



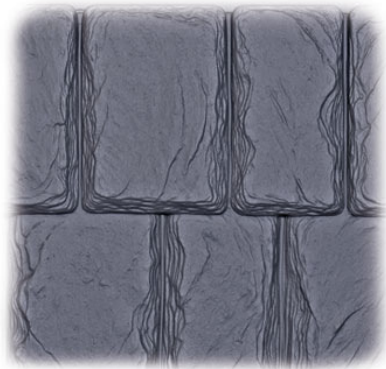
# INSTALLATION MANUAL

ICC # ES-ESR-1874

January 2009



**Nu-Shake**



**Nu-Slate**

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***For more information or further assistance, please call:***

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## Abbreviated Instructions

1. Prepare the roof:
  - a. Repair any structural damage to decking, rafters, fascia, etc.
  - b. Cut back asphalt shingles even with the deck along the gable ends when doing an overlay.
  - c. Install drip edge.
  - d. Cut in ridge opening vents when required.
  - e. Before installing underlayment, put down 2X2 wood running boards on hip and ridge lines and cover with underlayment you will use the 2x2 to screw hip and ridge caps in place.
2. Install starter edge metal.
3. Prepare valley metal and install.
4. Plan all transitions and intersections.
5. Install all flashings required for double flashing.
6. Install starter panels using appropriate stagger and directions.
7. Install panels.
8. Install primary flashings.
9. Install hips.
10. Install rake caps.
11. Install ridge caps.
12. Finish valley termination.
13. If using roof staging brackets, remove carefully.

# Recommended Installation Procedures

## Decking New Construction

Decking should conform to your city code specifications. The deck should be securely fastened to the roof structure. Any type of roof insulation, such as wood fiber, foam, fiberglass or perlite, which is used on roof deck, insulation must be sandwiched between existing deck and new installed deck. Extreme care must be used to eliminate the possibility of tearing the felt before, during and after installation.

## Decking/Re-roofing

**Check your local building codes** to determine if an existing roof must be removed. All re-roofing projects must be free of loose or buckled shingles and protruding nails. Trim back all old roofing that hangs over fascia boards to be even with roof decking at all eave and gable locations. This system should not be installed over cedar shake. Your contractor can determine the suitability of other roofing materials for roofing over.

## Underlayment

Install 1 layer of 30 pound roofing felt or PALISADE™ Synthetic Underlayment ([www.sdp-products.com](http://www.sdp-products.com)) or code equivalent to 36 inch wide non-perforated over entire roof area over plywood deck. If using non-ASTM felt, we recommend two layers of 30# felt for longevity. This is done for all installations, both new and re-roof. Underlayment must extend 12 inch past ridges, hips and valleys from both sides of the roof, unless ridge vent is to be used. Where ridge vent is used, trim underlayment even with top of decking. Lap underlayment course at least 2 inch on side lap and 6 inch on all end laps. All end laps must be staggered at least 3 feet apart. Where temperatures fall to 15°F or lower, seal all joints on eave overhang plus 4 feet beyond exterior wall line or use one layer of self-adhesive Ice & Water Shield extending 2 feet beyond exterior wall line.

## Pitch

Minimum pitch for normal installation of ArmorLite Roofing panels should be 4/12 with no limit for maximum slope or for mansard application. For slopes less than 4/12 and greater than 2/12, a complete waterproofing membrane must be installed with proper attic ventilation, prior to ArmorLite Panels being installed.

## Fastener

Fasteners shall be a minimum No. 11 or 12 gauge, 7/16 inch minimum diameter-head corrosion-resistant roofing nails or screws. Fasteners shall be of sufficient length to penetrate into the roof sheathing or decking a minimum of 3/4 inch or through the sheathing, whichever is less. If fracturing of panels occurs when using a pneumatic nail gun in cool climates adjust pressure on gun, nail by hand or use screws to fasten panels. Screws are recommended in high wind areas and six fasteners per panel plus 2 screws on outside of water channel side of panel. When using nails stainless steel ring necked are recommended.

## Metalwork - Special Notes

The ArmorLite Roofing System is a panelized system and we recommend ArmorLite accessories to finish areas such as, starter edge, valleys and gable rakes. Metal is manufactured in 26 gauge, check with your city for their metal code. Copper flashings may be used if desired. Special care must be used in selecting the appropriate nails and/or screws to avoid oxidation.

# Simple Installation Steps

## Step 1. Drip Edge

Install a standard drip edge or special color match metal along all eaves of the roof before installing an underlayment (See Illustration 1). This is required only on new construction, when a tear off has taken place, or the existing drip edge is in "bad" condition. A new drip edge is not required on re-roofs, provided the existing drip edge is in "good" shape or pursuant to the code in your area.

## Step 2. Ice & Water Shield

Apply 36 inch continuous widths of Ice & Water Shield extending 2 feet beyond exterior wall or roof area where ice damming may occur.

