

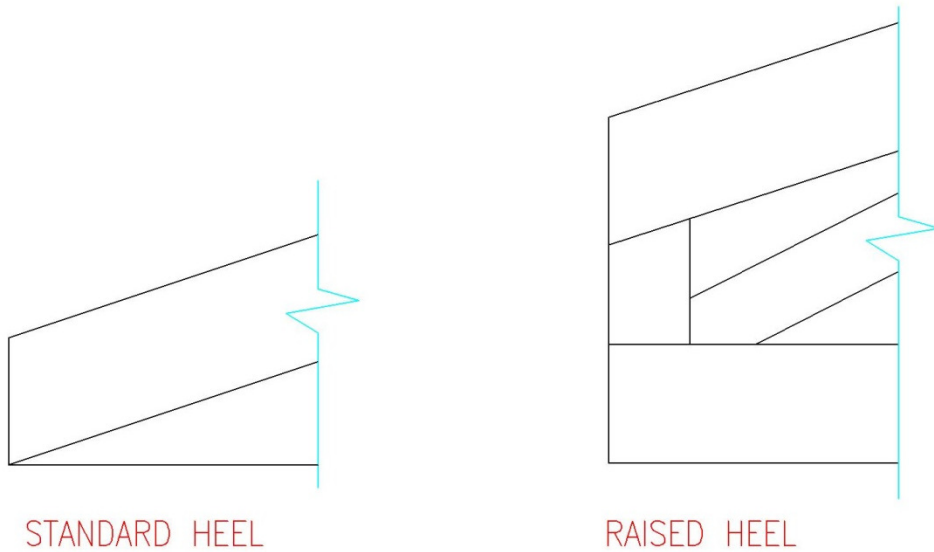
## Chapter 55: Side and End Overhang(s) - Enclosed



### Most Common Mistakes:

1. Expecting end trusses to have “tails”.
2. Placing beveled edge purlin below truss tails.
3. Locating “standard heel” end truss tops at same height as interior trusses.
4. Beveled edge and fascia purlin top edges not bevel cut to match roof slope.
5. Failure to notch end trusses into columns.
6. Not properly adjusting end truss first rake purlin spacing to compensate for lowered truss.
7. H-1 brackets omitted or not fully nailed.
8. Purlin (soffit support) blocks not cut for a snug fit.
9. Purlin (soffit support) blocks not set to overhang end truss nailer by 2”.
10. End trusses not set to stringline prior to cutting overhanging rake purlins to length.
11. Improper length of overhang(s).
12. Failure to install fly rafters and beveled fascia purlins with “crown” up.
13. Beveled fascia purlins not installed behind fly rafters.
14. Improper roof steel overhang past beveled fascia purlin.
15. Inside closures omitted from on top of beveled edge purlin.
16. Truss tails not properly trimmed around prior to wall steel installation.
17. Fascia purlin trims overlapped or caulking not placed behind splices.
18. Improper trim used for fly rafter lowers.
19. J Channel or fly rafter lower trims overlapped or caulking not placed behind splices.
20. Corner trims not properly cut at top.
21. Soffit panels installed other than perpendicular to sidewalls.

Endwall trusses with standard heels are designed to be set lower than common (interior) trusses by rake purlin thickness. In cases where trusses have a “raised heel”, end truss overall height may have been adjusted to compensate for rake purlin thickness. Measure end of raised heel trusses to verify. **See Figure 55-1**



**Figure 55-1 Standard vs. Raised Heel**



**Raised Heel Trusses**



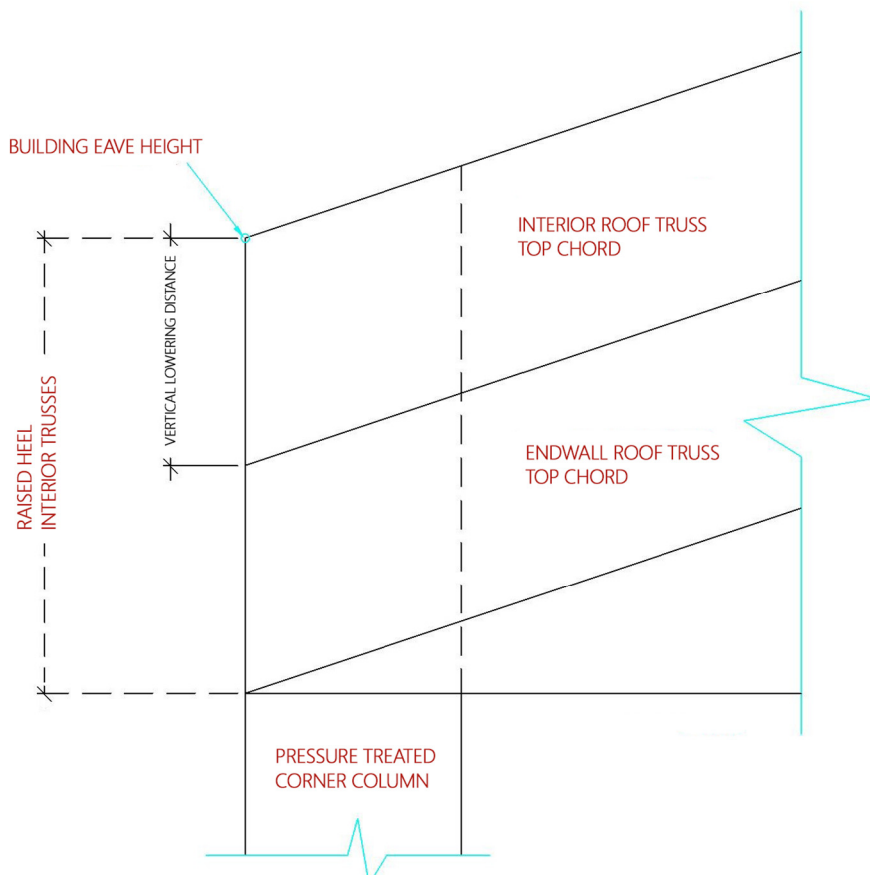
With proper planning, easily made errors can be avoided.

Lower endwall trusses as follows:

First, determine difference in height, on columns, between interior and endwall trusses.  
**See Table 55-1 and Figure 55-2**

**Table 55-1**  
**Vertical Lowering Distance**

Roof Slope	Rake purlins (inches)		
	2x6	2x8	2x10
2/12	5-9/16	7-3/8	9-3/8
3/12	5-11/16	7-1/2	9-1/2
4/12	5-13/16	7-5/8	9-3/4
5/12	5-15/16	7-7/8	10
6/12	6-1/8	8-1/8	10-5/16
7/12	6-3/8	8-3/8	10-11/16
8/12	6-5/8	8-3/4	11-1/8

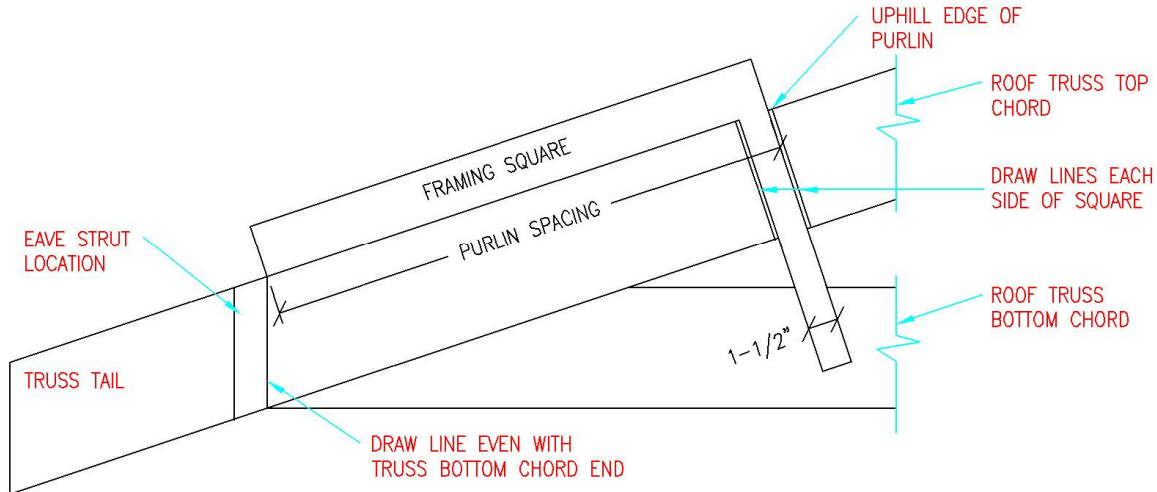


**Figure 55-2 Vertical Lowering Distance**

**Example:** At a 4/12 roof slope, with 2x6 rake purlins, end trusses will be placed 5-13/16" lower (measured vertically) than interior trusses.

Yes, we realize vertical lowering distances may “not seem right”. Trust us on this one, we’ve “done our math homework” and have also done thousands of buildings exactly this way - these dimensions DO work.

Fully recessed purlin layout still begins with eave strut location. Eave strut location is same with or without overhangs. **See Figure 55-3.**



**Figure 55-3 Beveled Eave Strut Location**

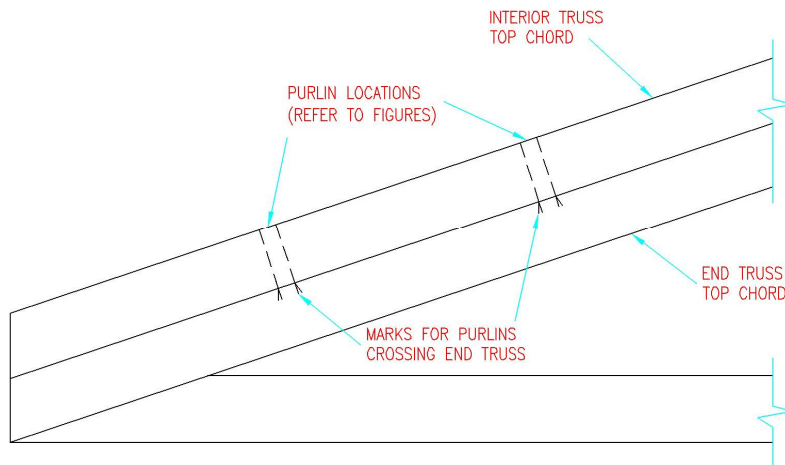
After laying out fully recessed purlin locations on interior trusses lay one of interior trusses flat on ground. Place an endwall truss on top of interior truss, holding end truss top chord vertical lowering distance (indicated in table above) *lower than interior truss top*.



**IMPORTANT:** Align two truss ends.

Working from lines drawn on interior trusses for fully recessed purlin locations, mark on endwall truss top where pencil lines on interior truss are at intersection of these two trusses. **See Figure 55-4**

This will be rake purlin locations as they cross endwall.



**Figure 55-4 Marking Rake purlin Locations**

As an alternative to this marking, a similar procedure to **Chapter 9** can be followed, with this immediately following exception.

Using **Table 55-2** ADD length shown (Example: 4/12 slope and 2x6 rake purlins = 1-13/16") to FIRST RAKE PURLIN SPACING ONLY, and draw marks on truss top accordingly.

Balance of rake purlins will be on *standard purlin spacing* from **first pair of marks**.

**Table 55-2**

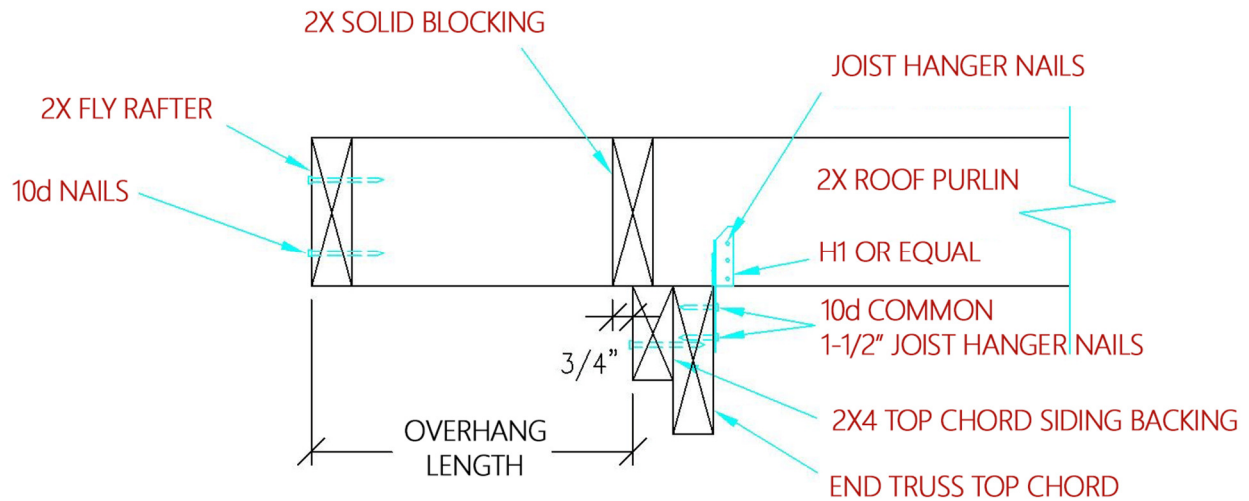
Roof Slope	ADD TO FIRST RAKE PURLIN SPACING		
	Rake purlins (inches)		
	2x6	2x8	2x10
2/12	7/8	1-3/16	1-1/2
3/12	1-3/16	1-13/16	2-5/16
4/12	1-13/16	2-7/16	3-1/16
5/12	2-5/16	3	3-7/8
6/12	2-3/4	3-5/8	4-5/8
7/12	3-1/4	4-1/4	5-3/8
8/12	3-11/16	4-13/16	6-3/16

Install H-1 hangers on endwall truss inside face at each rake purlin crossing location. Bracket portion receiving rake purlin will point outward toward endwall.

