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## INSTALLATION GUIDE: ROOF SHEETING

### Delivery / Receiving Materials

- 1) The labour requirements of the installer for receiving of materials must be clearly decided by the installer and the job supervisor before scheduling of delivery. This must be decided to match the predetermined specific requirements of the delivery, including but not limited to:
  - a. Site access
  - b. Storage location
  - c. Number of truck loads
  - d. Manual handling of materials; weight and dimensions of each unit.
  - e. Length of roof panel
- 2) The installer must be informed of the amount and type of materials to be delivered.
- 3) The party receiving the materials delivered must check that the type and quantity of materials delivered corresponds to the amount stated on the delivery note. Any inconsistencies must be reported to the job supervisor immediately.
- 4) The materials being delivered must be inspected before offloading. Any defects/scratches observed before, during or immediately after offloading must be reported to the job supervisor immediately.

### Material Handling

- 1) Ensure proper PPE is used. Always wear eye protection, steel toe boots, high visibility vests and safety gloves with handling roofing materials.
- 2) Practice proper lifting techniques when handling heavy materials: bending at knees. Use enough manpower for large loads.
- 3) Ensure that members are properly balanced when lifting and that the longer side of the section is lifted vertically. Eg: standing seam panel should be held by the seam to prevent bending.





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### Panel Installation

1. Prior to starting the installation, the installation area needs to be inspected, and any deficiencies reported to the proper parties. While the roof frame may not be the responsibility of the installer, it is imperative that the structure is ensured complete and safe before placement of the roof. The structure will only be fully loaded when the roof is installed, any imperfections in the structure will cause imperfections in the roof. Special attention must be given to:
  - a. Check that the roof is properly secure to the building structure.
  - b. If base plates are used make sure that they are grouted.
  - c. All bolted connections are tightened.
  - d. All welded connections are complete and primed.
  - e. Geometry of the roof design: square-ness of eaves & hips, symmetry of dormers.
  - f. Levelness of purlins on each roof section from eave to ridge.
  - g. Levelness of purlins along the length of valleys.
  - h. Levelness of purlins along hip lines.
  - i. Levelness of ridge.
  - j. No sagging or varying spaces between neighboring purlins.
  - k. Sag rods are tightened.
  - l. All cleats are properly secure to the structure.
  - m. All purlins are properly bolted to cleats.
  - n. Check that the purlin spacing is sufficient for the installation of roof sheeting: max 4ft for 24g and max 3ft for 26g.
  - o. Check that there is sufficient support for the top of valleys, hip supports, and valley supports.
  - p. Check the size of the fascia and that there will be sufficient support for the fascia trims at both the eave and gable ends.
  - q. Check the distance of the last purlin from the eave to ensure that the fascia can be installed.
2. Before installation, verify the design and location of all trims/flashings for the job. Also verify the sequence of their installation – if required before or after the placement of roof sheeting.
3. Eave Fascia
  - I. Decide on the direction of the flashing laps. Arrange the laps such that there is minimum visibility of lap joints.



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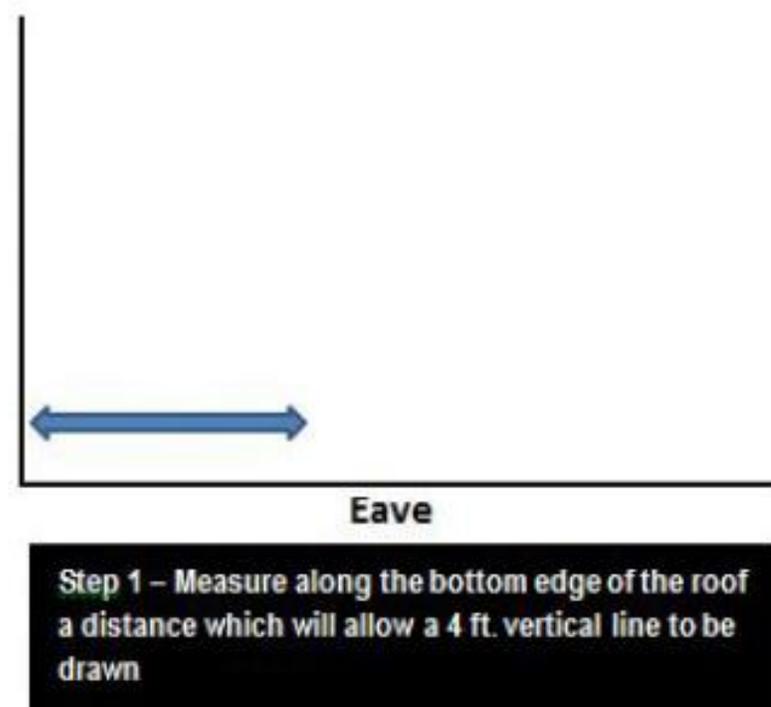
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- i. The top flange of the fascia is to be fixed to the last purlin at the eave using wafer screws.
  - ii. Laps in the fascia are to be minimum of 2 inches.
  - iii. If flashings are to be cut, ensure that the edge cut on site is placed under the factory cut end.
  - iv. Stitch screws with washer are required for joining of trims on the eave. Pin head screws are only allowed at the bottom of the flashings when soffit is installed.
4. It is critical to the overall installation that the first roof panel is installed square to the roof edge, normally the eave. When installing a square roof panel on a roof that is not square, installers often use the 3-4-5 method to ensure that the first panel is secured squarely.

