Build something great™

Boral STEEL™
STONE COATED ROOFING

DIRECT-TO-DECK
Installation Guidelines

PINE-CREST Shake | COTTAGE Shingle | PACIFIC Tile | BARREL-VAULT Tile (Exposed Fastened)


PACIFIC Tile


PINE-CREST Shake


COTTAGE Shingle


BARREL-VAULT Tile

NOTICE

These Guidelines are applicable to the four (4) Boral Steel™ profiles covered by this document. When the detail is unique and specific to a particular profile, we show that detail and label the page with the panel profile name.

INSTALLATION WARNING!

These installation guidelines demonstrate the recommended technique for installing the Boral Steel roof panels and accessories covered within this document.

The details and information in this document reflect current roofing practices used in the United States. Installers of Boral Steel Roof panels and accessories should have knowledge of roof structures, an understanding of how to work with stone coated steel panels and accessories, and experience working with sloped roofs.

Boral Steel recommends that installers of Boral Steel Roof products use a Cutter, and have completed an *Installer Orientation Training Program* for each profile installed (see www.Boralroof.com for more details). Boral Steel does not consider its products to be “do-it-yourself” (D.I.Y.) mainly due to specialized cutting & bending tools used during installation.

DIRECT-TO-DECK Installation Guidelines

Boral STEEL STONE COATED ROOFING

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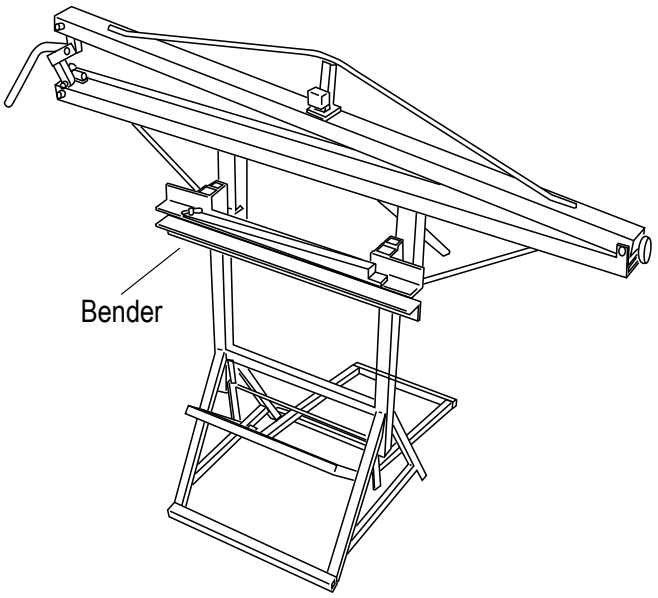
DIRECT-TO-DECK Installation Guidelines

INTRODUCTION

These guidelines use a Direct-to-Deck, direct-to-deck, simplified installation method that incorporates the cut & tuck process for Boral Steel panels, at valleys, rakes and roof-to-wall areas. Hip & Ridges are mitered or over-lapped and capped with the appropriate trim. The result is a roof you can count on to weather the elements.

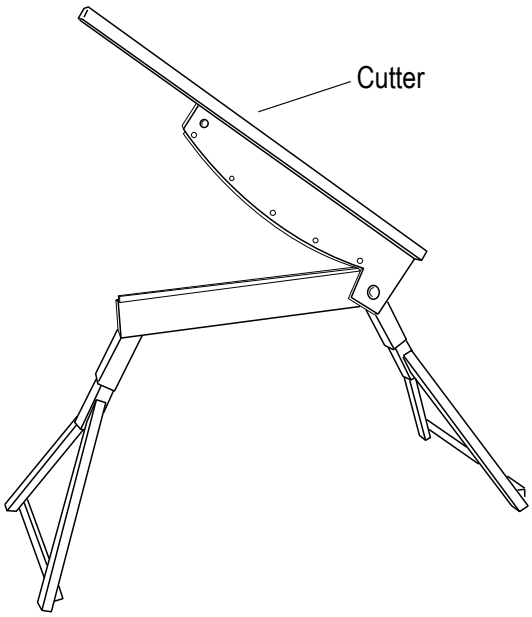


INSTALLATION TOOLS:

- **Boral Steel Installation Kit** - 150 lbs (68.1 kg)
  - CUTTER - 40 lbs (18.16 kg)
  - FULL PANEL BENDER attachment - 62 lbs (28.1 kg)
  - FOOT BENDER - 48 lbs (21.8 kg)
- **Hand Tools**
  - Impact Driver
  - Red & Green Snips
  - 3” Hand Seamers

OTHER TOOLS:

- Nail Gun
- Hammer
- Tape Measure
- Caulking Gun
- String-Line
- Soap Stone (used to mark panels)
- Standard Slot Scredriver



GENERAL

These install details are designed to be used in conjunction with Boral Steel’s *Installer Orientation Training Program.*

Boral Steel Roof Products - 10 Basic Steps to a Great Job:

1. Install **DRIP EDGE & RISER** perimeter metals
2. Install **RAKE CHANNELS**
3. Install **VALLEY** Metals
4. Install field **PANELS** across roof sections
5. Fasten field **PANELS** & bottom row
6. Measure, Mark, Cut & Bend - **HIP, VALLEY, RIDGE & RAKE** panel sections
7. Install **PIPE** Flashings Pipe-Jacks, Sleeves, EZ-Vents, etc.
8. Install **CHIMNEY** flashings panel sections
9. Install **TRIM CAPS** on Hip & Ridge and/or Rake
10. **CHECK** overall job

In cold climate zones with cathedral ceilings, use Boral Steel's Elevated Batten System (EBS) or a counter-batten system to help prevent ice damming.

INTRODUCTION (cont)

EXPOSED FASTENED
PINE-CREST Shake, PACIFIC Tile, BARREL-VAULT Tile and COTTAGE Shingle panels are Exposed fastened. When installed in a Direct-to-Deck configuration, they use vertically positioned fasteners across the back flange and angled fasteners across the nose down turn.

MATERIALS
The panels are produced from AZ-50, Aluminum-zinc alloy coated steel complying with ASTM A792.

PACKING AND STORAGE
A pallet of panels contains approximately 20 squares (186 sqM). Panels should be stored under a weather-proof cover or inside in an area free from moisture.

ROOFING UNDERLAYMENT
Minimum one layer ASTM D226 Type-II (No. 30 Felt), head lapped 2” and end lapped 6”, or approved equal to or better per code.

ROOF DECK SHEATHING
The panels must be installed on a minimum 15/32” thick (11.9 mm) plywood, close fitted sheathing or spaced sheathing that complies with the applicable code.

SEALANT/CAULKING
Only exterior grade urethane or (non-acidic) silicone caulking should be used for sealant.

FASTENERS
All fasteners (Screws or Nails) used on a Boral Steel system shall meet or exceed the corrosion resistant standard as defined in ASTM B-117, (1,000-hr minimum Salt Spray Corrosion Resistance).

Panel fasteners shall be of sufficient length to penetrate into the roof deck a minimum of .75”.

For HVHZ (High Velocity Hurricane Zone) areas refer to local code requirements and/or Boral Steel website (www.BoralRoof.com) for details.

TESTING
The panels have been tested and evaluated and are covered by the International Code Council (ICC Evaluation Service Report (ESR) #’s 1188, 1492, 3012, 3098 for the USA and CCMC for Canada #’s 13258 R, 13260 R, and 13313 R. Testing has been conducted to evaluate fire, wind, impact resistance, water infiltration, and durability resistance. Information regarding specific tests and approvals can be obtained from Boral Steel.

VENTILATION
Ensure proper attic ventilation as prescribed per local codes. Either Boral Steel Vents or Ridge venting can be installed to help achieve adequate ventilation.

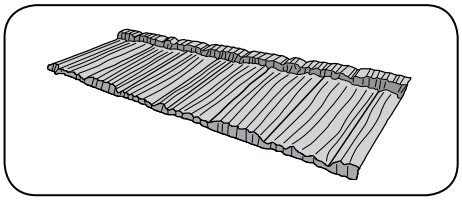
WARRANTY
The panels carry a limited warranty for fifty years. This limited warranty is transferable and does not cover damage due to improper handling or installation. Complete warranty details available at www.BoralRoof.com.

DISSIMILAR METALS
To avoid adverse corrosion effects caused by dissimilar metals, COPPER and LEAD flashings should not be used with Boral Steel panels and accessories.

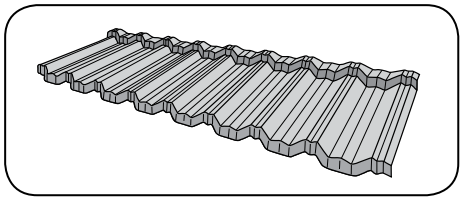
FINISH COATING
Minor scuffing of the stone coated finish can be repaired with a Touch-Up Kit. Use the basecoat acrylic supplied in the kit (not caulking) for repairs. Unfinished flashing material can be painted with durable acrylic aerosol paints. Colored aerosol paints should never be used as "touch-up" on stone coated products.

Colored aerosol paints should never be sprayed on stone coated panels & accessories.

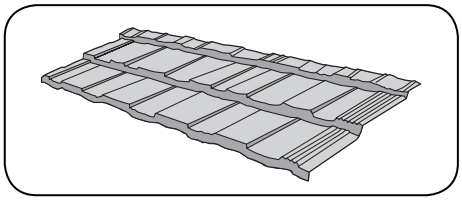
STONE COATED PANELS, CAPS AND VENTS



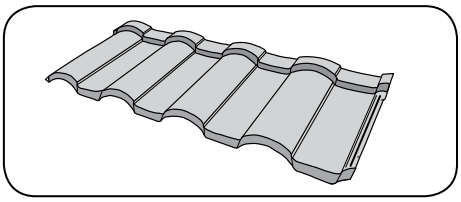
PINE-CREST Shake Panel
Cover: 14.5" x 49.5" (368 x 1257 mm)
6.5 lbs (2.95 Kg) 20 pcs/sq



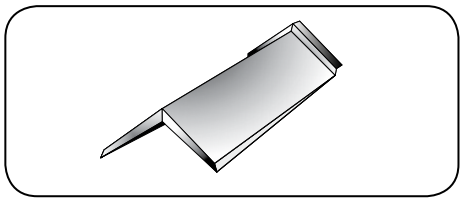
PACIFIC TILE Panel
Cover: 14.5" x 49.5" (368 x 1257 mm)
6.3 lbs (2.86 Kg) 20 pcs/sq



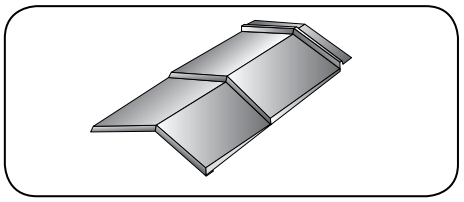
COTTAGE Shingle Panel
Cover: 14" x 47.5" (355 x 1206 mm)
5.9 lbs (2.68 Kg) 22 pcs/sq



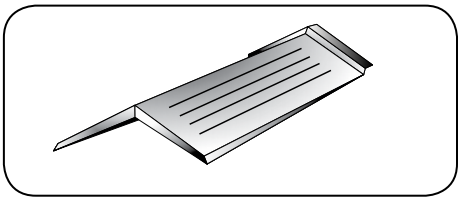
BARREL-VAULT Tile Panel
Cover: 14" x 43" (355 x 1092 mm)
5.5 lbs (2.5 Kg) 24 pcs/sq



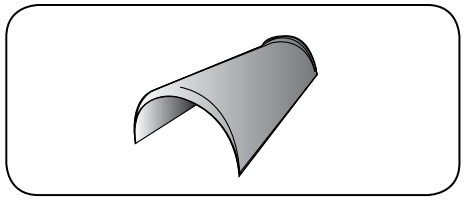
Cap Shake (Hip & Ridge)
6” x 14.5” (150 x 368 mm)



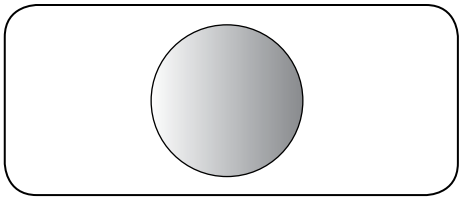
Cap Shingle (Hip & Ridge) 2-Course
8” x 14” (203 x 356 mm)



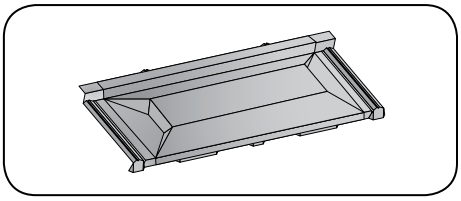
Cap Cottage (Hip & Ridge)
12” x 12” (300 x 300 mm)



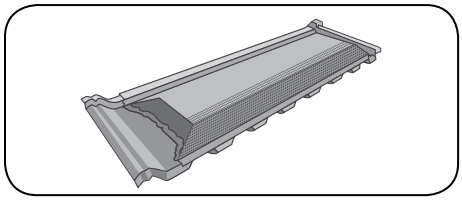
Cap Mission (Hip & Ridge)
6” x 14.5” (150 x 368 mm)



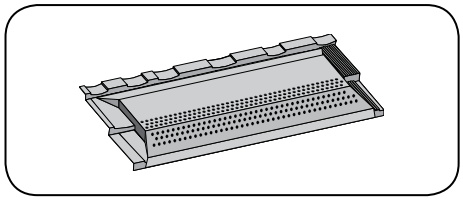
End Disc
6” Dia. (150 mm) 0.15 lbs (0.06 Kg)



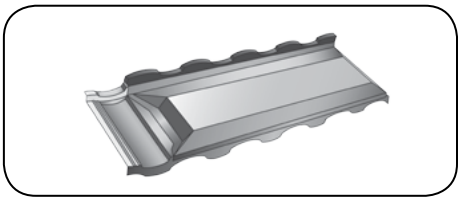
EZ-Vent PINE-CREST Shake
14.5" x 3.5" x 52" (368 x 89 x 1321 mm)
12.45 lbs (5.65 Kg) NFVA-82 sq in.



EZ-Vent PACIFIC Tile
14.5" x 3.5" x 52" (368 x 89 x 1321 mm)
12.45 lbs (5.65 Kg) NFVA-82 sq in.



EZ-Vent COTTAGE Shingle
14" x 3.5" x 52" (368 x 89 x 1321 mm)
11.90 lbs (5.40 Kg) NFVA-82 sq in.

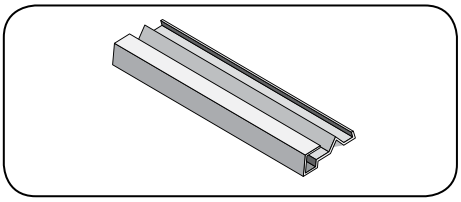


EZ-Vent BARREL-VAULT Tile
14" x 3.5" x 43" (355 x 89 x 1092 mm)
11.64 lbs (5.28 Kg) NFVA 66 sq in.

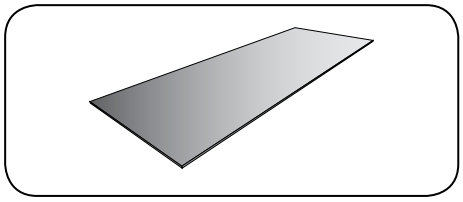
Weights are approximate.

Continued on Next Page.

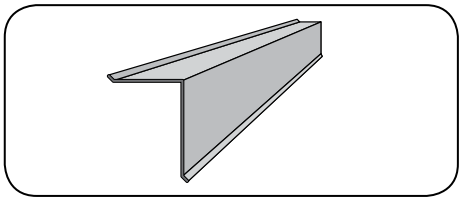
STONE COATED ACCESSORIES



Rake Channel
79” x 2-1/2” x 1-3/4”
(2006 x 64 x 45 mm) 4.55 lbs (2.10 Kg)



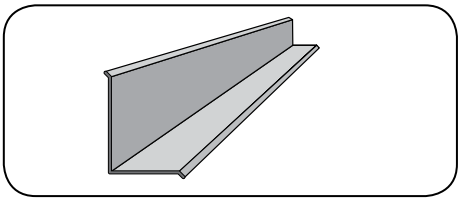
Flat Sheet
54” x 18” (1372 x 457 mm)
7.48 lbs (4.39 Kg)



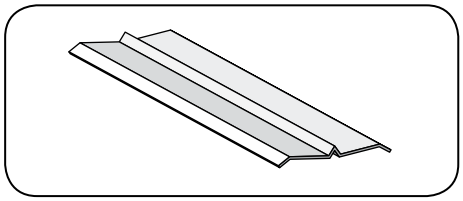
Fascia 3.50”
79” x 3.5” (2006 x 89 mm)
4.21 lbs (2.22 Kg)

Fascia 3.25” (Florida)
79” x 3.25” (2006 x 83 mm)
4.21 lbs (2.22 Kg)

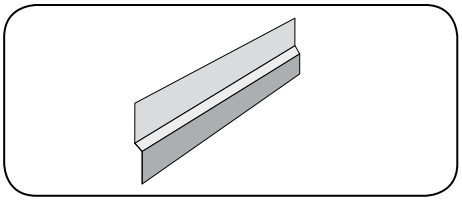
Fascia 5.0”
79” x 5” (2006 x 127 mm)
4.21 lbs (2.22 Kg)



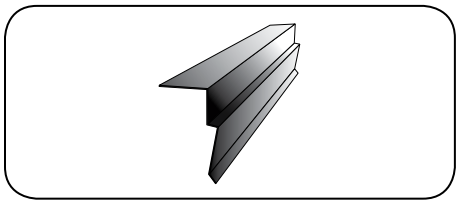
Head-Side-Wall Metal
79” x 5” x 3.5” (2006 x 127 x 89 mm)
4.21 lbs (2.22 Kg)



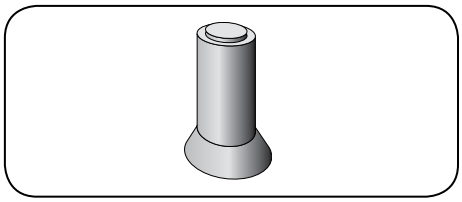
Valley Center Cover
79” x 4.5” (2006 x 108 mm)
4.19 lbs (1.90 Kg)



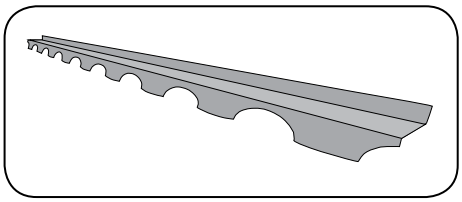
Z-Bar
79” x 5” (2006 x 127 mm)
4.8 lbs (2.18 Kg)



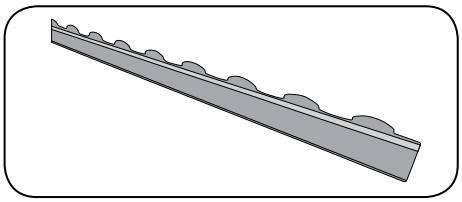
Trim Cap Rake Metal
79” x 2” x 3.5” (2006 x 50 x 89 mm)
3.8 lbs (1.73 Kg)



Pipe Sleeve
3/4” – 4” Dia. Pipes (19 – 100 mm)
1.72 lbs (0.78 Kg)

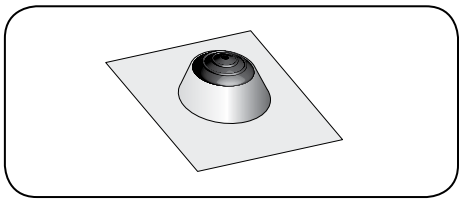


BARREL-VAULT Top Row
79” x 3.75” (2006 x 140 mm)
5.64 lbs (2.56 Kg)



BARREL-VAULT Bird-Stop 3.75”
79” x 3.75” (2006 x 95 mm)
5.90 lbs (2.68 Kg)

BARREL-VAULT Bird-Stop 5.0”
79” x 5.0” (2006 x 127 mm)
7.88 lbs (3.58 Kg)

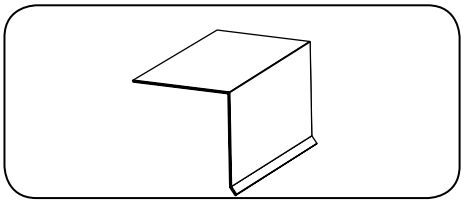


Pipe-Jack 3-in-1
Base 18” x 18”, 1” to 3” Pipes (75 mm)
1.78 lbs (0.81 Kg)

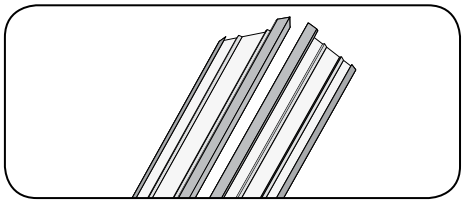
Pipe-Jack 3-in-4
Base 18” x 18”, 3” to 4” Pipes (100 mm)
1.86 lbs (0.84 Kg)

Weights are approximate.

