



# Metal Roofing Wholesalers

# DETAIL MANUAL

## For R-Panel / PBR Panel



1178 Topside Rd • Louisville, TN 37777

(865) 379-7777 • Toll Free (877) 646-6382 • Fax (865) 982-4222



# Metal Roofing Wholesalers



Figure 1 Metal Roofing Plant

## PBR/R-Panel

The 26-gauge R-Panel is a strong, durable, economic, and attractive answer to the growing demand for metal roofing and siding needs. R-Panels provide a 36-inch net coverage with 1¼ inch ribs on twelve-inch centers that provide the strength you need for industrial, commercial, agricultural, and utility buildings, as well as homes and businesses.

Our panels and trim are fabricated using state-of-the-art computerized equipment to assure uniformity and consistency in product manufacture. Panels are roll-formed to the lengths specified by customers in 26-gauge high-tensile steel, in either Galvalume® or any of twelve colors, ready for either customer pickup or on-site delivery. All of our R-Panels carry limited coil manufacturer's finish warranties from 25-45 years. Your representative is waiting to assist you in making the best choice for your particular roofing needs.



Figure 2 Profile of R-Panel

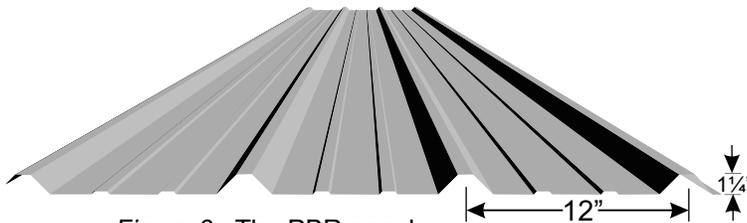


Figure 3 The PBR panel

R-Panel is produced in a bare Galvalume® finish, as well as a baked-on enamel painted finish. The Galvalume® finish is not only durable and cost effective, but offers the reflectivity which is so valuable for energy efficiency. The paint system employed on our painted panels offers optimum exterior protection plus superior resistance to corrosion and ultraviolet radiation. All of our' finishes are of the highest quality in the industry

(865) 379-7777 • Toll Free (877) 646-6382 • Fax (865) 982-4222



# Metal Roofing Wholesalers

## Installation of Panels

### Roof Pitch

Our roofing panels require a certain degree of pitch to ensure proper water drainage.

**R-Panel requires a minimum pitch of 1/12.** This means that the minimum roof slope required for all panels is 1 inches of rise per foot. As a general principle, the less steep the roof, the more necessary the use of ridge closures, and the more necessary also that butyl sealant be used at all side-laps to prevent water from siphoning over the ribs (see *Figure 7* on page 6). Consult our representative for recommendations for your particular roof pitch, and about roofing options if you have less than a 1/12 pitch.

### 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 full panel width in (approx. 38") from the roof edge. At this point chalk a line from ridge to eave (**avoid getting chalk on panels— it may discolor them!**). 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 (see *fig. 7* on page 6).

In applications where end-lapping is necessary, the upper panel on the slope should lap over the panel that is lower on the slope. Lower roof pitch requires a greater amount of panel overlap. All end-lap applications require two horizontal rows (across the panel) of butyl sealant tape and proper fastening to provide a maximum water seal.

An overhang of 2 to 3 inches is recommended to provide a drip edge, while only 1 inch overhang is necessary where gutters are used (*see p. 15*). The open panel ribs at the eave can be sealed with inside closures. For maximum weather-tightness, a row of butyl tape can be applied above and beneath inside closures.

### Trimming and Cutting Steel Panels

The best device for cutting steel panels *across the profile* is either a portable or hand shear, or a nibbler. Nibblers, however, and especially Carborundum blades on electric saws, do have a tendency to either leave hot metal particles that can burn paint surfaces or leave rust marks on panels and trim. The same is true of any filings left on the roof caused by the application of screws. Care should be taken to brush all such particles from roof surfaces after application.

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.

