Chapter 16: Roof Steel

Most Common Mistakes:

1. Roof purlins not checked for alignment.
2. Failure to properly square roof.
3. Reversing steel laps.
4. Using not enough or too many screws.
5. Over or under driving screws.
6. Using incorrect driver bits.
7. Not pre-drilling roof sheets.
8. Failure to maintain proper overlap past eave girt.
9. Installing steel roofing over wet insulation.

Other than in an instance where a roof “pitch break” occurs, the entire roof surface is best sheathed or sheeted prior to any wall framing installation. No wall steel or trims (or in cases with overhangs – soffit, fascia or varge trims) should be installed prior to the roof steel.

Follow instructions explicitly, or installing roof steel will not be a happy experience.

Inspect roof framing for any structural damage such as bowing or sagging rafters and warped or loose purlins or solid decking. Repair these areas prior to installing roofing panels.

Prior to installation, confirm no nails or fasteners protrude from roof framing or wood substrate which could damage panels and impede installation process.

When installed, panel distortion may occur if not applied over properly aligned and uniform substructure.

Overlap/Underlap

The steel roofing and siding has a full rib on one edge and a 3/4 rib on other edge. The 3/4 rib is the OVERLAP. The full rib MAY have a siphon groove on one side and will be the UNDERLAP. **See Figure 16-1.**

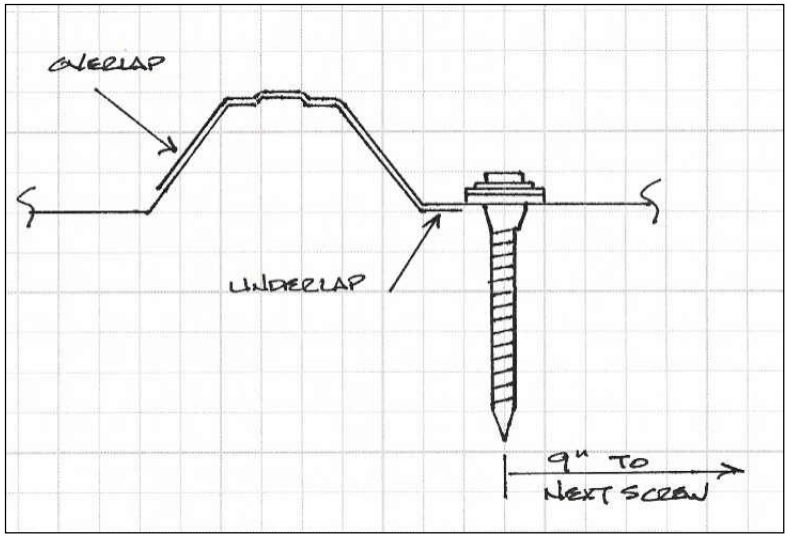


Figure 16-1

If AT ALL unsure which steel edge is underlap and which is overlap, request Technical Support prior to any steel panel installation. To prevent leaks, as well as an unsightly fit, properly lap panels. Even the most experienced installers have made the error of installing some or all panels lapped incorrectly.

Basic Installation Skills

To install steel roofing and siding, master three basic skills:

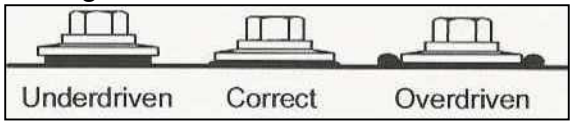
- Making accurate measurements.
- Cutting accurately to assure proper fit and minimum waste.
- Fastening panels to assure lasting quality.

Once learned, these skills will be put to use at all installation steps.

Steel Sheeting Through Screws

No major steel roofing and siding manufacturer recommends steel be fastened to framing below with screws through steel high ribs. From a strength standpoint, screws driven through high ribs do not provide the shear strength as do screws driven into “flats”. This is due to the screw’s ability to flex or bend in the airspace created between the steel high rib and the wood below. From a leak standpoint, screws placed in high ribs are far more likely to be the leak cause. This is due to steel’s ability to “flex” at the rib due to overdriven screws or natural expansion and contraction from temperature. This can cause poorly seated or under driven screws to leak. A screw properly driven in the flats will seldom, if ever, result in a leak.

See example below for sheeting screws



Helpful hint – To prevent screw wobbling during installation, fully engage fastener head in socket. If head does not go all the way into socket – tap magnet deeper into socket to allow full head engagement. Metal chips will build up from drilling, so remove from time to time.

Use sheeting screws **ONLY** on one side of each high rib (**See Figure 16-2**) with the following exception:

- Roof – each high rib side at Eave Girt and Ridge Purlin (as well as at any end over end splices).

