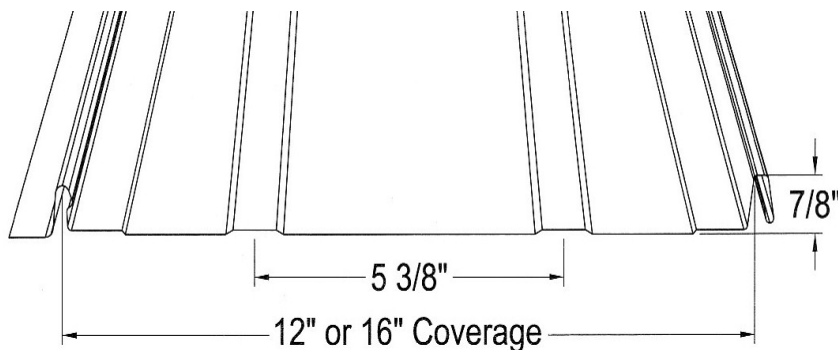




# *Eco-Lock*



## **Metal Roofing System Ordering & Installation Guide**



**THIS GUIDE CAN BE USED IN CONJUNCTION WITH OUR ECO-RIB 4 & 5  
INSTALL GUIDE FOR FURTHER DETAIL ON SPECIFIC APPLICATIONS OF  
TRIMS & ACCESSORIES.**

**Specifications Contained herein are subject to change without notice or  
Any obligation to make changes in products previously purchased**

## MINIMUM RECOMMENDED TOOLS & EQUIPMENT

**Caulking Gun** - Used for miscellaneous caulking and sealing to inhibit water infiltration.

**Chalk Line** - Used to assist in the alignment of panels, flashings, etc.

**Electric Drill** - Used to drill holes such as those required for pop rivet installation.

**Electric Nibblers or Metal Shears** - Used for general metal cutting, such as cutting the panels in hip and valley areas.

*Some installers prefer using a circular saw with a metal cutting abrasive blade. This method may be faster, but it has some drawbacks:*

- *Saw cut edges are jagged and unsightly and tend to rust more quickly than sheared edges.*
- *Saw cutting produces hot metal filings that can embed in the paint and cause rust marks on the face of the panel.*
- *Saw cutting burns the paint & galvanizing at the cut edge leading to the onset of edge rust.*

**End Bender Tool** - Used to hand bend the ends of the panels as indicated in the details of this manual.

**Locking Pliers** - Standard and "Duckbill" style for miscellaneous clamping and bending of parts.

**Marking Tools** - Indelible markers, pencils, or scratching tools.

**Rivet Tool** - Used for miscellaneous flashing and trim applications.

**Rubber Mallet** - may be used to help snap panels together.

**Scratch Awl** - Can be made from old screw drivers ground to a point. Used to mark the steel, open hems, and as a punch.

**Screw Gun** - 2,000 to 2,500 rpm Clutch type screw gun with a depth sensing nose piece is recommended to ensure proper installation of the screws. The following bits will be required:

- 1/4" hex
- #2 Combination Square/Phillips bit

**Snips** - For miscellaneous panel and flashing cutting requirements. Three pairs will be required: one for left edge, one for right edge, and one for centerline cuts.

**Tape Measure** - 25 foot minimum.

**Utility Knife** - Used for miscellaneous cutting.

## **SAFETY CONSIDERATIONS**

**Never use unsecured or partially installed panels as a working platform.** Do not walk on panels until they are in place on the roof and all of the fasteners have been installed.

**Metal roofing panels are slippery when wet, dusty, frosty, or oily.** Do not attempt to walk on a metal roof under these conditions. Wearing soft soled shoes will improve traction and minimize damage to the painted surface.

**Always be aware of your position on the roof relative to your surroundings.** Take note of the locations of roof openings, roof edges, equipment, co-workers, etc.

**Always wear proper clothing and safety attire.** Wear proper clothing when working with sheet metal in order to minimize the potential for cuts, abrasions and other injuries. Eye protection and gloves are a must when working with sheet metal products. Hearing protection should be used when power-cutting metal panels. When working on a roof, fall protection is highly recommended. Follow all OSHA Safety Requirements.

**Use care when operating electrical and other power equipment.** Observe all manufacturers' safety recommendations.

**Roof installation on windy days can be dangerous.** Avoid working with sheet metal products on windy days.

## **DELIVERY, HANDLING & STORAGE**

Always inspect the shipment upon delivery. Check for damage and verify material quantities against the shipping list. Note any damaged material or shortages on the bill of lading at the time of delivery.

Handle panel bundles and individual panels with care to avoid damage. Longer bundles and panels may require two or more "pick points" properly spaced to avoid damage that can result from buckling and/or bending of the panels.

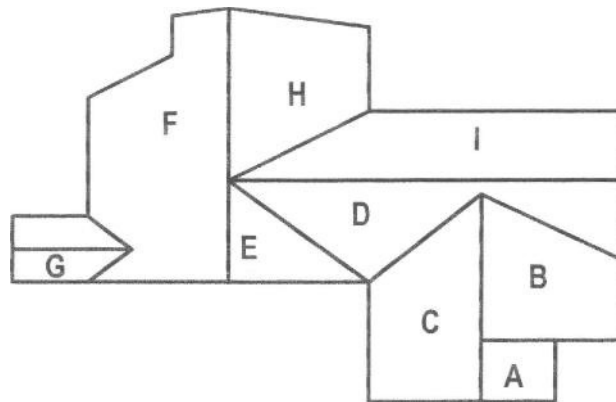
Store the panels and other materials in a dry, well ventilated area, away from traffic. Elevate one end of the bundle so that any moisture that may have accumulated during shipping can run off. If outdoor storage cannot be avoided, protect the metal with a breathable canvas or waterproof paper cover. Leave the bottom of the cover loose to allow air circulation. Do not use plastic which causes sweating or condensation.

Wear clean, non-marking, soft soled shoes when walking on the panels to avoid shoe marks or damage to the finish. Step only in the flat area of the panels. Do not step on the ribs.

## ESTIMATING & ORDERING A ROOF

### Step 1

- A. Sketch a birds-eye view of the roof and label each section (see example below.)



- B. Show the measurements of each roof section. Show all measurements. **It is important to measure the exact center of the ridge to the eave edge.** Do not allow anything for overhang.

**Additional Information Required:** Roof Pitch, Skylights (Location & Size), Chimneys (Location & Size), and Size and Number of Pipe Penetrations.