**See Figure 55-5**



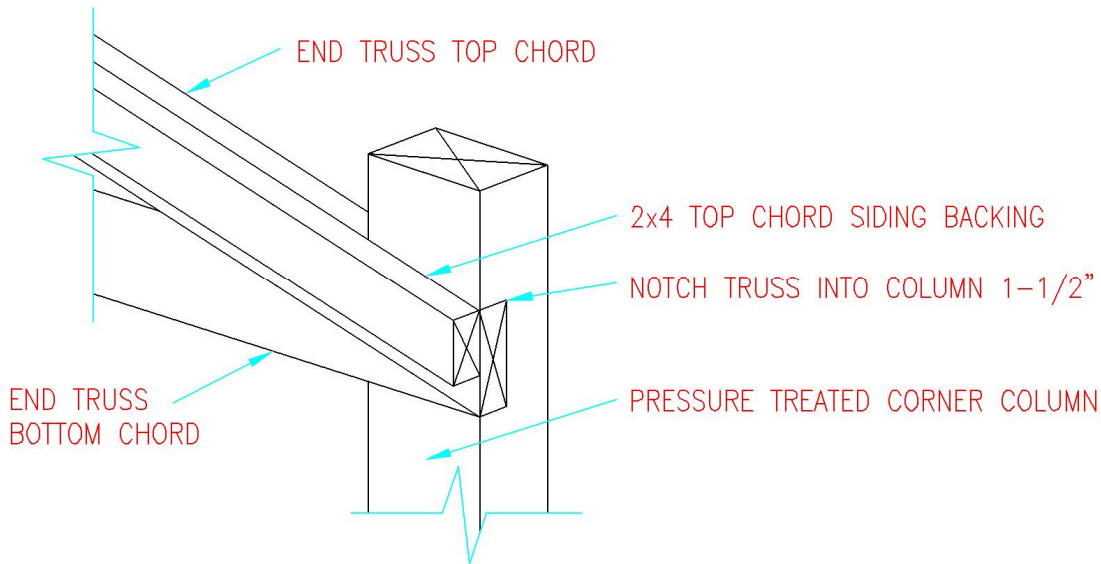
**H-1 installed on inside of end truss**



**Figure 55-5 H-1 Hangers to End Truss**

Install endwall truss into notches cut into corner and endwall columns. Remembering to have lowered end trusses on columns by appropriate distance below interior truss level.

**See Figure 55-6**



**Figure 55-6 End Truss at Corner**



**Beveled fascia purlin and beveled eave struts are installed perpendicular to ground**, avoid rotating to be perpendicular to roof angle.



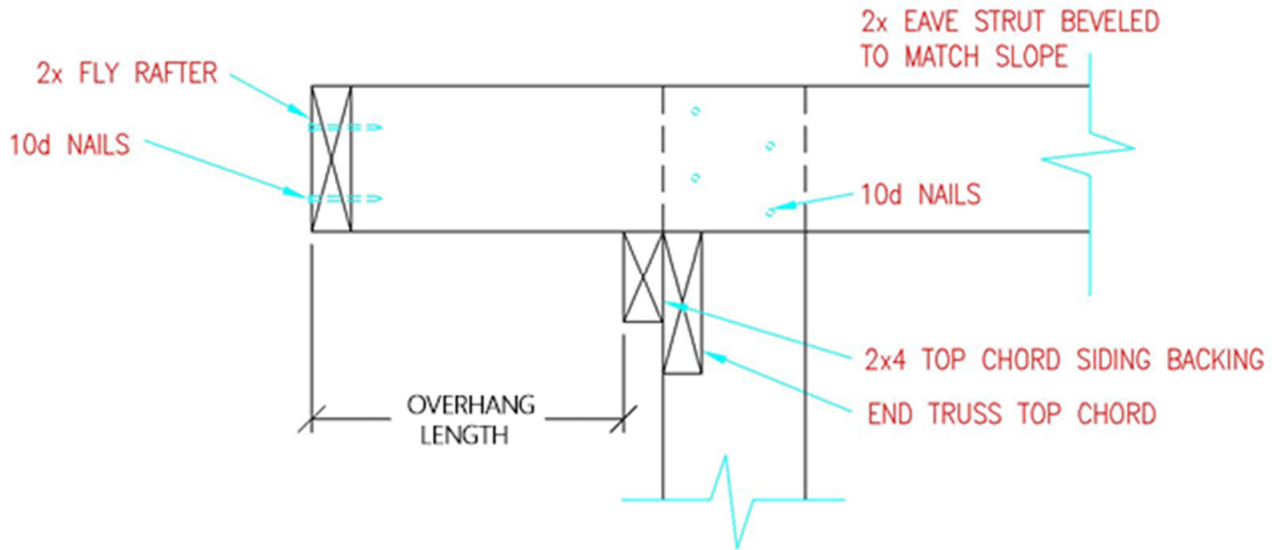
Beveled fascia purlins and beveled eave struts are installed with top edge in same plane as roof fully recessed purlins, they do NOT install below trusses. Beveled fascia purlins are only on eave sidewalls.

At corners, beveled eave struts nail to corner column, with eave strut (purlin) projecting PAST corner column outside edge to support fly rafter). At sidewall columns, eave struts nail to remaining (unnotched) column portion and are joist hung to side of roof truss. Attach to columns with 6-10d common nails minimum.



For instances of a shed or wing only, where end truss or rafter is on column face (no 2x4 top chord siding backing is then required), end overhang length is to be measured from face of end truss or rafter.

Install eave struts level in end bays first. **See Figure 55-7**



**Figure 55-7 Eave Strut Overhang**



Install rake purlins over endwall truss top into previously installed H-1 brackets.



Before nailing rake purlins into place, verify endwall trusses are plumb and overall roof length (from end truss outside to end truss outside) is equal to building length.

Pre-cutting rake purlins to length now will save trimming later.

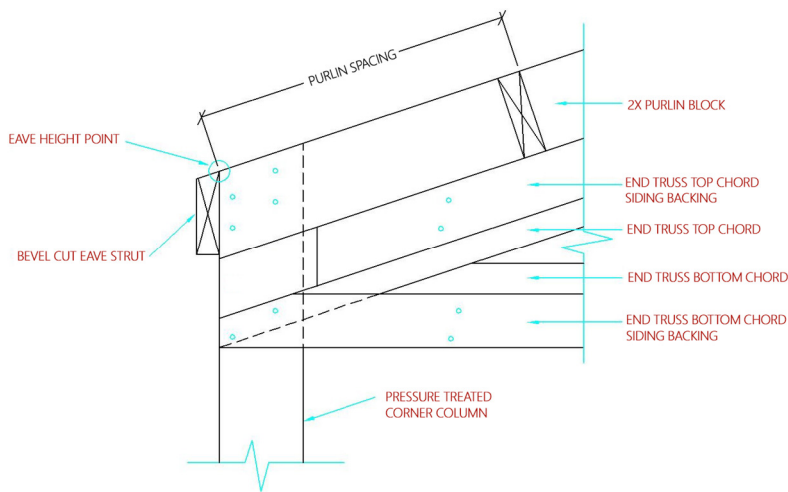
IF corner column and next column along sidewall are perfectly plumb, and column spacing is “right on money”, this can save time.

Rake purlin length will be distance from first truss pair face, to endwall truss outside edge, **plus** overhang distance.

Cut “purlin blocks” to fit between rake purlins and above endwall truss. **See Figure 55-8**

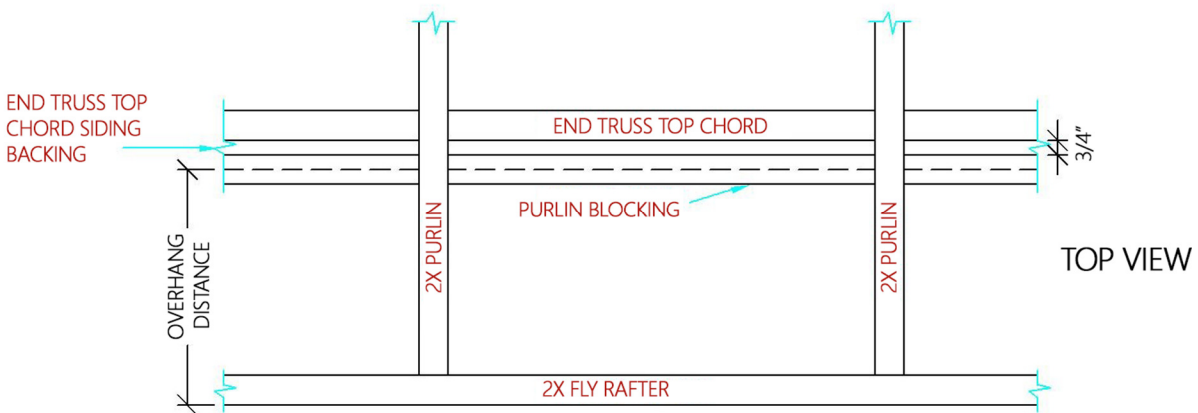
First block will be angle cut (on lower end) to fit snug against beveled edge purlin (even with outside edge of corner column).

Balance of blocks (until getting to ridge) can be square cut to length at rake purlin spacing less 1-9/16”.



**Figure 55-8 Purlin block Placement**

When installing purlin blocks, hold block inside face  $\frac{3}{4}$ " beyond outside edge of end truss face. **See Figure 55-9**

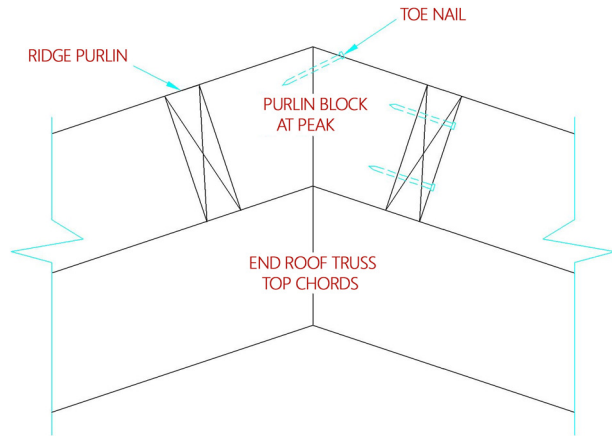


**Figure 55-9 Purlin blocking**





**IMPORTANT!** Do not neglect custom cutting small blocks to fit space between ridge rake purlin and peak. **See Figure 55-10**



**Figure 55-10 Purlin blocks Between Ridge Rake purlins and Peak**



If rake purlins were not pre-cut to length previously, trim now.

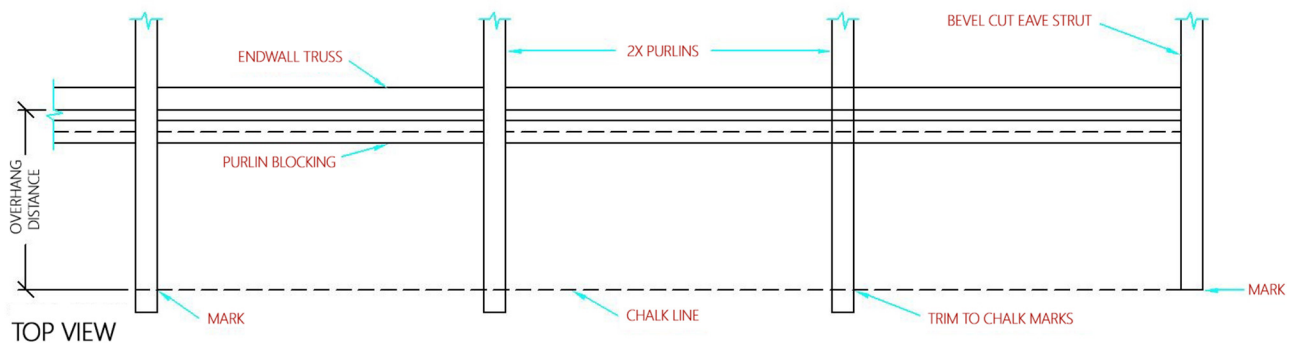


Before cutting, square roof and plumb endwall truss.

From endwall truss outside face, measure out overhang distance on both beveled edge purlin and ridge rake purlin.

