WESTMAN STEEL

STATEMENTS IN STEEL™

TOUGHRIB

Install Guide

CAMBRIDGE, ON (855) 620-2720 | BRANDON/WINNIPEG, MB (800) 661-2823
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This installation guide is intended for the homeowner, contractor and commercial metal roof installer. Please read and understand the manual content before beginning your roof installation in order to ensure a trouble free installation and maintain applicable warranties. If you have any questions regarding the installation of your metal roof system, please contact Westman Steel.

By using this Guide, you accept the risks and responsibilities for all losses, damages, costs and other consequences resulting directly or indirectly from using this Guide. These installation instructions are intended as suggestions, or guidelines, only.

Westman Steel assumes no responsibility for the performance, or quality, of the roof system installation, nor any personal injury or damage that might occur as a result of improper installation.

Westman Steel does not warrant any product or material as meeting the current building codes, laws or regulations of any particular jurisdiction or local municipality.

The information provided herein was in effect at the time this publication was printed. To meet code, and the frequent associated updates, Westman Steel reserves the right to modify, without notice, any specifications and/or designs at any time without incurring any obligations. To insure you are up to date, please inquire with your local RSM, our CSR's located at our Manufacturing facilities, or visit our web site.

Application and design details are for illustrative purposes only and may not be appropriate for all environmental conditions and/or building designs.

Projects should be engineered and installed to conform to applicable building codes, regulations, and accepted industry practices.

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1. Exposed fastener structural roof and wall panels, given the correct span and load requirements, can be installed directly over purlins or joists, or direct to deck.

2. Recommended minimum roof slopes are noted on the Steel Profile page.

3. Galvalume panels, or pre painted Galvalume panels, should not be used in Hog Barn applications.

4. Galvalume material must not come into contact with concrete or pressure treated lumber.

5. Load Tables contained herein were prepared by Dr R M Schuster P.Eng, Professor Emeritus of Structural Engineering, University of Waterloo, Ontario Canada.

6. All sealants shown on the details are a recommendation only by Westman Steel. Unless requested prior to ordering, Westman Steel will not supply tape sealant or caulking in quotes or cladding packages.

7. Types and locations of tape sealant and tube caulking shown on the details are the best recommendation for a proper seal.

8. All screw types shown on the details are the best suited fastener for each location recommended by Westman Steel.

9. Screw lengths shown on the details are the standard recommended length. Different length fasteners are available and can be supplied if requested.

10. All fasteners shown on the details are/can be supplied by Westman Steel.

11. Panel End Lap details can be supplied but may vary based on actual site conditions.

12. Hip and Valley details can be supplied but may vary based on actual site conditions. These details are to be used as a guideline only for installation.

13. Ridge venting will not be assumed to be included in quotes or cladding packages. If venting is required, please notify Westman Steel prior to estimating or ordering.

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1. Upon receiving material, please check your Receiving Report against the Bill of Lading for shortages and damage. Please notify Westman Steel of any discrepancies as soon as possible. Westman Steel will not be responsible for shortages or damage unless they are noted on the Bills of Lading.

2. Handle all bundle/lift/skid/crate's and individual panels with care to avoid damage.

3. Each bundle/lift/skid/crate is to be lifted at its centre of gravity, with your forks evenly spread as much as possible.

Spread forks evenly under each bundle/lift/skid/crate

4. If possible, each bundle/lift/skid/crate should not be opened, or un-banded, until it is staged in a convenient location adjacent to the portion of building it is being applied to. If it is to be moved, each bundle/lift/skid/crate should be re-banded prior to doing so.

5. When lifting a bundle/lift/skid/crate with a crane, a spreader bar is recommended if available. Use nylon straps, and never use wire rope, or chain, as they will damage the panels.

Use spreader bar with a forklift.

Using a nylon strap when utilizing a crane for lifting.

6. When moving each bundle/lift/skid/crate, please drive slowly in rough terrain to prevent the panel buckling.

7. Each sheet should be lifted from its bundle/lift/skid/crate. Never drag a panel as this will cause to the next sheet.

8. During installation, panels should be carried on edge to prevent buckling.

9. If sheets are longer than 10', each panel should be carried by 2 people, again on edge to prevent buckling. Add an extra person for each 10' increment.

10. Panels should never be lifted, or picked up, by the ends.

The correct way to carry a profiles sheet

11. Do not drag sheets on the ground or over each other.

12. Westman Steel is not responsible for damage incurred because of improper handling.

Upon receipt of your roofing panels, store them in a well ventilated, dry location.

Rain or condensation can be drawn between the stacked sheets where it can cause premature failure of the protective coating, cause water stains, or white rust. Trapped moisture, between pre painted metal, can also cause white rust to form underneath the paint finish, causing paint blisters, or paint to flake off immediately or over time.

Do not store panels in direct contact with the ground. Ensure the panels are adequately supported and elevated off the ground, preferably with a slope to allow water to drain.

Cover panels with a waterproof cover spaced off the panels to allow air movement. Never cover panels in plastic, as this will encourage condensation to form.

Prolonged storage of panels in a lift is not recommend. If longer than 4 weeks, after receipt of your order, the lift should be opened and the panels inspected.

Store panels inside if possible

Raise one end to drain moisture, and cover with waterproof tarp while still allowing airflow.

Given the best conditions, steel will provide you with many years of “peace of mind” protection as one of the longest lasting cladding materials available.

Here are a few tips for keeping your steel performing the way it’s supposed to - for years to come!

1. Visually inspect your roof on a yearly basis. Things move with prolonged exposure to the elements! Check to make sure there are no holes or gaps, and that all screws are correctly installed.

2. Our Paint finish, although durable, should be cleaned thoroughly, and on a yearly basis, if it is not already exposed to washing by rain. Use warm water, a little dish soap, and a soft bristled brush.

3. Remove any branches, leaves, or debris that may fall on your roof. This will allow moisture to properly drain away when necessary.

4. Remove, or trim back any trees and bushes etc, that will potentially be in continual contact with your steel cladding. Over time, with movement through wind and growth, these can potentially cause abrasion damage to your Paint finish.

5. Some trees will emit a sap that can build up on your cladding. This will need to be cleaned periodically with warm water, dish soap, and a soft bristled brush. Otherwise, left alone, this will build up and give the appearance of discolouration.

6. While most steel roofs are “walkable”, it is best to minimize foot traffic as much as possible. If you do need to get on the roof, don’t stand on the ribs, and make sure to walk where the strapping is located to avoid damage.

7. Clean your gutters! Give your roof a chance to dry out. Continual contact with wet material is detrimental to your steel roof, and can lead to premature rusting and/or edge creep.

8. Remember to keep different metals separate. For example, keep copper pipes from touching steel roof systems. When different types of metal come into contact with each other and eventually become wet, they will break down in a process called electrolytic corrosion

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Tools and equipment, required, will vary by job, and by profile.

Depending on application, you may, or may not, require some or all of the following:

1. Metal shears, nibblers, power shears or circular saw with metal-cutting cutting blade. Note: Saw cut edges can be jagged, unsightly and tend to rust sooner than sheared edges. Hot metal filings are produced when saw cutting, which may embed in and damage the paint coating. Also, saw cutting burns the paint and galvanizing treatment, leading to the onset of edge rust.
2. Metal snips (left edge, right edge and centerline cutting snips).
3. Hem bending tool
4. Gloves and protective clothing
5. Safety goggles and ear plugs (Eye and ear protection)
6. Tape measure and chalk line
7. Rubber mallet
8. Screw gun or drill (adjustable clutch recommended)
9. 1/4”, 5/16”, 3/8” sockets – must be lobular and replaced after 10,000 to 15,000 fasteners
10. Drill bits, screw bits
11. Pop rivet gun
12. Caulking gun
13. Pencils and markers
14. Utility knife
15. Locking sheet metal pliers
16. Hammer staplers

The following is a basic step-by-step guide for the installation of Westman Steel's steel roofing and siding.

STEP 1: Material Checklist

It is necessary to make sure all pieces are on hand before starting.

Please stage your material according to roofing, side walls, end walls, sliding door sheets, trims and fasteners, and put them in a convenient location nearest to their application point.

Make sure to use the correct length of sheet in the correct area and be careful to stage, or secure, sheets prior to installation from the elements, and wind, at all times. Please see storage recommendations attached.

Depending on your application, some trims need to be installed before cladding, so to avoid delays please make ensure you have what you need.

STEP 2: Install Roof Trim, Flashing and Westman Steel Underlayment

The examples of trims and flashings used in this guide are only representative of the products available, and may not be recommended in certain applications. Please call us for advice, or direction, as needed.

While the use of trims/flashings are needed to ensure a weathertight building, some trims are optional and can be used to enhance appearance. The following installation instructions refer to flashings and trims that are either, installed before the cladding (Before applied), or installed after the cladding (After applied).

Determine which type you have purchased and follow the appropriate installation procedure.

(a) Gable Trim *(Before applied)*:
To install gable trim, fit the pieces in place, fastening through (at 36" spacing maximum) both top and bottom nailing flanges. If this type of trim is used, it is important to properly seal (sealer tape is commonly used) and fasten the cladding sheet along the gable to prevent water from migrating under the sheet and into the building.

(b) Eave Trim *(Before applied)*:
Eave trim are installed before the roof sheets.
There the Eave trim will cover wall sheeting, determine the wall panel depth (e.g. 3/4") and fasten the top nailing flange of eave trim to allow a space for the wall panels plus a 1/8" clearance. Use at least three fasteners per 10'6" length of trim.

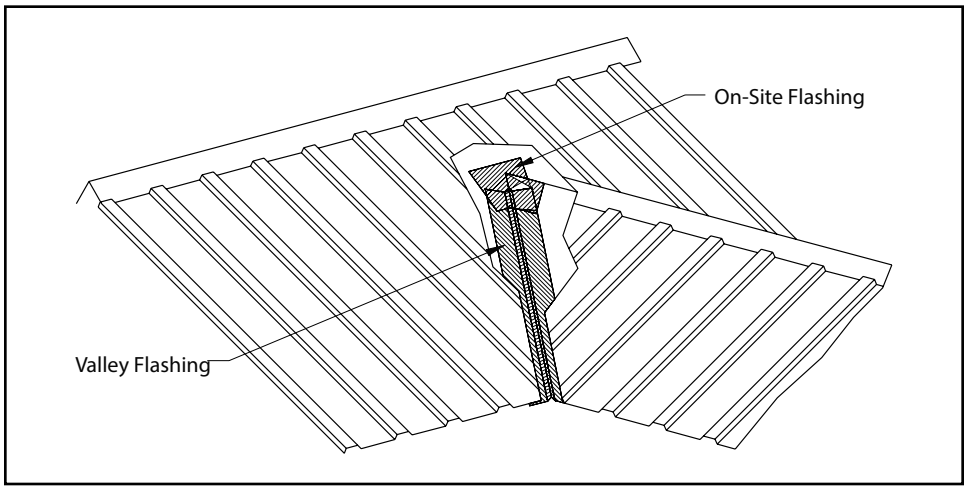
(c) Corner and Ridge Boxes *(if required)*:
Corner and ridge boxes are optional items and are installed after the eave and gable trims are in place. Follow the manufacturer's directions.

(d) Dormer and Valley Flashings:

Where required, install the valley flashings as shown. It is important that the valley flashing be supported by sheathing or blocking along its entire length. Without this support the flashing will not lie flat and it will be impossible to make a weathertight seal between the roof sheet and the flashing.

The size and shape of valley flashings differ from one roof to another. A low-pitch roof may require a 36” wide valley flashing, whereas a higher-pitch roof may only require one 24” wide. The roofing sheets should be cut at an angle to accommodate the pitch of the valley. A “W” valley is more effective in channeling water off the roof than a “V” type. Care needs to be taken to close off the cladding ribs to prevent water backing up under the sheet.

Flashing where the dormer meets the main roof area can be done using Westman Steel Roof Shield, which is an EPDM dormer cap designed for this application (shown as an On-Site Flashing below). Installation details for this can be found at the back of this Installation Guide. The dormer ridge cap needs to be cut and fitted under the main roof sheets.

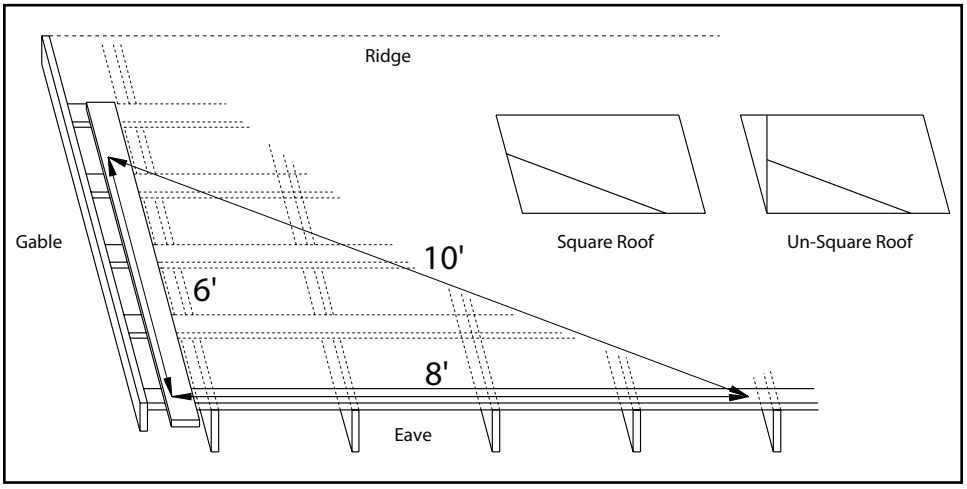


(e) Membrane:

When sheet steel roofing is installed over a sheathing material such as plywood, it is common practice in some regions, and some applications, to install a synthetic underlayment, or a peel and stick membrane over portions of the roof area. Please consult with your Westman Steel representative for recommendations.

STEP 3: Roof Sheets

(a) The first thing is to check the roof squareness. At the corner where an eave and gable meet, measure eight feet along the eave purlin and mark. Then measure six feet up the gable edge from the eave and make another mark. Measure the distance between the two marks. If it is exactly ten feet, you have a square roof at that corner. Check all roof corners using this procedure.



NOTE: *The following instructions assume that the roof is square. If the roof is not square there are two correction methods that can be used depending upon the severity. If the deviation is not too significant, it can be corrected a little sheet by sheet taking advantage of the tolerances in the sheet side laps. For unsquared roofs, the sheet along the gable can be trimmed along its length to match. An After applied gable flashing is used to reduce the visual impact of the trimmed sheet.*

(b) Identify the proper seam lap and the proper screw placement to fasten the sheets to the building.
NOTE: *When walking on a roof, avoid walking on the ribs. Step where the purlins are and follow the fasteners up or across.*

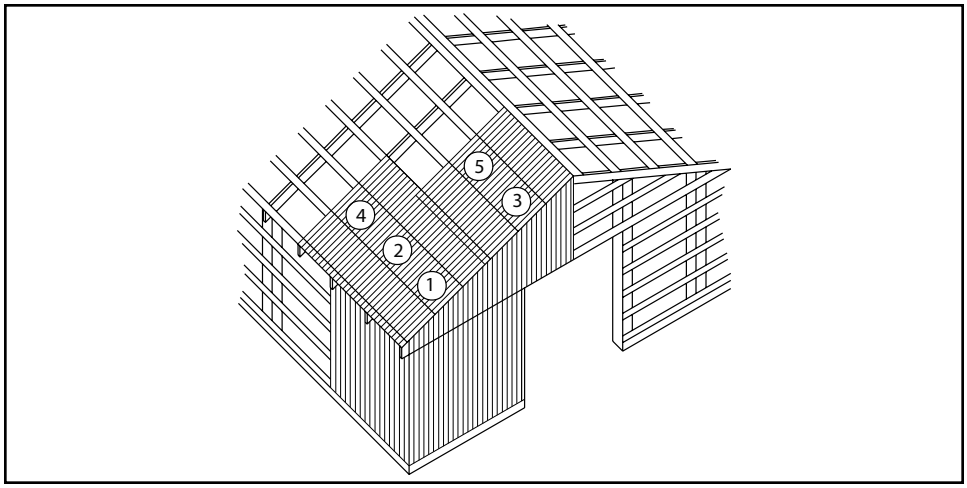
(c) To get the roof sheets up on the roof, put a board or ladder against the fascia board and slope to ground as far away from the building as possible. Using vise grips and a rope, pull sheets up the board and onto the roof. This method is not suited to long sheets.
NOTE: *Extra care needs to be taken on windy days to prevent the sheet from buckling or getting out of hand. Work safely.*

(d) Start at the eave on the end of the building farthest away from the prevailing winds. Extend the sheet about 1” over gable edge and 1” to 2” over the eave.

(e) Overlap sheet ends by at least 6”. Sheet end overlaps should only be made at a purlin for support. Lay sheets one by one from eave to ridge before commencing second row (below). Do not fasten open side before starting next row. Except for large buildings, a single sheet will span from eave to ridge without requiring overlaps.

(f) Check sheet alignment every four to five rows by chalking a line square to the eave.

(g) Leave the required space at the ridge to accommodate ventilation requirements.



STEP 4: Install Ridge Cap

There are a number of ridge cap and venting options. When venting, enough space must be left at the top of the roof sheeting allowing a sufficient opening as specified by the manufacturer.

(a) Chalk location of ridge cap on both sides of roof.

(b) Install closure strips/vented closure strips depending on application along chalk line with adhesive.

(c) Place ridge cap, or vents/vented ridge cap, on top and fasten through top of cladding rib and through closure strip. For vents/vented ridge cap, please make sure that closures do not block any drainage holes.

(d) For standard ridge cap, caulk overlapping portion and place next ridge cap on top, repeating the above steps.

(e) For vents and vented ridge cap, they should be fastened through the ribs of the roof sheets and a generous bead of caulking must be applied between the ridge cover and the vent end flanges.) For a ridge longer than the length of a single vent (normally 10 feet) butt two vents together with the connector flange underneath at the joint. Both vent and end panels fit between the two tabs on the connector flange. End panels are used when vents are installed individually.

STEP 5: Gable Trim (After applied)

Certain Gable trim are installed after the roof sheets have been installed. If you are using this type of trim, it should be installed as per details attached.

STEP 6: Install Base Flashing

(a) Measure side wall sheeting length and add 1" to determine location of base flashing.

(b) Measure nailing flange of base flashing.

(c) Subtract (b) from (a).

(d) Using the measurement found in (c), chalk a line around the building.

(e) Install base flashing, matching the top of the nailing flange to the chalk line. Using fasteners every 24", fasten trim.

STEP 7: Other Wall Trims and Flashings

Depending upon the type of building, there are a number of other flashings and trims needed to close off around the various wall penetrations such as doors and windows. The following describes some of the more common types as shown in the details following. Here again, some wall flashings and trims are installed before the wall cladding while others are installed after the cladding. Make sure you know which type you are using.

(a) Inside Corner: available for before and after applied applications.

(b) Outside Corner: available for before and after applied applications. Other options may be available. Please inquire.

(c) Gable Divider: Installed after the end wall siding, but before the gable siding. A gable divider is not needed if the end wall sheets are cut to fit the slope of the roof.

(d) Jamb Flashing: Jamb flashing is used around door openings and installed before the wall siding.

(e) J Trim: Finishing around a door, trimming windows, or being used as a termination strip on wall panels, J trim can be used in a multitude of different applications.

(f) Drip Flashing: Can be used over doors and windows, or as a base and header trim.

STEP 8: Wall Sheeting

Install the side wall and end wall sheeting, beginning on the side opposite primary view, usually the rear wall of the building. This will produce the best appearance since the sheeting laps will be out of immediate view.

(a) Inside Corner: available for before and after applied applications.

(b) Identify the proper seam lap and the proper screw placement to fasten the sheets to the building.

(c) Begin placing sheeting on the side wall at the corner. It is very important to use a level to plumb the wall sheets before fastening.

(d) Check seam lap to ensure a snug fit.

(e) Run the first two fasteners through the girt to hold the sheet in place.

(f) Finish fastening the wall sheets using the proper screw placement, ensuring that the sheets are square and laid evenly.

(g) Continue to fasten the wall sheets around the building, finishing with the gable ends.

STEP 9: Caulking and Clean-up

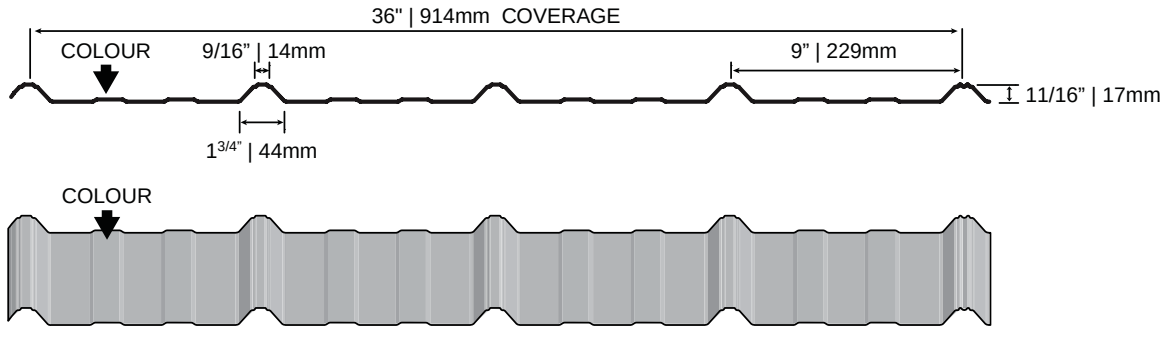
(a) Caulk around windows and doors for that professional look.

(b) After the cladding sheets are installed, take a soft bristle broom and sweep the sheets to remove any steel shavings or other dirt.

(c) Steel particles left on the cladding will rust very quickly, often staining the paint finish, giving the impression that the roof sheet has rusted.