**Additional Identification:** Ridge, Hips, Valleys, Gables, Etc.

## ESTIMATING & ORDERING A ROOF

### Step 2

With the information from the diagram you completed in Step 1, you are now ready to complete your roofing panel cut list. Each panel is either 12" or 16" wide so the only measurement you need is the distance from the eave to the ridge. You can then determine the number of panels needed to cover the length from gable to gable by dividing your eave length by the panel width. Repeat this step for each section from your diagram from step 1. After completing each section of your diagram you will have a list of panel lengths that will cover all sections of your roof. **Step 3** will help you to determine your trim and flashing needs.

**If your roof diagram has hips or valleys, refer to hip & valley chart below**

#### Hip & Valley Chart

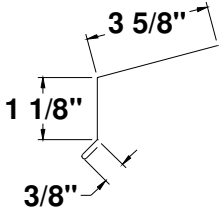
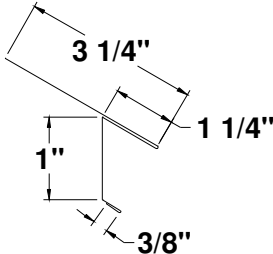
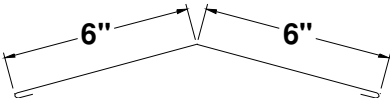
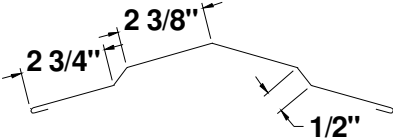
when determining the panel length needed for a hip or valley, the panel will either be shorter or longer as you go up or down the hip or valley. The chart below shows you the amount to add or subtract from each panel according to your roof pitch. Pitch is how much rise your roof has in inches for every foot of horizontal run.

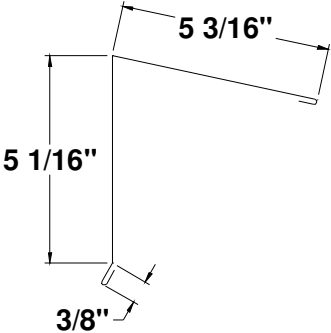
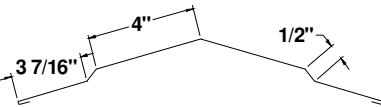
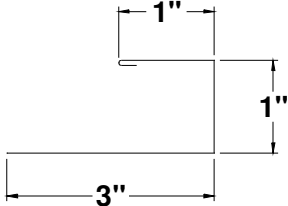
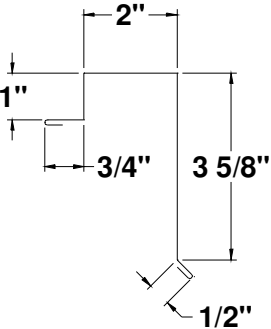
- $3/12p = 12''$
- $4/12p = 12''$
- $5/12p = 13$
- $6/12p = 13 \frac{1}{2}''$
- $7/12p = 14''$
- $8/12p = 14 \frac{3}{8}''$
- $9/12p = 15''$
- $10/12p = 15 \frac{1}{2}''$
- $11/12p = 16 \frac{1}{4}''$
- $12/12p = 17''$

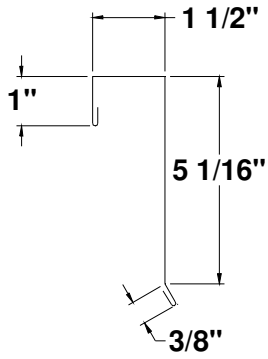
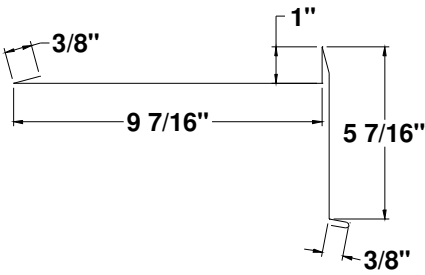
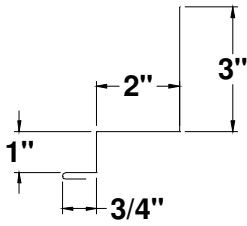
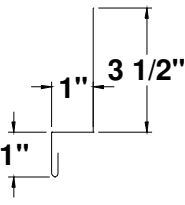
**Note:** When determining panel length, always round up to the next full inch.

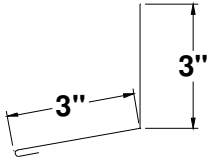
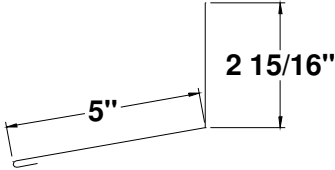

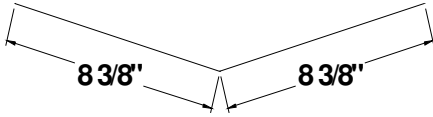
**ESTIMATING & ORDERING A ROOF  
STEP 3**

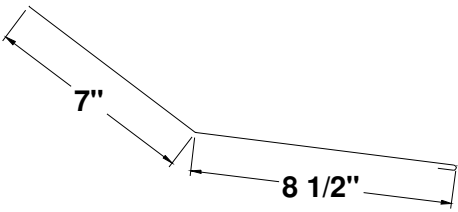
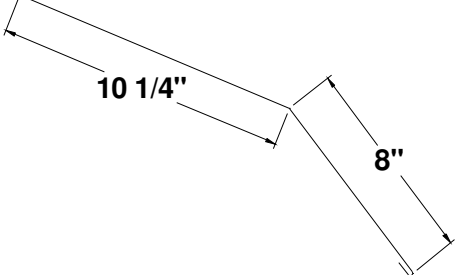
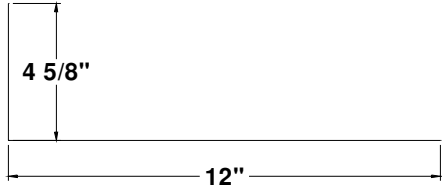
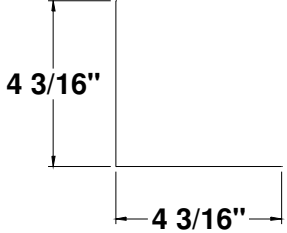
On your roof diagram from step 1 you labeled all of your hips, valley's, ridges, gables, skylights and pipe penetrations. From the trim list below you will determine the amount and style of trim you will need for your roof package. All trim is sold in lengths of 10' 6", keeping that in mind will help you to determine how many of each piece you will need.

