



## **B.U.R., Modified, & Steep Slope Roofing Systems**

### **7. Steep Slope Roofing Systems**

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### 7.1 HANDLING & STORAGE REQUIREMENTS

The following is a list of Malarkey basic requirements for handling and storing of shingles.

Unload, handle and store all roofing products and construction materials with care.

Check all packaged materials delivered to the work site for damage. If any material is damaged, contact your roofing products distributor to resolve the issue. All damaged material (this does not include damaged packaging with undamaged shingles and/or ridge products) must be removed and replaced. Malarkey will assume no liability for damaged material once it has been released from Malarkey's manufacturing or warehouse facilities.

Protect all roofing materials and construction products from weather before, during, and after delivery.

Never double stack the pallets of laminate shingles.

Protect any roll goods, adhesives, and coatings from freezing.

When roof top loading shingle materials make sure that the staging area is structurally sound, able to safely store the materials, and presents no danger to the occupants or structure.

Materials stored on the roof surface shall be dispersed to avoid concentrated loading. Larger concentrations shall be set over major structural members.

### 7.2 SAFETY

Malarkey recommends that all applicable safety standards and good roofing practices are followed.

Refer to OSHA's guidelines for Residential Fall Protection.

All roofing and construction personnel are responsible for their own safety on the work site, as well as those around them.

Roofers should always wear and maintain their Personnel Protection Equipment (PPE) when handling or installing components of the roofing system.

Keep the roofing and staging areas clean.

All roofing personnel must be properly trained to operate and install roofing systems safely and effectively.

All roofing and construction materials should be stored and protected in a manner as not to endanger any workman, personal property, occupants and contents of the building that is being roofed.

Always keep first aid kits, emergency telephone numbers, escape routes and area maps to emergency facilities in a place that is easily located.

Thoroughly train all personnel in first aid procedures.

Properly store and handle flammable materials.

Only use flammable materials in safe, well-ventilated areas.

Maintain and service all ladders, and roofing equipment.

### 7.3 GENERAL REQUIREMENTS

Asphalt shingles are to be used on steep slope roof decks and only in areas that are approved by state and local building codes as an acceptable roof covering over the building that is being roofed.

Steep slope roof decks are decks that have a slope of at least 2" of rise per 12" of roof span.

Underlayment type and the installation guidelines will vary based on the amount of roof slope and the geographic location. Install the underlayment according to the installation instructions located on the shingle wrapper.

The type of shingle and the installation guidelines for the shingles will vary based on the amount of roof slope, geographic location, and time of year of the installation. Install the shingles according to the installation instructions located on the shingle wrapper.

In geographic regions that have the possibility of Ice dams (i.e. areas with January temperatures of 30 degrees or less), installation of an ice & water shield, compatible with asphalt shingles is recommended. The installation of the ice and water shield must comply with all state and local code requirements.

Fastener placement and number of fasteners used per shingle will vary depending on geographic locations, and local code requirements. All fasteners must be placed as outlined in the installation instructions located on each of the shingle wrappers.

All Malarkey 3-tab shingles are 1 (one) meter long, with an exposure of 5-5/8".

All Malarkey laminate shingles are 40" long.

Install all shingles with a minimum offset of 5-5/8". Any deviation of the printed installation instructions may void your material warranty.

Malarkey assumes no responsibility for color variations. The color granules embedded in the shingle are subject to variation absorption and reflection of light. This may cause apparent variations in color shade, but in no way affects the durability of the shingle.

Roofers installing Malarkey shingles should use good judgment when installing in extreme cold or hot periods of the year.

Cold temperatures can cause asphalt shingles to freeze together in the bundles, making them hard to handle and install.

Cold temperatures may not allow the shingles to seal on their own until the following spring or summer. During that time, contamination of the thermal sealant may prevent the shingles from sealing on their own. Malarkey requires hand sealing (see 7-I and 7-L) when installing in cold temperatures.

Hot weather elevates the surface temperature of asphalt shingles, bringing it close to the asphalt softening point. Normal roof top traffic during the installation of shingles can result in foot prints, drag marks and scarring. This damage is basically the asphalt and granules scraping away from the fiberglass mat.

Roofers should start in the morning at the side of the roof that is not in the direct sunlight. As the sun rises and the temperatures rise, the section that they started in is usually completed. When the temperatures get to a point where even the lightest roofer is causing damage, stop working in that area and work in an area that is not in direct sunlight.

When installing SBS shingles only open a bundle at a time. Some roofers like to open several bundles, laying them out for easy reach and quicker installation. Having the shingles exposed to direct sunlight and hot temperatures, softens the shingles. The white plastic wrappers keep the shingles a lot cooler than having them directly in the sun.

Roofers should try to keep their feet flat and limit the amount of kneeling on the installed shingles. When a roofer is kneeling, he shifts his weight from his knees to his feet. The front of the foot is dug into the shingle, causing a twisting of the SBS compound.

Try wearing flat soled shoes. Shoes with an aggressive tread design like cross training and heeled work boots will dig into the SBS compound. Make sure that you choose a type that is accepted by your company's safety officer.

Don't leave scrap or cut shingles spread throughout the roof. Set a few wrappers out to place your cut pieces in. This limits the amount of foot traffic when you clean the roof and also the sticking of scraps to the finish roof.

## 7.4 WARRANTY

Malarkey laminated shingles (Legacy, Northwest XL, Highlander-CS) carry a 'limited warranty' when a product warranty card is completed and returned to Malarkey Roofing Products. A confirmation letter is sent to the building owner on receipt and completion of the warranty card.

