

BORAL ROOFING
Build something great™



Monterey™ Shake & Slate

CLAY ROOF TILES INSTALLATION GUIDE



IMPORTANT NOTICE:

Boral Roofing will issue publications containing recommendations for the installation of its products from time to time. These are recommendations for the proper installation of Monterey™ Shake and Slate.

GOVERNING CODE BODIES:

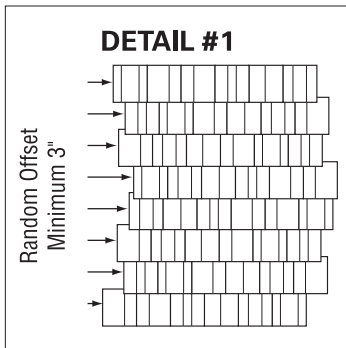
Information contained herein is based on values and practices consistent with provisions of the International Building Code (IBC). Criteria established by the International Code Council (ICC) are the basis for Boral Roofing LLC product approvals.

DISCLAIMER:

The installation recommendations provided in this guide are being furnished as general information to the users of Boral Roofing LLC products. Boral Roofing LLC is a manufacturer of clay and concrete roofing tiles. The installation of the roofing tiles is the responsibility of the roofing contractor and must be performed in accordance with prevailing building code requirements. In some instances, a licensed engineer must also approve the roofing design and/or installation. Accordingly, Boral Roofing LLC makes no representations or warranties of any type regarding (i) the effectiveness of any particular method of installation (ii) the accuracy of the information contained herein or (iii) the suitability of its materials for any particular application. These recommendations are not to be used in lieu of reliance upon the expertise of a roofing contractor or an engineer, if applicable, or in lieu of following the prevailing building code rules and regulations that are applicable in your geographic location.

GENERAL:

Monterey™ Shake and Slate have several different surface patterns and it is suggested that they be applied randomly with a broken-bond and a minimum 3" offset (see detail #1) between the sidelaps of adjacent courses. Sidelaps in alternate courses shall not be in direct alignment.



Due to the irregular shape of the nose edge of this tile, a maximum 11½" exposure is allowed to maintain a minimum 2¼" headlap.

PITCH SPECIFICATIONS:

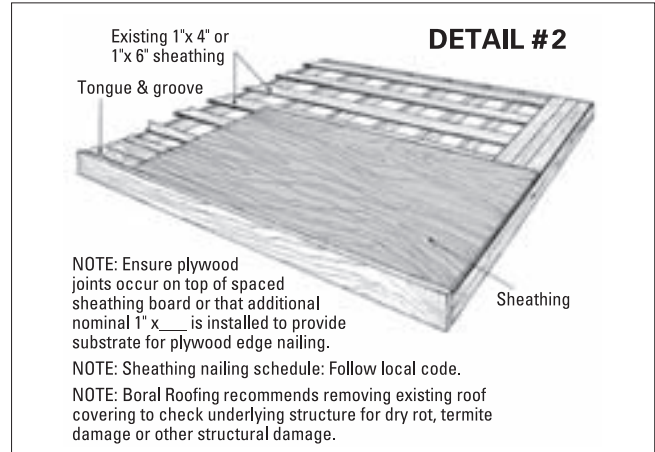
Monterey™ Shake and Slate tiles must be installed on a minimum roof slope of 4:12 (33 percent) when installed with one layer of underlayment or on a minimum roof slope of 3:12 (25 percent) when installed over solid sheathing with two layers of underlayment.

SHEATHING:

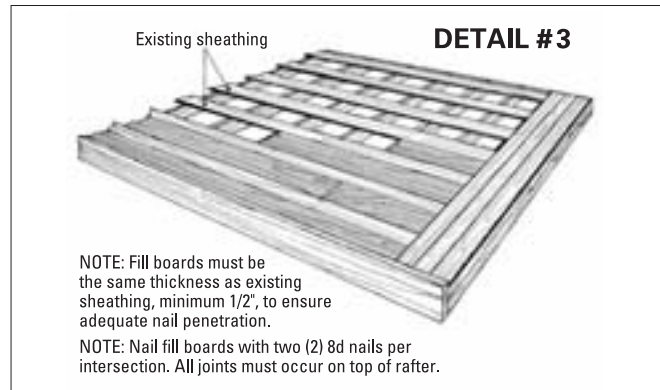
The roof sheathing and roof framing system must be designed for the appropriate loads determined in accordance with the applicable code, subject to the approval of the code official. Sheathing must be adequate to support the loads involved, but not less than 7/16 inch oriented strand board or 15/32 inch thick wood structural panels. Nailing of substrate must be done in accordance with the IBC and IRC or local codes, as applicable.