	<p align="center"><b>Eave 1</b></p> <p align="center"><b><u>TDE-1-XXX</u></b></p> <p align="center">10' 6"</p>
	<p align="center"><b>Eave 2</b></p> <p align="center"><b><u>TDE-2-XXX</u></b></p> <p align="center">10' 6"</p>
	<p align="center"><b>Ridge Cap 2</b></p> <p align="center"><b><u>TDRC-2-XXX</u></b></p> <p align="center">10' 6"</p>
	<p align="center"><b>Hip Cap</b></p> <p align="center"><b><u>TDHC-1-XXX</u></b></p> <p align="center">10' 6"</p>

	<p><b>Clear Story</b></p> <p><b><u>TDCS-XXX</u></b></p> <p>10' 6"</p>
	<p><b>Ridge Cap 1</b></p> <p><b><u>TDRC-1-XXX</u></b></p> <p>10' 6"</p>
	<p><b>Ridge / Hip J Flash</b></p> <p><b><u>TDRH-1-XXX</u></b></p> <p>10' 6"</p>
	<p><b>Gable Trim 1</b></p> <p><b><u>TDG-1-XXX</u></b></p> <p>10' 6"</p>

	<p><b>Gable Trim 2</b></p> <p><b><u>TDG-2-XXX</u></b></p> <p>10' 6"</p>
	<p><b>Gable Trim—Swept Wing</b></p> <p><b><u>TDGSW-1-XXX</u></b></p> <p>10' 6"</p>
	<p><b>Sidewall 1</b></p> <p><b><u>TDSW-1-XXX</u></b></p> <p>10' 6"</p>
	<p><b>Sidewall 2</b></p> <p><b><u>TDSW-2-XXX</u></b></p> <p>10' 6"</p>

	<p>End wall 1</p> <p><b><u>TDEW-1-XXX</u></b></p> <p>10' 6"</p>
	<p>End wall 2</p> <p><b><u>TDEW-2-XXX</u></b></p> <p>10' 6"</p>
	<p>W Valley</p> <p><b><u>TDWV-1-XXX</u></b></p> <p>10' 6"</p>
	<p>V-Valley</p> <p><b><u>TDVV-2-XXX</u></b></p> <p>10' 6"</p>

	<p><b>Transition</b>  <b>TDTRF-1-XXX</b>  10' 6"</p>
	<p><b>Gambrel / Slope Transition</b>  <b>TDGT-1-XXX</b>  10' 6"</p>
	<p><b>Top Flash—Skylight / Chimney</b>  <b>TDTF-1-XXX</b>  10' 6"</p>
	<p><b>Bottom Flash</b>  <b>TDBF-1-XXX</b>  10' 6"</p>

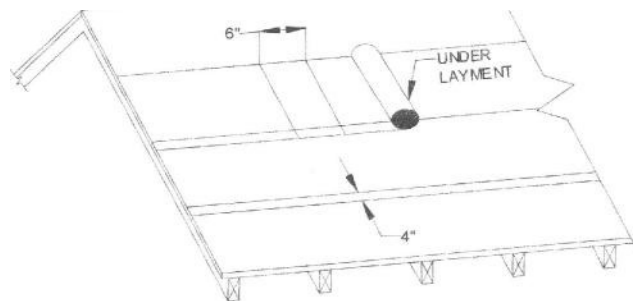
## APPLYING A NEW ROOF Step 4

Now that you have completed steps 1 thru 3 and have ordered and received your roof package you can begin the installation. If you are applying your roof over an existing roof, we highly recommend that you first check with your local Building Codes Department to make certain that you do not have too many layers of old roofing on the structure so that you do not violate any of your local building code requirements before you start. Once you have determined that you can go over your existing roof we recommend that you either apply an underlayment of either Perma-Felt or 30 lb. roofing felt, once this is complete you can start your installation. The application of your roof panels is the same as if you were starting with a clean roof deck, see the following;

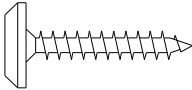
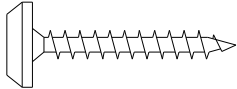
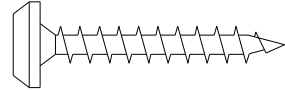
### NEW ROOF APPLICATION

1. Make sure there are no nails or other objects protruding from the substrate that might puncture the underlayment or damage the roof panels. Clean all debris from the deck.
2. Check all details for possible roof penetrations which must be added to the deck prior to roof panel installation (vented ridge for example).
3. Cover the entire roof deck with PERMA-FELT, or 30 lb. felt (hereinafter referred to as underlayment). Begin at the eave at the gable end and roll out the underlayment horizontally (parallel to the eave). Allow each consecutive course to overlap the previous one by 4 to 6". Overlap the end a minimum of 6" when starting a new row of underlayment. Areas of underlayment that have been torn or cut should be replaced or repaired prior to installation of the metal roof. (See Illustration #1 below) Ice & Water shield should be used in cold climates starting at the eave and extending at least 24" past exterior walls.