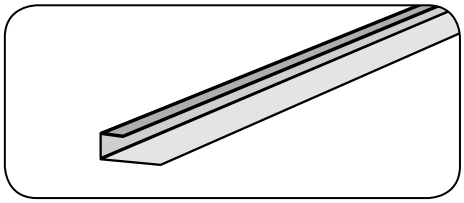
PAINTED OR BARE ACCESSORIES AND SEALANTS



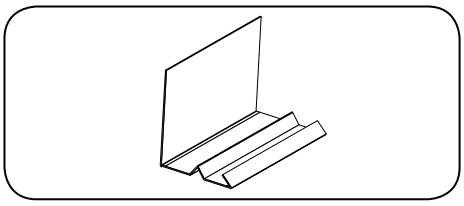
Drip Edge
120" x 1.5" (3048 x 38 mm)
1.6 lbs (0.72 Kg)
Painted Black, Brown or White



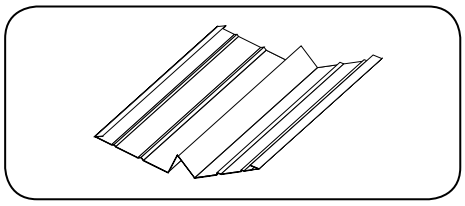
Valley 2-Pc - Bare
120" x 9" (3048 x 229 mm)
7.35 lbs (3.33 Kg) Painted Black inside



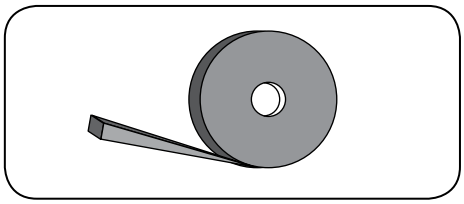
Gutter Riser Metal / Accessory Batten
120" x .625" (3048 x 16 mm)
1.9 lbs (0.86 Kg), Painted Black outside



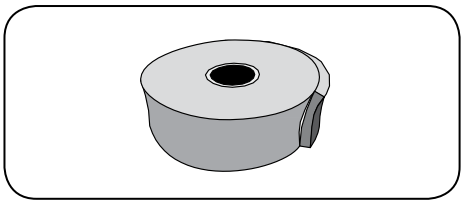
Side-Wall Under-Pan Metal
120" x 4" x 3" (3048 x 100 x 76 mm)
5 lbs (2.3 Kg) Painted Brown inside



Valley Five 'V'
120" x 18" (3048 X 457 mm) 13 lbs (5.90 Kg)
Painted Black, Brown or White inside

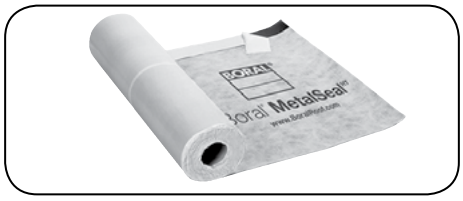


EmSeal Foam Tape Rolls
19.68 ft x 1" x .75" (6000 x 25 x 19 mm)
1 lbs (0.45 Kg)

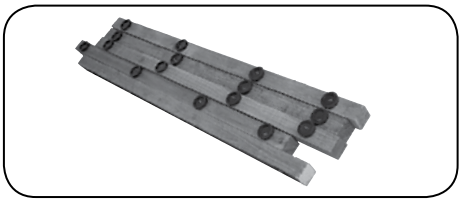


Barrier Foam Rolls
20 ft x 1" x 6" (6096 x 25 x 150 mm)
3.5 lbs (1.6 Kg)

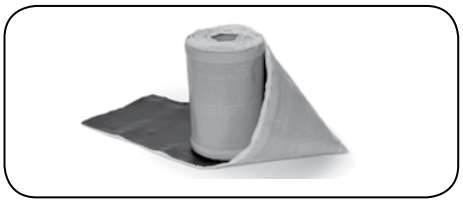
ROOF SYSTEM COMPONENTS



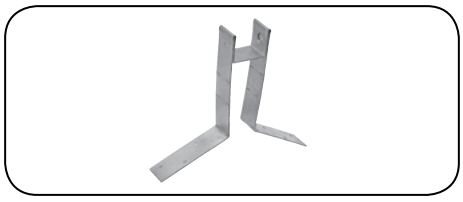
Boral® MetalSeal - Self-Adhered, High-Temperature Underlayment
3 ft wide x 72 ft long, 60 mils thick
66 lbs/roll



2x2 Elevated Batten System® (EBS)
2" x 2" x 96", 12 pcs/bundle
96 lin-ft/bundle



Wakaflex® Universal Flashing
11" wide x 33 ft long - Black
22" wide x 16.5 ft long - Black
11" wide x 33 ft long - Brown
11" wide x 33 ft long - Terra Cotta



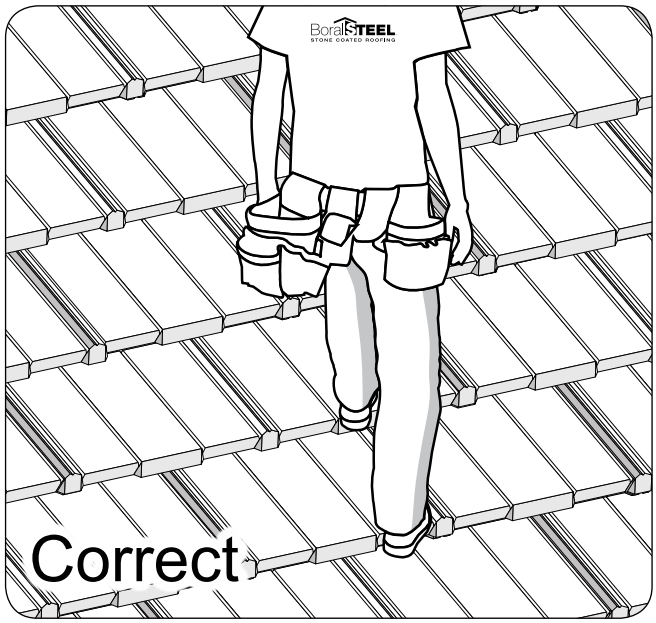
Ridge Riser® Brackets
16 gauge galv. steel, 100 pcs/box

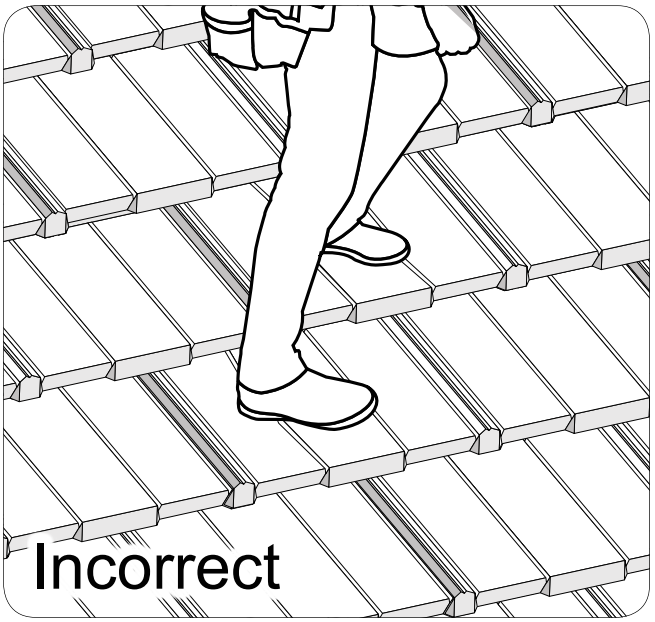
Weights are approximate.

WALKING ON YOUR ROOF (PINE-CREST Shake shown)

PANEL WALKING

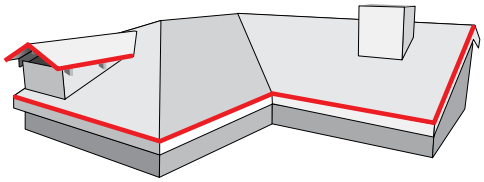
Appropriate OSHA approved fall protection must be used when walking on roofs panels.
Place your feet over the front lip of the panels as shown in left image below. Avoid walking near the panel side-laps as shown in right image below.





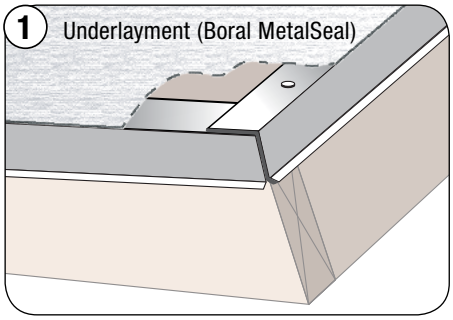
DIRECT-TO-DECK Installation Guidelines

PERIMETER METAL If using PINE-CREST Shake, PACIFIC Tile, COTTAGE Shingle



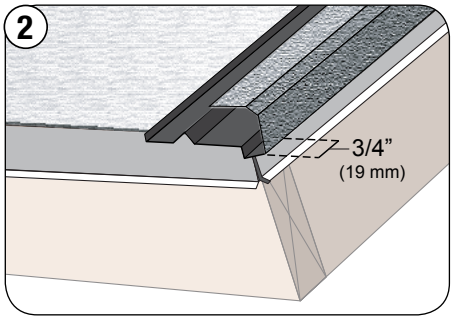
Boral Steel Direct-to-Deck panels are installed on new or existing roofs pitched a minimum of 3:12 (12 degrees). Underlayment is to be installed as per local code and manufacturer's instructions.

DRIP EDGE METAL If using PINE-CREST Shake, PACIFIC Tile, COTTAGE Shingle

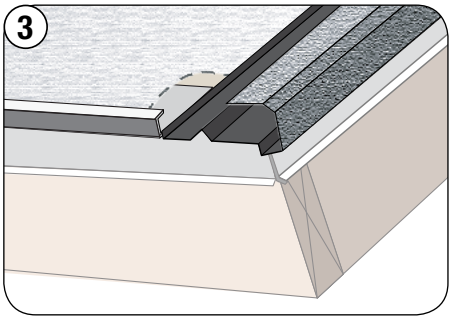


Install Drip Edge across fascia and up rake edges, when using Rake Channel. Install underlayment (Boral MetalSeal) on top of Drip Edge, as shown.

If using Trim Caps on the Rake edges, first install Trim-Cap Rake Metal edging on rakes.



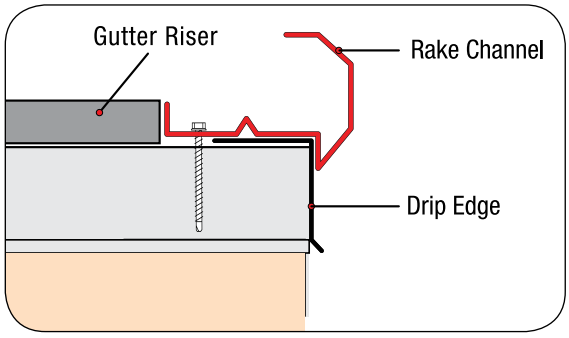
Install the Rake Channel up the rake extending it past the fascia Drip Edge by 3/4" (19 mm). Make sure the 'Locator-Lip' is snug against the rake Drip Edge and fasten with washer & grommet screws or apply sealant to screws.



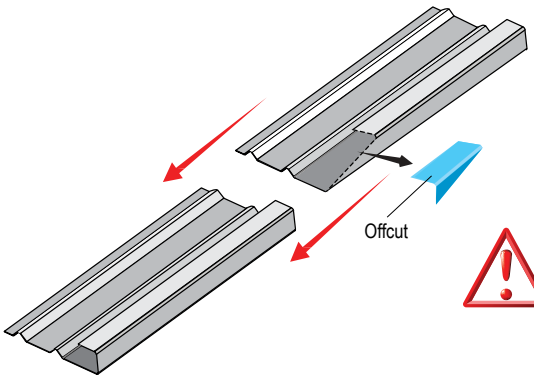
Install Gutter Riser across the fascia, underneath Underlayment and butt up against the Rake Channel and Valley pans.

For HVHZ (High Velocity Hurricane Zone) areas, perimeter flashings are fastened per local code.

RAKE CHANNEL If using PINE-CREST Shake, PACIFIC Tile, COTTAGE Shingle

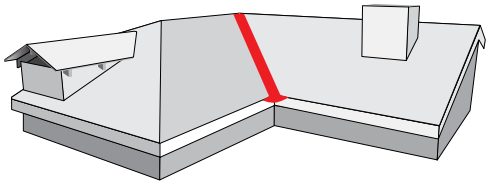


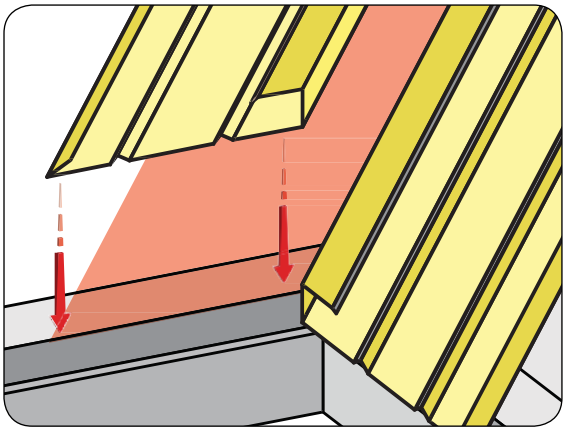
Install the Boral Steel Rake Channel using fasteners placed as shown. If fasteners do not have a sealing washer, apply a bead of sealant around each one. Rake Channel metal is notched to lap a minimum of 2" (50 mm) with water flow, as shown.



Lap 2" (50 mm) minimum to prevent leakage through seams.

VALLEY 2-PC - CLOSED If using PINE-CREST Shake, PACIFIC Tile, COTTAGE Shingle





Estimating formula:
Lin-ft of Valley divided by 9.75 x 2 = # of Valley 2-Pc required.

Boral Steel Valley 2-Pc requires sealant or sealant tape down center covering both pieces before installing stone coated Valley Center Cover.

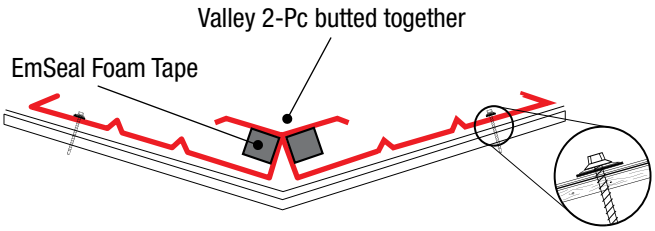
Depending on the valley metal used, Boral Steel panels can be installed to form either a 'Closed' or 'Open' valley. This page shows the Boral Steel Valley 2-Pc metal which is used to create a 'Closed' valley.

Boral Steel Valley 2-Pc consists of:

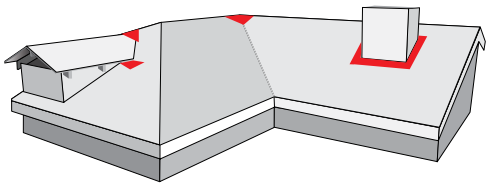
a) 1 piece of Valley 2-Pc (Use on left side)
b) 1 piece of Valley 2-Pc (Use on right side)
c) 1 piece Valley Center Cover (after installing panels)

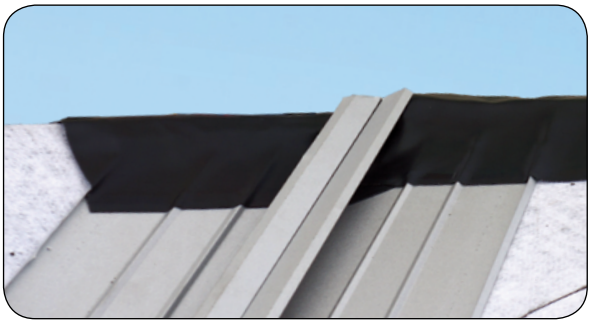
Boral Steel Valley 2-Pc uses two (2) pieces per each 10 foot (3048 mm) length of valley.

Install each side of the Valley 2-Pc as shown, lap Valley as per local code requirements. Fasten as normal for a valley pan.



WAKAFLEX® UNIVERSAL FLASHING





VALLEY INTERSECTING RIDGES:

Where two valleys meet at the ridge line, Wakaflex® universal flashing can be used to seal the intersecting pieces of valley.

The following necessary steps are provided to prevent water migration under the roof tile.

1. Cut Wakaflex of equal width to form on top of the 2 pieces of valley metal extended min 6" on both sides.
2. Remove the protective film exposing the butyl strip and form on top both sides of valley metal.
3. Ensure that the top upper side of the Wakaflex is integrated into underlayment installed to prevent moisture from penetrating roof deck.

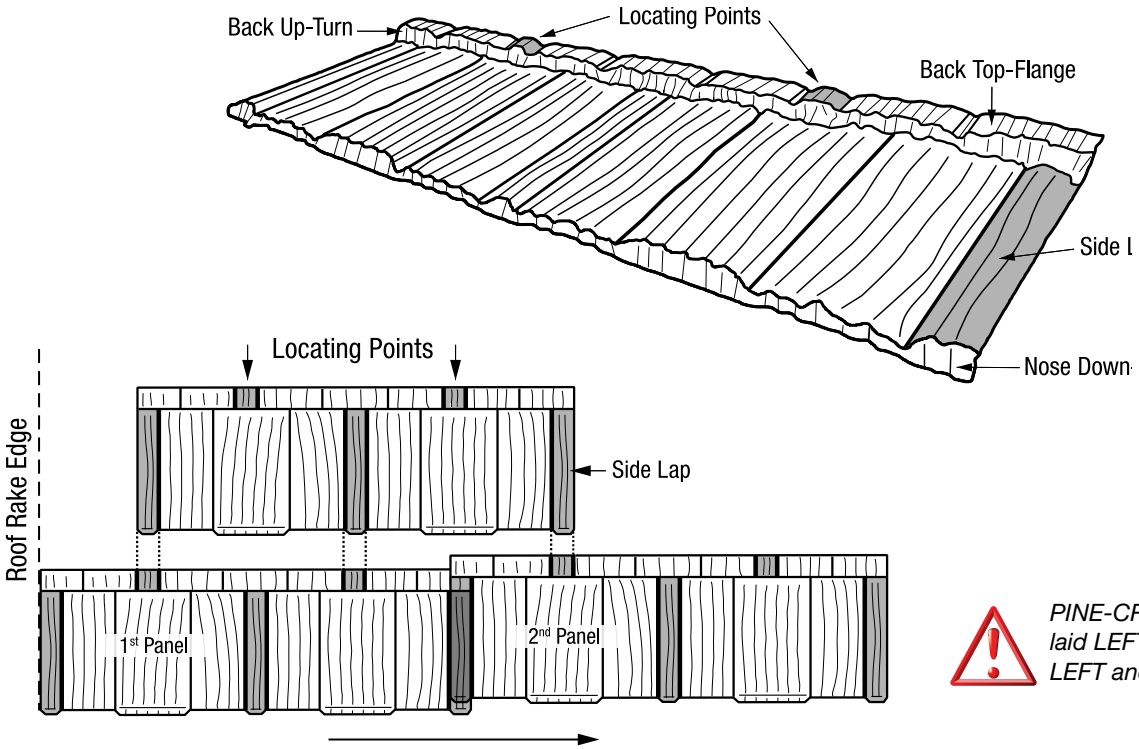
Wakaflex can also be used for:

- *Sidewalls*
- *Splayed Gables*
- *Hip & Ridge Junctures*
- *Solar Panels*
- *Chimneys*
- *Tricky details that require weather protection*
- *Variety of repair applications*

DIRECT-TO-DECK Installation Guidelines

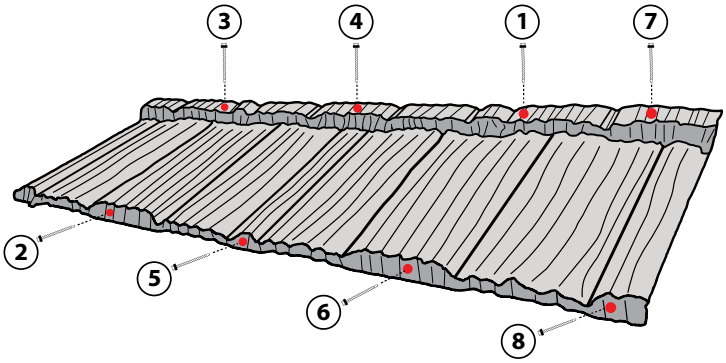
PANEL LAYOUT - PINE-CREST SHAKE

PINE-CREST Shake panels have a 2” (50 mm) side-lap and two staggered locating points along the back flange of the panel. The panels are designed to be installed on battens or Direct-to-Deck in a staggered pattern and placed according to their locating points. They **CANNOT** be straight laid.



