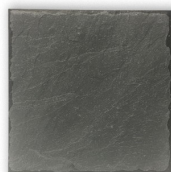


## Parts & Specifications

### Field Tile

12 inches X 12 inches (approx.)  
 CTN Qty: 11 pieces (approx.) standard  
 9 pieces Impact Resistant (IR)  
 CTN Weight: 45 lbs.  
 Tiles/Sq.: 120 (approx.)  
 Weight/Sq.: 538 lbs. (Approx) standard  
 650 lbs. (Approx) Impact Resistant (IR)  
 CTN/ Pallet: 64  
 Weight/ Pallet: 2,816 lbs.  
 Sq./ Pallet: 5.8 (approx.)  
 Pallets/ Truckload: 15  
 Sq./ Truckload: 87 (approx)



### Battens & Hangers (Stainless or Galvanized)

Length: 48 inches  
 Hanger Intervals: 6 inches  
 CTN Qty: 80 pieces (approx. 2.5 Squares)  
 CTN Weight: 49.7 lbs.  
 Battens: 430SS/ 0.5mm thickness  
 Hangers: 304SS / 2.0mm thickness  
 Includes 10 extra hangers per box

### Tile Liner (HDPE interlayment)

Roll Length: 373 feet  
 Roll Weight: 45 lbs. (approx.)  
 Plastic: HDPE, 2% carbon black (min.)  
 Thickness: 0.025 inches  
 Width: 12 inches



### Trim Tiles

Width: 6 inches  
 Length: 12 inches  
 Pieces/ CTN: 24  
 LF/ CTN: 10  
 Weight/ CTN: 48 lbs.



### Trim Spacer

Width: 5.6 inches  
 Length: 48 inches  
 Scored to fold-over  
 Thickness: 3/8 inch  
 Plastic: Coroplast HDPE  
 Pieces/ Bundle: 13



### Trim Saddle

Width: 3.25 inches  
 Length: 11.5 inches  
 Bent to fit over roof  
 Metal: 16oz. Copper  
 Thickness: 3/8 inch  
 Pieces/ CTN: 12  
 LF/ CTN: 10  
 Includes 48 1.625 inch SS screws



# Basic Requirements and Specifications

## Slope

The minimum roof pitch for Ironstone is a 4:12. **Never install Ironstone below a 4:12.** Self-adhered leak barrier must be installed on slopes 5:12 and below. There is no maximum slope requirement for Ironstone.

It is recommended that the structural design of the structure be evaluated by a registered engineer to determine that it can support the roof. Most building codes require an engineering review and may be required by local building codes.

## Deck

Roof covering shall be installed only over code complying sheathing.

Install Ironstone on a roof deck that is solid and considered a "nailable surface." American Plywood Association rated plywood 15/32" thick is suggested. APA rated plywood, APA rated wood panels, 7/16" approved OSB, or other building materials meeting minimum requirements in accordance with DOC PS-1 are also acceptable.

## Underlayment

Select an underlayment product that is suitable to specific location, climate, roof pitch and attic ventilation. When selecting an underlayment, remember that Ironstone is a lifetime product and will last over 75 years, so the underlayment should be of comparable quality.

### Recommended for slopes over 5:12

Use one layer of synthetic mechanically attached roof deck protection conforming to ASTM D226, ASTM D2626 Type I, or ASTM D6380 Class M covering the entire deck. At vulnerable areas (valley, ridge, drip edge, etc.) use self-adhered Leak Barrier.

### Required for slopes 4:12 up to and including 5:12

Use self-adhered Leak Barrier covering the FULL deck. All hips and ridges, valleys, rakes, eaves, gable/rake edge, around roof protrusions and any other vulnerable areas are required to be covered with a self-adhered leak barrier. At eaves, the leak barrier should extend over the drip edge metal at the eave edge.

**NOTE:** In regions where the average daily January temperature is 25 degrees Fahrenheit or lower, or where ice buildup is possible/where ice dams may form, it is required to install self-adhered leak barrier from the bottom edge, extending two feet above the exterior wall line on all eaves.

To meet Class A Fire Rating: To achieve a Class A Fire Rating System, one layer of GAF VersaShield® fire resistant roof deck protection must be installed OVER one layer of mechanically attached roof deck protection conforming to ASTM D226.

**NOTE:** Roofing underlayment should meet or exceed ASTM standards D226/D2626. Self-adhered Leak Barrier should meet or exceed ASTM D1970. Follow all installation and fastening requirements set by the manufacturer for each underlayment and self-adhered Leak Barrier product.

**\*\*NEVER install Ironstone on a slope less than 4:12\*\***

## Basic Requirements and Specifications (cont.)

### Fasteners

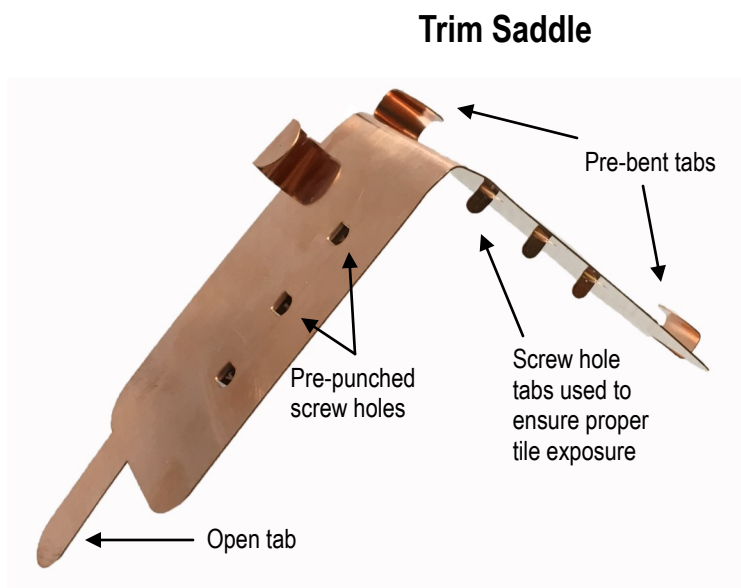
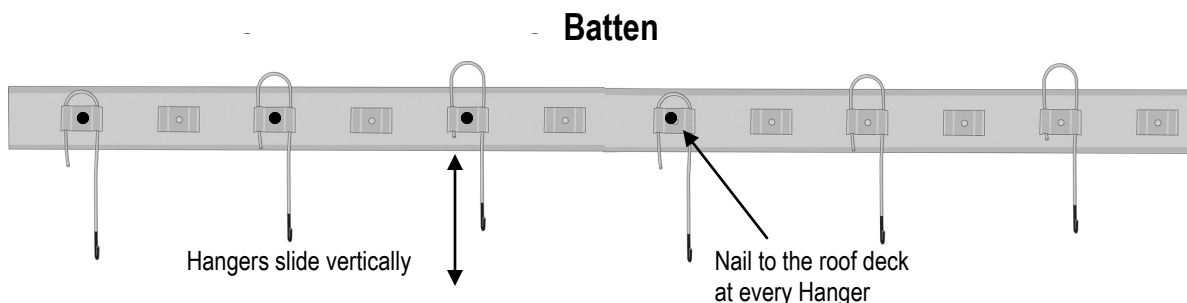
Ironstone Roof Tiles are attached to the roof deck with a Batten and Hanger system. No screws or nails go directly through the Ironstone tiles.

Each Batten and Hanger strip will be nailed to the roof using corrosive resistant fasteners at a minimum of 11-guage shank and 5/16" head. Ironstone recommends ring shank roofing nails at 1-1/4" in length.

Corrosive resistant screws with a minimum of 5/16" head may also be used to fasten Batten and Hanger strips.

\*For upgraded stainless steel Battens and Hangers, 1-1/4" stainless steel nails are required to fasten the stainless steel Battens to the roof deck.

Trim pieces are fastened to the Hip and Ridge of the roof with a copper "Saddle". The Saddle is screwed directly into the Trim Spacer and roof-deck using four #8 1-5/8" pan head, stainless steel screws provided by Ironstone. No screws or nails go directly through the Ironstone Trim tiles.



## Flashing Notes

### Metals

Where a roof intersects another roof, adjoins a vertical wall, chimney, vent, plumbing stack, or other structural protrusions, flashing metals are required. Proper flashing installations are critical for a water-tight roof. Always refer to and follow applicable building codes and standards and best roofing practices.

Roof flashings shall be new and not be less than 0.019-inch (0.48mm) No. 26 gauge corrosion-resistant metal or 16 oz. copper. **All flashings should be separated from contact with battens using self-adhered leak barrier to avoid corrosion.**

The valley flashing shall extend at least 10 inches (279mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25mm) high at the flow line formed as part of the flashing. Also, the valley flashing shall have a 36 inch wide (914mm) underlayment of self-adhered leak barrier complying with ASTM D1970, in addition to other required underlayment.

Sections of valley flashings shall have an end lap of not less than 4 inches (102mm).