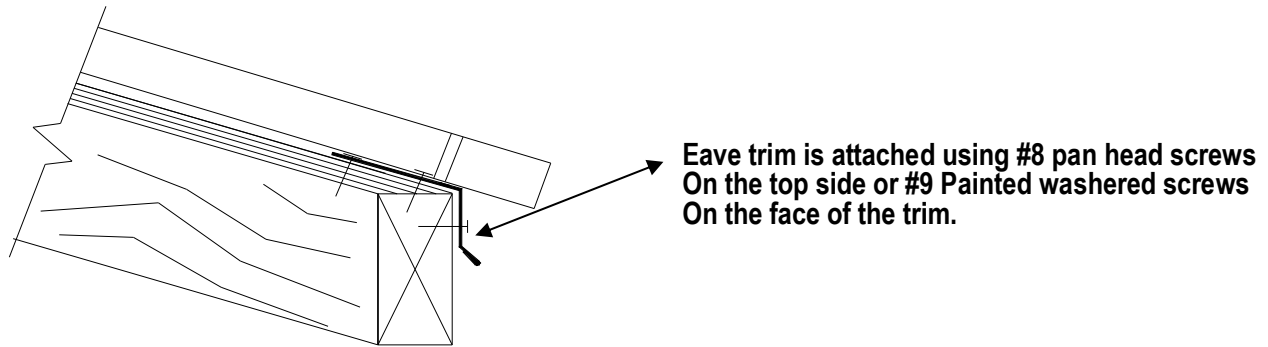
ILLUSTRATION #1



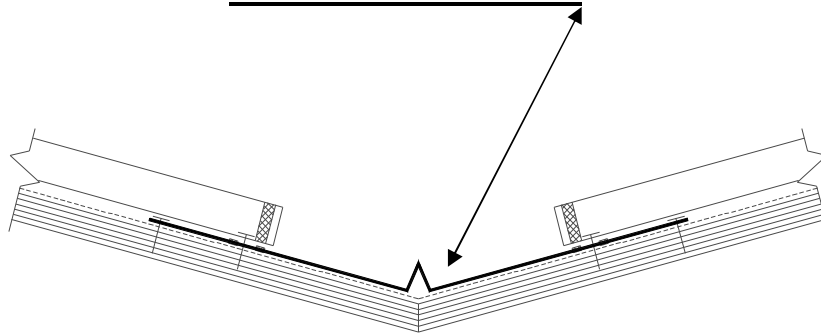
4. Place an alignment line on the roof deck where the first roof panel will be installed. **THIS LINE MUST BE LOCATED IN FROM THE GABLE EDGE OF THE ROOF DECK AND SQUARE WITH THE EAVE LINE.** Various methods exist (3, 4, 5 method) for ensuring that the line is square. Call your nearest AFP Metal Products dealer or representative if you need assistance. You can now place your first panel down and attach to roof deck with the #8 pan head fasteners; panels should be fastened along screw flange of panel every 18" on center along screw flange. If you are attaching to a clean deck the screw length should be 1" long, if you are going over an existing roofing material you will want to determine the length of the fastener depending on how thick the existing roofing is, the fastener should be long enough to fully penetrate the wood deck of your structure. Below is a schedule of fasteners to be use for Eco-Lock panels.

<b>Modified Truss Head</b>	<b>Part #</b>	
<b>FOR USE WITH CONCEALED FASTENER PANELS</b>		
	<b>#8 x 1"</b>	<b>SW-G-8-1</b>
	<b>#8 x 1 5/8"</b>	<b>SW-G-8-1.625</b>
	<b>#8 x 2 1/4"</b>	<b>SW-G-8-2.25</b>

## EAVE DETAIL



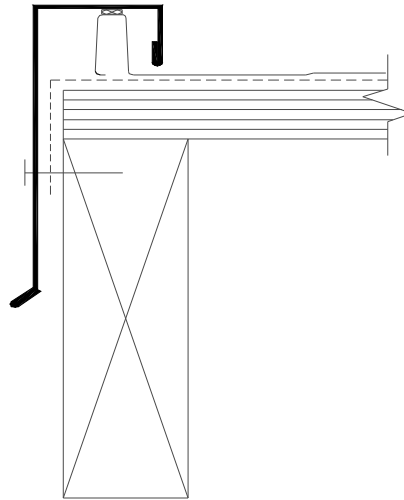
## VALLEY DETAIL



### Notes:

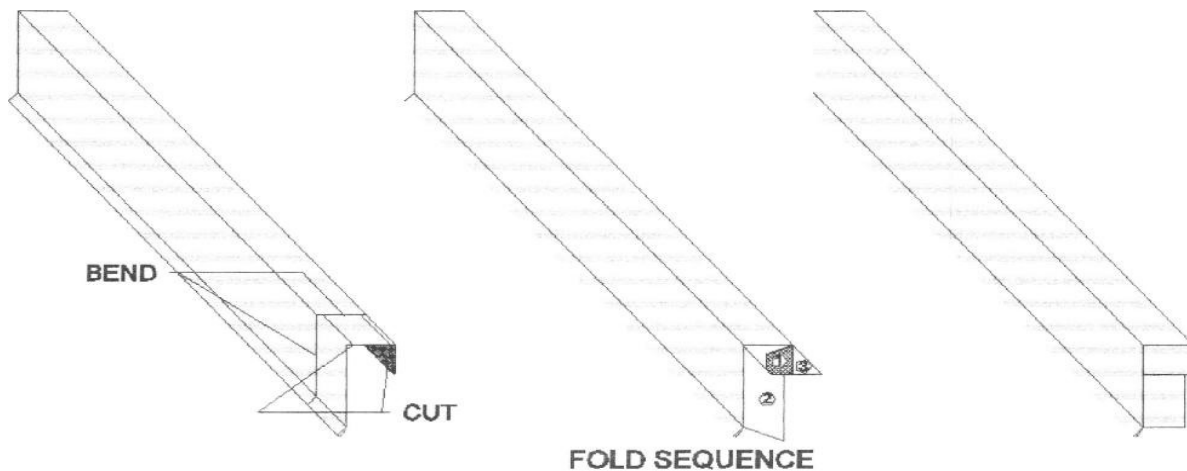
1. Ice and water shield or similar membrane is recommended in all valleys. Install this before installing roofing felt.
2. Double rows of bead mastic should be applied on both sides of the valley pan prior to panel installation; the bead mastic should be applied 1" back from panel edge and the second row 4" from the first row under the panel on both sides.
3. Place a second layer of 36" roofing underlayment in the center line of the valley with 18" of underlayment on each side of the valley. Additional underlayment may be required in cold climates due to ice damming.
4. When valley flashing is overlapped, 6" of lap is recommended with sealant applied under the lap.
5. Refer to above detail.

## GABLE DETAIL

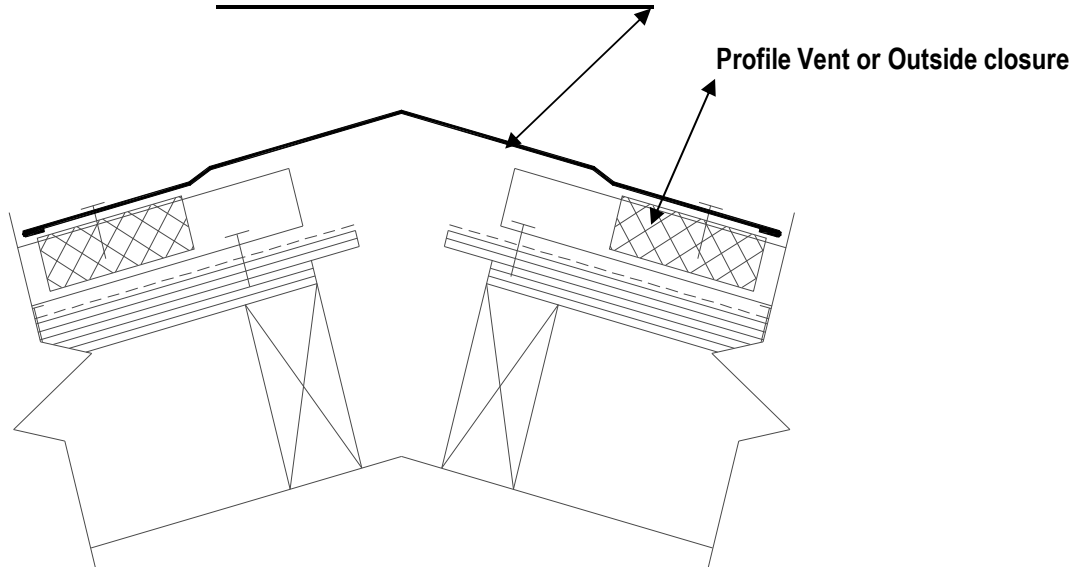


### Notes:

1. Roofing underlayment is the dotted line.
2. Install the gable trim by placing it over the seam rib as shown and fasten it to the fascia board at 24" on center.
3. The eave end of the gable trim can be closed off by snipping and folding (see detail Below).
4. For gable detail at ridge, Gable is applied prior to the ridge cap, ridge cap goes on over top of gable trim.
5. When the last roof panel overhangs the gable end cut off allowing 1" of panel to overhang the gable of the roof deck, fold that 1" up at a 90 degree angle so when the gable trim is applied it work act as a water dam.