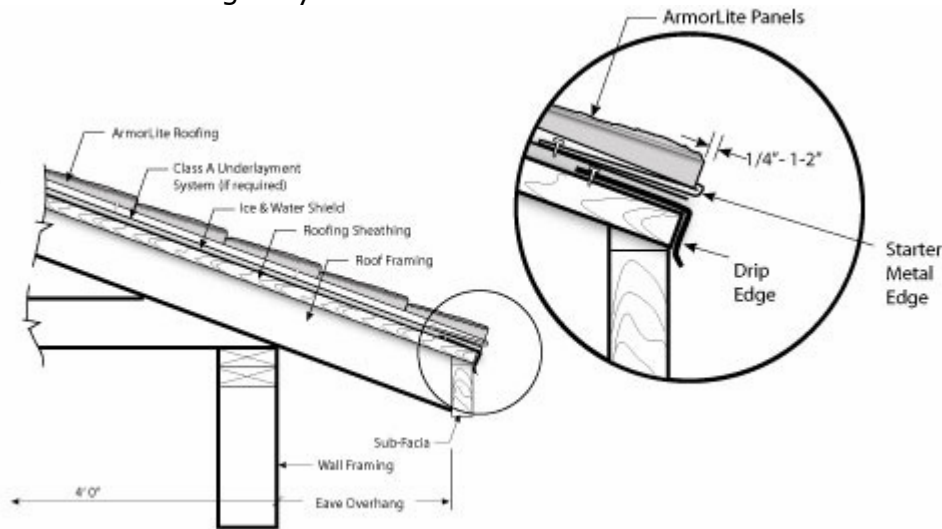


Illustration 1 – Water & Ice Shield

## Step 3. Fire rating

1. **Class "A"** - Install 1 layer of 30 pound roofing felt or PALISADE™ Synthetic Underlayment ([www.sdp-products.com](http://www.sdp-products.com)) or code equivalent to 36 inch wide non-perforated over entire roof area over plywood deck. If using non-ASTM felt, we recommend two layers of 30# felt for longevity over ½ inch DensDeck.
2. **Class "A"** - When installing over existing asphalt roofs use 1 layer of 30 pound roofing felt or PALISADE™ Synthetic Underlayment ([www.sdp-products.com](http://www.sdp-products.com)), or code equivalent to 36 inch wide non-perforated over entire roof area.
3. **Class "B"**- Install recommendation 2 layer of 30 pound felt or equivalent, over 1 layer of G3 Type Cap Sheet or equivalent
4. **Class "C"** - Use 1 layer of 30 pound roofing felt or PALISADE™ Synthetic Underlayment ([www.sdp-products.com](http://www.sdp-products.com)), or code equivalent to 36 inch wide non-perforated over entire roof area.

## Installation of DensDeck®:

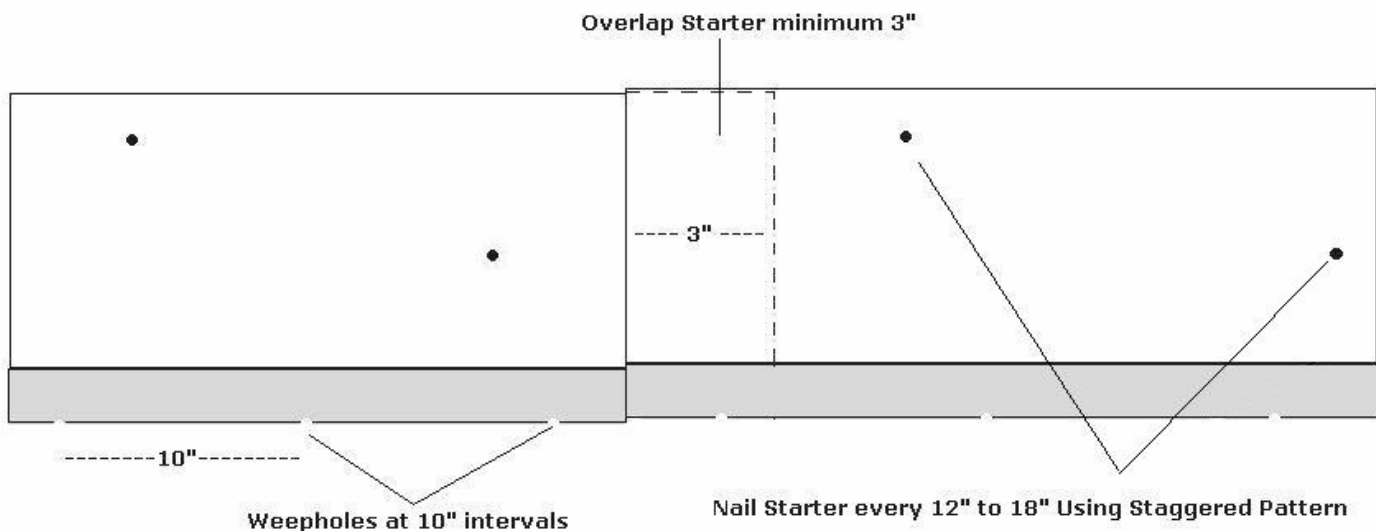
When installing DensDeck as a double fire barrier in a Class A roofing system use the following instructions:

1. DensDeck should be installed with ends and edges butted tightly;
2. Edge joints should be located on, and parallel to, deck ribs. End joints of adjacent lengths of DensDeck should be staggered; and
3. Fasten DensDeck with screws or nails as per manufacture's instructions, to secure in place to plywood.

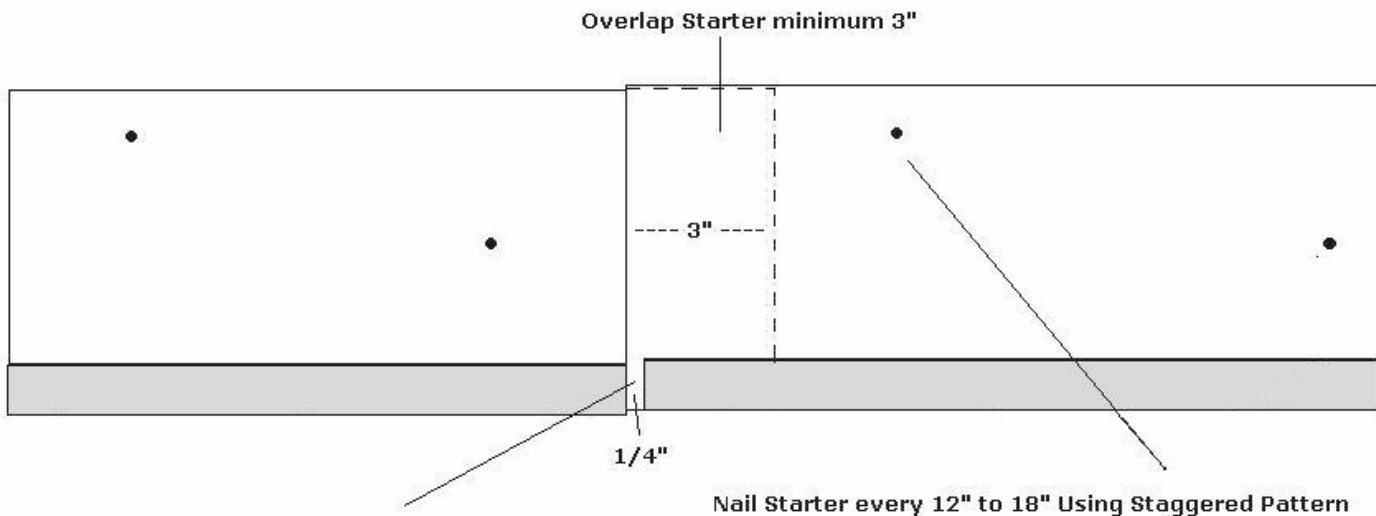
### Step 4. Starter Metal and drip edge

Installer must use ArmorLite starter metal or similar type trim (see Illustration 2). Install starter edge metal and Nail starter in place every 12 to 18 inches staggered along top edge and cover each nail head with silicon. ArmorLite starter trim is available in 10 foot lengths, and is designed to work with ArmorLite panels. Overlap at each butt joint to allow a continuous look.