Note: **PENCIL MARKINGS WILL CAUSE CORROSION OF A ROOF** – Chalk and marker are good alternatives. (Permanent marker can be easily removed from roof)

### The 3-4-5 Method:

#### STEP 1

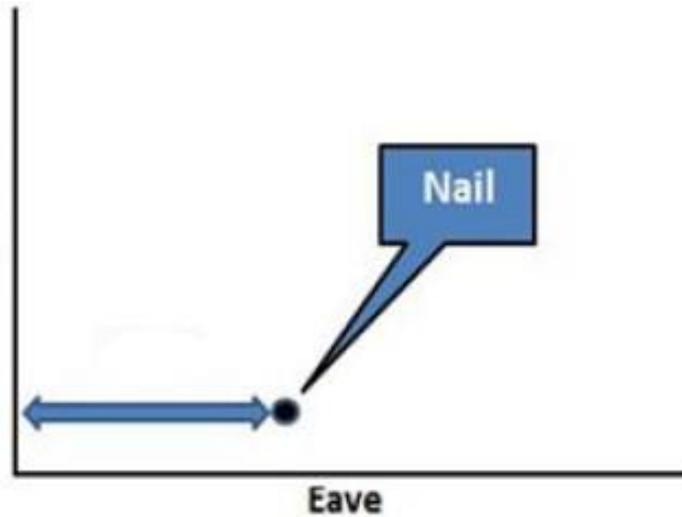




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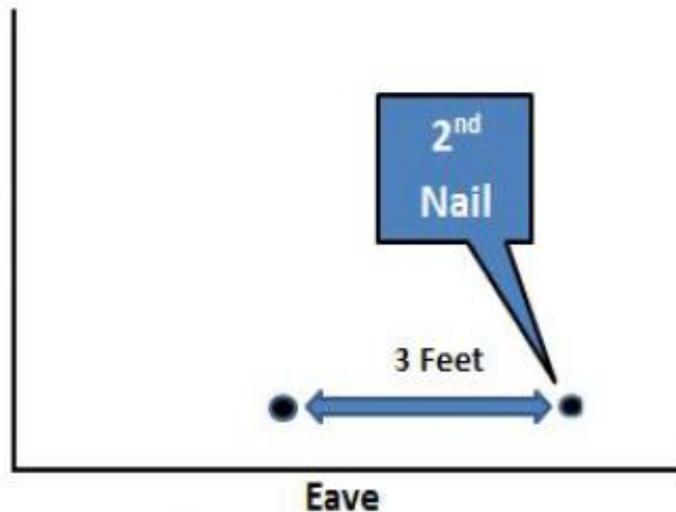
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### STEP 2



Step 2 - Set a nail at that point. Later, a chalk line will be attached to this nail.

### STEP 3



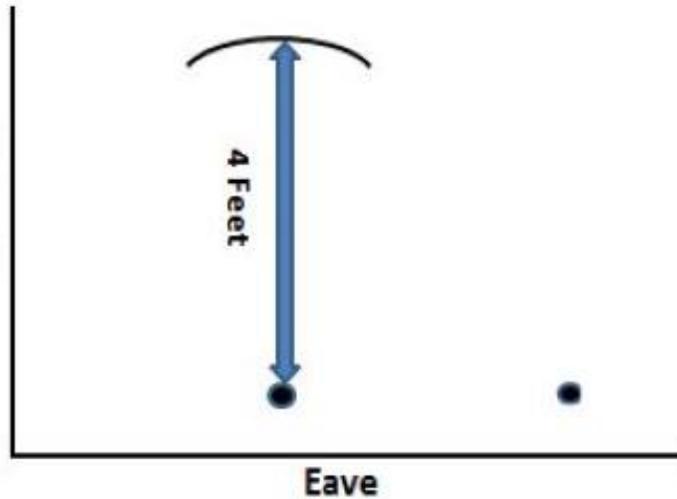
Step 3 - From the first nail, measure exactly 3 feet from that nail in the opposite direction along the bottom edge of the roof and set another nail to mark it.