Run a string line between these two points and place a mark on each rake purlin. A chalk line is handy for this. **See Figure 55-11.**

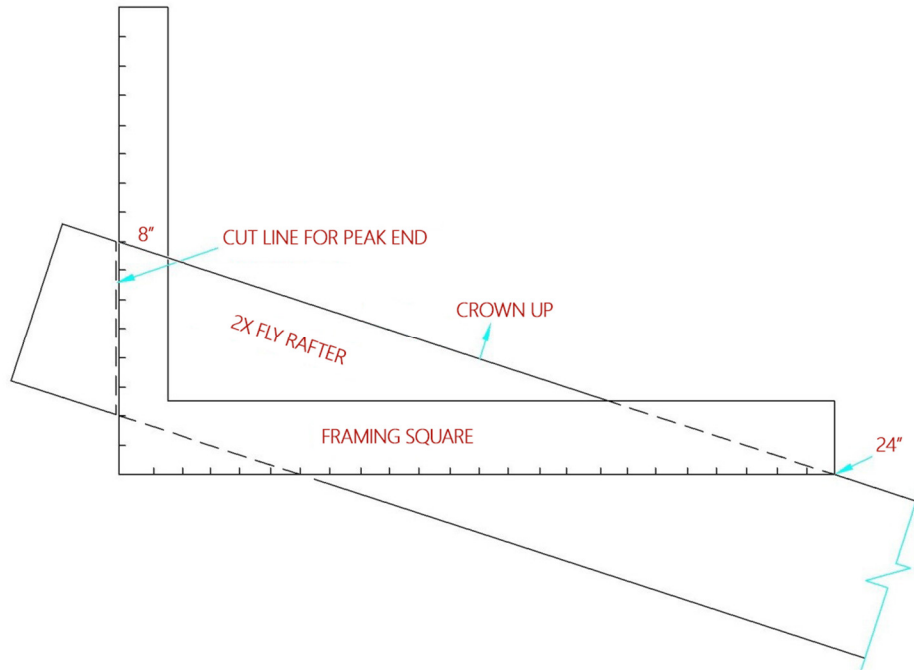
Trim rake purlins off vertically from this mark.



**Figure 55-11 Trimming Rake purlins**

If a choice exists between several boards to use for fly rafters, select ones as straight as possible.

Place boards with crown up, cut an angle on upper end to match roof slope (example shown is for a 4/12 roof slope). **See Figure 55-12**

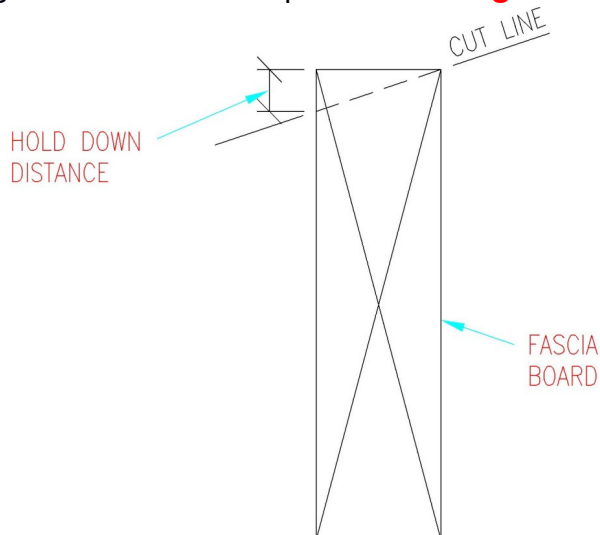


**Figure 55-12 Cutting Fly Rafter**

Nail fly rafter to overhanging rake purlin ends and eave struts (purlins).

If a choice exists between several boards to use for beveled fascia purlins, select ones as straight as possible.

Fascia purlins are to have upper edge bevel cut at an angle to follow roof slope (same as eave struts). This is easiest done with a table saw. Make sure to cut off from “crowned up” edge of beveled fascia purlins. **See Figure 55-13**



### Figure 55-13 Beveled fascia purlin Bevel Cut

“Hold Down” measurements are based upon 2x6 at 5-1/2”, 2x8 at 7-1/4”, 2x10 at 9-1/4”, 2x12 at 11-1/4”. If your lumber happens to be under these dimensions, subtract any under dimension amount from hold down listed in Table below.

Table 55-3 BEVEL CUT DISTANCE

Roof Slope	Hold Down
2/12	1/4"
3/12	3/8"
4/12	1/2"
5/12	5/8"
6/12	3/4"
7/12	7/8"
8/12	1"
9/12	1-1/8"
10/12	1-1/4"
11/12	1-3/8"
12/12	1-1/2"



Beveled fascia purlin is installed perpendicular to ground, not rotated to be perpendicular to roof angle.

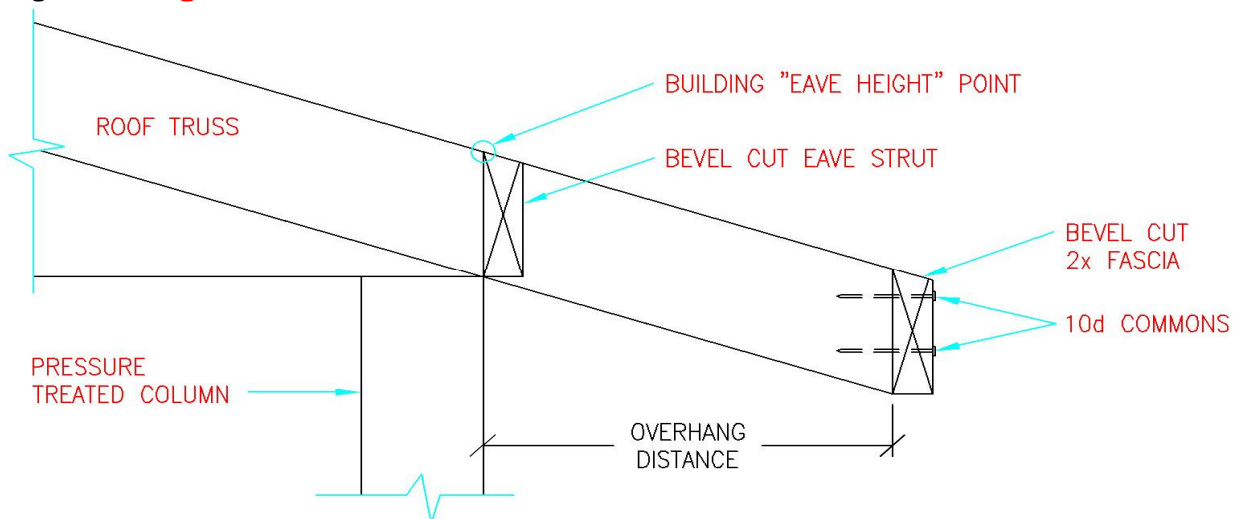


Beveled fascia purlins are installed with top edge in same plane as roof rake purlins. Beveled fascia purlins are only on eave sidewalls, not on endwalls.

**CAUTION**

*If this step is not followed carefully, roof steel will not lie properly and may “kink” at eave or fascia purlin.*

Any sidewall overhang “width” is measured parallel to ground, not with “roof run”. Overhang distance will be horizontal measure from sidewall column face to truss (or rafter) tail outside edge. **See Figure 55-14**



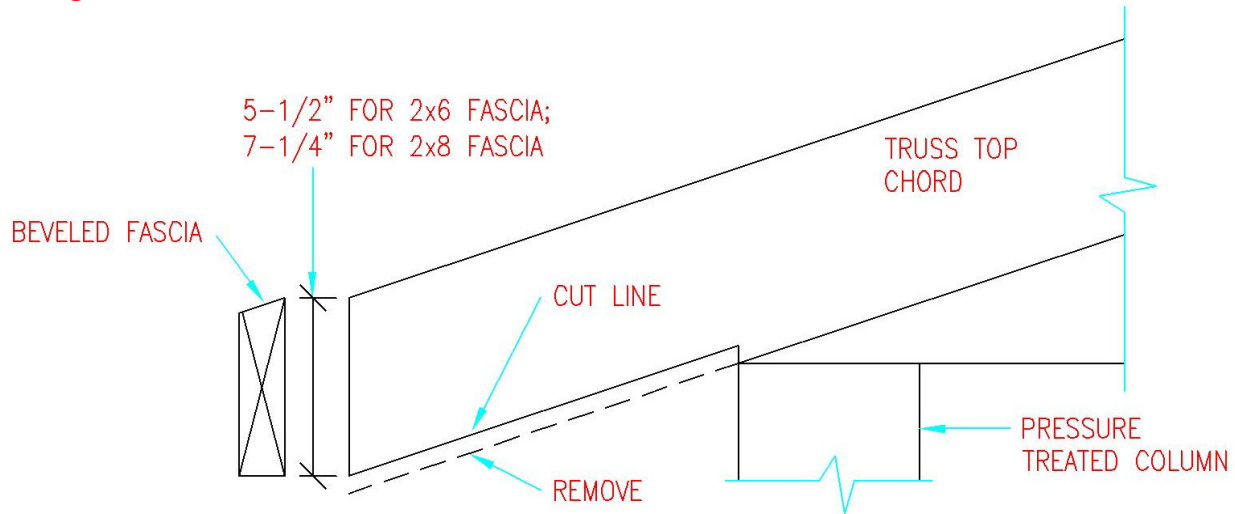
### Figure 55-14 Measuring Overhang Distance

Beveled fascia purlins will be installed one sidewall at a time, beginning with side most likely to be viewed. Straighten top of all columns on this eave side to a stringline.

If necessary, trim truss "tails" off at correct overhang distance measure.

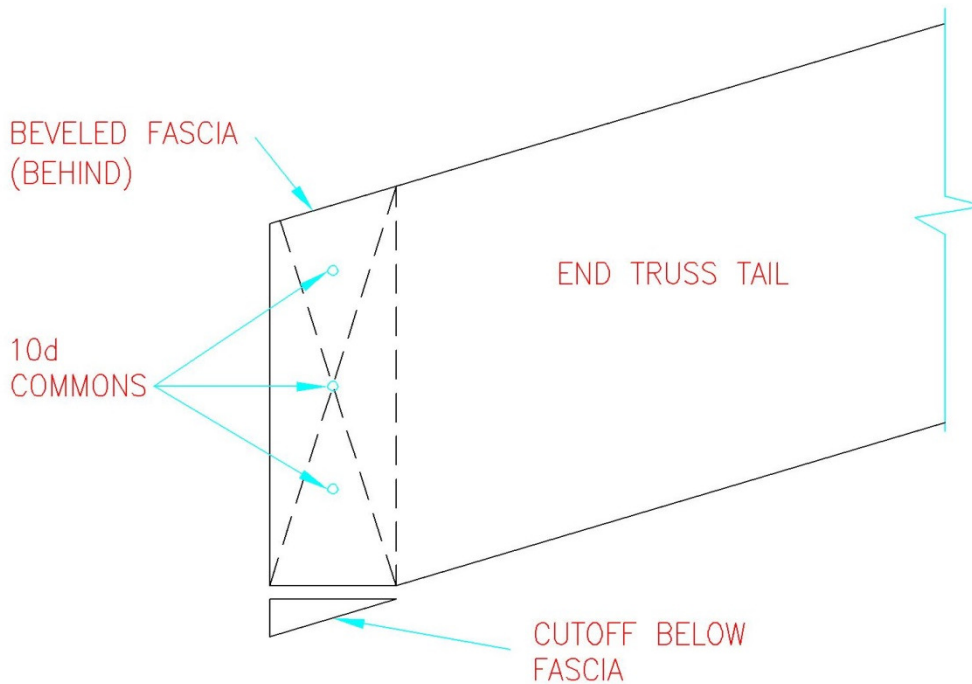
Cut off bottom edge of interior truss tails to match beveled fascia purlin inside height.