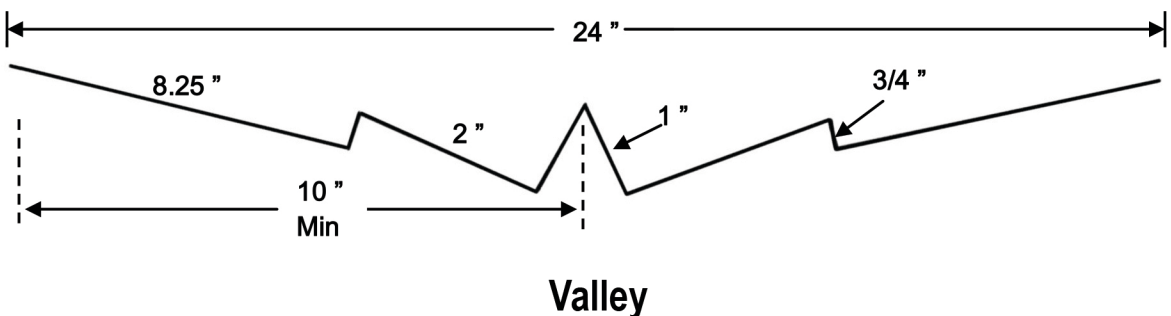
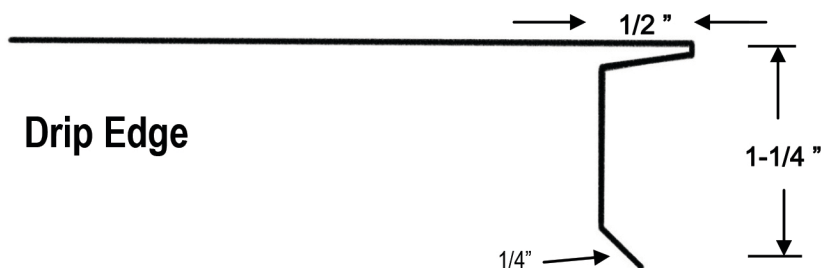
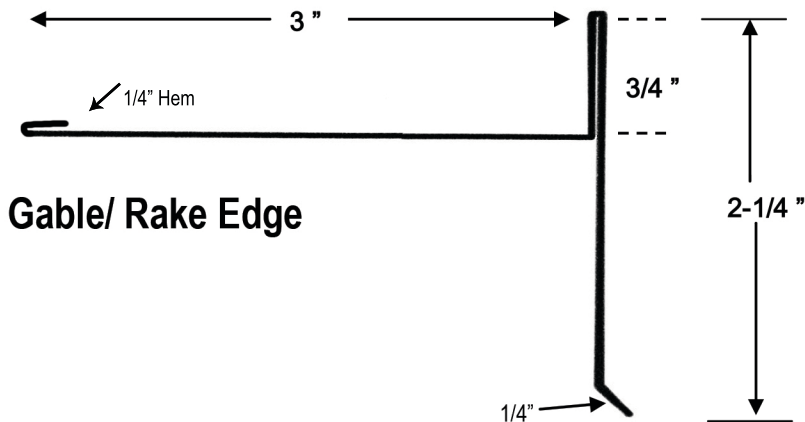
Be sure to cover fastener heads on the gable/rake edge metal with self-adhered leak barrier.

\*Metal flashings shall be in accordance with IBC Section 1503.2 or 1507.3.9 or IRC Section R903.2 or IRC Section R905.3.8 as applicable.

**IMPORTANT: All flashings should be separated from contact with battens using self-adhered leak barrier to avoid corrosion.**

## Required Metal Flashings

**IMPORTANT:** Roof flashings shall not be less than No. 26 gauge, 0.019-inch (0.48mm) corrosion-resistant metal or 16 oz copper.



### SAFETY FIRST

Safety is priority! Protect yourself and your crew by following all safety tips included in this guide, safety labels on your power tools and **always** follow OSHA requirements in your area.

### SAFETY WARNING – TILE DUST

Roofing tiles are made from clays and other mined minerals that contain naturally occurring amounts of crystalline silica (quartz) and traces of other hazardous substances. These are released as dust when dry-cutting or grinding this product and can be inhaled if proper respiratory protection is not utilized. Do not use dry cutting equipment without integral air pollution controls. Cutting roof tiles should only be done using a “wet saw”.

**WARNING:** Crystalline silica is a substance known to cause cancer. Other chemicals, also naturally occurring in these products, are known to cause cancer, birth defects and other reproductive harm. Please refer to Federal and State OSHA requirements for proper compliance.

## Required Tools and Equipment

### Tools

#### Hand Tools:

- Hammer
- Tin snips
- Chalk line
- Tape measure
- Utility knife
- Marker/pencil
- Pliers
- Small flat head screw driver

#### Power Tools:

- Drill (need Phillip's head driver bit)
- Air compressor and hoses
- Pneumatic roofing nail gun
- Extension cords
- Tile cutting "wet" saw (porcelain quality diamond blade) and a snap-and-cut tile cutter.

**Time Saving Tip! – Use a tile snap cutter to quickly and easily cut straight lines in Ironstone tiles.**

### Specialty Equipment:

- Forklift or conveyor lift
- Toe jacks for toe boards

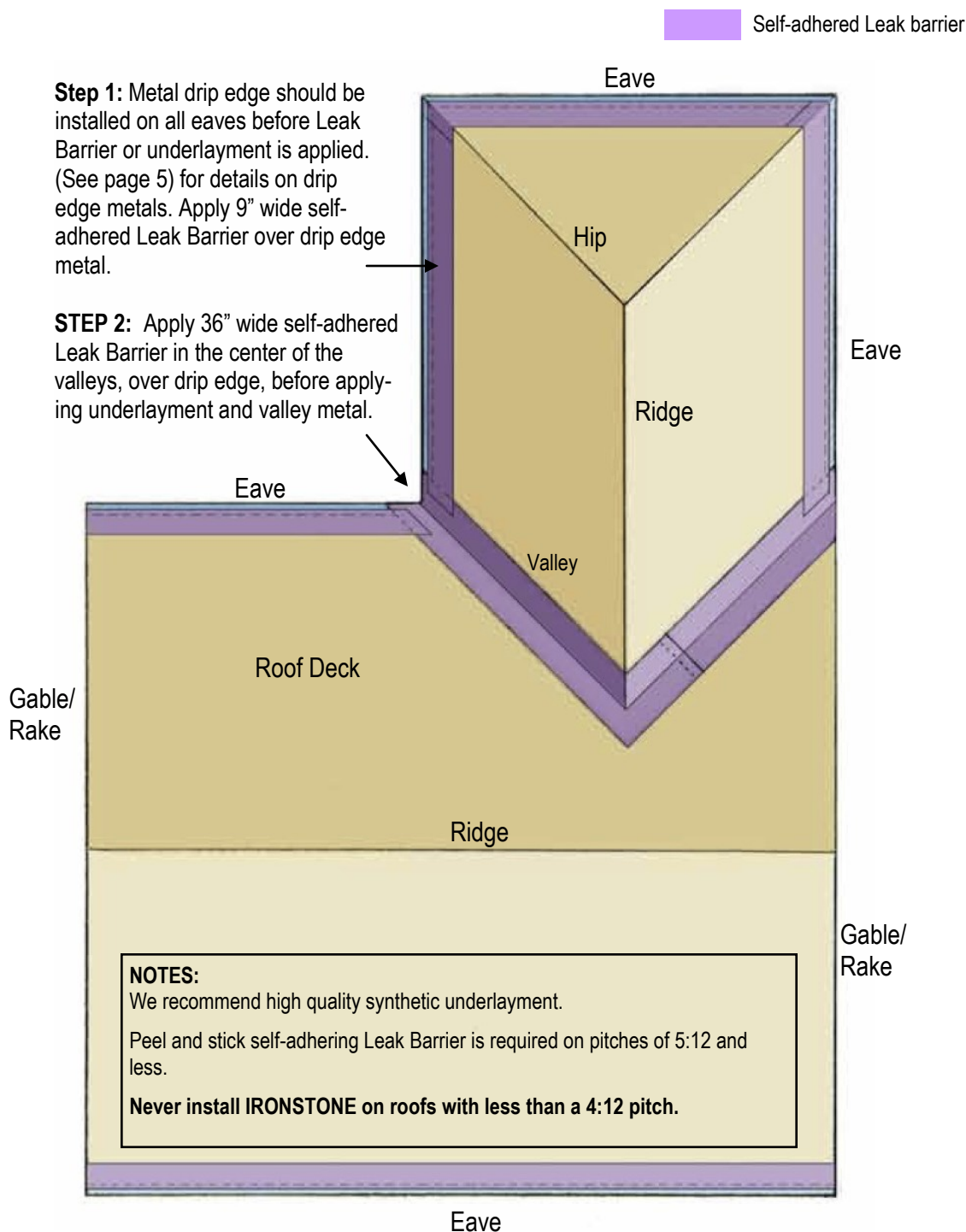
### Safety Equipment:

- Hand protection
- Eye protection
- Respiratory Protection (for tile dust)
- Safety belts and harness
- Ropes and other required fall protection
- Hard hats
- Scaffolding and or ladders

## SAFETY WARNING – TILE DUST

Roofing tiles are made from clays and other mined minerals that contain naturally occurring amounts of crystalline silica (quartz) and traces of other hazardous substances. These are released as dust when dry-cutting or grinding this product and can be inhaled if proper respiratory protection is not utilized. Do not use dry cutting equipment without integral air pollution controls. Cutting roof tiles should only be done using a "wet saw".