**CAUTION! clean all metal shavings and particles off of roof to avoid unsightly rust stains**

(865) 379-7777 • Toll Free (877) 646-6382 • Fax (865) 982-4222

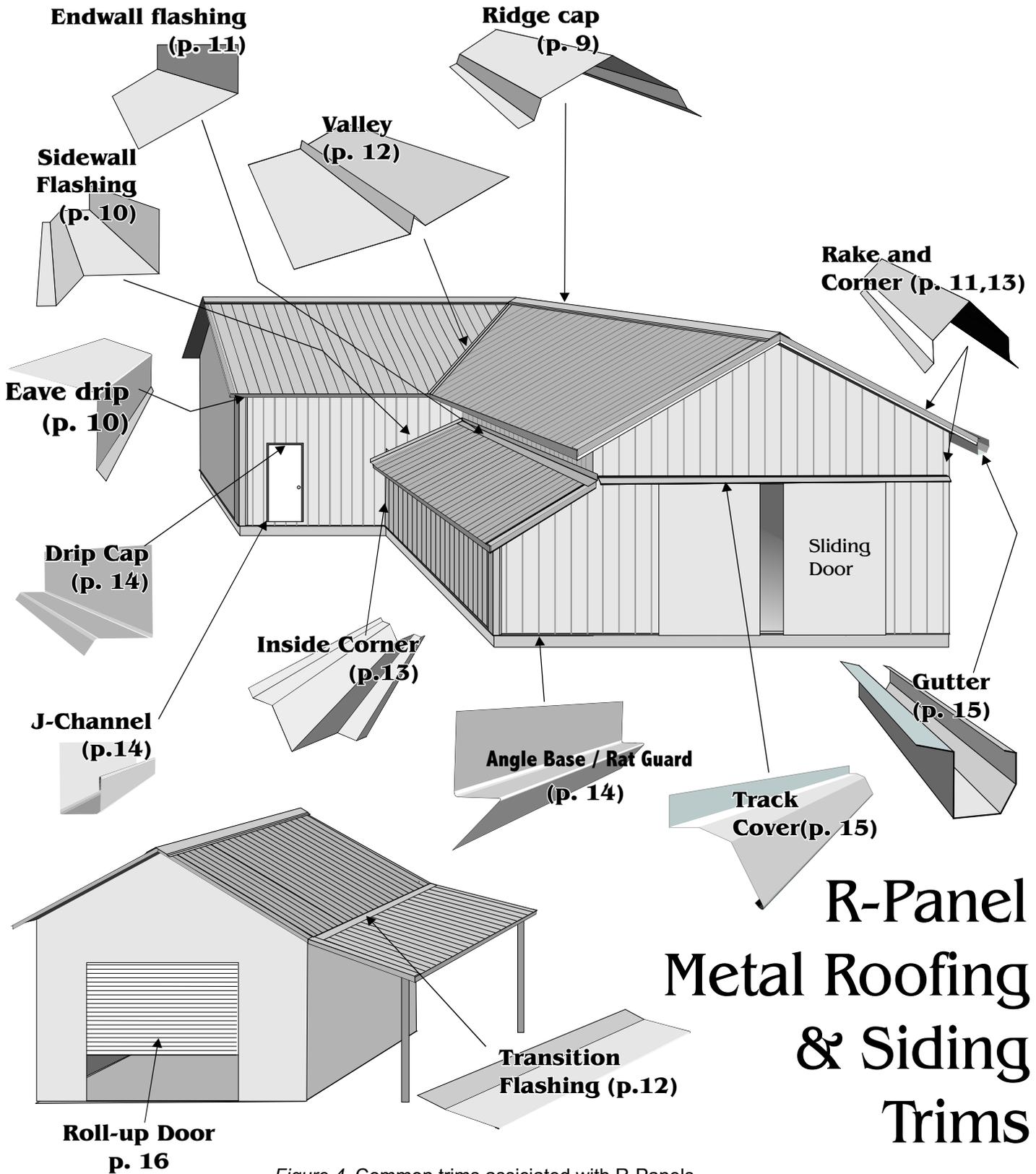


Figure 4 Common trims associated with R-Panels



# Metal Roofing Wholesalers

## Ordering Roof Panels and Screws

Care should be taken to order panels of the correct length to avoid having to make corrective measures after purchase. Panel lengths should fall 2 to 3 inches short of the ridge *when a vented ridge is desired*, and should extend 2 to 3 inches past the eave to allow a sufficient drip edge (except as noted on pg. 3 concerning gutters). Our sales personnel are ready to assist customers with information specific to their particular roof.

Specially-washed screws applied through the flat of the metal is the most recommended method used to attach roofing panels. 1-inch screws can be used if penetration of only  $\frac{3}{4}$  inch is either necessary or desired; otherwise,  $1\frac{1}{2}$  inch screws are usually recommended.  $2\frac{1}{2}$  inch screws are also available, and are often used by those who adhere to through-the-rib fastening, and for ridge-cap application. For attachment to metal purlins, a minimum of #12 x 1" hex head TEK screw or equivalent is recommended, and for stitching panels and trim to panels, we recommend #14 x  $\frac{7}{8}$ " lap TEK self-drilling screws. See pages 6 and 7 for more information on screw spacing and ordering.

## Ordering and Applying Trim

The most common flashing for metal roofing is the *ridge cap*, which is used at the peak of a roof where two opposing roof slopes join. Other flashings include *transition flashing*, *end wall* and *sidewall flashings*, and *valleys* (see diagram on right for application). Eave flashings include *gable flashing* and *drip edge*, both of which are often applied above *fascia* trim. When roof pitch exceeds  $\frac{5}{12}$  (a 5 inch rise in 12 inches), the slope of the roof should be mentioned when ordering ridge caps, endwalls, and drip edge. When a steeper roof slope meets a lesser slope, both slopes should be mentioned when ordering transition flashing.

At the gable edge the use of gable trim adds to the appearance of the structure and protects the fly-rafter, and sidewall flashing is used where the *side* of a panel butts up against an adjacent wall. In either case, the installer should be careful to seal between the gable rake or sidewall and panel with butyl sealant tape, and to fasten the trim every 6" to 12" up the slope of the roof with the appropriate screws. If drip edge is used on the gable, the number of 90 degree drip edge for the gable should be specified separately from that used on the drip edge when ordering.

To prevent penetration of water, insects, and debris at the ridge, either solid or vented closure material may be inserted between the ridge cap and the top end of the panel (shown on p. 9). Screws are applied through the ridge cap, closure, and each rib of the panels.  $2\frac{1}{2}$ " wood screws or self-drilling lap screws should be used for attaching ridge caps.

## Keep Materials Dry!

Paint and finishes of our panels and trim are designed to withstand severe rain and wet weather conditions. Neither paint, galvanized, or Galvalume finishes, however, are designed to be in continuous contact with water for long periods of time. ***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.



# Metal Roofing Wholesalers

linear feet of panels in your order	Screw (purlin) Spacing			
	12 inch	18 inch	24 inch	30 inch
50	190	143	95	76
100	380	285	190	152
200	760	570	380	304
300	1140	855	570	456
400	1520	1140	760	608
500	1900	1425	950	760
600	2280	1710	1140	912
700	2660	1995	1330	1064
800	3040	2280	1520	1216
900	3420	2565	1710	1368
1000	3800	2850	1900	1520
1100	4180	3135	2090	1672
1200	4560	3420	2280	1824

Figure 5 R panel screw calculation chart

Panel lap detail

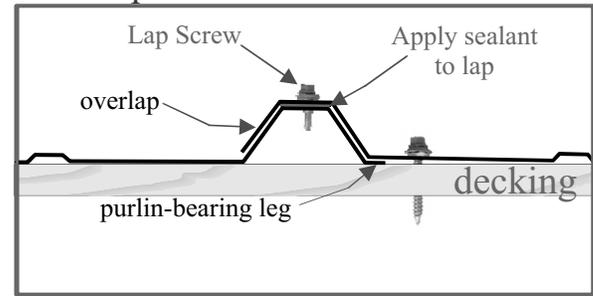


Figure 6 On low-pitched roofs lap screws and butyl tape or caulk should be applied at the panel lap to keep water from overflowing the lap. Note that the *underlap* side of the panel has a distinct purlin-bearing leg that rests on the roof decking.

## How to Figure and Apply Screws

Metal Roofing Wholesalers carries screws in 3 different lengths: 1 inch, 1½ inch, and 2 ½ inch. 1-inch screws will barely penetrate a 1x4, but the 1½ inch are the best all-purpose size. **2½-inch wood screws or self-drilling lap screws are necessary for attaching ridge caps.** The above table (Figure 6) can be used to figure approximate quantities of screws for various purlin spacings and sizes of roofs. For 2-foot spacing between rows of screws, multiply the total linear feet of metal times 1.9

*Example:* your order is 1250 feet of R-Panel roofing. 1250 x 1.9 = 2375 screws

Please confirm all estimates with your representative when you place your order.

Codes allow re-roofing over shingles without the use of battens providing the roof has been checked by a licensed roofing contractor to insure levelness and pullout integrity.

R-Panel metal roofing can be separated from the moisture barrier by minimum, nominal 1"x3" yellow pine battens spaced on maximum 24" centers, or according to ASCE calculations where applicable. Since **direct contact between pressure treated lumber and metal roofing must be avoided in order to prevent potential corrosion.**

**CAUTION:** Battens must be fastened to the roof deck with minimum #6 screws at 12" on-center, or two minimum 8d common or pneumatic nails spaced 8" on-center, or one every 4" on-center (or by applicable calculations according to ASCE 7-98). **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 ½-inch structural plywood or OSB (5/8" for Metro-Dade new construction and for any high velocity wind zone of 120 and above) supported on rafters at a maximum of 24" on center is required. In residential applications, building codes require a plywood deck with the use of #30 felt to provide adequate thermal and moisture barrier protection.

If care is taken, metal roofing application can be aided by pre-drilling panels, allowing screws to go quickly and accurately into the desired spacing. Pre-drilling will work provided that pilot holes are placed accurately in the proper locations on panels. Purlin spacing must be uniform and carefully measured.