(d) Dirt left on the sheets will hold moisture and accelerate the deterioration of the paint system

Market Segments – Agricultural | Residential | Commercial



MINIMUM 3:12 PITCH

Classic/Comm	Colour Code	Gauge(s) 29	26
Antique Linen	8696		•
Black	8262	•	•
Bone White	8273	•	•
Bright Red	8386	•	
Bright White	8783	•	•
Buckskin	9202	•	•
Burgundy	8011	•	
Cambridge White	8695		•
Charcoal	8306	•	•
Coffee	8326	•	•
Dark Brown	8229		•
Dark Red	8250	•	•

Classic/Comm	Colour Code	Gauge(s) 29	26
Deep Water Green	8684	•	
Galvalume	2	•	•
Galvanized	1	•	
Gold	8276	•	•
Heron Blue	8330	•	•
Hickory Moss	9368	•	
Int'l Orange	8234	•	•
Ivory	8802	•	
Light Stone	9367	•	•
Medium Green	8329	•	•
Melcher's Green	8307	•	•
Metro Brown	8228	•	

Classic/Comm	Colour Code	Gauge(s) 29	26
Pacific Turquoise	8258	•	
Regent Grey	8730	•	•
Royal Blue	8790	•	•
Sapphire Blue	8261	•	
Slate Blue	8260	•	•
Stone Grey	8305	•	•
Tan	8315	•	•
Tile Red	8259	•	
Whistler Green	8093	•	
White White	8317	•	•

Textured	Colour Code	29	26
Chocolate Brown	6034		•
Chrome Green	6037		•
Graphite Grey	6035		•

Textured	Colour Code	29	26
Jet Black	6039		•
Oxide Red	6042		•
Sepia Brown	6041		•

Exotic	Colour Code	29	26
Copper Penny	2005	•	•
Dark Zinc	1430		•
Rustic Red	1426		•
Silver Mist	8047		•

Wood Grain	Colour Code
Frontier Espresso	4100

Wood Grain	Colour Code
Frontier Cedar	4101

Product Description	Grade(s)	lbs./Lin. Ft.	Additional Information
29 Gauge Plain Galvanized	80	2.03	PLEASE CALL FOR PRICING Please contact your nearest location for availability and minimum/maximum lengths. Extended lead time may be required.
29 Gauge Plain Galvalume	80	2.03	
29 Gauge Coloured	80	2.03	
26 Gauge Plain Galvalume	50/80	3.12	
26 Gauge Coloured	50/80	3.12	

Check your local Westman branch for colour availability • Prices subject to change without notice. • "Special" crating charges where applicable.
Charges apply for Short Sheet production less than 36" • Fabrication charges where applicable.

General - Presented in the load tables are maximum uniformly distributed specified loads.

Steel - Conforms to ASTM A653/A653M or A792/A792M. Grade 33/230; Yield stress 33 ksi/230 MPa and tensile stress 45 ksi/310 MPa. Grade 50 /345; Yield stress 50 ksi/345 MPa and tensile stress 65 ksi/450 MPa; Grade 80 /550; Yield stress 80 ksi/550 MPa and tensile stress 82 ksi/565 MPa.

Finishes - A25/ZF75, G90/Z275 or AZ50/AZM150. For heavier metallic coatings, refer to ASTM A653/A653M or A792/A792M.

Load Tables - The following information regarding the determination of the specified wind and snow loads is contained in the 2010 Edition of the National Building Code of Canada (NBCC). Importance factors are applied to both strength (ULS) and serviceability/deflection (SLS) limit state design considerations. A lower load factor for wind of 1.4, instead of 1.5 for live and snow loads, is now being used. This lower load factor for wind somewhat offsets the higher wind loads (1 in 50 year return) that are now listed in the NBCC by geographic location. The importance category of the end use of the building/structure must also be recognized, such as Normal or Low.

All of this will impact how the load tables are to be used. In an effort to help the design professional with the load tables, the information below was taken directly from Division B, Part 4 (Structural Design) of the NBCC.

Specified Wind Load

$$W = I_w \boxed{qC_eC_gC_p} \qquad [1]$$

Importance Category	Importance Factor, I_w	
	ULS	SLS
Low	***0.8***	***0.75***
Normal	***1.0***	***0.75***
High	1.15	0.75
Post-Disaster	1.25	0.75

Specified Snow Load

$$S = I_s \boxed{[S_s\,(C_b\,C_w\,C_s\,C_a) + S_r]} \qquad [2]$$

Importance Category	Importance Factor, I_w	
	ULS	SLS
Low	***0.8***	***0.9***
Normal	***1.0***	***0.9***
High	1.15	0.9
Post-Disaster	1.25	0.9

The importance factors, I_w and I_s, have been incorporated in the load tables, as well as the importance category. The parameters in the boxed-in portion of Equations [1] and [2] must be determined by the design professional in accordance with the NBCC.

Strength - The maximum uniformly distributed specified load based on strength in the load table must be equal to or greater than ***(Specified live load + 0.833 times the specified dead load).*** Where 0.833 = 1.25/1.5. The specified live load can be either due to use and occupancy or snow load. In cases where live load and snow load act together, the load combination factors in the NBCC must be followed.

Serviceability (Deflection) - The maximum uniformly distributed specified load based on deflection in the load table must be equal to or greater than the specified live load. The effective moment of inertia for deflection determination was calculated at an assumed specified live load stress of $\boldsymbol{0.6F_y}$.

EXAMPLE (Use of Load Table)

Deckmate Roof (Normal Importance Category)

Given: (Imperial units)

(LLF = 1.5 and I_s = 0.9)
~ Deck thickness, t = 0.024 in
~ Triple span continuous, L = 6.0 ft each span
~ Bearing length, N = 3 in
~ L/240 deflection limit
~ Specified Loads
1) Dead load (DL)
a) Deck 1.36 psf
b) Superimposed 9.50 psf; DL = 10.86 psf
2) Snow Live load (LL) LL = 40 psf

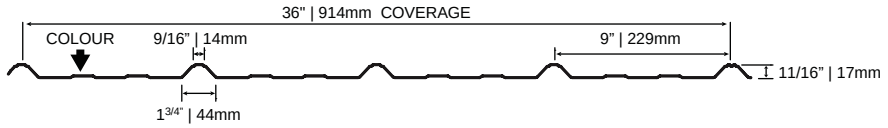
The live load is the value of the boxed-in portion of the specified snow load expression [2].

Solution:
Strength "S"
1) Specified load [LL +0.833DL] = 49.0 psf
2) Maximum specified load (from Load Table)
Is ***59 psf***
Since ***59 > 49.0 ∴ OK***
3) Check web crippling (N = 3 in)
a) End reaction = 0.400(49.0)6 = ***118 lb/ft***
(from section property table)
$P_e = P_{e1} + P_{e2}\,[N/t]^{1/2}$
$= 102 + 25.5[3/0.024]^{1/2}$ = ***387 lb/ft***
Since ***387 > 118*** ∴ OK
b) Interior reaction = 1.10(49.0)6 = ***323 lb/ft***
(from section property table)
$P_i = P_{i1} + P_{i2}\,[N/t]^{1/2}$
$= 197 + 33.4[3/0.024]^{1/2}$ = ***570 lb/ft***
Since ***570 > 323*** ∴ OK
Deflection "D"
From table L/180 = ***113 psf***
For L/240, multiply 113 by 180/240 = ***84.8 psf***
Since ***84.8 > 40*** ∴ OK

Load Table | Imperial
Tough Rib Roof Profile

1. Based on ASTM A 653 structural steel.
2. Values in row "S" are based on strength.
3. Values in row "D" are based on deflection of 1/180th span.
4. Web crippling not included in strength calculation. See example.
5. Limit States Design principles were used in accordance with CSA Standard S136-12.

LIMIT STATES DESIGN



SECTION PROPERTIES | Per Foot of Width

Base Steel Thickness (inches)	Weight [G90] (psf)	Yield Stress (ksi)	Section Modulus		Deflection Moment of Inertia (in^4)	Specified Web Crippling Data			
			Midspan (in^3)	Support (in^3)		Pe1 End (lb)	Pe2 End (lb)	Pi1 Interior (lb)	Pi1 Interior (lb)
0.0135	0.68	80	0.0120	0.0096	0.0069	32.6	8.16	60.7	10.3
0.0180	0.88	50	0.0161	0.0134	0.0092	50.7	12.7	94.6	16.1

LLF = 1.50; IMPF = 0.90; NORMAL OCCUPANCY = 1.0

LOAD TABLE | Maximum Uniformly Distributed Specified Loads (psf).

Span Length (ft)		1-Span Base Steel Thickness (inches)						2-Span Base Steel Thickness (inches)						3-Span Base Steel Thickness (inches)					
		0.0135	0.0180					0.0135	0.0180					0.0135	0.0180				
Y.S.* (ksi)		80	50					80	50					80	50				
1.5	S	128	143					102	119					127	149				
1.5	D	198	264					476	634					375	499				
2.0	S	72	80					57	67					72	84				
2.0	D	84	111					201	267					158	210				
2.5	S	46	52					37	43					46	54				
2.5	D	43	57					103	137					81	108				
3.0	S	32	36					25	30					32	37				
3.0	D	25	33					60	79					47	62				
3.5	S	23	26					19	22					23	27				
3.5	D	16	21					37	50					30	39				
4.0	S	18	20					14	17					18	21				
4.0	D	10	14					25	33					20	26				
4.5	S	14	16					11	13					14	17				
4.5	D	7	10					18	23					14	18				
5.0	S	12	13					9	11					11	13				
5.0	D	5	7					13	17					10	13				

* Y.S. = Yield Strength

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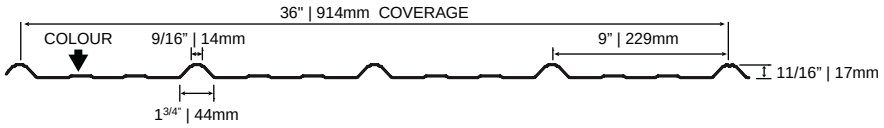
Load Table | Metric
Tough Rib Roof Profile

1. Based on ASTM A 653 structural steel.
2. Values in row "S" are based on strength.
3. Values in row "D" are based on deflection of 1/180th span.
4. Web crippling not included in strength calculation. See example.
5. Limit States Design principles were used in accordance with CSA Standard S136-12.

LIMIT STATES DESIGN



SECTION PROPERTIES | Per Metre of Width

Base Steel Thickness (mm)	Mass [Z275] (kg/m²)	Yield Stress (MPa)	Section Modulus		Deflection Moment of Inertia	Specified Web Crippling Data			
			Midspan (x10³ mm³)	Support (x10³ mm³)	(x10⁶ mm⁴)	Pe1 End (kN)	Pe2 End (kN)	Pi1 Interior (kN)	Pi1 Interior (kN)
0.343	3.30	550	0.645	0.514	0.0094	0.475	0.119	0.883	0.150
0.457	4.31	345	0.866	0.721	0.0126	0.740	0.185	1.38	0.235

LLF = 1.50; IMPF = 0.90; NORMAL OCCUPANCY = 1.0

LOAD TABLE | Maximum Uniformly Distributed Specified Loads (kPa).

Span Length (m)		1-Span Base Steel Thickness (mm)						2-Span Base Steel Thickness (mm)						3-Span Base Steel Thickness (mm)					
		0.343	0.457					0.343	0.457					0.343	0.457				
Y.S.* (MPa)		550	345					550	345					550	345				
0.5	S	5.11	5.73					4.07	4.78					5.09	5.97				
0.5	D	7.26	9.66					17.4	23.2					13.7	18.3				
0.6	S	3.55	3.98					2.83	3.32					3.53	4.15				
0.6	D	4.20	5.59					10.1	13.4					7.94	10.6				
0.8	S	2.00	2.24					1.59	1.87					1.99	2.33				
0.8	D	1.77	2.36					4.25	5.66					3.35	4.46				
1.0	S	1.28	1.43					1.02	1.19					1.27	1.49				
1.0	D	0.91	1.21					2.18	2.90					1.72	2.28				
1.2	S	0.89	1.00					0.71	0.83					0.88	1.04				
1.2	D	0.53	0.70					1.26	1.68					0.99	1.32				
1.4	S	0.65	0.73					0.52	0.61					0.65	0.76				
1.4	D	0.33	0.44					0.79	1.06					0.63	0.83				
1.6	S	0.50	0.56					0.40	0.47					0.50	0.58				
1.6	D	0.22	0.29					0.53	0.71					0.42	0.56				

* Y.S. = Yield Strength

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General - Presented in the load tables are maximum uniformly distributed specified loads.

Steel - Conforms to ASTM A653/A653M or A792/A792M. Grade 33/230; Yield stress 33 ksi/230 MPa and tensile stress 45 ksi/310 MPa. Grade 50 /345; Yield stress 50 ksi/345 MPa and tensile stress 65 ksi/450 MPa; Grade 80 /550; Yield stress 80 ksi/550 MPa and tensile stress 82 ksi/565 MPa.

Finishes - A25/ZF75, G90/Z275 or AZ50/AZM150. For heavier metallic coatings, refer to ASTM A653/A653M or A792/A792M.

Load Tables - The following information regarding the determination of the specified wind and snow loads is contained in the 2010 Edition of the National Building Code of Canada (NBCC). Importance factors are applied to both strength (ULS) and serviceability/deflection (SLS) limit state design considerations. A lower load factor for wind of 1.4, instead of 1.5 for live and snow loads, is now being used. This lower load factor for wind somewhat offsets the higher wind loads (1 in 50 year return) that are now listed in the NBCC by geographic location. The importance category of the end use of the building/structure must also be recognized, such as Normal or Low.

All of this will impact how the load tables are to be used. In an effort to help the design professional with the load tables, the information below was taken directly from Division B, Part 4 (Structural Design) of the NBCC.

Specified Wind Load

$$W = I_w \boxed{qC_eC_gC_p} \qquad [1]$$

Importance Category	Importance Factor, I_w	
	ULS	SLS
Low	***0.8***	***0.75***
Normal	***1.0***	***0.75***
High	1.15	0.75
Post-Disaster	1.25	0.75

Specified Snow Load

$$S = I_s \boxed{[S_s\,(C_b\,C_w\,C_s\,C_a) + S_r]} \qquad [2]$$

Importance Category	Importance Factor, I_w	
	ULS	SLS
Low	***0.8***	***0.9***
Normal	***1.0***	***0.9***
High	1.15	0.9
Post-Disaster	1.25	0.9

The importance factors, I_w and I_s, have been incorporated in the load tables, as well as the importance category. The parameters in the boxed-in portion of Equations [1] and [2] must be determined by the design professional in accordance with the NBCC.

Strength - The maximum uniformly distributed specified load based on strength in the load table must be equal to or greater than the ***specified live load.***

Serviceability (Deflection) - The maximum uniformly distributed specified load based on deflection in the load table must be equal to or greater than the ***specified live load.*** The effective moment of inertia for deflection determination was calculated at an assumed specified live load stress of $\boldsymbol{0.6F_y}$.

EXAMPLE (Use of Load Table)

Ultra Span Wall (Normal Importance Category)

Given: (Metric units)

(LLF = 1.4 and I_w = 0.75)
~ Deck thickness, t = 0.762 mm
~ Double span continuous, L = 2.6 m each span
~ Bearing length, N = 50 mm
~ L/240 deflection limit
~ Wind live load, LL = 1.5 kPa

The live load is the value of the boxed-in portion of the specified wind load expression [1].

Solution:

Strength "S"
1) Specified wind live load = 1.5 kPa

2) Maximum specified load (from Load Table)
   Is ***1.65 kPa***
   Since ***1.65 > 1.5 ∴ OK***

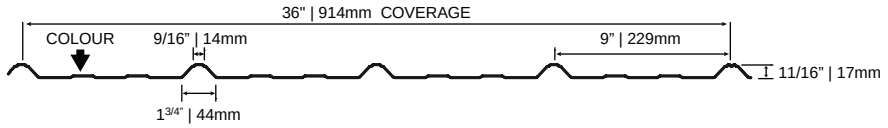
3) Check web crippling (N = 50 mm)
   a) End reaction = 0.375(1.5)2.6 = ***1.46 kN/m***
      (from section property table)
      $P_e = P_{e1} + P_{e2}$ [N/t]$^{1/2}$
      = 2.78 + 0.695[50/0.762]$^{1/2}$ = ***8.41 kN/m***
      Since ***8.41 > 1.46*** ∴ OK
   b) Interior reaction = 1.25(1.5)2.6 = ***4.88 kN/m***
      (from section property table)
      $P_i = P_{i1} + P_{i2}$ [N/t]$^{1/2}$
      = 5.29 + 0.900[50/0.762]$^{1/2}$ = ***12.6 kN/m***
      Since ***12.6 > 4.88*** ∴ OK

Deflection "D"
From table L/180 = ***3.26 kPa***
For L/240, multiply 3.26 by 180/240 = ***2.45 kPa***
Since ***2.45 > 1.5*** ∴ OK

Load Table | Imperial
Tough Rib Cladding Profile

1. Based on ASTM A 653 structural steel.
2. Values in row "S" are based on strength.
3. Values in row "D" are based on deflection of 1/180th span.
4. Web crippling not included in strength calculation. See example.
5. Limit States Design principles were used in accordance with CSA Standard S136-12.

LIMIT STATES DESIGN



SECTION PROPERTIES | Per Foot of Width

Base Steel Thickness (inches)	Weight [G90] (psf)	Yield Stress (ksi)	Section Modulus		Deflection Moment of Inertia (in^4)	Specified Web Crippling Data			
			Midspan (in^3)	Support (in^3)		Pe1 End (lb)	Pe2 End (lb)	Pi1 Interior (lb)	Pi1 Interior (lb)
0.0135	0.68	80	0.0120	0.0096	0.0069	35.0	8.74	65.0	11.1
0.0180	0.88	50	0.0161	0.0134	0.0092	54.3	13.6	101	17.2

LLF = 1.40; IMPF = 0.75; NORMAL OCCUPANCY = 1.0

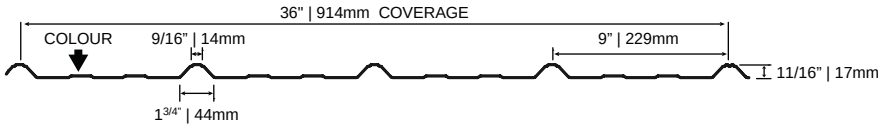
LOAD TABLE | Maximum Uniformly Distributed Specified Loads (psf).

Span Length (ft)		1-Span Base Steel Thickness (inches)						2-Span Base Steel Thickness (inches)						3-Span Base Steel Thickness (inches)					
		0.0135	0.0180					0.0135	0.0180					0.0135	0.0180				
Y.S.* (ksi)		80	50					80	50					80	50				
1.5	S	137	153					109	128					137	160				
1.5	D	238	317					571	760					450	599				
2.0	S	77	86					61	72					77	90				
2.0	D	100	134					241	321					190	253				
2.5	S	49	55					39	46					49	58				
2.5	D	51	68					123	164					97	129				
3.0	S	34	38					27	32					34	40				
3.0	D	30	40					71	95					56	75				
3.5	S	25	28					20	23					25	29				
3.5	D	19	25					45	60					35	47				
4.0	S	19	22					15	18					19	22				
4.0	D	13	17					30	40					24	32				
4.5	S	15	17					12	14					15	18				
4.5	D	9	12					21	28					17	22				
5.0	S	12	14					10	12					12	14				
5.0	D	6	9					15	21					12	16				

* Y.S. = Yield Strength

1. Based on ASTM A 653 structural steel.
2. Values in row "S" are based on strength.
3. Values in row "D" are based on deflection of 1/180th span.
4. Web crippling not included in strength calculation. See example.
5. Limit States Design principles were used in accordance with CSA Standard S136-12.

LIMIT STATES DESIGN



SECTION PROPERTIES | Per Metre of Width

Base Steel Thickness (mm)	Mass [Z275] (kg/m²)	Yield Stress (MPa)	Section Modulus		Deflection Moment of Inertia	Specified Web Crippling Data			
			Midspan (x10³ mm³)	Support (x10³ mm³)	(x10⁶ mm⁴)	Pe1 End (kN)	Pe2 End (kN)	Pi1 Interior (kN)	Pi1 Interior (kN)
0.343	3.30	550	0.645	0.514	0.0094	0.509	0.127	0.95	0.161
0.457	4.31	345	0.866	0.721	0.0126	0.793	0.198	1.48	0.252

LLF = 1.40; IMPF = 0.75; NORMAL OCCUPANCY = 1.0

LOAD TABLE | Maximum Uniformly Distributed Specified Loads (kPa).