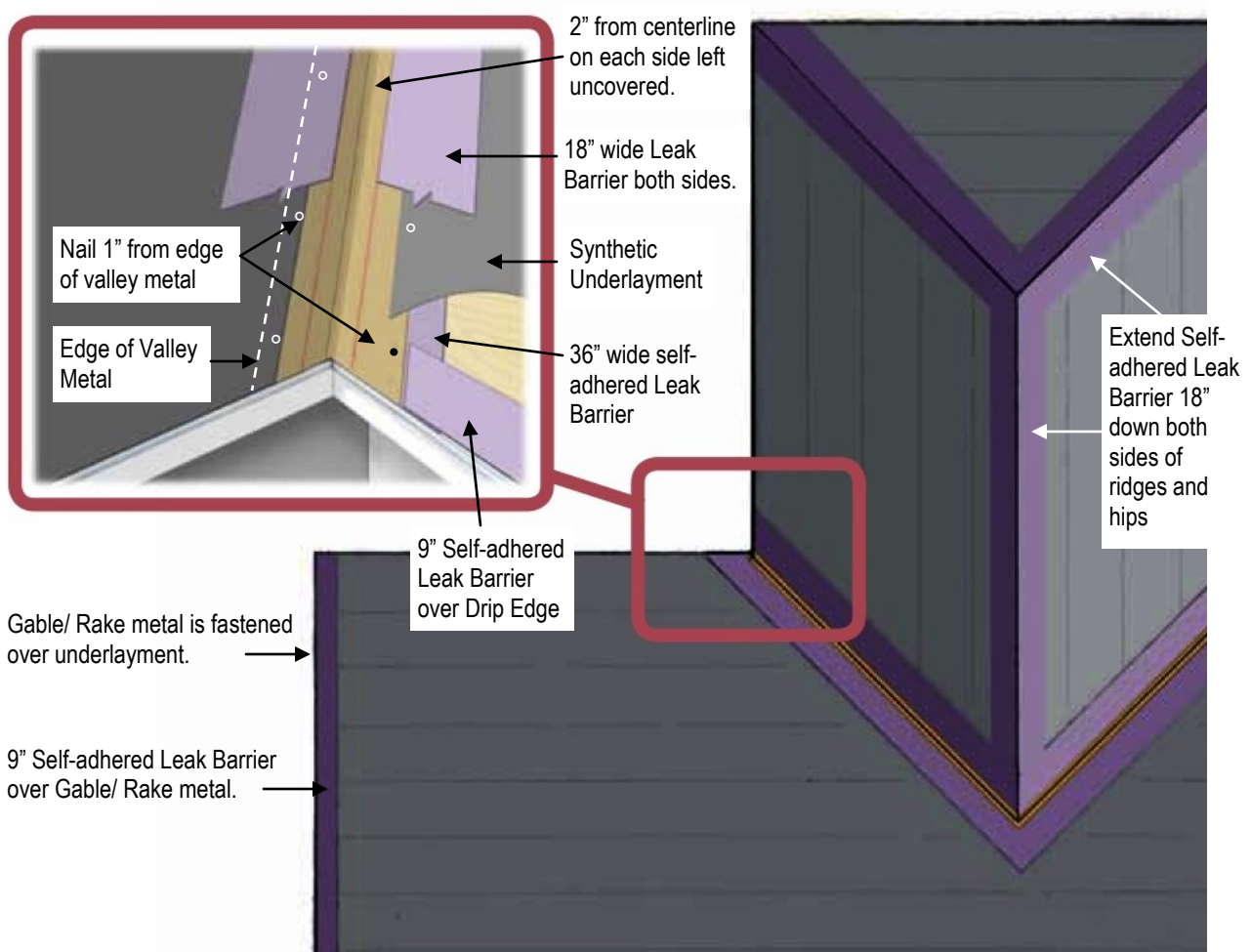
## Preparing the Roof Deck





## Preparing Valleys, Hips and Ridges

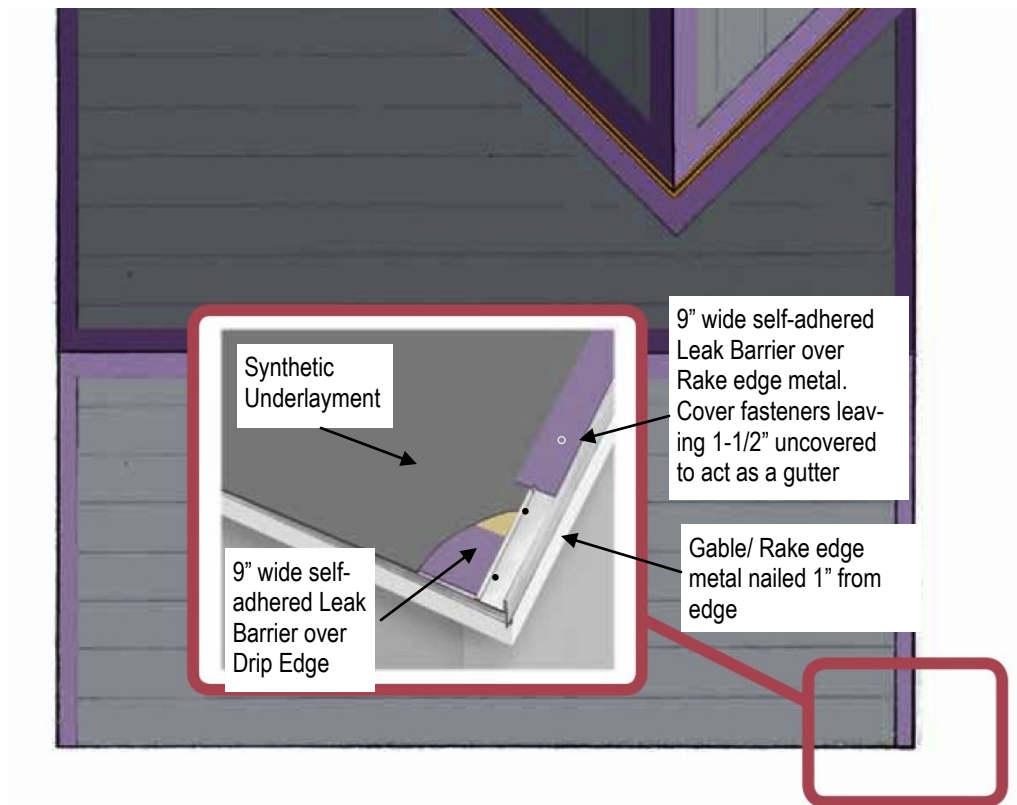
### (Open Valleys)



#### Important Notes:

1.) Nail valley metal no less than 10" from centerline of valley at 16" centers each side of valley. Nails should match the metal of the valley. For example: if copper valley metal is used, use copper nails. If galvanized valley metal is used, use galvanized nails. **Never mix metals.**

## Preparing Gable/ Rake Edges



**Important:** All flashings should be separated from contact with battens using self-adhered leak barrier to avoid corrosion.