When reroofing wood shake/shingle roofs, existing shakes/shingles shall be removed. Solid sheathing can then be accomplished in one of two ways:

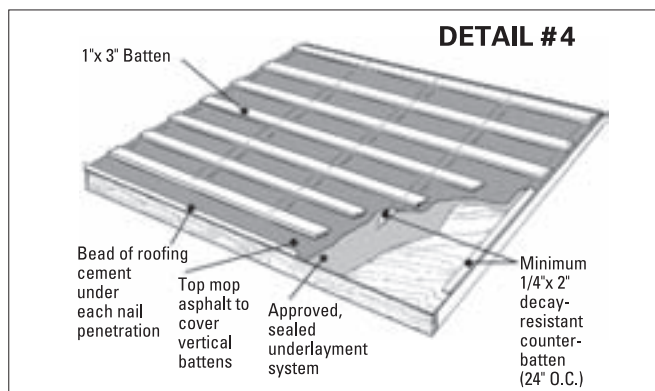
1. Plywood or equivalent approved decking material described above installed over top of existing skip sheathing (see detail #2).



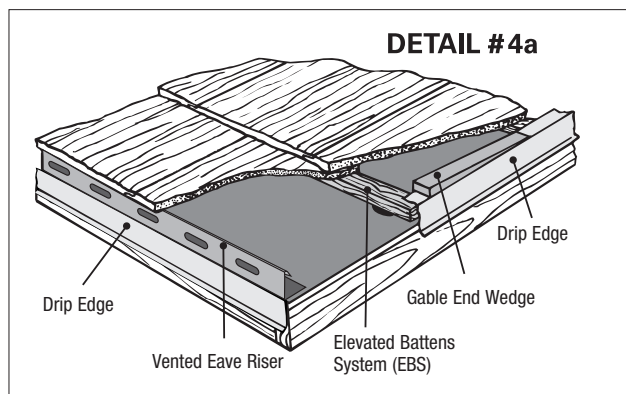
2. Fill in skip sheathing (see detail #3). CAUTION: When this system is used, care must be taken to ensure that fasteners used to fasten battens and tiles penetrate the roof deck.



3. Counter-battens with approved, sealed underlayment system and vertical and horizontal battens. Eave riser metal should be installed with this system to cover counter-battens (see detail #4).



4. Elevated Batten System™ (EBS) battens may be used as an alternative to counter battens (see detail #4a).



BATTENS:

Monterey™ Shake and Slate tiles may be installed directly to the roof deck without battens. Boral Roofing's Elevated Batten System™ (EBS) battens are optional and are recommended to help prolong the life of the roof (see detail #4a). Fastening tiles to the EBS battens without puncturing the underlayment helps to reduce the risks of leaks. The continuous air space beneath EBS battens allows drainage in case moisture gets under the tiles and allows free air flow to help keep the roof system cooler and dryer to last longer and be more energy efficient.

CLASS A & B FIRE RATED SYSTEMS:

A roof installed with Monterey™ Shake and Slate tiles with a minimum code standard ASTM D226, Type II (No. 30) underlayment or equivalent in compliance with the TRI Installation Guide is classified as a Class B fire rated assembly. To achieve a Class A fire rated assembly, Monterey™ Shake and Slate tiles must be installed in accordance with one of the following:

1. A double layer of underlayment specified by Boral Roofing installed as required by the TRI Installation Guide with or without battens.
2. A single layer of minimum code standard ASTM D226 or equivalent underlayment installed over 1/4" minimum thick DensDeck® Roof Boards or equivalent fire rated decking material with or without battens.
3. A single layer underlayment specified by Boral Roofing as required by TRI Installation Guide with flame-retardant elevated battens.
4. Any additional installation specified in ICC ESR 1017.