Span Length (m)		1-Span Base Steel Thickness (mm)						2-Span Base Steel Thickness (mm)						3-Span Base Steel Thickness (mm)					
		0.343	0.457					0.343	0.457					0.343	0.457				
Y.S.* (MPa)		550	345					550	345					550	345				
0.5	S	5.47	6.14					4.36	5.12					5.45	6.40				
0.5	D	8.71	11.6					20.9	27.8					16.5	21.9				
0.6	S	3.80	4.27					3.03	3.56					3.79	4.44				
0.6	D	5.04	6.71					12.1	16.1					9.53	12.7				
0.8	S	2.14	2.40					1.70	2.00					2.13	2.50				
0.8	D	2.13	2.83					5.11	6.79					4.02	5.35				
1.0	S	1.37	1.54					1.09	1.28					1.36	1.60				
1.0	D	1.09	1.45					2.61	3.48					2.06	2.74				
1.2	S	0.95	1.07					0.76	0.89					0.95	1.11				
1.2	D	0.63	0.84					1.51	2.01					1.19	1.59				
1.4	S	0.70	0.78					0.56	0.65					0.70	0.82				
1.4	D	0.40	0.53					0.95	1.27					0.75	1.00				
1.6	S	0.53	0.60					0.43	0.50					0.53	0.63				
1.6	D	0.27	0.35					0.64	0.85					0.50	0.67				

* Y.S. = Yield Strength

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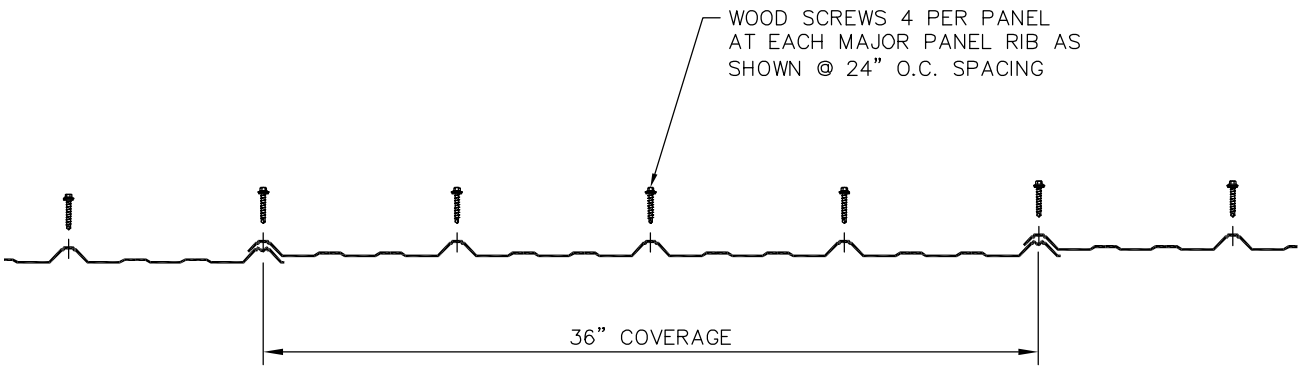
ROOF PANEL FASTENER LAYOUT (EAST)

SHT.	REV.
—	—



TOUGH-RIB FASTENER LAYOUT

NOTES:
A. DO NOT SCALE. DETAILS ARE FOR GUIDELINES ONLY, AND MAY NOT BE SUITABLE FOR ALL BUILDING DESIGNS AND CONDITIONS.
B. SCREW LENGTHS AND SIZES MAY VARY PER CUSTOMER REQUEST. PLEASE INQUIRE FOR STANDARDS IN YOUR AREA.

NOTE: ACCEPTABLE ROOFING SUBSTRATE
– MIN. 5/8 PLYWOOD SHEATHING
– WOOD STRAPPING

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ROOF PANEL FASTENER LAYOUT (WEST)

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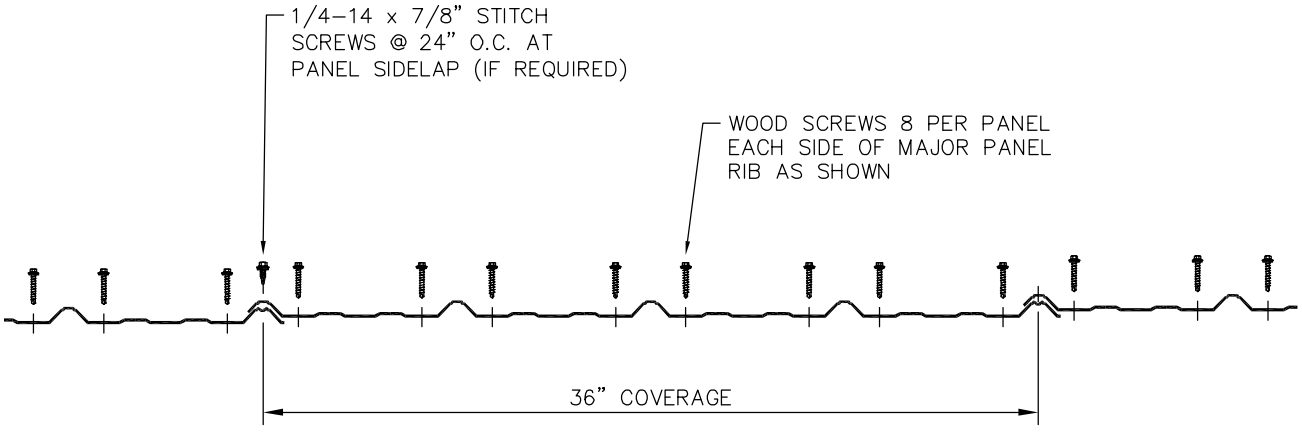
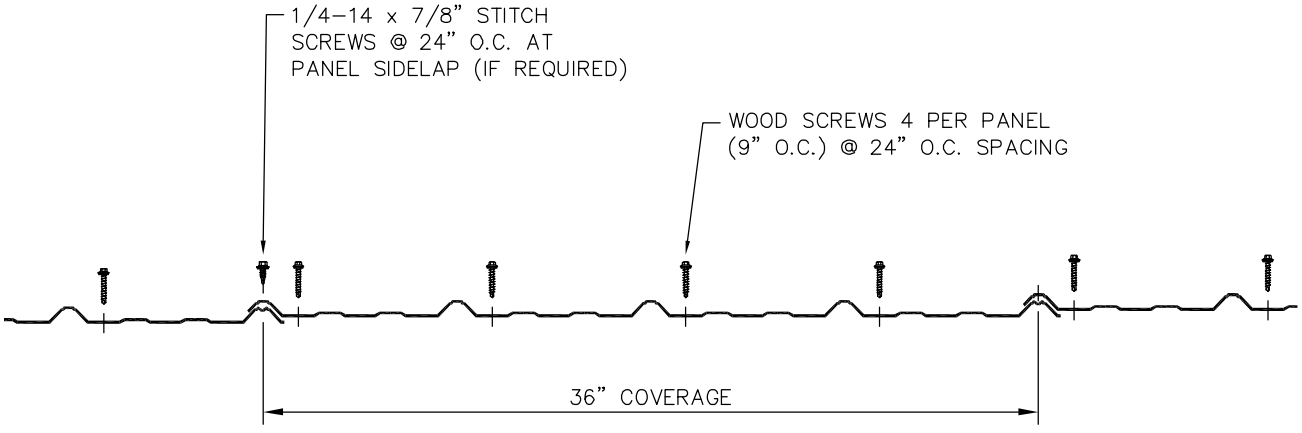


TOUGH–RIB FASTENER LAYOUT – EAVE, RIDGE & ENDLAP LOCATIONS



TOUGH–RIB FASTENER LAYOUT – INTERMEDIATE LOCATIONS

NOTE: ACCEPTABLE ROOFING SUBSTRATE
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

NOTES:
A. DO NOT SCALE. DETAILS ARE FOR GUIDELINES ONLY, AND MAY NOT BE SUITABLE FOR ALL BUILDING DESIGNS AND CONDITIONS.
B. SCREW LENGTHS AND SIZES MAY VARY PER CUSTOMER REQUEST. PLEASE INQUIRE FOR STANDARDS IN YOUR AREA.

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ROOF ENDLAP DETAILS

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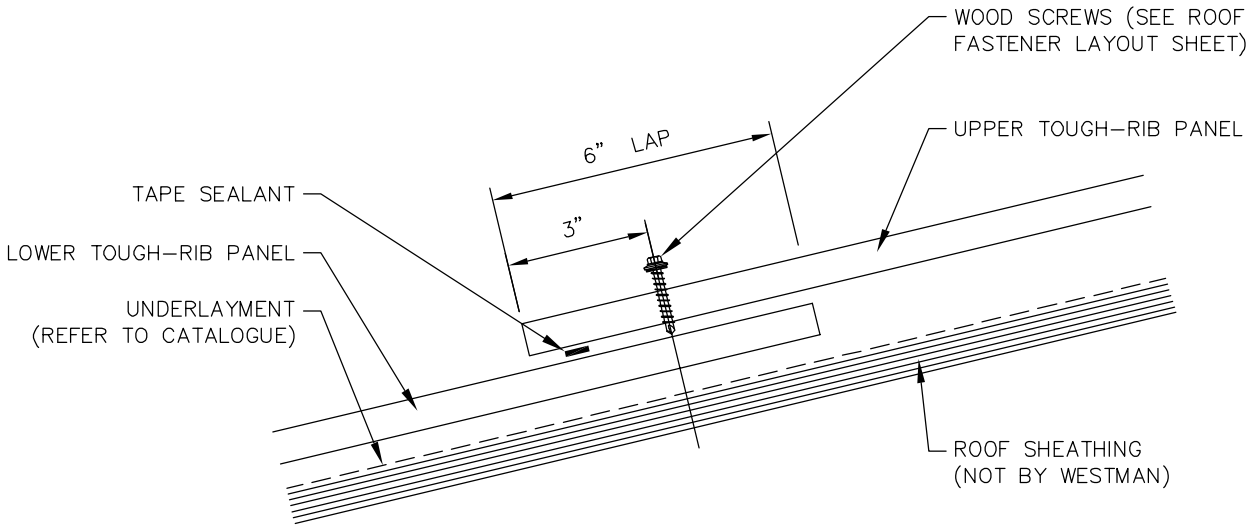
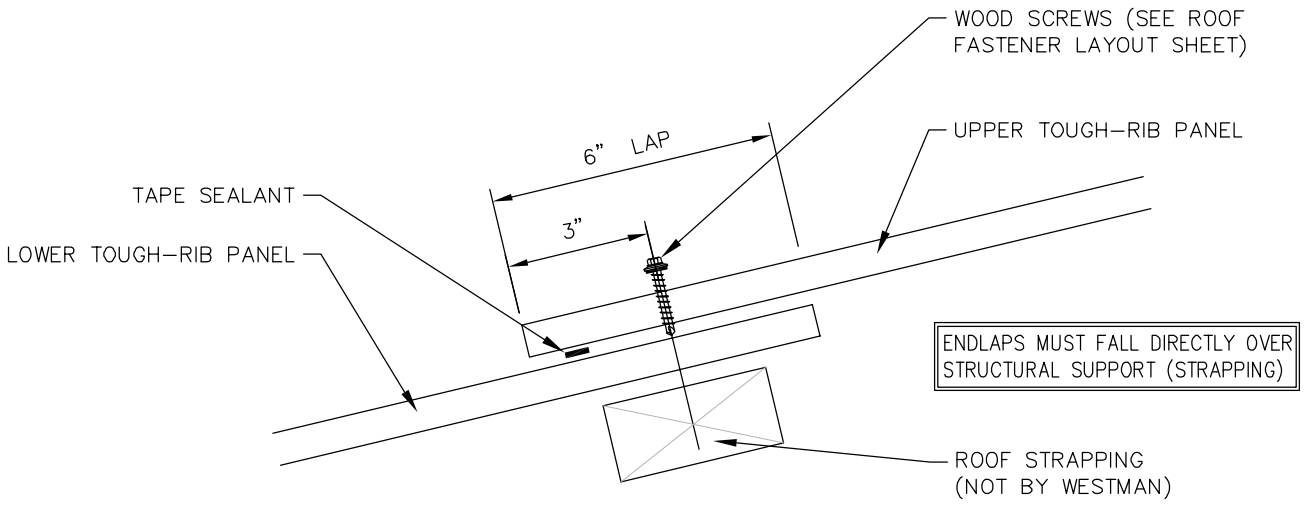


ENDLAP DETAIL ON PLYWOOD SHEATHING

DETAIL BASED ON 3:12 PITCH



ENDLAP DETAIL ON STRAPPING

DETAIL BASED ON 3:12 PITCH

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
- MIN.5/8 PLYWOOD SHEATHING
- WOOD STRAPPING

NOTES:
A. DO NOT SCALE. DETAILS ARE FOR GUIDELINES ONLY, AND MAY NOT BE SUITABLE FOR ALL BUILDING DESIGNS AND CONDITIONS.
B. SCREW LENGTHS AND SIZES MAY VARY PER CUSTOMER REQUEST. PLEASE INQUIRE FOR STANDARDS IN YOUR AREA.
C. ENDLAP DETAIL BASED ON 3:12 PITCH

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WALL PANEL FASTENER LAYOUT

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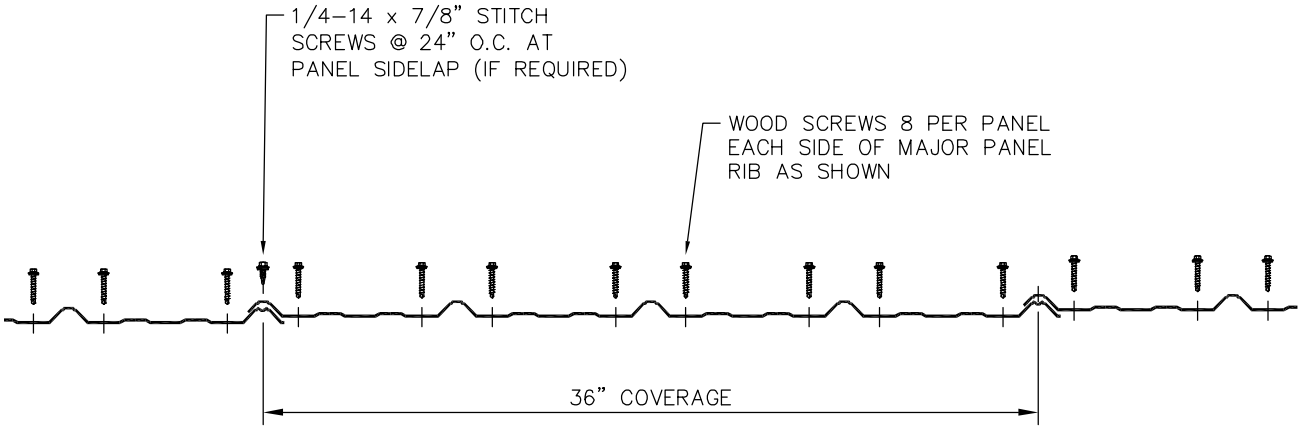
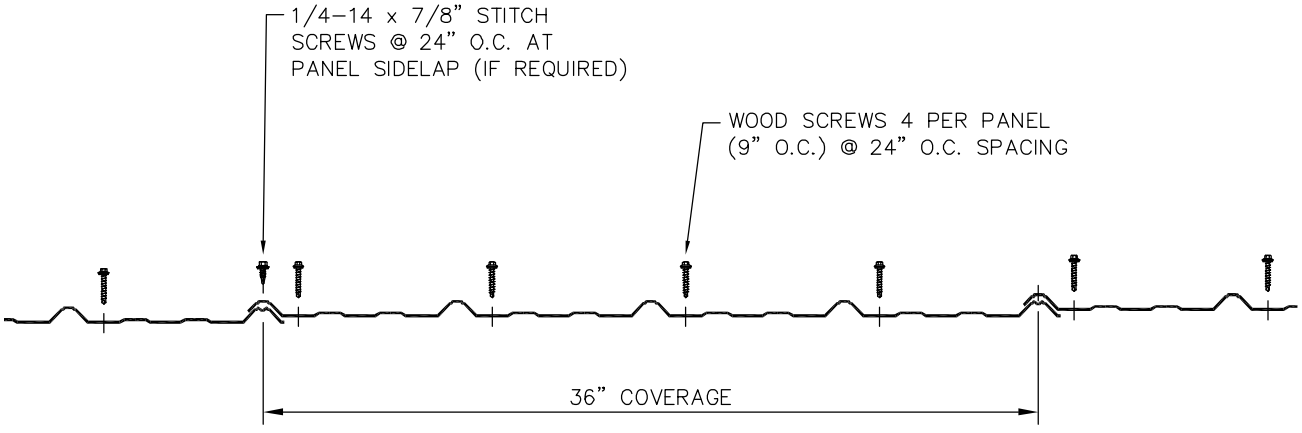


TOUGH–RIB FASTENER LAYOUT – TOP OF WALL & BASE OF WALL LOCATIONS



TOUGH–RIB FASTENER LAYOUT – INTERMEDIATE LOCATIONS

NOTE: ACCEPTABLE WALL SUBSTRATE
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

NOTES:
A. DO NOT SCALE. DETAILS ARE FOR GUIDELINES ONLY, AND MAY NOT BE SUITABLE FOR ALL BUILDING DESIGNS AND CONDITIONS.
B. SCREW LENGTHS AND SIZES MAY VARY PER CUSTOMER REQUEST. PLEASE INQUIRE FOR STANDARDS IN YOUR AREA.

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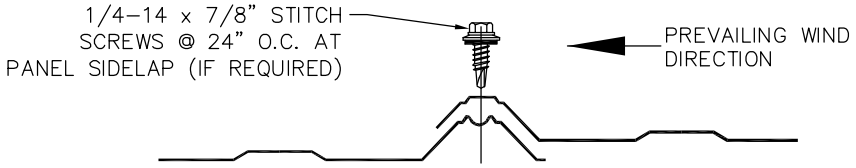
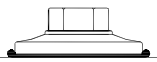
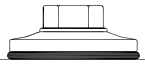
SIDELAP DETAIL and CORRECT FASTENER SEATING

SHT. —

REV. —



SIDELAP DETAIL

PROPER SEATING OF SCREWS		
		
OVERDRIVEN	PROPERLY DRIVEN	UNDERDRIVEN
– METAL WASHER DEFORMED and/or SEALING MATERIAL EXTRUDED BEYOND EDGE OF WASHER The weatherseal washer has been damaged by too much compression and/or cut by the turning metal washer. The seal will only be short–term.	– SEALING MATERIAL SLIGHTLY VISIBLE AT EDGE OF METAL WASHER – ASSEMBLY IS WEATHER TIGHT The weatherseal washer has been compressed but not damaged. Washer is just visible.	– SEALING MATERIAL NOT VISIBLE The weatherseal washer has not been compressed enough to seal.

NOTE: ACCEPTABLE WALL & ROOFING SUBSTRATE
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

NOTES:
A. DO NOT SCALE. DETAILS ARE FOR GUIDELINES ONLY, AND MAY NOT BE SUITABLE FOR ALL BUILDING DESIGNS AND CONDITIONS.
B. SCREW LENGTHS AND SIZES MAY VARY PER CUSTOMER REQUEST. PLEASE INQUIRE FOR STANDARDS IN YOUR AREA.

WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

RIDGE FLASHING DETAIL

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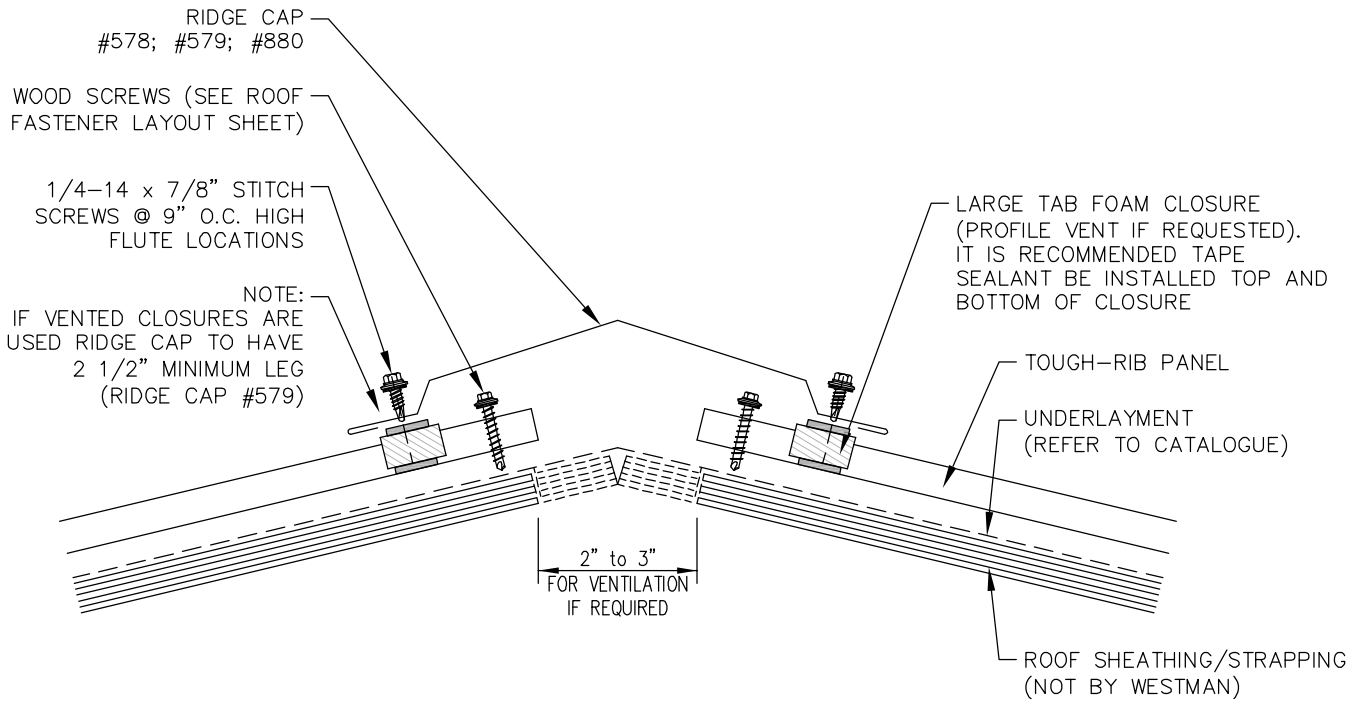
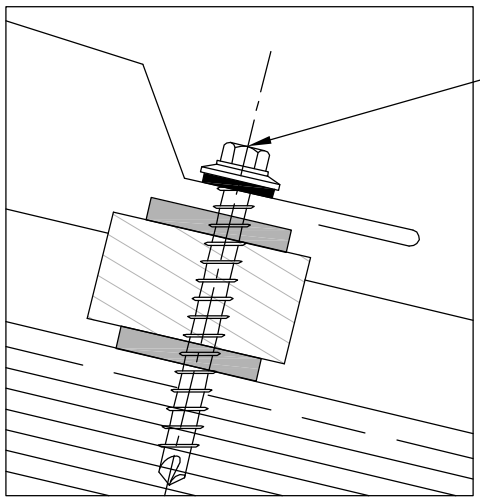