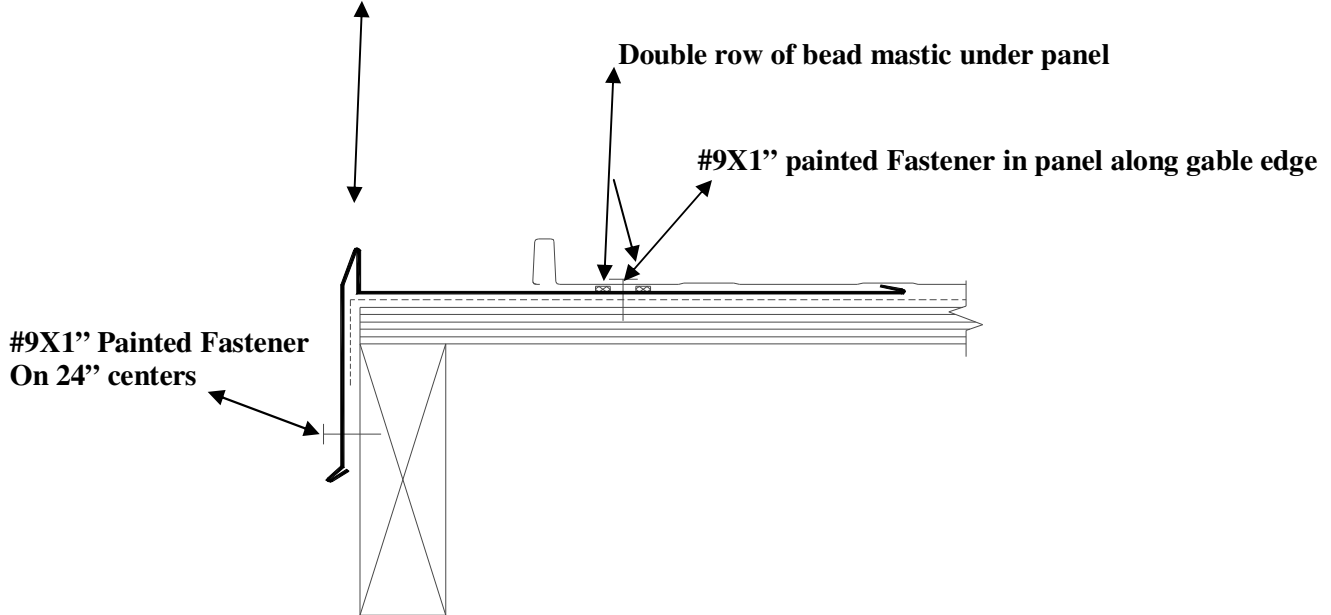
## RIDGE & HIP DETAIL



### Notes:

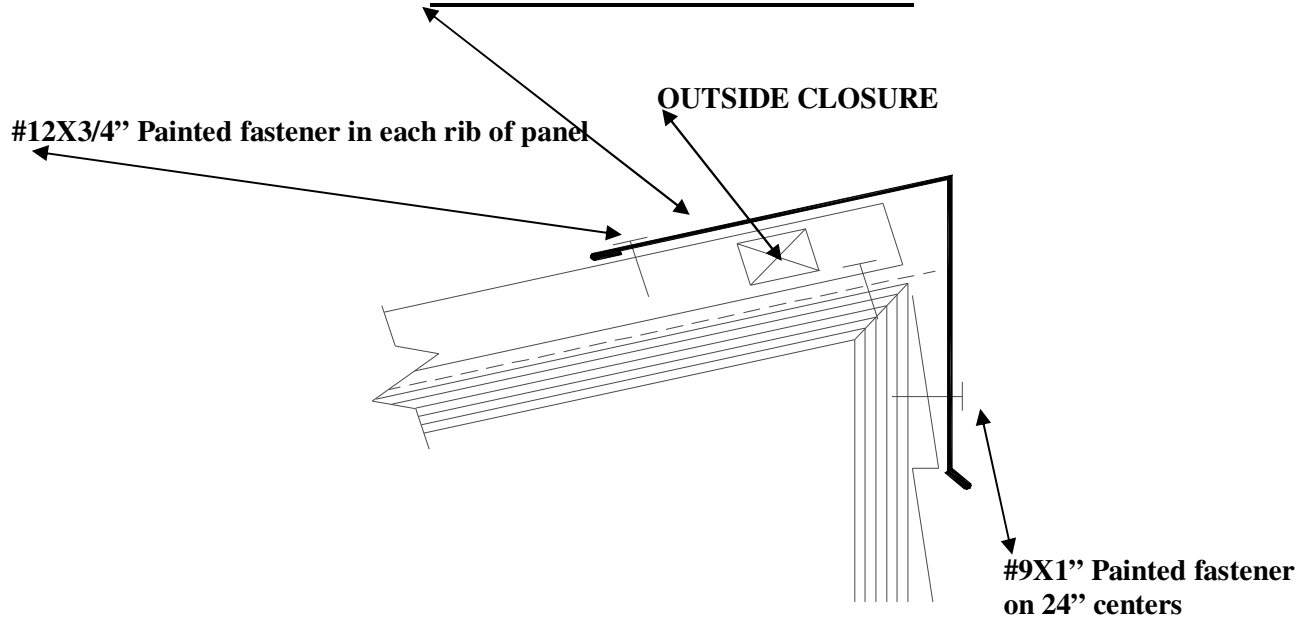
- 1. The gable flashing must be installed prior to installing the ridge.**
- Roofing underlayment is the dotted line.
- Plywood should be held back or cut back 2" from each side of the ridge.
- Install Profile Vent on each side of the ridge for vented ridge application or outside closure for non-vented ridge. If you are using the ridge to vent the roof be sure to cut your roof deck substrate back 2" on each side at the ridge.
- Fasten the ridge cap using #12 x 3/4" stitch screws on each panel rib 1" back from the edge of the ridge cap.
- Hip cap is applied in the same manner as the ridge cap, although it is not recommended to vent through the hip.