## Install Trim Spacers

### Hip, Ridge and Vented Ridge\*

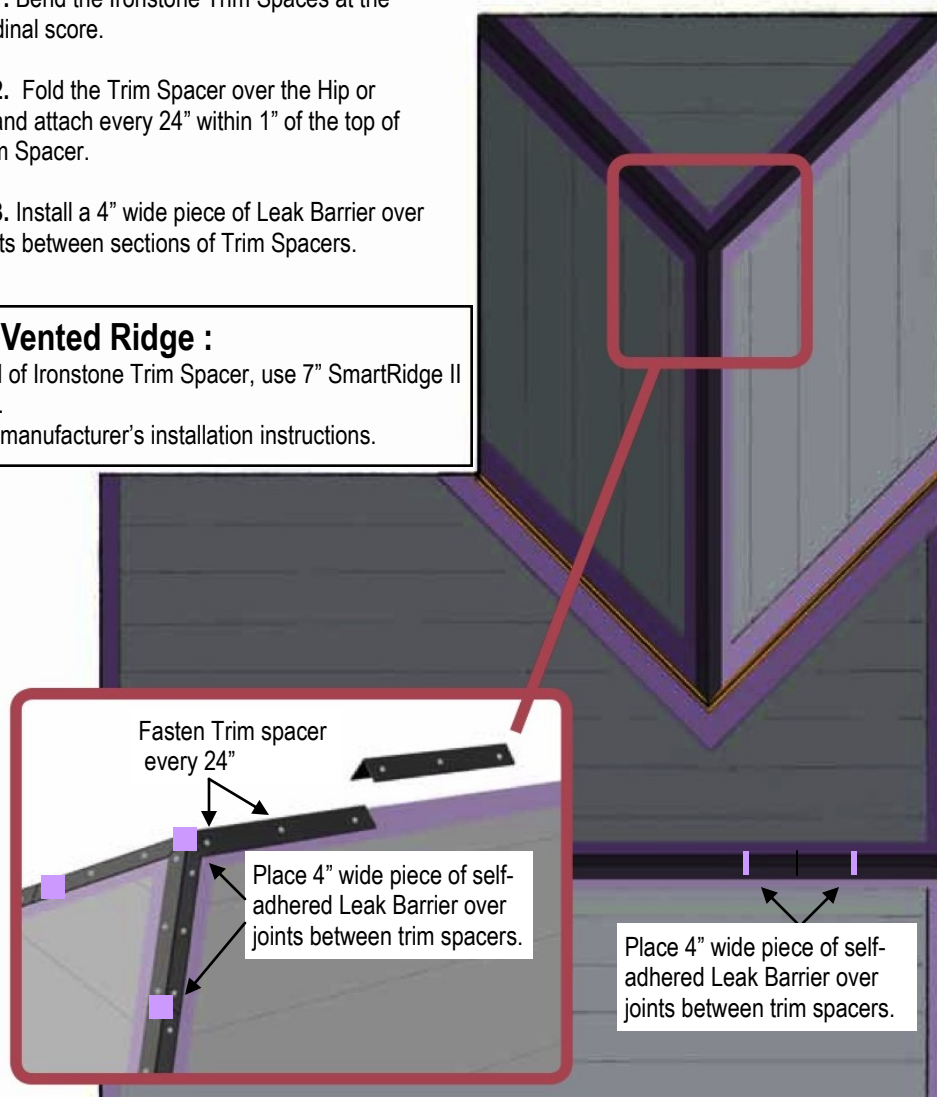
**STEP 1.** Bend the Ironstone Trim Spaces at the longitudinal score.

**STEP 2.** Fold the Trim Spacer over the Hip or Ridge and attach every 24" within 1" of the top of the Trim Spacer.

**STEP 3.** Install a 4" wide piece of Leak Barrier over the joints between sections of Trim Spacers.

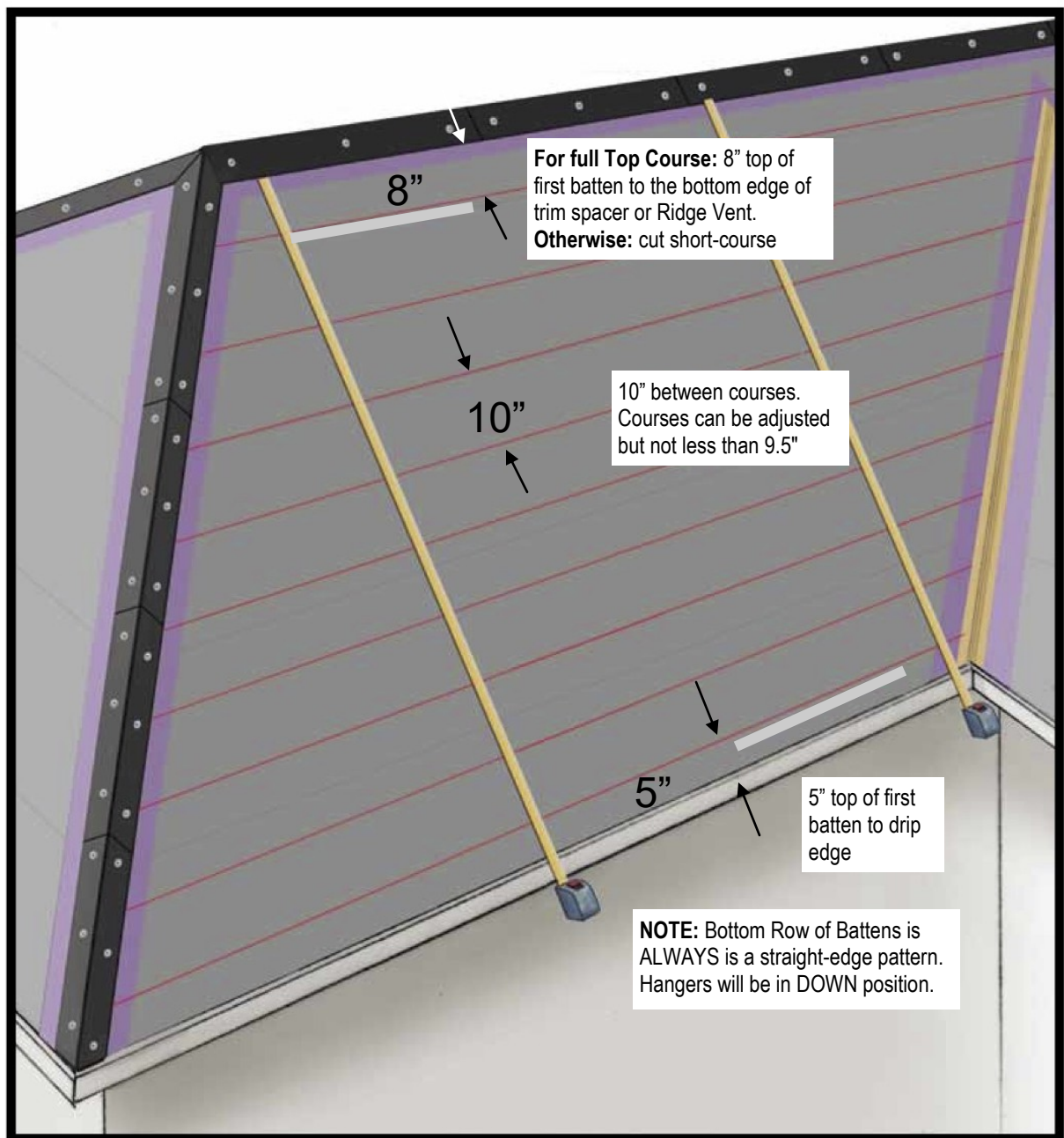
#### **\*For Vented Ridge :**

Instead of Ironstone Trim Spacer, use 7" SmartRidge II by DCI.  
Follow manufacturer's installation instructions.