ALTERNATE FASTENING
USING WOOD SCEWS

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
– MIN.5/8 PLYWOOD SHEATHING
– WOOD STRAPPING

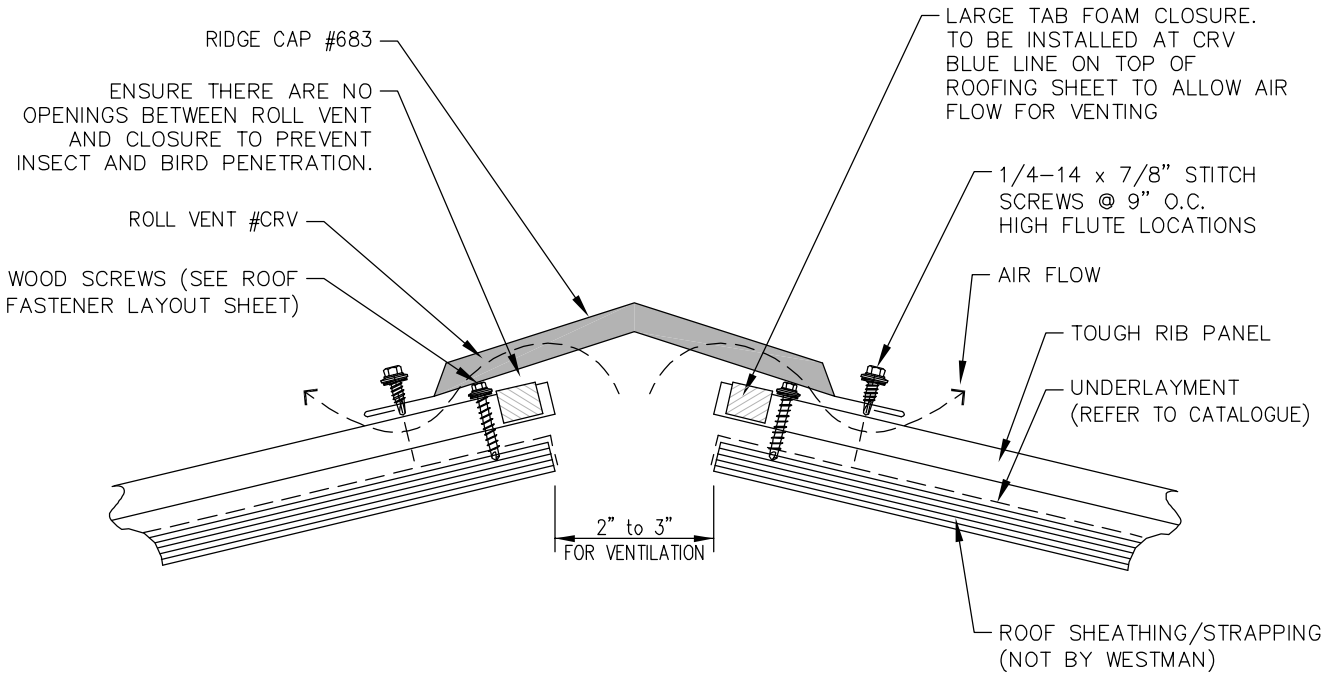
NOTES:
A. DO NOT SCALE. DETAILS ARE FOR GUIDELINES ONLY, AND MAY NOT BE SUITABLE FOR ALL BUILDING DESIGNS AND CONDITIONS.
B. SCREW LENGTHS AND SIZES MAY VARY PER CUSTOMER REQUEST. PLEASE INQUIRE FOR STANDARDS IN YOUR AREA.

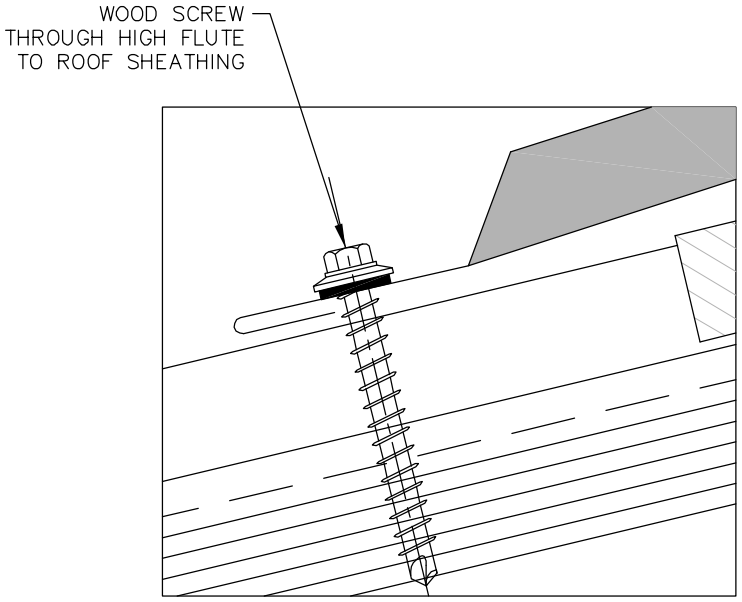
WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

ROLL VENTED RIDGE FLASHING DETAIL

SHT.	REV.
—	—





ALTERNATE FASTENING
USING WOOD SCEWS

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
– MIN.5/8 PLYWOOD SHEATHING
– WOOD STRAPPING

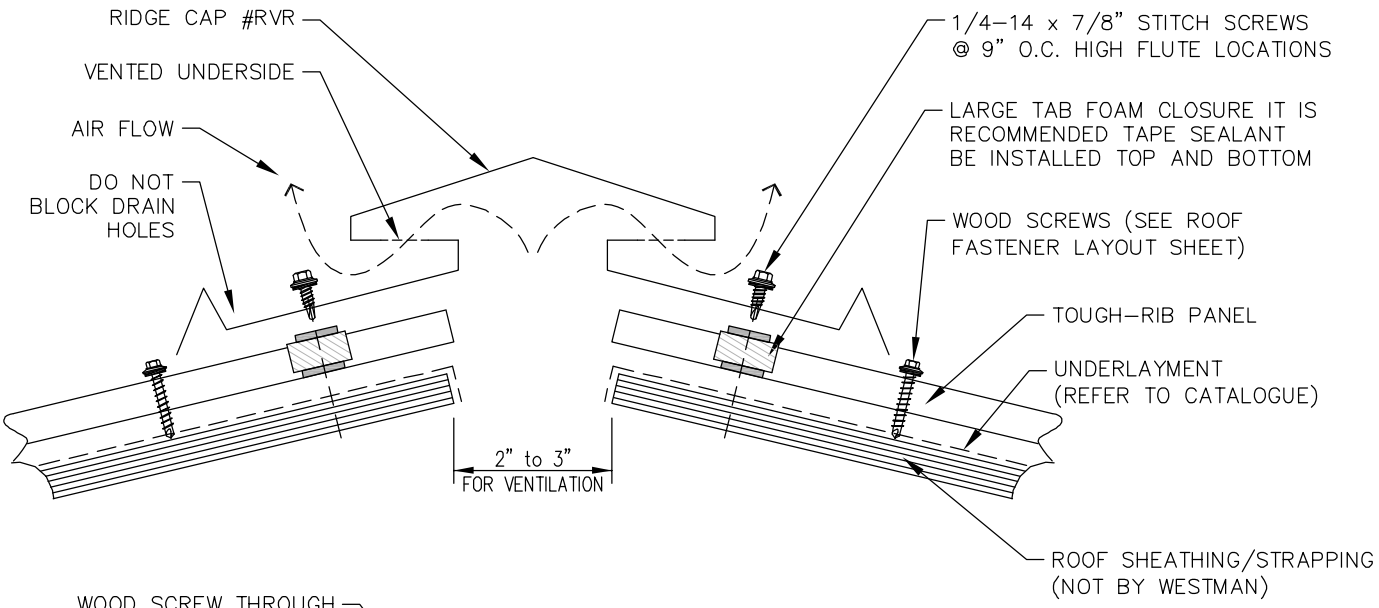
NOTES:
A. DO NOT SCALE. DETAILS ARE FOR GUIDELINES ONLY, AND MAY NOT BE SUITABLE FOR ALL BUILDING DESIGNS AND CONDITIONS.
B. SCREW LENGTHS AND SIZES MAY VARY PER CUSTOMER REQUEST. PLEASE INQUIRE FOR STANDARDS IN YOUR AREA..

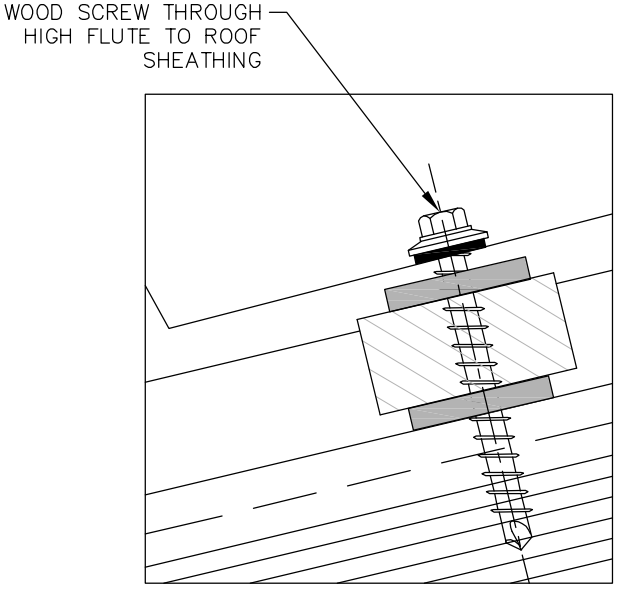
WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

VENTED RIDGE FLASHING DETAIL (EAST)

SHT.	REV.
—	—





ALTERNATE FASTENING USING WOOD SCEWS

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

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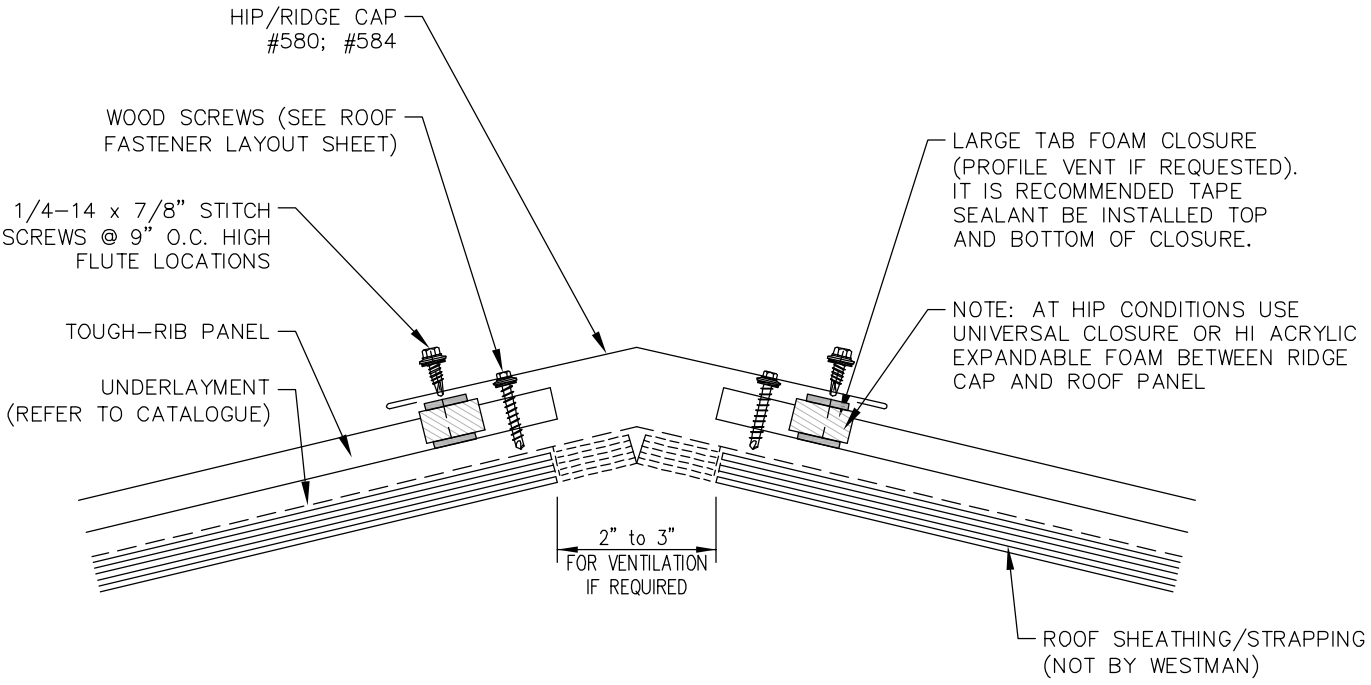
C. ROOF SLOPE UP TO 4:12

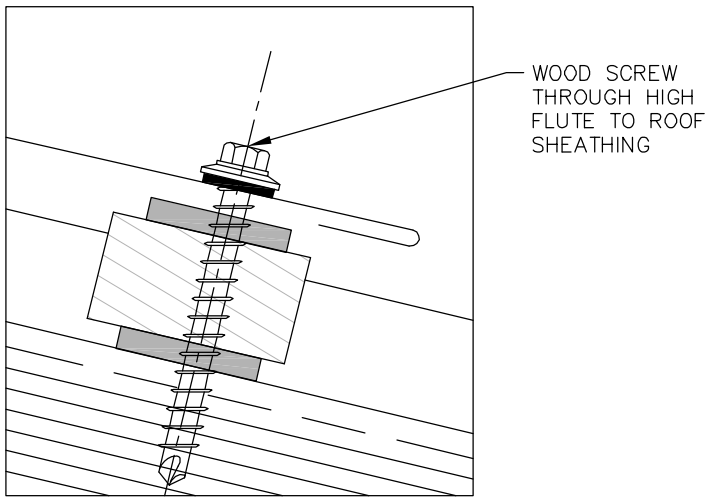
WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

HIP/RIDGE FLASHING DETAIL

SHT.	REV.
—	—





ALTERNATE FASTENING
USING WOOD SCEWS

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
– MIN.5/8 PLYWOOD SHEATHING
– WOOD STRAPPING

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

PEAK DETAIL

SHT.	REV.
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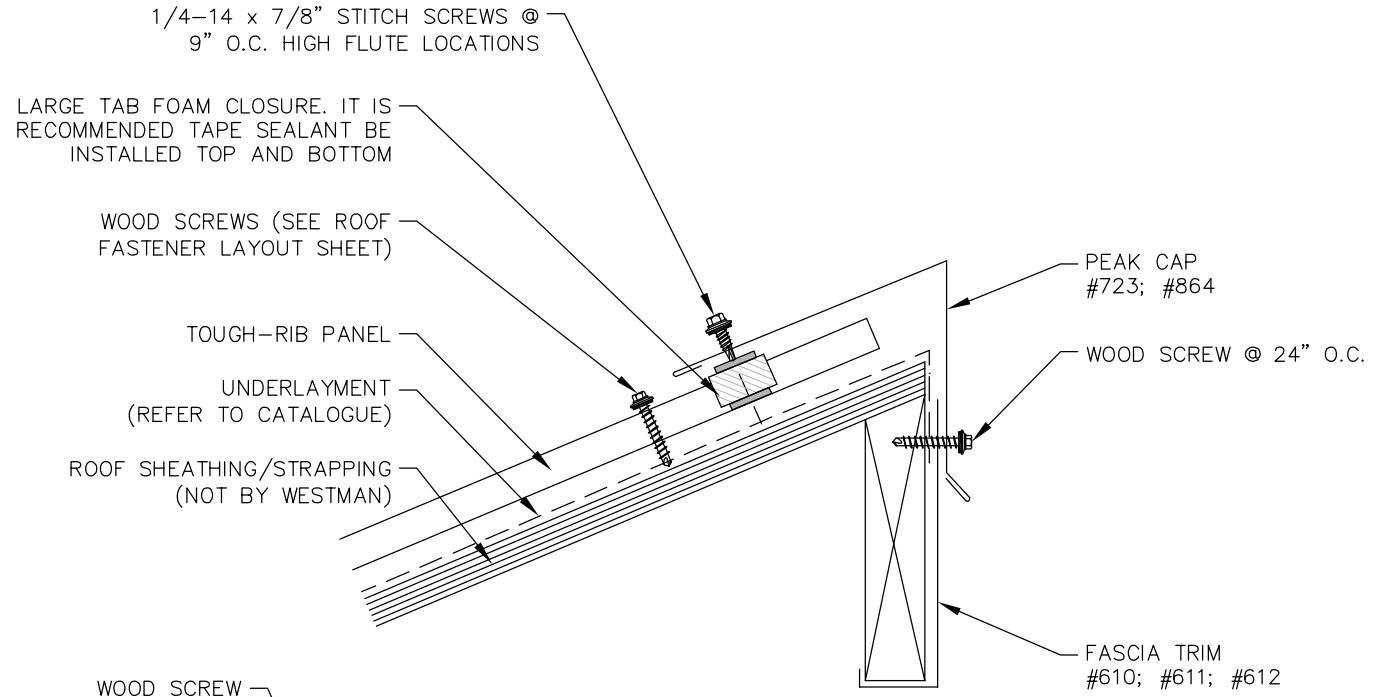

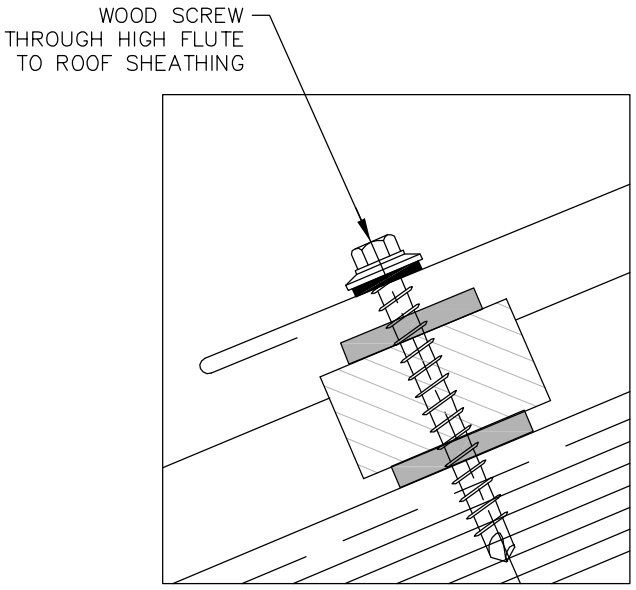

ALTERNATE FASTENING USING WOOD SCEWS

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

GABLE TRIM (AFTER APPLIED) DETAIL

SHT.	REV.
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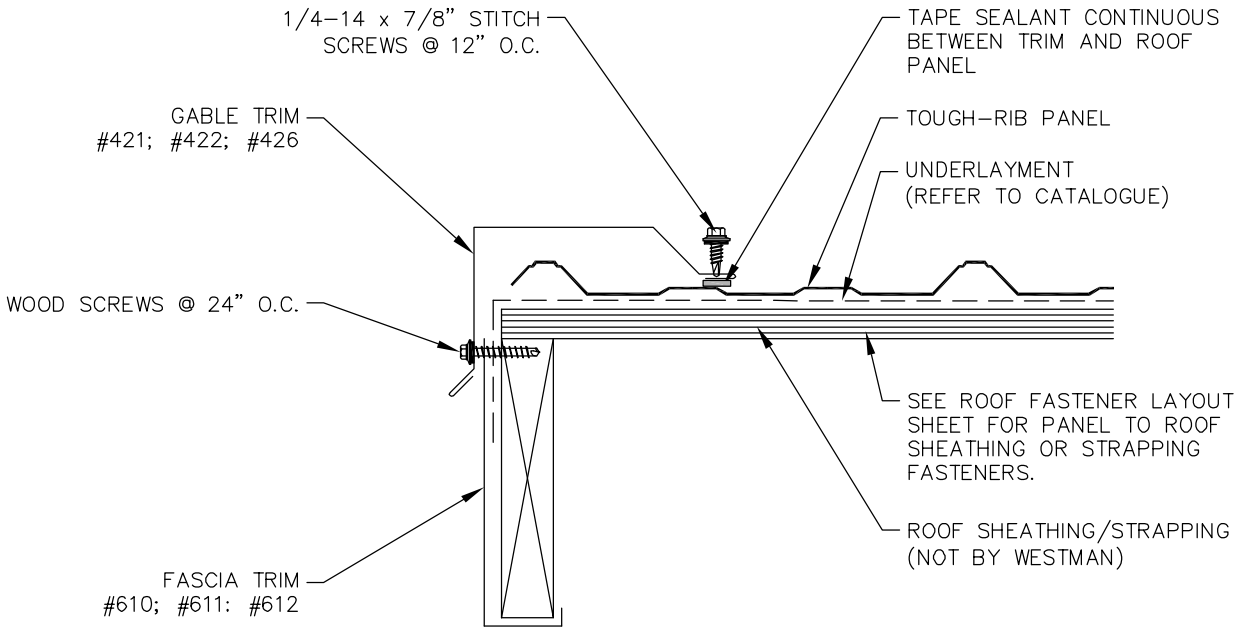
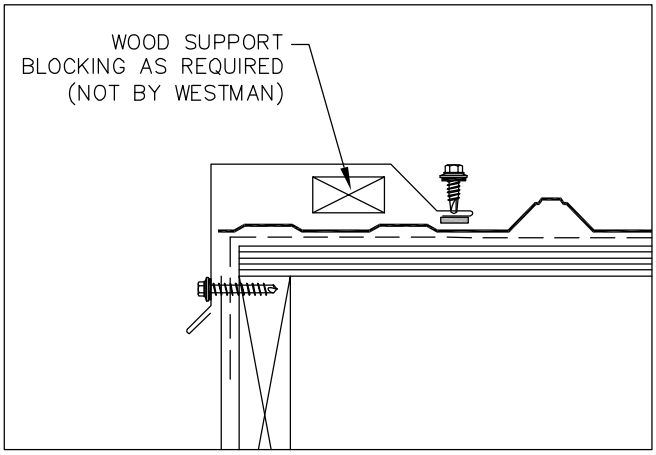