PINE-CREST Shake panels can be laid LEFT to RIGHT or RIGHT to LEFT and CANNOT be Straight-laid.

FASTENING SEQUENCE

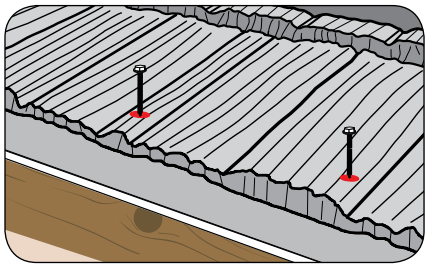


The fastening pattern for PINE-CREST Shake uses four (4) fasteners across the front Nose Down-Turn and four (4) across the Back Top-Flange of each panel.

Last fastener (#8) is fastened after placing next PINE-CREST Shake panel of the same course, and goes through both panels.

FASTENING SEQUENCE shown is for the Left to Right layout direction; applicable to any location and ensures the panels stay correctly aligned.

1ST ROW FASTENING

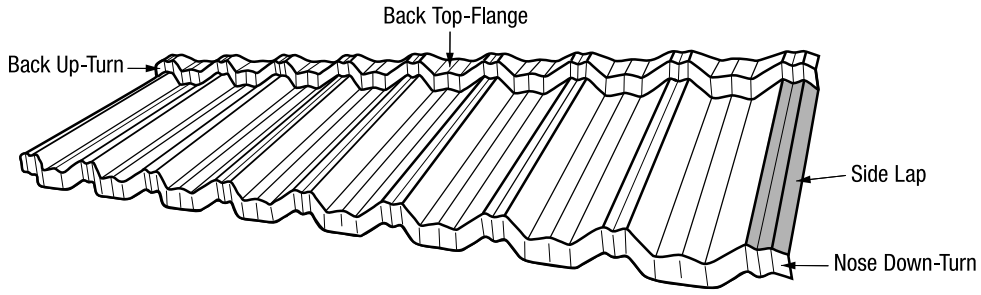


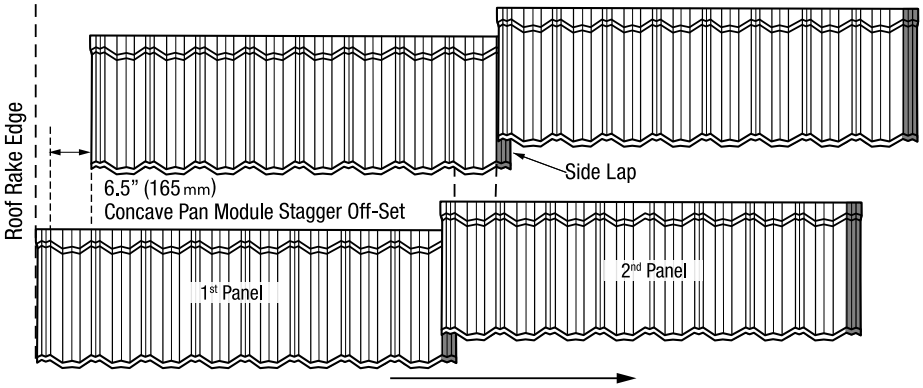
Fasten the bottom row panels through the top of the panel as shown, out of the main water channel of the panel. Top panel fastening is acceptable behind Boral Steel EZ-Vents and chimney/skylight details, as necessary.

Use the Touch-Up Kit to cover each top fastener.

PANEL LAYOUT - PACIFIC Tile

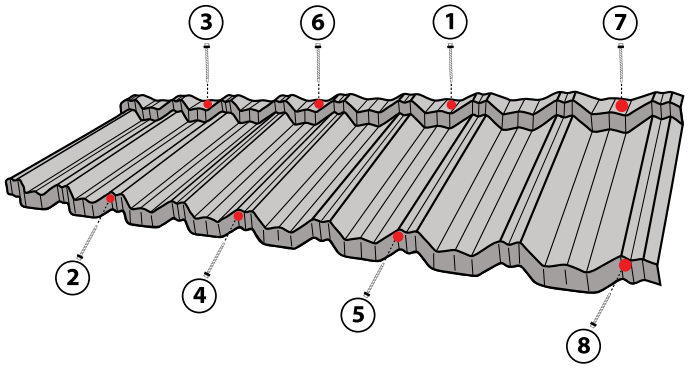
PACIFIC Tile panels have a 2” (50 mm) side-lap and can be staggered by one or multiple concave modules across the back of the panel as needed. The panels are designed to be installed on battens or Direct-to-Deck in a staggered pattern and **CANNOT** be straight laid.





PACIFIC Tile panels can be laid LEFT to RIGHT or RIGHT to LEFT

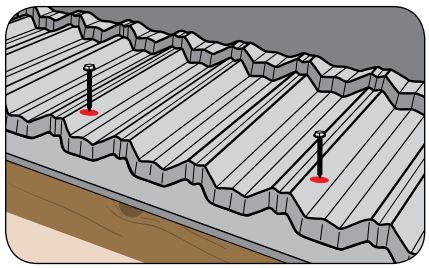
FASTENING SEQUENCE



The fastening pattern for PACIFIC Tile uses four (4) fasteners across the front Nose Down-Turn and four (4) across the Back Top-Flange of each panel.

FASTENING SEQUENCE shown is for the LEFT to RIGHT layout direction; applicable to any location and ensures the panels stay correctly aligned.

1ST ROW FASTENING



Fasten the bottom row panels through the top of the panel as shown, out of the main water channel of the panel.

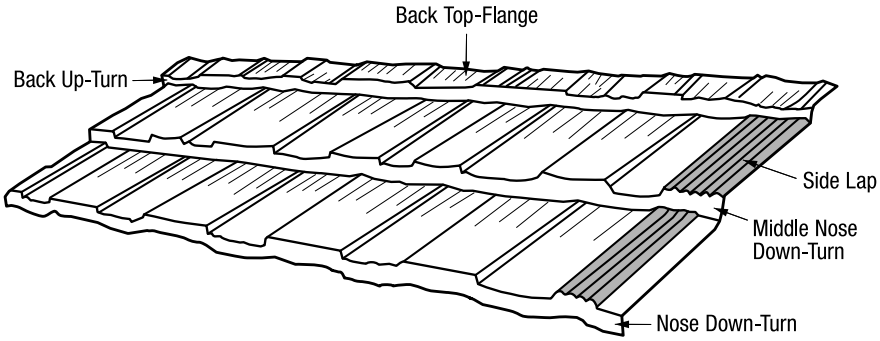
NOTE: Top panel fastening is acceptable behind Boral Steel EZ-Vents and chimney/skylight details, as necessary.

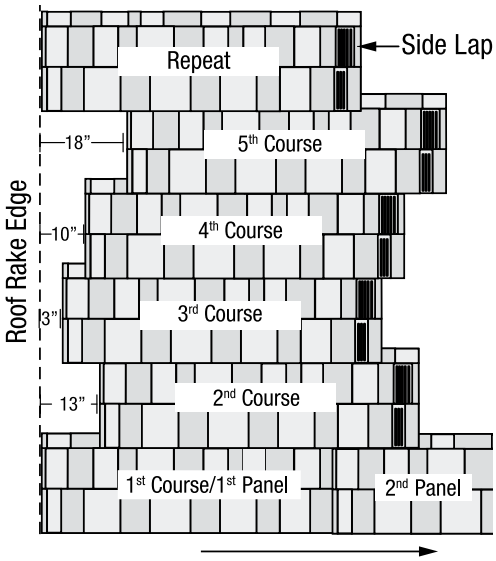
Use the Touch-Up Kit to cover each top fastener.

DIRECT-TO-DECK Installation Guidelines

PANEL LAYOUT - COTTAGE Shingle

COTTAGE Shingle panels have a 3-1/2" (89 mm) side-lap and require a set stagger pattern to limit any alignment issues. The panels are designed to be installed Direct-to-Deck in a staggered pattern and they **CANNOT** be straight laid.

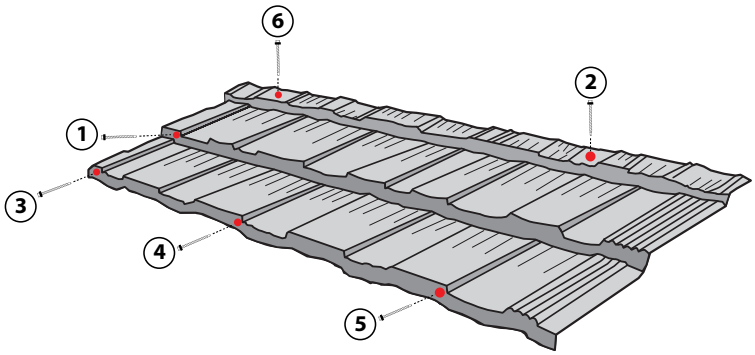




Side Lap: Grooved right-hand side of the panel is the "Under-Lap" portion and is covered by the "Over-Lap" of the next full panel on the same row.

COTTAGE Shingle panels can only be laid LEFT to RIGHT. Always complete each row across the roof before starting the next row above.

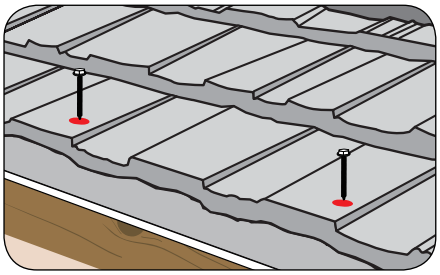
FASTENING SEQUENCE



The fastening pattern for COTTAGE Shingle uses three (3) fasteners across the front Nose Down-Turn, two (2) fasteners across the Back Top-Flange and one (1) fastener on the Middle Nose Down-Turn of each panel.

FASTENING SEQUENCE shown is applicable to any location and ensures the panels stay correctly aligned.

1ST ROW FASTENING



Fasten the bottom row panels through the top of the panel as shown, out of the main water channel of the panel. Top panel fastening is acceptable behind Boral Steel EZ-Vents and chimney/skylight details, as necessary.

Use the Touch-Up Kit to cover each top fastener. the screw cannot be installed at the low point of the water trough.

DIRECT-TO-DECK Installation Guidelines

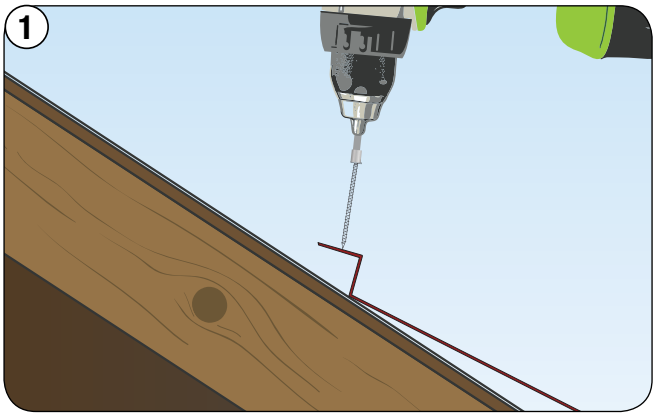
FASTENERS

Boral Steel panels can be installed with Screws as listed below:

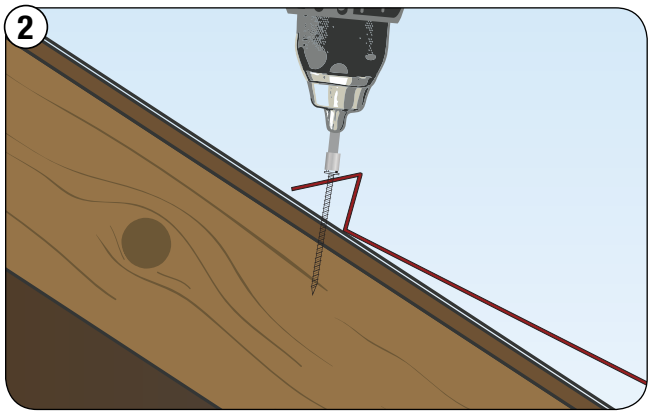
- **PANEL SCREWS:**
  PINE-CREST Shake, COTTAGE Shingle and PACIFIC Tile - #10 x 2” long x 1/4” HWH (50 mm x 6 mm)
  BARREL-VAULT Tile - #10 x 2-1/2” long x 1/4” HWH (64 mm x 6 mm)
- **TRIM SCREWS** - #10 x 1” long x 1/4” HWH (25 mm x 6 mm)
- **VALLEY PAN SCREWS** - #10 x 1-1/2” long x 1/4” HWH w/Rubber washer (38 mm x 6 mm)

All fasteners used on a Boral Steel roof shall meet or exceed the corrosion resistant standard as defined in ASTM B-117, (1,000 hr minimum Salt Spray Corrosion Resistance). Refer to Boral Steel’s High Velocity Hurricane Zone (HVHZ) fastening details found in Boral Steel’s Florida Building Code HVHZ Approval, for details.

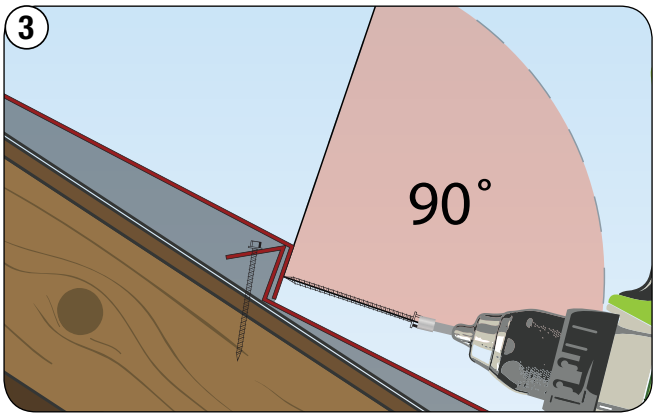
FASTENING DIRECT-TO-DECK PANELS



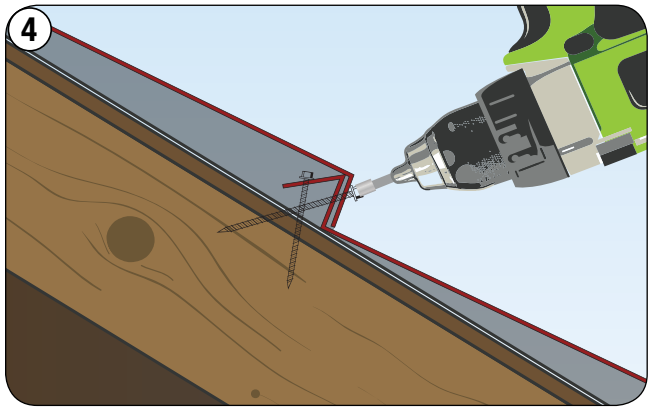
Panel Back Flange is fastened vertically into roof deck



Panel Back Flange is ‘seated’ down onto roof deck.



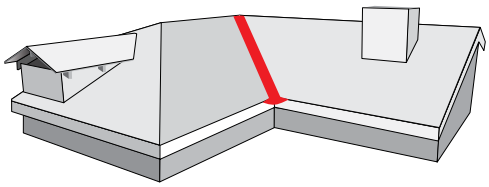
Start fastener at a 90° angle to the panel as shown.



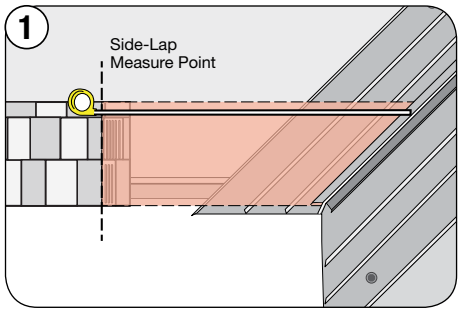
Once fastener has penetrated the nose, angle the screw to penetrate the Back Up-Turn of the panel beneath and into the deck. Due to the Back Flange and Nose Down-Turn fastener angles, the “x” pattern provides exceptional uplift resistance.

Step 1 and 2 above:
Do Not crush/flatten the Back Flange.

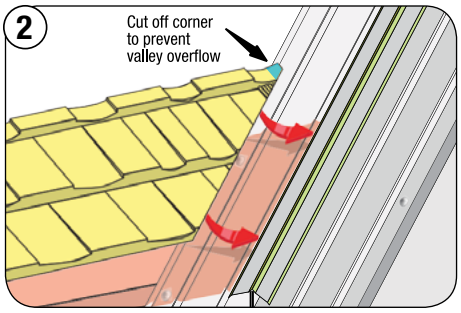
INSTALLING PANEL SECTIONS INTO VALLEY 2-PC All Profiles



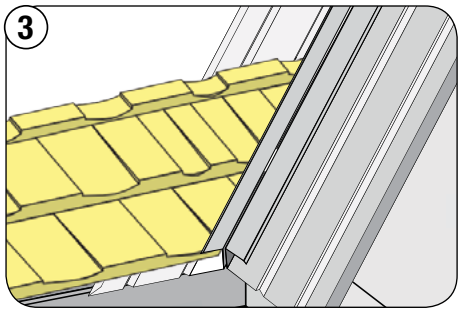
Where debris may accumulate in valleys use EmSeal Tape inserted into each piece of the two piece valley metal.



Measure from the Side-Lap reference point, mark & cut panels to fit into the Valley 2-Pc, matching the angle of the Valley.

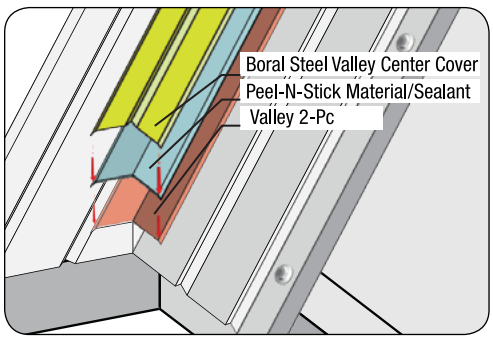


Notch the top Back Flange corner prior to fitting into the Valley.



Valley panel cut & notched sections are fitted into the Valley 2-Pc as shown.