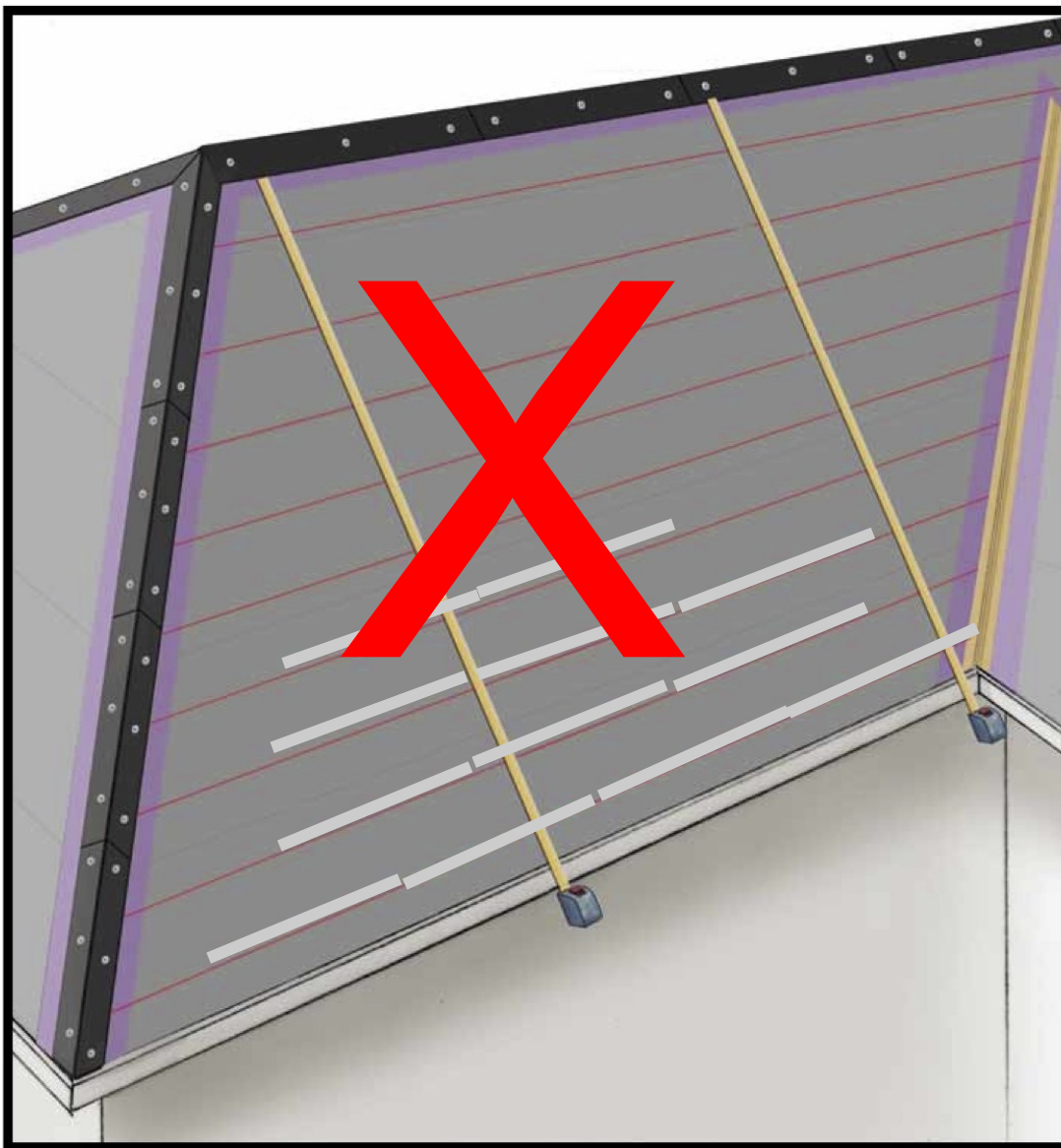
### Roof Lay Out

#### Critical Measurements



### DO NOT DO THIS

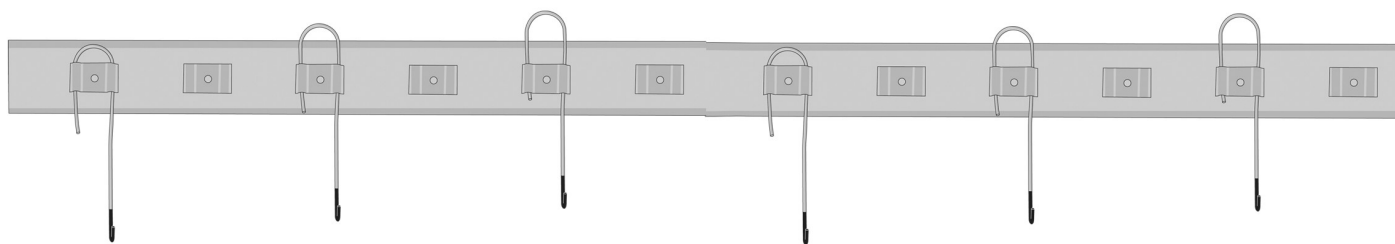
Never install a group of battens without tiles and liner.





## Hanger Tips

- 1.) Hangers are pre-installed in Battens. During shipment, Hangers shift to various lengths. To set Hangers to correct length see page 14.



- 2.) Each box of Battens contain 75 pieces, enough to install 2.5 squares of Ironstone.

- 3.) Each four-foot Batten has eight pre-installed stainless steel Hangers at six-inch intervals.

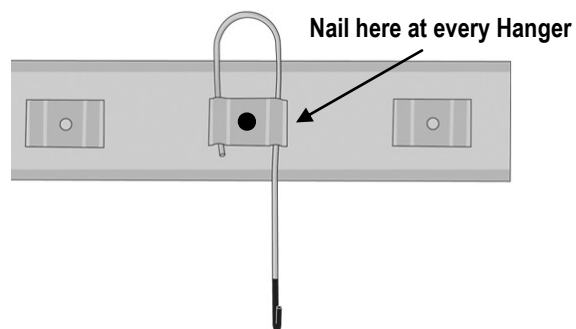
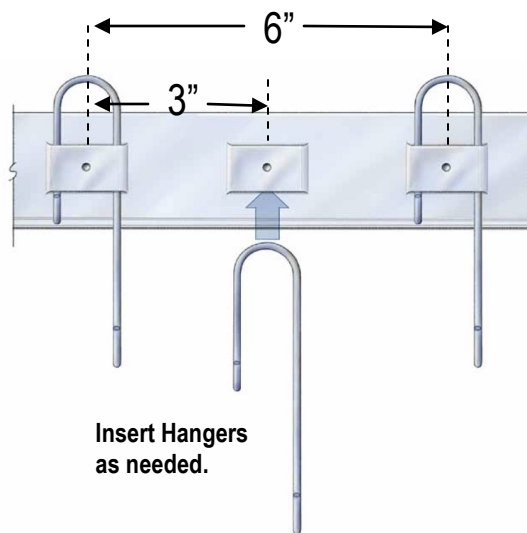
- 4.) Every tile should have at least two Hangers on the bottom edge. Hangers can be added to achieve a three-inch interval.

At the Valleys or at Gable/ Rake edges, tiles may have one hanger as long as the edge of the tile is securely contained by metal flashing.

- 5.) Standard Battens are corrosion resistant galvanized steel. Stainless steel Battens are available as an upgrade.

- 6.) Batten nails are 1-1/4" galvanized ring shank nails. For stainless steel Battens, stainless steel nails are required.

- 7.) Once the desired position of the Hangers is chosen (UP or DOWN for



## Select: Straight or Staggered-Edge Pattern

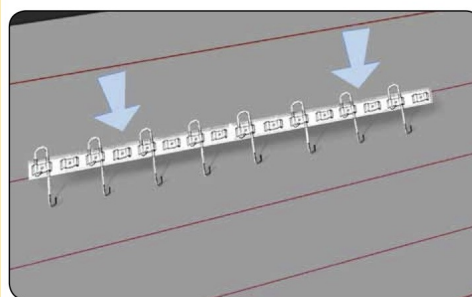
Ironstone's patented system allows for tiles to be installed in a straight or staggered-edge pattern.

Each four foot Batten has eight pre-installed stainless steel Hangers. The length of each Hanger can be adjusted before and after the Batten is nailed to the roof deck.

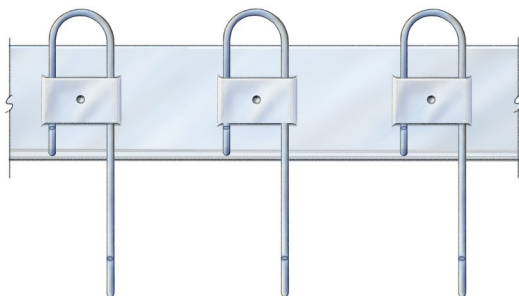
**For staggered-edge:** Tap the batten on the hook side to get all of the Hangers aligned in the **UP** position. Once the Batten is nailed to the roof, a staggered pattern is achieved by pressing some tiles down (max. 1") when installed.

**For straight-edge:** Tap the Batten on the top of hooks to get the Hangers aligned in the **DOWN** position. Once nailed to the roof deck, all Hangers will remain the same length.

Tap batten to align hangers UP or DOWN

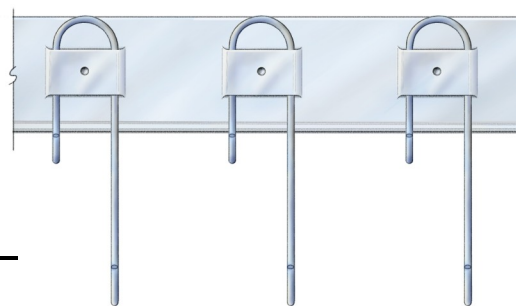


Hangers UP



For Staggered Edge

Hangers DOWN



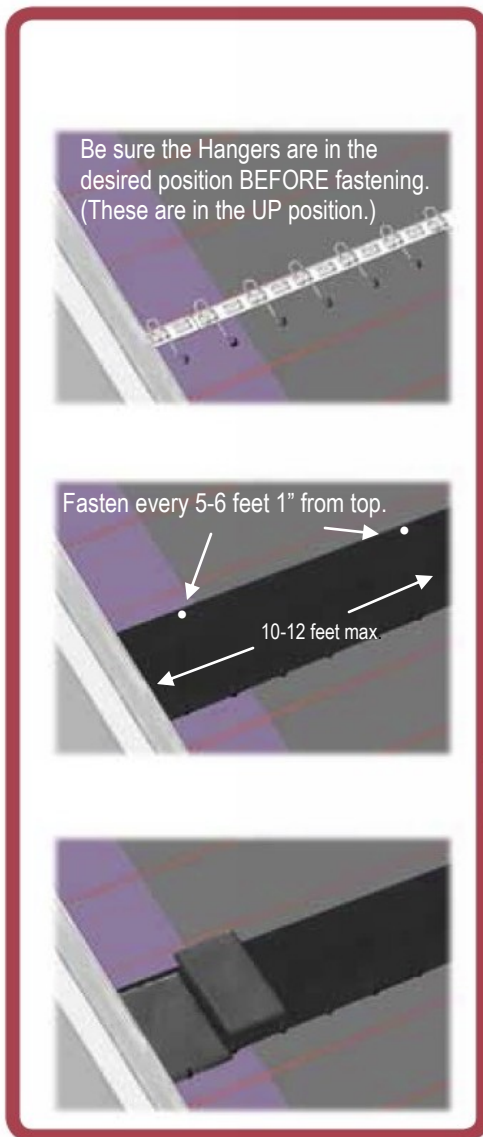
For Straight Edge

1" Max



## Getting Started

### The Basics



### Step 1.

Be sure the Hangers are all in the desired UP or DOWN position. For straight-edge pattern, tap Batten on the top edge to extend Hangers in the DOWN position. For staggered-edge, tap the Batten on the hook side of the Hangers to push the Hangers into the UP position.