Starter Metal Application With Weepholes



Starter Metal Application No Weepholes



Leave a 1/4 to 1/2 inch gap at each butt joint to allow any water to escape.

Illustration 2 – Starter Edge Metal

## Step 5. Hip & Ridge Caps

1. Begin at the lowest point of hip at eave.
2. Install one hip starter and cover the entire exposed roof deck without extending too far over joining eaves (making sure there are no openings exposed underneath hip starter) and fasten with non-corrosive screw at pre-drilled hole at each side of the hip cap. Square head drive seems to work best.
3. Install succeeding hip and ridge caps by over lapping installed hip and ridge cap and interlocking the back of prior cap and the front of the overlapping cap and fasten securely into place with a non-corrosive screw where the pre-drilled hole at back top of each cap into the 2x2 below.
4. Continue installing hip and ridge caps over the entire hip or ridge as explained in line #3.

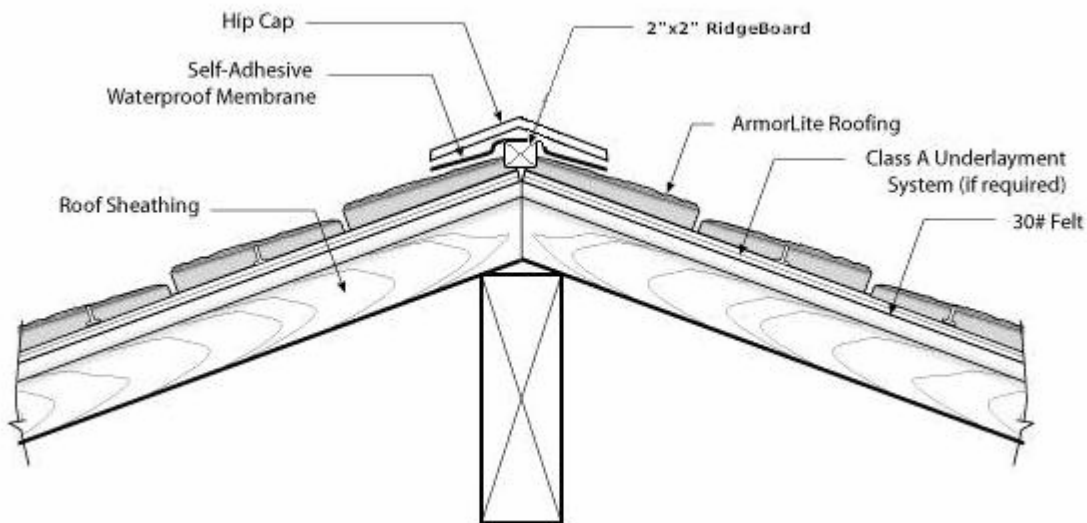


Illustration 3 – Hip & Ridge Preparation  
Cross Section of Hip or Ridge

**\*Note:** ARMORLITE HIP & RIDGE CAPS ARE DECORATIVE ONLY. THEY SHOULD NOT BE WALKED ON.

ArmorLite Hip & Ridge Caps should be installed working toward the prevailing wind.

90° Hip and Ridge caps should be used when pitch is 8/12 and higher

135° Hip and Ridge caps should be used when pitch is 7/12 and lower

### For ridges with gable end

1. Begin at gable end.
2. Install Rake caps using the pre-formed rake cap setting flush with fascia board and fasten securely into place with non-corrosive screw where pre-slot is located only screw cap into fascia board not into top panels on the deck. Interlock next cap into back of prior cap and repeat fastening.
3. Continue installing hip and ridge pieces over the entire ridge in same fashion as explained in line #2.

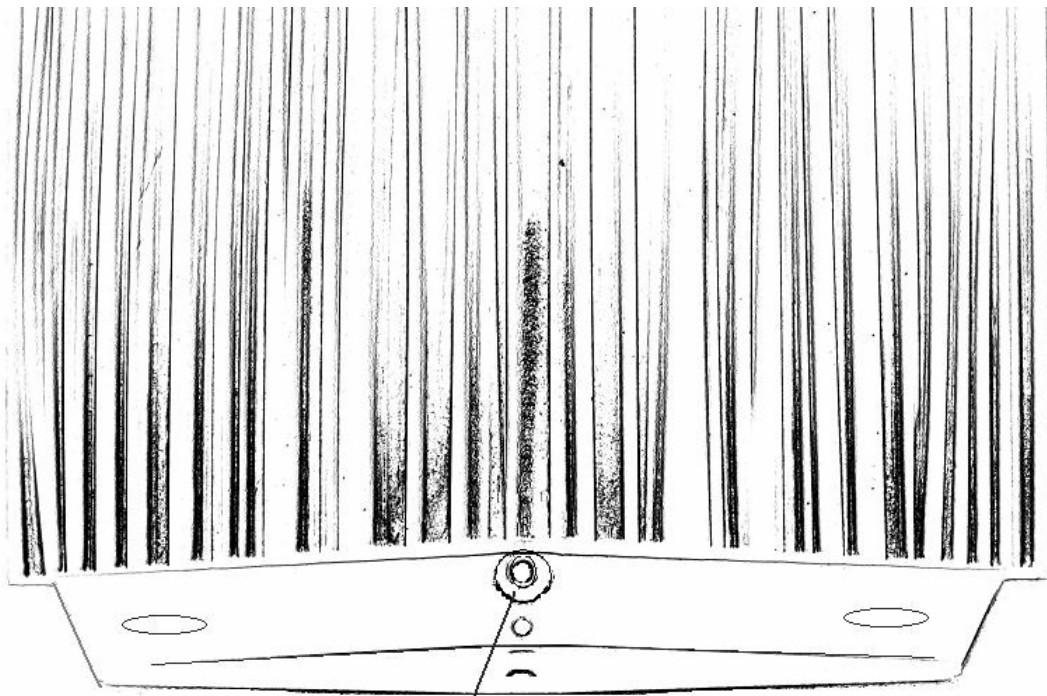
### For ridges with hip intersection

1. Begin at hip intersection.

2. Install hip and ridge at hip intersection by trimming both front side hip and ridge edges to conform to hip intersection. Using pre-painted sheet metal or water proof material, to cover open area where ridge cap and hip intersection meet. Fasten trimmed hip and ridge piece securely into place with a non-corrosive screw.
3. Install succeeding hip and ridge caps by over lapping installed hip and ridge cap by interlocking back of prior cap to front of the next cap fasten securely into place with a non-corrosive screw where the pre-drilled hole at back top of each cap into the 2x2 board below.
4. Continue installing hip and ridge caps over the entire in same fashion as explained in line #3.