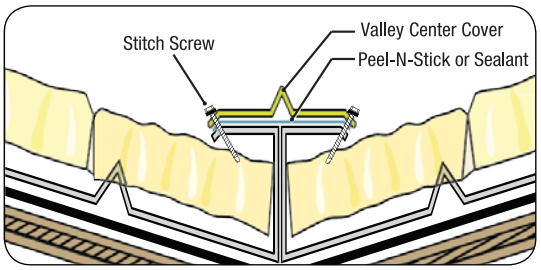
VALLEY CENTER COVER



After all valley cut sections are installed, install a strip (min. 4” (100 mm) wide) of Peel-N-Stick type material or Sealant over the center seam as shown.

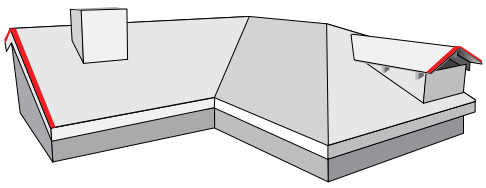
Install Valley Center Cover over the center seam with stitch screws. Vertical laps for both the Peel-N-Stick and the Valley Cover are a min of 4” (100 mm).

The Valley Center Cover is fastened to each panel course where it intersects the valley.

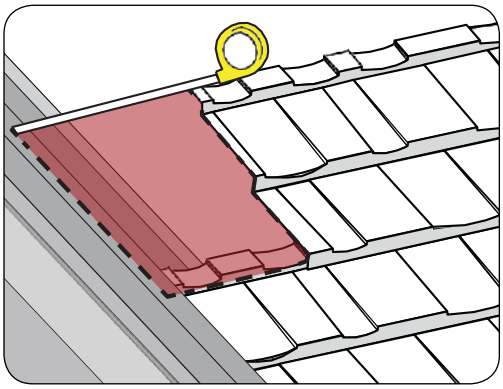


Do not penetrate the Valley Metal, *use Stitch screws to secure the Valley Cover.*

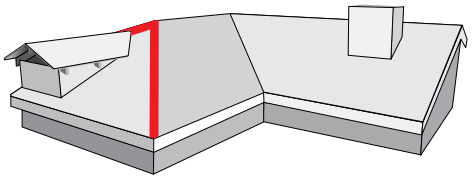
RAKE EDGE CUT SECTIONS All Profiles (COTTAGE Shingle Shown)



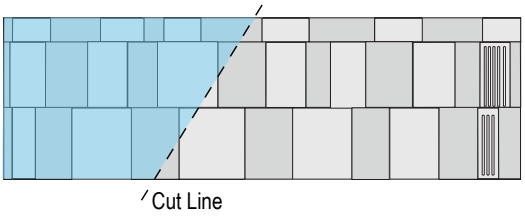
Measure, cut and install rake panel sections up each rake. Make sure to insert each section into the Rake Channel a min of .75". Refer to Panel Layout pages for correct panel lap and stagger layout.

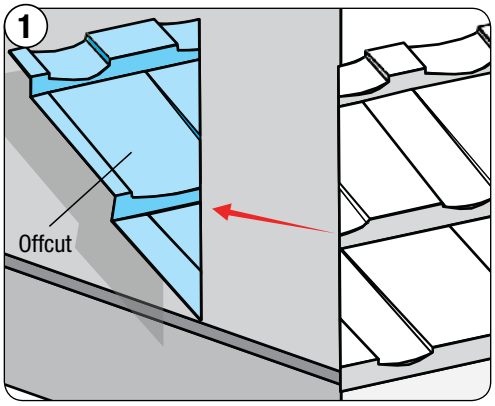


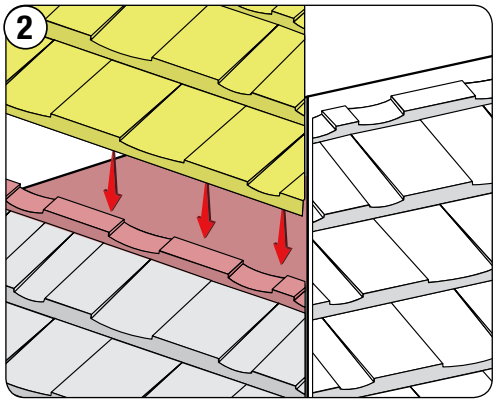
HIP CUT SECTIONS All Profiles (COTTAGE Shingle Shown)



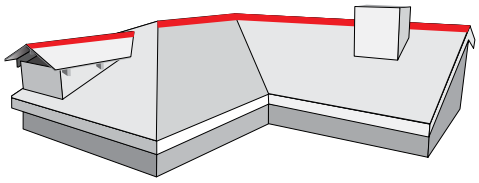
Measure, cut and fit panels to the hip center line. Overlapping panels is acceptable at the center line.



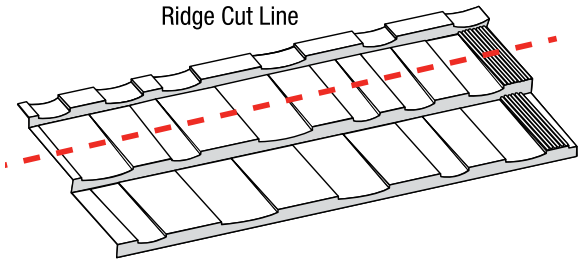


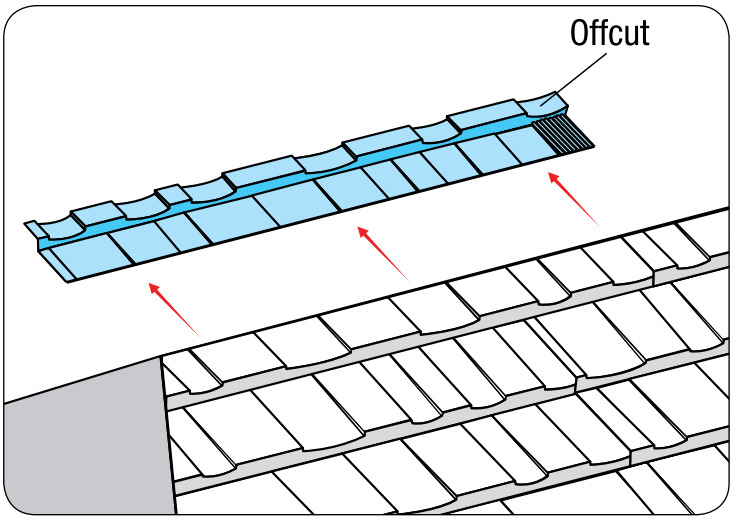


RIDGE CUT SECTIONS All Profiles (COTTAGE Shingle Shown)



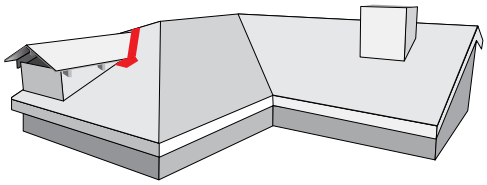
Measure, cut and install panels across ridge. Fasten as field panels. Overlapping panels is acceptable at the "horizontal" center line.





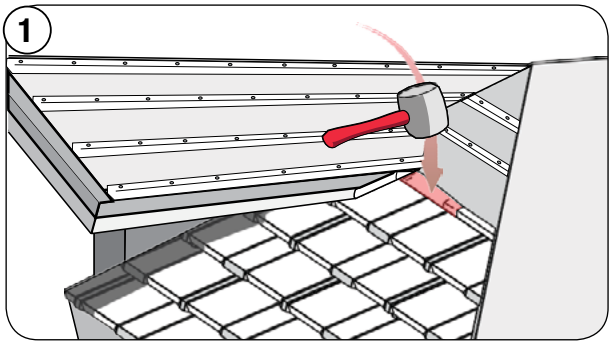
Continuous Ridge Venting is possible. Refer to Boral Steel website for details.

DORMER VALLEY EXIT - PANELS AND ACCESSORIES All Profiles (COTTAGE Shingle Shown)

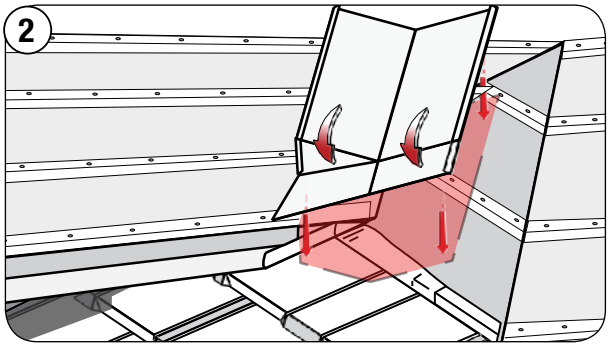


This is a critical roof area and requires special attention to ensure good weather protection. When the main roof intersects with a dormer roof, the panels back-lip where the valley exits onto the main roof must be flattened & the panels bent-up against the dormer roof (see steps below).

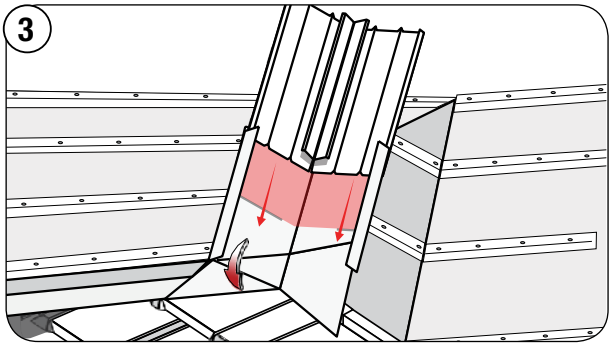
Use either Boral Steel stone coated Flat Sheet or Wakaflex® flashing to create a valley exit piece with hemmed edges for the valley to exit onto. Apply a bead of sealant to the Flat Sheet exit piece before fitting the valley metal onto field panels



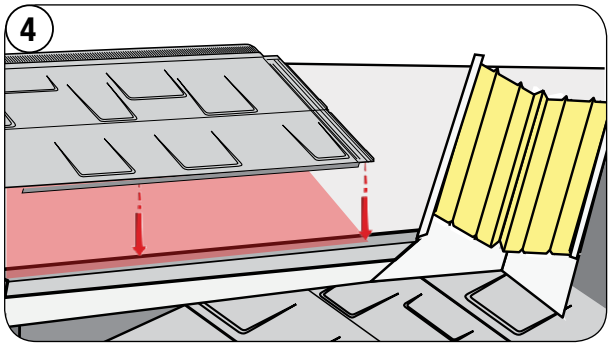
Flatten back flange against the roof deck.



Form the stone coated Flat Sheet as an extension and exit tray for the upcoming valley. Apply sealant under the Flat Sheet where it exits on top of the panel beneath.



Install Valley metal over and onto the stone coated Flat Sheet. Apply a bead of sealant across the top of the Flat Sheet and embed the Valley into the sealant.



Then install the panels regularly as valley cut sections into the Valley 2-Pc.

WAKAFLEX® FLASHING USE INSTEAD OF VALLEY EXIT TRAY

Where a typical standard metal valley flashing transitions onto an adjoining roof plane, a Wakaflex® flexible extension must be added to make certain that moisture flows from the valley and onto the courses of roof tiles below. The following necessary steps are provided to prevent water migration under the roof panels.

1. Cut Wakaflex of equal width of the valley metal plus additional amount to allow Wakaflex to cover 1” mininum past the high barrel portion (crown) of a profiled panel on both sides.
2. With top surface facing up fold forward completely 6” one end of the Wakaflex (butyl strip side is now facing upwards) place under the lower end of the valley metal.
3. Remove the 5-1/2” strip protective release film to expose butyl, press butyl strip firmly onto the bottom side of valley metal. This will prevent any windblown moisture under the valley metal.
4. Form the other portion of Wakaflex on top of the panel, remove the protective release film and form Wakaflex to top side of profile panel ensuring a complete bond.

Wakaflex should be painted or stone coated to match the panel color.

PIPE FLASHING - SANDWICH METHOD

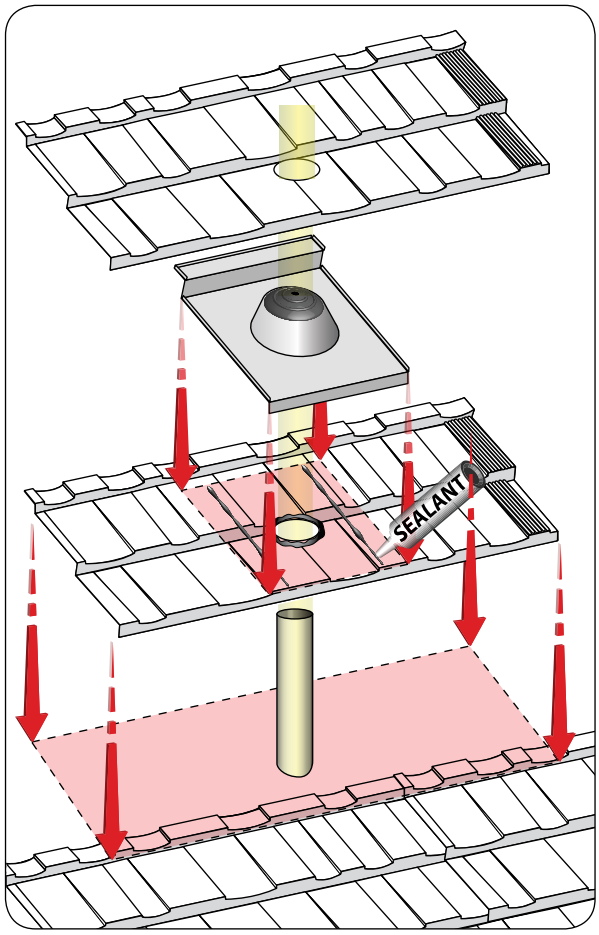
All profiles shown in these instructions allow the panels to nest on top of each other. The Pipe-Jack flashing can be "Sandwiched" between 2 panels providing a weather tight detail around pipe penetrations.

Cut a pipe sized hole in the base panel. Install base panel and apply a bead of sealant on each side and around the hole of the pipe, as shown.

Slide the Pipe-Jack flashing over the pipe and seat it into the sealant.

Conform the Pipe-Jack flashing to the panel contours. If needed fold-up the back and nose portion of the Pipe-Jack, as shown below.

Fasten the Pipe-Sleeve through the back of the sleeve into the pipe. Make sure to fasten at least 2" above the Pipe-Jack Cone.



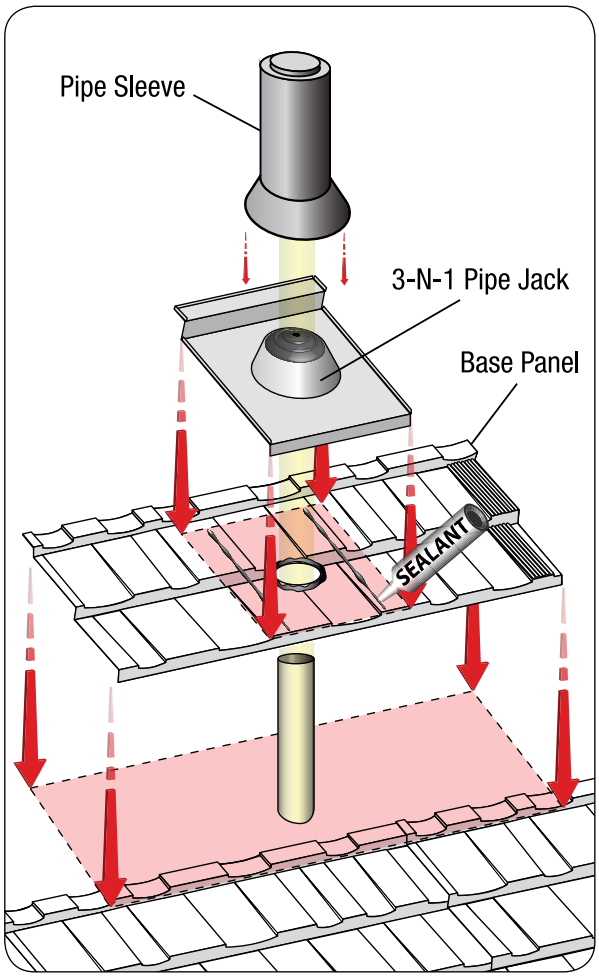
PIPE FLASHING - STANDARD METHOD

Cut a pipe sized hole in the base panel. Install base panel and apply a bead of sealant on each side and around the hole of the pipe, as shown.

Slide the Pipe-Jack flashing over the pipe and seat it into the sealant.

Conform the Pipe-Jack Flashing to the panel contours, as shown below.

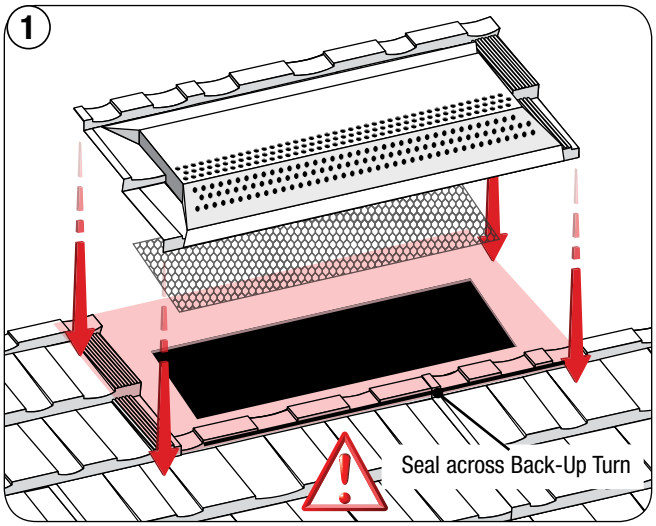
Fasten Pipe Sleeve with screws through the back of the sleeve into the pipe. DO NOT fasten into the raised Pipe-Jack cone base.

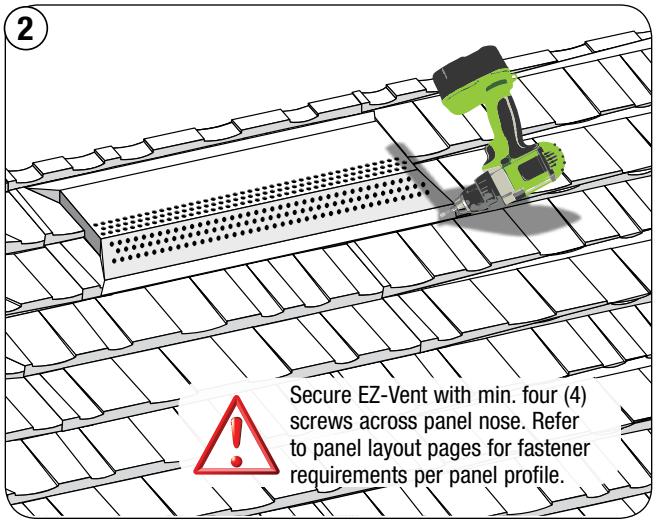


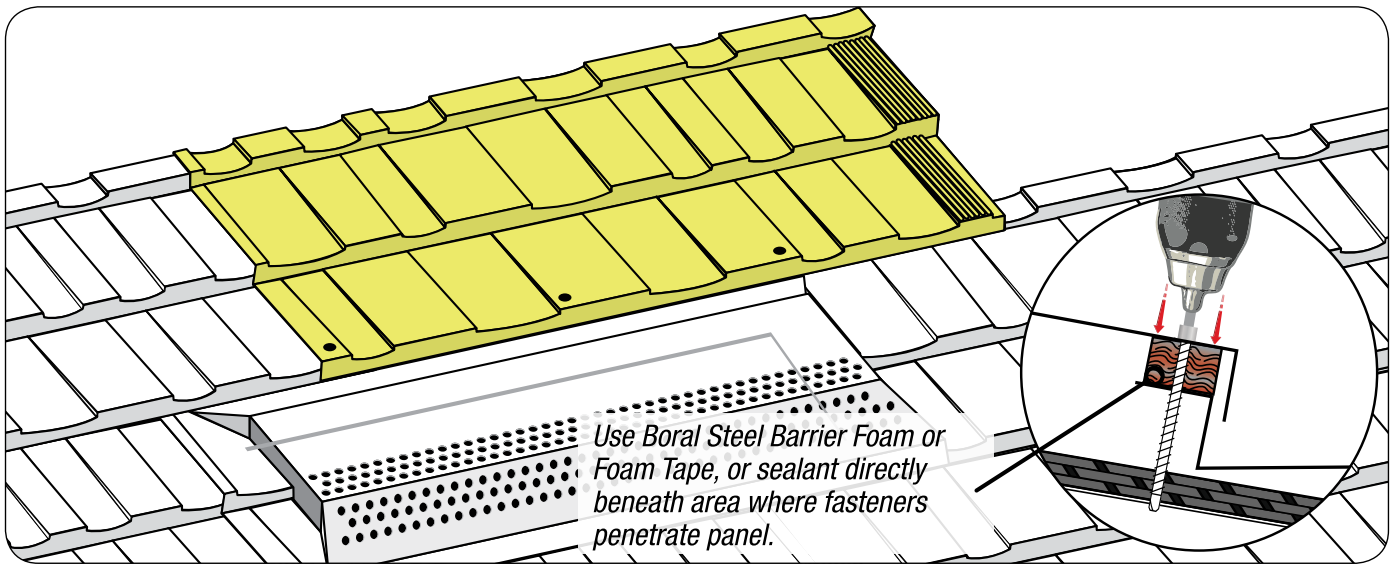
Dissimilar Metals
To avoid adverse corrosion effects caused by dissimilar metals, COPPER and LEAD flashings should not be used with Boral Steel products and accessories.