**FASTEN AT EACH AND EVERY HANGER**

**EVERY TILE SHOULD HAVE A MINIMUM OF TWO HANGERS.** Add more Hangers to the Battens if needed.

**NO TILE SHOULD BE LESS THAN 4" ON THE BOTTOM EDGE.**  
If necessary, cut the adjacent tile back to allow for larger cut piece.

### Step 2.

Install Tile Liner in Hangers. Keep the shiny side of the Liner facing down. Work in 10-12 foot lengths.

Fasten the plastic no more than 1" from the top edge every 5-6 feet using Batten nails.

Overlap 12" minimum at side laps.

### Step 3.

Place tiles in Hangers. If a staggered-edge pattern is desired, firmly push every other tile down to extend the Hangers downward not more than 1".

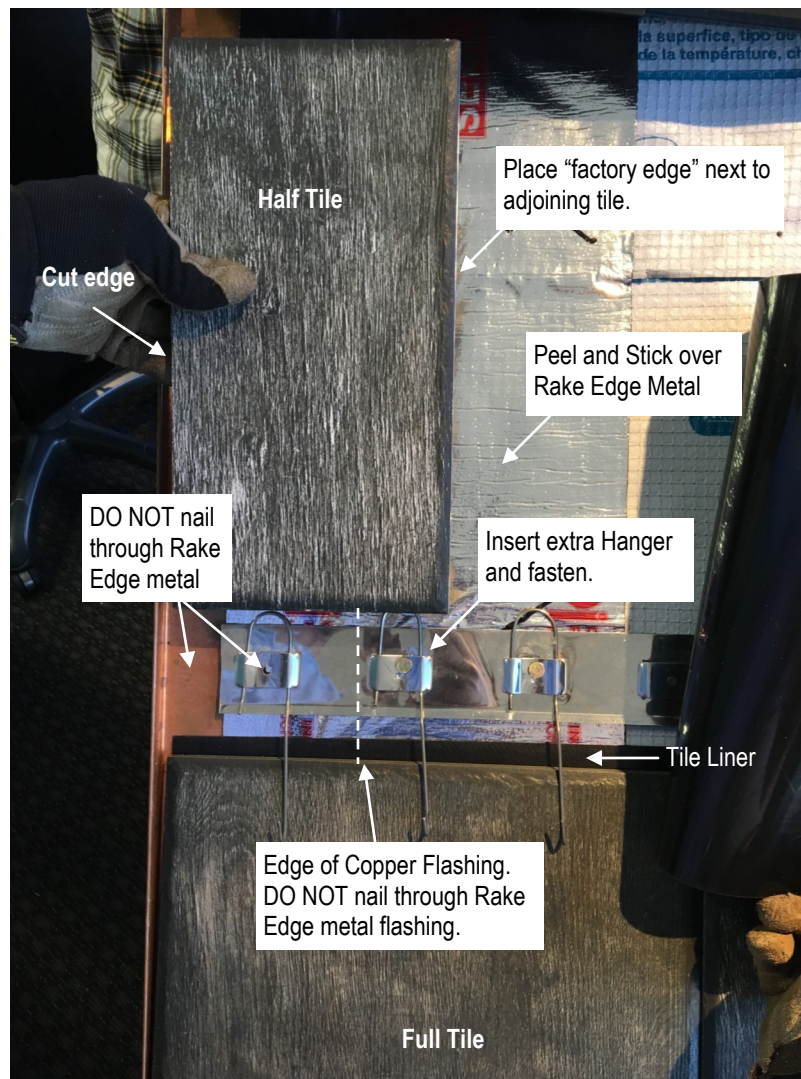
Be careful not to overextend the Hangers by pushing down more than 1".



## Installing Ironstone

### Half Tile Offset

Always have two Hangers under each tile. Add Hangers where needed



## Installing Ironstone

Four rows down from the ridge,  
work up the roof.

AFTER the roof is laid out:

### Step 1.

Start at the fourth chalk line down from the top of the ridge trim spacer/ ridge vent. Tap Hangers into the correct position (See page 14).

### Step 2.

Nail the Hangers into place. Nail at each and every Hanger.

### Step 3.

Insert Tile Liner into hangers (work in 10-12 ft. lengths overlap at side laps 12"). Keep dull side facing up, shiny side down.

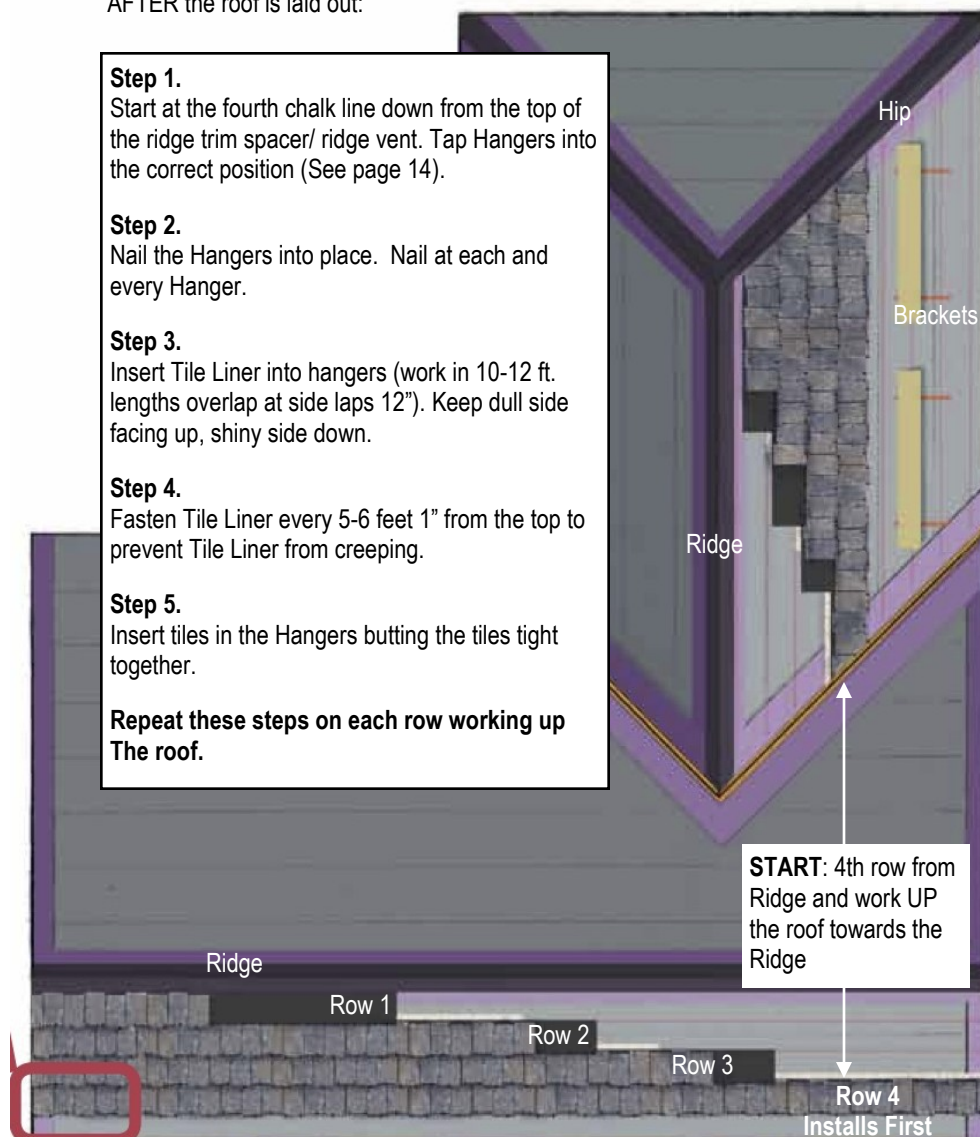
### Step 4.

Fasten Tile Liner every 5-6 feet 1" from the top to prevent Tile Liner from creeping.