### **Rake Installation**

1. Begin at lowest point of rake.
2. Install Rake caps using the pre-formed rake cap setting flush with fascia board and fasten securely into place with non-corrosive screw where the pre-slot is located only screw cap into fascia board not into top panels on the deck. Interlock next cap into back of prior cap and repeat fastening.
3. Install succeeding rake caps by overlapping installed rake caps by Interlocking next cap into back of prior cap and repeat fastening. Continue fastening into fascia board as explained in line #2. Cover entire rake in same fashion.



Male Interlock Ridge and Gable Caps

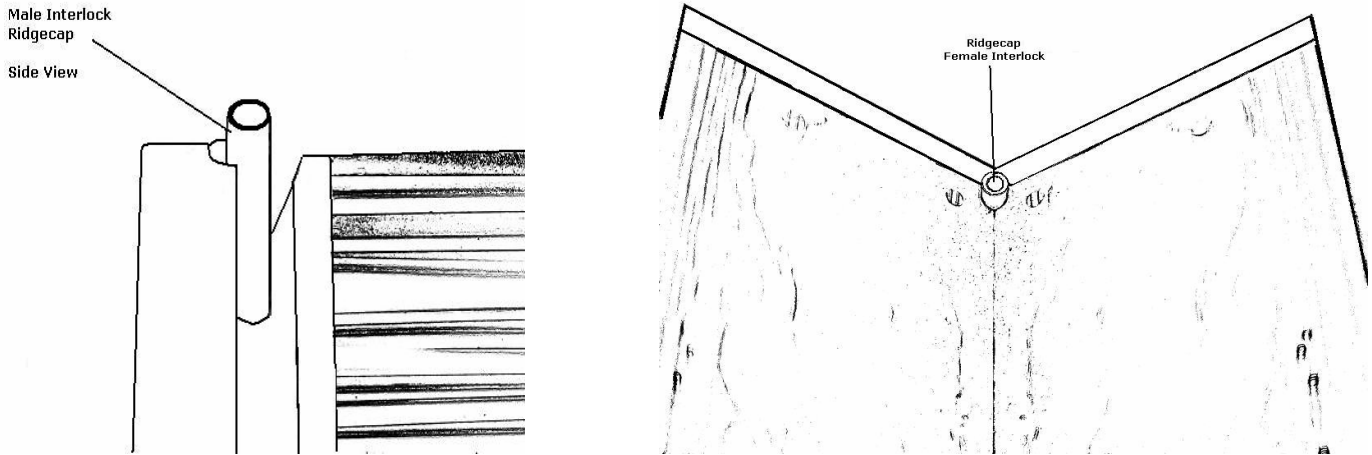


Illustration 4 – Ridgecap Interlocks

### Step 6. Valley Preparation

Valleys are first prepared by running a 36 inch width of Ice and Water Shield or equivalent down the entire length of valleys. Two layers of 30 pound roofing felt or equivalent are applied after applying the Ice and Water Shield. ArmorLite valley metal will be installed after the valley preparation is complete.

### Step 6a. Valley Treatment

ArmorLite valley metal is available in 10 foot lengths. Where two valleys meet at the peak overlap 4 to 6 inches and use a Butyl based or self adhering foil faced flashing tape to seal the two ends.

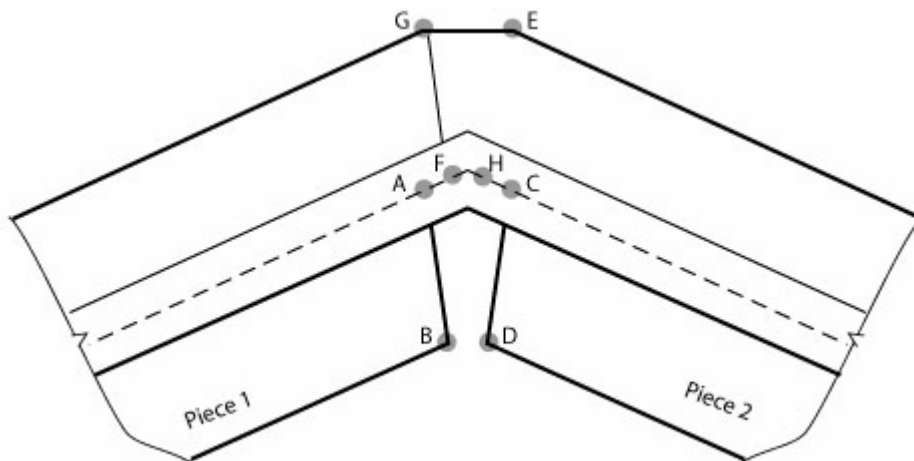


Illustration 5 – Valley Joint Overlap

- Step 1** Install 10 feet valley metal.
- Step 2** Valley metal connects for longer runs by the one end inserted to the flared end of piece 2.
- Step 3** Cut pitch angle on center "T" section of both piece 1 and piece 2, to create a mitre joint at the ridge peak.
- Step 4** Insure valley metal has not altered the roof line at either the panel line or the ridge intersections, secure the valley finisher with non-corrosive nails every 12 to 18 inches.
- Step 5** The valley intersections at the ridge intersection should now be flashed with a Butyl based tape. These should be neatly trimmed, then painted with a matching finish paint, to give the best aesthetic appearance and weather protection. The valley pans should extend over adjoining panels of eaves to insure water is carried down the roof, not under installed panels.