## **SWEPTWING GABLE DETAIL**



1. Sweptwing gable is used when the ridge line of the structure is longer than the eave line of the structure, also known as a prowl.
2. The Sweptwing gable is applied prior to panel installation.
3. When applying panels on a Sweptwing application the panels are cut on an angle to the gable, when cutting the panels they must be cut 4" back from the 1" rise on the Sweptwing gable flashing, this will allow for water to run between the panels and the Sweptwing gable and be roted to the eave and not be allowed to run off the gable face of the structure.
4. Panel is face screwed along the angle cut edge on the gable with a #9X1" painted fastener.

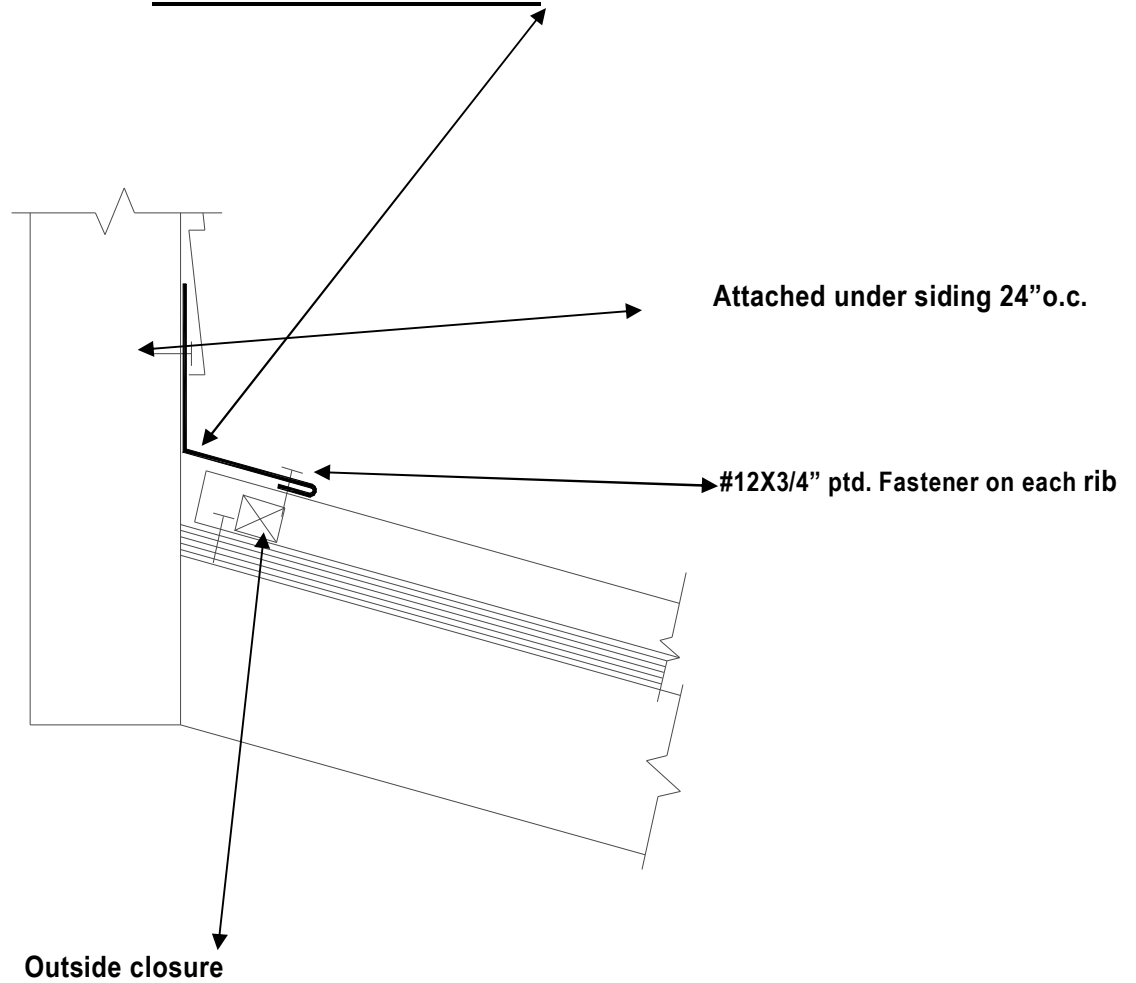
## CLEAR STORY DETAIL



### Notes:

1. Roofing underlayment is the dotted line.
2. Apply sealant to the bottom of the foam closure and position it on the roof panel approximately 2" back from the edge of the flashing as shown.
3. Apply sealant to the top of the foam closure.
4. Install flashing as shown.
5. When more than one length of flashing is used, a 6" minimum overlap is recommended. Apply sealant between the laps.

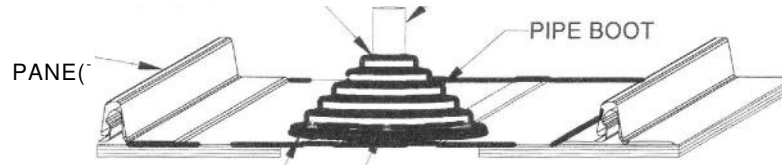
## ENDWALL DETAIL



### Notes:

1. Roofing underlayment not shown.
2. Install the foam closure as shown using sealant on the top and bottom.
3. Install endwall flashing as shown.
4. When more than one length of endwall trim is needed, a 6" minimum overlap is recommended with sealant between the laps.

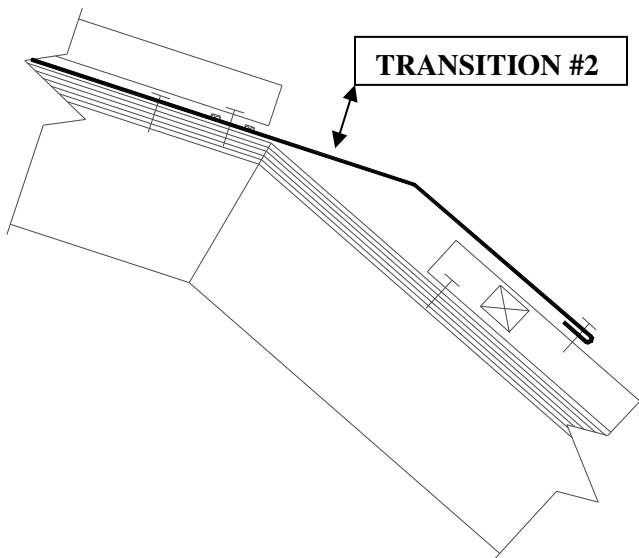
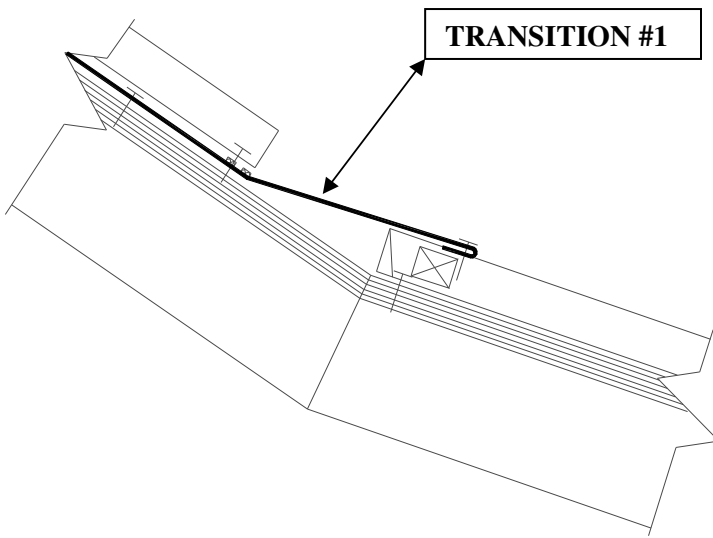
# PIPE FLASHING