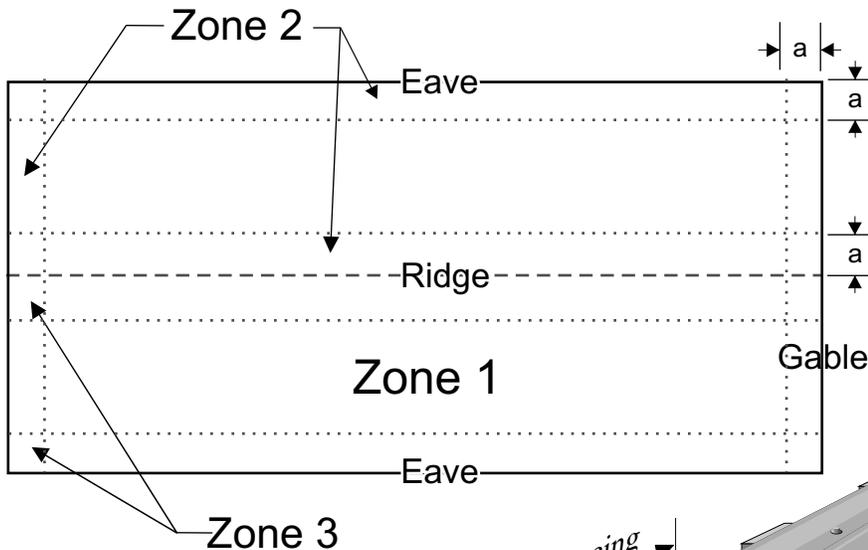
# Metal Roofing Wholesalers

## R-Panels

SECTION PROPERTIES							ALLOWABLE LOADS (PSF)																		
Panel Gauge	Fy KSI	Thickness In.	Fb. KSI		Weight PSF	Girth In.	lx In.	Sx In.	lx In.	Sx In.	Wind Load					Live Load (Stress)					Live Load (Deflection)				
			Pos.	Neg.			Positive Bending		Negative Bending		2'	2'6"	3'	3'6"	4'	2'	2'6"	3'	3'6"	4'	2'	2'6"	3'	3'6"	4'
26 ga.	80	.0187	36	36	.91	42	.0288	.0482	.0288	.1892	170	109	76	56	42	128	82	57	42	32	102	52	30	19	13

### Fastening Schedule for Various Wind Speeds

Roof Zone	Fastener Type	Fastener Size	Attaching to:	Wind Speed Region					
				100-110 MPH		120-130 MPH		140-150 MPH	
				O.C. Spacing	Trim Areas	O.C. Spacing	Trim Areas	O.C. Spacing	Trim Areas
Zone 1	Woodgrip	#9 x 1	wood	36"	18"	24"	12"	24"	12"
	S/D TEK	#14 x 7/8	metal purlin	36"	18"	24"	12"	24"	12"
Zones 2 & 3	Woodgrip	#9 x 1	wood	36"	18"	24"	12"	16"	8"
	S/D TEK	#14 x 7/8	metal purlin	36"	18"	24"	12"	16"	8"



Note: Dimension **a** is defined as 10% of the minimum width of the building, or 40% of the mean height of the roof, whichever is smaller; however, **a** cannot be less than either 4% of the minimum width of the building, or 3 feet.

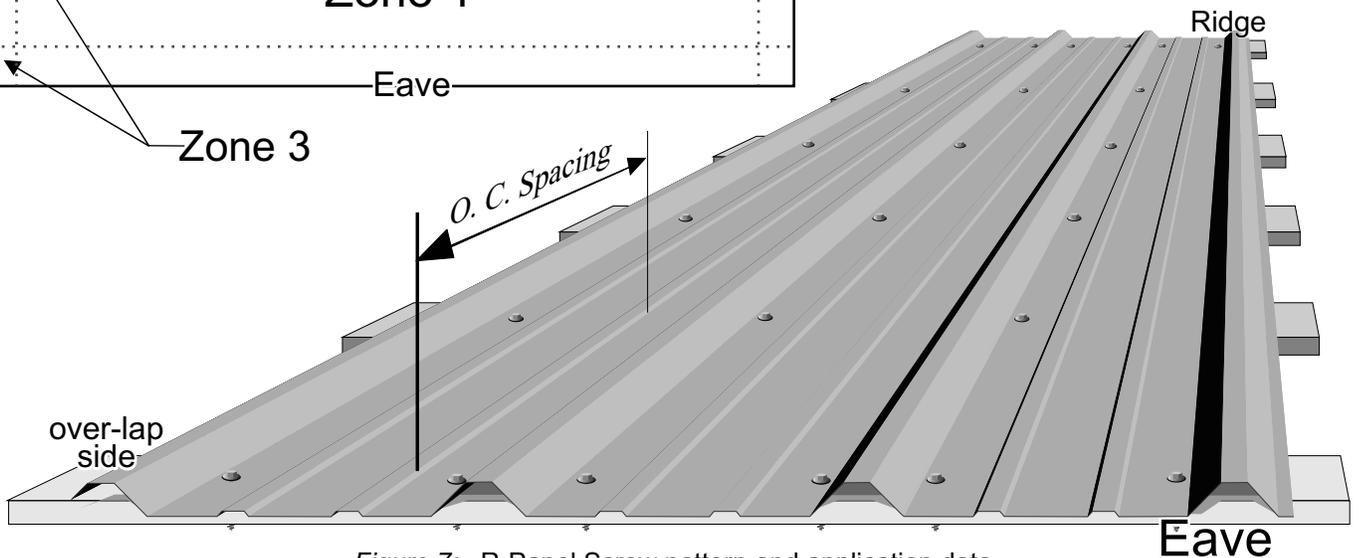


Figure 7: R-Panel Screw pattern and application data.

(865) 379-7777 • Toll Free (877) 646-6382 • Fax (865) 982-4222



# Metal Roofing Wholesalers

## Policies

**Delivery policy** Delivery charges apply to all orders where delivery is requested. Please consult your Metal Roofing Wholesalers sales department for details.

### Sales tax

All orders picked up at Metal Roofing Wholesalers, and all orders delivered within the state of Tennessee, are subject to state sales tax. Tax exemptions should be verified prior to delivery or customer pickup. Most orders delivered out-of-state are tax exempt.

**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.

---

### Summary of Common Stock Trims and Flashings

<i>item</i>	<i>special order information</i>
Ridge caps	Specify pitch if less than 3/12 or greater than 6/12. Closures recommended (see p. 9).
Drip Edge	Installed on gutter end.
Gable flashings	Use butyl sealant between rake and panel.
Valleys	Specify pitch if greater than 7/12. Seal with universal foam closure material
Sidewall	Use butyl sealant between sidewall flashing and panel.
Endwall	Specify pitch if greater than 5/12. Seal with outside closures.
Transition flashing	Specify pitches of both roof slopes. Seal lower slope using outside closures and, if desired, inside closures on upper slope.
Capping Trims	Seal off the ends of siding panels. Base drip seals the bottoms at floor level; J-channel caps panels on sides and below doors and windows, while drip caps seal the bottoms of panels above them.