GABLE DETAIL

ALTERNATE DETAIL WITH WOOD BLOCKING TRIM SUPPORT



NOTE: ACCEPTABLE ROOFING SUBSTRATE
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

GABLE TRIM (BEFORE APPLIED) DETAIL

SHT.	REV.
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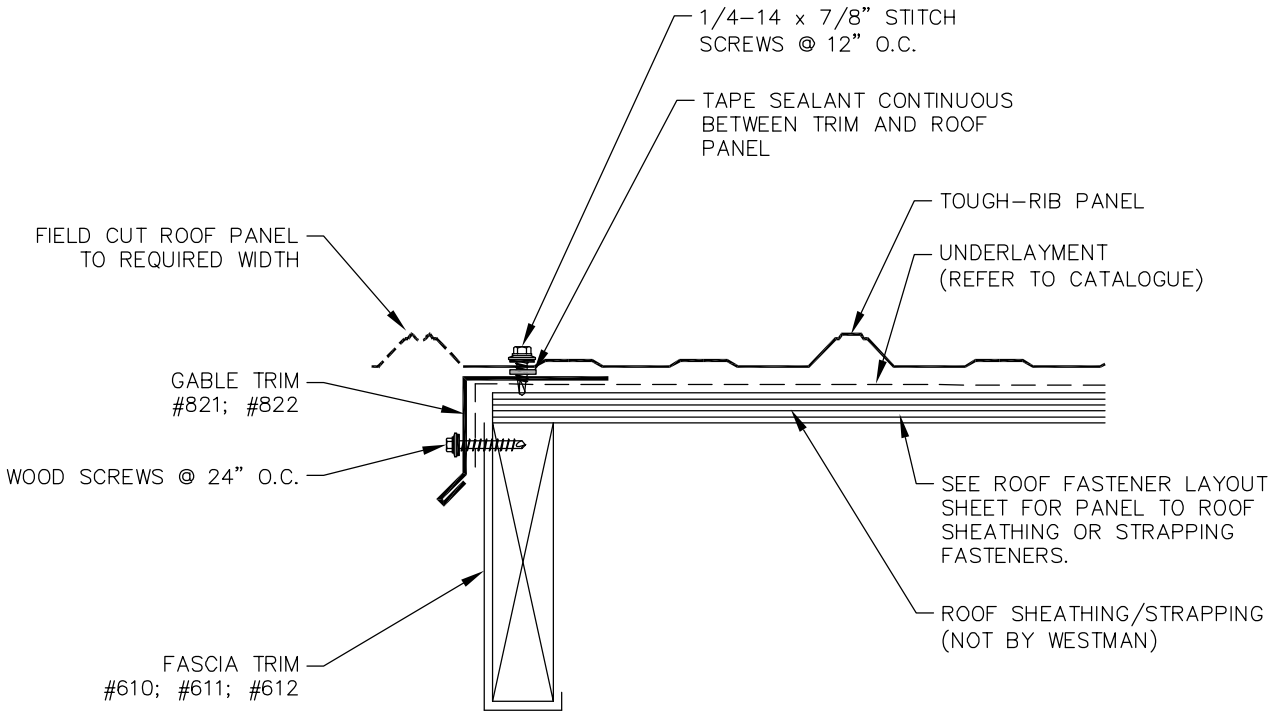

NOTE: ACCEPTABLE ROOFING SUBSTRATE
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

EAVE (BEFORE APPLIED) DETAIL

SHT.	REV.
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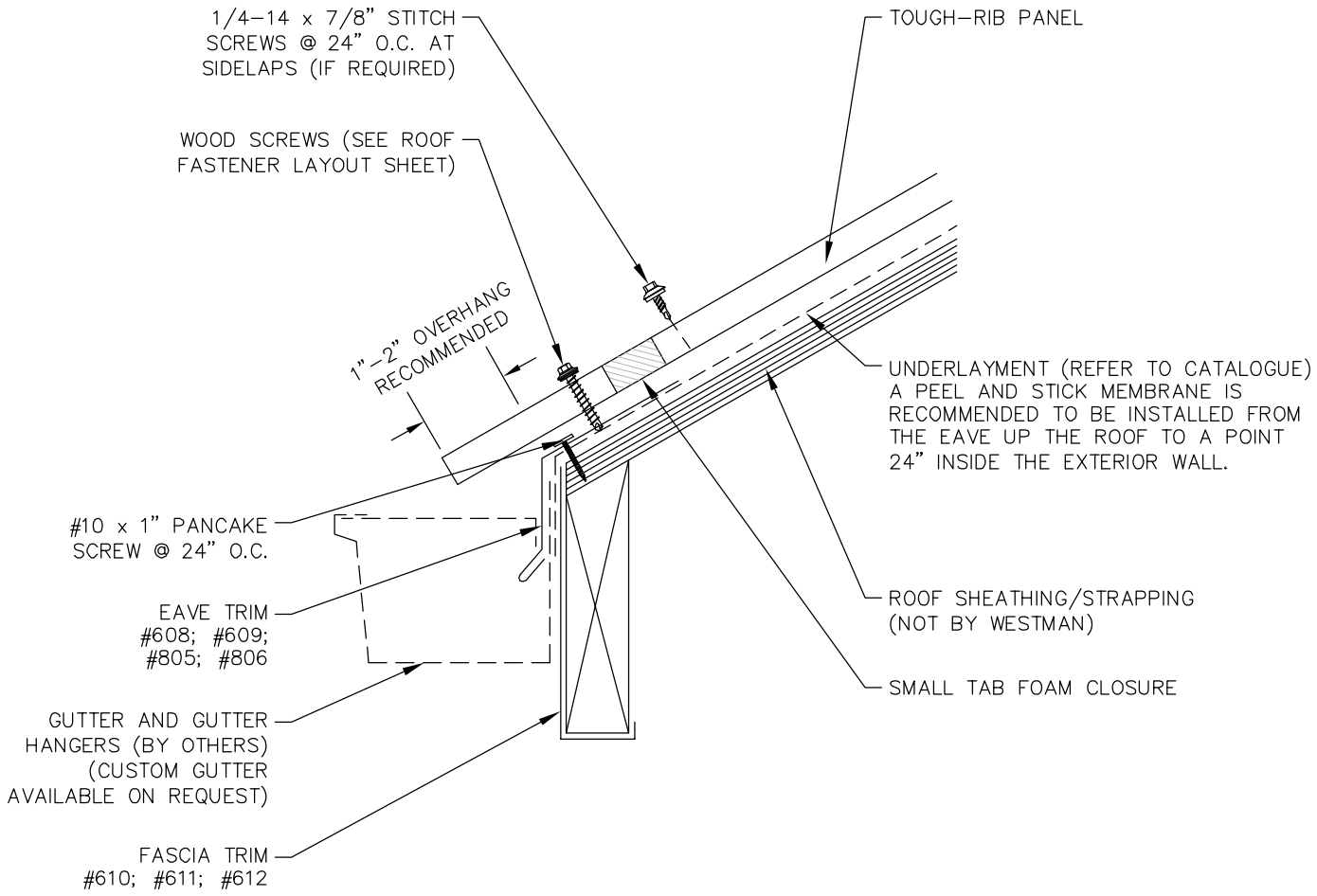

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NOTE: ACCEPTABLE ROOFING SUBSTRATE.
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

VALLEY FLASHING DETAIL (EAST)

SHT.	REV.
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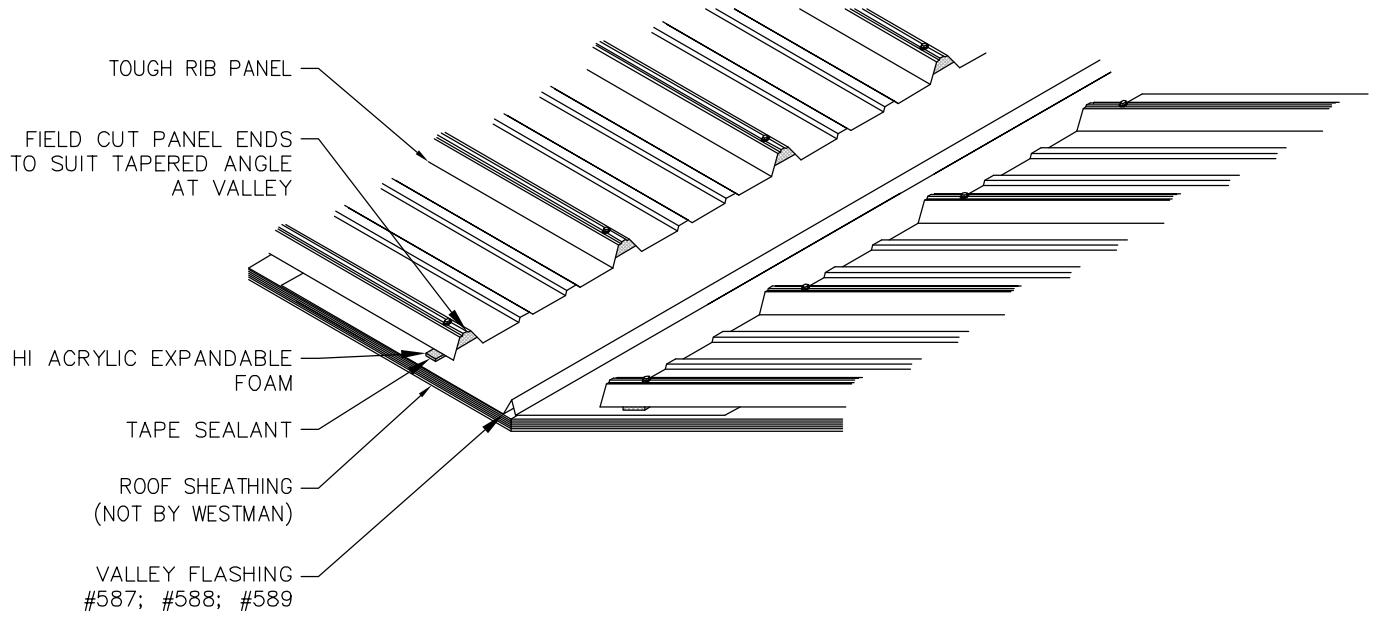

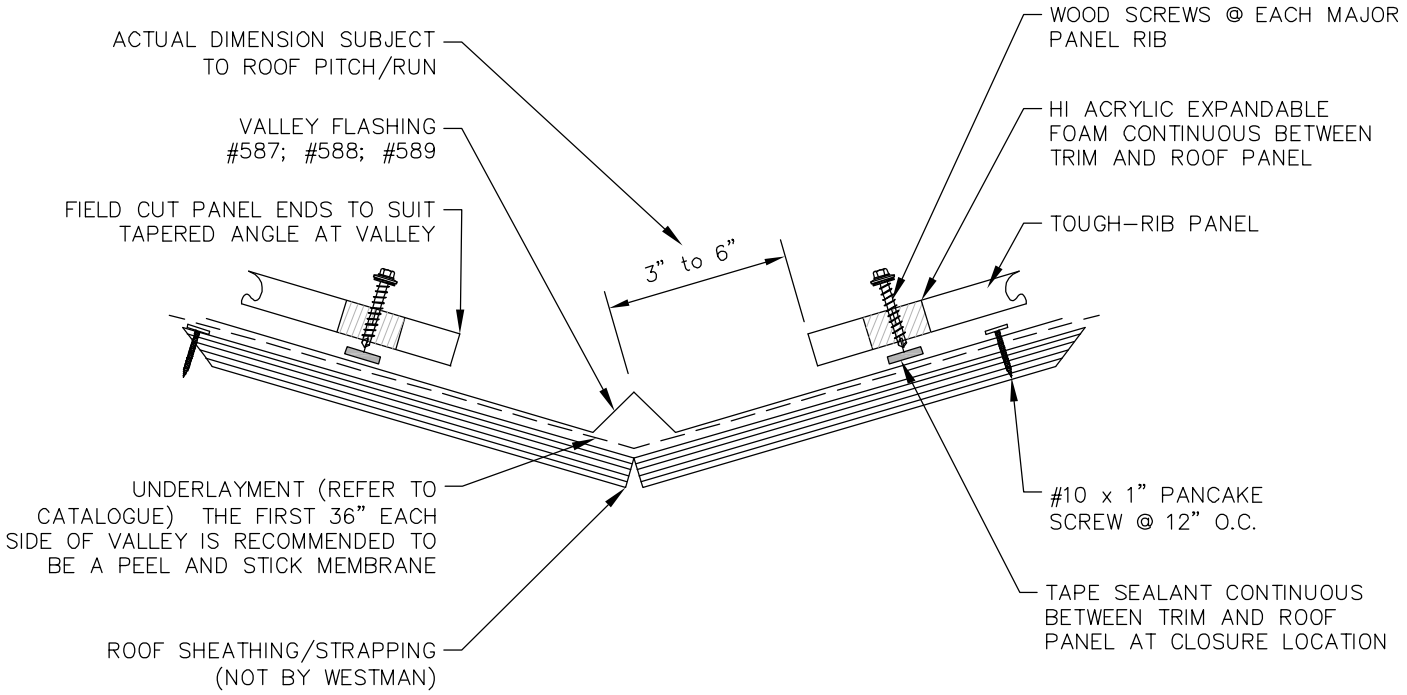

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
—MIN.5/8 PLYWOOD SHEATHING
—WOOD STRAPPING

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

VALLEY FLASHING DETAIL (WEST)

SHT.	REV.
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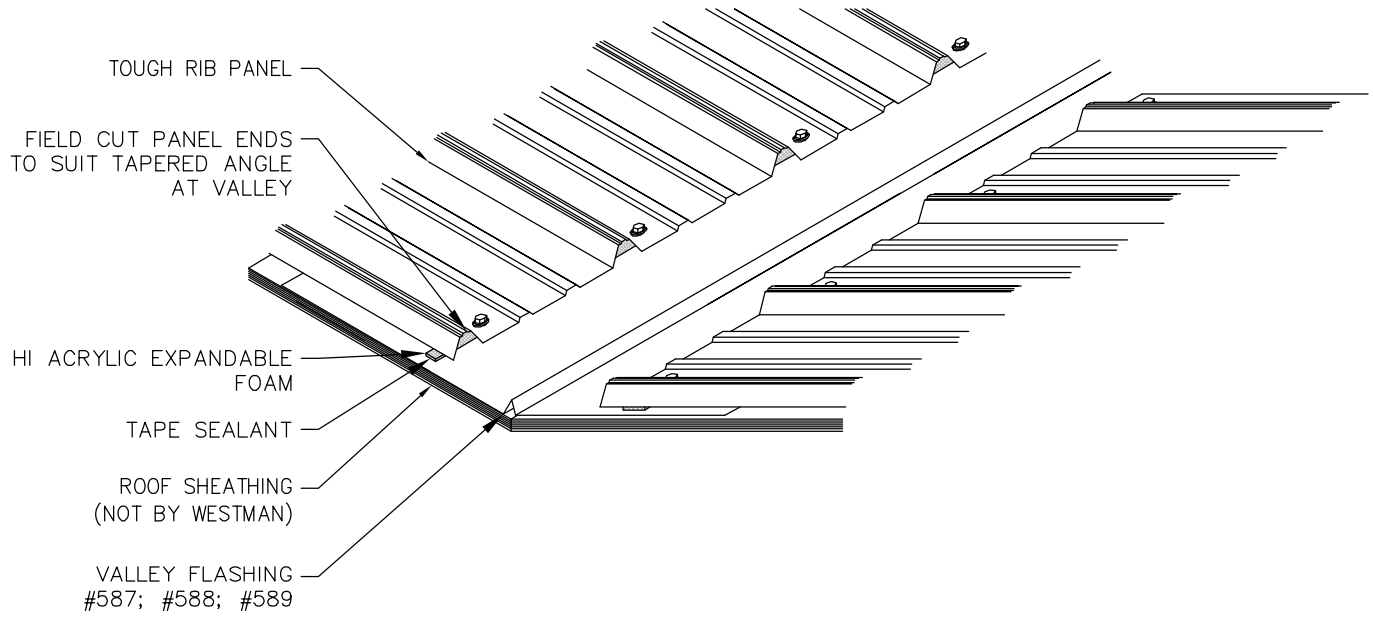

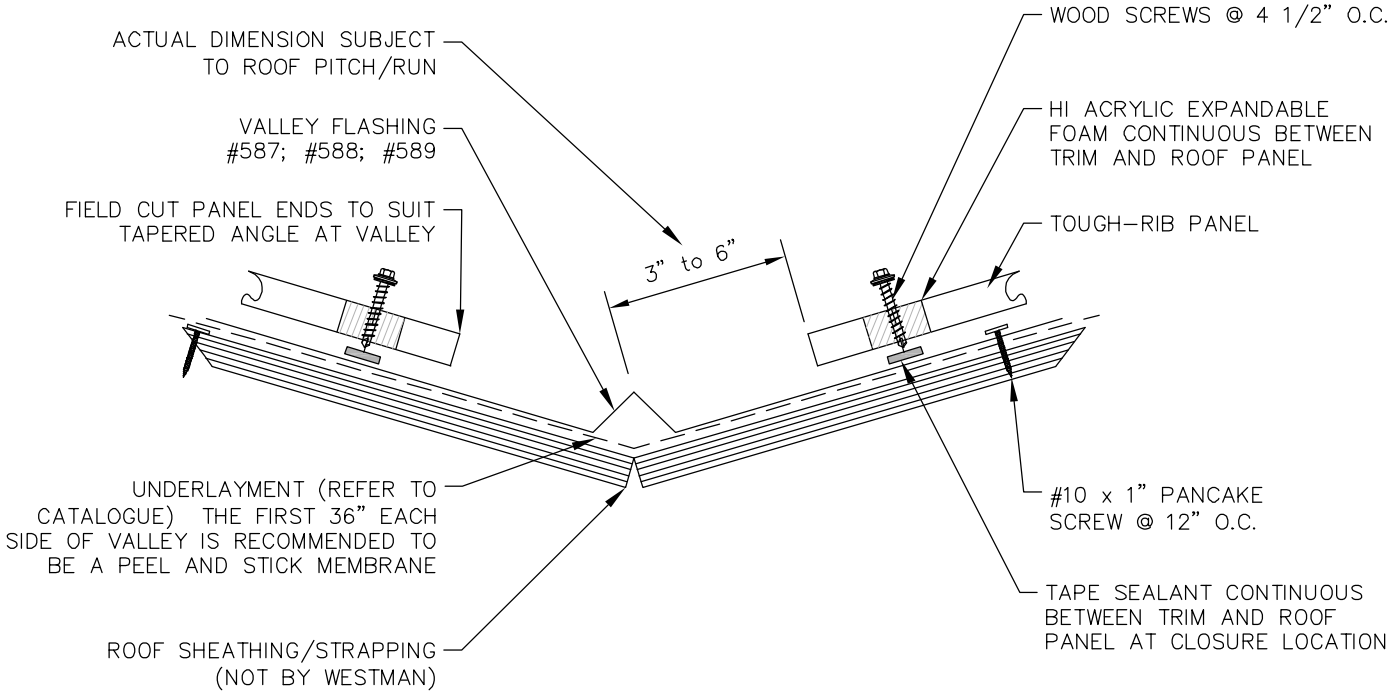

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—WOOD STRAPPING

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

SIDEWALL DETAIL

SHT.	REV.
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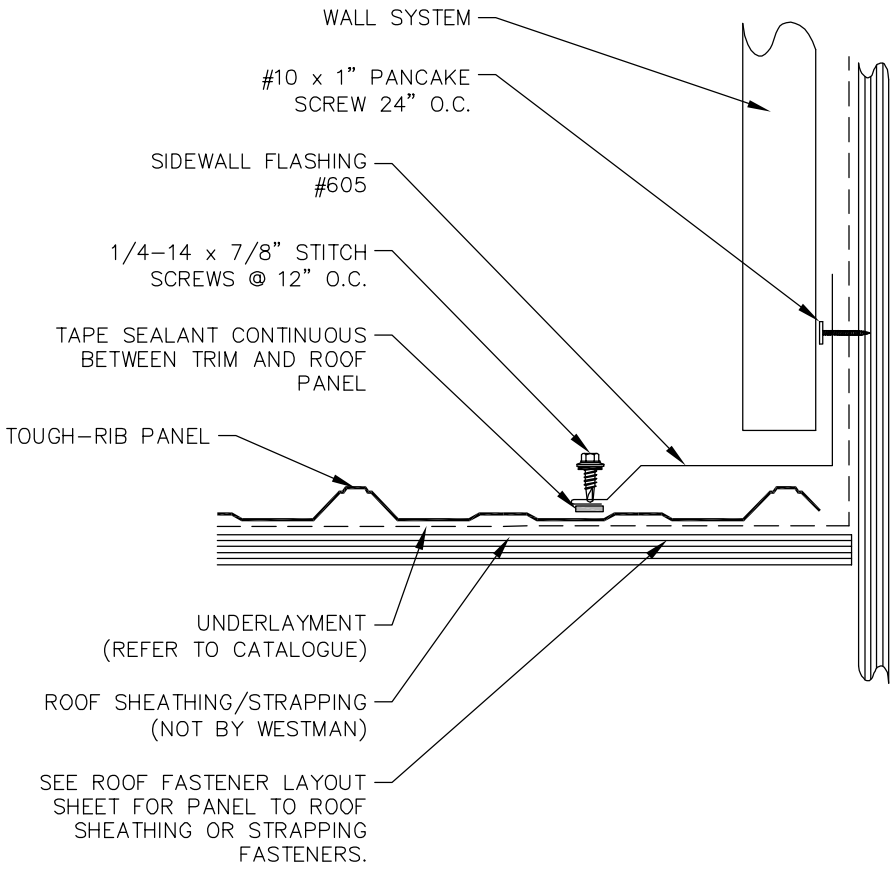

