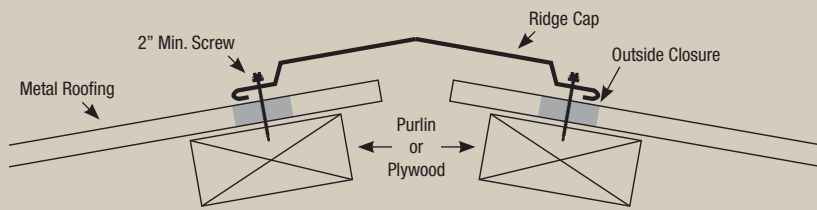


Round Door
Track Cover
#T-RDT



F-J Trim
#T-FJ

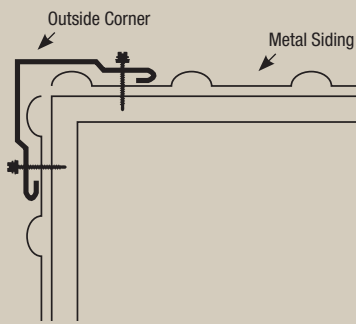
Ridge Cap – #T-RC



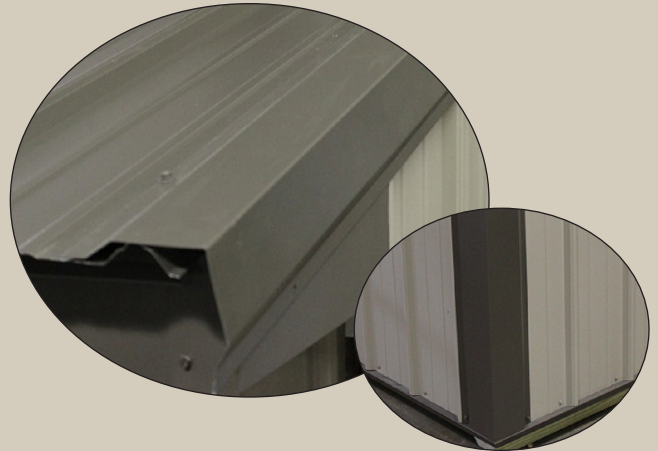
- To vent, use vented closure.
- Cap outside ends by cutting and folding raised section.



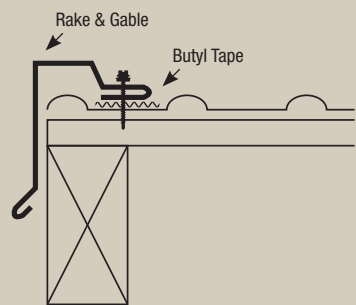
Outside Corner – #T-OCN or #T-OCW



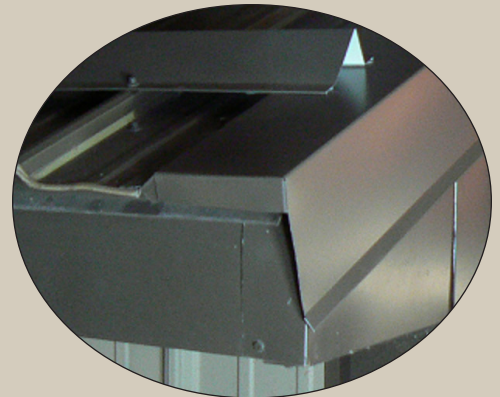
- When laying out the siding, try to ensure the screw flange of the outside corner does not rest on a rib.
- May also be used for gables. If so, it should be installed like the rake and gable below.



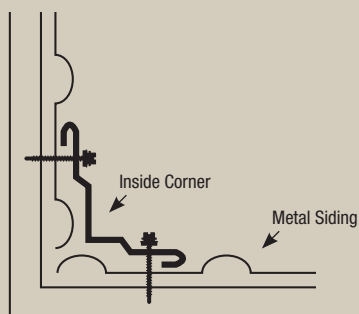
Rake & Gable – #T-RNG



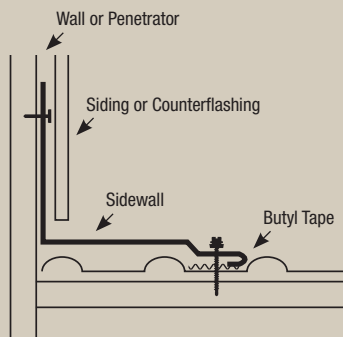
- Cap the bottom end of the rake gable by cutting a flap in the raised section to bend over the opening.
- The ridge cap should go over the top of the ridge end.
- It is important that 3/8" butyl tape be placed between the screw flange and the roof and that the screws go through the tape.



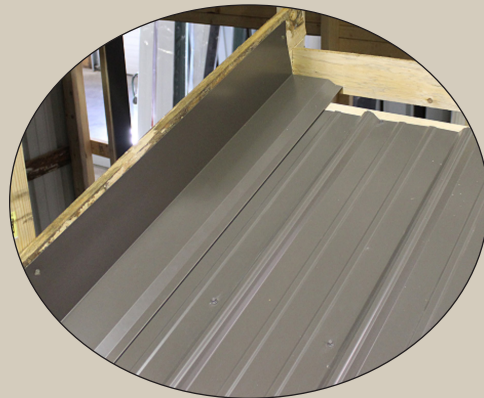
Inside Corner – #T-IC



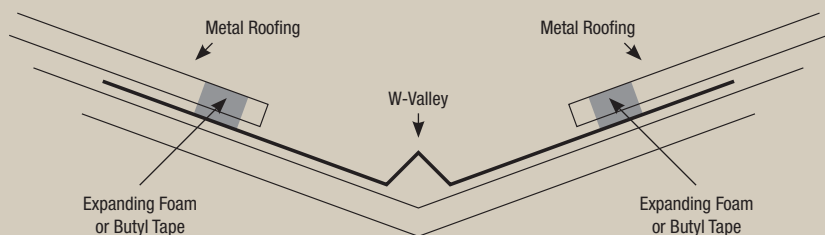
Sidewall – #T-SW



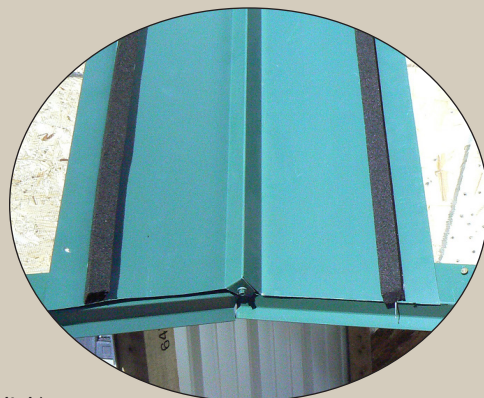
- Used where wall or penetration meets the long side of a roof panel.
- 3/8" butyl tape should be used between the screw flange of the flashing and the roof panel.
- Cap the bottom end of the sidewall by cutting a flap in the raised section to bend over the opening.



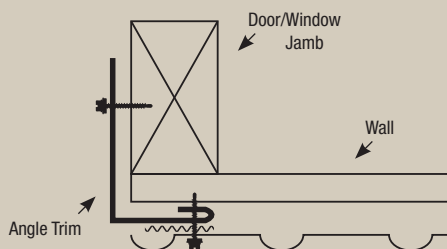
W-Valley – #T-WV



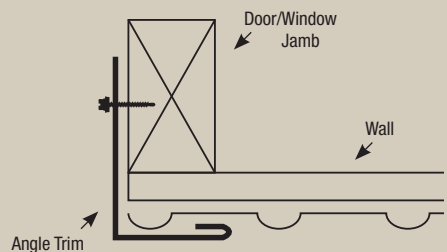
- Expanding foam closure tape should be used to seal the end.
- Alternatively 1" butyl tape could be used on steep slope valleys (above 8/12 pitch).



Angle Trim



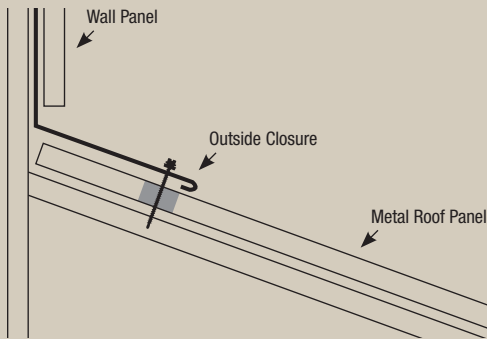
ALTERNATE



- Angle trim comes in several widths to cover various size jambs on terminations.
- Angle trim on jambs should be covered with a drip cap for windows and doors.
- Angle trim can also be used as a fascia trim.



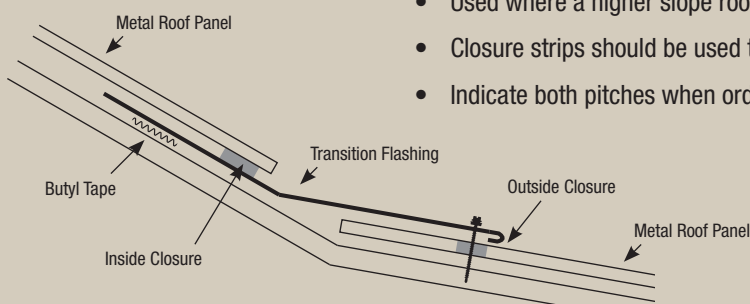
Endwall – #T-EW



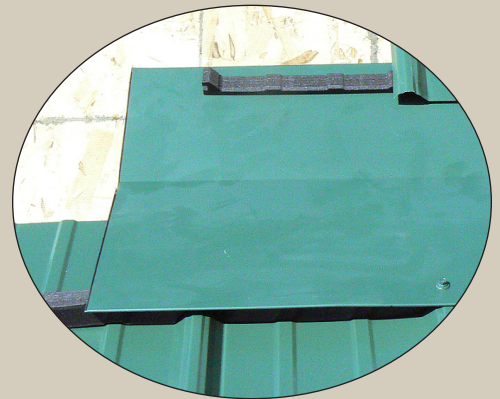
- Used where a roof terminates against a verticle wall.
- Indicate pitch of roof when ordering.



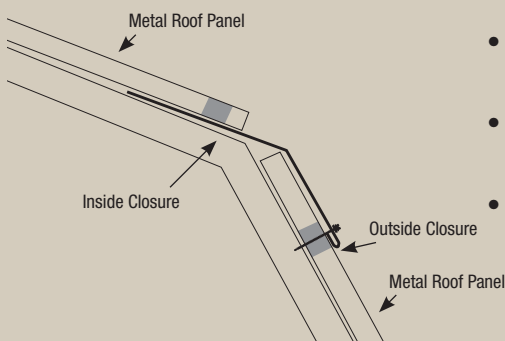
Transition – #T-EW



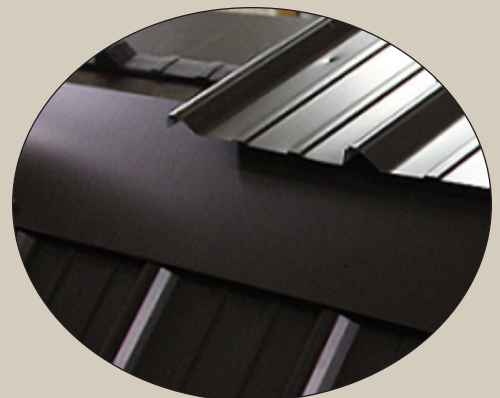
- Used where a higher slope roof meets a lower one.
- Closure strips should be used to seal panel ends.
- Indicate both pitches when ordering.



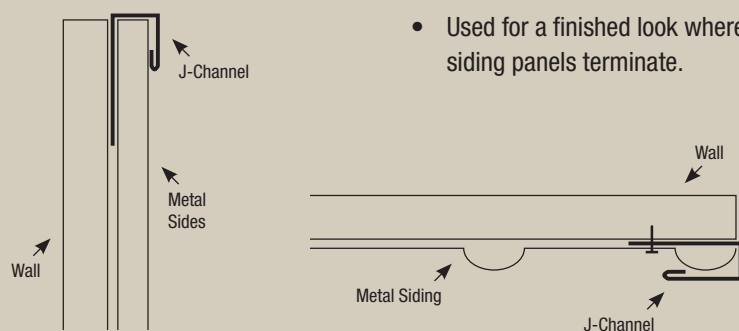
Gambrel – #T-GF



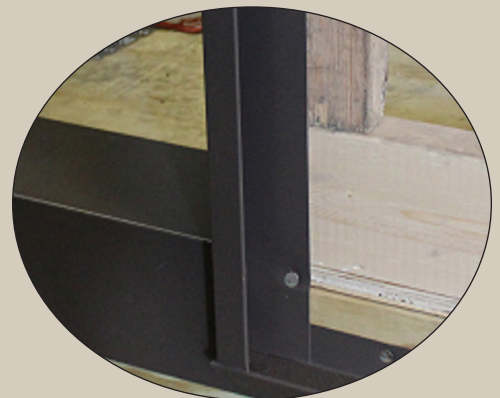
- Used where low slope roof meets a higher one.
- Closure strip should be used to seal if panel ends.
- Indicate the pitches when ordering.



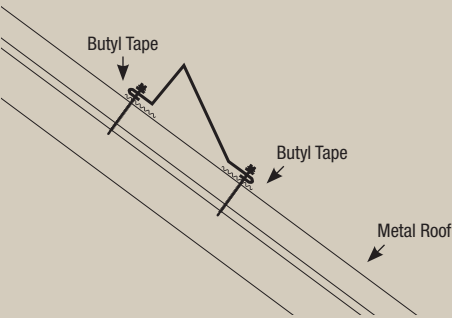
J-Channel – #T-JC



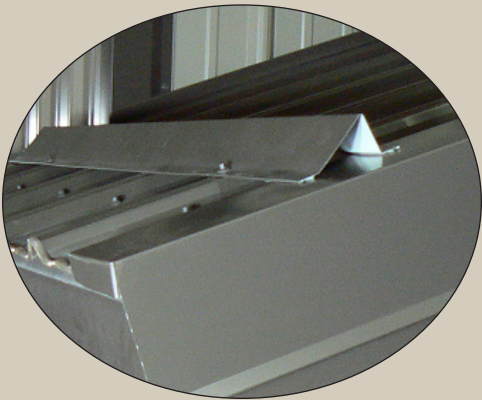
- Used for a finished look where edges of siding panels terminate.



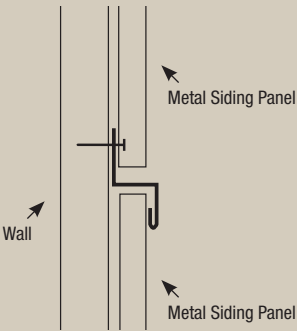
Carolina Snow Guard – #T-GS-G



- Small pieces of butyl tape should be used between the guard and the rib of the roof panel.
- Screws should be placed through the rib and be minimum of 2” long.



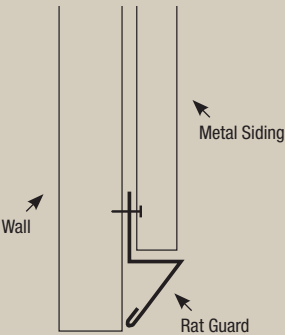
Wainscoat – #T-WT



- Used to trim the joint where two siding panels meet.
- May also be used as a drip cap.



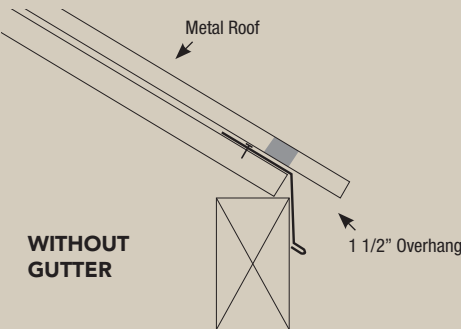
Rat Guard – #T-RG



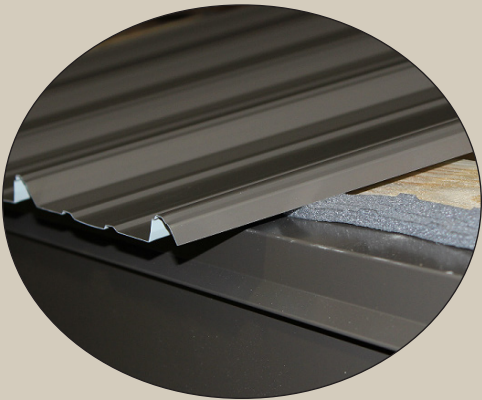
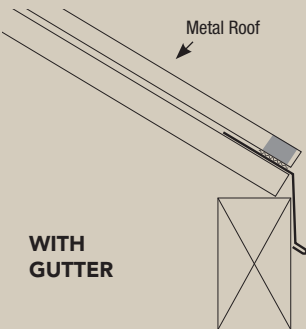
- Panel should be kept 1/8” minimum off base of guard.
- Rat guard should be kept a minimum of 2” off the ground.