EZ-VENT All Profiles (Cottage Vent Shown)

Boral Steel EZ-Vents are used in place of regular panels on the first full course down from the ridge where ventilation is required. The vents are installed similar to panels after cutting a ventilation hole in the roof deck (approximately 8” x 30”). A Boral Steel COTTAGE Shingle EZ-Vent provides approximately 82 sq. inches of Net Free Vent Area (NFVA). Care should be taken to adequately ventilate the building. Check with the local codes for correct Net Free Vent Area required for attic ventilation.

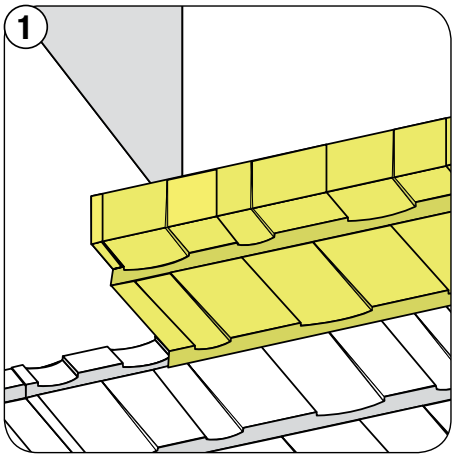




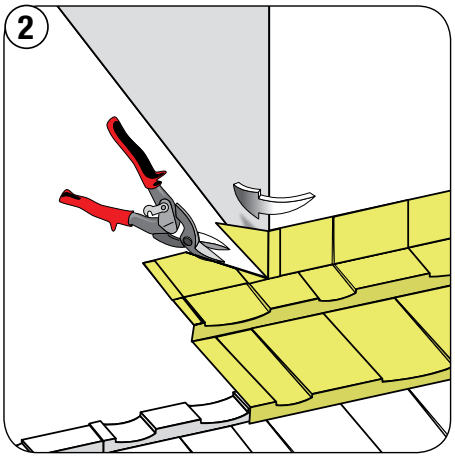


Top panel fastening is acceptable behind Boral Steel EZ-Vents, Chimney’s & Skylights as long as they are positioned out of the main water channels on the high ribs of the panel. Fasteners should be covered with material from a Boral Steel Touch-Up Kit.

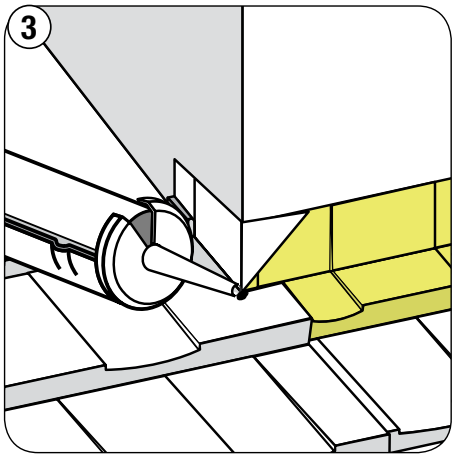
CHIMNEY / SKYLIGHT All Profiles (COTTAGE Shingle Shown)



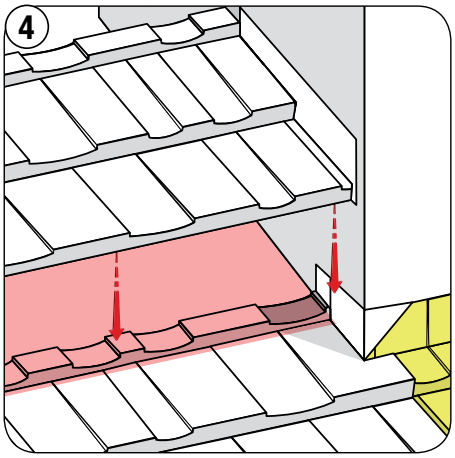
Measure, cut, and fold up panel 2” min. from the back of the panel to the front of protrusion.



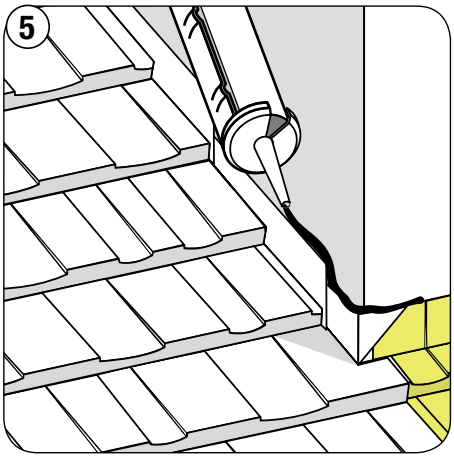
Cut a 45 degree angle as shown and fold tabs around protrusion.



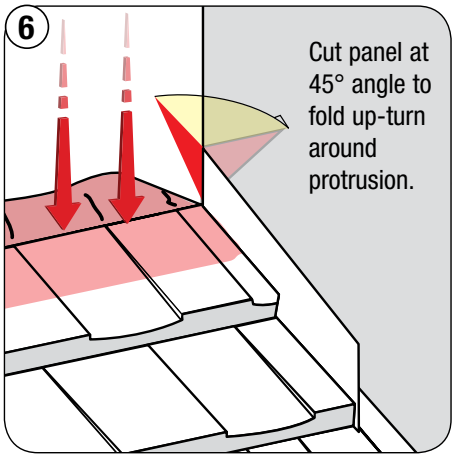
Cut and fold up panels 2” at sides of protrusion. Seal corner laps as shown.



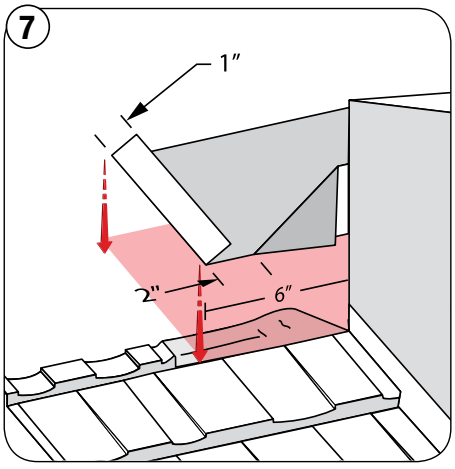
Install subsequent panels with a 2” bend up against the protrusion.



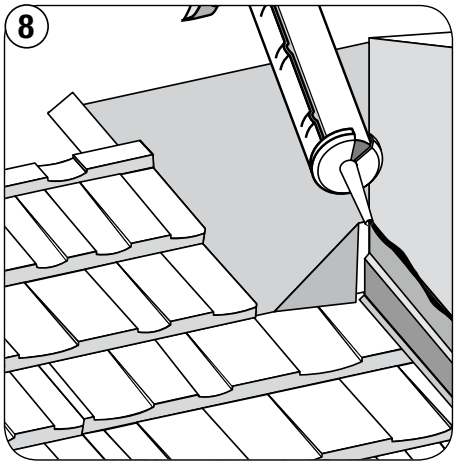
Seal around perimeter of folded panels prior to fastening to the protrusion.



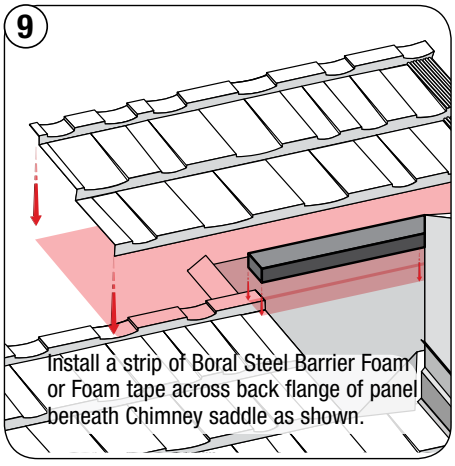
Flatten the back flange of the panel intersecting the top of the protrusion.



Install chimney saddle metal at back of chimney as shown. Extend saddle metal a minimum of 4” past each side of protrusion. Wakaflex® may be used as an option to form a chimney saddle around roof protrusions.



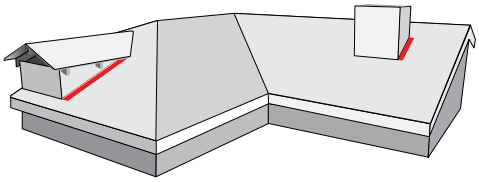
Install and seal Z-Bar flashing metal over folded sections as shown.



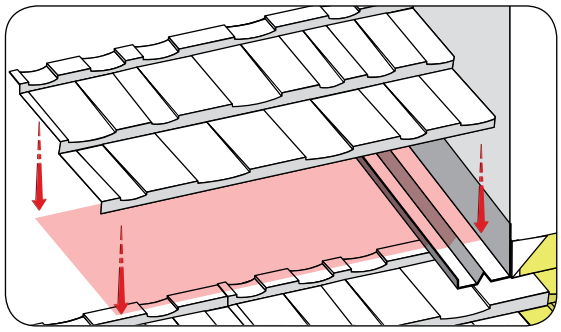
For added protection install a foam weather block under the panel overlapping the saddle.

Always start from the bottom of the item being flashed to ensure correct weather protection.

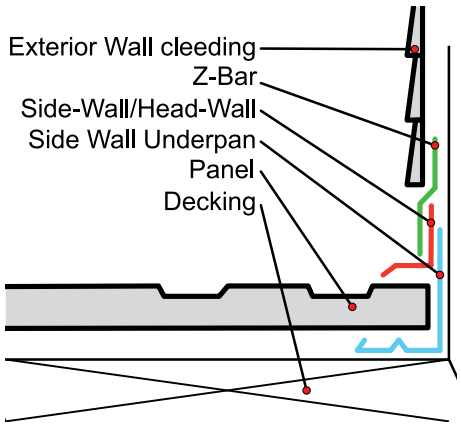
SIDE-WALL UNDER-PAN METAL All Profiles (COTTAGE Shingle Shown)



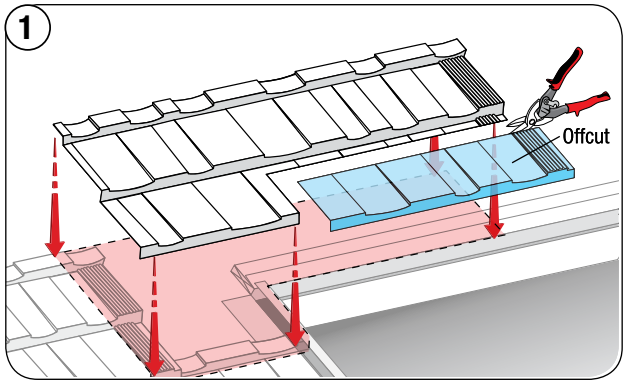
An alternative to folding panels up against sloped side walls is to use Underpan metal installed next to the wall and behind an existing wall flashing. Boral Steel Counter-Flashing metal or standard Z-Bar metal can be utilized to assist with weatherproofing where the wall flashing metal is needed.



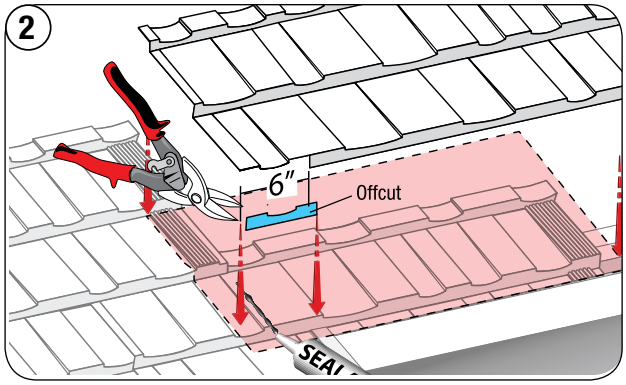
Cut out or fold-up nose of panel where Underpan metal exits onto lower panels. This allows water flow to exit the side-wall Underpan and onto the roof panels below.



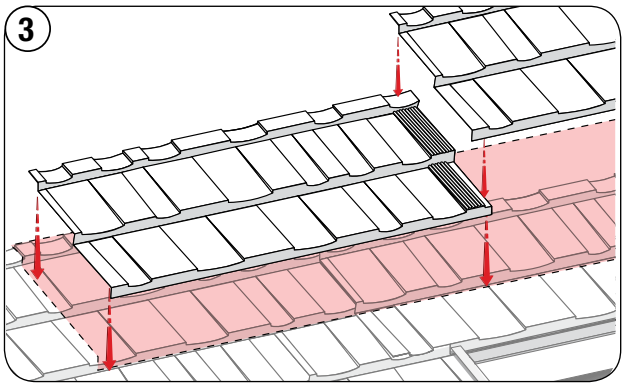
SHORT COURSE DETAIL All Profiles (COTTAGE Shingle Shown)



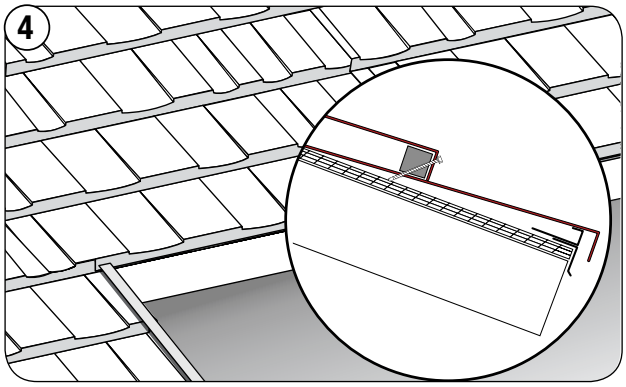
Cut the overhanging portion of the panel where it intersects with the stepped fascia as shown.



Lap the first cut-panel with a new full panel and cut/remove the section and seal as shown.

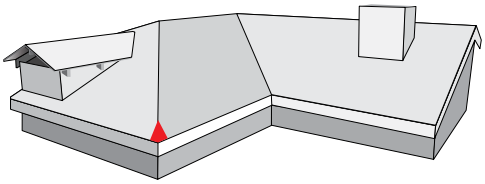


Apply either a bead of sealant, Barrier Foam or Foam Tape along the top surface of the under panel. Then install additional full panels half-lapping onto lower panel as shown.

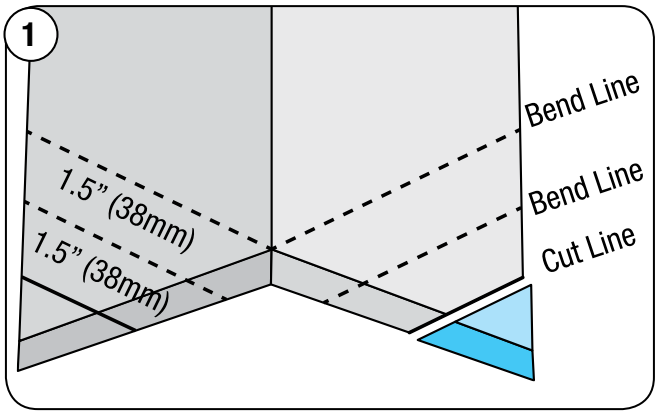


Finished short course detail with all parts in place.

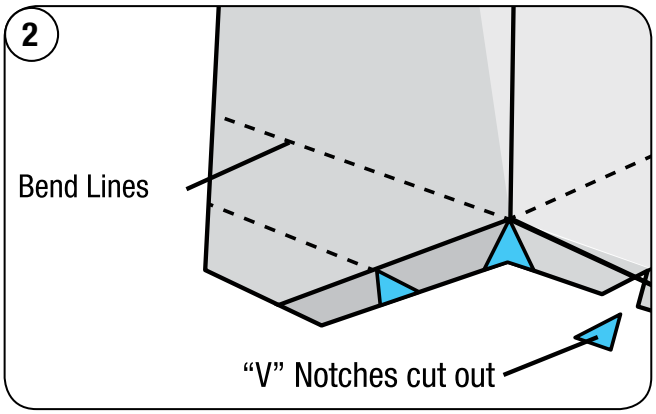
HIP STARTER Cap Cottage Shown



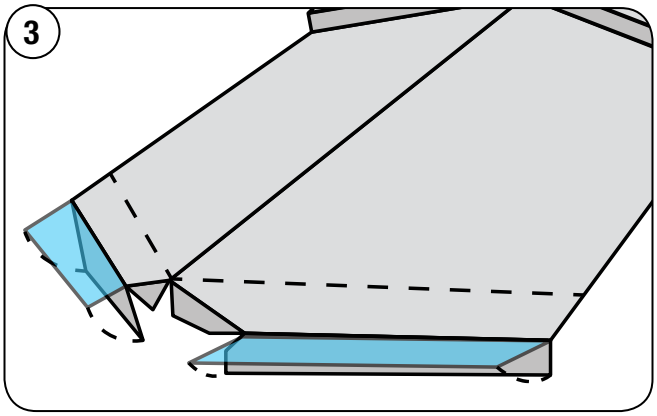
After all field panels, hip / ridge cut panels and rake cut sections are installed, the final step is to install trim caps. For Cap Cottage or Cap Shingle (2-Course) a hip starter is used at the hip / fascia corner. See steps 1-4 below and 1-3 on Page 24.



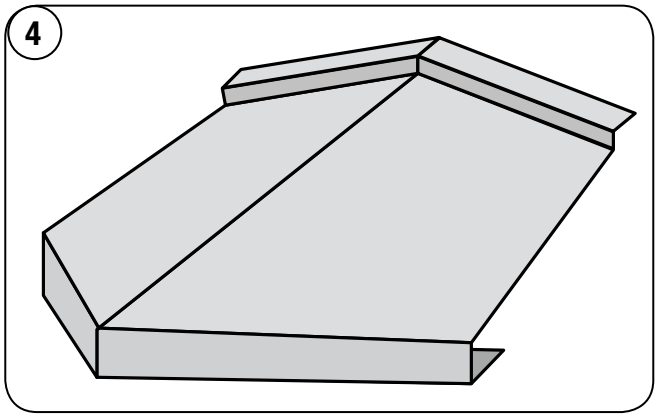
Mark cap as shown at center point. mark lines with 1.5” (38 mm) of spacing.



Cut & notch as shown.