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
–MIN.5/8 PLYWOOD SHEATHING
–WOOD STRAPPING

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

ENDWALL DETAIL

SHT.	REV.
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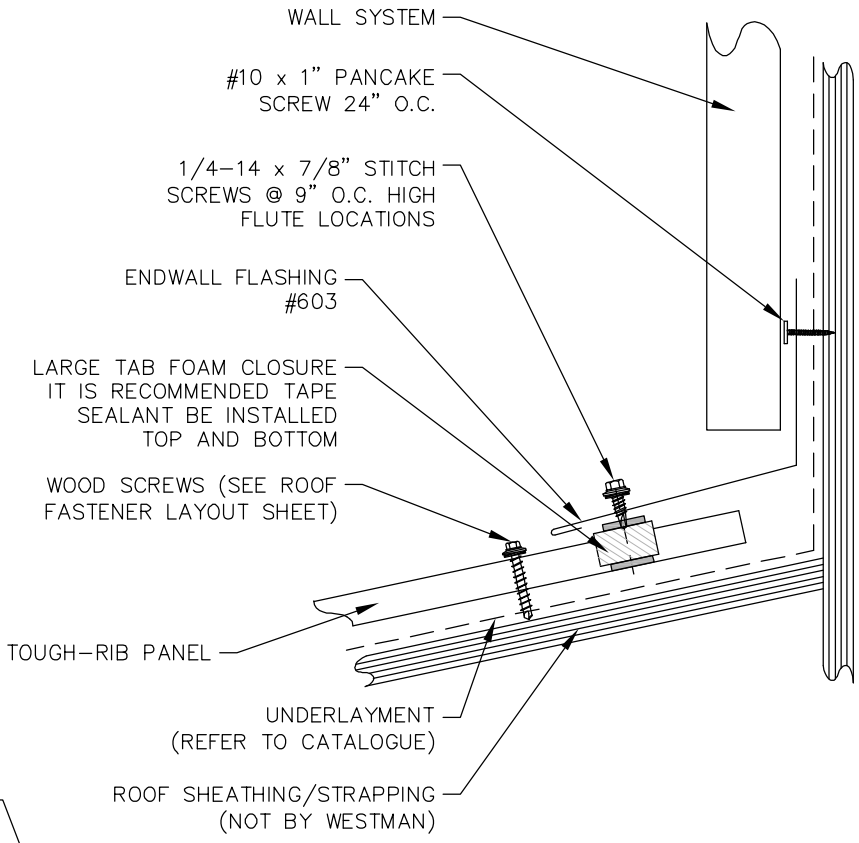

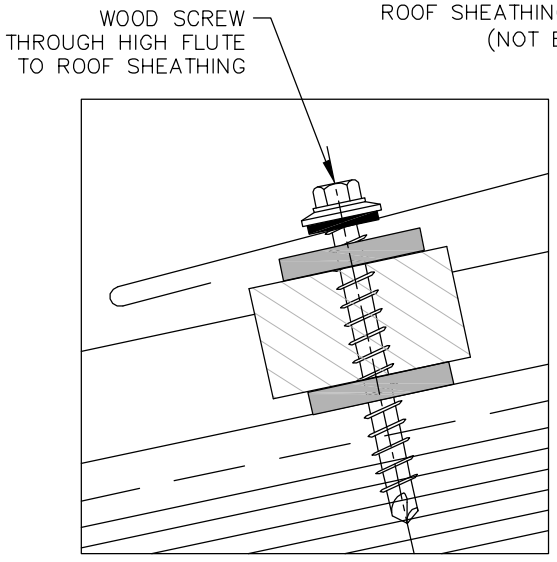

ALTERNATE FASTENING
USING WOOD SCEWS

NOTE: ACCEPTABLE ROOFING SUBSTRATE.
-MIN.5/8 PLYWOOD SHEATHING
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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

TRANSITION FLASHING DETAIL

SHT.	REV.
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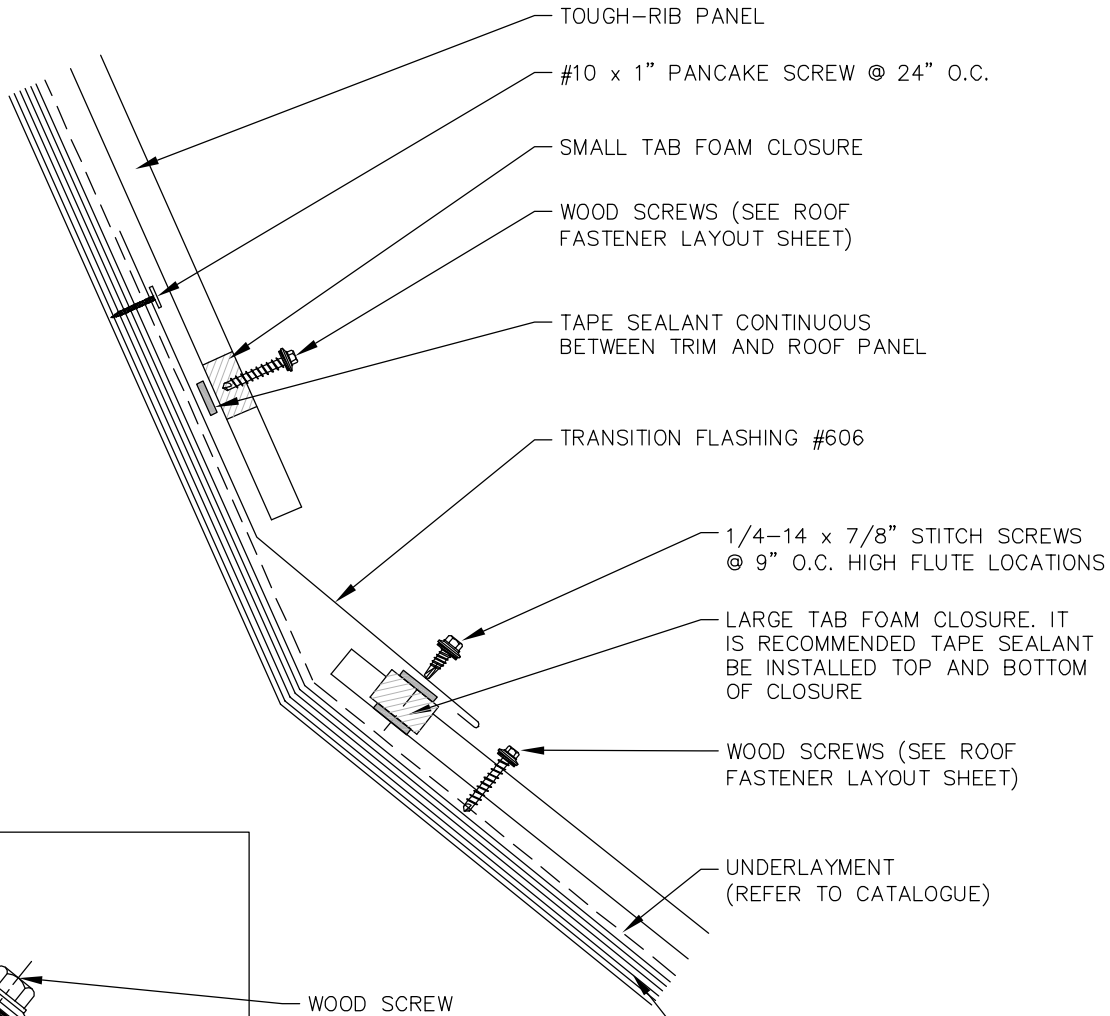

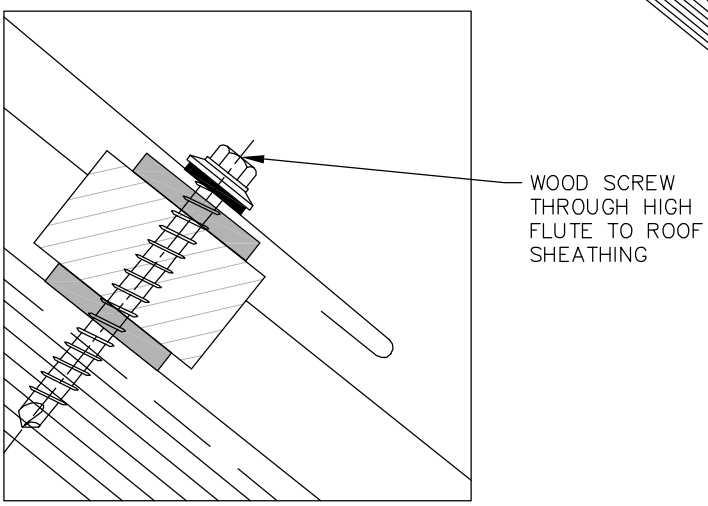

ALTERNATE FASTENING
USING WOOD SCEWS

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- MIN.5/8 PLYWOOD SHEATHING
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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

OUTSIDE CORNER DETAIL (BEFORE APPLIED) (EAST)

SHT.	REV.
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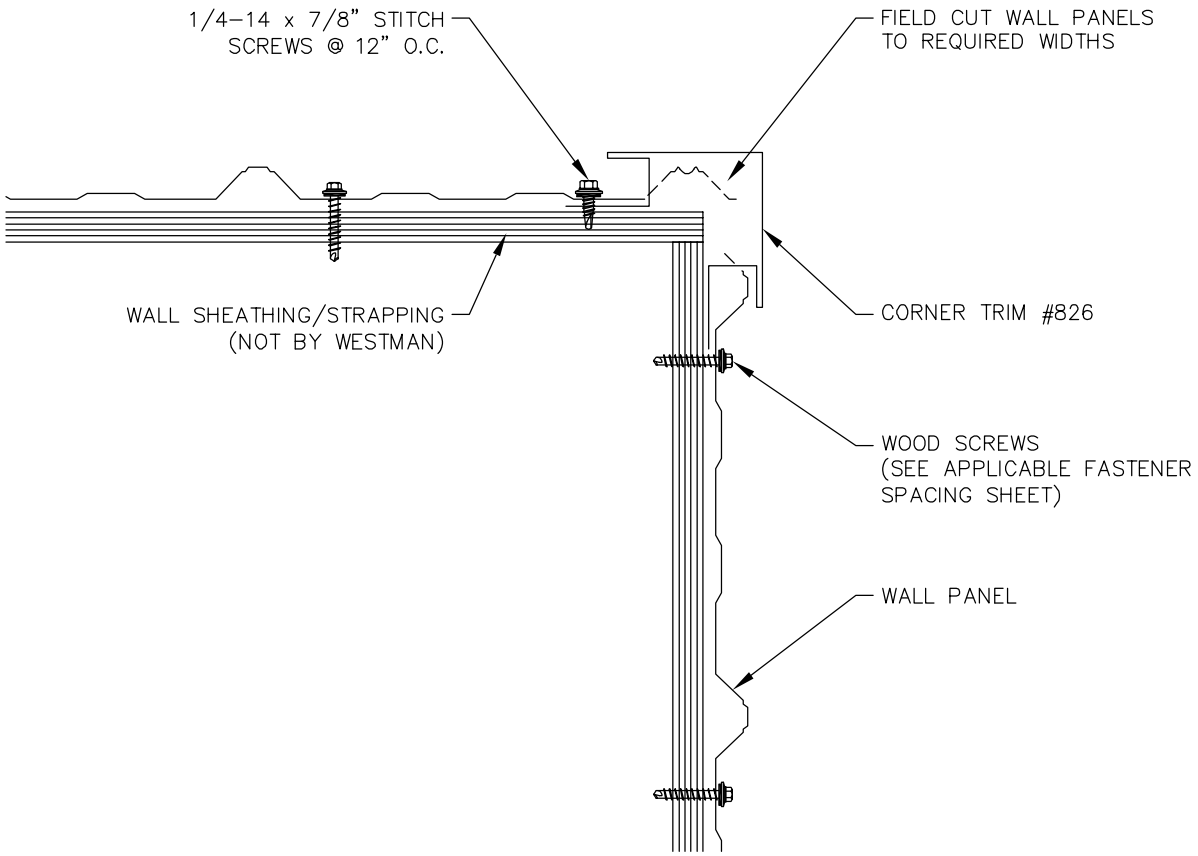

NOTE: ACCEPTABLE WALL SUBSTRATE.
– MIN.5/8 PLYWOOD SHEATHING
– WOOD STRAPPING

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

OUTSIDE CORNER DETAIL (AFTER APPLIED)

SHT.	REV.
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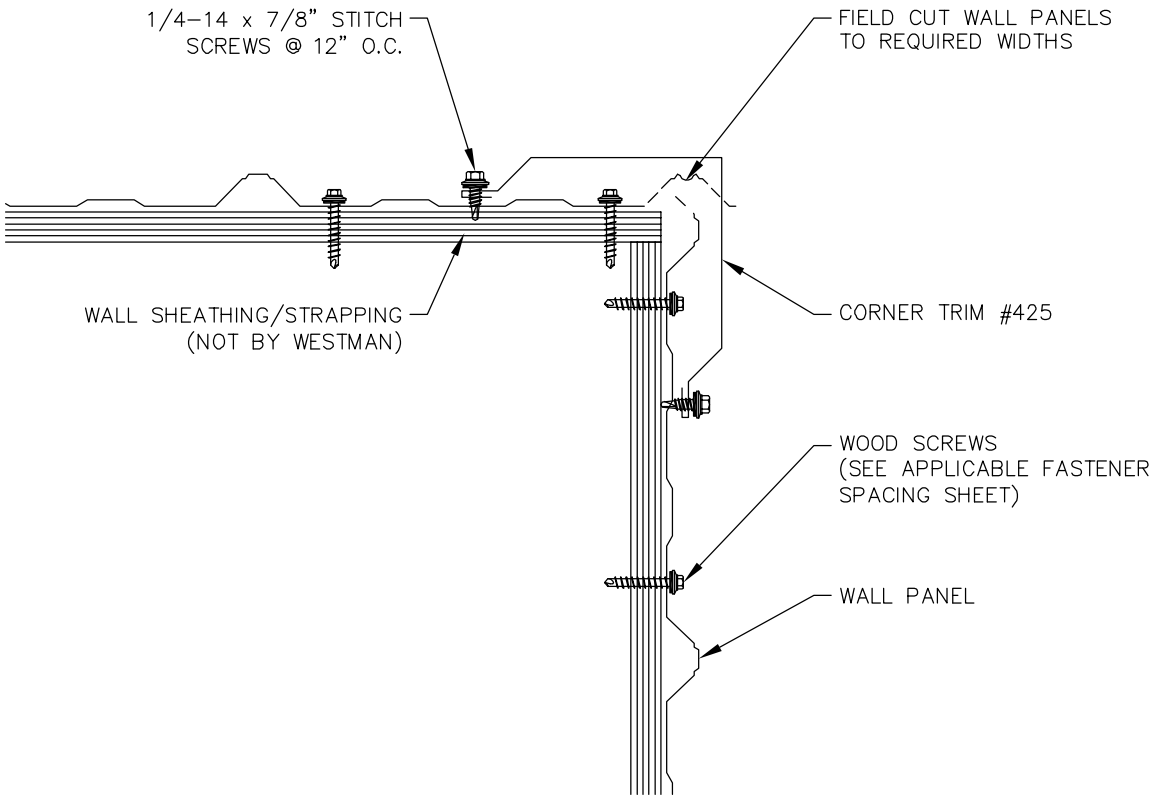

NOTE: ACCEPTABLE WALL SUBSTRATE.
– MIN.5/8 PLYWOOD SHEATHING
– WOOD STRAPPING

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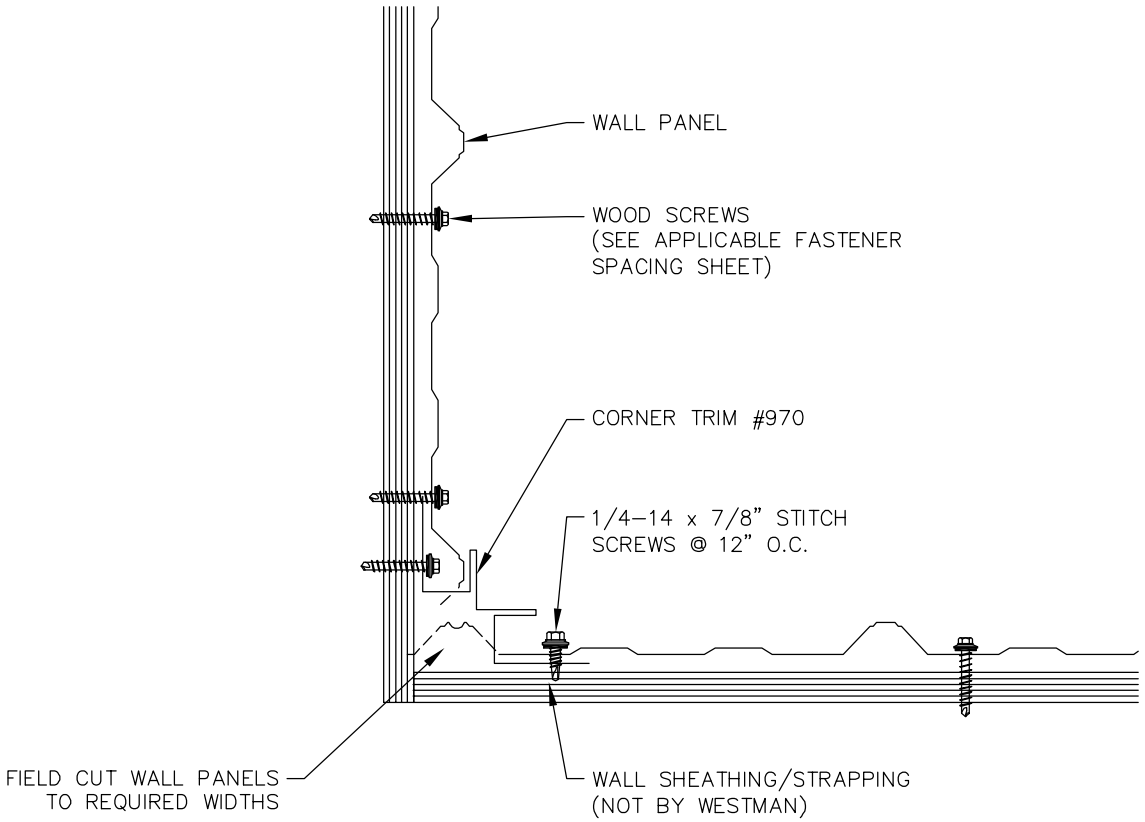
WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

INSIDE CORNER DETAIL (BEFORE APPLIED) (EAST)

SHT.	REV.
—	—



NOTE: ACCEPTABLE WALL SUBSTRATE.
– MIN.5/8 PLYWOOD SHEATHING
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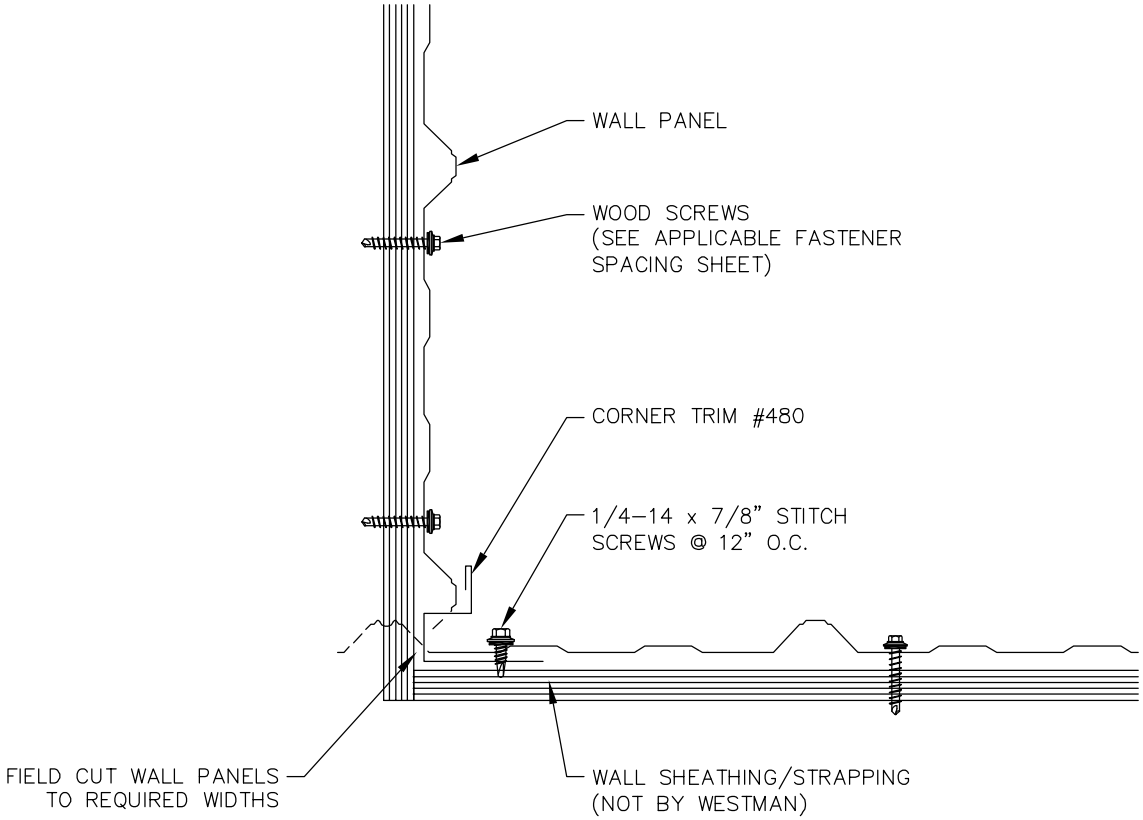
WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