---

(865) 379-7777 • Toll Free (877) 646-6382 • Fax (865) 982-4222

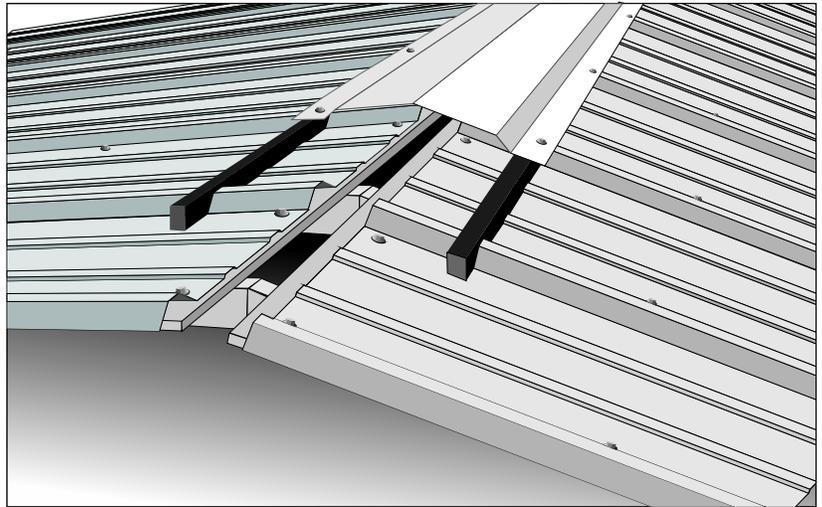
## Ridge Cap ►

The Ridge Cap is used to seal the upper point at which two slopes meet. This can be both along the ridge of the roof as well as the covering for a hip. Either woodgrip or self-drilling lap TEK screws are applied through the ribs of the metal.

Debris, insects, and blowing rain can find easy access under the ridge cap, so closures are often used to either completely or partially seal the opening. Closures under ridge caps come in 2 types: solid and vented.

**Solid closures** (“Outside Closures”) are as long as the width of the panels. They lock together in a row placed directly under the screws that attach the ridge cap, and form a solid, water-tight, air-tight barrier. (see *Figure 8* above).

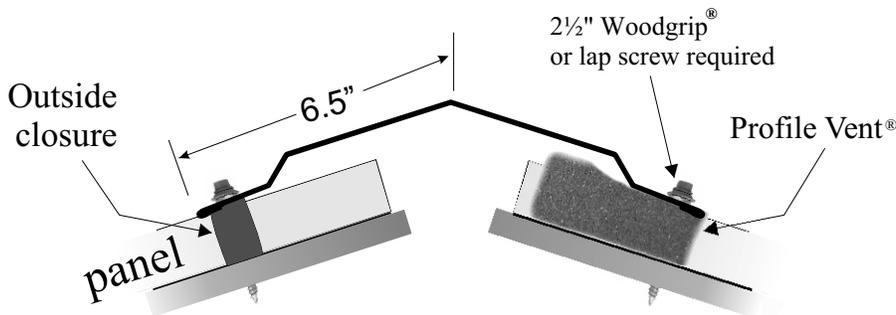
**Profile Vent®** comes in 25 foot rolls, is 3 inches wide, and forms a water-retardant, insect resistant barrier that allows hot air to escape from the attic. It is superior to many more elaborate and expensive venting systems.



*Figure 8* Ridge cap with outside closures in place. R-Panel requires either 7/8 inch lap tech or 2 1/2 inch Woodgrip® screws for attaching the ridge cap.

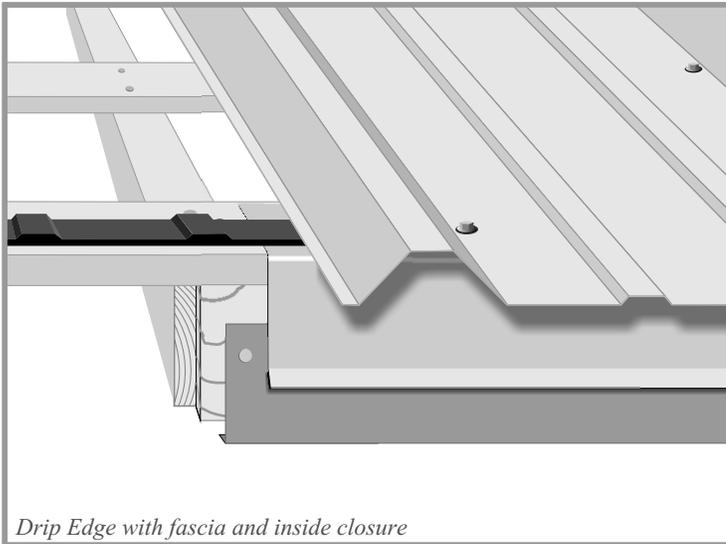


*Figure 9* Pipe Boots provide a water-tight seal around roof vents and come in a variety of sizes. They seal with caulk and conform to the shape of the panel ribs.



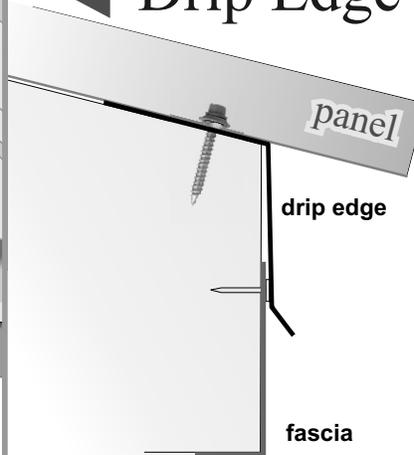
### Standard 13-inch Ridge Caps

are strong, economical and adequate for most of your roofing needs



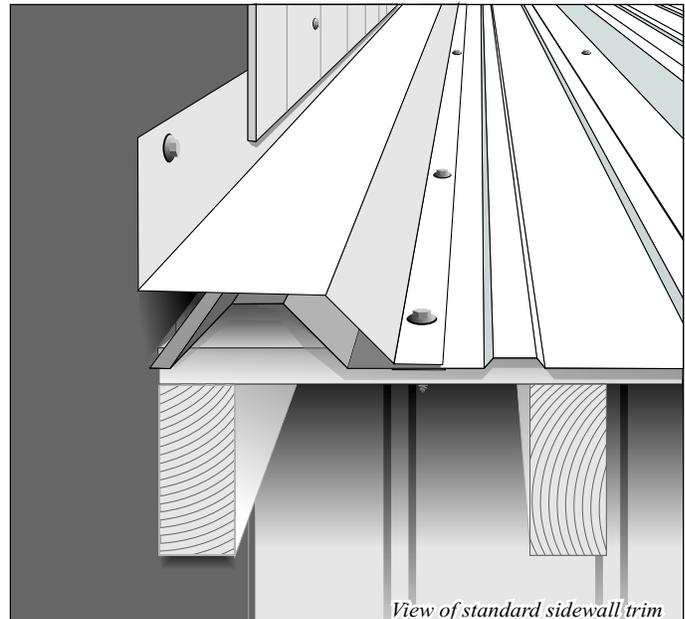
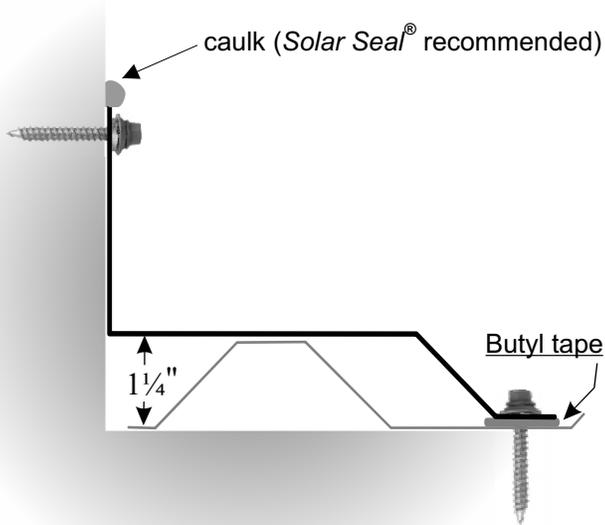
**Figure 10** Drip Edge and fascia give a finished look along the drip eave of the building, as well as providing protection for the materials they cover. The drip edge should completely cover the top edge of the fascia. Inside closures, which seal off the open ribs of the panels, are optional.