## Notes:

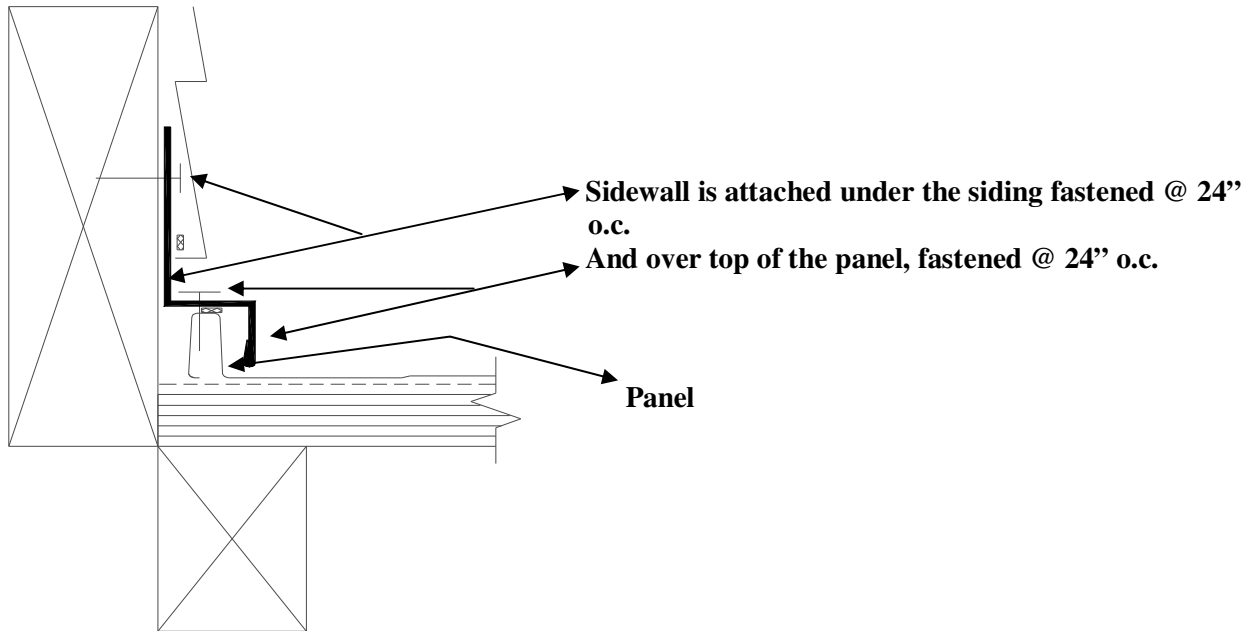
1. Cut the hole in the flashing 20% smaller than the pipe diameter.
2. Slide the flashing down the pipe.
3. Form the flashing to the roof profile.
4. Apply sealant around the perimeter of the underside of the flashing base and fasten to roof using #9 x 1 or #14 x 1 woodscrew fasteners 2" o.c.

## GAMBREL & SLOPE TRANSITION DETAIL



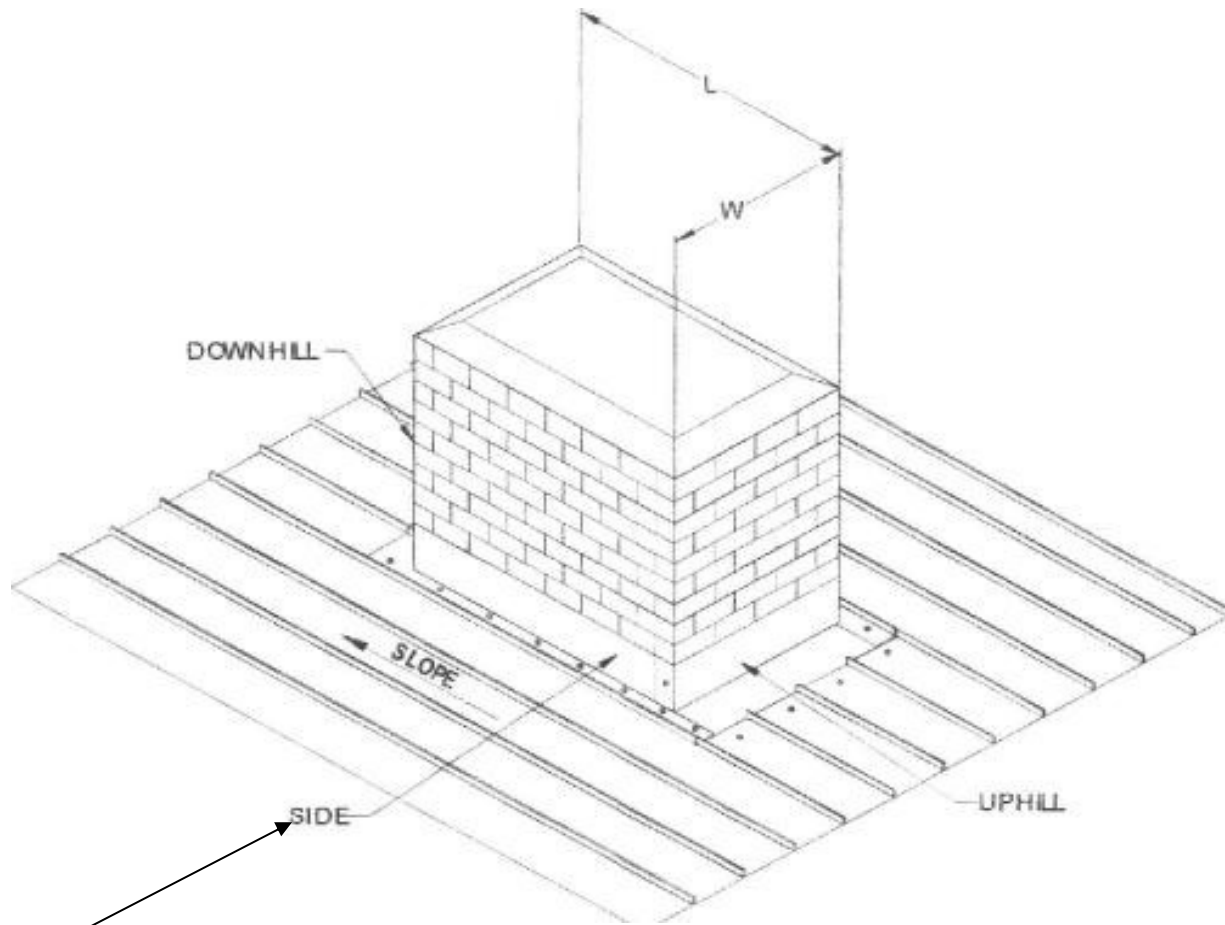
1. Roofing underlayment not shown.
2. **Bottom panels of the pitch change or transition must be installed first.**
3. Apply sealant to the bottom of the foam closure and set in place. Apply sealant to the top of the closure.
4. Install Pitch Change trim using stitch screws to each rib seam of the bottom transition panels.
5. Apply sealant as indicated above.
6. ***Notice***  
Depending on which transition that you are making, transition #1 you will want your top panels 4 to 6" shorter & transition #2 the bottom panels will be 4 to 6" shorter (see detail)