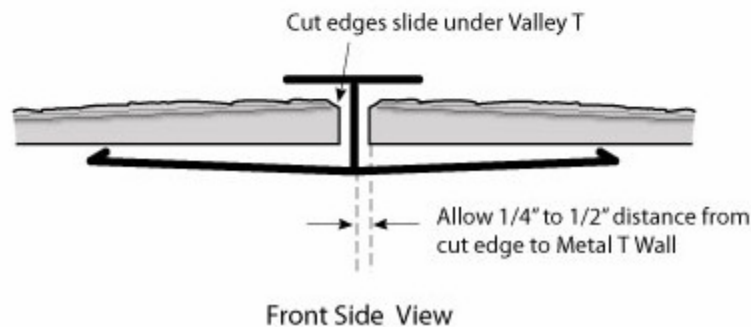
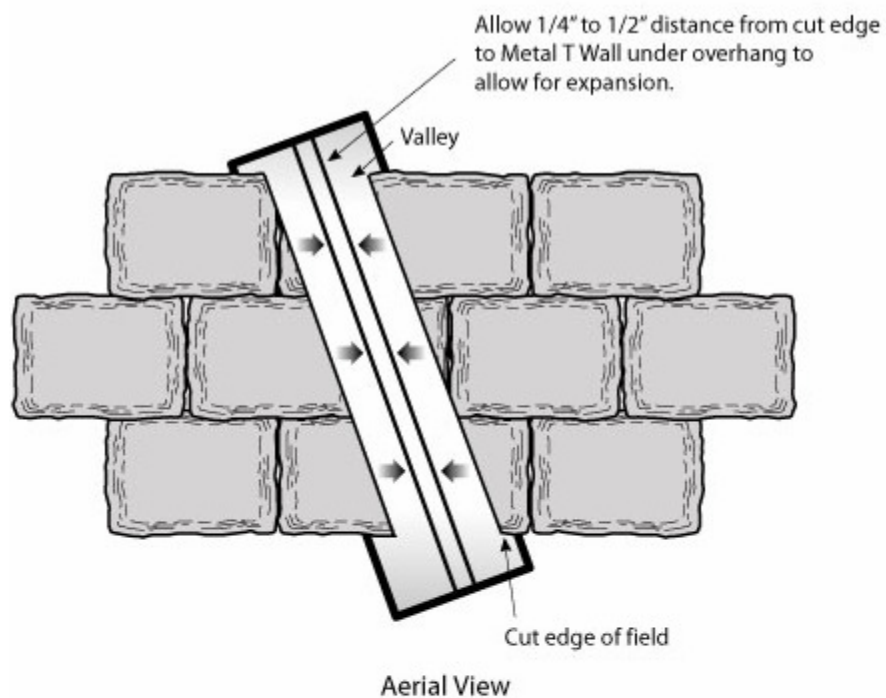


Illustration 6 – Valley to Panel Transition

- Step 1** Slide the male end of the 10 foot Valley Metal into the female end of the next Valley Metal to extend length.
- Step 2** Place the first section in the valley so that it extends at least 2 inches past the end of the valley. At the valley termination cut the valley to match the roof edge line. The bottom of the flashing should extend to the drip edge and rest on, but not in, the drip edge. Neat, clean trim lines will enhance the appearance of your installation, adding value and quality to the ArmorLite roof.
- Step 3** At lower end of valley, cut "T" and bend to form bull nose.
- Step 4** When installing valley, plan the ridge cap run from the intersection for the best appearance and weather protection.