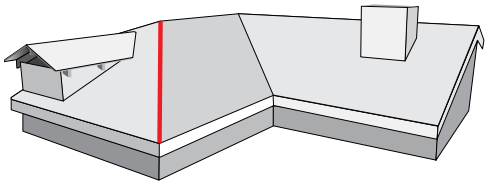


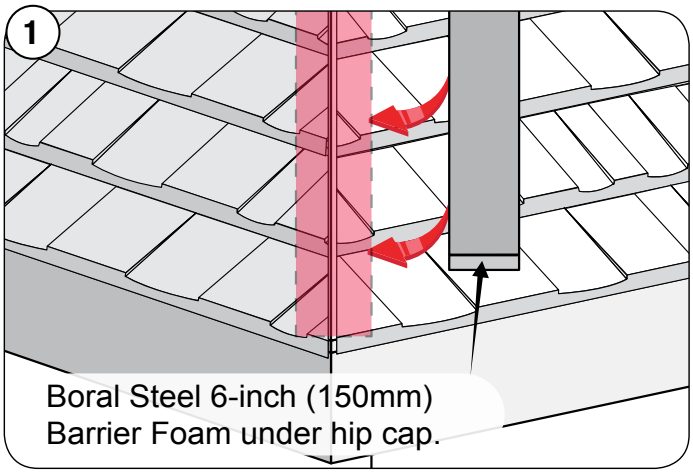
Fold cap at the first bend line.



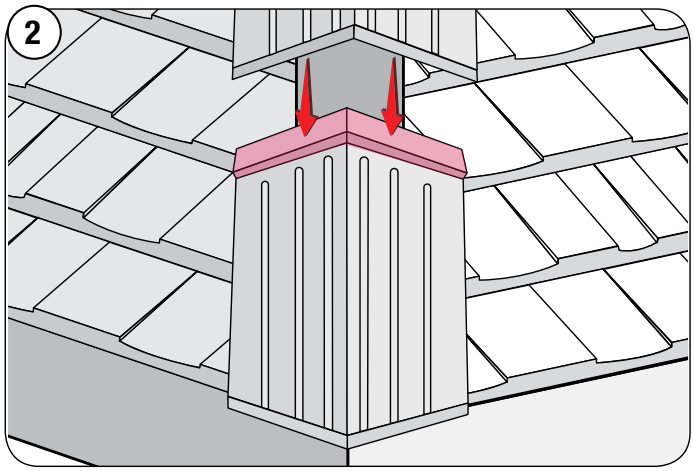
Fold Cap at the second bend line.

HIP CUT PANELS / TRIM CAPS Cap Cottage Shown

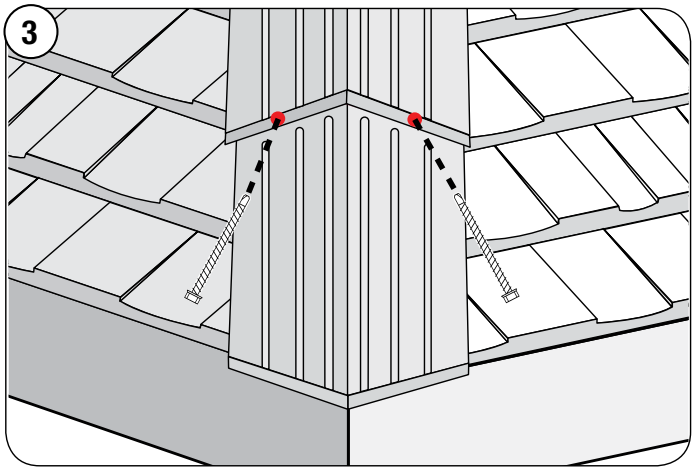




After cutting and installing panels to the Hip center-line, and creating a Hip Starter piece, apply Barrier Foam Roll (6” x 1” x 240”) or butyl tape down center of hip, making sure the tape is seated on the panel surface at each panel course step.



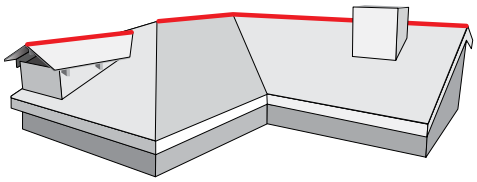
Position the Starter Cap at the fascia trimming the end to form a 3-D shape (Refer to hip starter cap detail Step 4 on page 21.)



Fit and fasten each cap through the nose 2.5” (64 mm) from the outside edge of the cap.

Follow this procedure with each cap up the hip to ridge intersection.

RIDGE TRIM CAPS - BARRIER FOAM All Profiles (COTTAGE Shingle Shown)

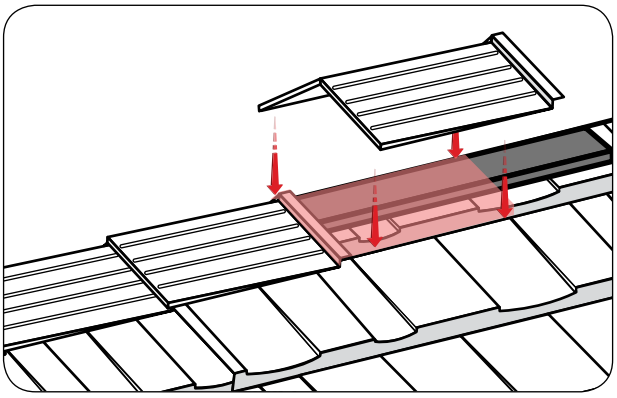


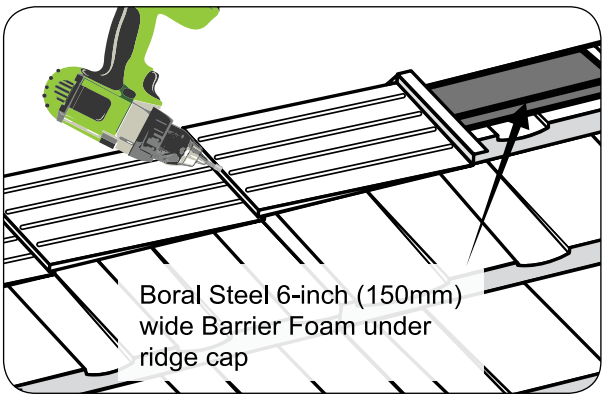
NO RIDGE VENT

After cutting and installing panels to the ridge center-line, apply Barrier Foam Roll (6” x 1” x 240”) down center of ridge or butyl tape down the center-line, making sure the tape is seated on the panel surface.

Install Ridge Trim Caps starting at the rake edge, trimming the end to form a 3-D shape (Refer to starter cap detail), then fit and fasten each cap through the nose 2.5" from the outside edge of the cap.

Follow this procedure with each cap across the ridge to the center-line, then repeat from the other end of the ridge to meet in the middle for a finished effect.





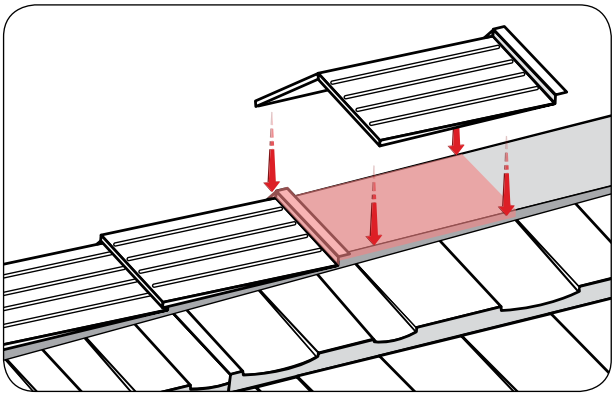
RIDGE TRIP CAPS - CONTINUOUS RIDGE VENTING All Profiles (COTTAGE Shingle Shown)

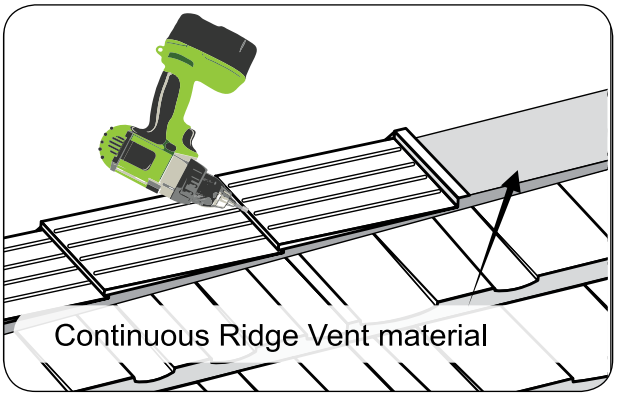
CONTINUOUS RIDGE VENTING

After cutting and installing panels to Ridge sheathing edge, apply Boral Steel Barrier Foam or Foam Tape down either side or sealant. Install the Continuous Ridge Vent material (Standard 11.5” wide) and press into the foam/sealant and fasten in place.

Position the starter cap at the rake, trimming the end to form a 3-D shape (Refer to starter cap detail), then fit and fasten each cap through the nose 2.5" (64 mm) from the outside edge of the cap.

Follow this procedure with each cap across the ridge to the center-line, then repeat from the other end of the ridge to meet in the middle for a finished effect.





Cap fasteners to be 2.5” (64 mm) in from the outside edge of the cap and installed through the nose of each cap, through the foam/sealant/continuous Ridge Vent beneath & into the roof deck.

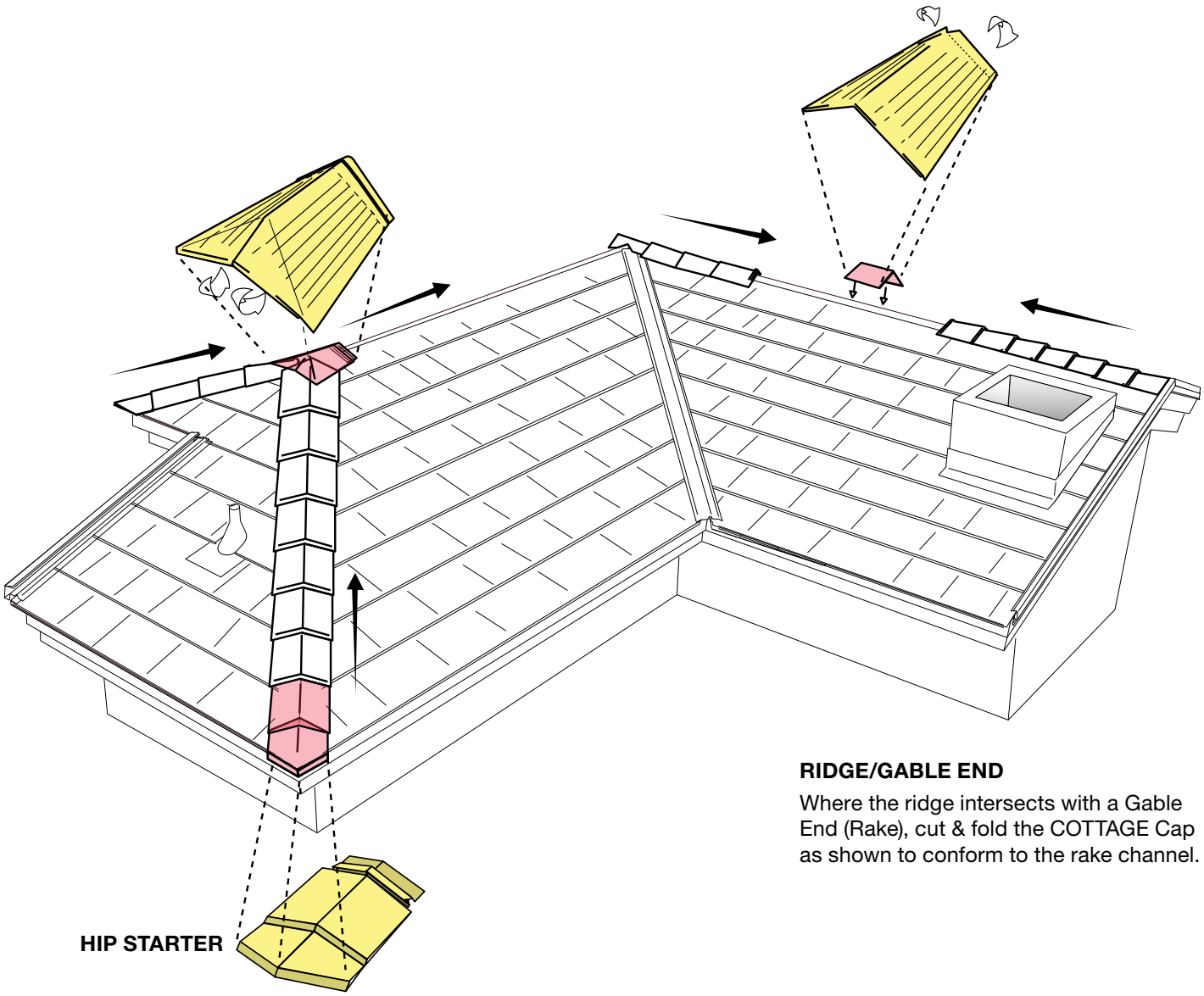
INSTALLING TRIM CAPS - HIP & RIDGE All Profiles (Cap Cottage Shown)

HIP/RIDGE INTERSECTION

Install Hip Caps from the bottom using 2 fasteners per Trim Cap. Overlap Trim Caps at hip/ridge intersection. Cut and fit the Ridge Cap over both intersecting Hip Caps as shown.

RIDGE CENTER CAP

At the center of a ridge line, a small/short Ridge Cap as shown can be made from a full Boral Steel Trim Cap and installed in the ridge center.



HIP STARTER

RIDGE/GABLE END

Where the ridge intersects with a Gable End (Rake), cut & fold the COTTAGE Cap as shown to conform to the rake channel.

Barrier Foam Roll material is designed for use on both the Hip & Ridge to provide a weather barrier between the panel and the Trim Caps being used.

After installing Trim Caps at intersections, seal cut edges and apply Boral Steel basecoat and stone chip to provide a complete stone coat finish.

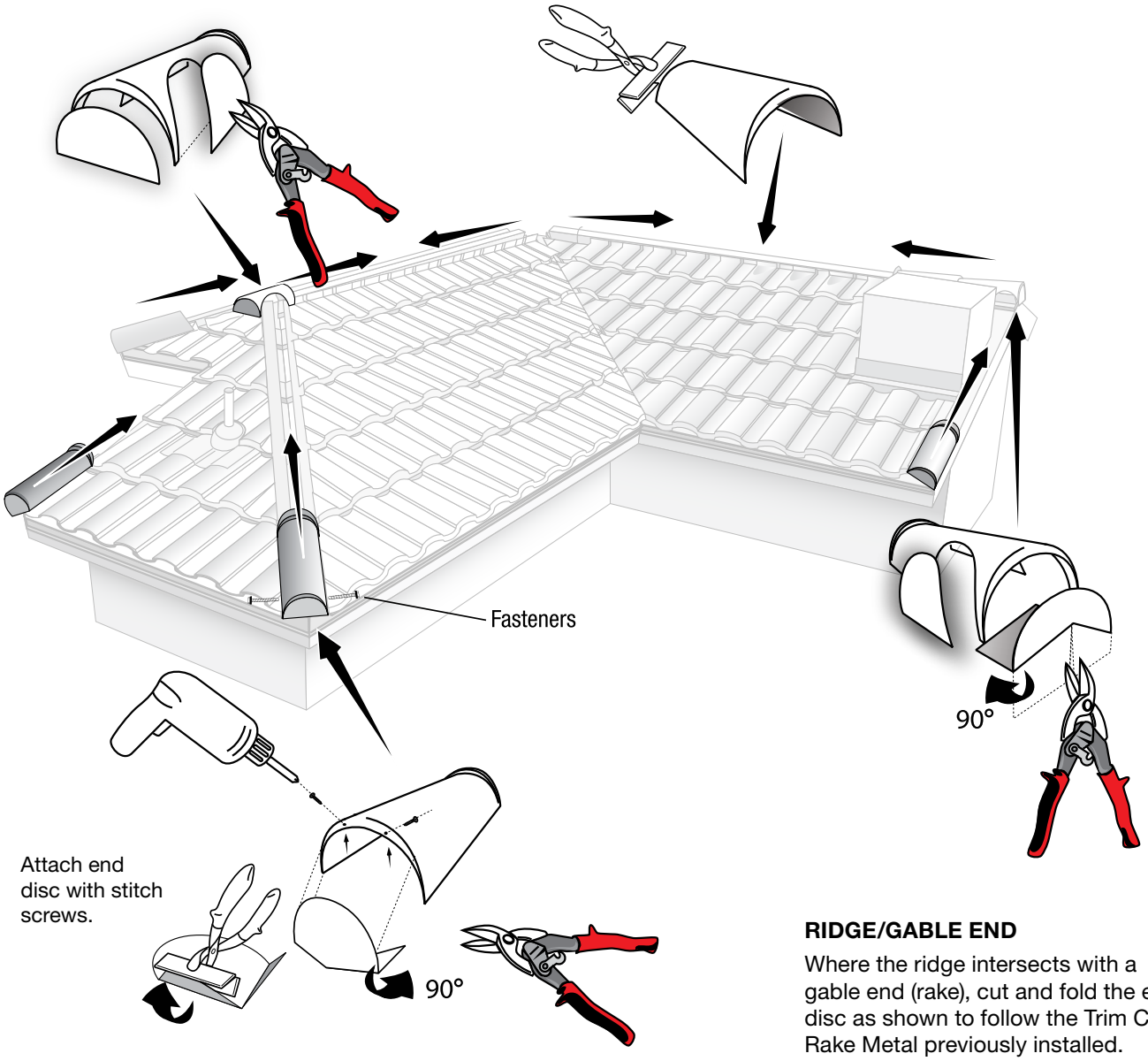
INSTALLING TRIM CAPS - HIP, RIDGE & RAKE – Cap Mission (Shown) or Cap Shake

HIP/RIDGE INTERSECTION

Install hip caps from the bottom using 2 fasteners per trim cap. Overlap trim caps at hip/ridge intersection. Cut and fit the ridge cap over both intersecting hip caps as shown.

RIDGE CENTER CAP

At the center of a ridge line, a small/short ridge cap, as shown, can be made where cap pieces arrive from different directions.



RIDGE/GABLE END

Where the ridge intersects with a gable end (rake), cut and fold the end disc as shown to follow the Trim Cap Rake Metal previously installed.

HIP CORNER

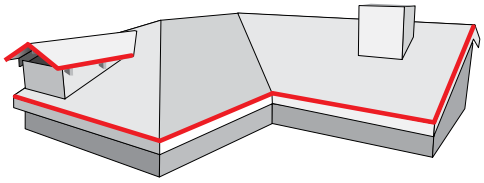
Notch & fold the end disc as shown to form a closed 3-dimensional end cap. Fit end disc to bottom hip corner with stitch screws and install balance of trim caps up the hip. Fasten each cap on either side of hip boards.

After installing cap at intersections, seal cut edges and apply Boral Steel basecoat & stone chip to provide a complete stone coat finish.

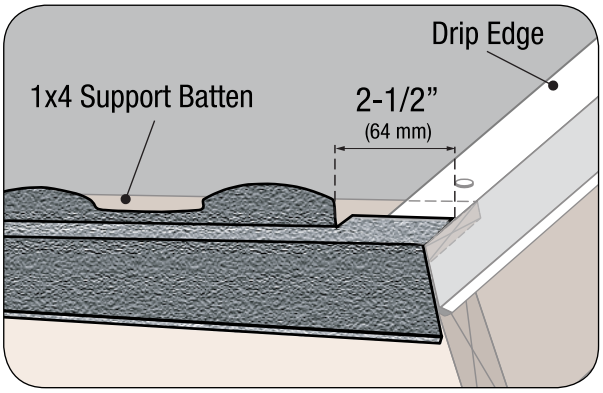
NOTES

BARREL-VAULT Tile & OPTIONAL Installation Techniques

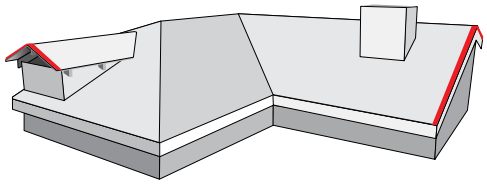
BIRD-STOP RISER If using BARREL-VAULT Tile



Install the BARREL-VAULT Tile Bird-Stop Riser across the fascia on top of a 1x4 Support Batten. The positioning is critical as this part will dictate panel layout across the roof, as the panels follow the scalloped profile of the Bird-Stop.