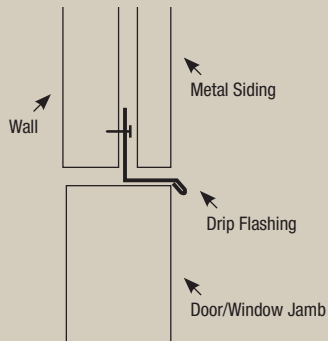
Drip Edge – #T-DE



Drip Edge – #T-DE3



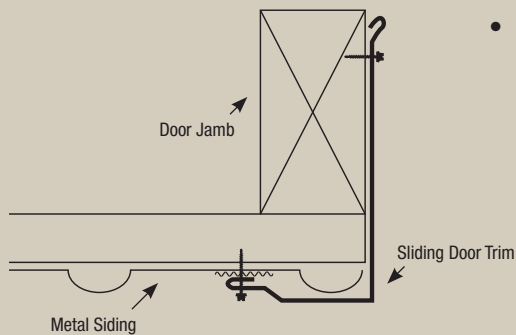
Drip Flashing – #T-DF



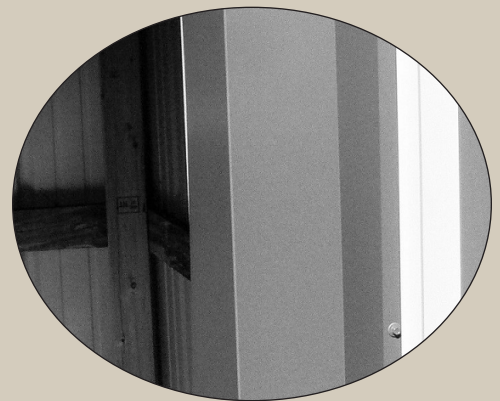
- Drip flashing should cover J-channel or L-trim at the sides.
- Tube sealant should be placed at each corner.



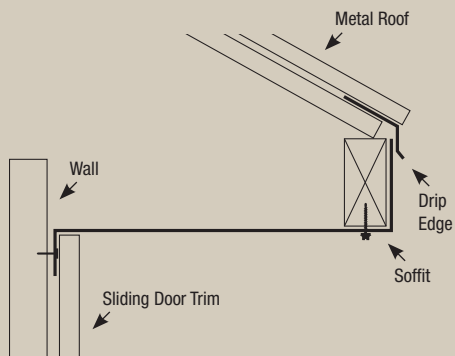
Sliding Door Trim – #T-SD10 or #T-SD5



- Used over jambs of sliding doors to give better seal.



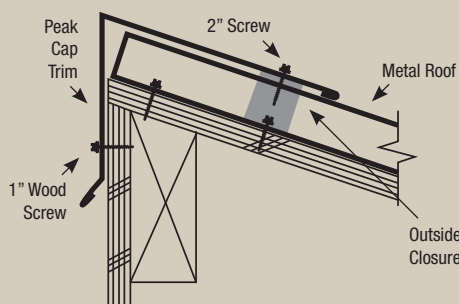
Soffit – #T-ST



- Soffit can be purchased in widths between 12" and 18" wide.
- Accurate measurement is critical. Don't forget to subtract the depth of the siding panel.
- For widths wider than 12", 3' OC supports are recommended.



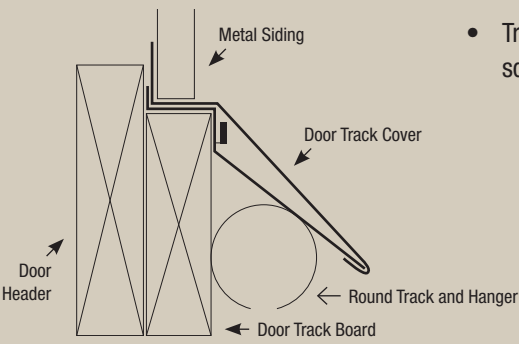
Peak Cap Trim – #T-PC



- Used where roof terminates at its highest side.



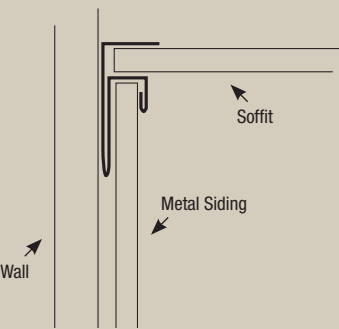
Round Door Track Cover – #T-RDT



- Track cover can also be made for square track.



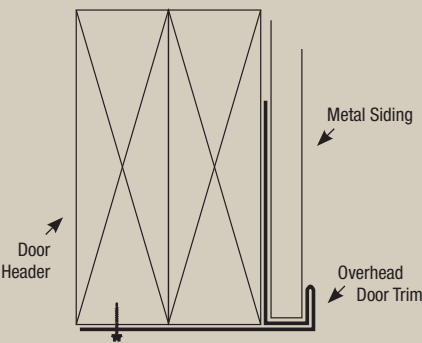
F-J Trim – #T-FJ



- Used to trim corner where wall and soffit meet.
- May also be used as an inside corner.



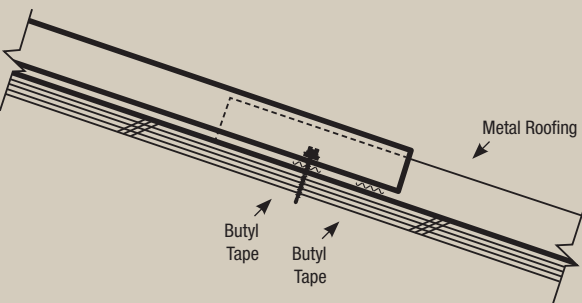
Overhead Door Trim – #T-OHD



- Overhead door trim should completely overlap J-channel or angle trim at the sides.
- Tube sealant should be used at the corners.

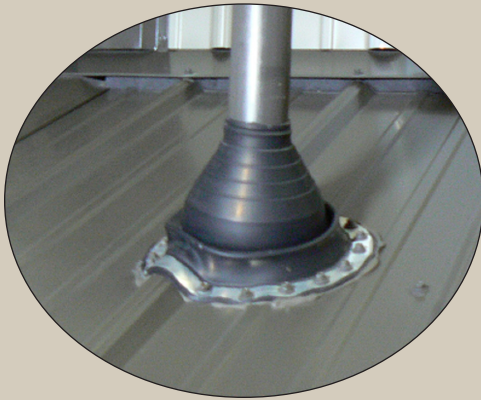
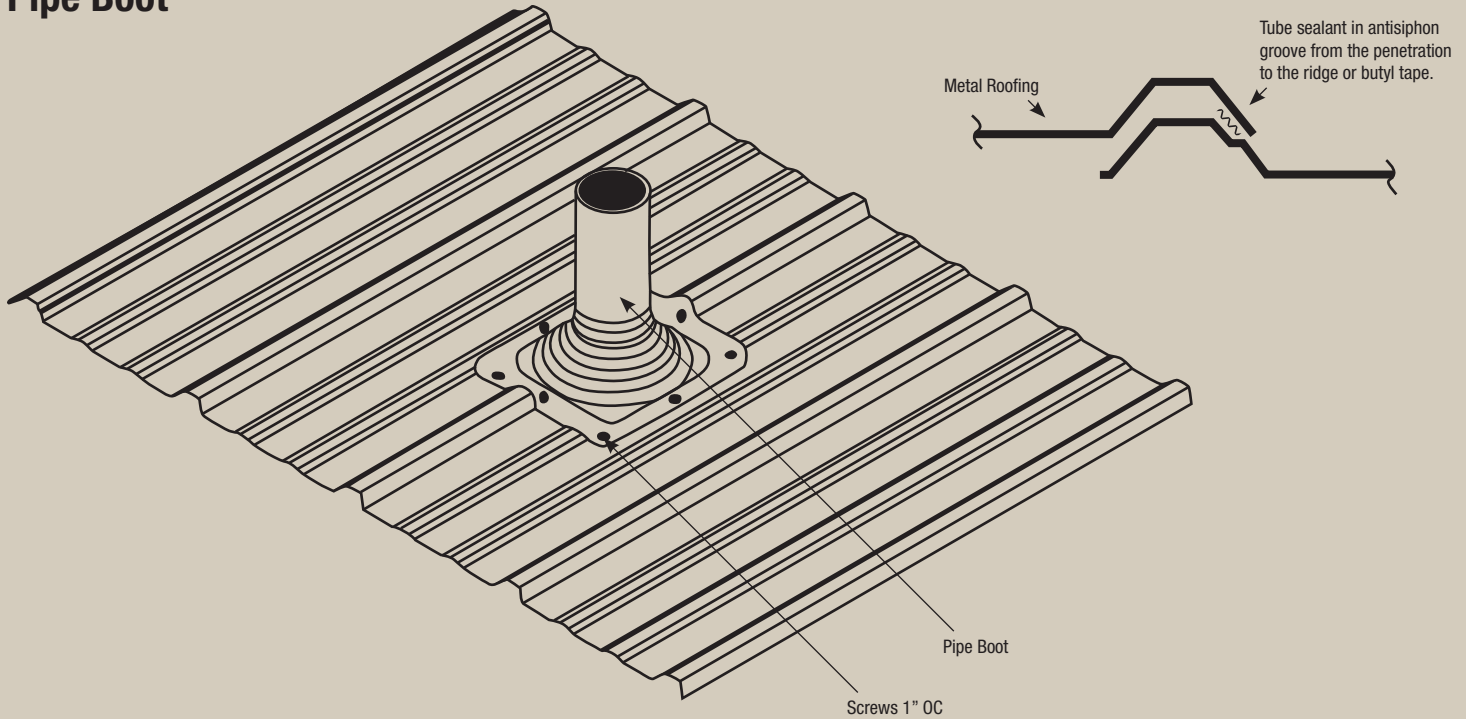


Panel End Lap



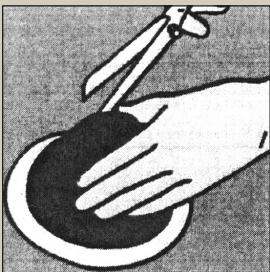
- Method used to provide watertight seal when panels are overlapped at ends.

Pipe Boot



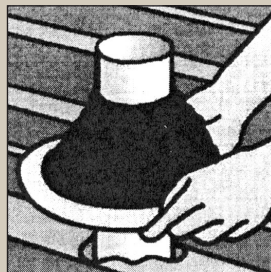
- Leave minimum of 2" between edge of boot and adjacent ribs for drainage.
- If the boot covers the space between two or more ribs, special techniques are required. Call your Marco Metals dealer for suggestions.
- Screws should be placed every inch around the flange.
- Tube sealant should be placed heavily on based boot before fastening to the roof.

Vent/Pipe Boot Installation Procedure



STEP 1: Cut

Cut to pipe diameter marked on Flashers (this is approximately 20% smaller than the diameter of the pipe).



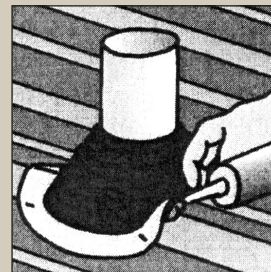
STEP 2: Slide

Slide the boot down the pipe, using water to lubricate if necessary.



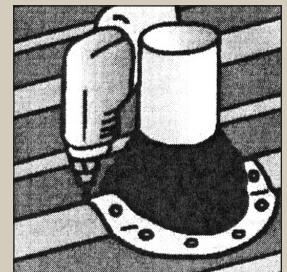
STEP 3: Form

Form and bend the aluminum base of the boot to fit the surface of the roof.



STEP 4: Seal

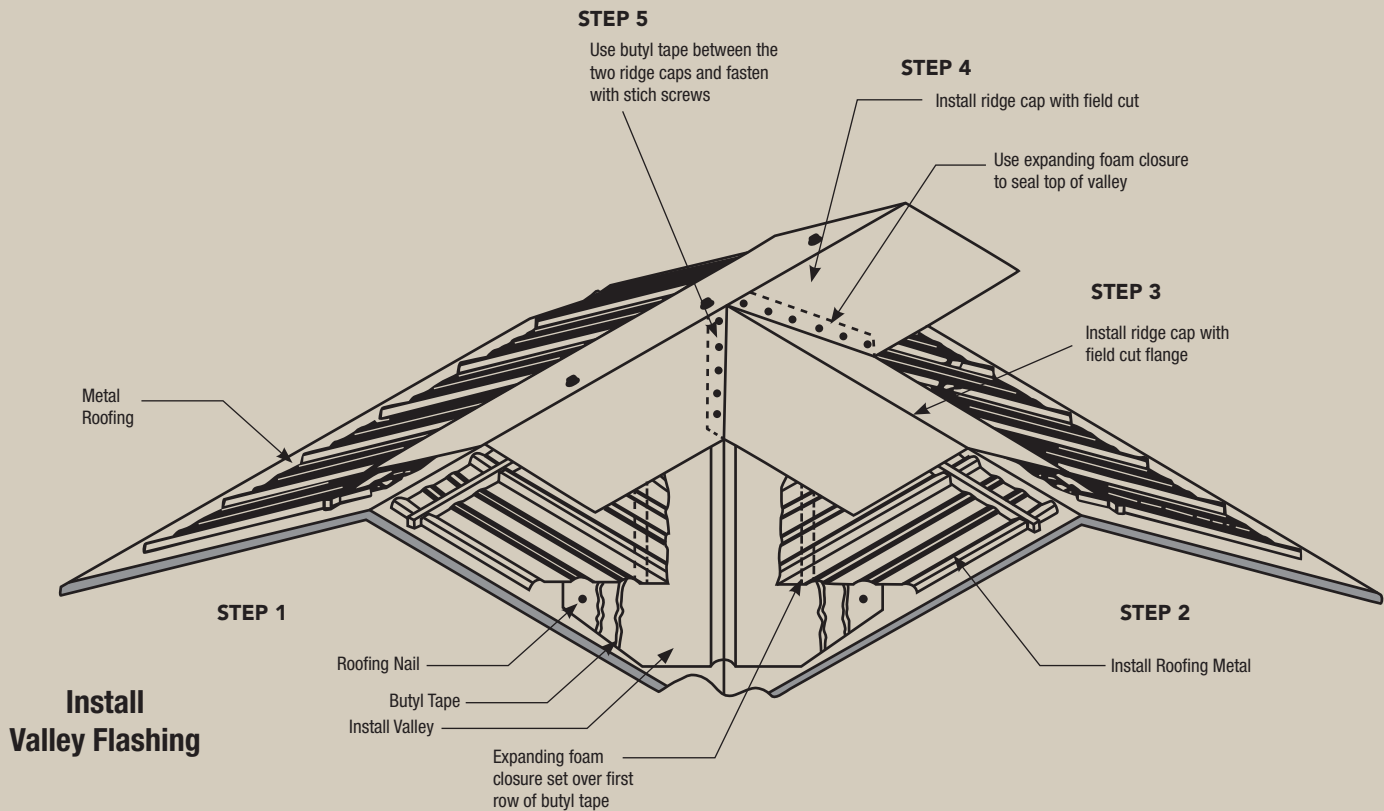
Seal the boot by applying urethane/silicone sealant between the boot and the roof. Use a large slot screwdriver to press the base down tightly.