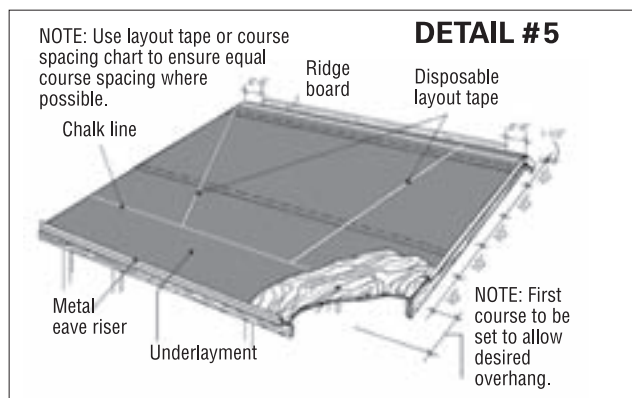
UNDERLAYMENT:

Monterey™ Shake and Slate require a minimum of a single layer of underlayment in accordance with the TRI Installation Manual, ICC ESR 2015P, for minimum roof slopes of 4:12. Roof slopes of 3:12 to less than 4:12 require two layers of underlayment.

Refer to underlayment manufacturer's guidelines for alternative underlayment installation requirements. All penetrations or cuts through the underlayment, e.g. vents, stacks, skylights, etc., must be sealed in accordance with acceptable roofing practice and local codes. Underlayment must be completely watertight before Monterey™ Shake and Slate tiles are installed.

COURSING:

Monterey™ Shake and Slate may be laid with a variable headlap to prevent cutting of the top course. The use of a pre-marked layout tape with 1 1/2" coursing will maintain the minimum 2 1/4" headlap. The first course is marked at a maximum of 13" from the edge of the roof, and the last course is marked 1/2" from the nailer board or 1" from the center of the ridge. Hold the layout tape perpendicular to the eave and swing the tape until the top mark is 1/2" from ridge board to mark course spacing (see detail #5).



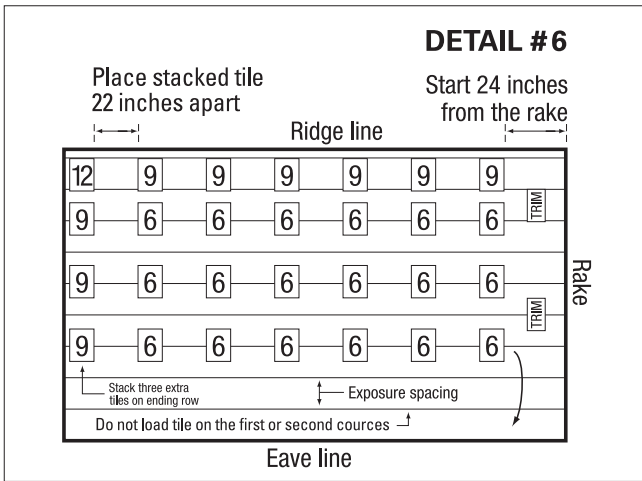
LOADING:

The method of roof loading shown (see details #6, #7, #8) represents one method of placement for efficient application but is not intended to suggest that this is the only method that will work. Each applicator will have personal preferences for stack location and spacing. The important aspect of loading is to spread the load evenly across the roof while using proper increments that assure that the proper amount of tile is loaded on the roof. Additionally, proper loading will minimize both the movement of tile and the need to walk on installed portions of the roof.

TYPICAL GABLE ROOF:

Lay out stacks beginning from the ridgeline down to the eaves. Place stacks 22” apart and always start at the right side. Repeat procedure every other course thereafter. Do not load stacks on the first course from the eave.

Detail #6 represents a roof with an odd number of courses, placing nine tiles in a stack along the eave course. If there is an even number of courses on the roof, the tiles will need to be in stacks of twelve on the ridge. See detail #6 for number of tiles per stack.

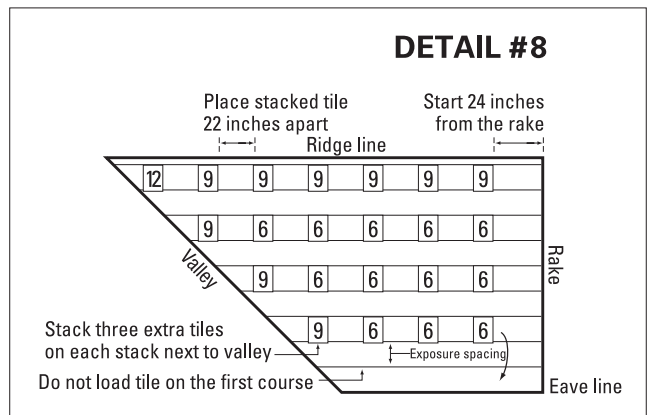


TYPICAL VALLEY ROOF:

Lay out stacks beginning from the ridgeline down to the eaves. Place stacks 22” apart and always start at the right side. Repeat procedure at every other course thereafter. Do not load stacks on the first course from the eave.