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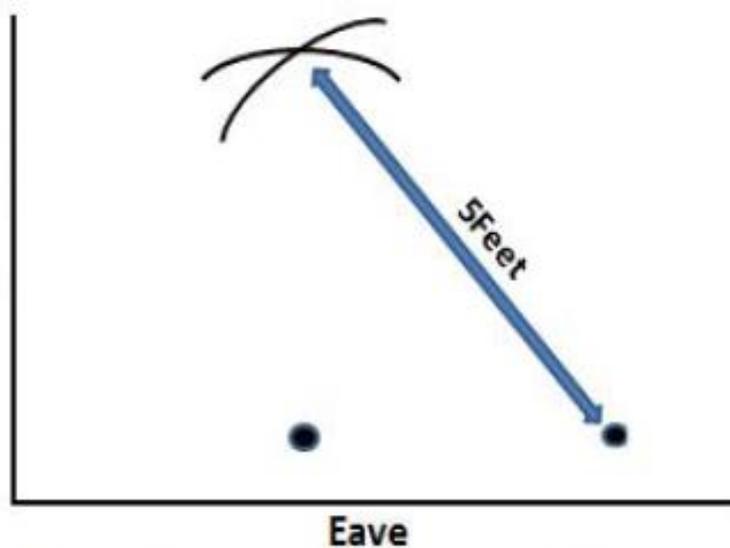
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### STEP 4



Step 4 - From the first nail, measure exactly 4 feet straight up the slope of the roof and draw a small arc.

### STEP 5



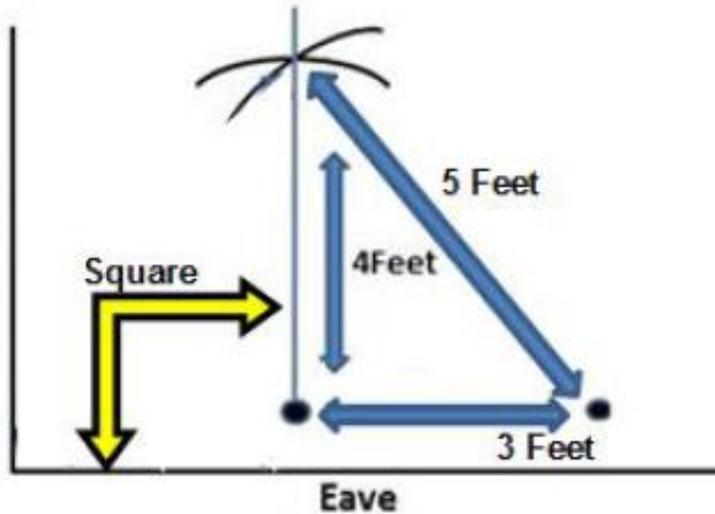
Step 5 - Measure from the second nail exactly 5 feet and draw an arc that intersects the first arc.



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The end result will produce a 3-4-5 triangle as shown below with the chalk line along the 4-foot side square to the eave. This method works a lot better than just a big square as any small error in the square can result in a large tilt when the sheet lengths are long.



Starting the first panel square to the eave also establishes a baseline and reference for the remaining panels to be installed. When the first panel is not square, all remaining panels will also be out-of-square when attached. When this difference is significant, it will become visible and will cause problems at the eaves, ridges, peaks, and valleys, of the installation.

Attempts to correct this issue after the installation is underway will likely cause sealing issues, as well as an even more noticeably visual mismatch.



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The photo below shows some typical areas where visual alignment is critical.