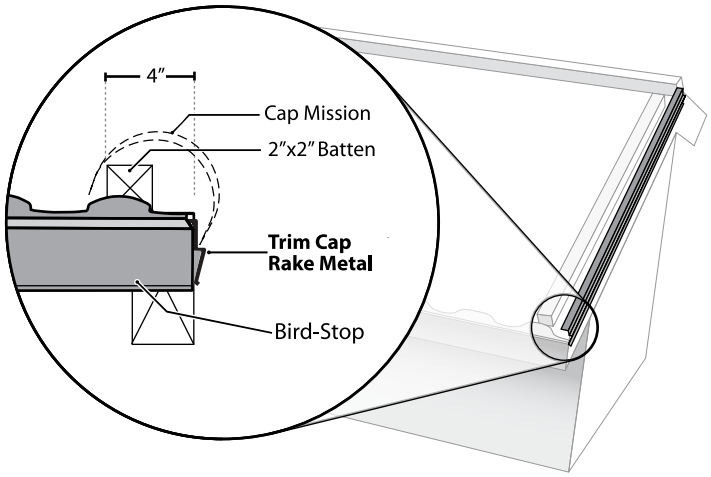
TRIM CAP RAKE METAL If using Trim Caps on the Rake Edges (Optional) OPTIONAL

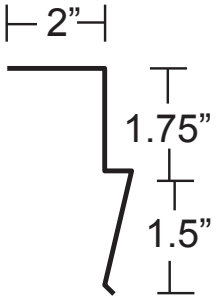


Boral Steel Trim Cap Rake Metal is installed along the rake edges as shown. This metal edging aids in positioning Boral Steel Trim Caps.

Tile Rake metal is placed on the wood build-up.

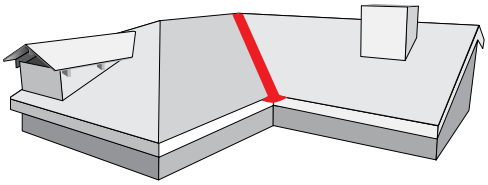
The Boral Steel Trim Caps cover Battens and folded up Boral Steel panel.





2" x 1-3/4" x 1-1/2" Trim-Cap Rake Metal

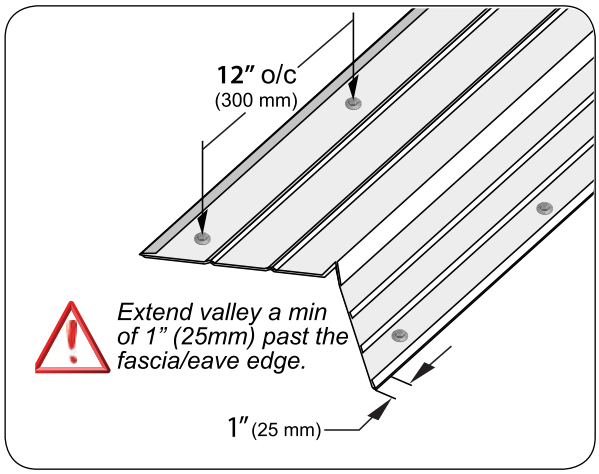
VALLEY FIVE 'V' - CLOSED OR OPEN All Profiles (Optional) OPTIONAL

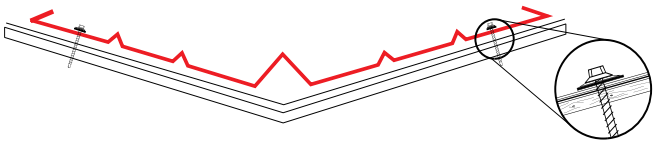


Use when extensive debris from surrounding trees (especially pine trees) are encountered.

Install new Valley Five 'V' metal overlapping a minimum of 4" (100 mm). Valleys are attached with washer & grommet screws in the outside locations as shown. Site fabricated clips may also be used to secure valley metal.

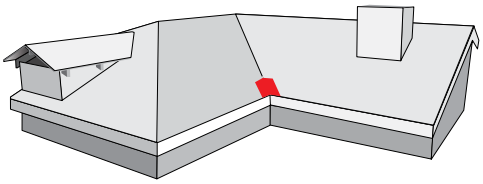
This valley metal allows for either an 'Open' or 'Closed' valley detail.

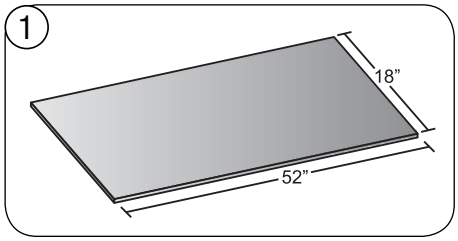




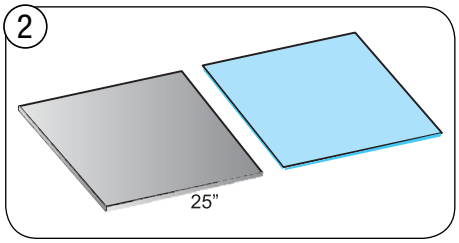
OPEN Valleys (min. 6 inches) between each side of the Boral Steel panels are recommended for areas where trees or others debris may block the valley. This detail facilitates easier periodic cleaning of the valley pans.

FASCIA VALLEY EXIT (Optional - All Profiles) OPTIONAL

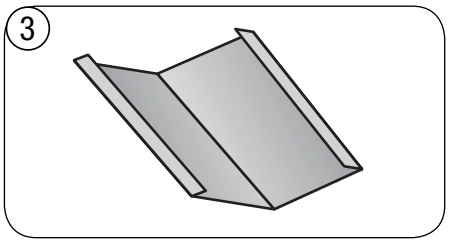




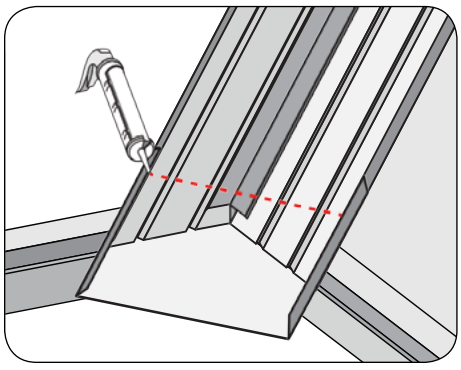
Use Flat Sheet.



Cut in half to approximately 25".



Hem both sides of the folded Flat Sheet as shown to fit around outside edges of valley.

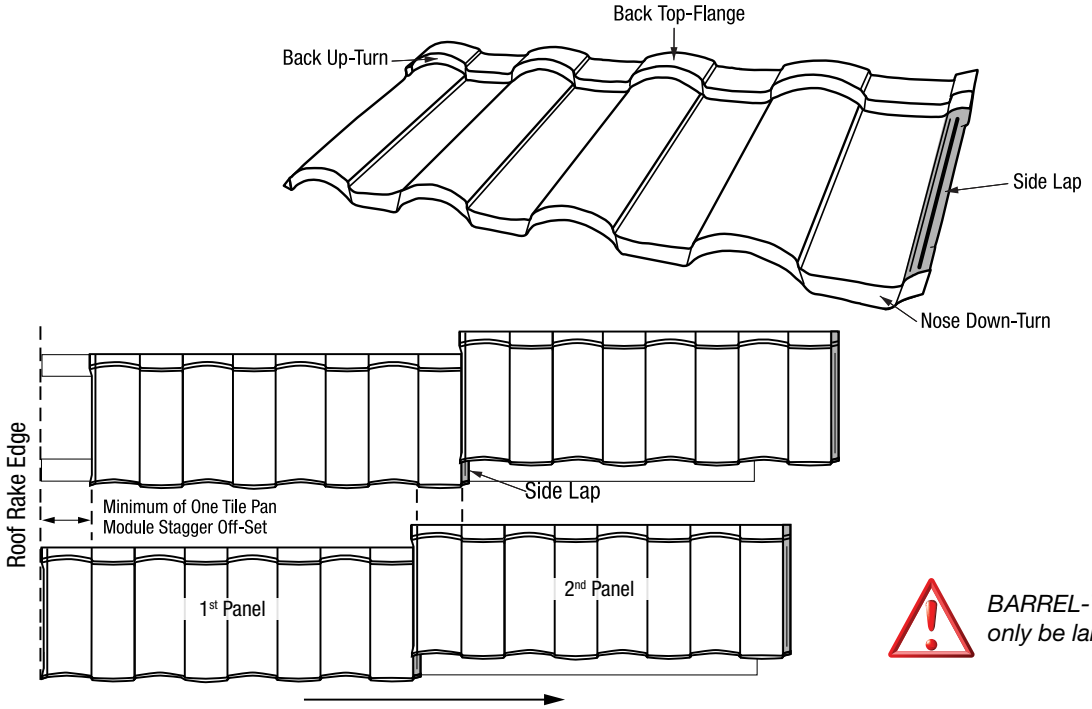


Apply a bead of sealant atop the Flat Sheet and seat the Valley Metal as shown.

Flat Sheet may me left straight or cut and folded into a "V" at the fascia.

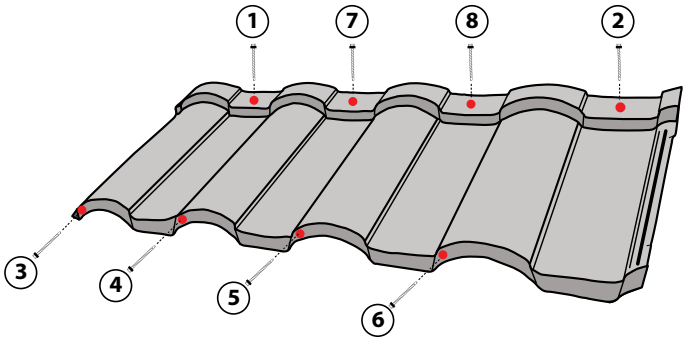
PANEL LAYOUT - BARREL-VAULT Tile

BARREL-VAULT Tile panels have a 9/16" (14 mm) side-lap and can be staggered by one or multiple concave/convex modules across the panel as needed. The panels are designed to be installed on battens or Direct-to-Deck (direct-to-the-roof-deck) in a staggered pattern and they **CANNOT be straight laid.**



BARREL-VAULT Tile panels can only be laid LEFT to RIGHT

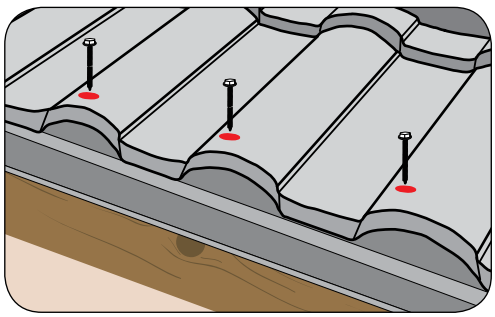
FASTENING SEQUENCE



The fastening pattern for BARREL-VAULT Tile uses four (4) fasteners across the front nose down-turn and four (4) across the back up-turn of each panel.

FASTENING SEQUENCE shown is applicable to any location and ensures the panels stay correctly aligned.

1ST ROW FASTENING

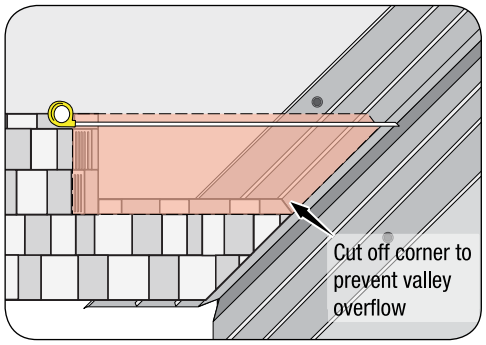


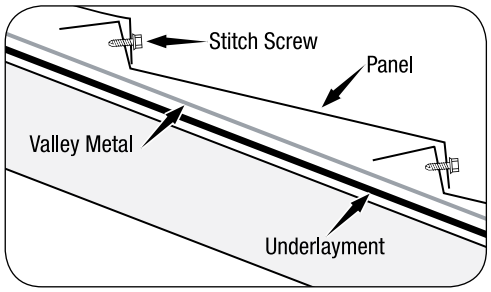
Fasten the bottom row panels through the top of the panel as shown, out of the main water channel of the panel. Top panel fastening is acceptable behind Boral Steel EZ-Vents and chimney/skylight details, as necessary.

NOTE: Top panel fastening is also acceptable behind Boral Steel EZ-Vents and chimney/skylight details, as necessary.

Use the Touch-Up Kit to cover each top fastener.

VALLEY FIVE 'V' - PANEL SECTIONS BENT DOWN INTO VALLEY — OPTIONAL





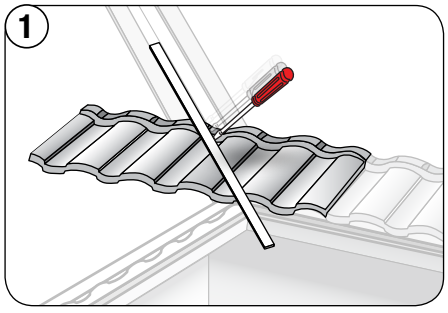
Measure, mark & cut panels to fit tightly against Valley center (reverse 'V'). Fasten valley section panels to roof decking similar to the other panels without penetrating valley flashing.

Stitch panels together that lap over Valley Metal with corrosion resistant screws (#10 x 1" long (25 mm) making sure to not penetrate valley flashing.

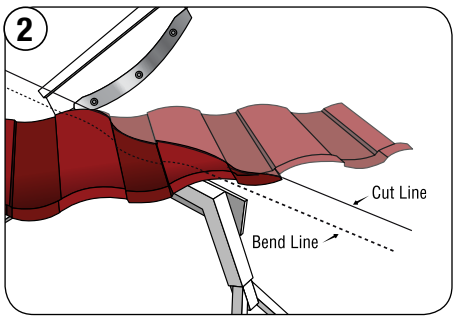
Cut off corner to prevent valley overflow.

After all valley cut sections are installed, install a Boral Steel Valley Center Cover at the center of the valley, lapping each section a minimum of 4" (100 mm).

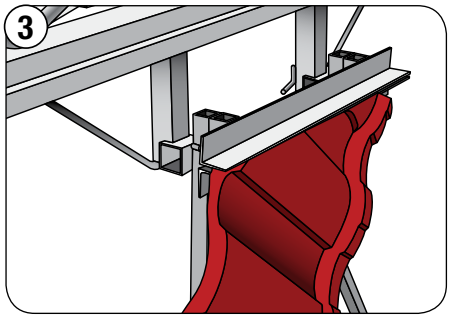
Optional with a Closed Valley:
If panel layout starts at a valley, start the 1st panel 12" (300 mm) from the valley edge. This allows the valley cut sections to be securely fastened to the roof deck without penetrating the valley pan. Make sure you Do NOT penetrate the valley pan, use small stitch screws (#8 x 1/2" long x 1/4" HWH (12 mm x 6 mm) to secure the valley cover.



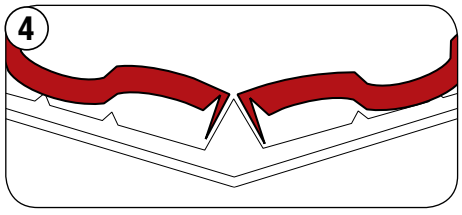
Measure, mark and cut panels to fit tightly against Valley center (reverse 'V').



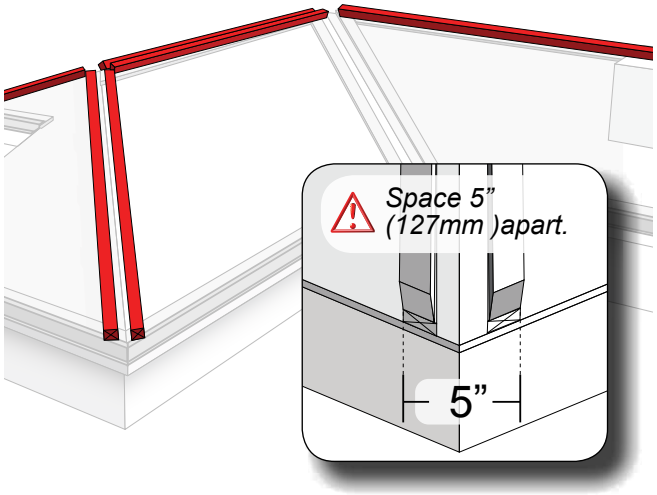
Mark the bend line 1½" in from the cut line (1" bend down when istalled Direct-to-Deck).



Bend panel down to fit into valley metal.



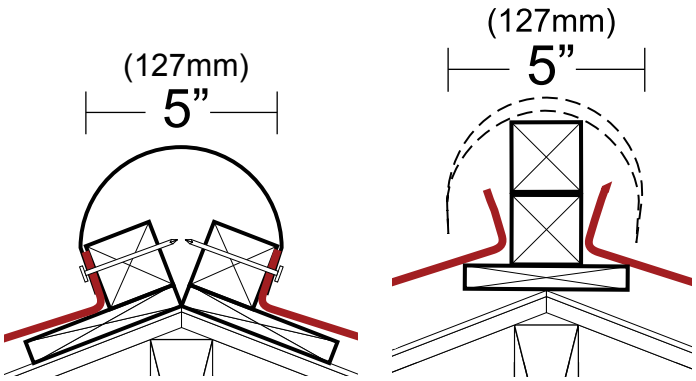
HIP & RIDGE BATTENS If using BARREL-VAULT Tile — OPTIONAL



Ridge & Hip battens can be positioned side by side, or vertically stacked as shown, using either 2x2, 1x4 or combination of both. They are used to provide approximately 1.5 inch of build-up height from hip and ridge pieces. Hip battens are installed directly on top of intersecting panel battens if used, so the panel cut sections can be fitted against the battens.

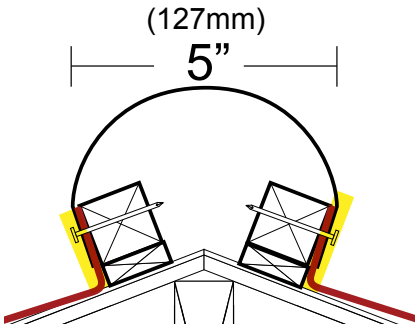
RIDGE

RIDGE SUPPORT BATTENS
Install 1x4 (25 x 100 mm) support battens and 2x2 (50 x 50 mm) ridge battens as shown. Bend of ridge panels are fastened to the 1x4 and 2x2 as shown below.

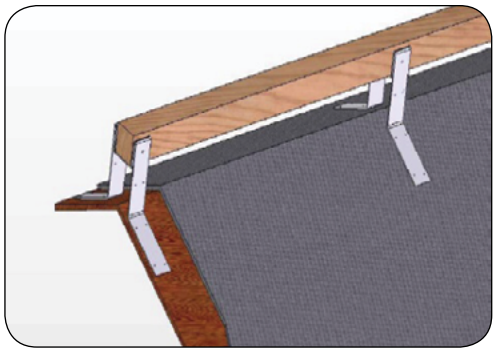


HIP

HIP SUPPORT BATTENS
Install 1x2 (25 x 50 mm) support battens to the required height as shown. The 1x2 is installed flush with the 2x2 (50 x 50 mm) hip battens, or Boral's Elevated Battens System® battens can be used. The ridge panel is fastened to the 2x2 hip battens.



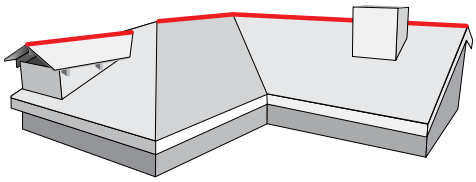
RIDGE RIZER® BRACKETS — OPTIONAL



Install Ridge Riser Brackets no greater than 24 inches apart, place a 2”x 2” wood nailer board into Ridge Riser Brackets. Fasten wood nailer to Ridge Riser Brackets with a #8 min. 3/4 inch screw or roofing nail.

Note: Florida requires Ridge Riser Brackets be no greater than 18 inches apart and fastened to the deck and 2”x 2” wood nailer with screws only.