Stacks which sit next to the valley should have three extra pieces to compensate for the cut pieces that will be filled in.

Do not load product within the 24” valley zone where the valley metal will be placed. Number of tiles next to the valley will vary due to roof size. See detail #8 for number of tiles per stack.

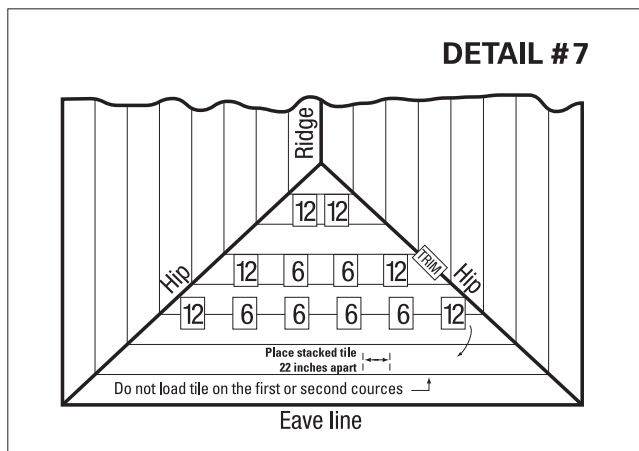


TYPICAL HIP ROOF:

Lay out stacks beginning from the eave up. Place stacks on the second or third course from the eave and at every other course up to the top of the hip. Place stacks 22” apart and always start from the right side.

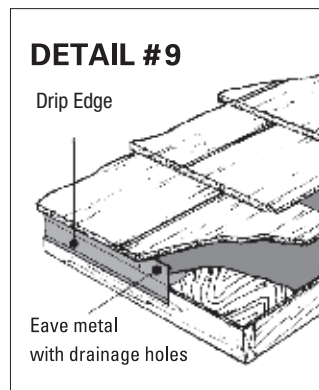
Stacks which sit next to the hip line should have twelve tiles to compensate for the cut pieces that will be filled in.

Number of tiles in stacks at far left may vary due to roof size. See detail #7 for number of tiles per stack.



EAVE TREATMENT:

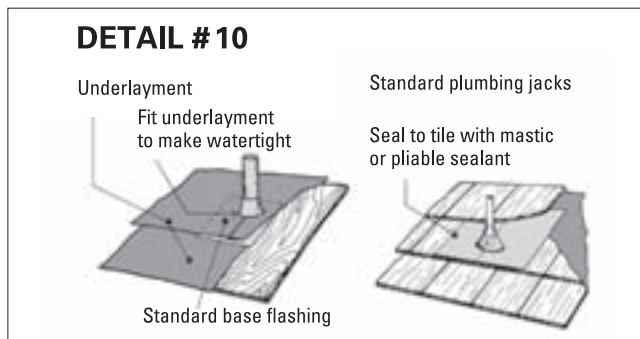
The butt end of the tile shall extend beyond the eave approximately 1”. Install metal Eave Riser at all eaves according to Eave Riser installation instructions available at Boral Roofing’s website, www.boralroof.com. Installations of Monterey™ Shake and Slate tiles on Boral’s Elevated Batten System™ battens requires 1-1/2” tall Eave Riser. The Vented Eave Riser is recommended for these installations on Boral’s Elevated Batten System™ battens for improved energy efficiency as part of Boral’s Energy Efficient Roof System.



PIPE FLASHING:

Install the base flashing in shingle fashion with the underlayment. Seal all penetrations through underlayment.

The primary flashing must be installed shingle fashion with the tiles with a minimum 3" headlap (see detail #10). Wakaflex® is recommended for its durability and flexibility that increases the longevity of the entire roof.