INSIDE CORNER DETAIL (BEFORE APPLIED)

SHT.	REV.
—	—



NOTE: ACCEPTABLE WALL SUBSTRATE.
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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

INSIDE CORNER DETAIL (AFTER APPLIED)

SHT.	REV.
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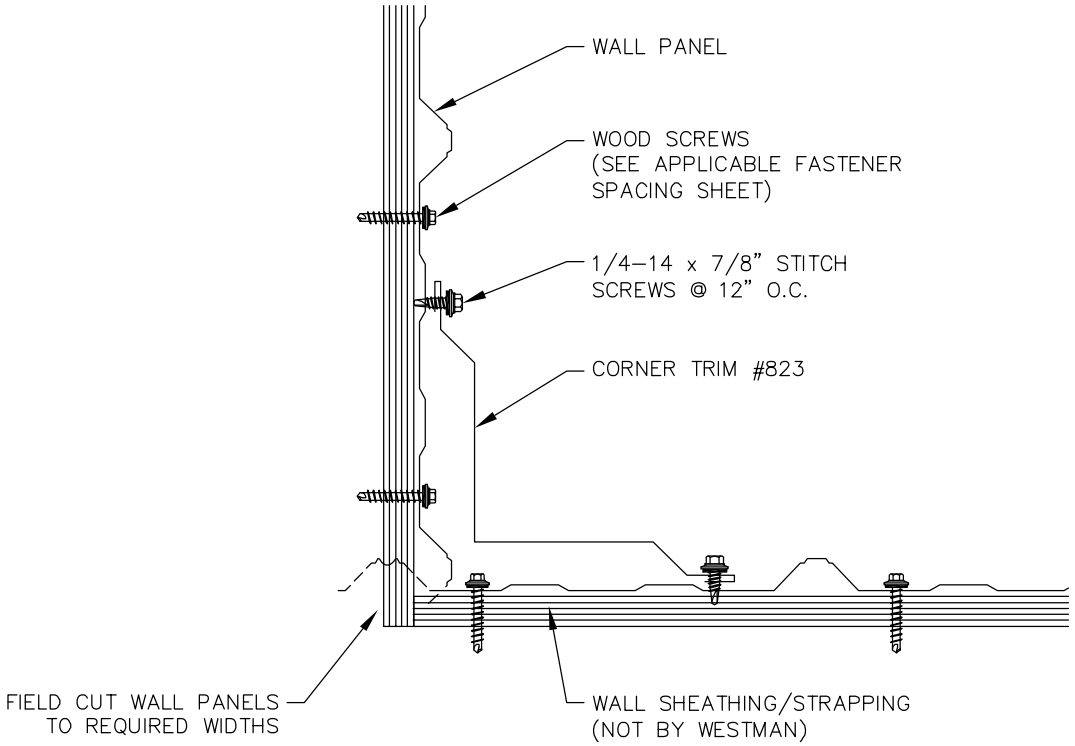

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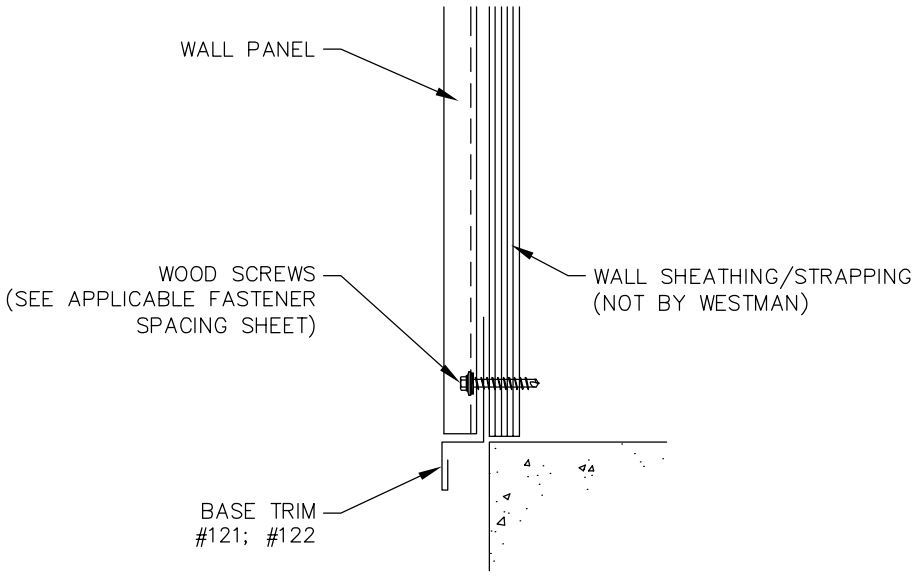
WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

BASE TRIM DETAIL

SHT.	REV.
—	—



NOTE: ACCEPTABLE WALL SUBSTRATE.
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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

GABLE DIVIDE DETAIL

SHT.	REV.
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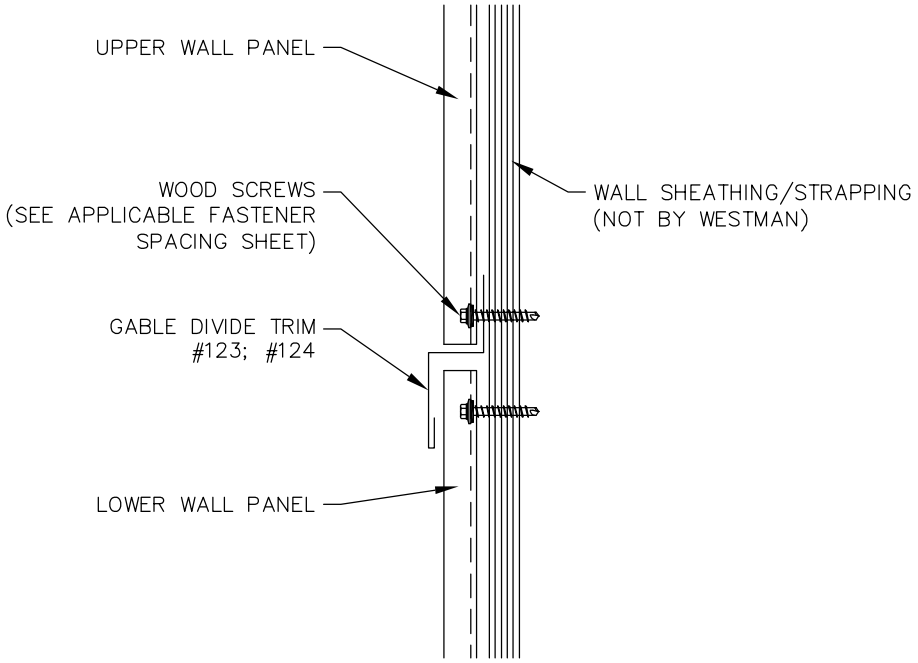

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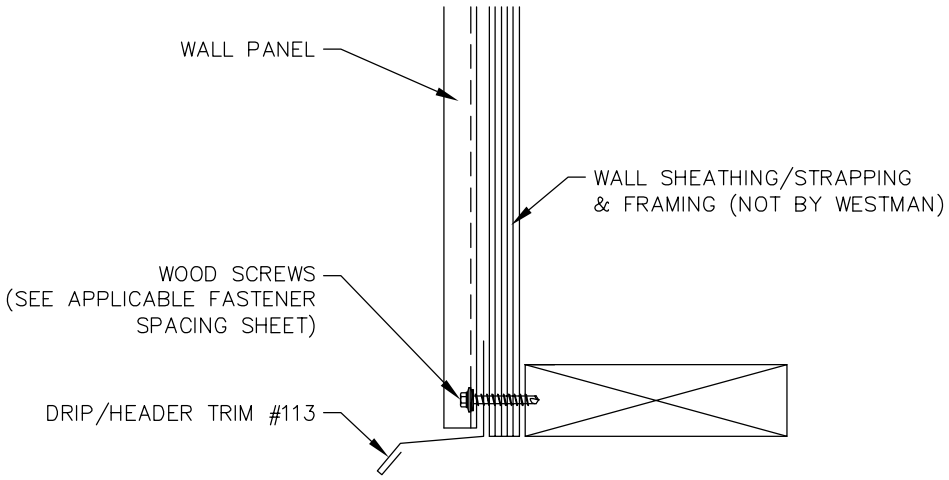
WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

DRIP/HEADER DETAIL - DRIP TRIM

SHT.	REV.
—	—



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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

DRIP/HEADER DETAIL - DOOR MOULD TRIM

SHT.	REV.
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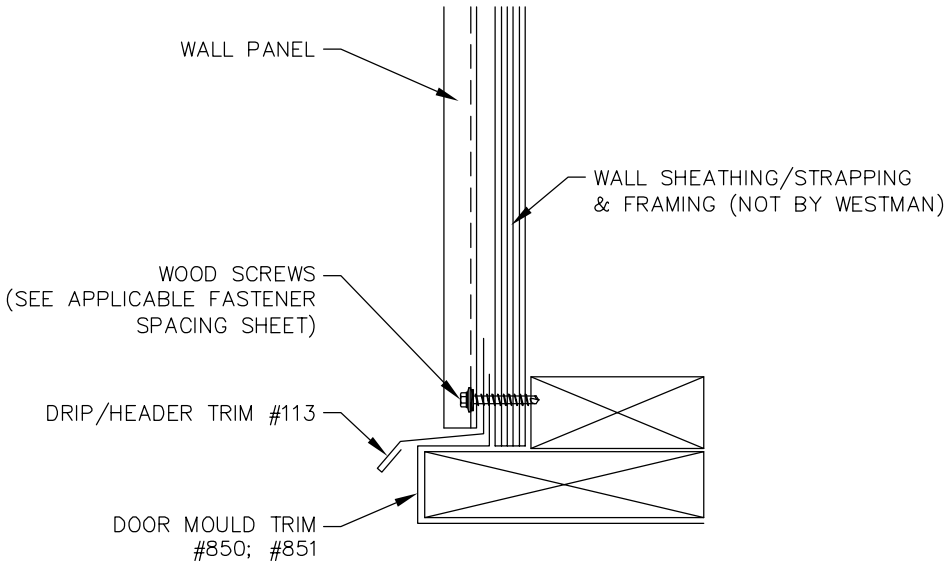

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

JAMB DETAIL - J TRIM

SHT.	REV.
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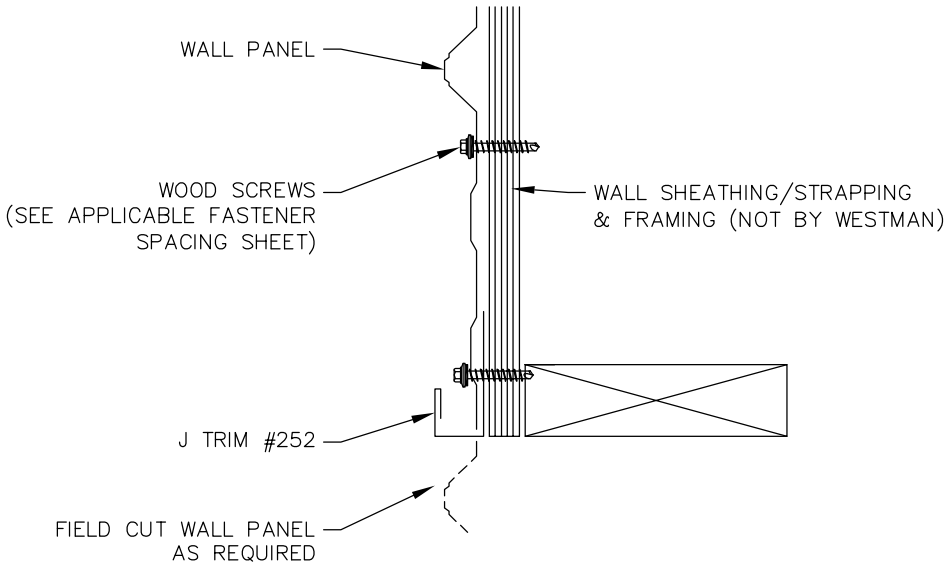

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WESTMAN STEEL
STATEMENTS IN STEEL™

TOUGH-RIB

JAMB DETAIL - DOOR MOULD TRIM

SHT.	REV.
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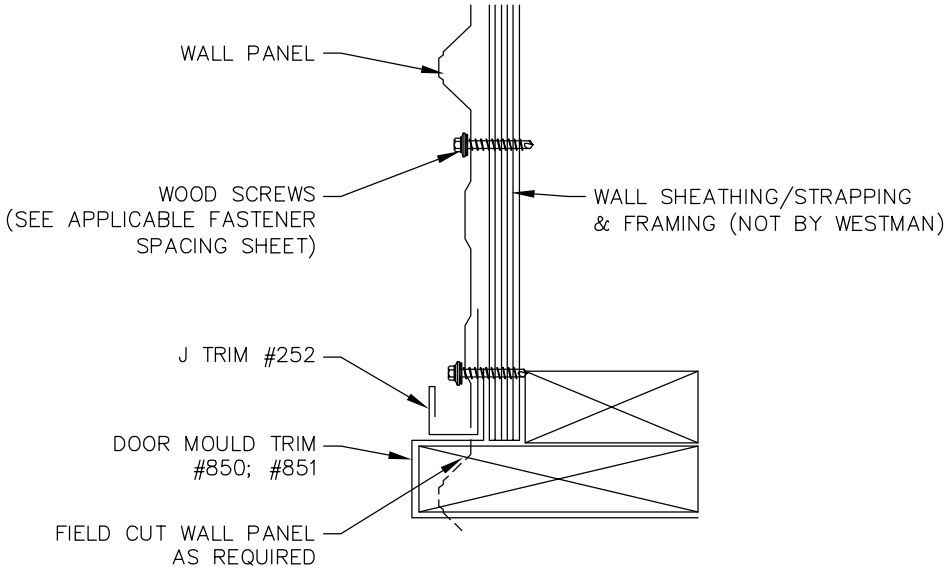


NOTE: ACCEPTABLE WALL SUBSTRATE.
- MIN.5/8 PLYWOOD SHEATHING
- WOOD STRAPPING

NOTES:
A. DO NOT SCALE. DETAILS ARE FOR GUIDELINES ONLY, AND MAY NOT BE SUITABLE FOR ALL BUILDING DESIGNS AND CONDITIONS.
B. SCREW LENGTHS AND SIZES MAY VARY PER CUSTOMER REQUEST. PLEASE INQUIRE FOR STANDARDS IN YOUR AREA.

Caution: Always follow Safety Instruction, Building Codes and Safe Work Practices issued by the local Govt. bodies (e.g. OSHA / WCB)

Westman Steel Underlayment products should be installed with Plastics Cap or Metal Cap nails with either ring shank or smooth shank Nails. DO NOT USE STAPLES. Use of staples will void the Manufacturer's warranty.

Westman Steel Underlayment products are a secondary layer protection approved for installation over Plywood with proper fasteners. Westman Steel Underlayment is an air, vapour and water barrier with <1 Perm.

Lay out horizontally with printed side up using 6" vertical laps and 4" horizontal laps. The overlaps ensure that the water runs over the overlaps without getting under the material. Before installing the underlayment ensure that the roof is clear of any debris or any sharp protrusions.

Product must be attached to the roofing structure using 1" plastic or metal cap nails. Product must be fastened with the nail pattern printed on the product. All anchoring must be performed flush to the roof, 90 degrees to the roof deck that will hold the material tightly with the plywood. The use of every other anchoring location printed on the product is also acceptable.

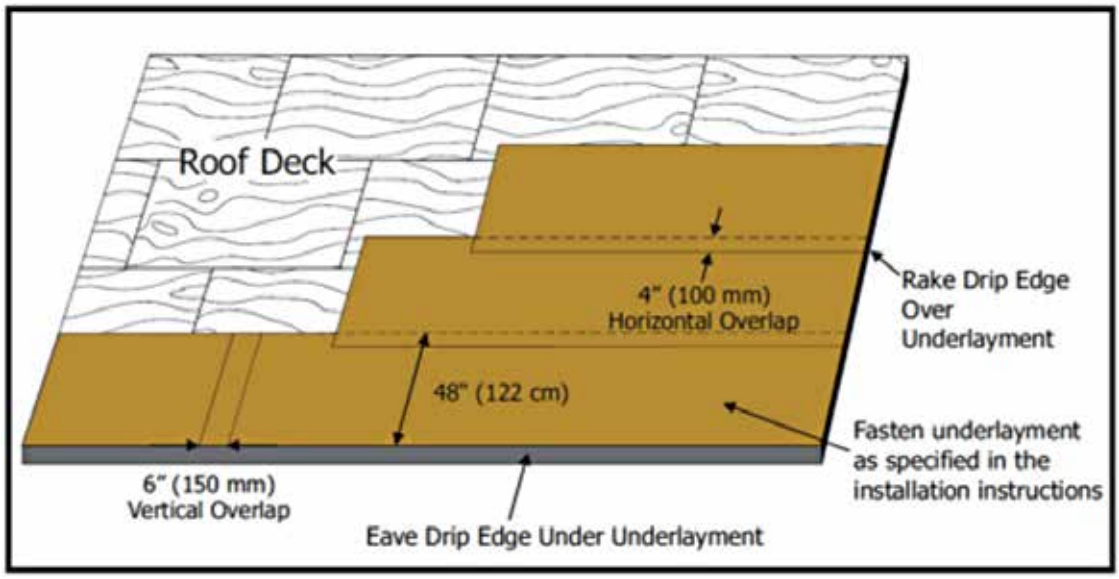
For prolonged exposure, double the overlaps and use every anchor location. Product has 90 Day (Silver) and 180 Day (Platinum) UV protection but it should not be considered a final roofing system. A proper final roofing system should be installed over the product to get the proper protection. Product is a secondary barrier used over plywood, under a roofing system like wood and asphalt shingles, tiles, slate and metal roof.

Safety Notification:

Westman Steel Underlayment products are designed with the GRIPSPOT technology for better skid protection for the roofer but product may become slippery due to high moisture, frost, rain, water, dust, debris or other conditions. Use precautions when working on the roof. Follow all local and federal safety codes when installing any roofing system including Westman Steel Underlayment products. Failure to adhere to those procedures may result in serious injury or even death.

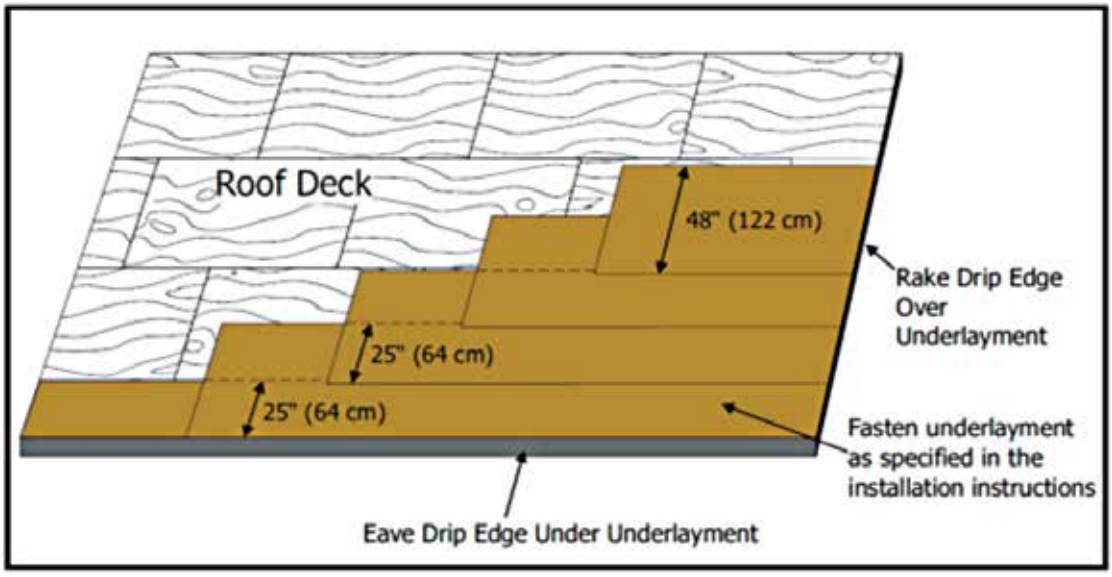
Single Layer Application of Westman Steel Underlayment

For slopes greater than 4:12, Westman Steel Underlayment should be installed horizontally starting from the bottom of the roof with 4” overlaps working up the roof.



Double Layer Application of Westman Steel Underlayment

For slopes 2:12 to 4:12, Westman Steel Underlayment should be installed horizontally starting from the bottom of the roof with 25” overlaps working up the roof.



Master Flash Pipe Flashing

An Engineered Flashing for all Seasons & Reasons

Roof Adaptability

Master Flash works on all types of roofing surfaces, including metal, plastic, tile, rubber membrane, and others. Aluminum base bends with ease to conform to any panel configuration or roof pitch.

Weather Protected

Master Flash is compounded specifically for maximum resistance to weathering due to ozone and ultraviolet light.

Easy On-Site Customization

Master Flash comes in 11 sizes to fit all pipes and vents 1/8" to 26". Standard colors black and grey.