## ◀ Drip Edge & Fascia



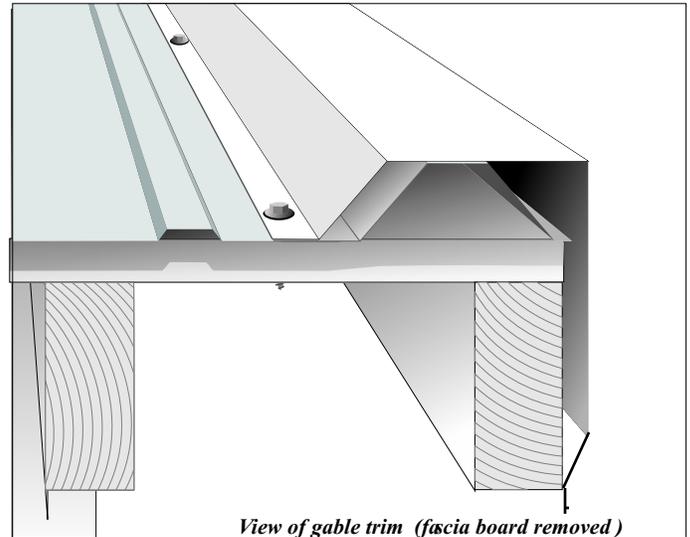
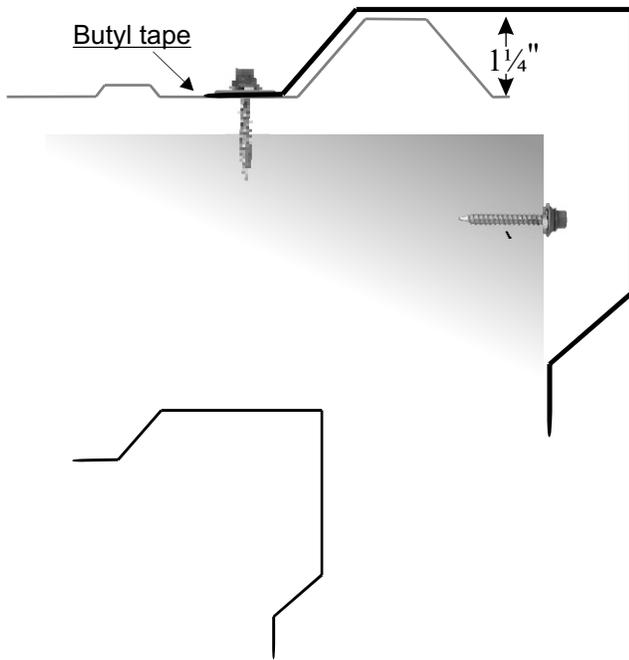
If used as gable trim, be sure to mention the number of 90° drip edge for the gable. If fascia is to be used, be sure that the dimension you order will allow the top of the fascia to be hidden by the drip edge.

## Side-wall Flashing ▶

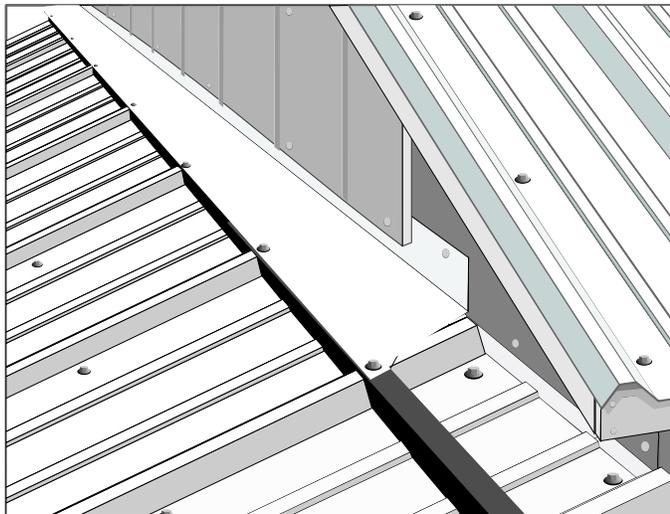


**Figure 11** Sidewall flashing is applied when the side of the roof butts up against an adjacent wall. The wall-side of the flashing can either be covered over with siding or sealed with caulk. Butyl tape should be applied where the "foot" of the flashing attaches to the roof, and, if used, along the top edge of the counterflashing.

## Gable Flashing



*Figure 12* Gable flashing is used to trim the edge of the roofing panel at the gable end of the roof. It should match the eave drip that extends along the drip edge of the roof. If the panel is allowed to hang over the gable end, eave drip can be used instead. Butyl tape between the trim and panel eliminates leaks. Secured both to roof and rafter with screws.