### Step 5.

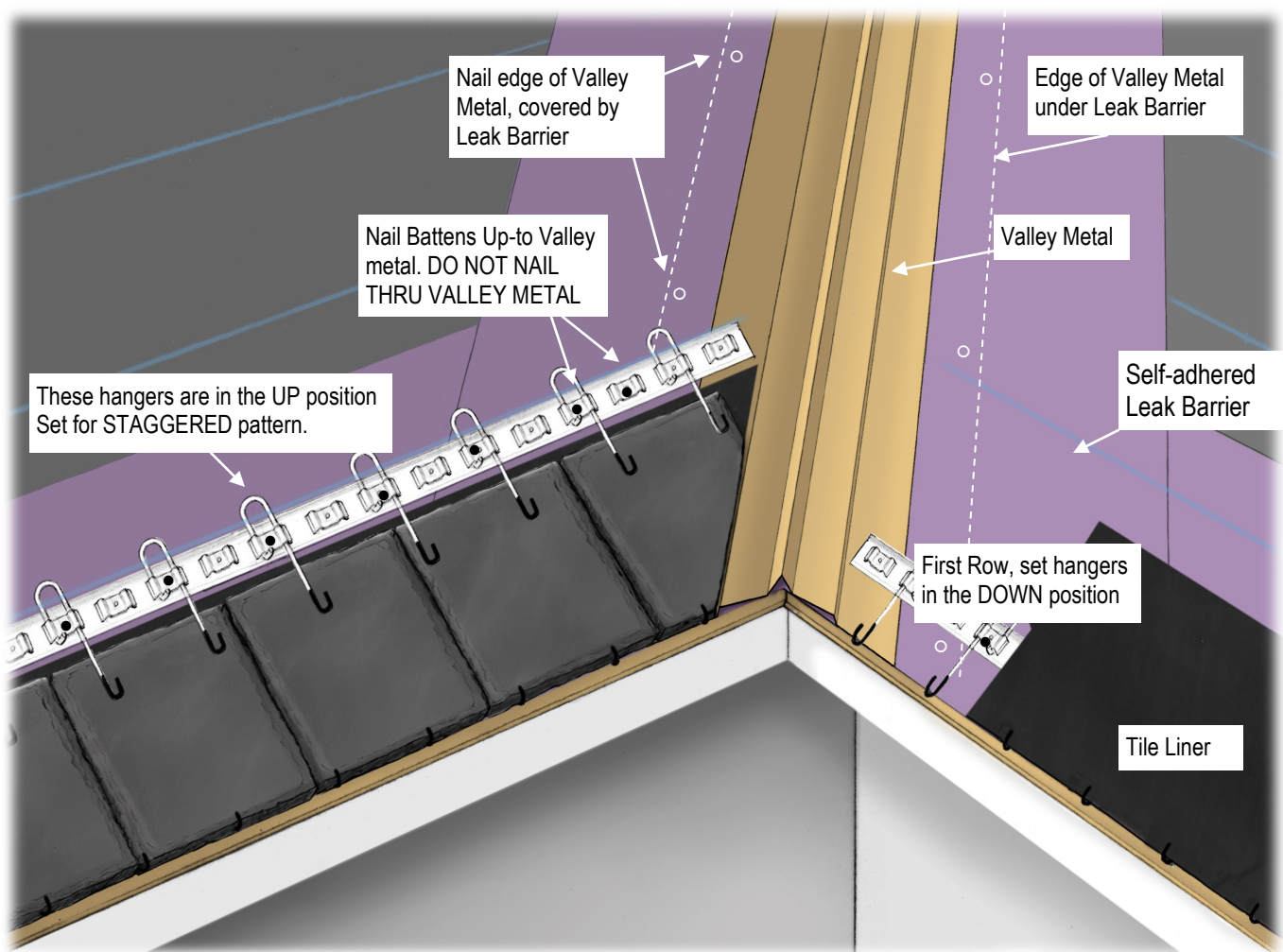
Insert tiles in the Hangers butting the tiles tight together.

**Repeat these steps on each row working up The roof.**



### Installing Ironstone

#### At the Valley





## Installing Ironstone

### Continue Installing Field Tiles

#### Step 1.

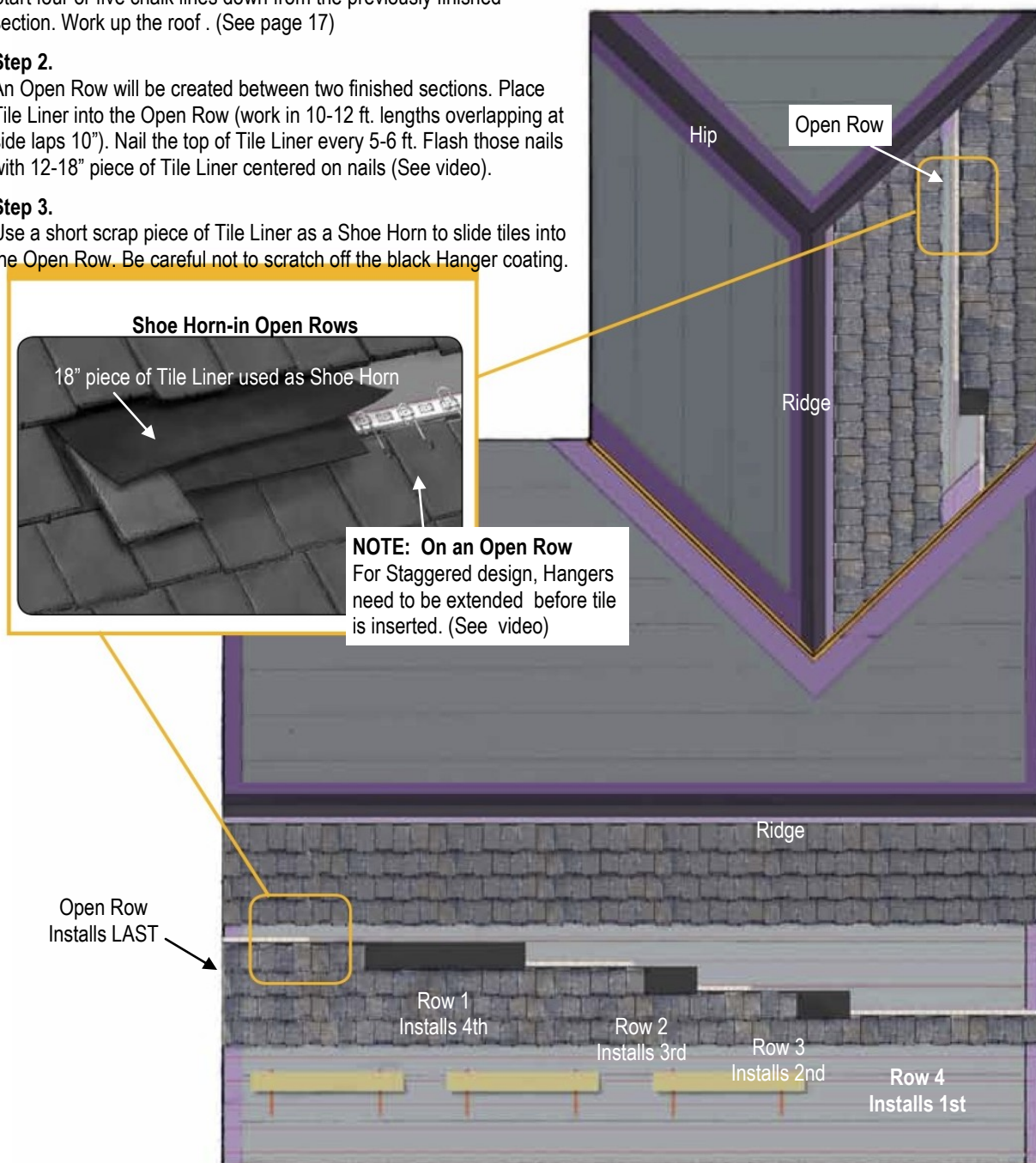
Start four or five chalk lines down from the previously finished section. Work up the roof. (See page 17)