FASTENING:

Monterey™ Shake and Slate tiles must be fastened to the sheathing with one screw per tile or two nails per tile or two screws per tile in accordance with ICC ESR-1017 for the maximum allowable wind speed, roof height, zone and exposure as noted. Screws must be No. 8 flat head coarse-threaded wood screws, zinc-plated steel complying with ANSI/ASME B18.6.1, with minimum 0.120 inch (304 mm) shank diameter, minimum 0.341 inch (7.98 mm) head diameter, minimum 2 inches (50.8 mm) long. Nails must be minimum No.11 gauge [0.120 inch (3.04 mm)] and have minimum 5/16 inch diameter (0.312 mm) heads.

In certain areas it may be impossible to secure the tile with nails or screws (under flashings). In these areas, tile must be secured with an approved adhesive.

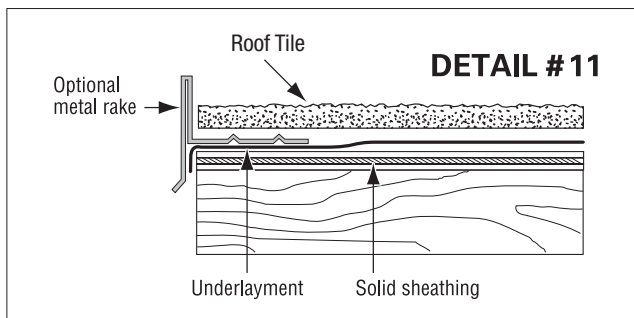
As an alternative to fastening with nails or screws, Monterey™ Shake and Slate tiles may be fastened with roof tile adhesives recognized in a current ICC-ES evaluation report for use in roof tile applications and installation must be in accordance with the adhesive manufacturer's ICC-ES evaluation report.

When battens are used, the top edge of the tile should align evenly with the top edge of the batten.

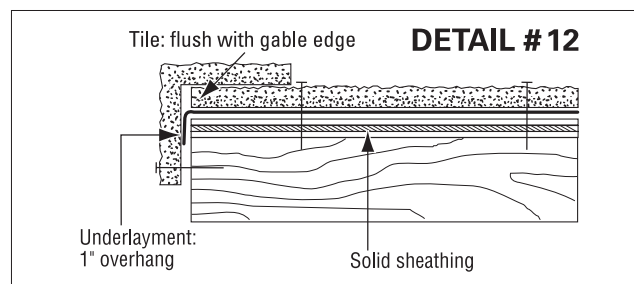
RAKE OR GABLE END TREATMENT:

There are three options to complete the gable edge of the roof:

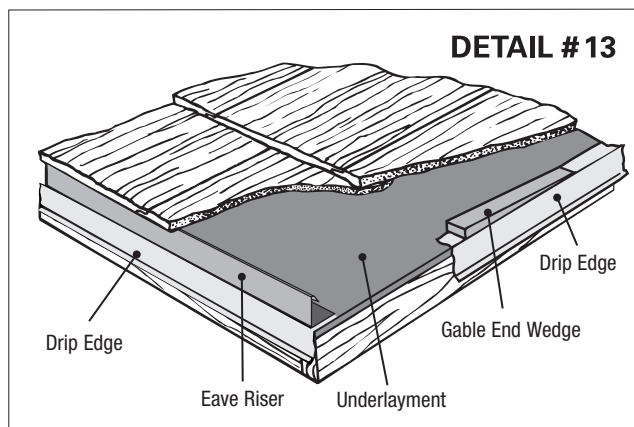
- A. **Metal Rake Trim:** The underlayment overlaps the edge of the roof by a minimum 3/4". Metal Rake Trim with ribbed pan closes the cut edge of the tile. Tiles are cut flush to the inside edge of the flashing (see detail #11).



- B. **Rake Trim Tiles:** The underlayment overlaps the edge of the roof by 1". The rake tile is applied flush to the gable edge. Rake tiles are fastened with two corrosion-resistant fasteners of sufficient length to penetrate 3/4" into the barge rafter (see detail #12).



- C. **Gable End Wedges:** The underlayment overlaps the edge of the roof by a minimum 3/4". A metal drip edge flashing is installed along the gable ends of the roof of sufficient size to cover the exposed edge of the sheathing. A Gable End Rubber Wedge is adhesively fastened to the top surface of the drip edge for each course of tiles (see detail #13).



Each course will extend at least 3/4" over the edge of the roof. It is important to cut each rake course to ensure desired aesthetics. Tiles at gable end should vary in width to maintain random broken-bond pattern.