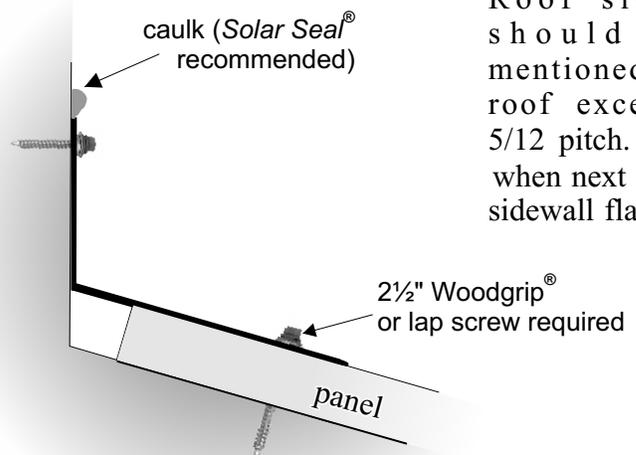


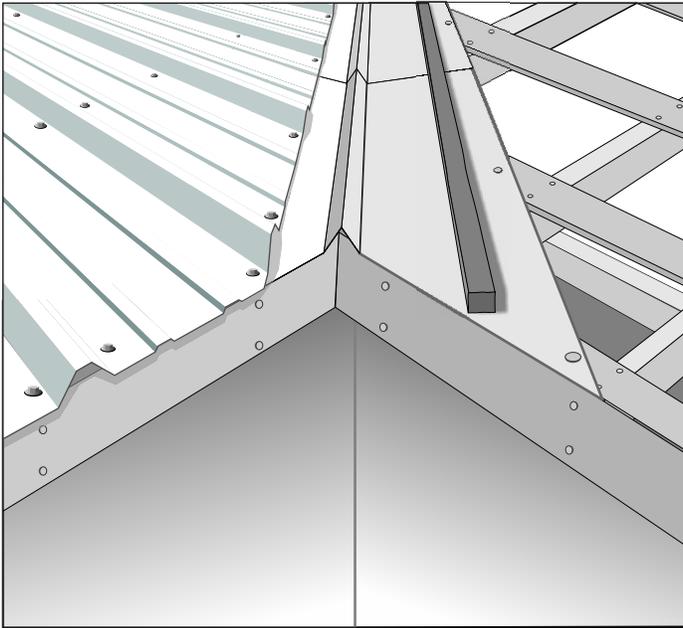
*Figure 13* As with the ridge cap, the ENDWALL FLASHING above can be sealed using outside closures.

## End-wall Flashing

End-wall flashing is applied where the upward slope of a roof meets a wall. The wall side of the flashing can be covered with siding or counter-flashing, and outside closures are used to seal between the flashing and the panel.

Roof slope should be mentioned if roof exceeds 5/12 pitch. Use when next to sidewall flashing.





## ◀ Preformed Valley

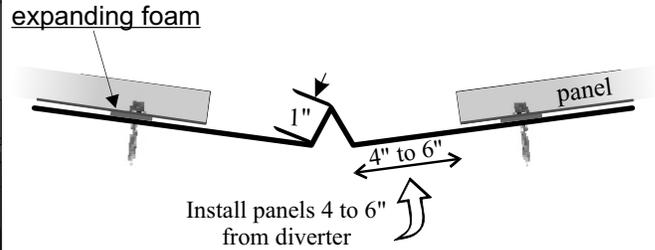


Figure 14 Pre-formed valleys use a diverter to prevent water from rushing under panels on the opposite side while meanwhile channeling water off the roof. Expanding foam closures (as the one shown in place above) are recommended to assure a good seal.

## Transition Flashing ▶

TRANSITION FLASHING prevents leakage at the point where two different roof pitches meet. It is sealed on the lower side with outside closures, and can be sealed underneath the upper panels with inside closures. The less difference there is between the two pitches, the more necessary a larger lower dimension becomes.

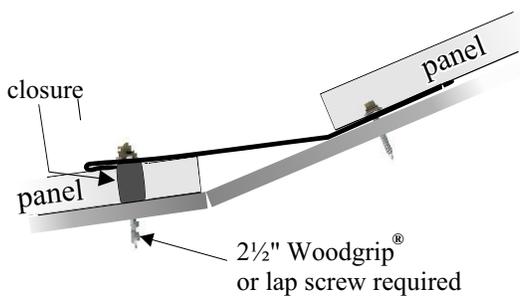
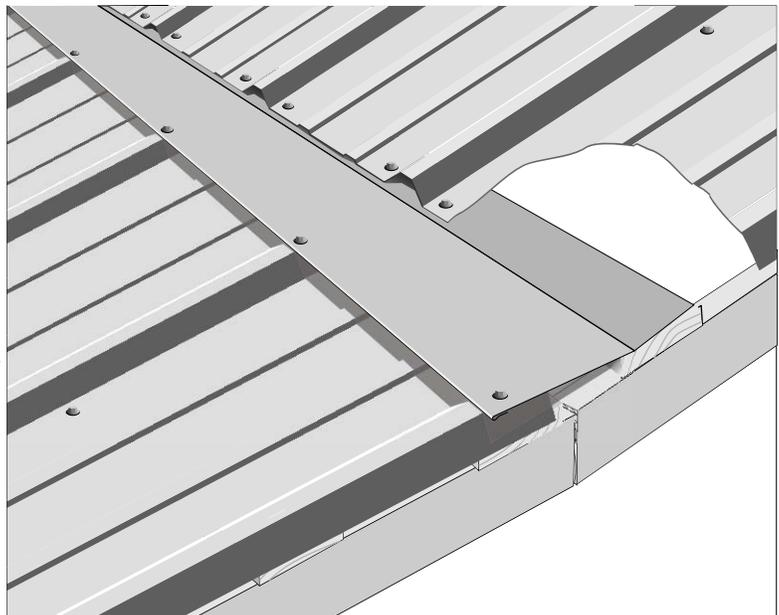
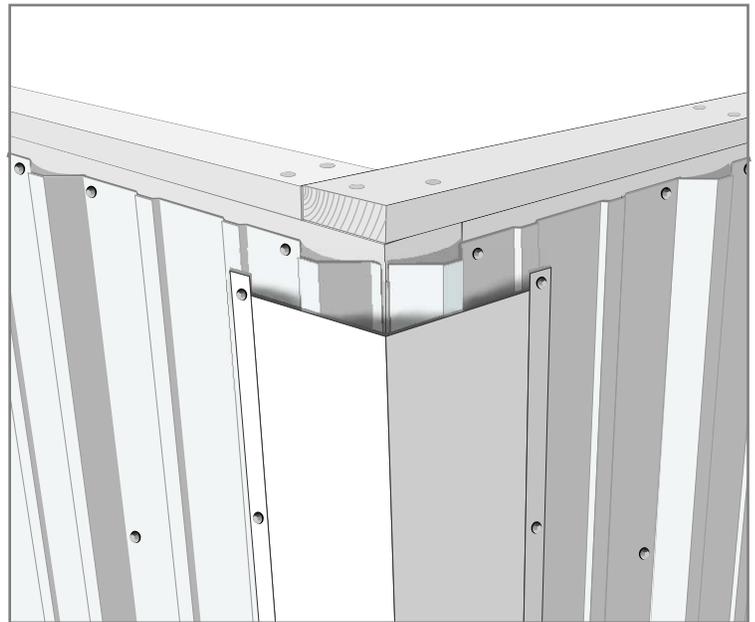
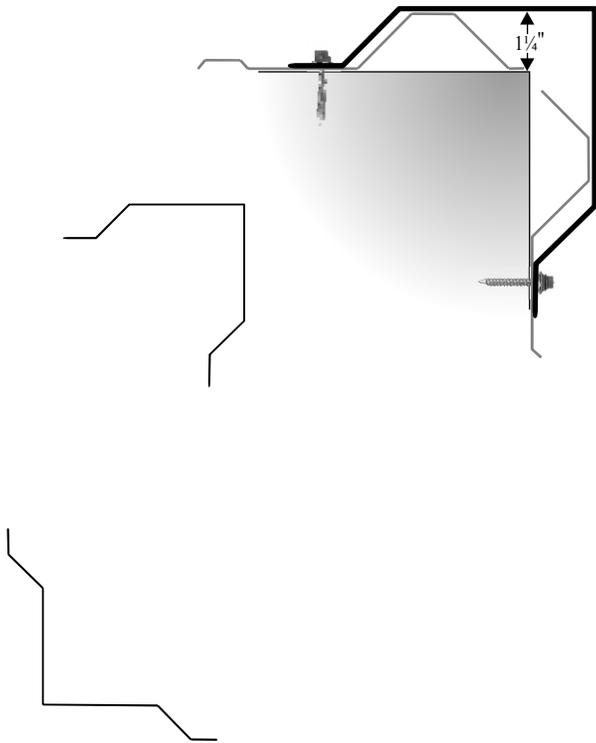
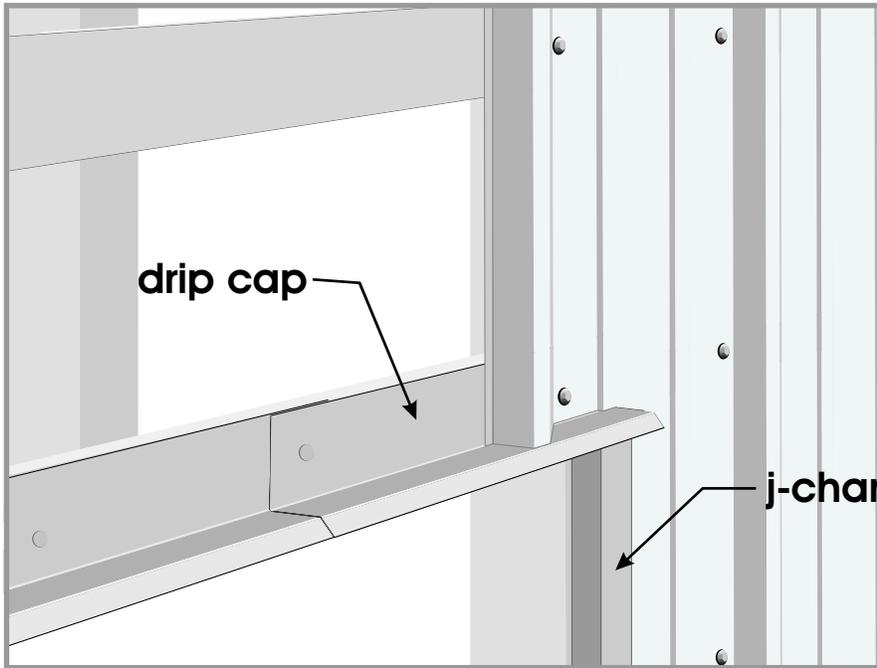