#### Step 2.

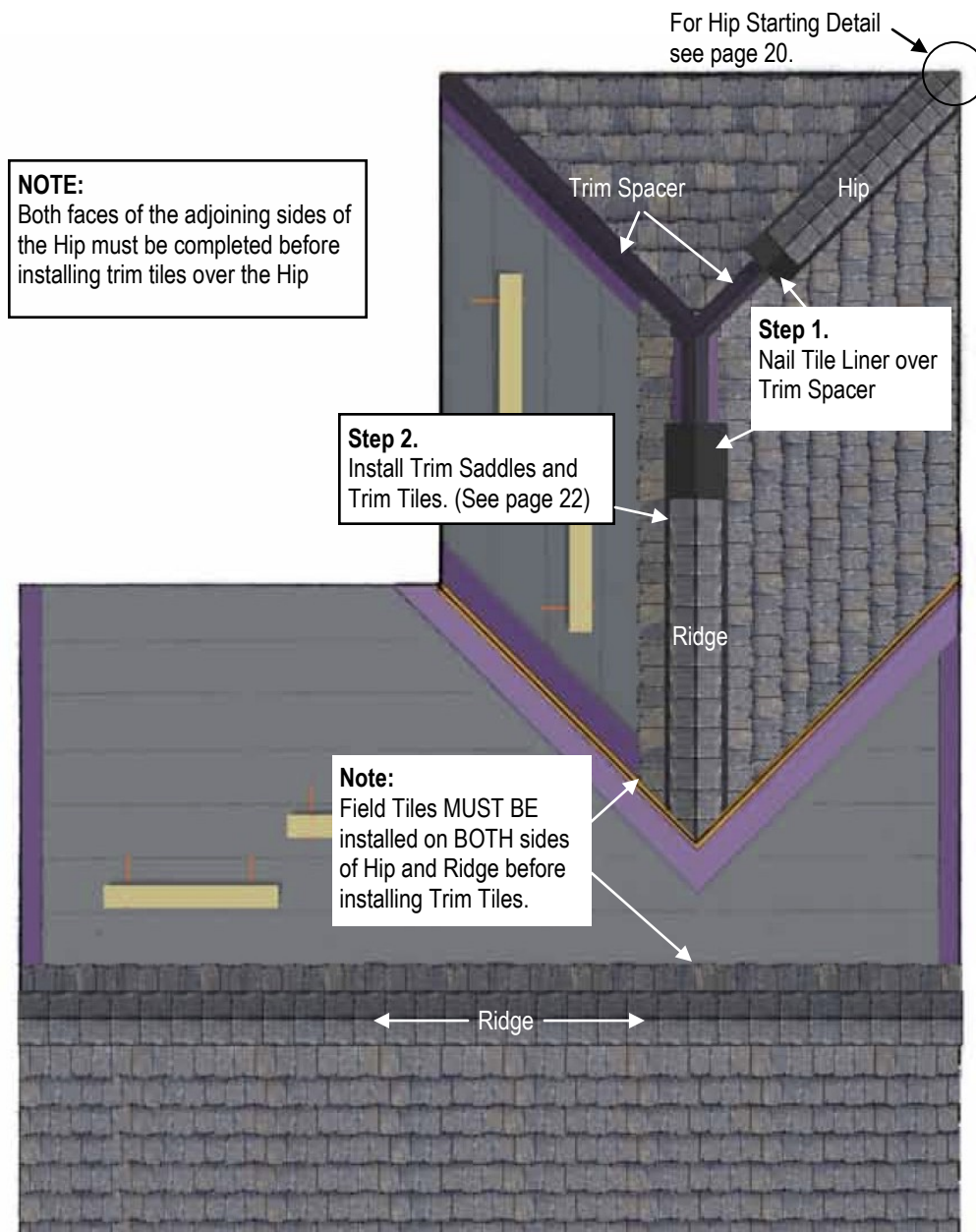
An Open Row will be created between two finished sections. Place Tile Liner into the Open Row (work in 10-12 ft. lengths overlapping at side laps 10"). Nail the top of Tile Liner every 5-6 ft. Flash those nails with 12-18" piece of Tile Liner centered on nails (See video).

#### Step 3.

Use a short scrap piece of Tile Liner as a Shoe Horn to slide tiles into the Open Row. Be careful not to scratch off the black Hanger coating.

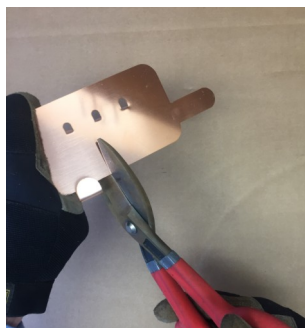


## Installing Hip and Ridge Trim Tiles



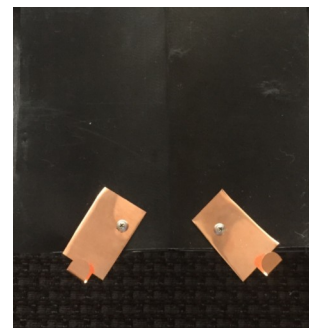
## Beginning Hips

### Modify Trim Spacer for First Tile



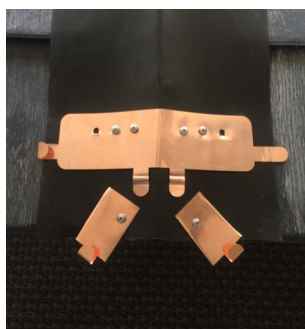
#### Step 1.

Begin at the bottom of a Hip or one end of Ridge. In workable strips of 4'-5', fold Tile Liner in half length-wise and place over Trim Spacer/ Ridge Vent. Be sure to overlap the Tile Liner a minimum of 8" at ends and fasten just enough to hold liner in place.



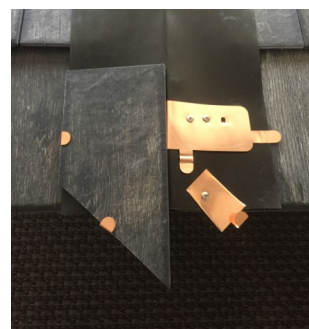
#### Step 2.

Once the Tile Liner is in place, fasten a copper Trim Saddle over the Trim Spacer or Ridge Vent using the stainless steel screws provided. Two screws each side. Use the two holes closest to top for standard Hips and non-vented Ridge. Use bottom two holes when installing Ridge Vent. Be sure screws are snug.



#### Step 3.

Place the first Trim Tile piece in Trim Saddle using the pre-bent tabs to hold the first tile in place. Place the second tile tight against the top edge of the first in an over-lapping fashion. Fold the open tab up and over the second tile securing it in place.



#### Step 4.

Fasten the second Trim Saddle like the first using the pre-bent tabs to hold the first tile in place. Fold the open tab up and over the second tile securing it in place. Be sure to use the nail hole tabs to press firmly against the previous tile. This will squeeze the tile in place and provides a "stop" to ensure correct (10") exposure on each Trim Tile.



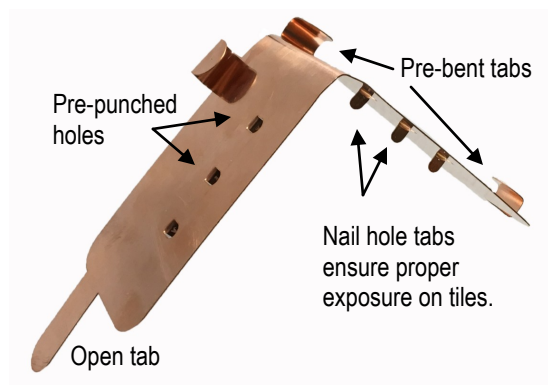
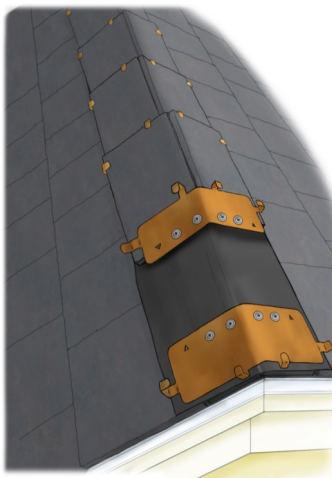
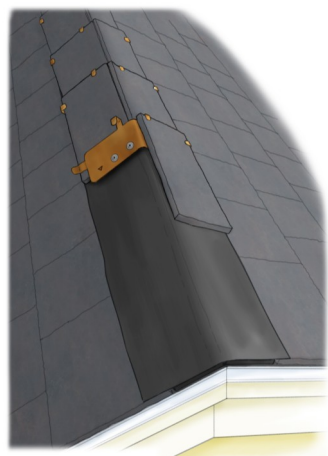
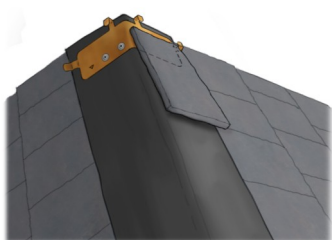
**The last or end Trim Saddle is reversed**, last Trim Tiles cut to length and installed.

When finished, trim exposed Tile Liner along the completed Ridge with a utility knife.



## Installing Ridges and Hips

### Using Ironstone Trim Saddles



#### Step 1.

Begin at the bottom of a Hip or one end of Ridge. In workable strips of 4'-5', fold Tile Liner in half length-wise and place over Trim Spacer/ Ridge Vent. Be sure to overlap the Tile Liner a minimum of 8" at ends and fasten just enough to hold liner in place.

#### Step 2.

Once the Tile Liner is in place, fasten a copper Trim Saddle over the Trim Spacer or Ridge Vent using the stainless steel screws provided. Two screws each side. Use the two holes closest to top for standard Hips and non-vented Ridge. Use bottom two holes when installing Ridge Vent. Be sure screws are snug.

**ON THE FIRST SADDLE ONLY:** Flatten the nail-hole tabs to avoid damaging the Tile Liner. (See Video)

#### Step 3.

Place the first Trim Tile piece in Trim Saddle using the pre-bent tabs to hold the first tile in place. Place the second tile tight against the top edge of the first in an over-lapping fashion. Fold the open tab up and over the second tile securing it in place.

#### Step 4.

Fasten the second Trim Saddle like the first using the pre-bent tabs to hold the first tile in place. Fold the open tab up and over the second tile securing it in place. Be sure to use the nail hole tabs to press firmly against the previous tile. This will squeeze the tile in place and provides a "stop" to ensure correct (10") exposure on each Trim Tile.

**The last or end Trim Saddle is reversed,** last Trim Tiles cut to length and installed.

When finished, trim exposed Tile Liner along the completed Ridge with a utility knife.

Continue working up the roof in 4-5 row sections.

Once a section is complete, move DOWN the roof 4-5 chalk lines to begin another section and work UP the roof.