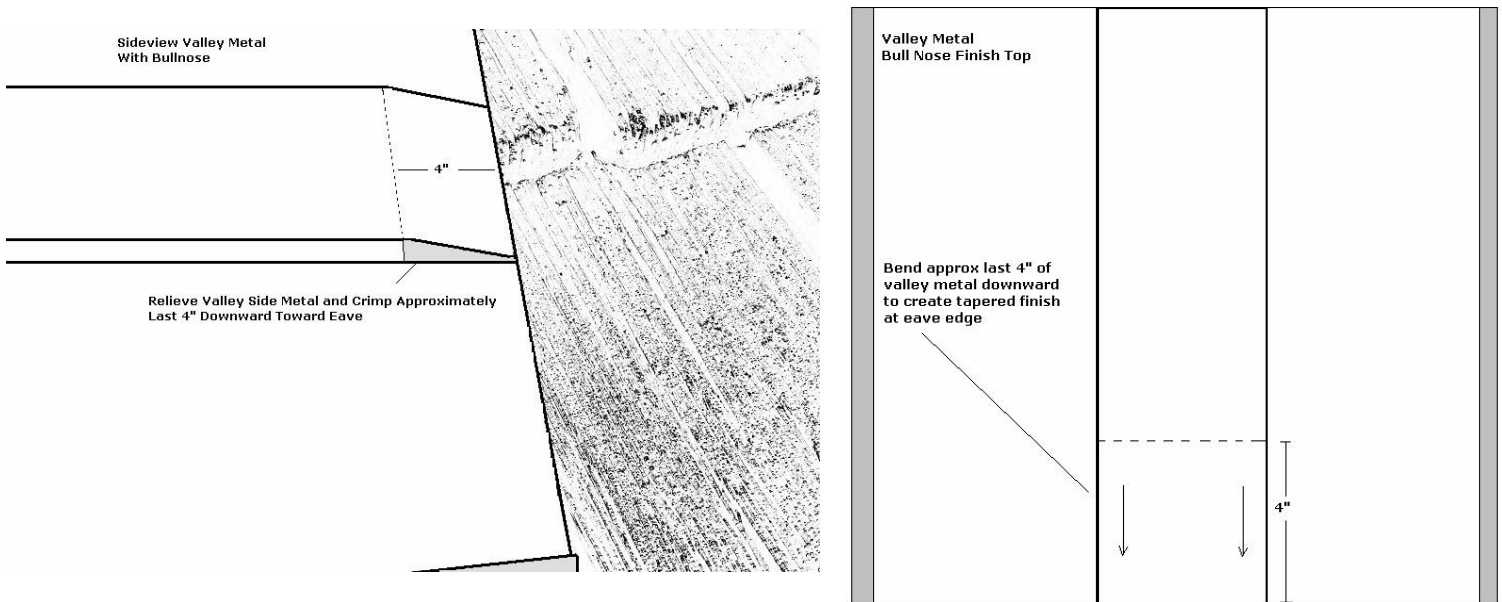


Illustration 7 – Valley Metal Bullnose

## Step 7. Panel Installation

Panels should be installed from right to left. Begin at the lowest corner of each surface to be covered. Each panel course must be offset, using the engraved cut line number. The order of use is engraved on the panel (see Illustration 9). ArmorLite Roofing panels utilize an interlock system which holds each panel to the panel(s) below and to the side of it. During installation, slide panel downward with a slight forward pressure into continuous receiving groove. Make absolutely sure that the panel's lower tongue is completely seated in the receiver groove of the lower course. A properly seated panel will have the left nailer hole in or above the right nailer hole on the side lapped panel. (See Illustration 8) If the nail hole is below the right nailer hole there is a misalignment that must be corrected. Do not nail if the nail hole is below the lapped right nailer. If fracturing of panels occurs when using a pneumatic nail gun in cool climates adjust pressure on gun, nail by hand or use screws to fasten panels. (Use 4 to 6 nails per panel)

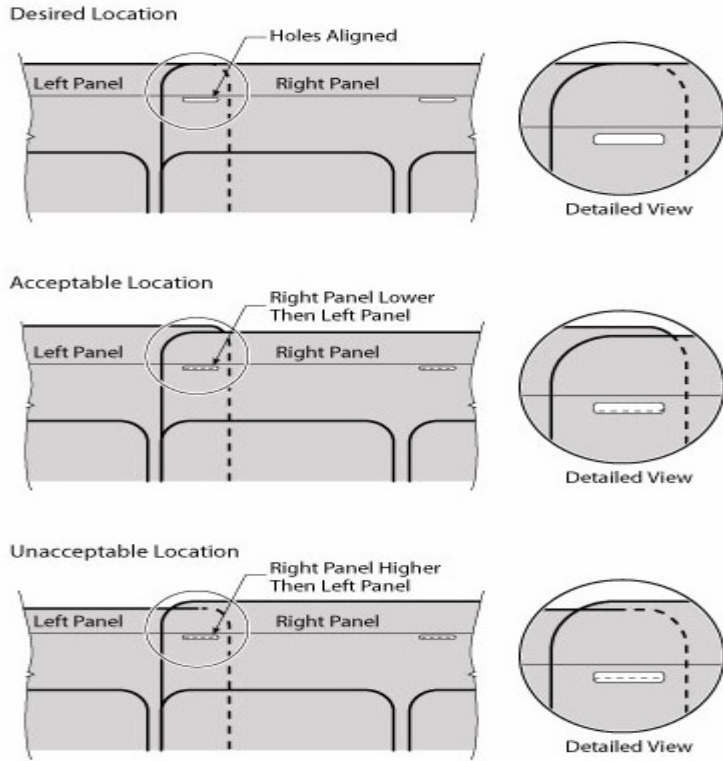


Illustration 8 - Panel Lap Method

Illustration 8 demonstrates the proper location of panels for installation. Adhering to these positions is extremely important, as this pattern insures the continued parallel installation of panels.

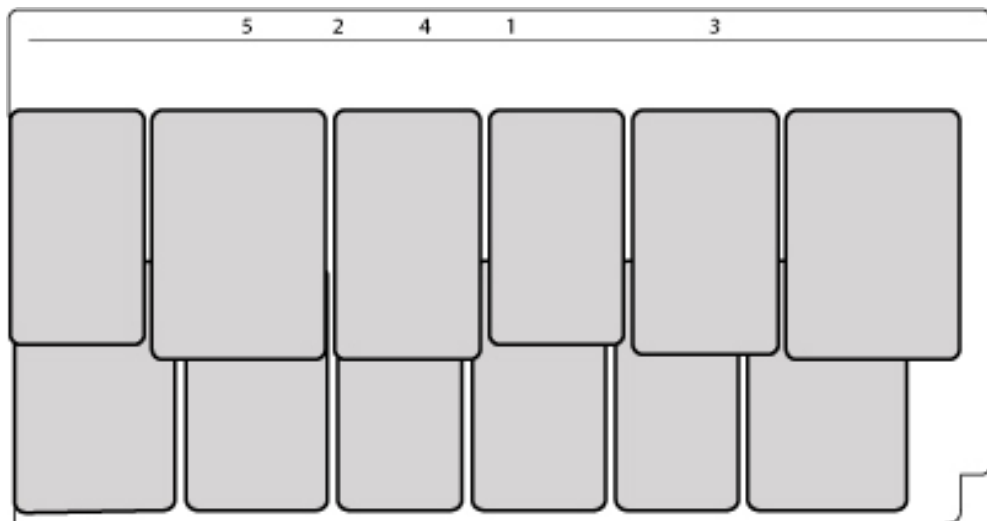
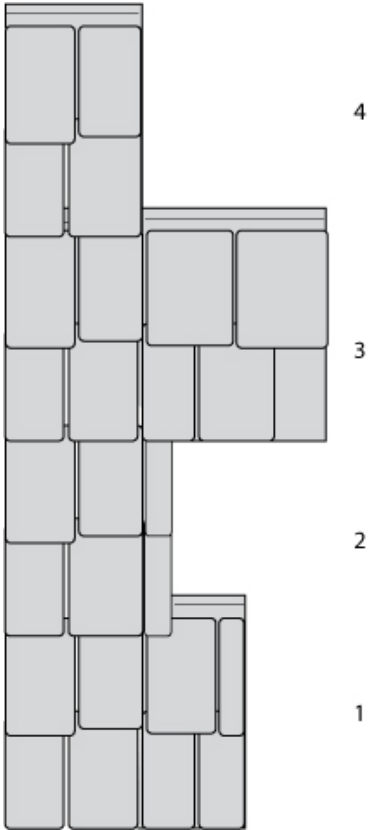


Illustration 9 - Starter Panel Cut Pattern

The first course panel would be cut at line 1, the second vertical panel would be cut at line 2, and the third vertical panel would be cut at line 3, and so on through the 5th panel. At the 6th vertical panel, the cut pattern begins over again (See Illustration 10).