RIDGE PANEL - BENT UP METHOD All Profiles (BARREL-VAULT Tile Shown) OPTIONAL



The following steps should be followed to ensure a weather tight installation along the ridge.

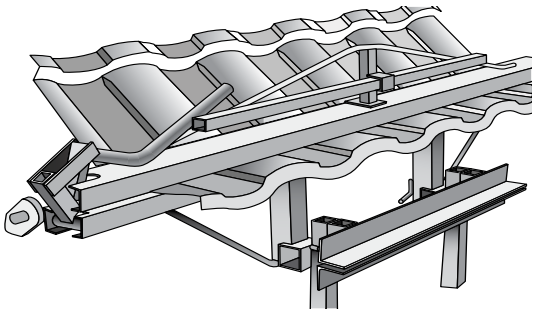
The top course of panels requires a cut and bent panel to complete the ridge line.

Bend all ridge panels using Boral Steel top bender.

1

Ridge cut line is 2” above and parallel to bend line to allow for bend up on ridge battens.

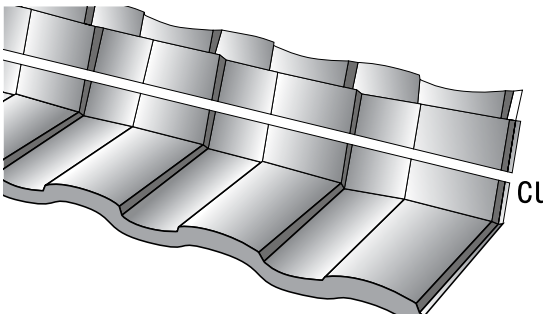
2



Always bend the ridge panels before cutting as they deform slightly in the bender. Deduct ½” from measurements. Mark both bend, and cut lines for each panel prior to cutting or bending.

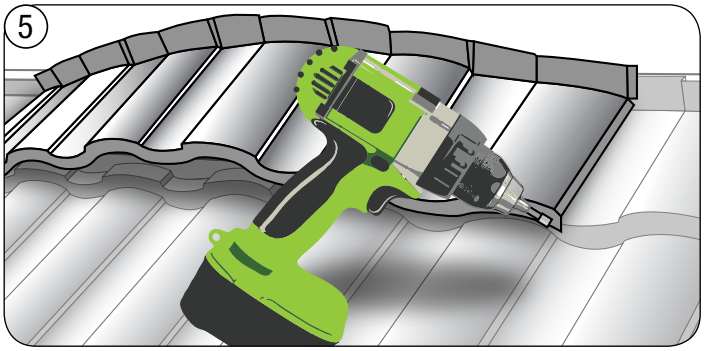
3 Indentations created through ridge panel bending process should be ‘popped out’ by using a rubber mallet on the under side of the panel.

4



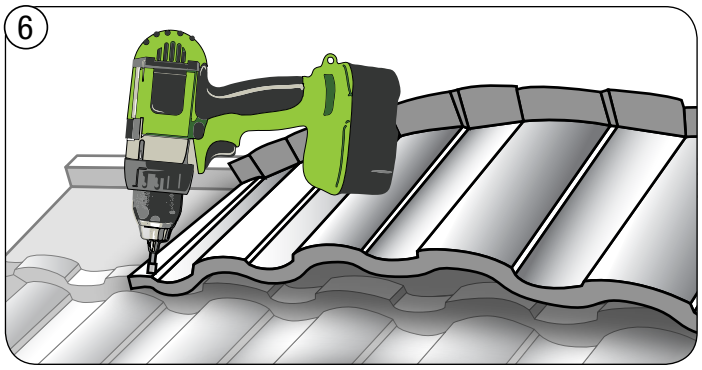
Cut panel at pre-drawn cut line.

5



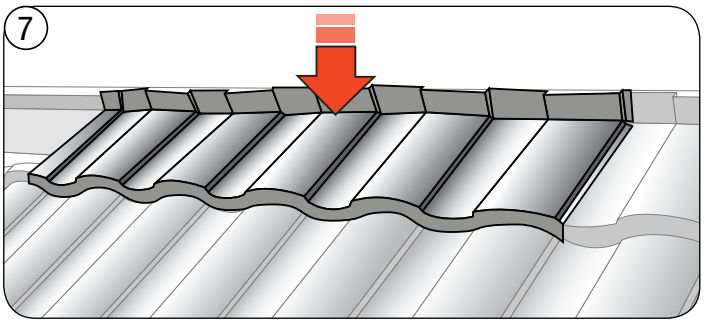
Fasten first at bottom right corner.

6



Then fasten at bottom far left corner. Panels are then pushed down to fit coursing properly.

7

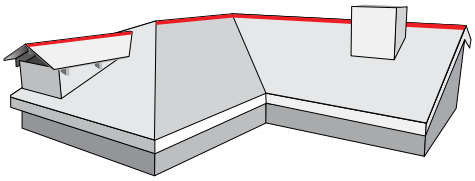


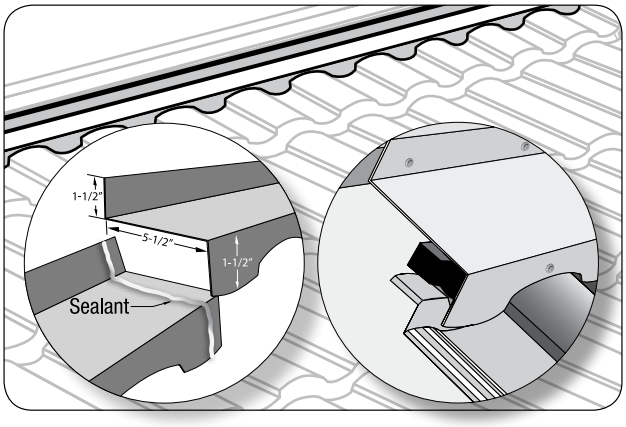
Force back of panel into position against ridge batten before fastening

8

Fasten Ridge panel using four (4) fasteners across the nose (Refer to panel layout pages).

BARREL-VAULT TOP ROW METAL — OPTIONAL





Apply a bead of Sealant between two overlapping Top Row pieces.

Top Row metal may be used to avoid bending and cutting full BARREL-VAULT Tile panels at the ridge.

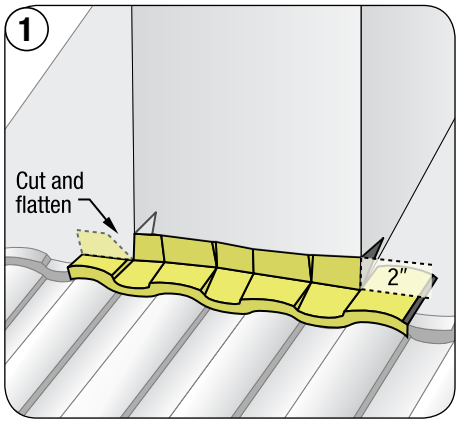
Top Row metal can also be used at the front of chimneys, skylights and head-wall areas.

A foam closure is required under the Top Row metal for wind driven rain protection.

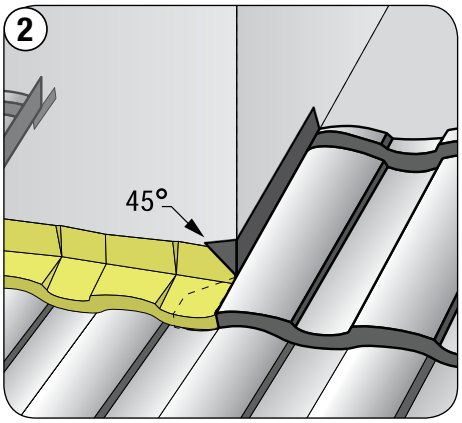
Top Row metal can also be fastened through the top but will require sealing of each fastener or use of Valley screws with a dome cap covering a rubber sealing washer. Fasten Top Row in the same pattern as the full panels.

CHIMNEY / SIDE-WALL / HEADWALL BARREL-VAULT Tile Shown — OPTIONAL

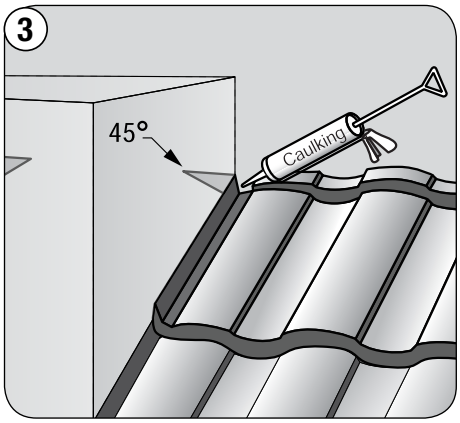
The following details apply to any square cornered protrusion through a roof.



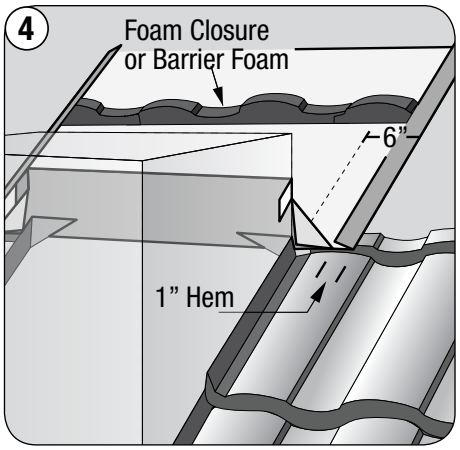
At front of chimney, measure, cut and fold up panel up 2".



Cut 45° angle and fold tabs around chimney.

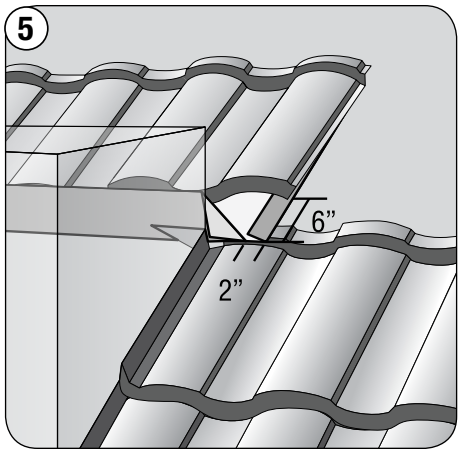


At back of chimney, seal each top corner section. Keep panel battens away from saddle as shown.

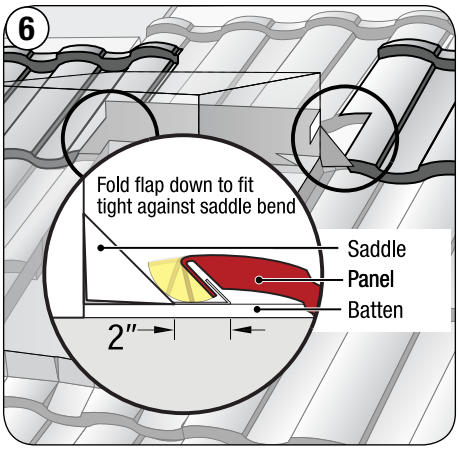


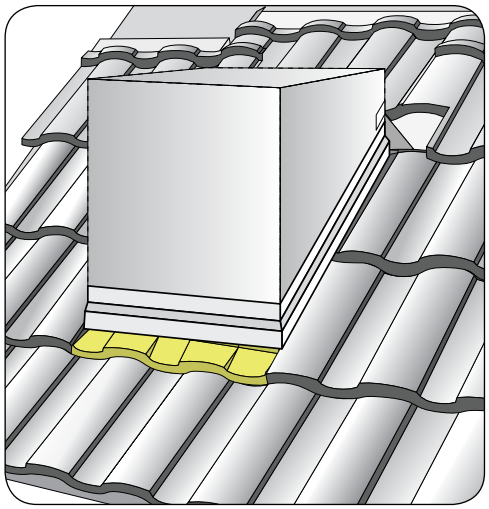
At back of chimney, install chimney saddle as shown. Extend saddle a minimum of 4" (100 mm) past each side of chimney. Hem ends 1" (25 mm) to keep water on saddle flashing.

Install a section of Foam (debris block) across the chimney saddle as shown (align with BARREL-VAULT Tile profile).



Apply a bead of sealant across Foam and 'seat' back cut-section panel onto Foam. Panels are to be fastened through front down-turn flashing, Foam and saddle into decking.

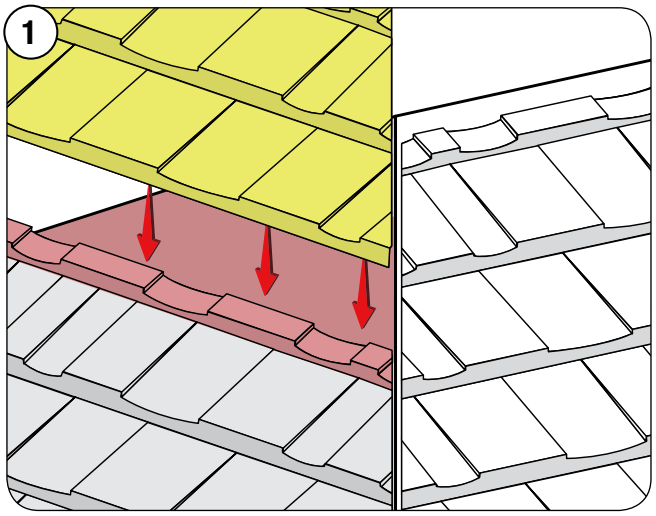




Always start from the bottom of the item being flashed to ensure correct weather protection.

Counter Flashing metal, Fascia or Z-Bar covers bent up edges of panels.

HIP & RIDGE ACCESSORY BATTENS — OPTIONAL

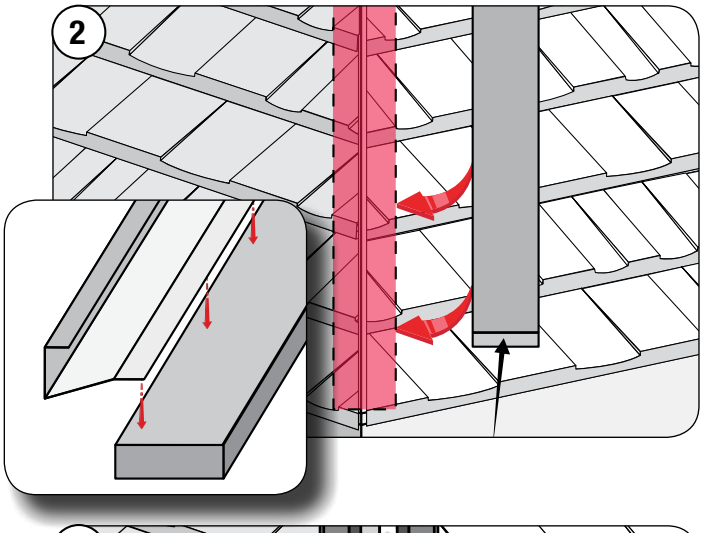


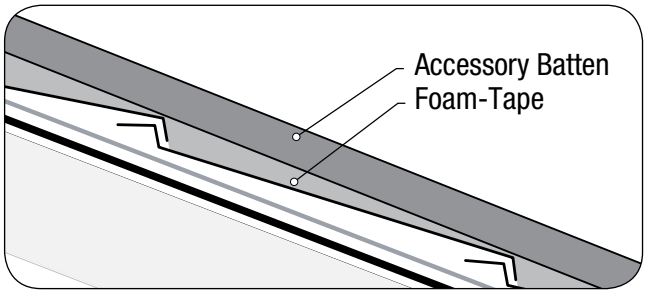
Optional accessory steel batten made from minimum 24 ga steel may be used to install caps on hips and ridges without the need to bend-up the panels. Steel battens require 2-pcs per each 10-ft length of hip or ridge. Steel accessory battens require the use of EmSeal foam tape or Barrier foam rolls under the batten.

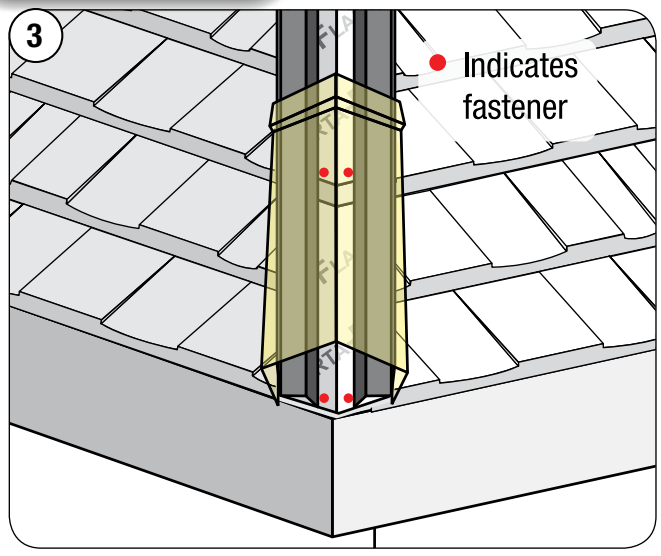
After mitering & installing panels to center-line, apply Foam tape or Barrier roll beneath the Accessory Batten and position using the Trim Cap as a guide to ensure center of Trim Cap is aligned with center of hip or ridge.

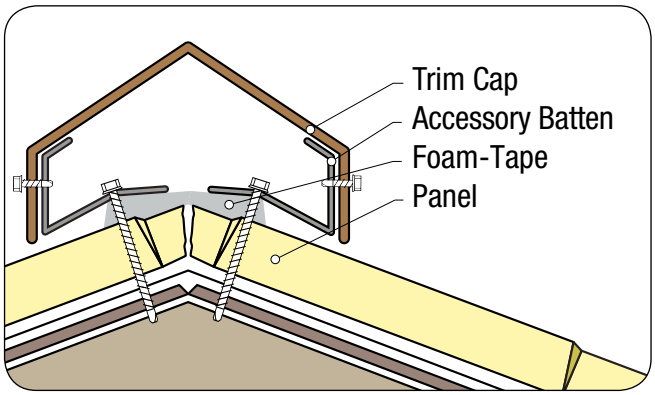
Screw batten on one side through flat section, Foam-Tape or Roll, Boral Steel panel and into the roof deck.

Use the Trim Cap to correctly position the other batten and then install the Trim Caps up the hip or across ridge.









NOTES

PINE-CREST Shake Charcoal

BORAL STEEL SERVICE CENTERS:

Mesquite, TX	Leesburg, FL	Kansas City, MO	Placentia, CA
972.216.5380	866.919.7663	816.421.4503	877.638.2576

ABOUT BORAL ROOFING

Boral Roofing LLC is a subsidiary of Boral USA and is the country's largest premium provider of complete roofing and re-roofing solutions for architects as well as commercial and residential builders. Boral Roofing operates manufacturing plants throughout the US.

ABOUT BORAL NORTH AMERICA

Headquartered in Roswell, Georgia, Boral North America is a leader in key construction materials and building products markets with operations across the USA, Canada and Mexico. In 2017 Boral acquired Headwaters Incorporated, expanding Boral's product offering and manufacturing and distribution footprint across North America. In construction materials, Boral has a national footprint and industry-leading position in the processing and distribution of fly ash – a by-product of coal combustion – as well as a Texas-based concrete block business, and Denver concrete and quarries operations.

In building products, Boral manufactures and supplies cladding, roof tiles, windows and other light building products for residential and commercial markets nationally. Boral's manufactured stone veneer includes leading brands Cultured Stone® by Boral®, Boral Versetta Stone®, Eldorado Stone, Dutch Quality Stone and StoneCraft. Boral's light building products portfolio includes Boral TruExterior® Siding & Trim – a pioneer of the innovative poly-ash category of exterior building products – as well as shutters, gable vents, mounting blocks and tool systems. In roofing, Boral is a leading manufacturer of clay and concrete roof tiles, and also produces composite polymer and stone coated metal roof tiles.

Boral also has a 50% share of the Meridian Brick joint venture, a leading clay and concrete brick manufacturer which was formed with Forterra Brick in 2016.