**See Figure 55-15**



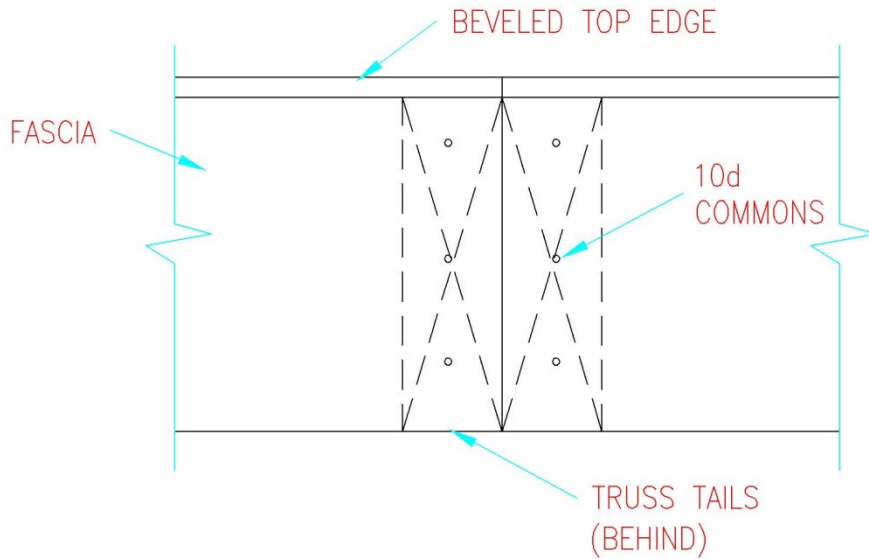
### Figure 55-15 Ripping Truss Tails to Overhang Distance

Cut off bottom edge of fly rafter to match bottom of fascia purlin. **See Figure 55-16**



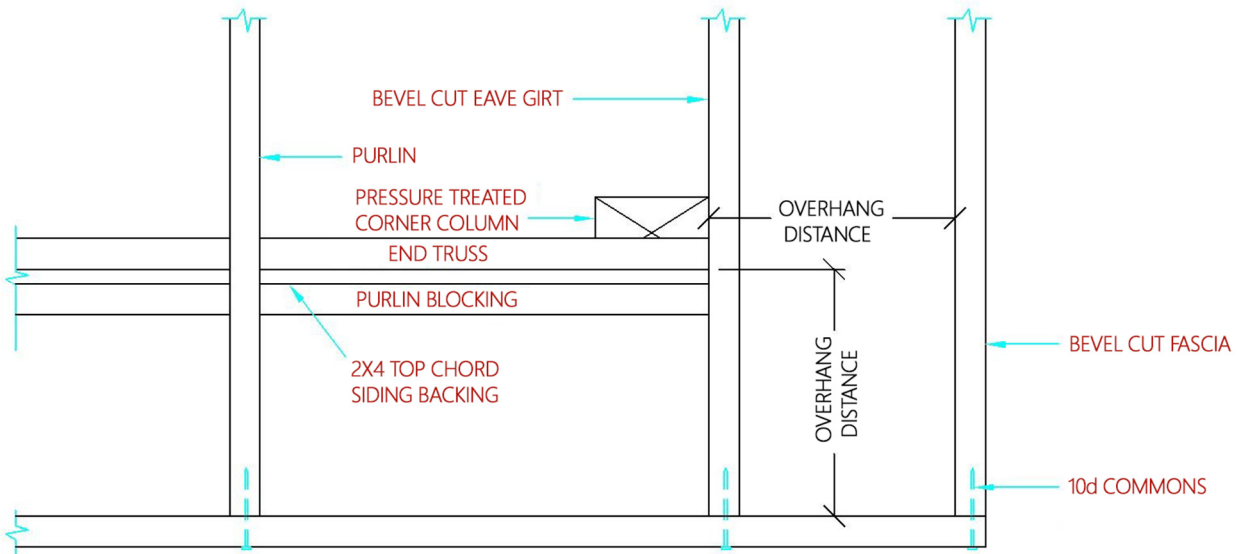
### Figure 55-16 Trimming Bottom Edge of End Truss Tail

Nail beveled fascia purlins to interior truss tails ends (crowned up) with 10d commons.  
**See Figure 55-17**



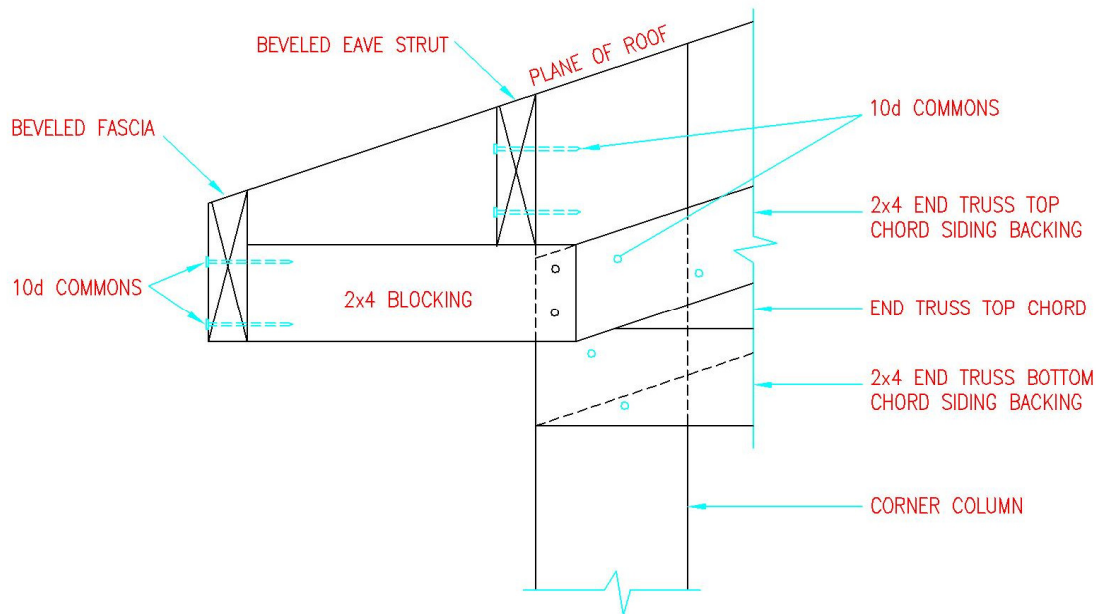
**Figure 55-17 Nailing Beveled fascia purlins to Interior Truss Tail Ends**

Install beveled fascia purlin (crowned up) from first overhanging truss tail to fit behind fly rafter, nailing through end truss tail into fascia purlin end with 10d commons. Trim fly rafter even with beveled fascia purlin outside (downhill) edge. **See Figure 55-18**



**Figure 55-18 Fly Rafter/Fascia purlin**

A 2x4 backing block installs from fascia purlin back to face of end truss at corner column.  
**See Figure 55-19**



**Figure 55-19 2x4 Siding Backing Block**

### Installing Roof Steel

From a looks standpoint, recommendation is to install roof steel starting at rear endwall, working towards front (start steel at edge furthest away from home or street).



**Tip:** To maintain straight screw lines and avoid roof leaks, stack roof steel in a pile, mark screw locations (we've found a "dry erase white board" marker works well) and pre-drill steel sheets with a lesser diameter drill bit than screws. For best results, drill no more than four sheets at a time.

**Attempting to drill through large steel sheet quantities may result in damage to panels and cost money to replace!** 

Carefully remove any steel shavings caused by pre-drilling, from sheeting. Lift, do not drag, pre-drilled roof panels from stack (dragging will scratch paint surface).

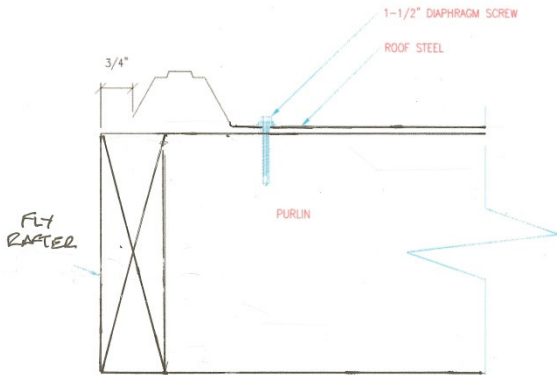
Roof steel installation process is best done with two or more persons. One person located at roof peak, standing safely on a ladder or scaffold inside building. Another person placed on building exterior at eave. An additional person on building interior on a ladder next to side wall is also helpful.

Distance from roof framing edge to first roof steel sheet edge is to be consistent from top to bottom. Otherwise, end wall is improperly aligned, straighten before roof steel can be properly applied.

**CAUTION**

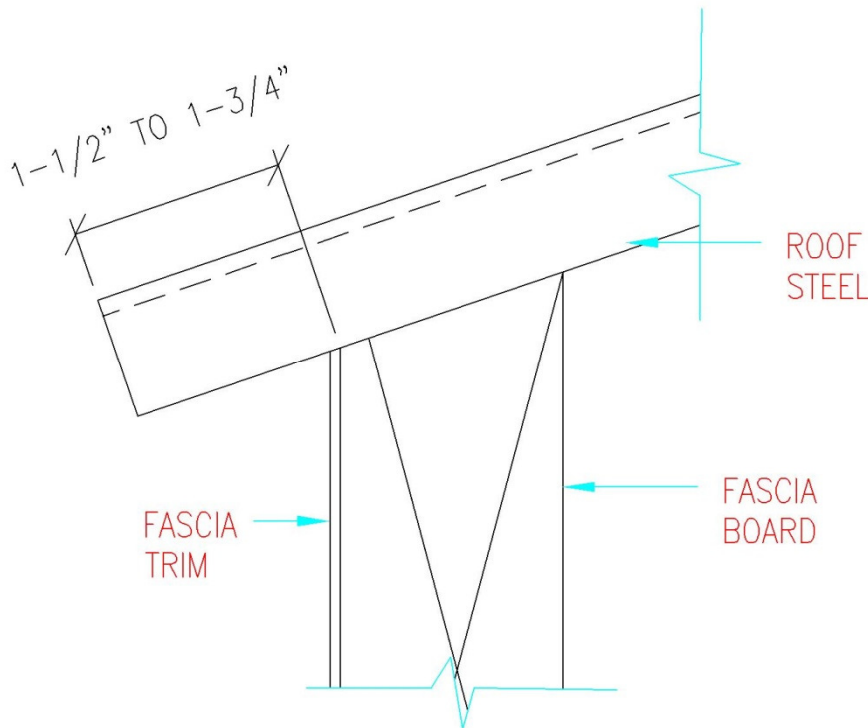
**First roof panel positioning is critical.** This panel establishes alignment and layout for installation balance. Accurately position and square before fastening.

Starting at roof edge, hold first steel sheet "overlap" edge even with fly rafter center. **See Figure 16-**



**Figure 55-20: Roof Steel First Panel**

Roof steel **MUST** extend past beveled fascia purlin **ONLY** by 1-1/2\" to 1-3/4\". **See Figure 55-21**



## Figure 55-21 Roof Steel Overhang Measurement

**Failure to adhere to these dimensions will cause a plethora of problems, including one or more of following: water to either flow behind or to shoot over any future gutter tops and/or ridge cap will not properly fit.**

For helpful installation tips read **APPENDIX IX, Straight Roof Steel Overhangs**



Place Inside (skinny) closure strips on beveled edge purlin (fascia board) tops below roof steel panels. Peel paper backing strips off adhesive and work closure strips into place. Strip ends will interlock at a major roof steel rib. Do this prior to installing any screw fasteners.



Roof steel is installed PRIOR to placing any trims on fascia purlins or fly rafters.



**IMPORTANT:** Install all soffit material and all wall trim (other than wainscot, eave light or corner trims) before installing any wall steel!



Cut soffit panels to overhang length (measured horizontally from soffit support face to beveled fascia purlin outside edge) **less 1/2"**. Yes, this means every piece has to be cut. Under no circumstance will soffit panels be run lengthwise.

Install endwall soffit material BEFORE installing trim. Use galvanized roofing nails, or staples to attach soffit to 2x4 soffit blocking underside and fly rafters.

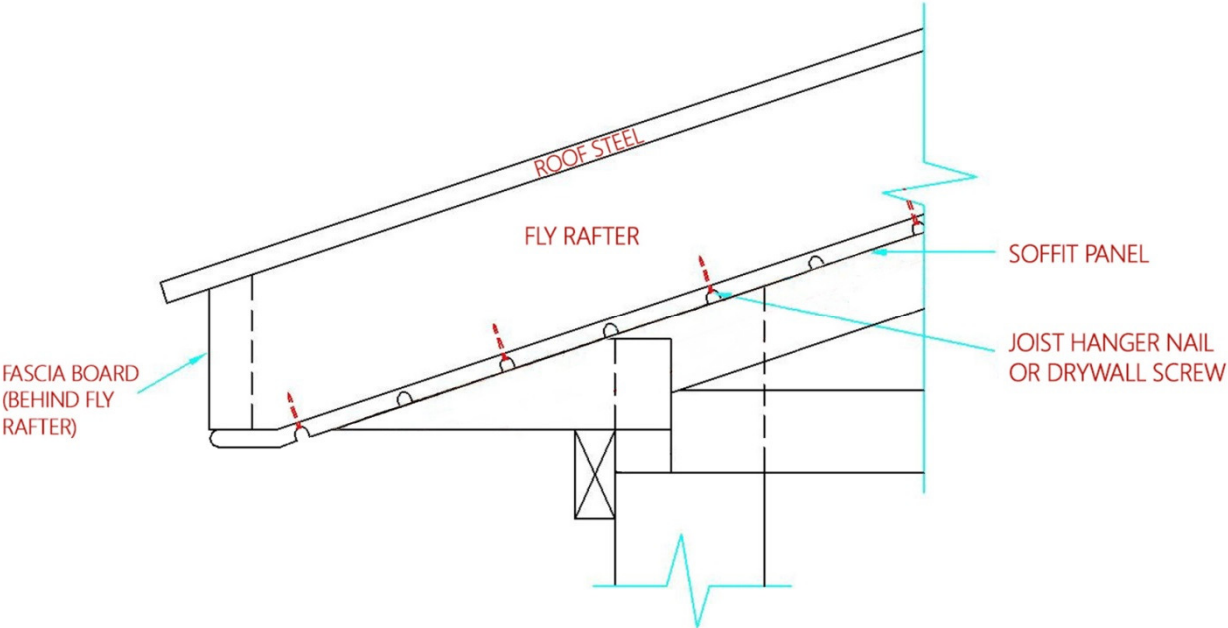


**IMPORTANT** – Soffit material ribs are at a 90-degree angle to building. On endwalls, ribs run same direction as rake purlins.