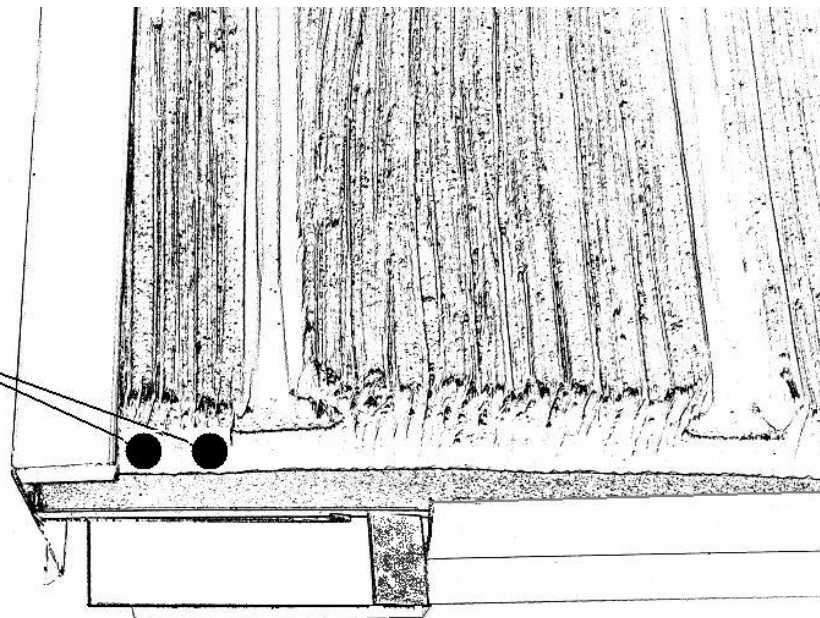
**\* Note:** The panels should not touch the gable rake, or valley when installed. They should have approximately 1/4 to 1/2 inch gap between end of panel and the metal. This will allow for expansion and contraction of the panel, without affecting the metal. In addition to this gap, the first nail should be placed to the side of the first slot farthest from the metal.

Fasteners shall be a minimum No. 11 or 12 gauge, 3/8 inch minimum diameter-head corrosion-resistant roofing nails or screws. Fasteners shall be of sufficient length to penetrate into the roof sheathing or decking a minimum of 3/4 inch or through the sheathing, whichever is less.

Illustration 10 – Left to Right Stagger Shake or Slate Pattern

Weep Holes End Panel with Gable Metal

Drill 3/8" weep holes in end gable panel to allow for moisture to be relieved



## Step 10. Vent/Pipe Flashing

Standard roofing practices should be adhered to when waterproofing vent pipe projections. We recommend all stacks should be flashed with lead plumbing or double flashed with galvanized flashing. Lead flashing should be cut to fit tightly against stack and then sealed with rubber or lead grommet and sealed with GE Silicone caulking or equivalent. Turn up edge on both sides and top of flashing. When the panel receiver is cut then the receiver needs to be chalked to dam water.

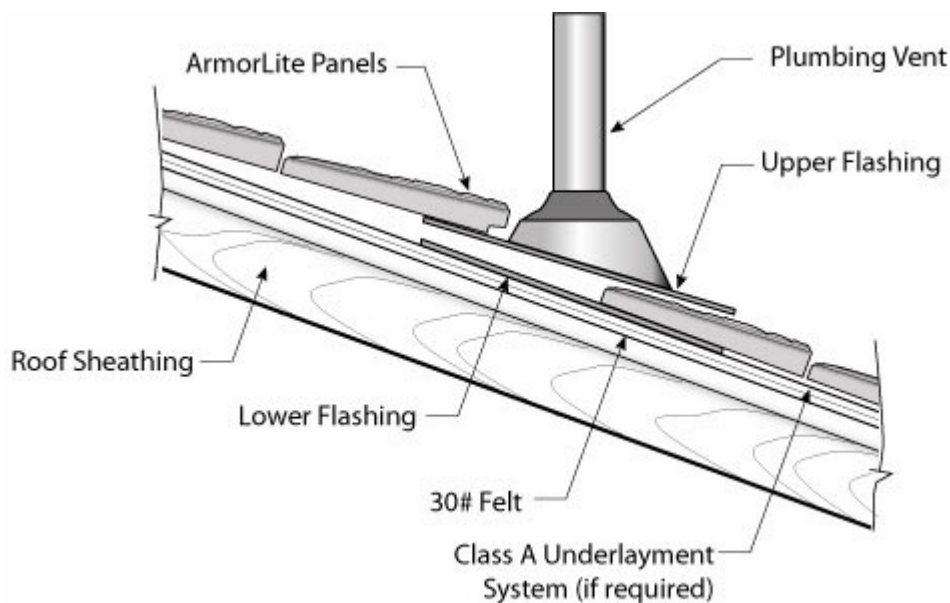


Illustration 12 – Double Flash Vent Pipe

### Step 10a. Vent/Pipe Procedure in middle of double panel

Use same procedure as above using pre-tapping screws. If air vent falls in the middle of a double course a pre-formed pipe flashing should be used as additional protection. This flashing can be screwed to the ArmorLite panel, without penetrating the roof decking, and all heads sealed with caulking. All screwed holes into any panel, ridge cap, hip cap, or metal must be predrilled. Do not penetrate through the decking with screws.

## Step 11. Intersecting Roof Pitches

Where two pitches intersect:

- A. Identify where the panels from both roof planes must align to carry one joint line horizontally across the roof (such as the course running across dormer ridges).
- B. Begin on the lower section of the main roof and install panels up to the first course line that will run continuously across the roof.
- C. The distance from the course joint line must be measured to the transition and the first panel.
- D. The transition should be flashed with rolled lead to form an under/over closure.

\*Note: Not recommended on pitches less than 4/12. Attention must be paid to how the Ice and Water Shield or equivalent is flashed under the steeper sloped section. In an over lay installation, this will require the old roof to be stripped to the deck for a distance of 8 inches minimum above the slope change. Therefore, the Ice and Water Shield can extend above the transition, and the new felt can lap over this extension.