# SIDEWALL DETAIL



1. Roofing underlayment is the dotted line.
2. Install sidewall flashing as shown.
3. When more than one length of endwall trim is needed, a 6" minimum overlap is recommended with sealant between the laps.

# SKYLIGHT & CHIMNEY FLASHING PREPARATION



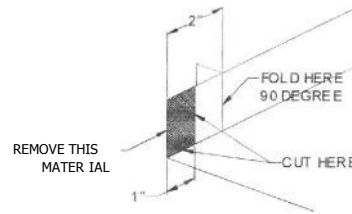
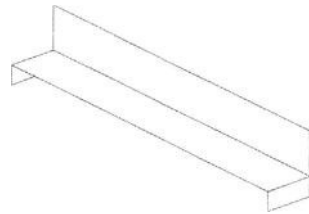
SEE DETAILS ON SIDEWALL FLASHING FOR SIDE OF CHIMNEY.

TOP & BOTTOM DETAIL ON THE FOLLOWING PAGES.

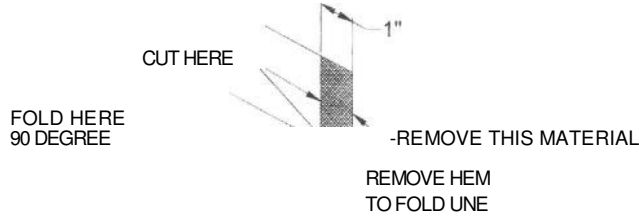
# SKYLIGHT & CHIMNEY FLASHING

## PREPARATION

### Detail A



**Detail C**

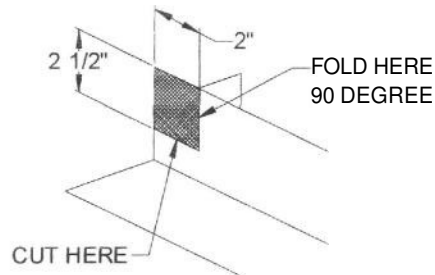
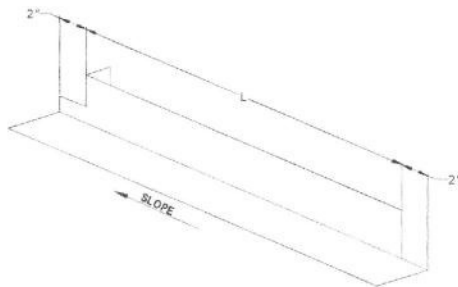


**Notes:**

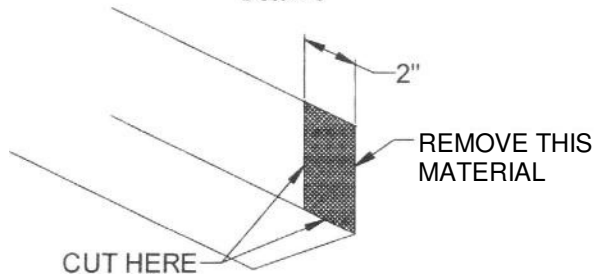
1. Trim both ends of the uphill and downhill sides of the skylight flashing as indicated.
2. Slide the uphill flashing into the slots of the Eco-Lock roofing and apply liberal amount of sealant.
3. Assemble the skylight as indicated below.
4. Trim and assemble chimney flashing similarly.

## SKYLIGHT & CHIMNEY FLASHING PREPARATION

### Detail B



**Detail C**



**Notes:**

1. Trim and bend the right side skylight flashing as indicated.
3. Trim the left side in a similar fashion. (Keep in mind the up from the downhill ends.)

## Key Terms

### **CHIMNEY OR SKYLIGHT**

See pages 23-26.

### **EAVE TRIM**

This piece is used at the eave or gutter edge of the building, and **must be installed before any panels**

### **ENDWALL**

This piece is used when the upper end of panel butts into a vertical wall.

### **HIP CAP**

This piece covers projecting angles formed at the intersection of the two sloping roof planes.

### **FASTENERS**

#### **3/4" Stitch Screw**

This fastener is used to attach two pieces of metal to each other.

#### **#14 x 1" Mill Point**

This fastener is used to fasten into panel near ridge, and can also be used for secure flashings and pipe boots.

#### **#8 x 1" Pancake Wood Fast**

This fastener is used to attach roofing panels to the roof deck. (Used to fasten into Eco-Lock fastener strip.)

#### **#9 x 1" Wood Fast**

This fastener is used to fasten flashing to fascia boards at eave or gable.

### **GABLE TRIM**

This piece is installed on the house between the ridge and the eave, holding down the first panel edge and the last panel edge.

### **GAMBREL CONDITION**

This trim is used to transition from a low slope on the upper roof to a steep slope on the lower roof.

### **MONOSLOPE RIDGE**

This piece is used at the top of a single sloped roof.

### **RIDGE CAP**

This piece is used at the peak of the roof. The ridge can be ventilated by leaving the foam closure out.

### **SIDEWALL**

This piece is used when the roofing panel is installed parallel to a vertical wall.

### **SLOPE TRANSITION**

This piece is used where two roofs of different pitch meet; the top section being steeper than the lower section.

### **W-VALLEY**

Used to flash the valley formed by intersecting roof planes.