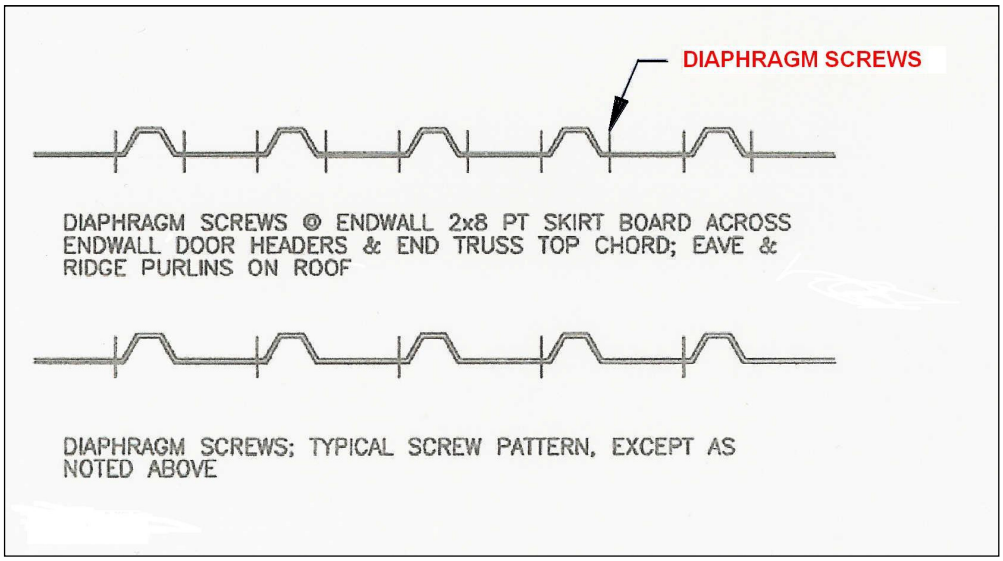


Figure 16-2

Use 1-1/2" long diaphragm screws at eave purlin and ridge purlin, installing one screw on EACH high rib side (unless instructions state otherwise).

If double screws are used at any other locations, there will **NOT** be enough screws.

Use a diaphragm screw next to each high rib (one side only) on field purlins. These will be 9" on center, with first screw next to overlap rib.

Let's Install Roof Steel

From a standpoint of looks, the 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 the 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.

After putting first roof insulation roll in place, building is ready to have steel roofing installed.

If, for whatever reason, the idea is to NOT install insulation between purlins and roof steel, this is the final opportunity to avoid making a crucial and costly error.

The roof steel installation process is best done with two or more persons. One person, safely on a ladder or scaffold inside building, at roof peak, another person 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. If NOT, end wall is not properly aligned, straighten before roof steel can be properly applied.

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 truss top chord center. **See Figure 16-3.**

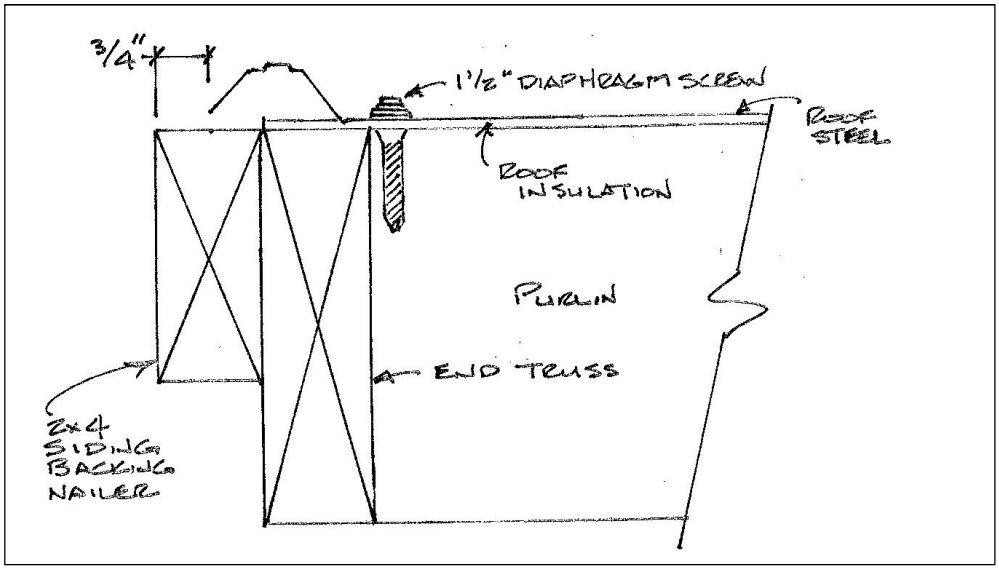


Figure 16-3

It is ESSENTIAL to follow these sidewall steel overhang dimensions:

Roof steel MUST extend past eave girt/eave purlin ONLY by 2-1/4" to 2-1/2".
See Figure 16-4..