Install soffit panels, from one eave side to other, starting flush with outside edge of beveled fascia purlin. Provided temperatures are above freezing, an air-powered stapler may be used (set pressure low to avoid cracking soffit panels). Other acceptable fasteners are 10d common x 1-1/2" galvanized joist hanger nails or 1/2" drywall screws.

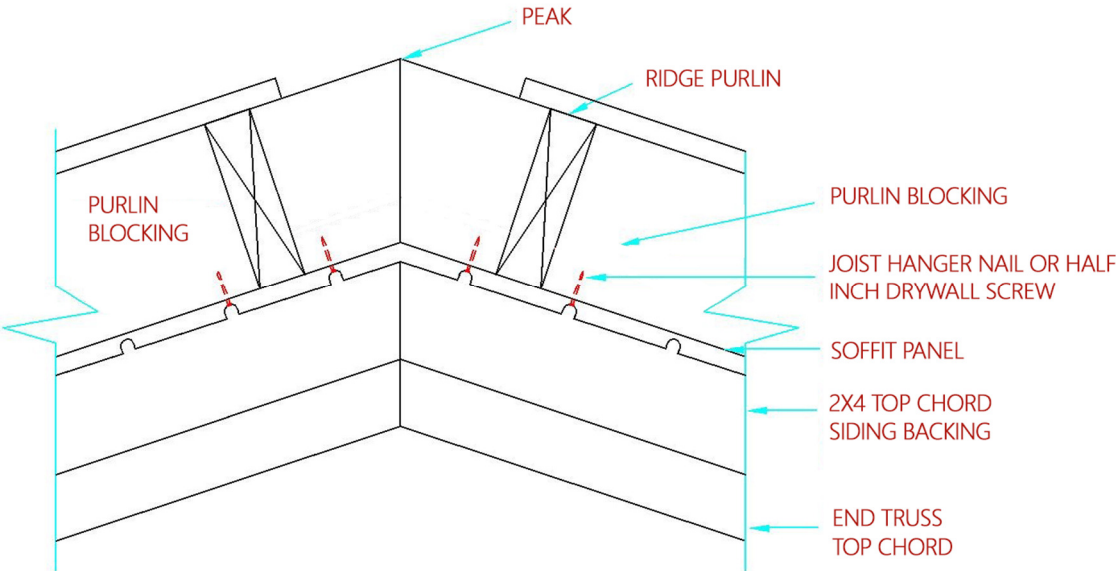


Position fasteners in nailing slot of underlap. Fully interlock each piece with previously installed panel. **See Figure 55-22**



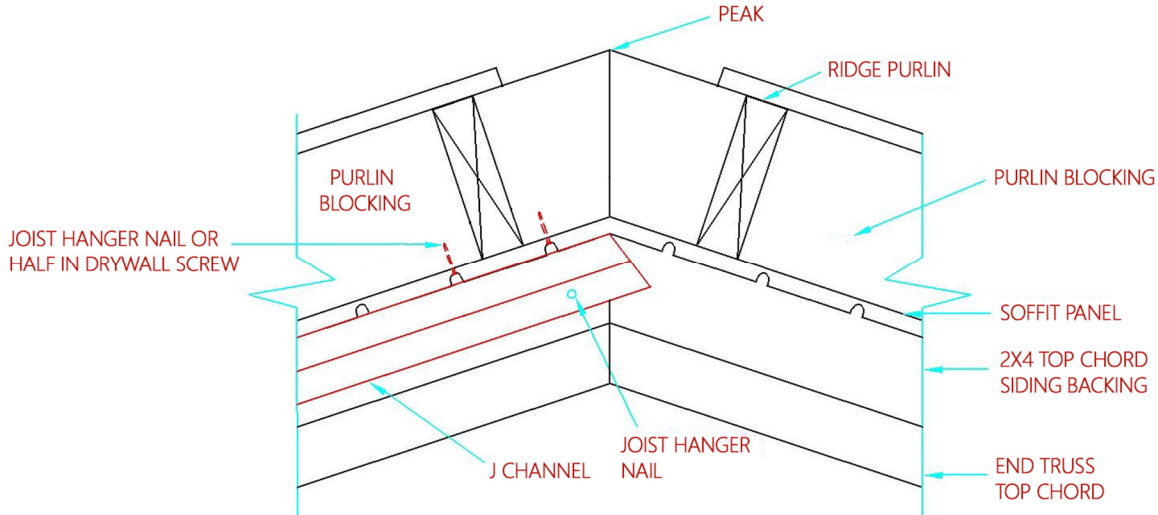
**Figure 55-22 Installing Soffit Panels**

Bend soffit panel at peak and continue towards opposite eave. **See Figure 55-23.**



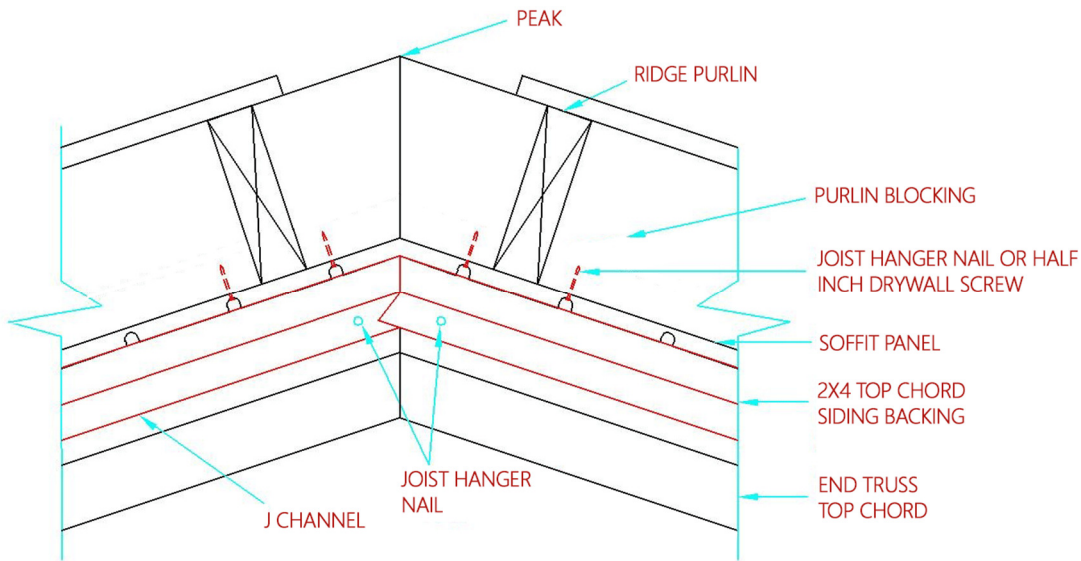
**Figure 55-23 Soffit Panels at Building Peak**

At opposite bevel cut fascia purlin, cut last soffit panel flush with fascia purlin outside edge. On building endwall face, tight below soffit panels, install J Channel with wide face against building and “open” side down (use 10d common x 1-1/2” galvanized joist hanger nails). Left side is installed with upper end square. **See Figure 55-24**



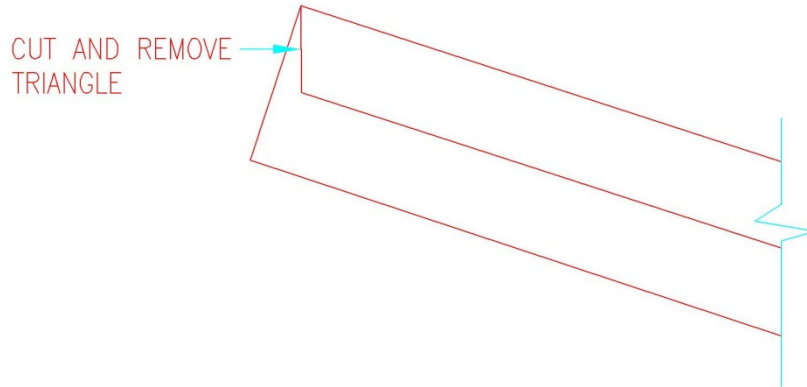
**Figure 55-24 J Channel to Soffit Panels**

Right side J Channel will have outer face cut at roof slope and will overlap left side J Channel. **See Figure 55-25**



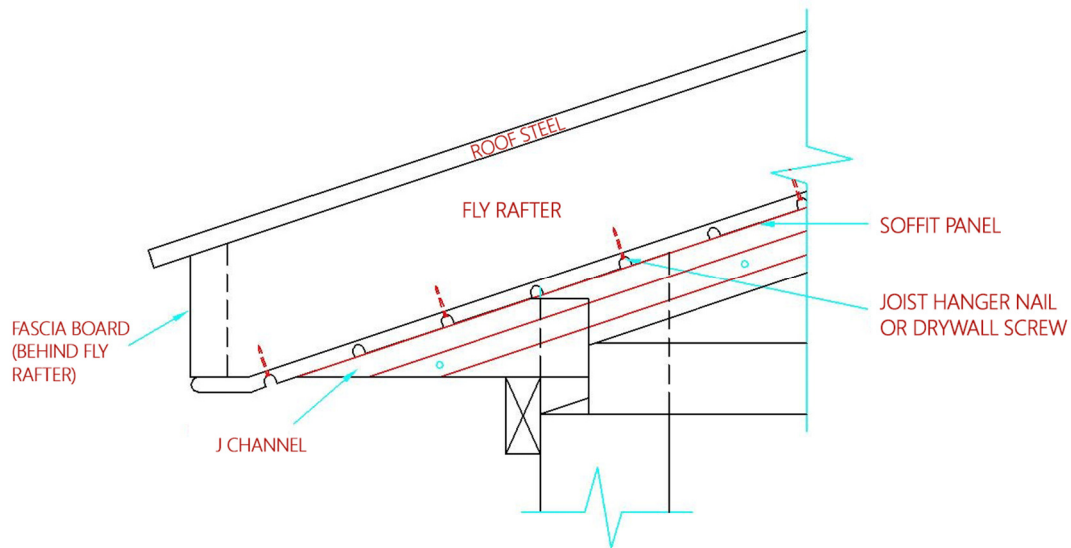
**Figure 55-25 Soffit Panel at Peak**

**See Figure 55-26**



**Figure 55-26 J Channel**

J Channel at low end will stop even with bottom of 2x4 blocking. **See Figure 55-27**

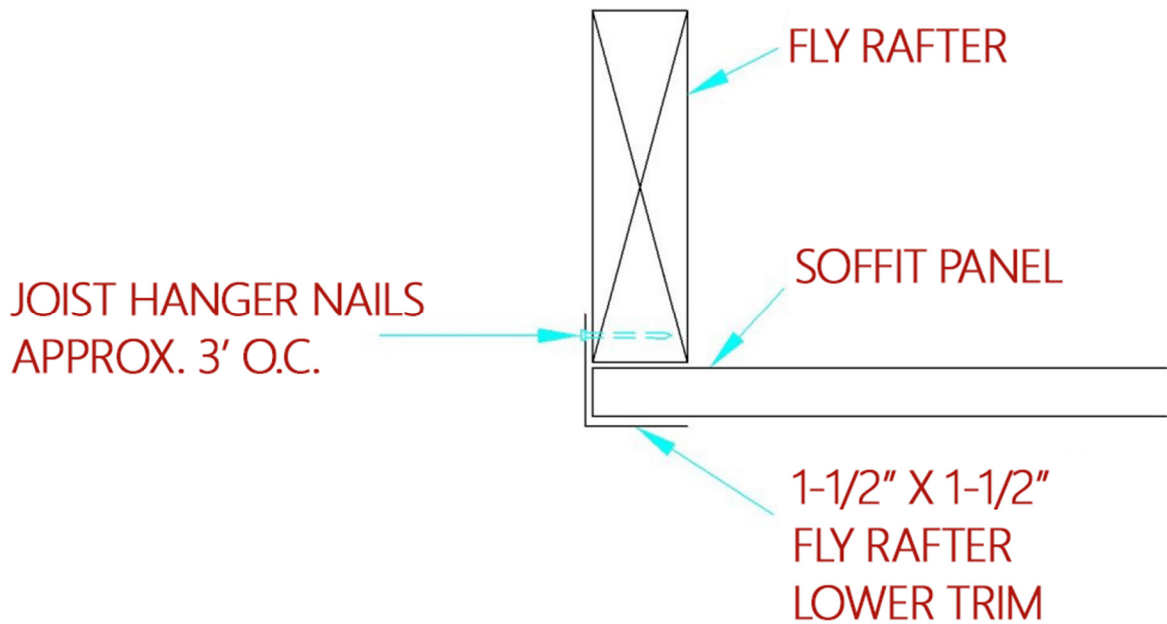


**Figure 55-27 J Channel at Low End**



J Channel trims do NOT overlap, other than beneath peak. Apply liberal amounts of caulking behind trims at butt splices.