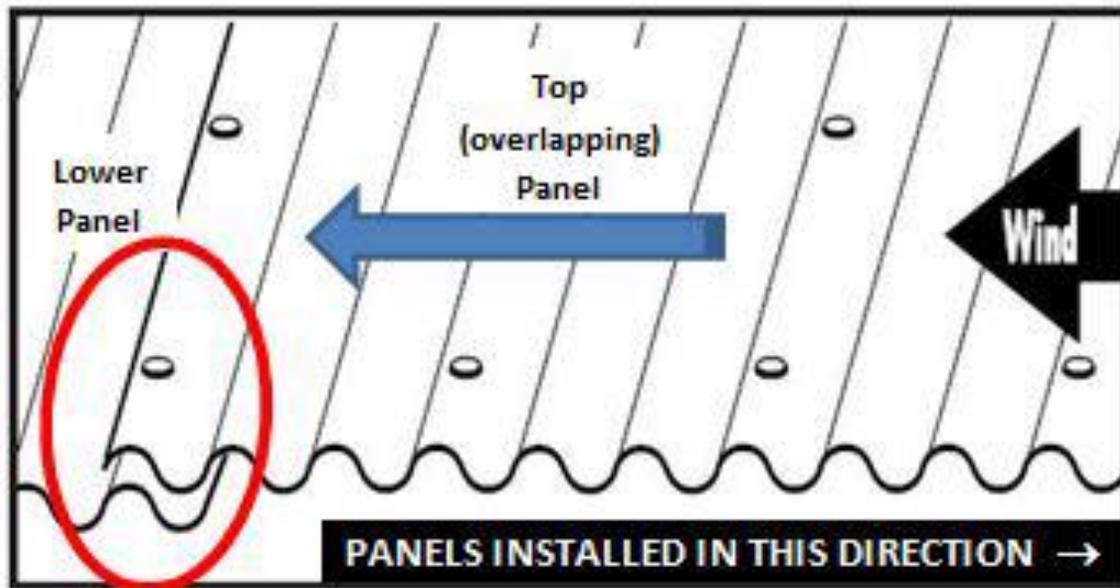




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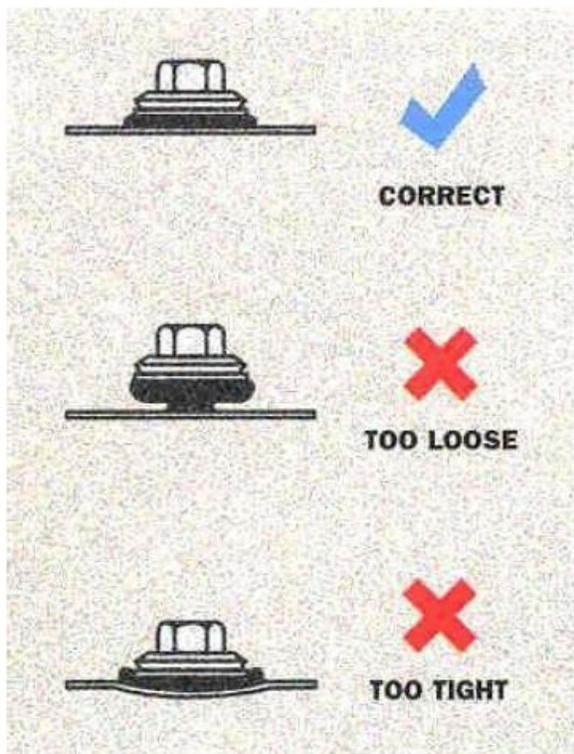
5. It is also necessary for installed roof panels to be both straight *and* flat. A panel can be installed perfectly straight, and not be flat. Straightness deals with the edges of an object, while flatness deals with the wide, open surfaces of an object. This area of the panel is often referred to as the flat, or pan, section. The problem of "oil-canning" is a direct result of panel surfaces which are not "flat." Flatness will not make a panel leak; however, when a panel is not installed flat, it can create areas of standing water or direct runoff to areas not designed to handle the additional water. These areas may eventually leak.
6. Start applying panels vertically at the lower corner of the roof edge, *downwind* or away from the prevailing wind. This is done so that wind, rain, and snow blows *over*, not under, the side lap seam joints.



7. Note also the type and direction of the laps. Corrugated sheets may be reversible, however Antilles/New Wave and standing seam profiles are not.
8. For long panel lengths, the direction must be taken into account when placing the sheets into temporary storage on site, as there may be any space available to turn the panels to the proper direction on the job site or at roof level. When the eave-to-ridge length of a roof can be covered by a single length panel, several factors and dimensional tolerances must be maintained by the installer. Panel straightness and flatness are critical.

**During some installations, temporary attachment of panels to the substructure may be necessary. Never step onto a roof panel which is not attached securely to the structure.**

9. Check the panel fastening method being used. Confirm that it matches the manufacturer's instructions, and that all installation team members are familiar with the requirements.
  - a. Ensure that the correct screw type, size and colour for the job is to be used.
  - b. Fasteners should be installed properly to avoid being over-driven, under-driven or driven at an angle. Over driven screws causes collection of water around the hole and faster corrosion around the screw.