Compound Choices

Standard EPDM covers all applications from - 65F to +275F. Red Silicone Master Flash is available for environmental extremes, from - 100F to +500F.

Numerous Applications

- Plumbing, heating/air conditioning vents and equipment
- Electrical service entrance
- Grain augers

The only EPDM Flashing to have CSA Approval

The CSA label on every piece of EPDM Black Master Flash means that installers will "NOT" be accosted by local Building Inspectors, making sign-offs that much easier.

CSA, IAPMO and ICC listing or approvals are only available on Master Flash products.

Don't be fooled by products that look like Master Flash!

Standard Master Flash*

Master Flash # 1 (1/4" - 2 1/2")
Master Flash # 2 (1-1/4" - 3")
Master Flash # 3 (1/4" - 5")
Master Flash # 4 (3" - 6 1/4")
Master Flash # 5 (4 1/4" - 7 3/4")
Master Flash # 6 (5" - 9")
Master Flash # 7 (6" - 11")
Master Flash # 8 (7" - 13")
Master Flash # 9 (9" - 19")

Master Flash Hi Temp*

Master Flash # 3 Hi Temp Silicone Red (1/4" - 4")
Master Flash # 5 Hi Temp Silicone Red (4 1/4" - 7 3/4")
Master Flash # 8 Hi Temp Silicone Red (7" - 13")
Master Flash # 9 Hi Temp Silicone Red (9" - 19")

Master Flash Retro Fit*

Retro Fit Master Flash (3/4" - 2 3/4")
Retro Fit Master Flash (2" - 7 1/4")
Retro Fit Master Flash (3 1/4" - 10")

** STANDARD & RETRO FIT MASTER FLASH OPERATING TEMPERATURES: -65F to +275F | HI TEMP MASTER FLASH OPERATING TEMPERATURES: -100F to +500F*

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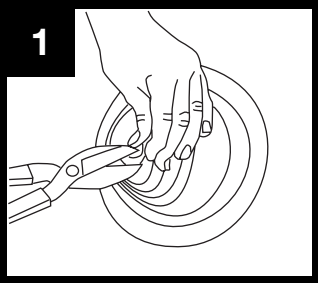
Master Flash Pipe Flashing

STANDARD | RETRO FIT | HI TEMP

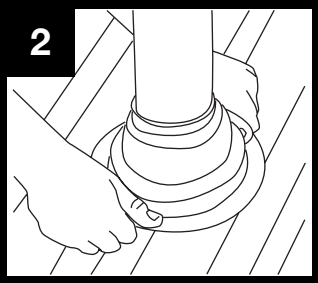
Standard & Hi Temp Installation Instructions

1



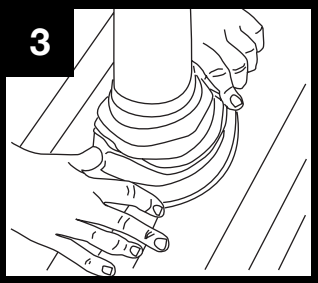
Choose pipe opening and trim

2



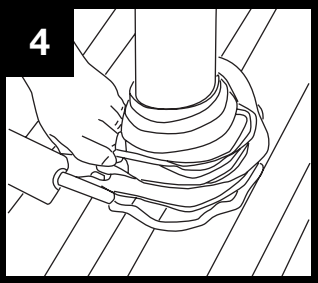
Slide flashing over pipe

3



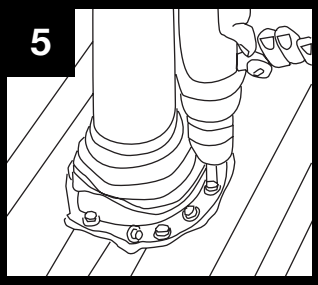
Form flashing to roof profile

4



Apply sealant

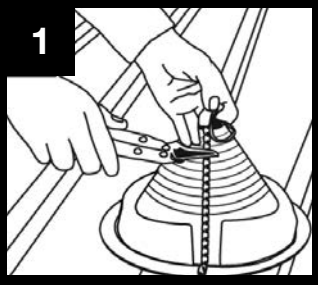
5



Fasten flashing to complete

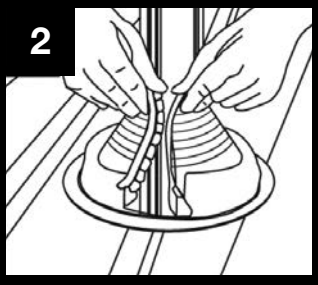
Retro Fit Installation Instructions

1



Using tin snips, cut the cone to fit the pipe, starting opposite the mechanical locking joiner.

2

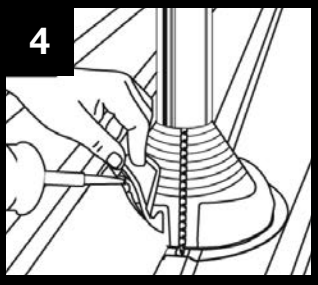


Wrap Retrofit around the pipe, join the interlocking teeth starting from the top and proceeding down.

3

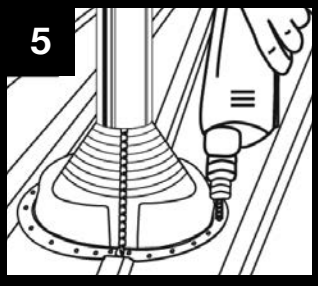
Squeeze joiner tightly with pliers to crimp, start at the top and work down to the base.

4



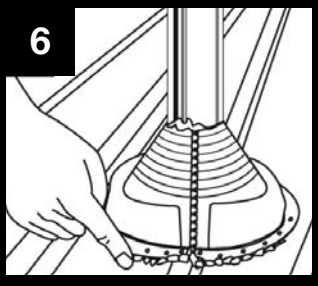
Apply sealant to the underside of the base. Shape Retrofit to roof by pressing the aluminum base to the roof profile.

5



Fasten Retrofit to roof using self-drilling screws, leave no gaps between base and the roof contours.

6



Apply additional sealant to mechanical locking joiner seam and to all areas that could be a potential leak risk.

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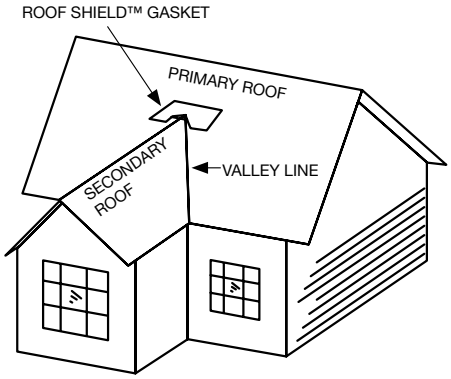
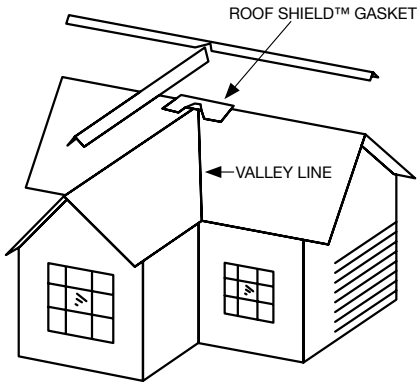
Roof Shield™

Roof Shields are a revolutionary new product designed to stop and prevent valley leaks while enhancing the beauty of metal roof systems. Recommended for all Metal Roof Systems, Open Valley Shingle Roof Systems, and Cedar Shakes. Roof Shields are warranted 20 years against damaging UV rays.

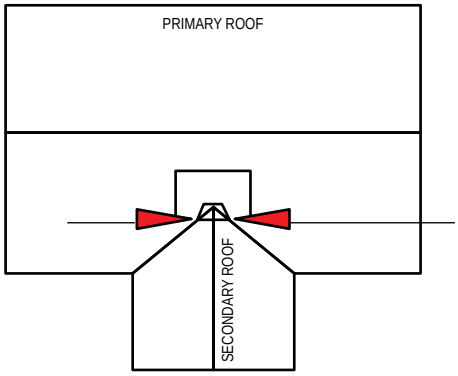
THE "PERMANENT PREVENTION" OF LEAKS WHERE PRIMARY & SECONDARY ROOFS INTERSECT WITH VALLEYS

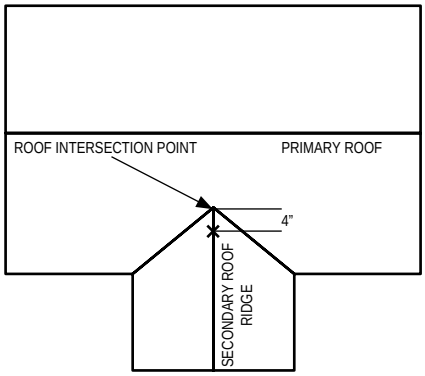




ELIMINATES BULGE & MAINTAINS STRAIGHT RIDGE LINE.

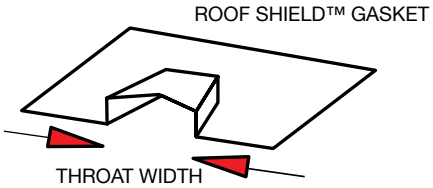
FOR USE WITH METAL AND OPEN VALLEY ROOF SYSTEMS





Measure from the centerline of the left side valley, straight across the secondary roof to the centerline of the right side valley.

The ROOF SHIELD™ gasket throat width must EQUAL or EXCEED the measured distance.



Two throat widths to choose from: 12 1/4" or 16 1/2"

NOTE:

From the roof intersection point, move 4" out the secondary roof ridge line to establish the correct location to measure the gasket throat width requirement.

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Roof Shield™

ROOF SHIELD INSTALLATION GUIDE – ALL METAL AND OPEN VALLEY SHINGLE ROOFS

Roof Shields work with standard Valley Flashing but W-Valley style flashings are recommended for the best overall Roof System. To properly install a Valley Cap the W-Valley Flashing must be notched and installed as shown on this instruction sheet. Roof Shields not only provide a permanent seal, but they are easy to install saving time and money.

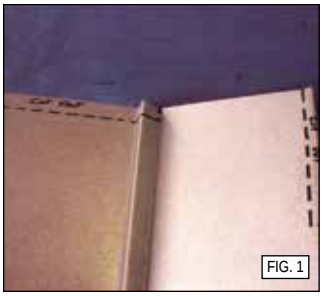


FIG. 1

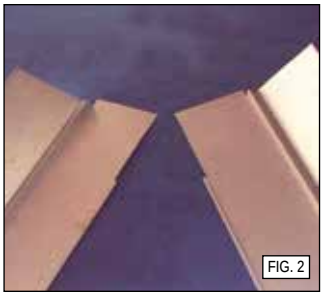


FIG. 2

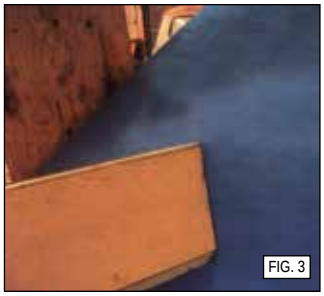


FIG. 3

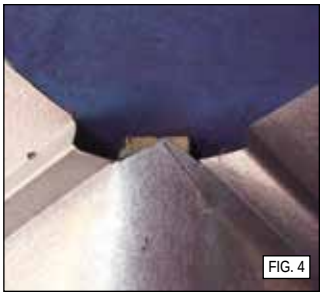
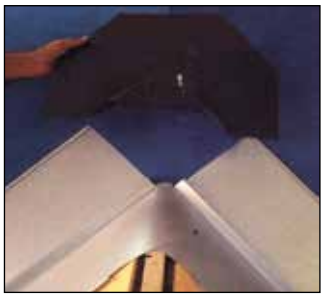


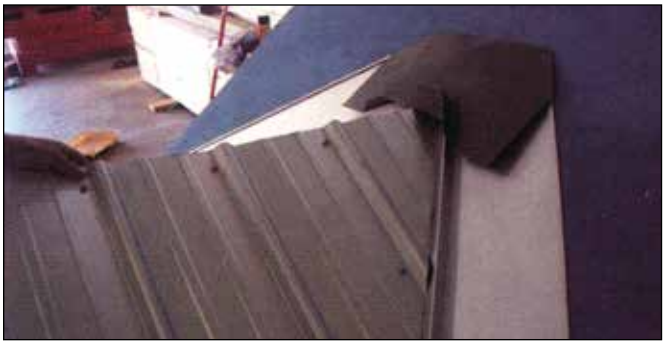
FIG. 4

STEP 1. NOTCH THE VALLEY FLASHING AS SHOWN IN FIG 1. THE SECOND VALLEY FLASHING MUST BE NOTCHED AS A MIRROR IMAGE OF THE FIRST (SEE FIG 2). NOTE THE LINE UP POINTS (FIG 2) ARE TO BE USED FOR CORRECT PLACEMENT OF THE VALLEY FLASHING AT THE PRIMARY AND SECONDARY ROOF INTERSECTION (SEE FIG. 3 AND FIG. 4).

STEP 2. PLACE THE FIRST VALLEY FLASHING THEN FOLD THE FLAP OVER THE SECONDARY ROOF RIDGE AND FASTEN. INSTALL SECOND VALLEY FLASHING IN THE SAME MANNER AND FASTEN. CHECK LINE UP POINTS (FIG 2) FOR CORRECT PLACEMENT (FIG 4)



STEP 3. PLACE FASTENERS UNDER SHINGLES OR PANELS. NOTE: ON A 4-12 PITCH ROOFS AND BELOW, OR IN SEVERE WEATHER AND HIGH WIND AREAS, PLUG FRONT OPENINGS WITH BUTYL OR NEURTAL CURE SILICONE.



STEP 4. INSTALL SECONDARY ROOF.

STEP 5. INSTALL PRIMARY ROOF PANELS. INSTALL RIDGE CAPS.

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Dangerous snow slides can occur when ice and snow build up on pitched roofs. Help reduce the possibility of personal injury or property damage by installing SNOWSHOES on sloped roof areas.

SNOWSHOES are molded from a tough polycarbonate polymer that can withstand heavy impacts at low temperatures. Effective on all metals, including Kynar 500® PVDF coated metal and copper. Also for use on slate, tile, EPDM rubber and PVC and TPO membranes. TPO primer is required with TPO membrane installation.

SNOWSHOES are designed with a unique “stealth” profile to be strong and inconspicuous. They are molded with a translucent matt finish that picks up the background color of roofing materials without reflecting sunlight. Paintable if strict color matching is required.

Installation is easy with translucent DuraSil™ adhesive provided in every kit. No screws or mechanical fasteners are ever required. DuraSil bonds aggressively to all roofing materials, including Kynar finishes. It bridges irregularities and will never shrink.

GREEN STANDARDS:

- LEED 2.2 for New Construction and Major Renovations: Low Emitting Materials (Section 4.1) 1 Point
- NAHB Model Green Home Building Guidelines: 5 Global Impact Points
- VOC Content: less than 33 grams / liter ASTM D2369 EPA Method 24 (tested at 240°F / 115°C)

COLOURS:

Clear	Smoke
SNOWSHOE size - 6” x 3 ½” x 2 ¾” (LxWxD)	

ADVANTAGES

- Solvent free, 100% solids, will not shrink
- Bonds to Kynar 500® PVDF metals
- Good color stability, will not suntan
- Paintable (pre-installation)
- Application at temperatures as low as 40°F (4°C) and rising.
- Neutral cure. Will not promote corrosion of metals

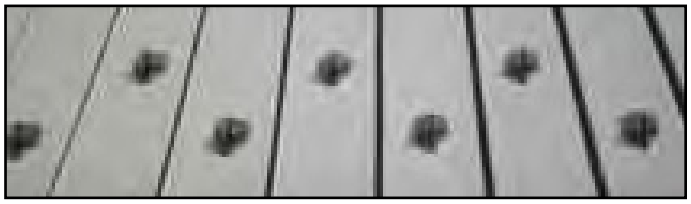
SNOWSHOE KIT COMPONENTS

- 24 SNOWSHOES
- 3 Cartridges of DuraSil Sealant/Adhesive
- 1 Pair of gloves
- 1 Applicator stick
- 1 Application guide

Step 1. Remove all surface contamination such as dirt, oil, caulking, and roof mastics from bonding area. Clean bonding surface with alcohol. New galvanized steel may require a vinegar scrub to remove protective wax coating. Wipe area dry before bonding.

Step 2. Mark position of each part before starting installation. Lay out SNOWSHOES with a tape measure in two staggered lines, approximately two feet apart horizontally and two feet apart vertically. To help prevent ice dams, set first row no less than one foot above plane of exterior wall.* (Refer to page 3)

Step 3. Roofs with a 6/12 pitch or greater require a third staggered row of SNOWSHOES. Also, if the distance from roof edge to peak is thirty feet or greater (regardless of slope), two additional staggered rows of SNOWSHOES should be installed at the midpoint. It is also recommended that SNOWSHOES be installed over all doorways and roof valley areas for added protection.



Step 4. Apply enough DuraSil adhesive to coat entire bottom of SNOWSHOE. Evenly tool adhesive with wooden applicator, so that a sufficient amount will bridge all gaps on textured surface.

Step 5. Press SNOWSHOE firmly in place above positioning mark with pointed end down. Press until excess adhesive is uniformly squeezed out around edges and through all vent holes. Transfer excess adhesive to bottom of next SNOWSHOE.

Step 6. Apply a small bead of DuraSil adhesive around perimeter of SNOWSHOE to seal edges.

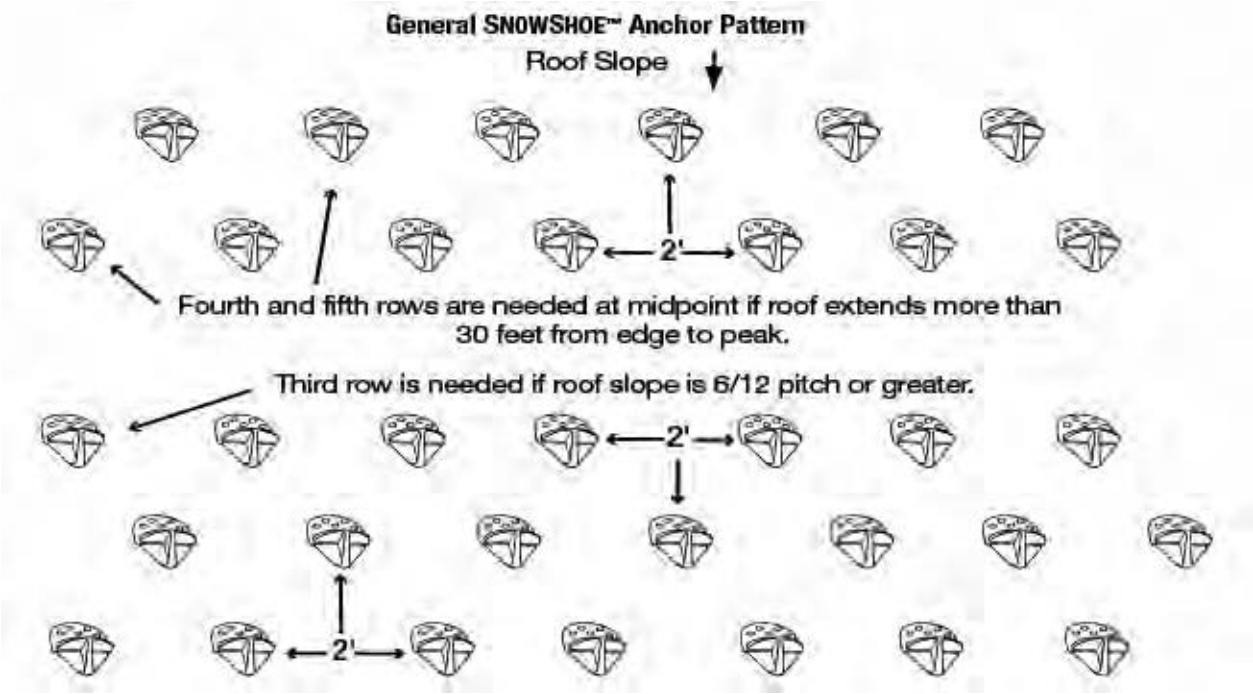
Step 7. Tool off excess adhesive from top of SNOWSHOE. Carefully tool edges with wooden applicator at a 45 degree angle to form a smooth, continuous fillet.

At least three days of 40°F (4°C) are required for DuraSil adhesive to set. Depending on temperature, SNOWSHOE installations develop full strength in seven to fourteen days.

SNOWSHOE™ KITS REQUIRED

ROOF PITCH	ROWS REQUIRED	COVERAGE PER KIT (24 SHOES)
5/12 or Less	2	24 Lineal Feet
6/12 or Greater	3	15 Lineal Feet
30' distance or greater between the ridge and eave edge regardless of pitch	5	8 Lineal Feet

NOTE: Above are guidelines only. End user is responsible for proper layout.



ADDITIONAL ROWS OF SNOWSHOES

Regardless of the slope of the roof, if the distance from the edge to the peak is thirty feet or greater, two more staggered rows of SNOWSHOES shall be installed at the midpoint of the roof. The SNOWSHOES shall be staggered two feet apart horizontally and two feet vertically as described above.

DOORWAYS

It is recommended that at least two additional rows of SNOWSHOES be placed above the top row of SNOWSHOES (near the bottom of the roof), over all doorways, extending past the doorway width a minimum of two feet on both sides.

DISCLAIMER

*Westman Steel is not responsible for determining the structural integrity or live load capacity of any roof on which SNOWSHOES are installed. That service shall be conducted by an architect or consultant.

Our snow guards are designed to help keep snow and ice from avalanching off the roof all at once causing damage to structures, landscaping, vehicles and people below. When more snow than expected accumulates on the roof, it should be removed to avoid damage to the roof, the building structure and anything below.

CSSBI
Canadian Sheet Steel Building Institute

CANADA'S BEST MANAGED COMPANIES
Platinum member