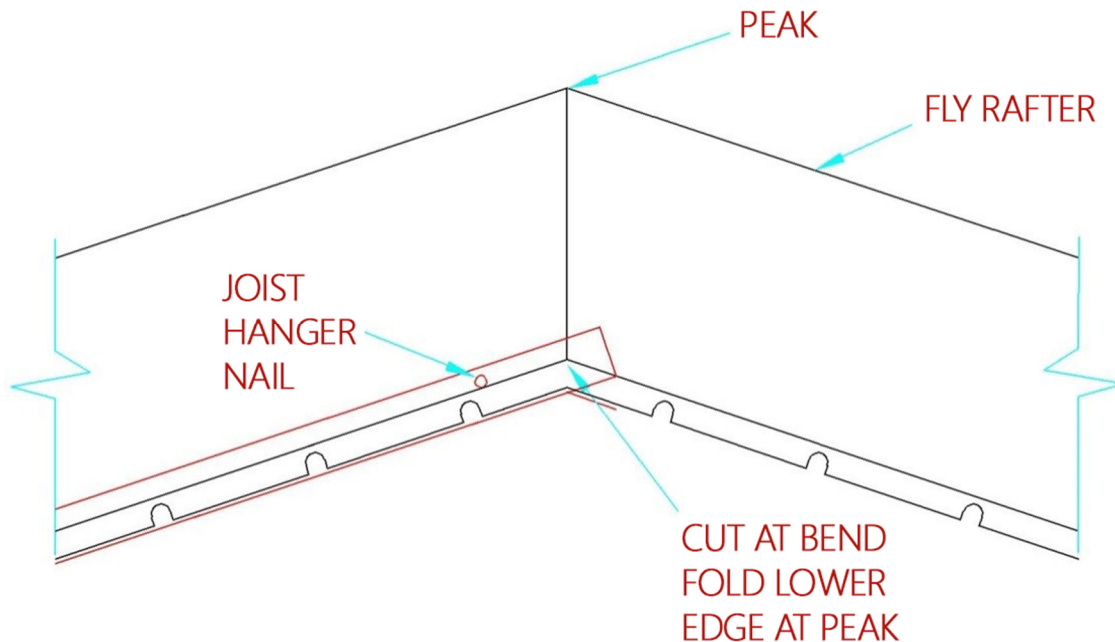
Install lower fly rafter trim. With a 2x6 fly rafter, this will be a 1-1/2" x 1-1/2" "L" shaped piece. With 2x8 fly rafter 1-1/2" x 3-1/2". **See Figure 55-28**



**Figure 55-28 Lower Fly Rafter Trim**

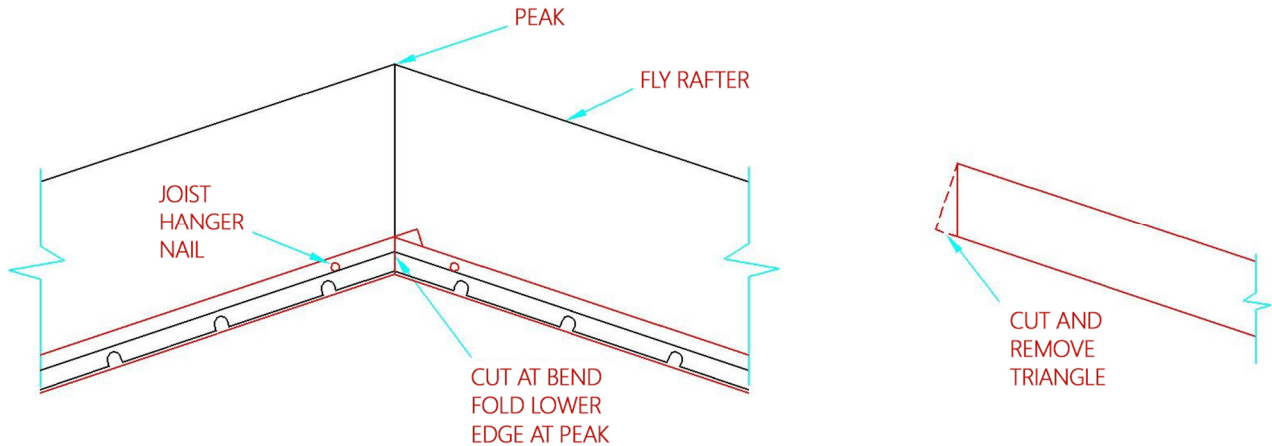
Push lower fly rafter trim up tight to soffit panels. Use widely spaced 10d common x 1-1/2" galvanized joist hanger nails, placed as close to lower fly rafter trim upper edge as possible, to hold until rake trim is installed. Lower fly rafter trims will be held in place by rake trim, to be installed after roofing is in place.

**See Figure 55-29**



**Figure 55-29 Lower Fly Rafter Trim to Soffit Panels**

See Figure 55-30

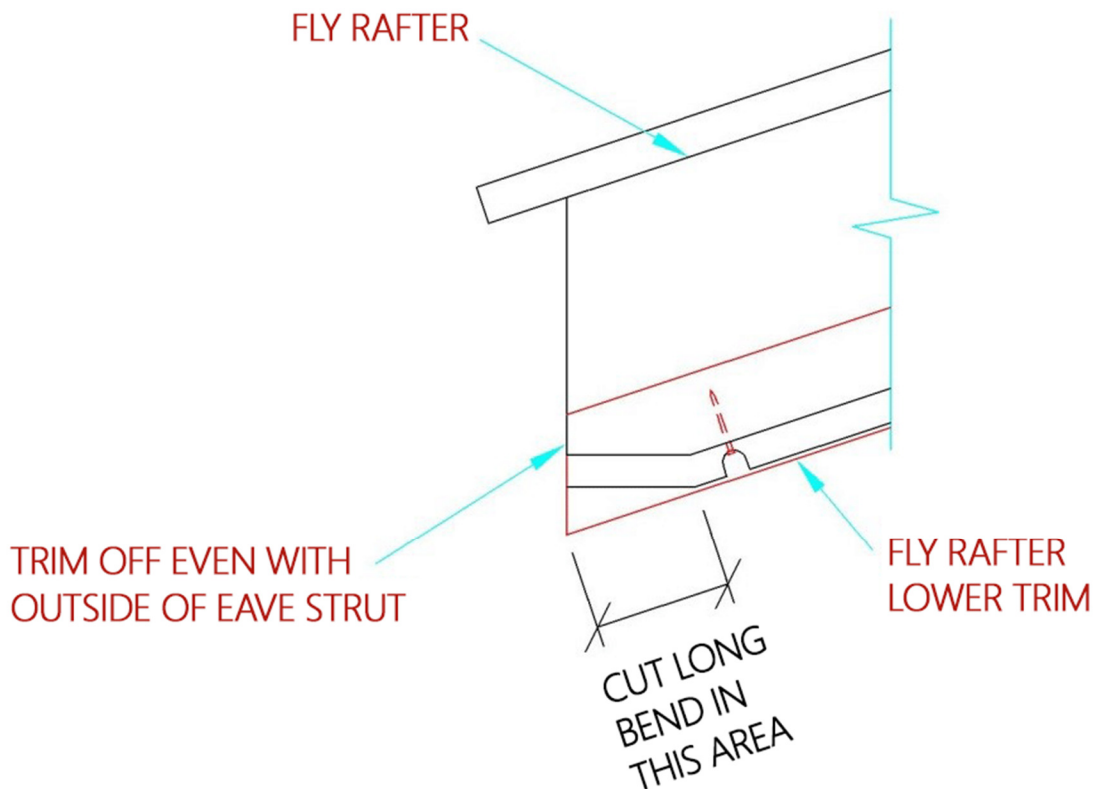


**Figure 55-30 Folding Lower Edge of Fly Rafter Trim at Peak**



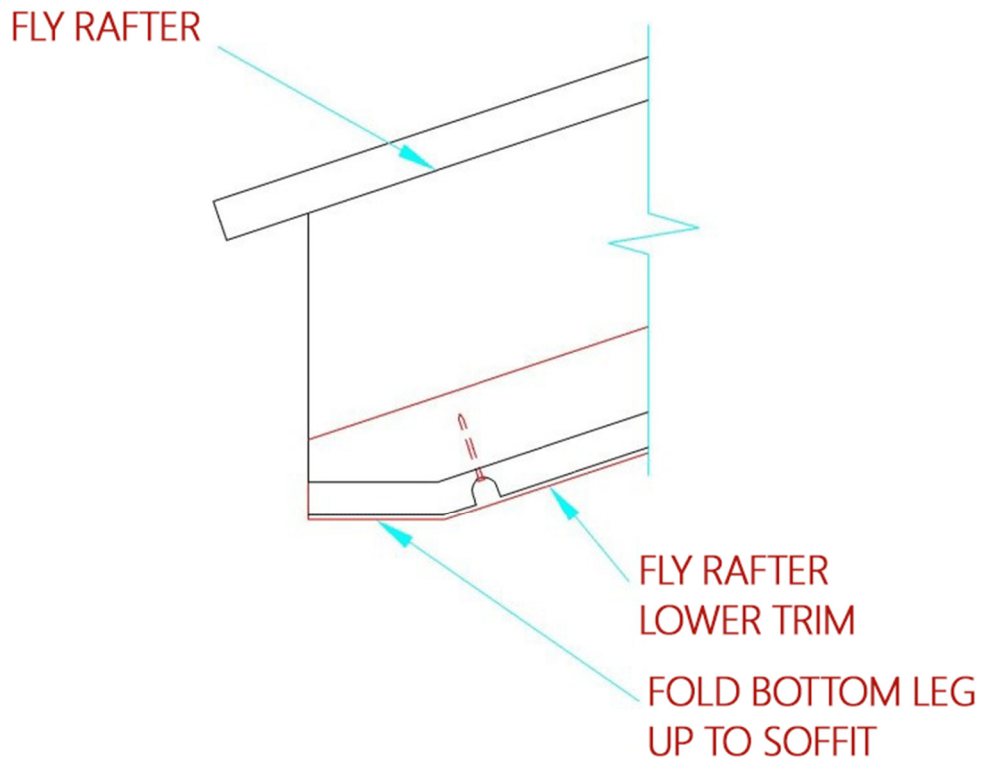
Lower fly rafter trims do NOT overlap, other than beneath peak. Apply liberal amounts of caulking behind trims at butt splices.

Cut “downhill” lower fly rafter trim end flush with fly rafter end. Cut along Lower Fly Rafter bend to “bend” in soffit panels. **See Figure 55-31**



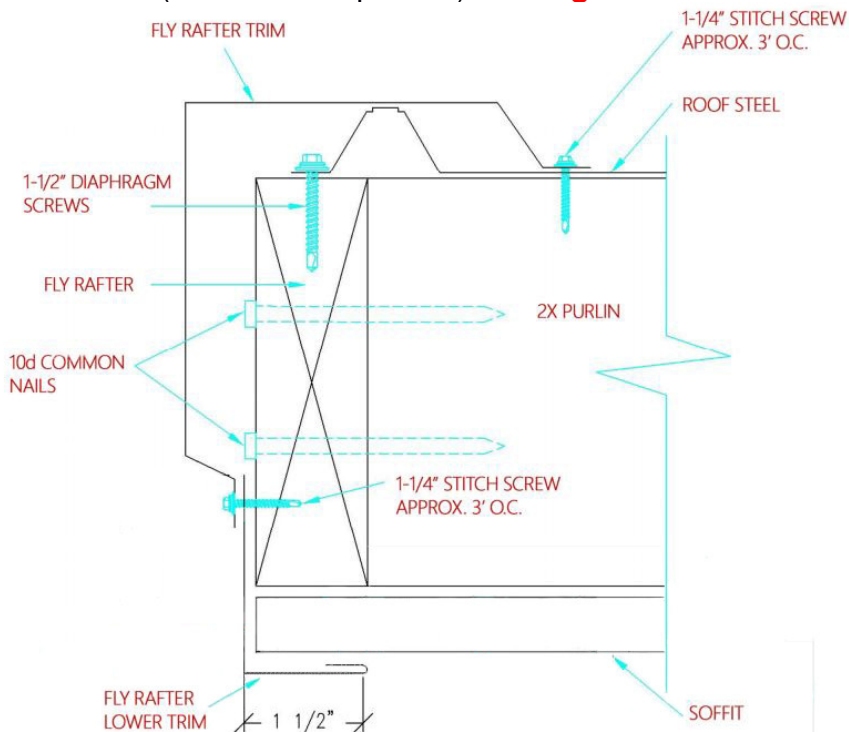
**Figure 55-31 Cutting Lower Fly Rafter Trim at Long Bend**