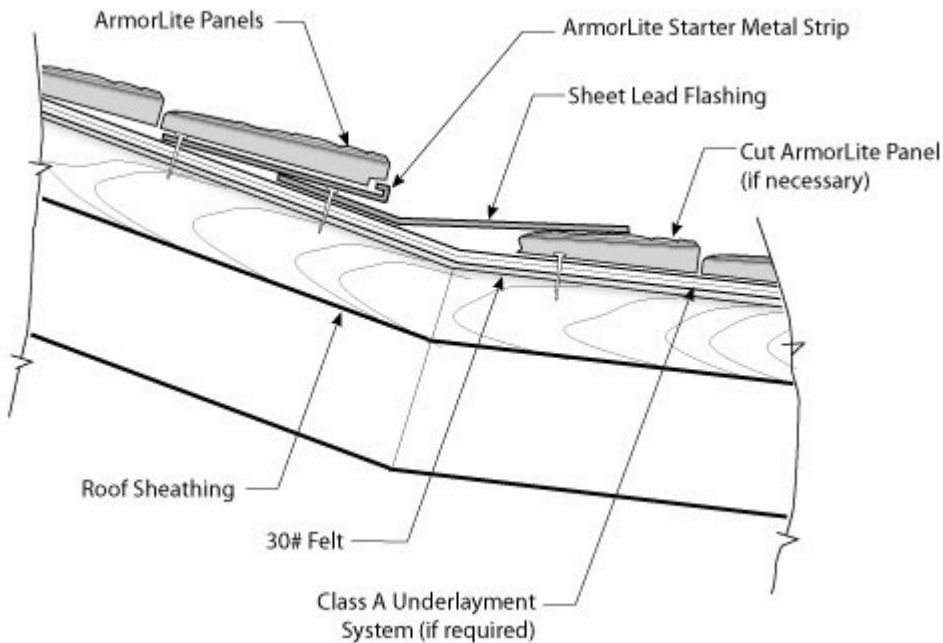


Illustration 13 – Intersecting Roof Pitches

### Step 12. Eave Differences

Where adjacent eave lines may be off by 1/2 to 1 inches, strike a horizontal line across the areas where the panel lines must converge and adjust any differences by moving the Starter Edge Metal up or down between the eaves to take out the differences.

# General Information

## **A. Roof Staging Bracket - When using roof staging bracket:**

1. Relief for the staging must be cut in the tongue. The cut should be wide enough to allow the lateral shift required to remove the staging bracket.
2. The base of the staging bracket should rest on protectors placed on the staging bracket or the panel.
3. Remove the staging bracket carefully; avoid jerking the staging down, catching the panel with the anchor slots, or damaging the panel face.

## **B. Repair or Replace Panel:**

1. Flex panel to be replaced to disengage from front interlock.
2. Slide crowbar under raised panel. Sever panel from nails at top of panel.
3. After removing panel insure that all broken panel pieces are removed.
4. Take new panel cut opening at existing nail slots. This will allow existing nails to slip into the openings created.
5. Interlock back panel and flex the front of the panel to slip into front interlock.

## **C. Tools:**

1. 3 ½ to 7 ¼ inch circular saws. (Worm drive saws are sometimes easier to use because the weight keeps the panel from jumping)
2. Metal snips.
3. Carbide blade reversed for aluminum and plastic.
4. Hole punch or drill.

## **D. Materials:**

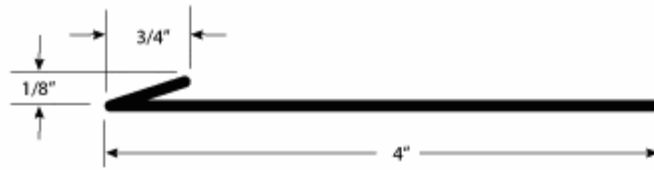
1. Underlayments
2. GE Silicone Chalking or equivalent
3. Butyl flashing tape

## **E. ArmorLite Roofing Parts List at Job Site:**

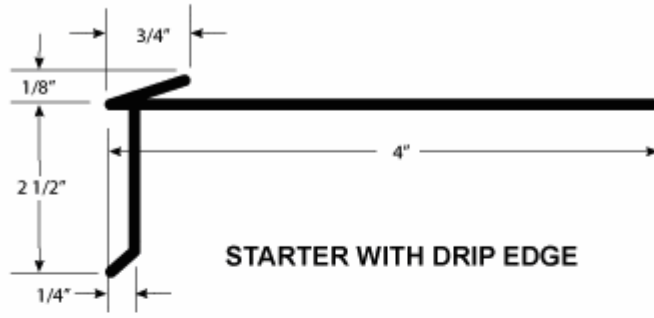
ArmorLite Panels  
Starter Metal-10 feet  
Drip Edge- 10 feet  
Valley Metal- 10 feet  
Rake caps  
Ridge/Hip caps

## **Contact:**

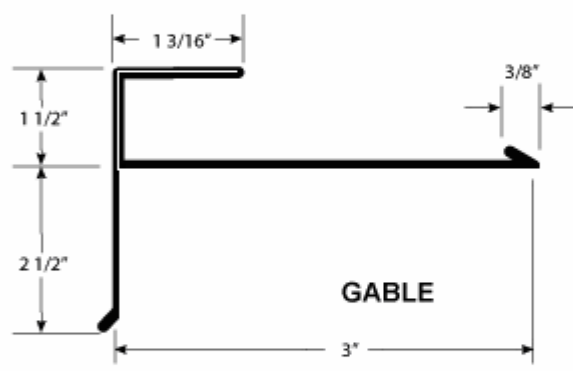
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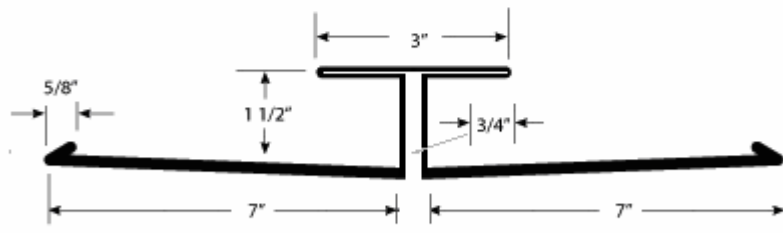
**STARTER**



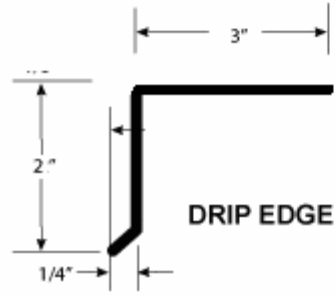
**STARTER WITH DRIP EDGE**



**GABLE**



**VALLEY**



**DRIP EDGE**

Illustration 14 – ArmorLite Metal Specifications