Small cut gable pieces must be secured in accordance with good roofing practice.

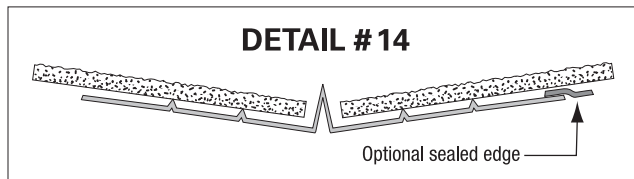
NOTE: Rain channels/sidelocks are to be removed on all tiles overhanging the barge rafter or gable end.

VALLEY TREATMENT:

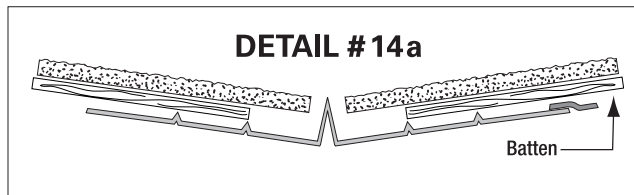
Underlayment may be woven through the valley before the metal is installed or a single layer of 36" wide underlayment shall be centered in the valley and applied the full length of the valley prior to the placement of the Ribbed Valley Metal. The underlayment may be lapped over the edge of the Ribbed Valley Metal or woven across the valley beneath the Ribbed Valley Metal. Ribbed Valley Metal helps to control water flow and support the tile extending into the valley. Flashing sections should be lapped at least 6" and secured to prevent movement. No fasteners should penetrate the flashing within the ribs of the valley metal. The outside edges may be sealed with roofer's cement or pressure-sensitive adhesive. Tiles may be cut close to center of the valley but in areas subject to heavy debris accumulation, it may be better to cut tiles away from the center to allow for cleaning. Cut tiles that cannot be fastened without penetrating the flashing should be attached with wire and/or approved adhesive.

Small cut pieces must be secured in accordance with good roofing practice.

Tiles cut close to the center diverter must be installed over Ribbed Valley Metal (see detail #14).



Valley flashing material must be minimum No. 26 gauge corrosion-resistant steel or better. When using counter battens or EBS, the battens should extend to the second rib of the valley metal in order to support the tile in the valley (see detail #14a).

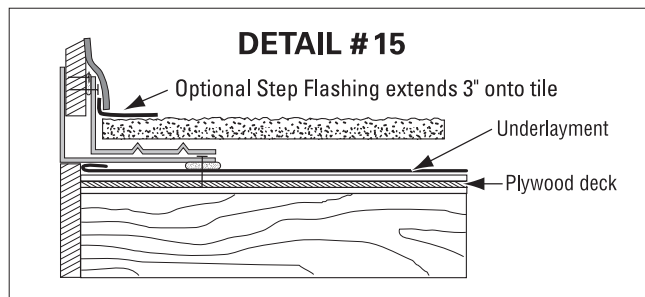


SIDE WALL TREATMENT:

For new construction, prepare flashing as prescribed in the TRI Installation Guide. For reroof situations where existing counter flashing may not allow conventional procedures, refer to the following guidelines.

The underlayment shall have a minimum 1" upward fold and be tucked at least 4" under the existing flashing. The edge of the flashing shall be sealed with a bead of mastic and secured to the roof deck at least every 24" on center. A rolled-hem pan flashing should be sealed to wall prior to nailing every 24". DO NOT PUNCTURE THE PAN PORTION OF THE FLASHING WHEN INSTALLING THE FLASHING OR THE TILE (see detail #15).

In areas of high rainfall or debris accumulation, the edge of the flashing should be three-coursed or an approved peel-and-stick membrane sealed to the roof underlayment. Step shingles are applied on top of each course and sealed to the wall with Wakaflex or a bead of plastic cement.



HEAD WALL TREATMENT:

For new construction, prepare flashing as prescribed in the TRI/WSRCA Installation Guide.