- c. For corrugated and Antilles profiles, ensure the correct screw pattern is determined. Should any person on site wish to comment on the screw pattern, ALWAYS check with the DRS job supervisor before proceeding.



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- d. Standing seam panels require standing seam clips be fastened with 2 wafer/pancake screws per clip. Use of a single screw on the clip will cause crimping of the seam when the panel expands.
10. Proper sealing of end laps is necessary to avoid water being driven "upslope" or where lapped joints may experience periods of standing water or become submerged.
    - a. Check that the roof panel end laps are correctly assembled and that the lapping panels are tightly nested without visible gaps.
    - b. Check that the sealant is in the correct position and is in complete contact with the lapped panels without any voids or gaps, especially at any radius between the panel flat and the vertical legs of the panel. Confirm that the panels are clean and dry during installation, and that the sealant is not wet or otherwise contaminated.
    - c. Check that panel surfaces above and below the end lap are not bowed. Depressed panel areas may create ponding and standing water.
  11. Approved methods of cutting include aviation snips, sheet metal hand shears, electric sheet metal shears, and pneumatic or electric nibblers.
  12. When possible, locate the field cut away from the weather. For instance, if a roof panel has to be trimmed to length, trim the top of the panel, where the cut will be hidden from the weather with a ridge flashing.
  13. When it is necessary to cut an eave flashing to length, put the field cut end *beneath* the factory cut end of the adjacent section.
  14. Always ensure that the sheets are "bread-panned" the ridge, hips, gables and apron ends. Bread-panning must be a minimum of one inch (1") tall. Consideration for bread-pan must be made when creating your cut-list.
  15. Ridge and hip flashings:



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- i. Inspect the bread pan to ensure it is sufficient before placement of the ridge
- ii. The alignment of the ridge and hips is vital to the finished appearance of the roof. Use a line to ensure a straight finish along the entire length wherever possible. Using a straight line will also reduce the chance of waviness in the flashing.
- iii. If the ridge needs to be cut at the seams/legs of sheets for placement, ensure that the flashing is laid out into position and marked.
- iv. Ensure that a minimum of 6 inches lap is taken into consideration for joining of ridge and hip flashings. And that this is taken into consideration when cutting for allowance of the seam of sheets.
- v. The cut for allowance for the seam/ leg into the ridge flashing must not exceed ¼" around the seam.
- vi. As with roof sheeting, the ridge trims should be installed against the wind so that the rain blows over the joint.
- vii. Sealant must be applied between overlapping trims and again at the edge of the top trim after placement, so that water does not enter the joint.
- viii. Flashings are to be fastened to the roof sheets at
  - a. Every crown – for standing seam
  - b. Every crown – for Antilles/New Wave profile
  - c. A maximum distance of 18 inches for corrugated and at each crown where a lap joint occurs
- ix. Only stitch screws with washers should be used for fastening of trims. Colour shall be specific to the job.
- x. Ensure that the flashing is closed at the end of the ridge line and properly sealed.

### 16. Apron flashings:

- i. Always ensure that the end sheets contain a seam OR is sufficiently bread-panned before installing apron trims.



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- ii. Apron trims at the gable or rake edge of a roof are to be installed from the eave towards the ridge, such that the downward flow of water on the roof runs over the joints.
- iii. Sealant is to be placed between the wall and the back of the vertical stem of the apron before fastening.
- iv. Where there is no solid wall against the back of the apron, ensure that there is sufficient support for the apron to be straight.
- v. Sealant is to also be applied to the top of the apron where it meets the wall.
- vi. All joints should have a minimum of 3 inches overlap and sealant placed between flashings and pinned using stitch screws with washers. Use of pin head/pph screws is **not** acceptable.

### After Installation

1. After installation, any excess materials must be quantified and reported to the job supervisor.
2. All garbage must be removed from the roof and disposed of in site bins.
3. Where site bins are not available, the installer is to determine the best solution for the removal of the garbage from site by coordinating with the job supervisor.
4. Unless immediately removed from the site, excess materials must be stored in accordance with the guidelines identified under the section Material Storage.
5. Final clean-up should take place after all leftover material, tools, and equipment, have been taken off the roof.
6. All cuttings, metal trims, metal filings, screws and garbage must be removed from the roof surface and from the gutter. These may be removed by hand and a final sweep with a soft broom performed on the finished roof surface.
7. Where possible, a final wash of the roof should be performed.