Fold bottom (horizontal) leg up to soffit at soffit panel bend. Cut off vertical face portion below folded up leg. **See Figure 55-32**



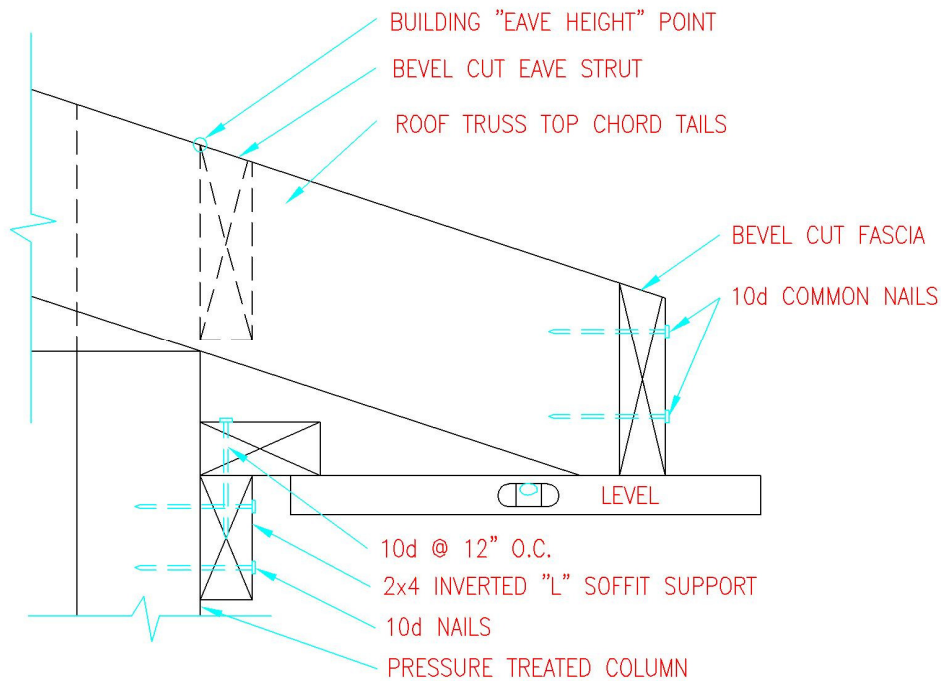
**Figure 55-32 Folding Bottom Leg of Lower Fly Rafter Trim**

Install rake trim (see also Chapter 22) **See Figure 55-33**



**Figure 55-33 Lower Fly Rafter Trim**

Install 2x4 inverted "L" soffit supports to sidewall columns. **See Figure 55-34**



**Figure 55-34 L Soffit Supports to Sidewall Columns**

For best results, level beveled fascia purlin bottom edge and 2x4 inverted “L” soffit support “inside”.

Before installing soffit panels straighten beveled fascia purlins and sidewall.



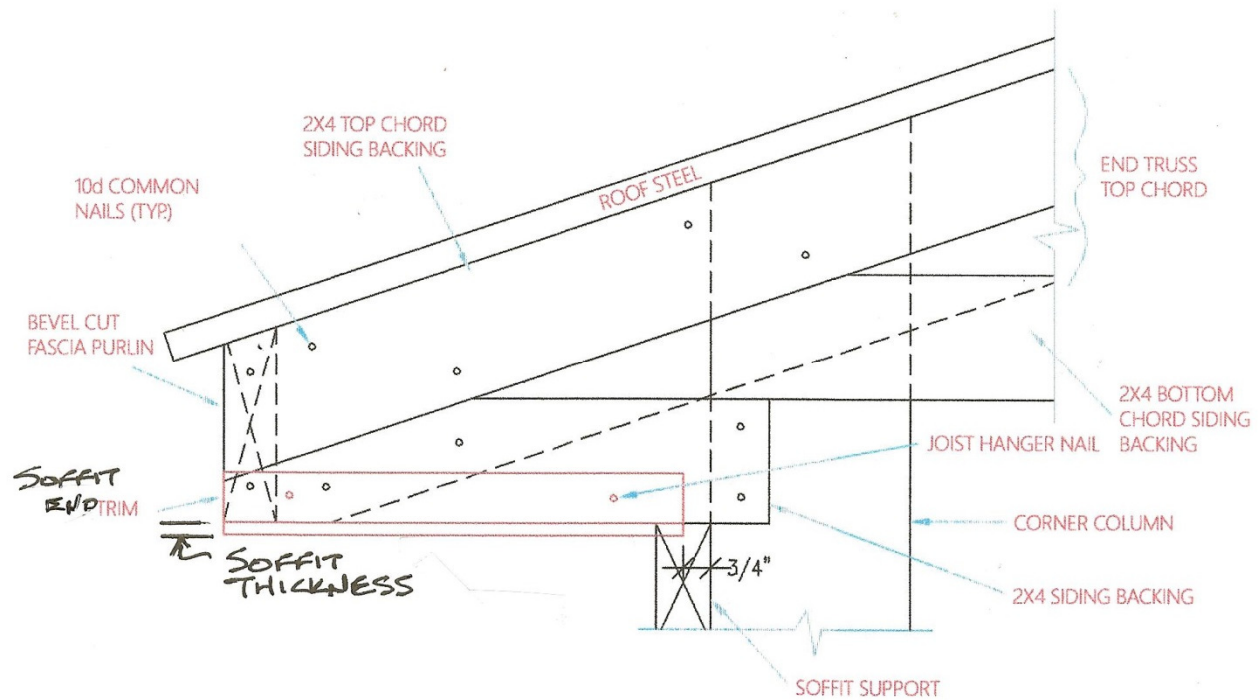
In any areas where beveled fascia purlin is either “in” or “out” from a straight line, remove roof screws. Push or pull beveled fascia purlin to straight, then reinstall screws.



Note: no framing is installed between eave strut and beveled fascia purlin.

Cut two soffit end trim pieces (one for each overhang end) sidewall overhang length plus  $\frac{3}{4}$ ". Soffit end trim bottom will be below 2x4 siding backing bottom by thickness of soffit (usually  $\frac{1}{2}$ "). Attach to 2x4 backing with 10d common x 1-1/2" galvanized joist hanger nails.

**See Figure 55-35**



**Figure 55-35 Soffit End Trim to Overhang Edges**



**IMPORTANT:** Install all soffit material and all wall trim (other than wainscot, eave light or corner trims) before installing any wall steel!

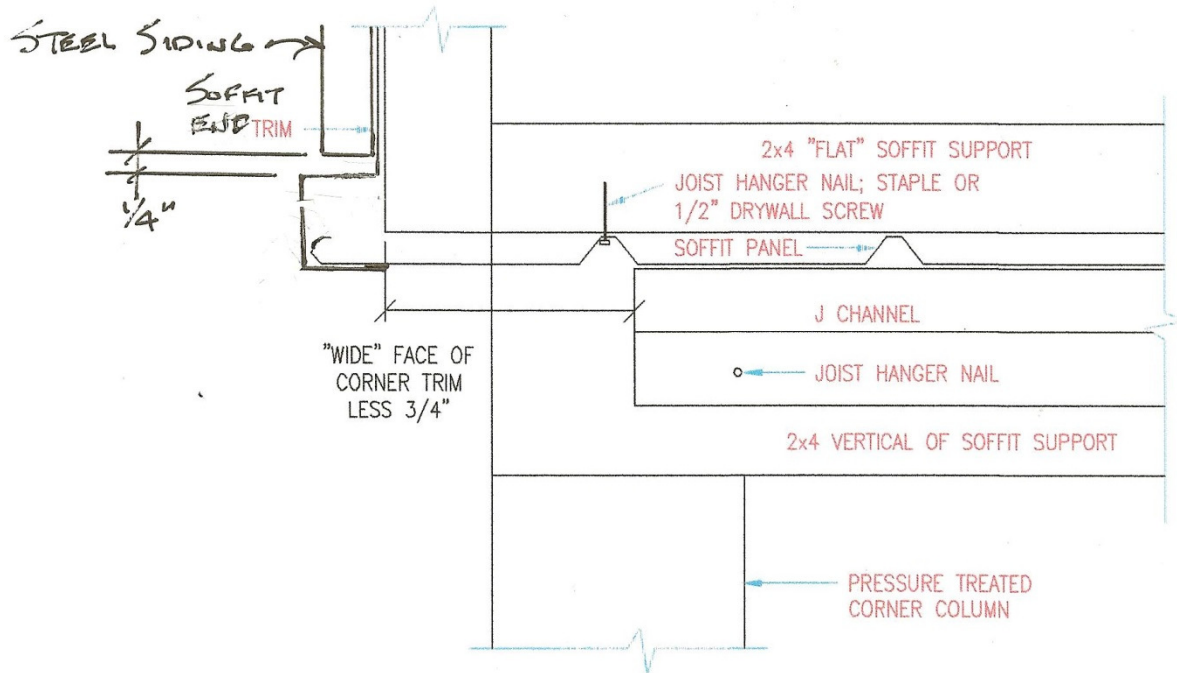


Cut soffit panels to overhang length (measured horizontally from soffit support face to beveled fascia purlin outside edge) **less 1/2"**. Yes, this means every piece has to be cut. Under no circumstance will soffit panels be run lengthwise.

Install soffit panels, perpendicular to wall, from one end to other, inserting leading edge into previously installed soffit end trim bottom channel. Provided temperatures are above freezing, an air-powered stapler may be used (set pressure low to avoid cracking soffit panels). Other acceptable fasteners are 10d common x 1-1/2" galvanized joist hanger nails or 1/2" drywall screws.

Position fasteners in nailing slot of underlap. Fully interlock each piece with previously installed soffit panel. **See Figure 55-36**

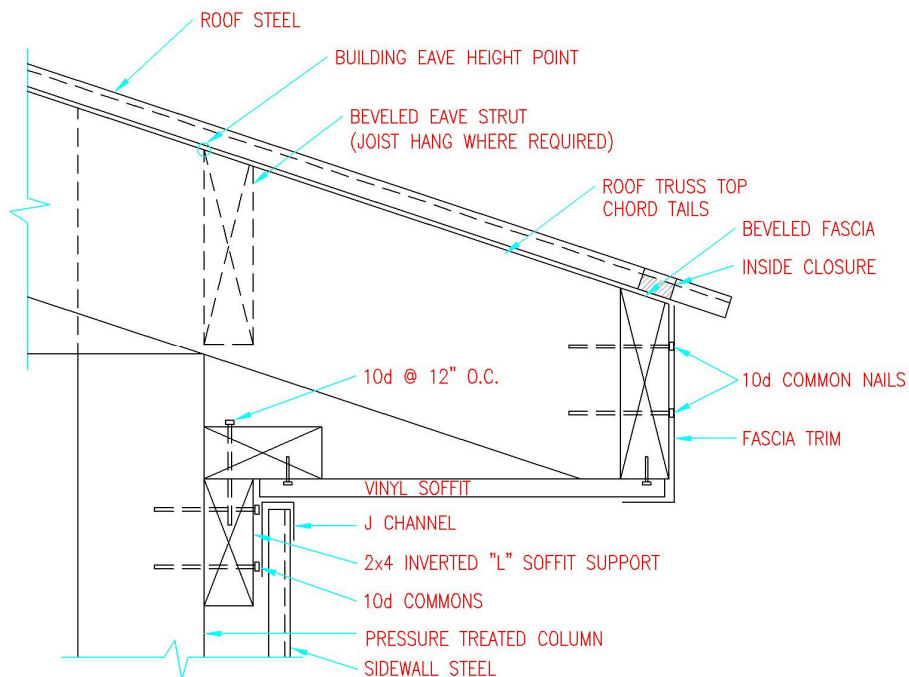




**Figure 55-36 Fastening Soffit Panels**

At sidewall far end, cut last soffit panel to slide fully into soffit end trim.