Figure 15 The transition flashing provides a continuous drainage where two slopes meet.

## R-Panel Rake and Corner



*Figure 16* Corner trim straddles the ribs of the panels where they meet at the corner of the building. The PBR outside corner also serves as a gable rake (see p.11). The inside corner has similar dimensions but with a reverse middle bend.



## ◀ Drip Cap and J-Channel

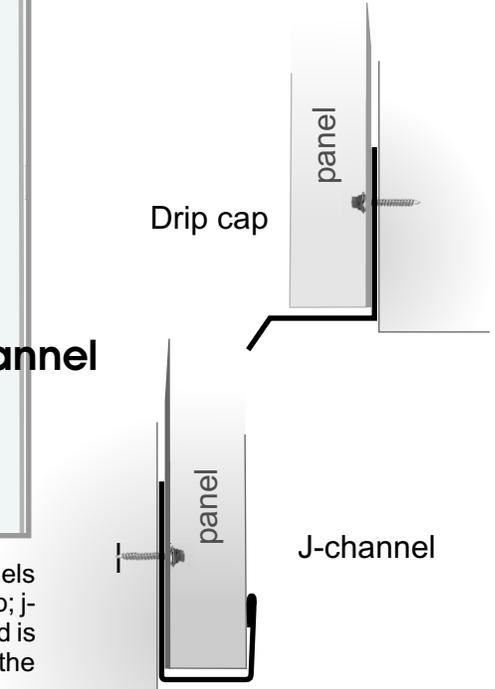


Figure 18 The drip cap is commonly used to trim out the bottoms of panels over doorways and windows, and occasionally takes the place of base drip; j-channel is used to cap raw panel edges where run-off is not a problem, and is most commonly used to trim around the bottom, sides, and occasionally the top of windows and doors, and also to cap the top sides of skirting.

## ▶ Angle Base / Rat Guard

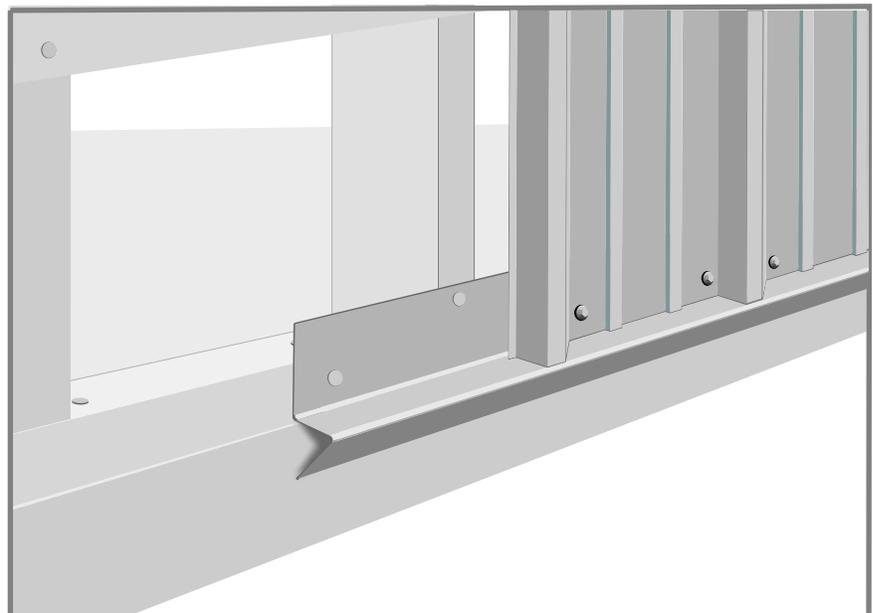
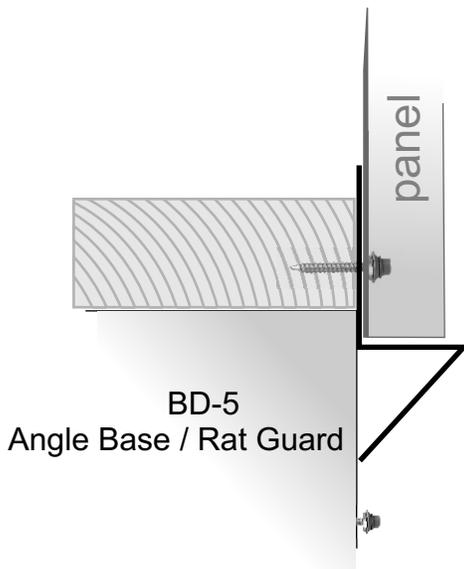


Figure 19 Angle Base seals off the bottoms of panels at the floor level, where it helps to prevent the entrance of rodents and insects, as well as a base for the setting of panels.