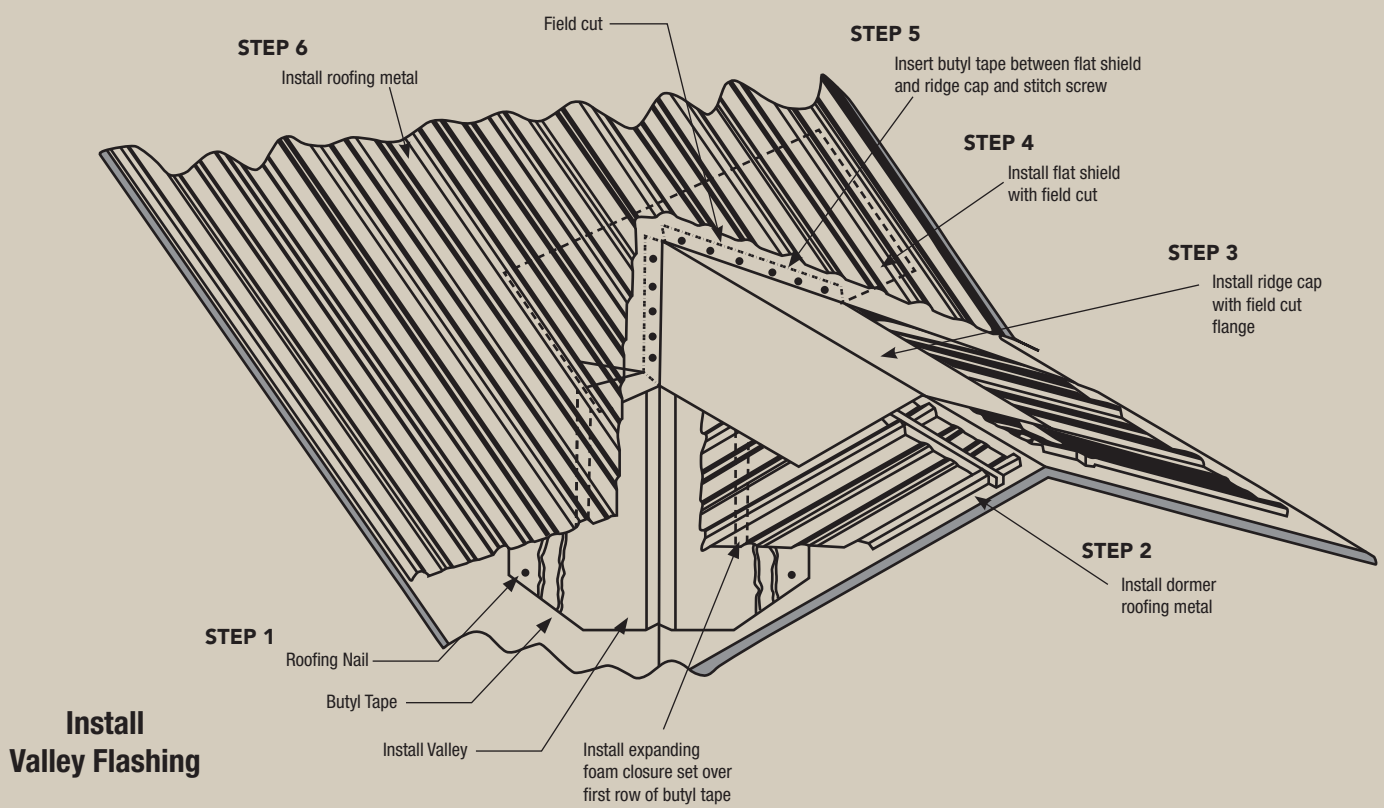
STEP 5: Fasten

Fasten the boot with weather-resistant fasteners at 1" spacing to complete the seal.

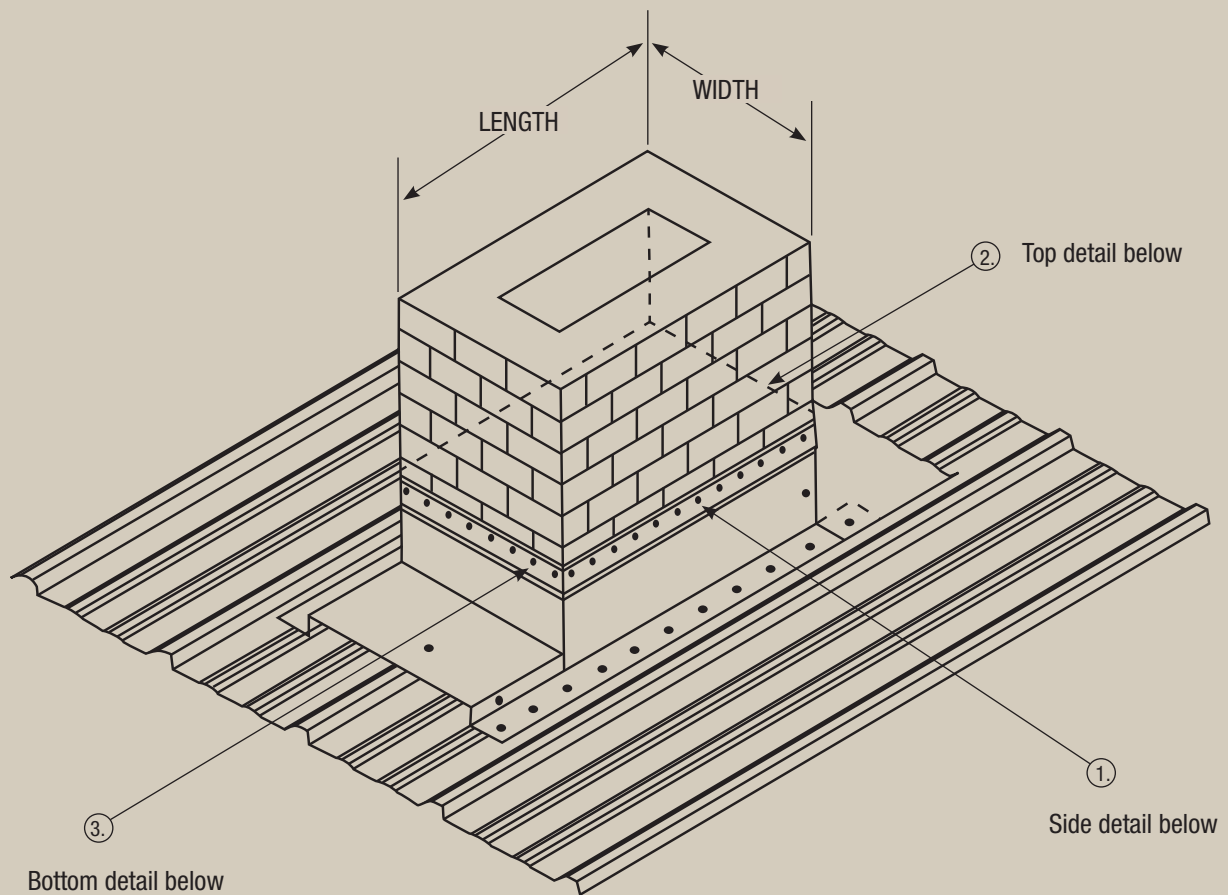
Double Ridge – Valley Junction



Valley Dormer



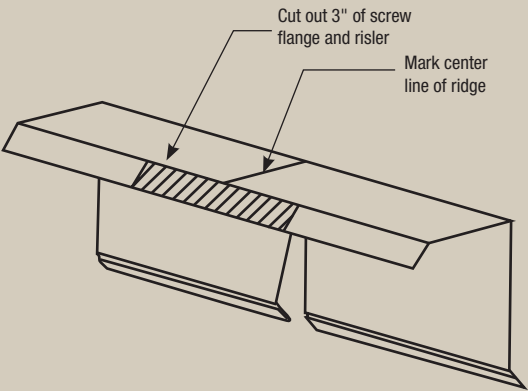
Chimney Flashing



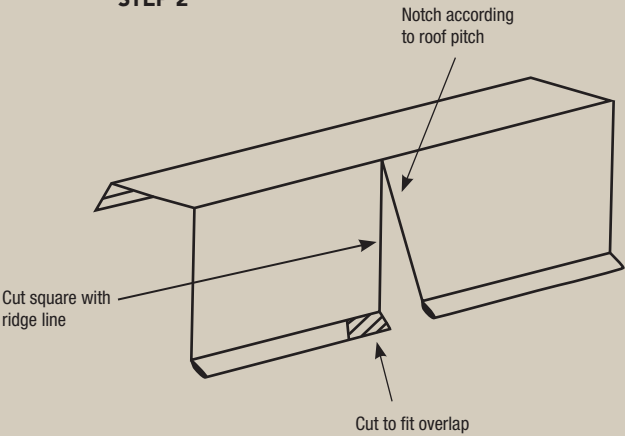
- Corner details where downhill, side, and uphill meet will need to be determined in the field based on where roofing ribs come in relation to the side. Upper flashing must always lap on top of lower metal and butyl tape must be used in all metal to metal contact.
- Skylights are trimmed in similar fashion. The use of a built-up curb to mount skylights assists in leak-proof flashing for skylights.

Gable Trim Detail at Ridge

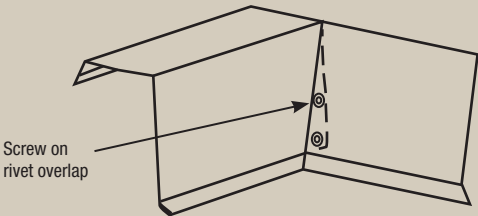
STEP 1



STEP 2



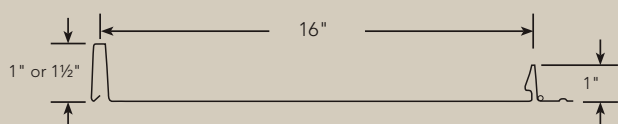
STEP 3



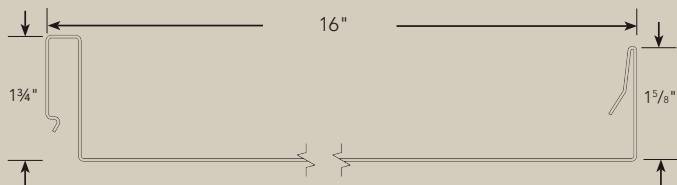
The Marco Metals Standing Seam Roofing Panels

Marco Metals standing seam panels come in a variety of profiles and finishes to meet most needs for residential and commercial roofing. Our most common panel, a snaplock, screw-flange panel, is ideal for residential and commercial applications where panel lengths do not exceed 40 feet and water flow is adequate to keep rainwater depth below $\frac{3}{4}$ ". Our clip-system panel is designed to allow for thermal movement of longer panels and the higher underlap rib will accommodate heavier rainflow. The mechanical seam panel works well for a tighter lock and a slimmer rib profile but requires expensive equipment to properly install. All standing seam panels are available with a flat pan or with striations or pencil ribs for increased strength and less oil canning. Both panels and trim are fabricated using state-of-the-art computerized equipment at our facility in Harrisonburg, Virginia to assure uniformity and consistency. We also offer jobsite fabrication for longer panels or complicated projects. Panels are roll-formed to the lengths specified by customers in either Acrylic-coated Galvalume® or any of our twelve colors of Fluropon® painted Galvalume® in 26-gauge and 24-gauge high-tensile metal. We have additional Kynar® colors available in 24 oz. 22-gauge steel and .032 or .040

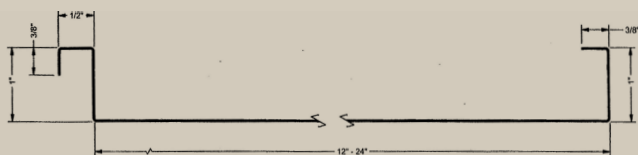
Screw Flange Panel



Clip Panel



Mechanical Seamed Panel



Aluminum with reasonable minimums. Your Marco Metals dealer will be happy to assist you in making the best choice for your particular roofing needs.

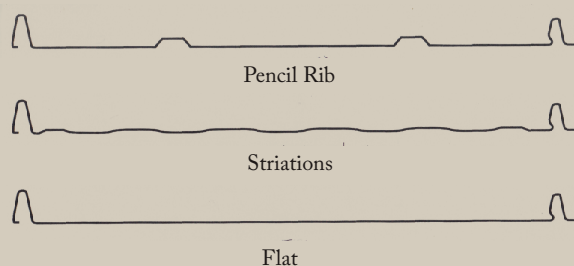
Marco Metals standing seam panels are fabricated from AZ-50 (painted) or AZ-55 (Acrylic-coated) Galvalume® grade 50 coil stock. The Acrylic finish is not only durable and cost effective, but also offers valuable reflectivity as well. The paint system used on painted products offers optimum exterior protection and superior resistance to corrosion and ultraviolet radiation while reflecting significant amounts of heat away from the building. Acrylic coated Galvalume® carries a 20-year limited finish warranty, while our Fluropon® painted metal carries a 40-year warranty.

Marco Metals stocks a complete line of fasteners, sealants, tools, pipe boots, and other accessories to meet the needs of the metal roofing contractor. A complete line of in-stock flashings and trims are available in all colors. We will also fabricate whatever custom trims you may need to complete your project.

Material Handling

Be careful when handling metal panels and trim. Edges are sharp and proper safety equipment should be worn to prevent injury. Forklifts can damage the underside and edges of panels so extreme caution is necessary when using such equipment. Do not drag panels off the stack to remove. Panels should be lifted off and carried vertically by the panel edge. Panels over 20' long may require extra help to handle.

CHOOSE YOUR PAN STYLE



Material Storage

Paint and finishes of Marco Metals panels and trim are designed to withstand severe rain and wet weather conditions. Neither paint, galvanized, nor Galvalume® finishes, however, are designed to be in continuous contact with water for long periods of time. ***Irreparable damage will result if uninstalled panels or trim are allowed to remain wet in storage.*** Be sure to store material that will not be installed immediately in a dry location. Wet material should be air-dried and re-stacked if installation is not planned right away. DO NOT cover metal panels with plastic or tarps without leaving adequate ventilation (at least 12 inches) under the cover and metal stack. Neglecting this will result in significant collection of moisture between panels and void the paint warranty.

Trimming and Cutting Steel Panels

Mark metal with a marker or pen, not a pencil. The graphite in pencils will eventually cause rust to develop.

The best device for cutting steel panels *across the profile* is a good-quality offset hand snips, a nibbler or a power shear. **Use of circular or reciprocating saws to cut metal panels is not recommended and will void the paint warranty.** If you do use a saw, cut with the bottom side up to prevent hot shavings from contacting the painted side. Be sure other panels are protected from hot shavings.

To *cut panels lengthwise*: Note Carefully where the panel is to be cut, and using a straight-edge, score deeply down the length of the panel with a sharp-pointed utility knife. Folding the panel along the score mark, and bending back again if necessary, should produce a clean break in the panel. Snips or shears may also be used.

Cutting holes in the metal panel is done by drilling a starter hole big enough to accommodate the cutting tool to be used.

Metal filings from cutting or the installation of screws, if left on the panel, can cause rust spots to form. Care should be taken to brush all such particles from the roof surface daily to maintain paint integrity.

CAUTION! - Clean all metal shavings and particles off the roof to avoid unsightly rust stains.

INSTALLATION OF PANELS

Roof Pitch

Marco Metals roofing panels require adequate pitch to ensure proper water drainage. Use of these panels on pitches lower than 3/12 are not recommended. It is important to remember that metal will not leak. Leaks happen at ends, sides and penetrations of metal panels.

Metal roof panels are designed to shed water, not contain it. Flashing and installation must be designed with that principle in mind. Our 1 3/4" rib, clipped panel will give the best protection if extra run-off accumulation is expected because of the pitch of the roof or the length of the panel.

Roof Preparation

Oil-canning is a wave-like, rippled appearance extending up the length of a metal roof panel after it has been installed on the roof. Some oil-canning is common with any metal roof but careful storage, handling and roof preparation will keep it to a minimum. Any irregularities in the roof, including uneven plywood joints, warped plywood, uneven trusses, poor application of underlayment, the use of button caps with underlayment, etc., can promote oil-canning or dimpling. Careless storage and handling can also contribute to oil-canning. **Care should be taken to provide a flat, uniform surface on which to attach the panels.** Striations or pencil-ribs may be added to the panel to minimize oil canning. Alternatively, 3/8" backer rod may be taped to the back center of a flat panel for the same purpose. Oil canning is normal and is not cause for rejection.

Synthetic underlayment should be used over solid decking rather than tar paper. Button cap nails will show through the metal and should be avoided in favor of staples for fastening underlayment. Standing seam panels should not be installed directly over shingles unless purlins are used over the shingles. Screws must be long enough to penetrate completely through the metal, shingles and the roof deck. They should be fastened according to the appropriate building code. **Battens must be installed to support the entire width and length of ridge, eave, hip, valley, and gable-end trims.**

For solid decking, at least 15/32" structural plywood or 5/8" OSB supported on rafters at a maximum of 24" on center is required.

WARNING; Direct contact between any lumber pressure treated with copper, and standing seam panels must be avoided in order to prevent potential corrosion.

Roof Application

Panel installation should begin at the gable end of the roof **opposite** the prevailing rain-bearing wind (this will provide added assurance against wind-driven rain being forced under the laps). Measure one panel width in from the roof edge. At this point chalk a line from ridge to eave. Place the leading edge of the first panel along this line. It is extremely important that this panel be laid square to the eave and ridge so that the remaining panels will line up square on the roof frame. It is wise to have a person at the eave and at the ridge to ensure that the proper panel coverage is being maintained across the roof. Also be sure that the panels are properly side-lapped and snapped down.

It is recommended that the eave end of the panel be hemmed around the drip edge. The open panel ribs at the eave can be sealed with caulk or trimmed to provide a cover flap.

Ventilation

Since standing seam panels are usually installed over solid decking, any ventilation issues arise from improper construction or installation and are not caused by the metal roofing itself. The temperature differences between shingle roofs and metal ones may require that ventilation will have to work differently and must be taken into account.