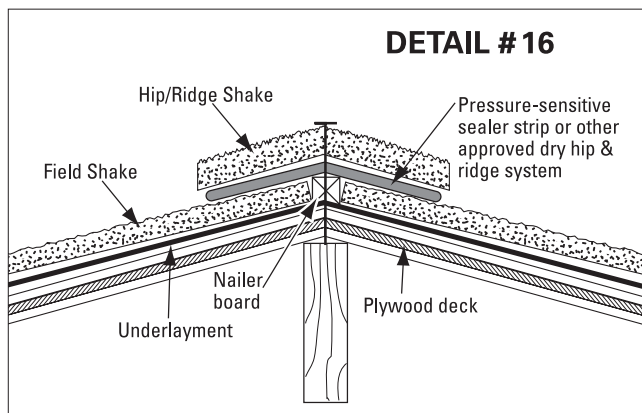
For reroof situations where existing counter flashing may not allow conventional procedures, refer to the following guidelines.

The underlayment shall have a minimum 1" upward fold and be tucked at least 4" under the existing flashing or shall extend up the wall at least 6". The tile is then fastened to roof deck. The horizontal flashing shall be 4" on the wall and 4" on the tiles with the break 5° less than the existing roof. The headwall flashing is set 1" above the plane of the roof deck.

NOTE: If the tile cannot be fastened directly to the deck, it must be secured to the head of the lower course with an approved adhesive. Follow good roofing practice to ensure all water is directed on top of tiles.

HIP AND RIDGE TREATMENT:

Non-Vented Ridge and/or Hips: The underlayment shall lap the hip and ridge a minimum of 6" on each side, effectively providing a minimum double layer of underlayment. Adequately fasten optional nailer board along the hip and ridge with corrosion-resistant fasteners. Tile is laid and cut to fit against nailer board on the hips, and laid to within 1/2" of the nailer board. The first hip piece may be boosted by a cut piece of trim tile, mortar or other approved methods. The ridge and hip should be installed with a minimum 2" headlap. Each trim piece is applied with one corrosion-resistant fastener long enough to penetrate 3/4" into the nailer board and plastic cement under the nose of the piece to cover the nail head and form a bond between the tiles (see detail #16).



IN AREAS OF EXTREME FREEZING, SNOW OR COLD:

Monterey™ Shake and Slate tiles are Grade 1 tiles and can be used for these areas.

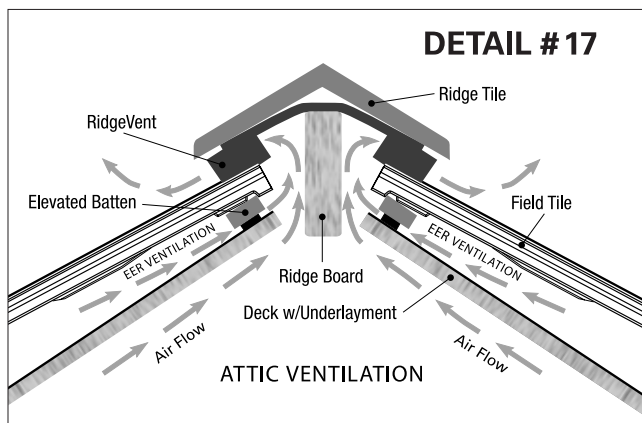
REPLACING BROKEN MONTEREY™ SHAKE AND SLATE:

Remove the broken piece and fasteners and patch the resulting hole in the underlayment. Gently lever up the left piece. Slide the new piece in place and fasten with approved adhesive. Refer to the TRI Installation Guide.

SPECIAL INSTRUCTIONS:

EACH DAY DURING INSTALLATION THE ROOF SHOULD BE SWEEPED AND WASHED TO REMOVE DUST AND DEBRIS WHICH CAN DISCOLOR THE TILE. UNLESS OTHERWISE SHOWN, ALL METHODS OF APPLICATION SHALL COMPLY WITH TRI INSTALLATION MANUAL, ICC ESR 2015P AND CHAPTER 15 OF THE IBC/CHAPTER 8 OF THE IRC.

Vented Ridge and/or Hips: Install according to the installation instructions of the vented hip & ridge product on Boral's website at www.boralroof.com. Vented ridge products are recommended for improved energy efficiency as part of Boral's Energy Efficient Roof System™ (EER) (see detail #17).



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ABOUT BORAL ROOFING

Boral Roofing 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 15 clay and concrete tile manufacturing plants throughout the U.S. and Mexico.

ABOUT BORAL USA

Headquartered in Roswell, Georgia, Boral USA through its subsidiaries employs approximately 1,500 individuals at more than 140 operating and distribution sites across the United States. The U.S. operations include the country's largest brick manufacturer and the largest clay and concrete roof tile manufacturer.

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