## Gutters ▶

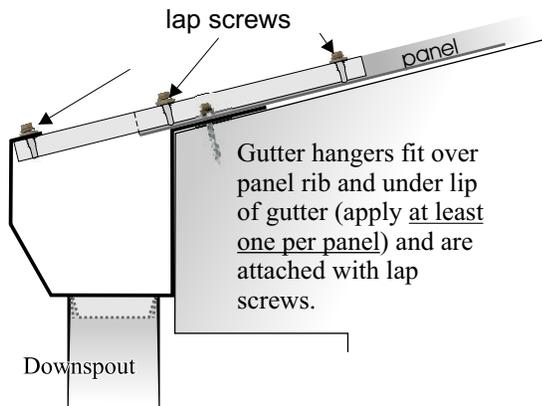


Figure 20 Exposed view of gutter showing gutter hanger placement, downspouts, and end caps. Caulk or butyl sealant under hangers will assure that the lap screws that attach to hangers are leak free. Hangers employ lap screws, and end caps are best attached with rivets.

○ Outer ← Inner → Outer ← Inner →

*Inner and outer gutter sections (marked "I" and "O") alternate along the eave to assure ease of application and gutter appearance.*

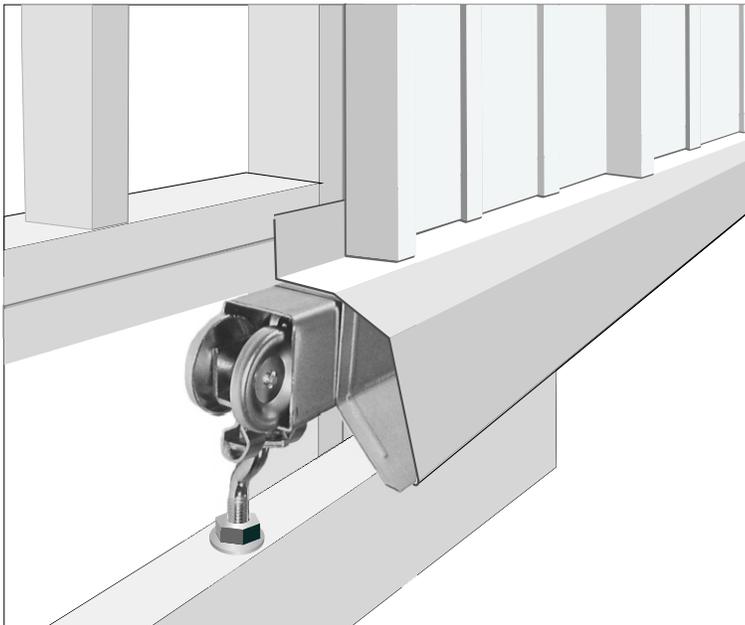
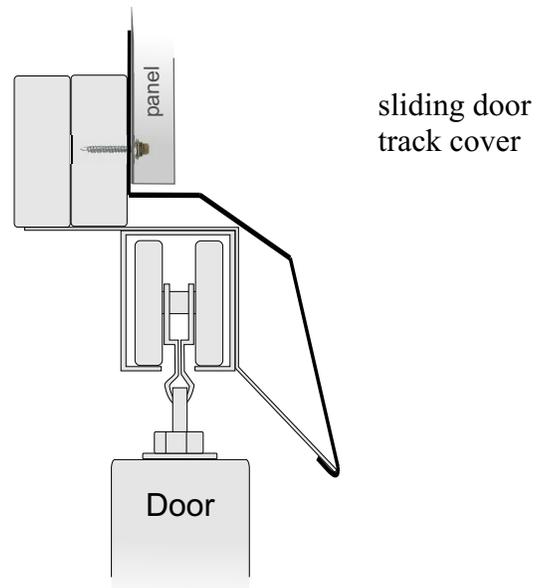
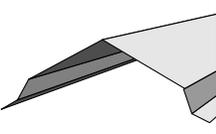
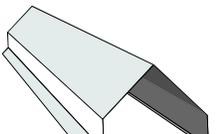
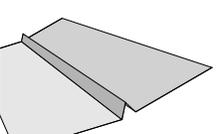
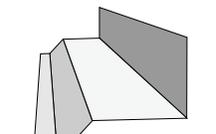
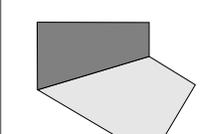
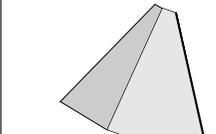
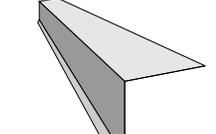


Figure 21 Sliding door track covers fit over the door track and under the panels to hide the track, assure a neat appearance, and shed water over the door.

## ◀ Track Covers



 Ridge cap (pg. 9)	 Rake & Corner (pg. 11, 13)	 Valley (pg. 12)	 Sidewall (pg. 10)	 Endwall (pg. 11)	 Transition flashing (pg. 12)
 Drip Edge (pg. 10)	 Pipe Boot (pg. 9)	 Electrical Boot	 Inside Closures	 Profile Vent <sup>®</sup>	 Butyl Tape
 Expanding Foam	 Touch-up Paint	 Solar Seal <sup>®</sup>			 TurboShear HD
 Woodgrip <sup>®</sup> Screws	 S/D/TEK Lap TEK TEK screws	 Ulti-mate <sup>®</sup> screws			

## Guide to Misc. Accessories

*item*

*application*

<b>pipe boot</b>	<b>Fits over vent and heat pipes. Available also in <i>heat-resistant</i> boots.</b>
<b>electrical boot</b>	<b>Fits around pipes with inaccessible tops (such as weatherheads).</b>
<b>outside closures</b>	<b>Seals under ridge caps and transition and endwall flashings.</b>
<b>inside closures</b>	<b>Seals <i>under</i> panels, particularly on the eave.</b>
<b>Profile Vent<sup>®</sup></b>	<b>Vented closure material surpassing many other venting systems.</b>
<b>expanding foam</b>	<b>Compressed adhesive foam expands to seal between valleys and panels.</b>
<b>TurboShear HD<sup>®</sup></b>	<b>The best tool for cutting metal roofing panels. Great for angle cuts.</b>
<b>touch-up paint</b>	<b>Hides scratches and mars encountered in installation.</b>
<b>butyl tape</b>	<b>General purpose low-cost sealant, used on panel laps and under trim.</b>
<b>Solar Seal<sup>®</sup></b>	<b>A superior general purpose caulk for all joints. Matches panel colors.</b>
<b>low-profile insulation</b>	<b>Greatly reduces radiant heat when installed under panels.</b>
<b>Woodgrip<sup>®</sup> screws</b>	<b>Used in all applications attaching metal to wood. 1", 1½", 2½" sizes.</b>
<b>TEK screws</b>	<b>Self-drilling TEK screws for metal purlins. Lap TEK screws draw together joints and attach trim.</b>
<b>Ulti-mate<sup>®</sup> screws</b>	<b>"Lifetime" screws; 1½", 2½", threaded for wood; self-drilling available.</b>

(865) 379-7777 • Toll Free (877) 646-6382 • Fax (865) 982-4222