Fastening

1" flat-head screws are the most common method used for installing screw-flange panels or panel clips. Screw and clip spacing must be done according to local wind codes. Most areas require a screw or clip at the eave and another 1' above that, with the same at the ridge. 14" to 24" spacing should be adequate for the rest of the panel depending on the wind load. For screw-flange panels it is important that

screws be placed in the center of the slot and not over-tightened. To allow for thermal movement the panel should only be fastened tightly at one end. Usually that is at the ridge since fastening z-bar there pins the panel tightly.

Color-matched pop rivets are used to fasten trims together. Remember that each pop rivet has a hole in the center and should be placed so that water dripping through will fall onto the roof pan. Pop rivets should be installed 2' on center.

Ordering Roof Panels and Screws

Care should be taken to order panels of the correct length (We will cut to the inch) to minimize cutting after purchase. You should add 2" to the roof plane length to allow for the hem over the extended eave trim. When a roof transition is involved, panels of the upper portion should be ordered short to allow proper placement of the transition flashing (see diagram on pg. ?). The end user is responsible to verify all measurements in the field and provide a detailed cut list when placing the order. Improper measurements or relying only on a blueprint for ordering **will** result in errors for which the customer is fully responsible even if we did the take-off. Our take-offs are for estimating purposes only not for ordering.

Order about 70 screws per 100 square feet of roof or 2 screws per clip.

Please confirm all estimates with your Marco Metals dealer when you place your order.

Ordering and Applying Trim

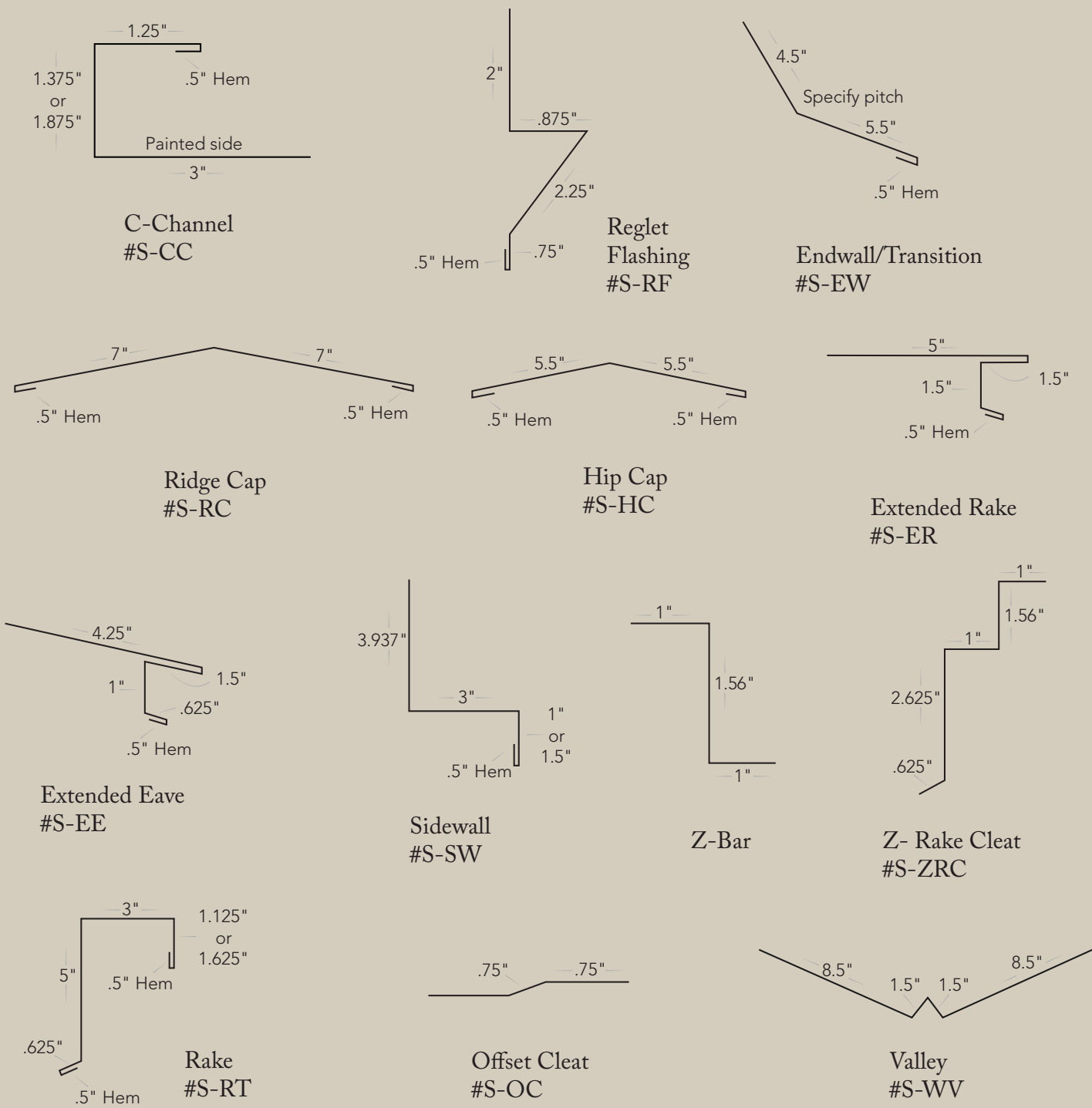
The most common flashing for metal roofing is the **ridge cap**, which is used at the peak of a roof. **Extended eave** is used at the eave and is often applied above **fascia** trim. When roof pitch exceeds 5/12 the slope of the roof should be mentioned when ordering **ridge cap**, **endwall**, and **extended eave**.

At the gable edge, the use of **rake** with **z-rake cleat**, or **extended rake** trim adds to the appearance of the structure and protects the fly-rafter. **Sidewall** flashing is used where the **side** of the panel butts up against an adjacent wall. **Endwall** flashing is used where the **top** of a roof slope meets a vertical wall. **Transition** flashing is used where two different roof pitches meet along the length of the

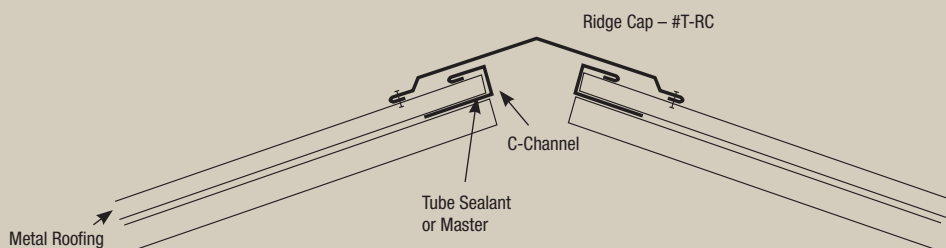
Standing Seam

roof. Both slopes should be mentioned when ordering **transition** or **gambrel** flashing, upper pitch first (ie. lower roof at 4/12 and upper at 10/12 would be ordered “10/12 to 4/12 transition”). **Valley** flashing is used at the intersection of two perpendicular roof planes. **Z-bar** is used with **ridge** and **hip caps**, **endwall**, and **sidewall**

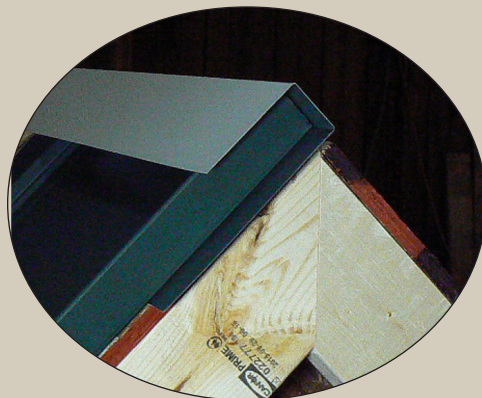
flashing. **Offset cleat** is used with **valley** and **transition**. Order two **z-bar** for each piece of **ridge**, or **hip**, and one piece of **z-bar** for each piece of **sidewall**, **endwall** or **transition**. Order two **offset cleat** per **valley** and one per **transition**. **1” wide butyl tape** must be used to seal between **offset cleat** or **z-bar** and the roof panel.



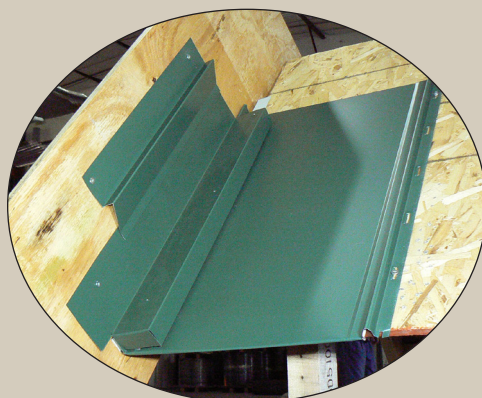
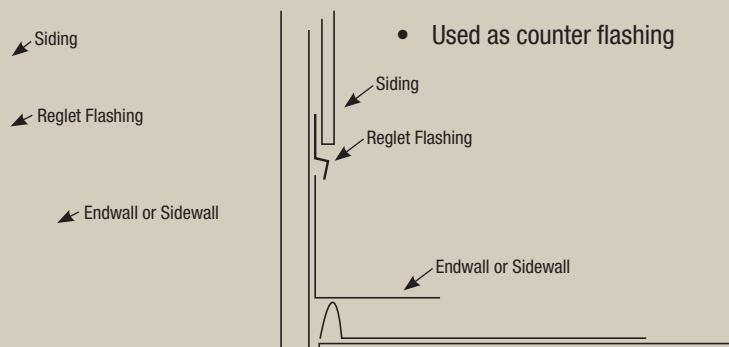
C-Channel – #S-CC



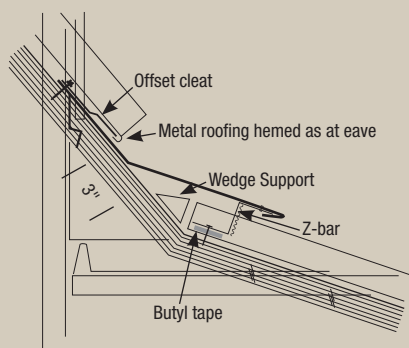
- Used for vented ridge alternative



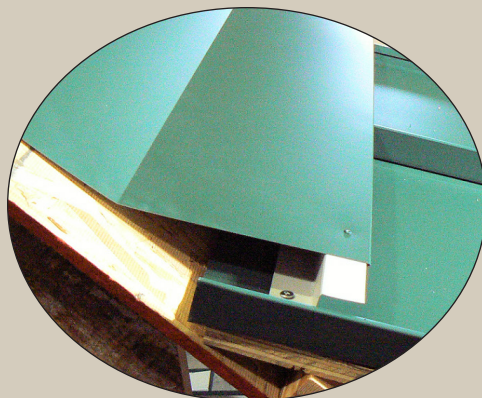
Reglet Flashing – #S-RF



Transition – #S-EW

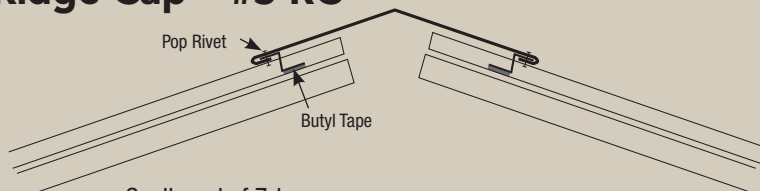


- Used at pitch changes
- The more flat the transition, the more desirable to support the back of the transition

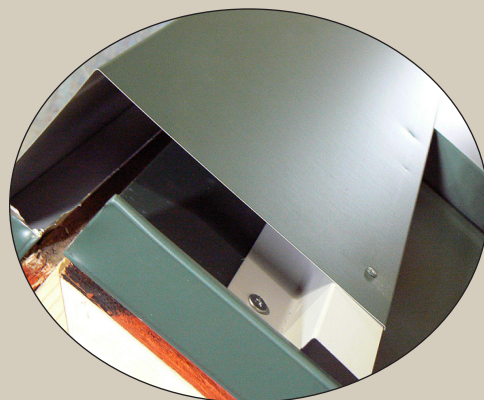


Standing Seam

Ridge Cap – #S-RC



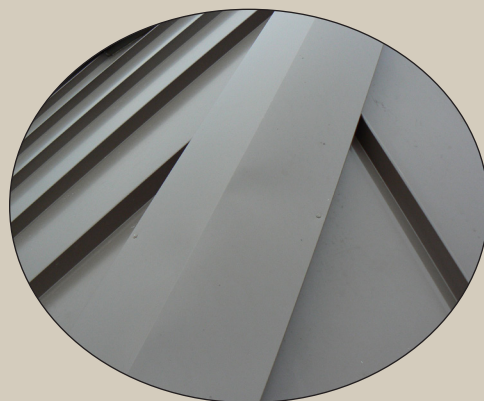
- Caulk end of Z-bar
- Use perforated Z-bar if venting is desired
- Carefully measure from the peak and snap a chalk mark on panel ribs before placing Z-bar so that the ridge cap will hook over the Z-bar. Place so that slight pressure can expand the ridge up to spread over and snap to the Z-bar



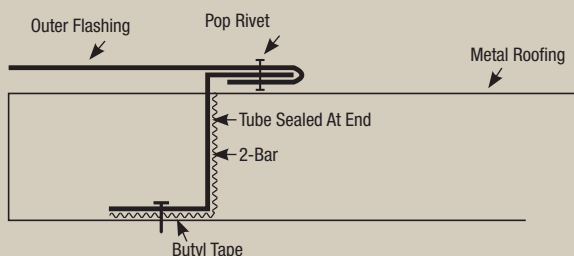
Hip Cap – #S-HC

Installed the same
as the ridge cap.

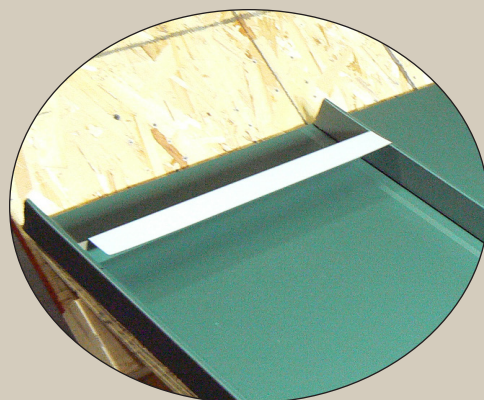
- Caulk all Z-bar ends
- Use butyl tape between the Z-bar and the roof panel
- Carefully measure from the peak and snap a chalk mark on panel ribs before placing Z-bar so that the ridge cap will hook over the Z-bar. Place so that slight pressure can't expand the ridge up to spread over and snap to the Z-bar



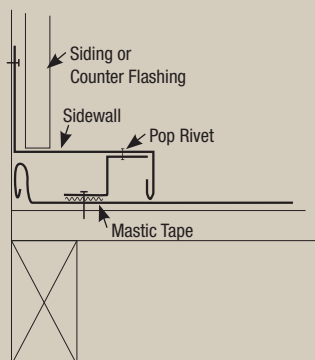
Z-Bar – #S-ZB / Perforated Z-Bar – #S-ZBP



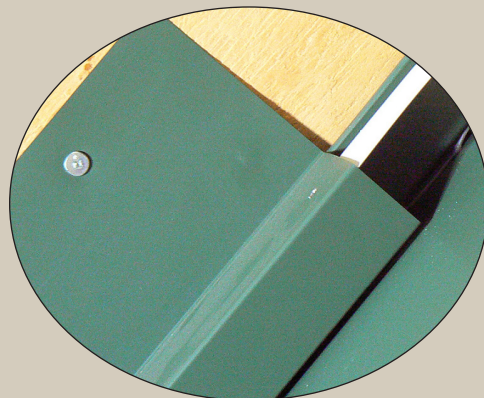
- Use perforated Z-bar where venting is desired
- Z-Bar must be cut to fit between the ribs.
- A bead of tube sealant advisable at each end.