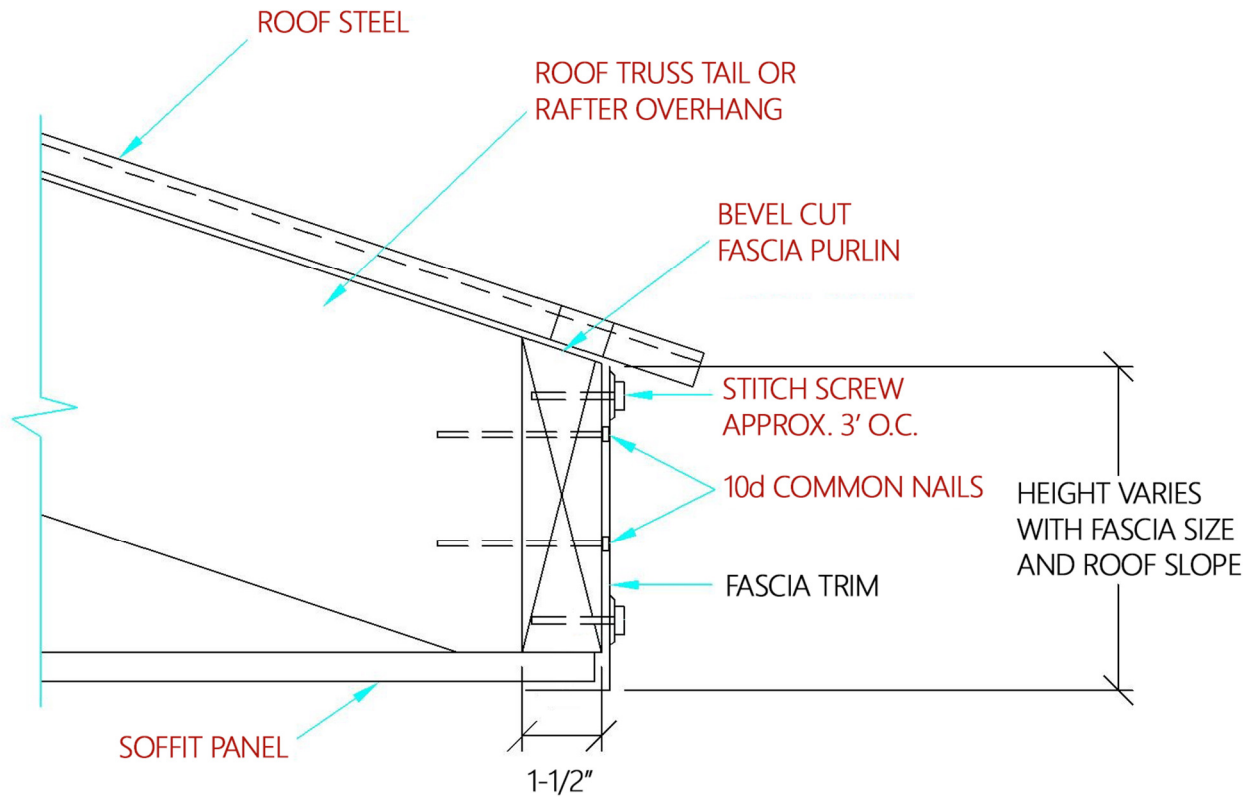
Using 10d common x 1-1/2" galvanized joist hanger nails, install inverted J Channel to soffit support 2x4 vertical, holding tight to underside of soffit panels. **See Figure 55-37**



**Figure 55-37 J Channel Trim to Soffit Support Vertical**

Building Codes do not require a drip edge with steel roofing. Properly installed fascia trim and inside closures protect bevel cut fascia purlin from weather.

Install 1-1/2" x height of low side of fascia purlin plus 1/2" trims. First piece begins at outside edge of 2x4 end truss top chord siding backing. These trims are best installed with screws placed into wide face of fascia purlin trims. Place close to top edge of trim and use as few as possible to minimize oil canning. **See Figure 55-38**



**Figure 55-38 Installing Fascia purlin Trims**

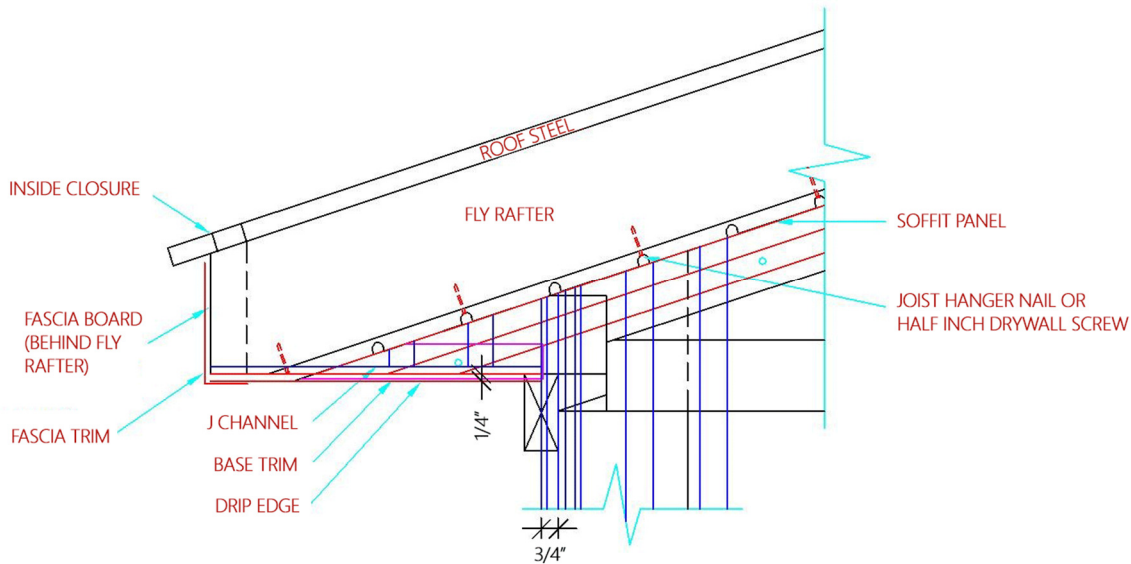


Fascia purlin trims do NOT overlap. Apply liberal amounts of caulking behind trims at butt splices.



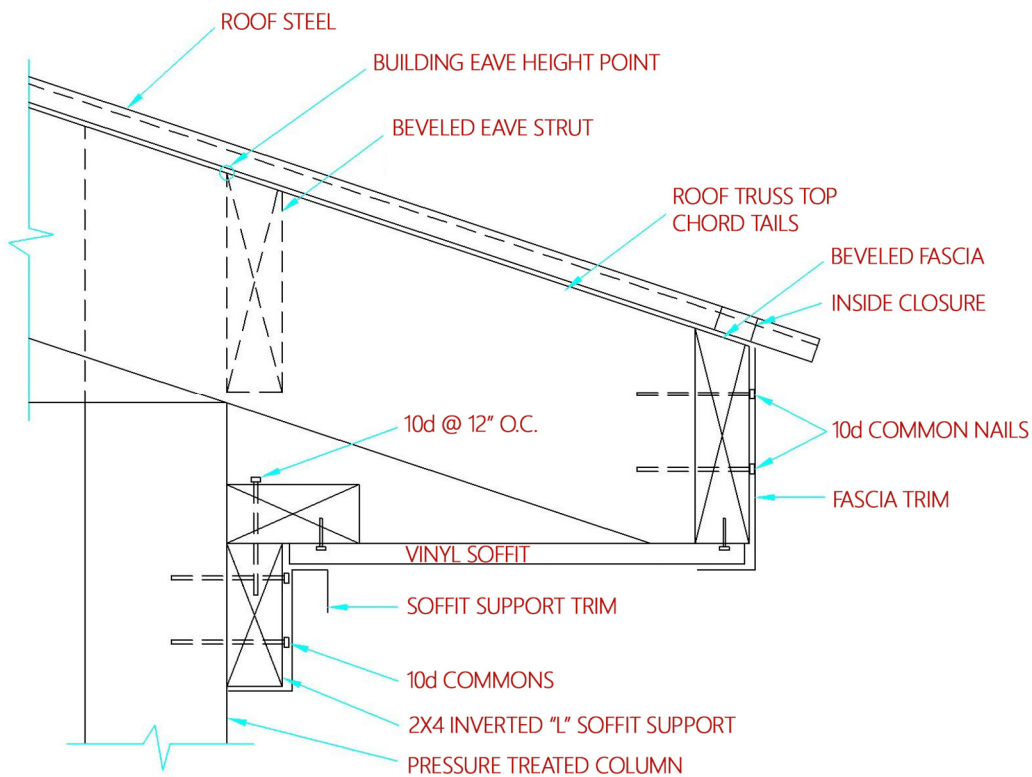
Gutters can easily be attached to fascia purlin. For best results, use continuous seamless gutters.

Cover end of overhang with a piece of wall steel (good place to utilize a cutoff). Hold bottom up 1/4" from base trim. **See Figure 55-39** (Steel ribs shown in blue)



**Figure 55-39 Covering End of Overhang**

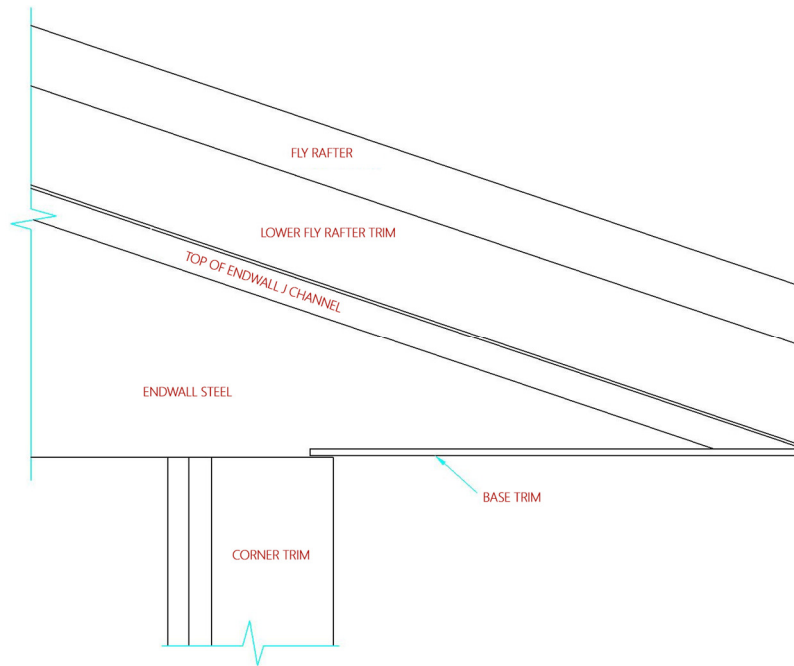
In cases where an enclosed sidewall overhang, is at an open bay, make adjustments shown below. **See Figure 55-40.**



**Figure 55-40 Enclosed Overhang at an Open Bay**

It is recommended to place screen material between soffit support and eave strut, to prevent birds or wasps from nesting in overhang area.

After siding is installed, place corner trims, with top edge of trim cut square and tight to underside of sidewall soffits. **See Figure 55-41**



### Figure 55-41 Installing Corner Trims

If desired, top edge of corner trims can be sealed against wall steel by one of these methods:

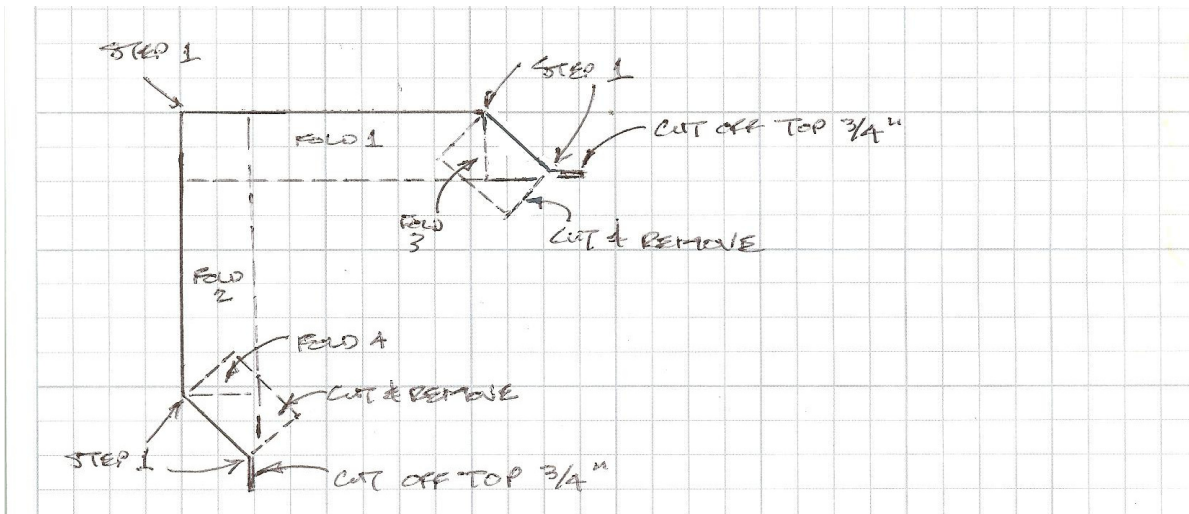
Easiest - fill "gap" with a Polyurethane spray foam such as Great Stuff™ (<https://www.greatstuff.dupont.com/?msclkid=59bda31e7bdb1d55c71ef8b1966c30ee>). Key to success, use a closed cell foam, hence polyurethane.

Next easiest - we have an expanding closed cell foam sealant in 13' long rolls. When unrolled it expands to 1" square. Read more information about it here:

<http://www.hansenpolebuildings.com/2016/03/emseal-self-expanding-sealant-tape-closures/>.

Most difficult - Step 1 Cut  $\frac{3}{4}$ " down length of corner trim along each bend. Next, fold over Tabs 1 and 2. Tab 3 and 4 are folded over next with "out of plane" triangular portion being cut from each. Cut top  $\frac{3}{4}$ " from each hemmed flange. Place liberal amounts of caulking between each tab overlap.

Cut steel high rib profiles out of flanges at any direct conflict. **See Figure 55-42**



**Figure 55-42 Fold Over Top Of Corner Trims**

Correct example:



Incorrect example pictured below:

