Chapter 54: Side and End Overhang(s) - Open

Most Common Mistakes:

1. Expecting end trusses to have “tails”.
2. Installing beveled edge purlin below truss tails.
3. Placing “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 blocks not cut for a snug fit.
9. Purlin blocks not set to overhang end truss siding backing by ¾”.
10. End trusses not set to string line 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.
15. Inside closures omitted from on top of beveled edge purlin.
16. Truss tails improperly 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.

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 54-1
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 54-1 & Figure 54-2

<table>
<thead>
<tr>
<th>Roof Slope</th>
<th>2x6</th>
<th>2x8</th>
<th>2x10</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/12</td>
<td>5-9/16</td>
<td>7-3/8</td>
<td>9-3/8</td>
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<tr>
<td>3/12</td>
<td>5-11/16</td>
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<td>5-13/16</td>
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<td>9-3/4</td>
</tr>
<tr>
<td>5/12</td>
<td>5-15/16</td>
<td>7-7/8</td>
<td>10</td>
</tr>
<tr>
<td>6/12</td>
<td>6-1/8</td>
<td>8-1/8</td>
<td>10-5/16</td>
</tr>
<tr>
<td>7/12</td>
<td>6-3/8</td>
<td>8-3/8</td>
<td>10-11/16</td>
</tr>
<tr>
<td>8/12</td>
<td>6-5/8</td>
<td>8-3/4</td>
<td>11-1/8</td>
</tr>
</tbody>
</table>
Figure 54-2 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 beveled edge purlin location. See Figure 54-3
Figure 54-3 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 54-4

This will be rake purlin locations as they cross endwall.

Figure 54-4 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 54-2 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 54-12

<table>
<thead>
<tr>
<th>Roof Slope</th>
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<td>5-3/8</td>
</tr>
<tr>
<td>8/12</td>
<td>3-11/16</td>
<td>4-13/16</td>
<td>6-3/16</td>
</tr>
</tbody>
</table>

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 54-5

H-1 installed on inside of end truss
Rake purlins and blocking in place, ready to be raised.

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

Install eave struts (purlins) level in end bays first. See Figure 54-6

Eave struts will project PAST corner column and help to support fly rafter.
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. It 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” (also referred to as “purlin blocking”) to fit between rake purlins and above endwall truss. **See Figure 54-8**

First block will be angle cut (on lower end) at roof slope to fit snug against eave strut (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 54-8 Purlin block Placement**

When installing purlin blocks, hold block inside face 3/4” outside endwall truss face. **See Figure 54-9.**
Figure 54-9 Purlin blocking

**IMPORTANT!** Do not neglect custom cutting small blocks to fit space between ridge rake purlin and peak. If forgotten, birds will likely be nesting in this location. See Figure 54-10

Figure 54-10 Purlin blocks at Roof Peak
If rake purlins were not pre-cut to length previously, trim them now.

**CAUTION** 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 stringline between these two points and place a mark on each rake purlin. A chalk line is handy for this. **See Figure 54-11**

Trim rake purlins off vertically from this mark.

![Figure 54-11 Trimming Rake purlins](image)

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 54-12**
Figure 54-12  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 54-13
Figure 54-13 Beveled fascia purlin Bevel Cut
Table 54-3

<table>
<thead>
<tr>
<th>Roof Slope</th>
<th>Hold Down</th>
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<td>11/12</td>
<td>1-3/8&quot;</td>
</tr>
<tr>
<td>12/12</td>
<td>1-1/2&quot;</td>
</tr>
</tbody>
</table>

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 54-14
Figure 54-14 Measuring Overhang Distance

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

Rip truss tails to match beveled fascia purlin inside height. See Figure 54-15

Figure 54-15 Ripping Truss Tails to Fascia Purlin Height

Nail beveled fascia purlins to interior truss tails ends (crowned up) with 10d commons. See Figure 54-16
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 54-17.

Roof steel MUST extend past beveled fascia purlin ONLY by 1-1/2” to 1-3/4”. See Figure 54-18.
Figure 54-18 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 XI, Straight Roof Steel Overhangs.

Reflective radiant barrier is not placed in overhangs. If reflective radiant barrier is installed in overhangs, there will be a **SHORTAGE**!

Place Inside (skinny) closure strips on beveled edge purlin tops below roof steel panels, other than in end overhang areas. 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 purlin or end truss tails.

On building endwall face, tight below purlin blocks, install J Channel with wide face against building and “open” side down. Left side is installed with upper end square. See Figure 54-19
Figure 54-19 Installing J Channel Underneath Purlin blocking

Right side J Channel will have outer face cut at roof slope and will overlap left side J Channel. See Figure 54-20

Figure 54-20 Installing Right J Channel Trim

J Channel at low end will stop short of corner. See Figure 54-21
Figure 54-21 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 54-22

Figure 54-22 Lower Fly Rafter Trim

Push lower fly rafter trim up tight to fly rafter bottom. Lower fly rafter trims will be held in place by rake trim, to be installed after roofing is in place.
Figure 54-23 Lower Fly Rafter Trim to Fly Rafter Bottom

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

When reaching intersection with beveled edge purlin, make a “score” cut (not completely through) in vertical trim face. Bending to wrap corner so lower fly rafter trim will be underneath beveled edge purlin trim when installed. **See Figure 54-25**
Figure 54-25 Folding Over Lower Fly Rafter Trim

1-1/2” horizontal face is to be trimmed off flush with fly rafter end.

Install rake trim. See Figure 54-26
Figure 54-26 Rake Trim

Trim Around Sidewall Truss Tails

Install a horizontal 2x block (cut from scrap) at least 8" in length to outside column face directly below truss tails. See Figure 54-27
Figure 54-27 Trimming Around Truss Tails (Open Overhangs Only)

To avoid running out of J Channel, install all longer lengths first, and then use cutoffs for these shorter segments.

Tack in place J Channel to beveled edge purlin snug to roof steel. Square cut a J Channel piece to 5” long (for trims provided by ABC use 4-1/2” length; McElroy 4-3/4”).

Using snips, cut 1” (for ABC trim 3/4”, McElroy 7/8”) in from each end along J Channel bends. Holding J Channel like an inverted “J”, bend up two tabs created between cuts. See Figure 54-28

Figure 54-28 J Channel Cutting for Truss Tails
Install this trim piece tight underneath overhanging truss tails, with folded-up tabs on each side. See Figure 54-29

Figure 54-29 Installing J Channel Beneath Truss Tails

Next install vertical J Channel pieces along each truss tail side. These piece lengths will vary depending upon roof slope and truss top chord size.

Top end (fitting tight against roof steel) will be square cut. Lower end will again have bends each cut, with snips, up 1”.

Fold area between cuts to form a tab. 1” J Channel face (3/4” face for ABC trims, 7/8” for McElroy) is to be cut at a 45-degree angle.

Install vertical pieces so area labeled A1 is on top of A2. Tab B will be inserted into inverted J top below truss tails. See Figure 54-30
Figure 54-30 Folding J Channel Tabs

Face B1 will be on top of Face B2. See Figure 54-31.

Figure 54-31 Cutting Tabs on J Channel
Cut to length a J Channel piece to fit between truss tails. 1” face (3/4” for ABC trims, 7/8” for McElroy) will be cut back from “J” bottom at a 45-degree angle. Install this J Channel piece tightly against roof steel so C1 is on top of C2 and D1 is on top of D2.

Carefully determine where truss tails will lie along sidewall steel. This can be done by installing full-length panels along wall until a tail is reached.

Easiest, if grade allows, slide panel to be cut up against trimmed out truss tail underside and put light pencil marks on steel to align with each truss tail side.

Cut out area to allow panel to fit snugly into trim.

When done properly, no light will shine into building from this area. If light does show through, use an appropriate mastic or caulk to seal area thoroughly.

After siding has been installed place corner trims (in blue below). See Figure 54-32
Figure 54-32 Eave Strut Trim

Corner trim is cut to allow beveled edge purlin to pass through (in blue below). Caulk between vertical cut in corner trim and beveled edge purlin trim. See Figure 54-33

Figure 54-33 J Channel at Low End