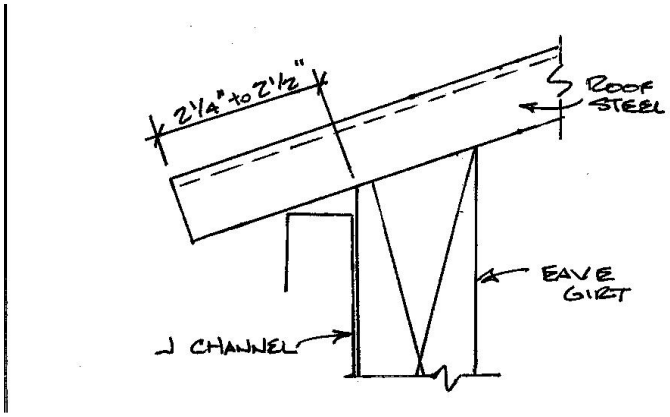


Figure 16-4

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

Steel from each roof side will ***not meet*** at ridge line. The ridge cap covers the space. If done correctly, roof steel will end about 4" from truss peak. This means steel from each side will be about 8" apart. The amount of steel overhanging eave girt IS the crucial dimension, not the space at the ridge.

Once first roof steel panel is located correctly, person at panel bottom installs a screw, next to the overlapping edge, into eave girt. These screws also go through any Inside Foam Closures when used. The person at panel top then installs a screw, next to overlapping edge, into ridge purlin.

Failure to thoroughly screw off each steel panel, as installed, can result in panel damage, or removal from building, in a sudden high wind event.

Flying steel panels can cause severe injuries or death.

Some steel manufacturers suggest "Roll Tape Sealant" or butyl sealant use between overlapping steel panels. Either are options not included in a Hansen Buildings Kit. The steel manufacturer and Hansen Buildings advise these sealants are *nonessential* to most building's adequate performance. In fact, any lap sealant use could cause overlapping steel panels to not fit securely or tightly against under-lapping panel. This will potentially cause leaks and overlaps which do not lie down smoothly can prove to be unsightly.


Important hint – Keep panels from stretching or compressing in width as they are installed. Panels cover 36" from major rib center on one panel side to major rib center at other side of panel. Measure each panel as installing or pre-mark building frame (or underlying insulation) every 36" to check panel width.

Why would this be important? If roof plane is square, endwall is straight and a 36" panel coverage is maintained, eave edges of each panel will come out straight. If eave edges begin to "stair step", this is a sign one of the following has occurred: roof plane was not square, eave girt boards are not straight, each panel was not installed to cover exactly 36".

Provided overall length of roof is a multiple of 3' (plus 3" to allow for framing), upon completion of one roof plane, last panel should not require trimming. Should last panel extend more than ¾" past the end of roof framing, rip panel lengthwise so cut edge falls ¾" inside edge of roof framing.

 If an ODD total number of roof panels has been supplied, the cutoff portion of the last roof panel, becomes the starting panel for the opposite side of the roof. Do NOT pre-drill screw holes in this panel, until AFTER it has been ripped lengthwise. Failure to follow these instructions will result in needing to purchase an extra panel of roof steel.

Important! Keep traffic over installed system to a minimum.

When standing or walking on earlier installed panels is unavoidable, do so carefully to avoid damage to roofing or personal injury. Safest practice is to stand directly on screw tops, as they create a "traction" point. Avoid attempting to stand on steel high ribs, as this will damage panels. Generally, weight is to be kept evenly distributed over soles of both feet to avoid concentrated weight on either heels or toes. Wear smooth soft-rubber soled shoes, as ribbed soles may pick up and hold small stones, swarf and other objects, which could scuff or damage steel. When walking on wet or newly laid sheets, take particular care, especially on steeply pitched roofs.

 Damp, wet or frosty steel will be extremely slick.

Oops, Missed!

 As roof steel panels were predrilled, if a screw (or screws) miss a purlin, remove screw which missed purlins, plus screws within three or four feet of each side of miss (along same purlin). From inside building, have someone push purlin either "uphill" or "downhill" until screw(s) can be driven through each hole into purlin.

If a "random miss" occurs, the repair is to have someone hold a wood block underneath hole and drive a screw through hole into block. This is the manufacturer's only approved repair for a missed screw.

Do ***NOT***, under any circumstance, attempt to fix a missed screw hole with caulking.