Sidewall – #S-SW

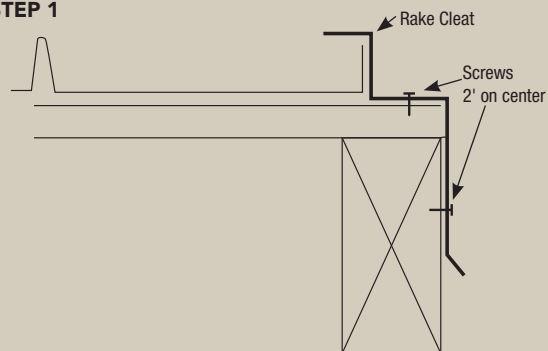


- Z-bar must be installed the proper distance from the wall so that the sidewall flashing will hook to it well

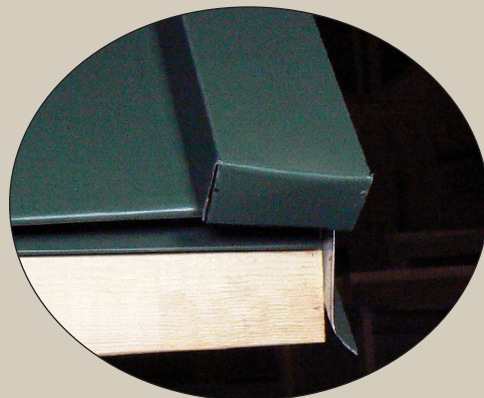


Rake Cleat – #S-ZRC / Rake – #S-RT

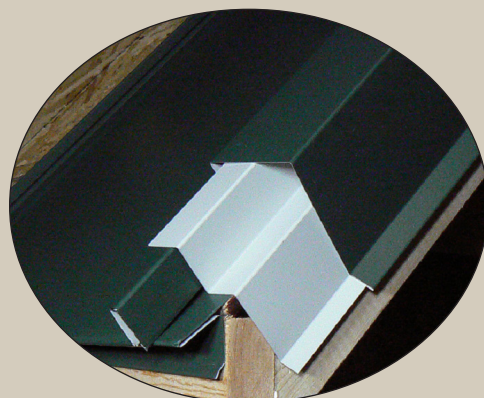
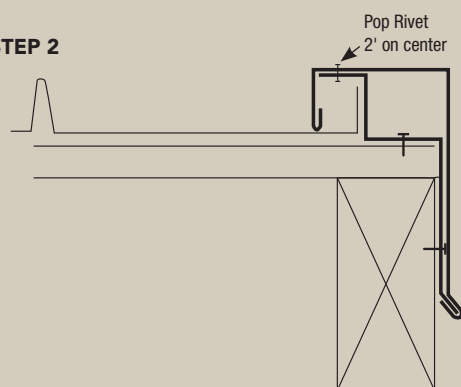
STEP 1



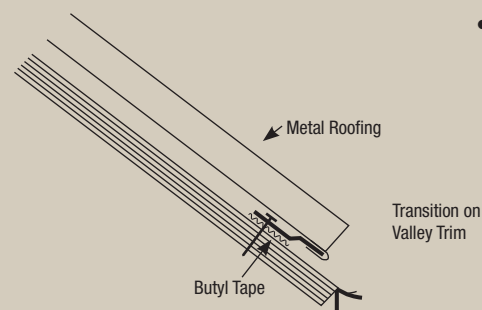
- Panel edge is located 1¼" from edge of roof
- If panel does not end at a rib it must be cut 1" long and the edge turned up 1" to fit under the cleat
- Pop rivet should be placed far enough out on the cleat so that it drips on the roof panel
- Rake trim should be cut long enough to allow for an end cap to be folded over



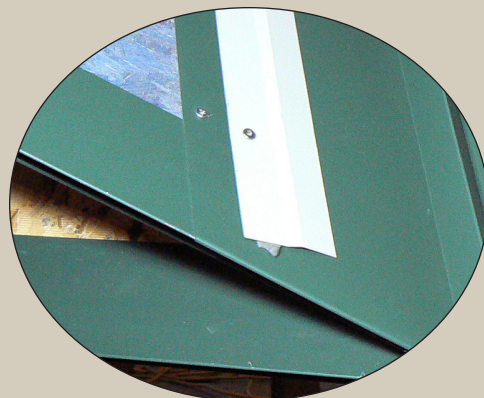
STEP 2



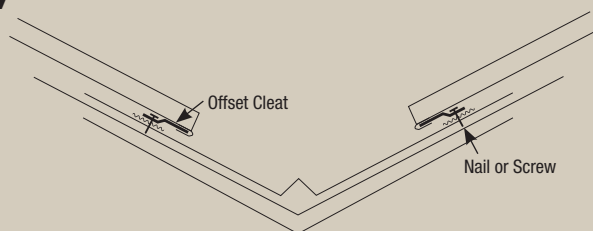
Offset Cleat – #S-OC



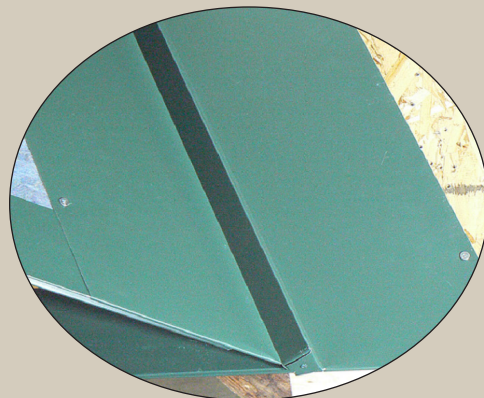
- Used where a roofing panel needs to be ended in a location other than the eave, such as at a valley or transition.



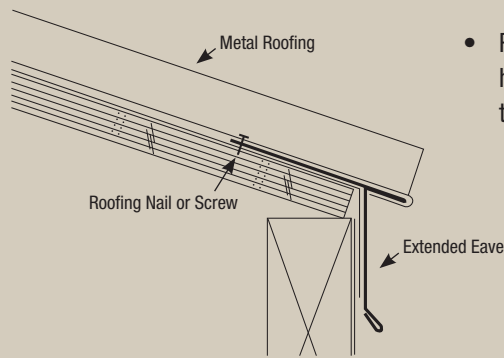
Valley – #S-WV



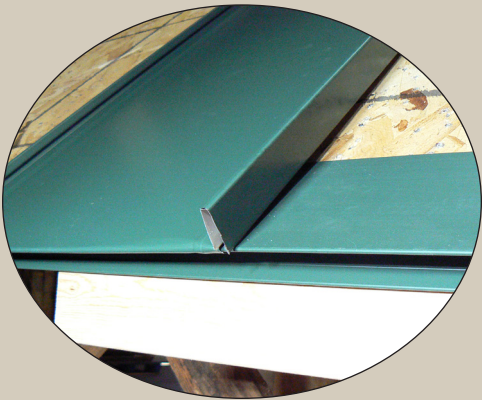
- Used with offset cleat
- Valley should be hemmed over the eave trim just like a panel
- The end of the center V should be filled with tube sealant with flaps folded over and riveted



Extended Eave – #S-EE

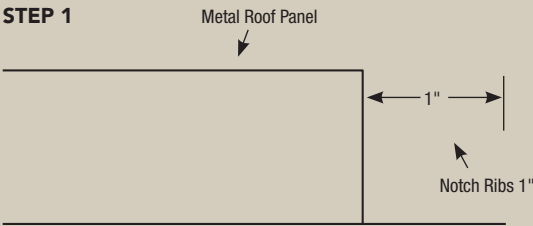


- Roof panel should be hemmed up and hooked over the extended eave to form the drip edge



Eave Termination without Fasteners

STEP 1

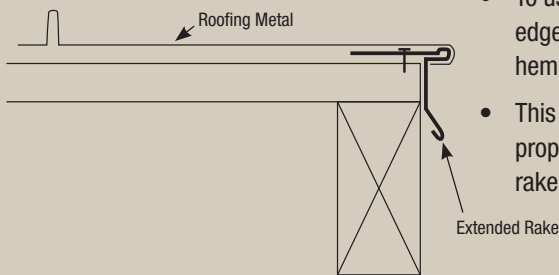


STEP 2

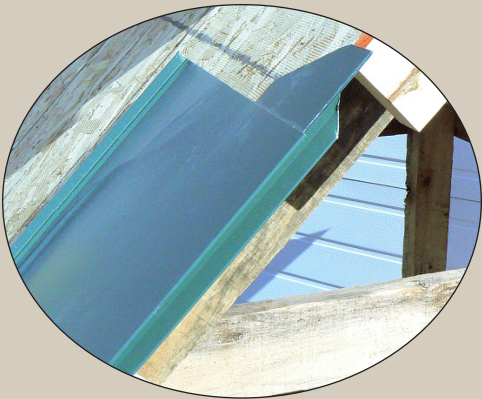
Use a hemming tool to bend tab under



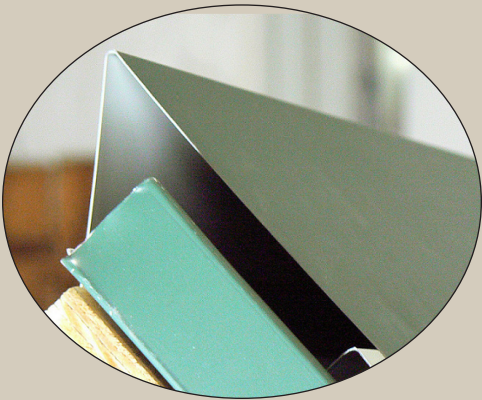
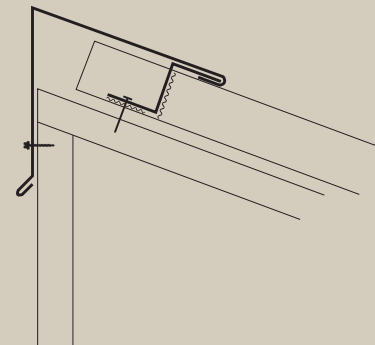
Extended Rake – #S-ER



- To use this trim the outside rib of the edge panel must be cut off and the edges hemmed 1" and hooked over the edge
- This detail is difficult to do well without proper tools, but it makes a clean, simple rake



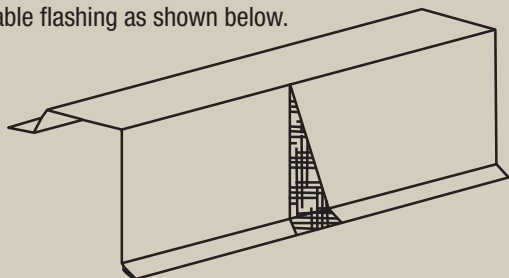
Peak Flashing



Gable Flashing Preparation at Ridge

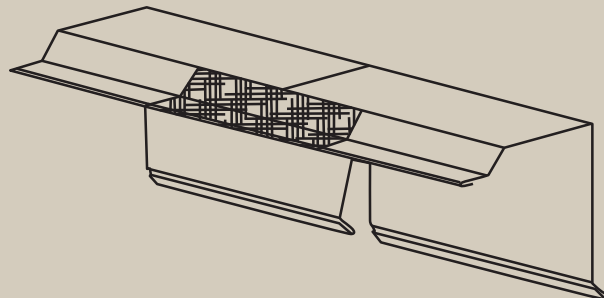
STEP 1

Remove a pie-shaped piece from the gable flashing as shown below.



STEP 2

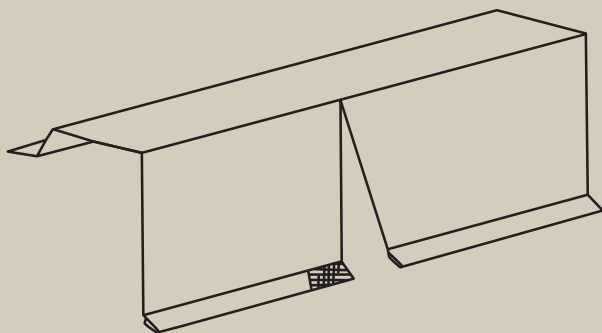
Notch out the downturn leg on the gable as shown below



STEP 3

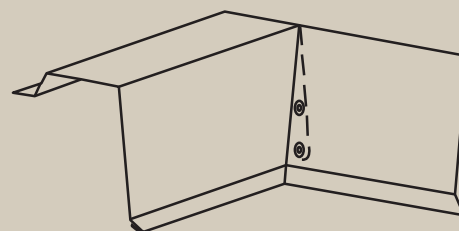
Roof Pitch	Dimension*
3:12	1-1/16"
3.5:12	1-1/4"
4:12	1-7/16"
5:12	1-3/4"
6:12	2-3/16"
12:12	4-7/16"

*Dimensions only apply to G16 and G17 Gable Flashing

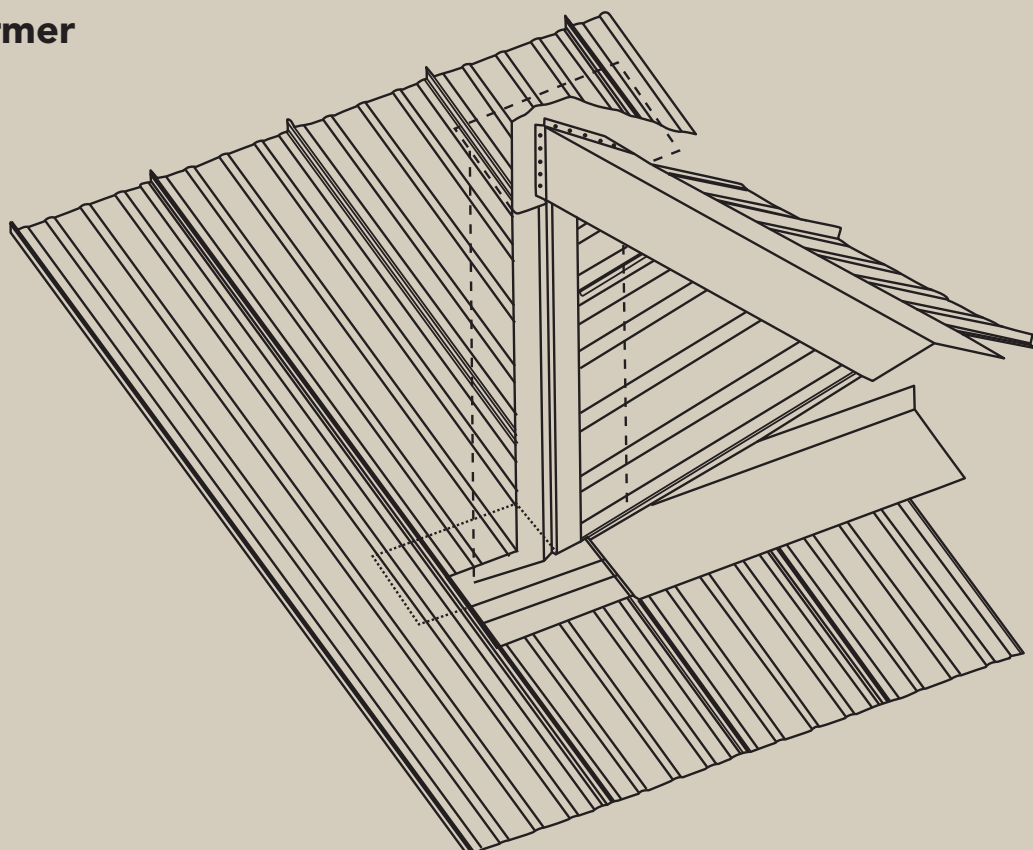


STEP 4

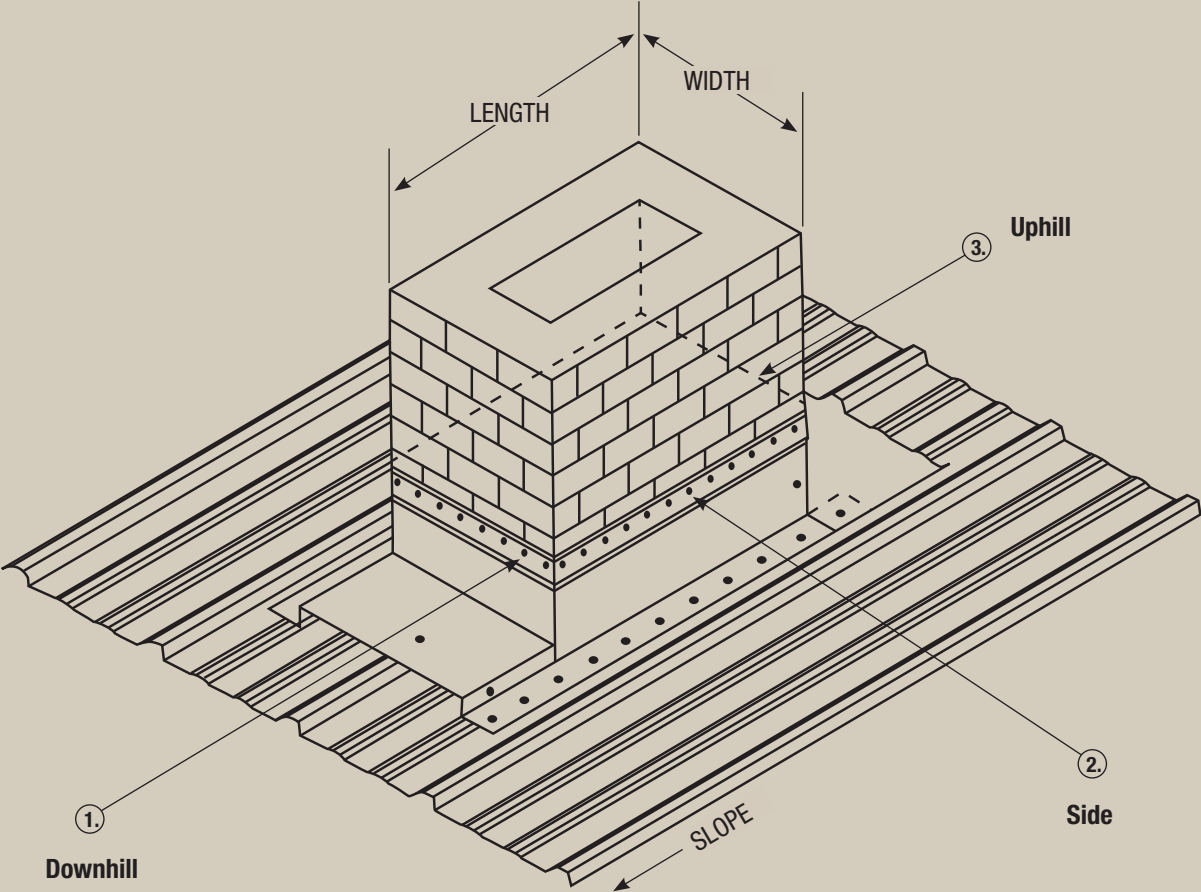
Center the flashing on the ridge at the gable and bend to roof pitch



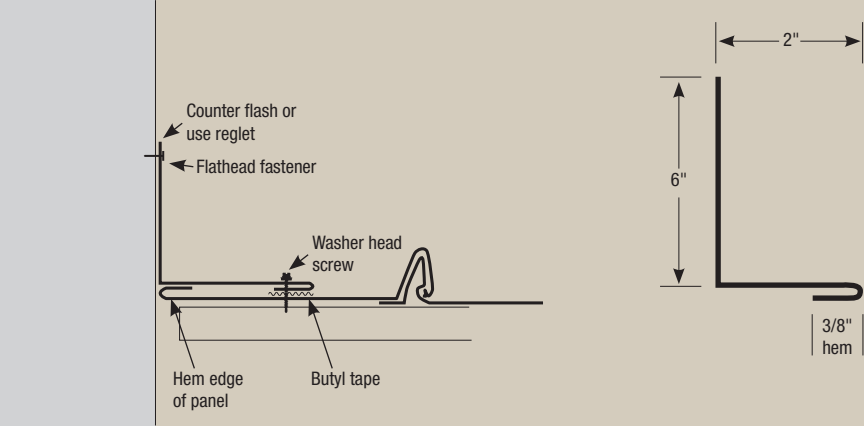
Valley Dormer



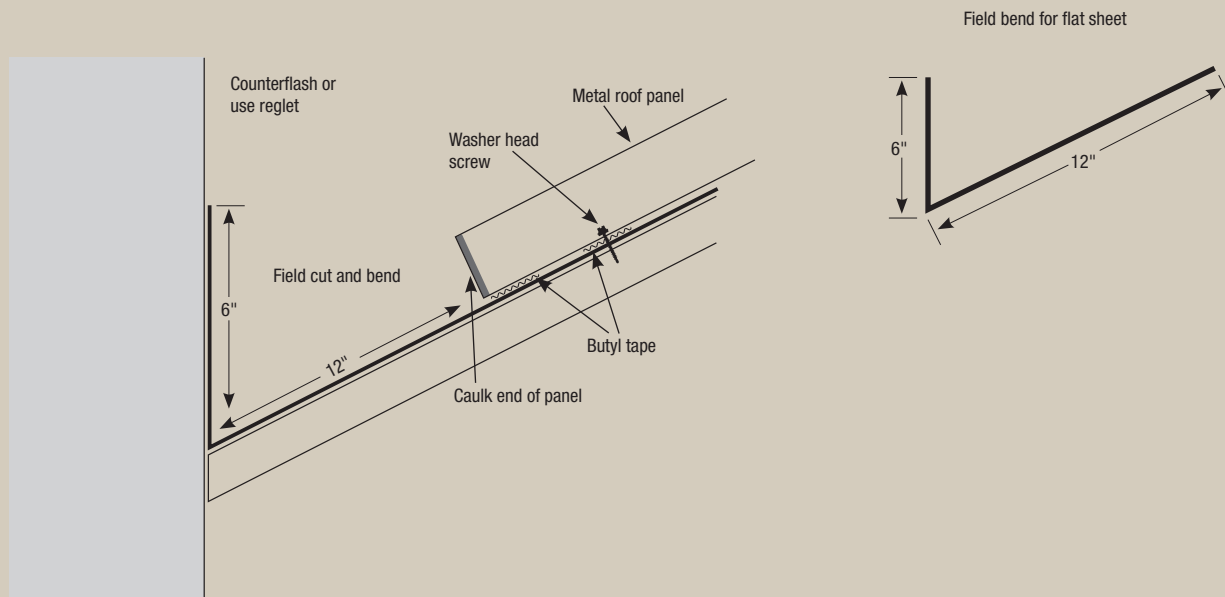
Chimney Flashing



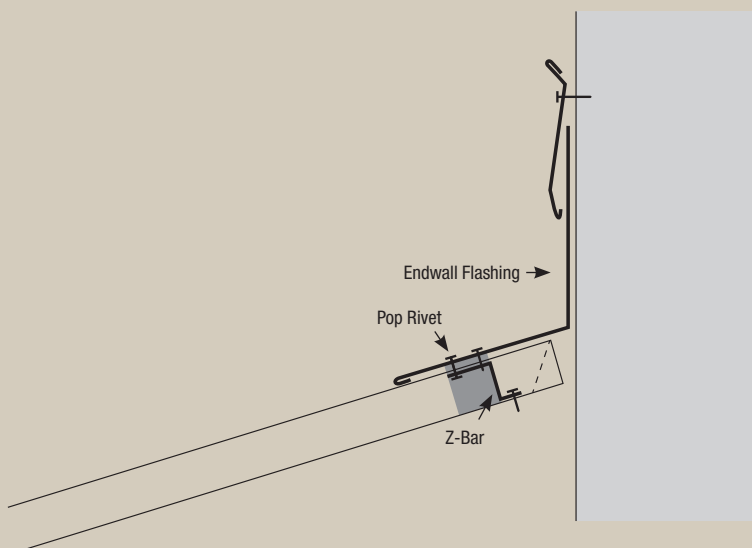
1. Chimney Flashing (Side)



② Chimney Flashing (Uphill)

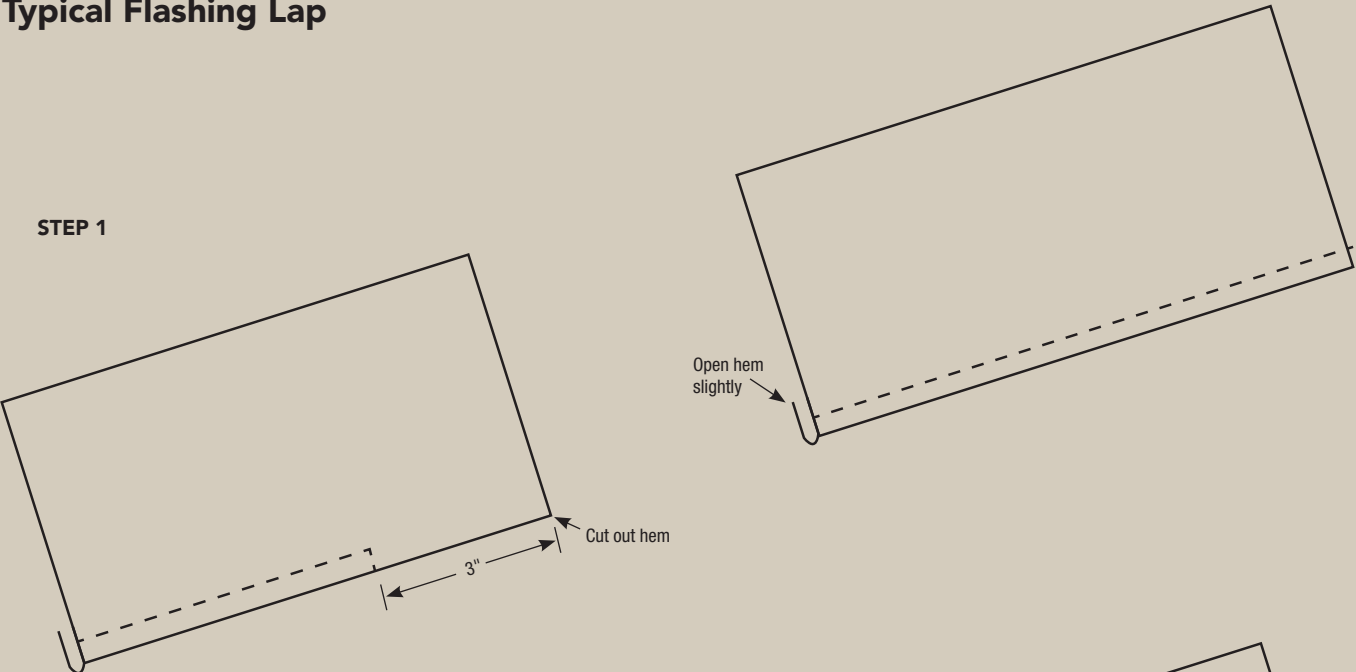


③ Chimney Flashing (Downhill)

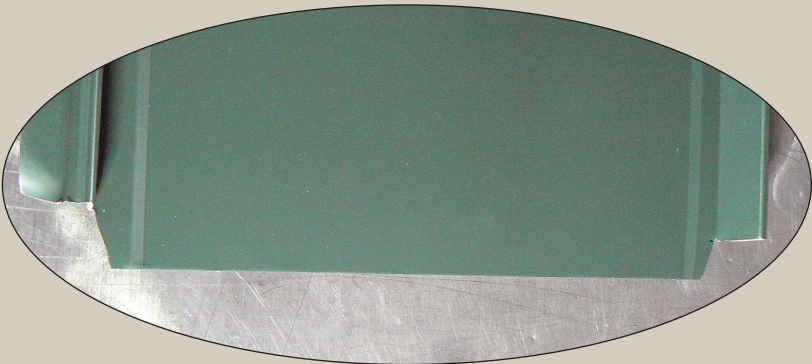
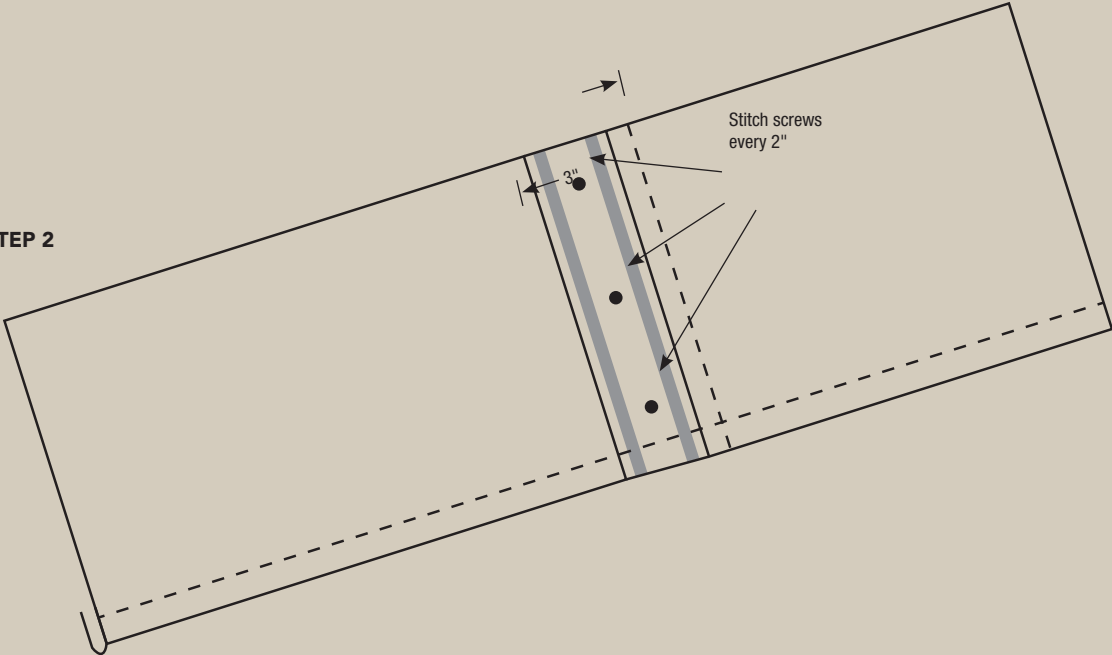


Procedure for Joining Hems
Typical Flashing Lap

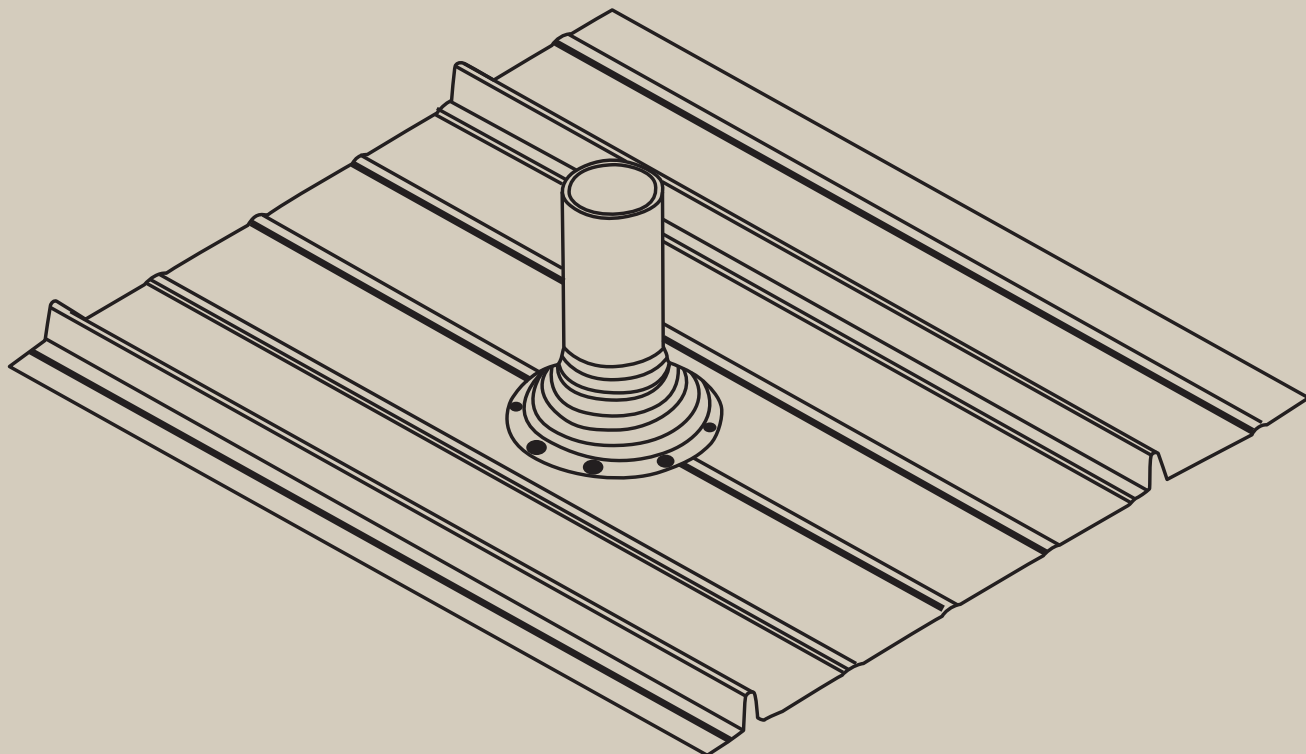
STEP 1



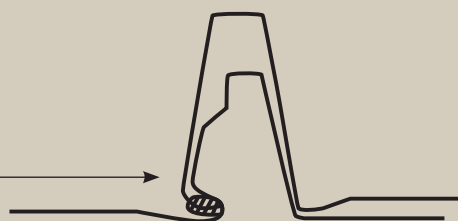
STEP 2

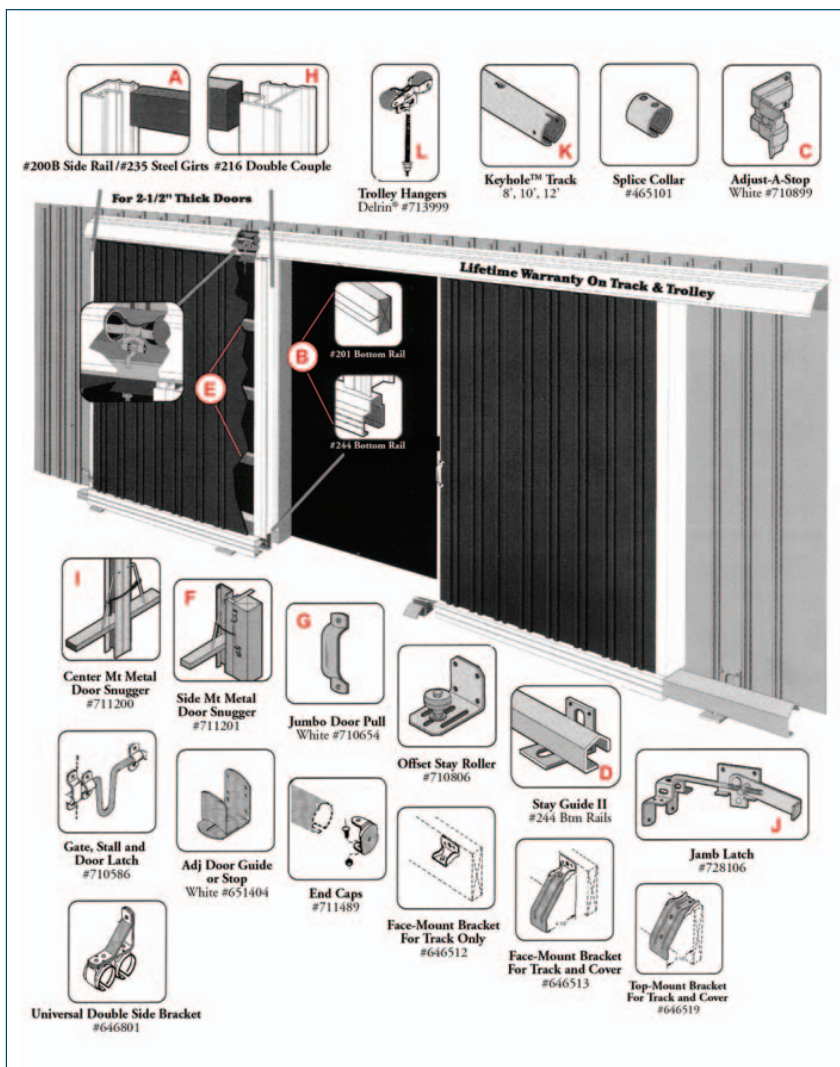


Vent Flashing



- If the boot is installed over a rib, tube sealout needs to be placed here from the boot to the ridge.
- See diagrams in Tuff-rib section also.
- When cutting out for a boot with standing seam panels, cut the substrate hole larger than the hole in the roof panel. The screws that hold the boot in place should not go into the substrate to allow for thermal movement of the panel.





SINGLE SLIDING DOOR

KIT INCLUDES:

- 2 verticals **A**
- 1 bottom rail **B** with rear stop **C**
- 1 stay guide for a least 60% of the door width **D**
- Steel horizontals. (One for every two feet of height) **E**
- 2 side snuggers **F**
- 1 door pull **G**

DOUBLE SLIDING DOOR

KIT INCLUDES:

- 3 verticals **A**
- 1 vertical double couple **H**
- 2 bottom rails **B** with stops **C**
- 2 stay guides for at 60% of the door width **D**
- Steel horizontals. (One for every two feet of door height - for each door section) **E**
- 2 side snuggers **F**
- 1 center snigger **I**
- 2 door pulls **G**

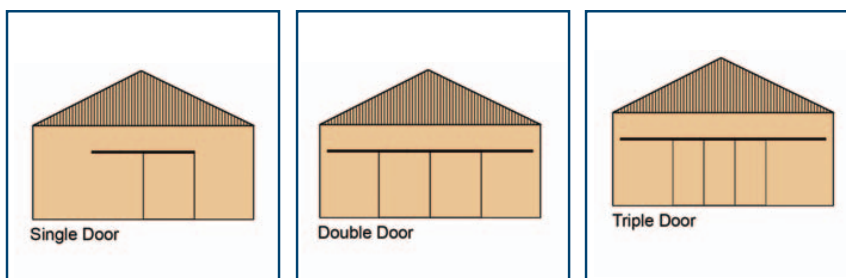
TRACK (A variety of cover options available):

- Track **K** should be twice the width of door opening.
- One track bracket for every two feet of track.

TROLLEYS:

- A single slider requires two trolleys **L**
- A split sliding door requires four trolleys **L**

Note: Contact factory for triple or bypassing door applications.



"Nobody does it better!"

ASSEMBLING AND INSTALLING SLIDING DOORS

STEP ONE.

Measure the opening, width first, then height. Allow for 1-1/2" to 3" overlap on the width and a 3/4" to 1" overlap on the height. If using the Stay guide II Guide Rail System, subtract 2" from the height for the bottom rail (#210, #244 or #394). Also make sure to allow for proper clearance of grade.

STEP TWO.

Cut all vertical rails to height determined in Step 1.

STEP THREE.

Cut all intermediate horizontals to width determined in Step 1. Horizontals should be spaced no more than 24" on center. Cut bottom rail to same width as horizontals. Select a horizontal for use as a top rail and drill a 17/32" hole centered 1" in from inward face and 12" (24" for doors 12' and over) in from each end for mounting trolleys (one hole on each end).

(Notes: For double leaf doors, cut horizontals and bottom rails to half of width measured in Step 1 and build two (2) top rails. When using Bigg Frame, three (3) horizontals should be used face-to-face to form the top rail and #714424 Support Plate should be used to mount trolleys.)

STEP FOUR.

Select a clear, level surface and lay vertical rails in place with J-trim facing upward. Insert top rail in one end of vertical rails, insert all remaining horizontals evenly spaced or roughly 24" on center, and insert bottom rail with ribs facing upward (**Figure A**). Secure the grid using a single #8 self-tapping screw at each of the four corners. All screws should be installed through the extruded grooves in the verticals (**See Figure B**).

STEP FIVE.

To square the door, measure diagonally from corner to corner for both diagonals and adjust rails as needed until both measurements are equal (**Figure C**). Once both diagonals are equal, install a second #8 screw in each corner.

STEP SIX.

Carefully turn the frame assembly over and re-square the door. Once both diagonals are equal, install two (2) #8 screws in each corner joint. Secure all intermediate horizontals with four (4) screws per joint (two per side). (**See Figure D**).

FIGURE A.

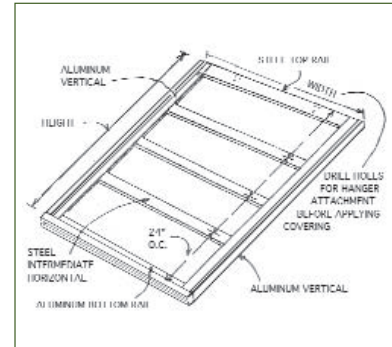


FIGURE B.

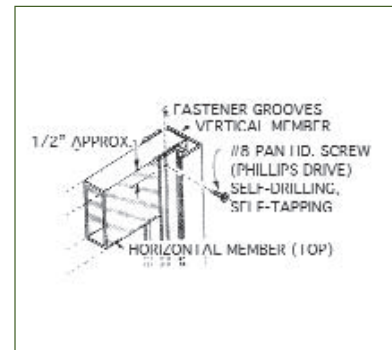


FIGURE C.

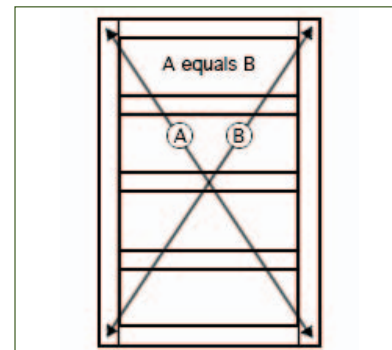
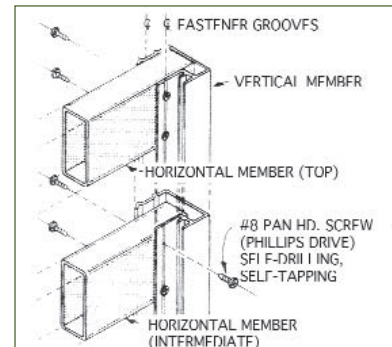


FIGURE D.



STEP SEVEN.

Install door skin into built-in J of the verticals and secure to girts. Install trolley hangers to top rail in holes drilled in Step 3. For multi-leaf doors, repeat Steps 4 through 7 for each leaf of door.

STEP EIGHT.

Install door track. Track should be double the door opening width.

Attach brackets to track 24" on center (12" on center for doors over 600lbs.). Position track as needed to allow for proper door opening and overlap. Level and attach track to track plank using 10 gauge ring shank nails or 5/16" lag bolts at least 1-1/2" in length.

STEP NINE.

Position the door leaf beneath one end of the track and lift vertically to install the trolley into the track. Lift the opposite end of the door and hold the door parallel to the track. Carefully slide the door forward until the second trolley can be installed in the track (**Figure E**). Position door to allow access to trolley bolts to adjust in-or-out and up-or-down until the door rolls freely in the track without interference. Install end caps, flashings, trims. Install door stops at fully opened and fully closed positions. Install any remaining pulls, latches, rollers, or snuggers.

STEP TEN.

Stay Guide II Installation (where applicable). With door in the full open position, draw a line on the face of the building along the bottom edge of the bottom rail. Slide the door to the fully closed position. Turn the guide rail upside down so that the slots are visible. Hold the guide rail flush to the edge of the door opening and mark the slot locations one (1) inch above the pencil line (**Figure F**). Install wall brackets with nailer holes on the vertical leg using the lag screws provided (**Figure G**). Bolt guide rail to brackets, finger tight, using included fasteners. Adjust rail for proper door clearance and secure all fasteners (**Figure H**).

FIGURE E.

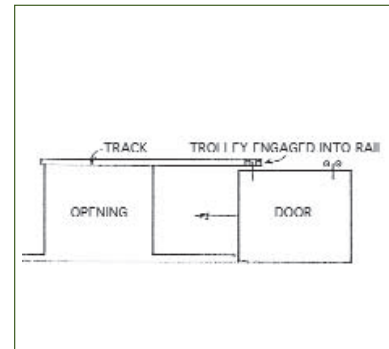


FIGURE F.

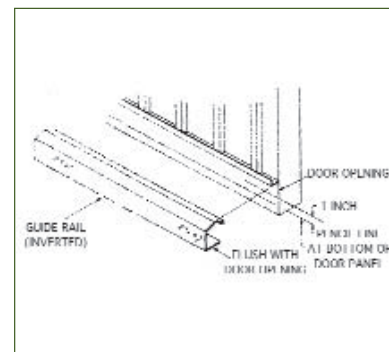


FIGURE G.

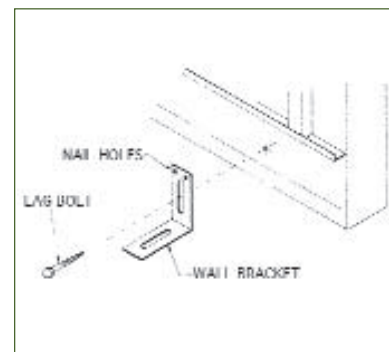
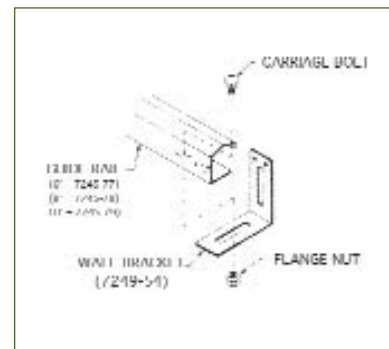


FIGURE H.





Patented

4500

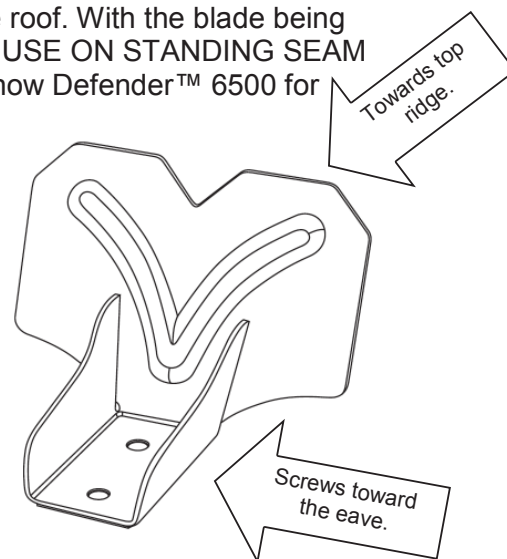
Installation Instructions

Fasten to roof using Levi's (or comparable quality) 2 inch or longer #12 screws with washers. After fastening the guard be sure that it is tightened properly, also check to make sure it is properly sealed. Screws are to be facing towards the eave of the roof. With the blade being toward the ridge. Snow Defender™ 4500 snow guards **DO NOT USE ON STANDING SEAM ROOFS OR ON ROOFS WITH PURLINS UPRIGHT**. Use the Snow Defender™ 6500 for standing seam and Snow Defender™ 1500 for applications with purlins in the upright position. Please call your distributor to order.

If OSB or plywood is used with no purlins beneath the metal install a 2x4 spacer between the rafters/trusses on the underside of the sheeting & use 2-1/2 inch or longer screws to fasten the guards. If your building has insulation between the roof and the purlin do not use the calculator. Consult with your engineer or architect.

It is recommended to install the guards in a staggered pattern. Installing 1 every 18 inches on the first purlin and going up to the next purlin installing the next row every 18" between the first row. This means putting 1 guard every 9" in a staggered row.

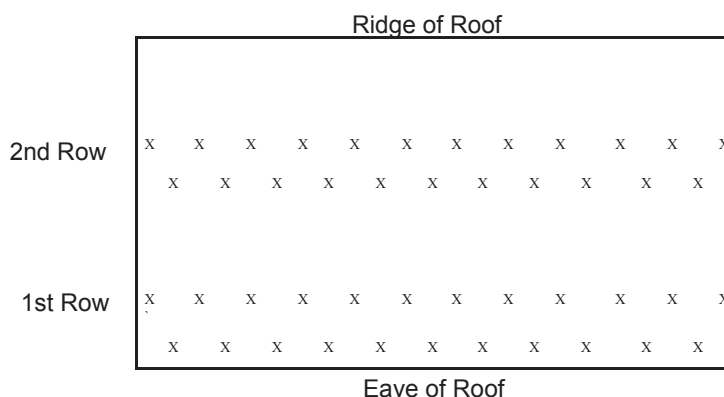
Failure to install an adequate amount of snow guards and in the proper pattern will void the warranty. Visit www.snowdefendercalculator.com to use our snow guard calculator to determine the amount needed.



For warranty details visit www.snow-defender.com



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Above example is based on Metal Roof Panels being 36" Panels with 9" rib spacing.

Remember it is very important to install the guards properly with the correct quantities. Do not only put snow guards over doorways, walkways, etc.

www.levisbuildingcomponents.com



Patented

6500

Installation Instructions

The Snow Defender™ 6500 is for standing seam roofing only. It is designed to fit standing seam panels in seam width up to 3/8" and most 1" to 1-3/4" high. It is not designed for seams below 1". Using a 7/32" hex bit unscrew the set screws till they are flush on the inside wall. Place the guard on the seam of the roof. The snow guard blade needs to be towards the eave. With your hand, apply even pressure on the top of the 6500. Torque all set screws in an alternate fashion. Set screws are to be torqued at a maximum of 220 inch pounds.

Note: Most electric & cordless drills will not achieve 220 inch pounds. It is recommended to use a torque wrench.

Towards ridge

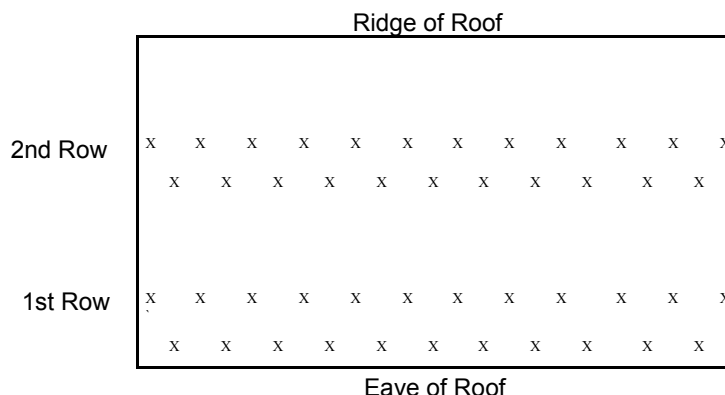


Face plate towards the eave.

Failure to install an adequate amount of snow guards and in the proper pattern will void the warranty. Visit www.snowdefendercalculator.com to use our snow guard calculator to determine the amount needed.



For warranty details visit www.snow-defender.com



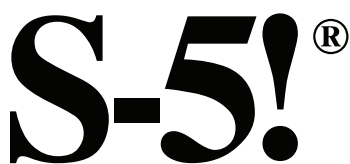
Above example is based on Metal Roof Panels being 36" Panels with 9" rib spacing.

Remember it is very important to install the guards properly with the correct quantities. Do not only put snow guards over doorways, walkways, etc.



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The Right Way!

The right way to attach almost anything to metal roofs!

Installation Instructions

Stop! Has your ColorGuard® system been designed properly with the assistance of a distributor or the online ColorGuard calculator? If not, see our Calculator and Load Table at www.S-5.com, or ask your distributor!

Notice to S-5!® users: Specific layout and assembly schematics for S-5! products are the responsibility of the user or project designer. Due to the many variables involved with specific panel products, climates, snow melt phenomena, and job particulars, the manufacturer cannot and does not express any opinions as to the suitability of any S-5! assembly for any specific application and assumes no liability with respect thereto. S-5! clamps are tested for ultimate holding strength on various seam types and materials. This information is available from the S-5! website: www.S-5.com. This document is an installation guide only and the photographs and drawings herein are for the purpose of illustrating installation, tools and techniques, not system designs. Read installation instructions in their entirety before beginning installation. Clamp spacing should never exceed 32" with ColorGuard snow retention assemblies (contact your distributor for products to accommodate a seam spacing greater than 32").

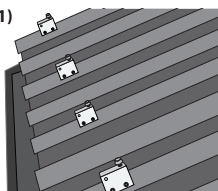
Tools Needed

- Screw Gun*
- Box End Wrench, 1/2" Drive
- Impact Wrench, or Ratchet
- Electric reciprocating saw to cut ColorGuard cross-member
- Tin Snips
- String Line
- Torque Wrench
- Pliers or Vice Grip Pliers

*For time saving tool recommendations contact S-5!

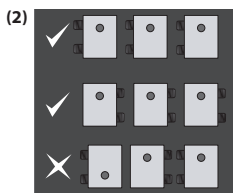
To Install ColorGuard®

1. Before you start: First, use a string (1) line across the top of the panel seams at the desired location to establish a true line for installation of the S-5! clamps. Individually measuring from the eave to determine each clamp location is not recommended (1).



Before continuing, please take a moment to read the important notice about SnoClip™ on the back side of these installation instructions.

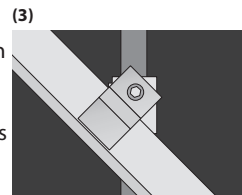
2. Preparing the Clamps: If the ColorGuard assembly utilizes the VersaClip™ for attachment of the ColorGuard cross-member, the bolt hole in the clamp should be at the upslope end of the clamp. If the assembly uses punched ColorGuard without VersaClip, the hole should be at the downslope end of the clamp. When using the S-5-U, determine which side of the clamp to load the setscrews into, and thread the setscrews into all clamps, being careful that the bolt hole will be in the correct (upslope or downslope) orientation, with the setscrews on the correct side of the seam. Both setscrews must be on the same side of the clamp (2).



3. Installing the clamps: S-5! clamps are installed differently depending upon clamp model and seam style. Please see the installation instructions included with your clamps. For maximum holding strength, setscrews should be tensioned and re-tensioned as the seam material compresses. Screw tension should be verified using a calibrated torque wrench between 160 and 180 inch pounds when used on 22ga steel and between 130 and 150 inch pounds for all other metals and

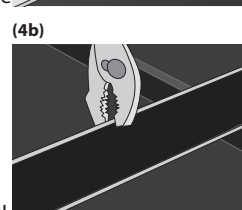
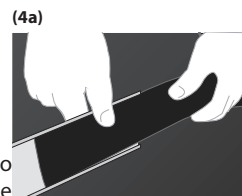
thinner gauges of steel. Please visit our load table at www.S-5.com to determine the proper screw tensions and holding strength.

Using VersaClip™: When seam spacing is not divisible by 4", when panels are not laid up true-to-dimension, or when ColorGuard is installed askew to the panel seams (3) (e.g. parallel with the line of a valley), the VersaClip facilitates installation. The VersaClips are inserted into the ColorGuard prior to placement of ColorGuard on the clamps. Align clips with S-5! clamp. VersaClip can be used with punched or unpunched ColorGuard.



4. Installing the ColorGuard:

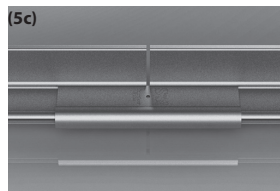
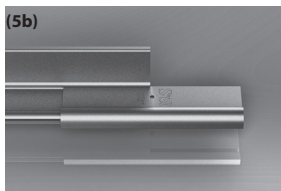
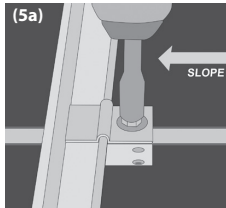
To maintain color conformity over time, ColorStrips should be sheared from the same pre-finished metal as the roof panels (supplied by others). Shear strips to exactly 2" wide (8' or 10' long). Slide the ColorStrip into the ColorGuard cross-member as shown (4a). If the strip length is 8', it may be pre-assembled into the ColorGuard cross-member. If the strip is 10' long, it will be assembled to the ColorGuard as installation progresses. Joints in the ColorGuard should be concealed by offsetting the joints of the ColorStrip from the joints of the ColorGuard. The joints of the ColorStrips can be overlapped about 1/2" if desired. Each ColorStrip should be secured to the ColorGuard somewhere along its length. This is done by pinching the retainer lip of the ColorGuard with an ordinary pair of pliers (4b). It can be done at one end of the ColorGuard section or anywhere along its length to prevent lateral migration of the ColorStrip.



These instructions are for use by those experienced in the trade. Always follow appropriate safety precautions and use appropriate tools.

5. Bolt ColorGard® to clamps:

Attach ColorGard to clamps with the stainless bolts provided. Bolts can be tightened with a 1/2" (13mm) box-end wrench, or ratchet (5a). On larger jobs, a 1/2" drive electric impact will expedite this work. Tension bolts to a minimum of 13 ft-lbs (18 Nm). Add splice pieces at each ColorGard joint as shown below (5b). The "dimple" in the splice piece will automatically provide a 1/8" space between adjoining sections (5c) to allow for linear thermal expansion of the ColorGard. Trim ColorGard at the end of the assembly, being sure it does not cantilever more than 4" beyond the last clamp of an assembly. Any trimmed piece of ColorGard must be attached with at least two clamps.



ColorGard® Cutting Tip: If it is necessary to field cut ColorGard, such as at the end of an assembly, it can be done with a hack saw or electric reciprocating saw with a fine tooth metal cutting blade. A power mitre saw with a fine tooth carbide tip blade also works well.

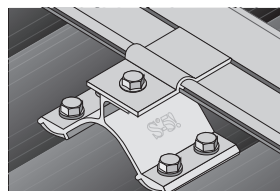
Using VersaBracket™

1. Install the bracket. See installation instructions that were included with your bracket.
2. Fasten unpunched ColorGard to the top flange of the bracket using a 1/4-14 stainless steel self drilling screw.



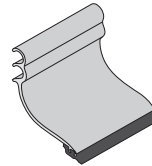
Using CorruBracket™

1. Install the bracket. See installation instructions that were included with your bracket. The threaded hole closest to the edge of bracket should be oriented upslope for unpunched ColorGard & downslope for punched ColorGard. When using VersaClip see step 3 on front page.
2. Fasten ColorGard to the bracket in the same fashion as step 5.

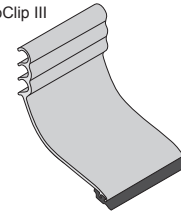


Using SnoClip™

SnoClip II

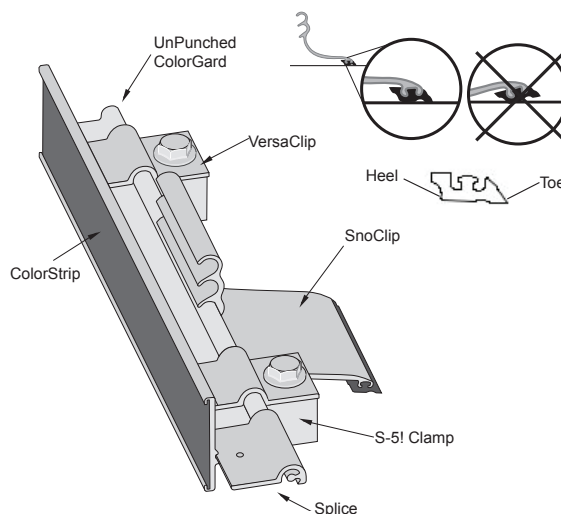
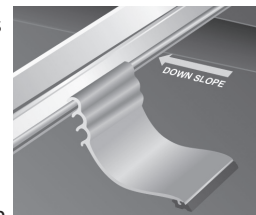
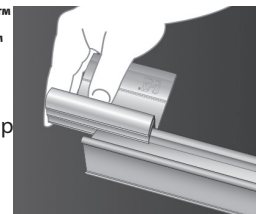


SnoClip III



IMPORTANT NOTICE! SnoClip™ design has changed. SnoClip™ must now slide on from the end of the ColorGard® cross-member. Be sure to slide SnoClip

onto assembly before attaching cross-member to clamps (a new Retro-Fit SnapClip™ is also available from your authorized S-5!® distributor). One SnoClip is used between seams (in some cases two SnoClips may be desired; see www.S-5.com for details). Mount the SnoClip to the back of the ColorGard using the lock that results with the rubber "foot" resting properly on the panel surface. When applying downward pressure on the part, the "toe" should engage the surface of the panel just before the "heel". Periodic maintenance over time may be necessary to ensure that the SnoClips maintain the appropriate positioning, as snow weight may sometimes flip the clip up slightly. Should crosswise panel deflection be excessive and allow the SnoClip to rotate under the ColorGard, then SnoClips should not be used.



S-5!® Warning! Please use this product responsibly!

Products are protected by multiple U.S. and foreign patents. For published data regarding holding strength, fastener torque, patents, and trademarks, visit the S-5! website at www.S-5.com.
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CGI-V1.1-1116



Premium Corrugated Polycarbonate Panels

BEFORE YOU BEGIN

Be sure to read these instructions completely before beginning. Before installation, check local building codes for relevant specifications and recommendations. Follow local codes at all times.

Transportation, Handling and Storage: Transport and store SunSky panels horizontally on flat, sturdy pallets equal or longer than the longest panels. Short panels should be secured and fastened to the pallet during transportation. Do not transport, leave or store panels in direct sun before installation. For outdoor storage, cover the panels securely with a white opaque polyethylene sheet, corrugated cardboard, or other materials that do not absorb or conduct heat.

INSTALLATION STEPS

Apply the sealing tape along the purlin line 2" to 4" above and below the SunSky panel. Apply the sealing tape to the corrugation crests immediately adjacent to the opening as shown.

Place the SunSky panel exactly in place. Attach the SunSky panel with 1-1/2" fasteners with Palram-approved bonded washer/gaskets. **NEVER USE SOFT PVC (vinyl) washer/gaskets.** Soft PVC is totally incompatible with polycarbonate and will harm the panel.



NEVER USE NAILS to fasten SunSky panels. The use of nails can damage the panel at the fastening point. Using nails will also prevent the panel from properly expanding and contracting with temperature change, thus resulting in buckling.

For panels longer than 12', pre-drill holes at all fastening points, 1/4" larger than the shank of the fastener. For panels 12' in length or less, pre-drill a hole 1/8" larger than the diameter of the fastener shank. Palram recommends that SunSky panels are not installed below 40°F or above 80°F.

INSTALLATION NOTES

To Cut Panels: Use a circular saw with small teeth rotating at high speed; advance saw slowly. A portable electric saw (jig saw) or sheet metal shears can also be used. Support the sheet in the vicinity of the cut; clean away debris after cutting.

Drilling: Use a power drill with standard high speed bit intended for metal, rotating at about 1000 rpm.

Sealants: Use only Palram approved sealants. Visit Palramamericas.com/sealants for the most up to date list.

Sealing Tape: Side-laps and end-laps of any SunSky profile should be treated with butyl rubber sealing strips, placed between the overlapping panels at all edges. In shallow pitch roofs (less than 5% double (parallel) sealing strips are recommended at end-laps.

Panel Orientation: SunSky's exterior surface is UV resistant, indicated by labeled strips on the protected side. Install panel with labeled side out. The protected side is up when panel edges are both pointing down. For multi-panel runs, begin installation of SunSky on the side away from wind and rain direction.

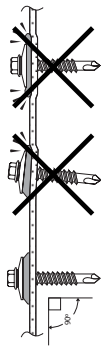
Roof Pitch: SunSky performs best when installed at pitch rates of 10% or more. When installed at a lower pitch, additional sealing should be applied to insure weather resistance. We recommend a minimum 5% pitch rate.

Safety Measures: Use ladders, crawling boards and other safety equipment required for safe installation. Use all safety measures required according to local safety regulations. Do not step on installed panels between purlins. Never leave SunSky panels unattended on the roof until all the required fasteners have been appropriately installed or the panels secured to the supporting structure.

Extra Fastening: On length runs, where SunSky overlaps metal panels on both sides, we recommend side stitching fasteners connecting the SunSky to the frame. These should be spaced along the side-laps about 12" to 16" apart.

IMPORTANT INSTALLATION COMMENTS

Avoid overtightening the fasteners. Allow gaskets to squeeze slightly until full contact with panel. Overtightening induces undue internal stresses, leading to premature failure. Regular Washer/Gaskets (Tek Screws) for metal panels apply excessive pressure, are inadequate for SunSky sealing, and cause undue internal stresses in the panel. The stresses result in crazing, fractures, and eventual failure.



Never apply paints, shading compounds, paint thinners or any material that may chemically attack SunSky, without first verifying compatibility to the panel by contacting Palram Americas or its distributor, or refer to www.PalramAmericas.com/Tech and view the Chemical Resistance of Palram Polycarbonate Products document. Use only Palram approved sealants. Incompatible sealing or bonding material may damage the panels, causing

Installation Overview

IMPORTANT!

This is an abbreviated installation overview for SunSky Premium Polycarbonate Panels. For complete installation details, see Form #505, titled SunSky Installation Guide, available at www.PalramAmericas.com, or by contacting Palram Americas by phone at (800) 999-9459.

failure that is not covered by the limited warranty. For the name of an approved sealing or bonding product, consult your Dealer, Distributor, Palram Americas or refer to www.PalramAmericas.com/sealants for the most up to date list.

Prior to installing clear SunSky, it is advisable to paint purlins using white acrylic paint, or to cover with aluminum tape, in order to prevent over-heating and/or charring of the purlins.

SunSky profiles were designed to closely match commonly used metal profiles. Other panels, appearing to be similar, differ in small but important ways and an exact match may be difficult to achieve. Slight detail differences such as corrugation height, slant, wave distance etc. will hinder exact matching of such a panel with a SunSky profile. This may lead to insufficient sealing, water leakage and forced installation, putting undue stresses on the SunSky panel while trying to adapt it to an almost similar metal profile. Undue stress may lead to premature failure, which is not covered by the limited warranty.

POSITIONING OF FASTENERS

Install the fasteners along the purlin line as shown below.

Figure 14a

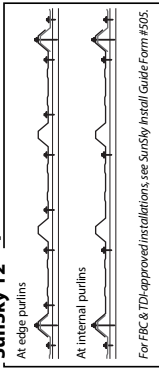
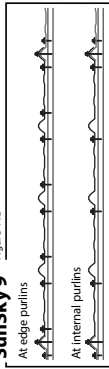


Figure 14b



MAXIMUM RECOMMENDED LOADS

SUNSKY 12 MAXIMUM ROOF SPAN (INCHES)

Load (lb/ft²)	.03" (.8mm) thickness			.04" (1.0mm) thickness			.05" (1.2mm) thickness			.06" (1.5mm) thickness		
	End Span	Mid Span	End Span	Mid Span	End Span	Mid Span	End Span	Mid Span	End Span	Mid Span	End Span	Mid Span
10	60	60	60	60	60	60	60	60	60	60	60	60
20	49	60	52	60	56	60	60	60	60	60	60	60
30	43	50	45	54	49	57	52	60	56	60	56	60
40	38	45	42	49	44	52	48	56	51	56	51	56
50	36	42	38	45	40	48	44	51	47	51	47	51
60	33	39	36	43	38	45	42	49	44	49	44	49
70	32	37	34	40	37	43	39	46	42	46	42	46
80	31	36	33	38	34	42	38	44	40	44	40	44
90	30	34	31	37	33	39	36	43	38	43	38	43
100	28	33	30	36	32	38	34	40	36	40	36	40

Notes About Maximum Roof Spans

- The specified dimensions do not supersede the requirements of local construction codes.
- The given spans are according to deflections criterion of L/20, and minimum slope of 10%.
- The maximum roof spans are based on calculation model and practical testing.
- The mentioned load refers to wind and snow load only.
- For vertical application spans can be increased by 10%.

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