All other Malarkey products (3-Tab shingles, ridge shingles, and rolled goods) carry a 'limited warranty' when a product warranty card is completed and returned to Malarkey Roofing Products. No confirmation letter is sent to the owner for these products.

Malarkey recommends that the owner photo copy the product warranty card and all of the printed terms and conditions of the warranty and retain for his/her own record.

All Malarkey shingles and ridge products are subject to the terms and conditions of the standard Malarkey 20, 25, 30, 35, 40, and 50 year limited warranty, which excludes consequential damages and is subject to a declining pro-rated liability for the warranty period.

Refer to Malarkey sample warranties in section 8 of this manual for warranty terms and conditions.

## 7.5 DECK REQUIREMENTS

Decks must be constructed of wood, plywood, or OSB (oriented strand board) and be rated for structural use as roof sheathing or roof decking. All other decking types must be approved by Malarkey before installation to ensure that the shingles will comply and qualify for a limited material warranty.

Malarkey recommends that building permits are applied for and that the roof deck is inspected by your local building official and/or inspector to ensure compliance with local code requirements.

Malarkey shingles are approved by ICC (formally ICBO) to be installed over new and existing buildings, and also as a re-cover over an existing shingle roof.

When recovering an existing shingle roof, evaluation of the existing weight and the addition of the new Malarkey roof system, the load limitation of the roof deck and local code requirements regarding recovers must be considered.

Malarkey accepts no responsibility for roofs that are installed contrary to state and local code requirements.

Malarkey roofing products should only be installed over decks that will sufficiently support the weight of the roofing system, and transient load during the application of the roofing system.

### 7.5.1 PLYWOOD/ORIENTED STRAND BOARD (OSB)

Plywood decks are to be composed of panels made of thin wood layers, and/or veneers that are peeled from logs. The layers are then laid in right angles to each other and glued together using heat and pressure. The number of cross-laminated layers will vary depending on the thickness of the plywood.

OSB decking consists of panels made from layers of compressed, glued wood strands. These strands are oriented at right angles to one another before being glued and formed into panels.

Designers should research and specify the correct thickness of the plywood or OSB deck based upon the amount of roof load (weight of roofing materials and desired performance, etc.) and local building codes to ensure structural compliance and integrity.

Plywood or OSB panels used to create roof decks (steep and low slope) should be rated for structural use as roof

sheathing. Most building codes require labeling assuring the user that the panel complies with industry standards. Contact APA (the Engineered Wood Association, formally known as the American Plywood Association) for specifics regarding the use of plywood in construction.

Each panel shall be supported, gapped and securely nailed to all framing members per APA recommendations.

Plywood or OSB decking should be protected to prevent the accumulation of moisture on its surface prior to the installation of the roofing assembly. This is shown to be effective in reducing delaminating, dimensional stability issues, and roof system problems attributed to plywood or OSB panels. See installation requirements for recommendations before installing roofing membranes.

Plywood and OSB minimum thickness for use as a nailable substrate for Malarkey roofing systems is 15/32".

Nails or staple legs are to penetrate a minimum of 3/4", or completely through 1/8" beyond the bottom surface of the plywood.

When plywood or OSB is installed over steel panels to provide a substrate to attach shingles, increase the thickness of the plywood or install furring strips between the steel deck and the plywood/OSB to allow 3/4" penetration into the wood or to penetrate completely through the wood and not come in contact with the steel deck. Shearing of the fasteners which hold the plywood in place can occur when the shingle fasteners 'punch' the top flutes of the steel decking.

Malarkey will accept no responsibility for damage to the decking, building, or the contents of the building when this occurs.

### 7.5.2 WOOD BOARD DECKS

Wood board decks must be an interlocking type (i.e. ship lap or tongue and groove) with a minimum thickness of 5/8".

Wood board decks are composed of solid-sawn dimensional lumber.

Wood board decks should be constructed of seasoned, kiln dried or water-base treated lumber.

Wood board decks are to be level and even, and not affected by warping, cupping or bowing.

Wood board decks shall be supported, gapped and securely nailed to all framing members.

Remove and replace all split or cracked wood boards prior to installing Malarkey roofing products.

Wood board decking should be protected to prevent the accumulation of moisture on its surface prior to the installation of the roofing assembly.

Wood boards must be no wider than 8".

Wood board decks will allow for nails or staple legs to penetrate a minimum of 3/4", or completely through 1/8" beyond the bottom surface of the wood board.

Malarkey does not accept skip sheathing as an acceptable substrate to install Malarkey roofing systems. Skip sheathing will be overlaid with a minimum 15/32" plywood or OSB and secured as outlined in Plywood/Oriented Strand Board (OSB) section above.

## 7.6 SLOPE REQUIREMENTS

Roof decks that are to be shingled must have a minimum of 2" of roof slope and a maximum of 21" of roof slope.

Roof slopes between 2" and 4" must have two (2) layers of underlayment installed over the entire roof deck prior to the installation of Malarkey shingles.

Roof slopes of 4" and greater require the installation of a single layer of underlayment.

Malarkey recommends 3-tab shingles on roof decks with slopes between 2" to 3". The single plane construction allows for quicker drainage on lower sloped roof decks.

Deck transitions (low slope or flat roofs that tie into a steep slope section) must have the correct flashing tie in to prevent water intrusion. See BUR Flashing Detail (6-K) for details.

Malarkey accepts no responsibility for roofs that are installed contrary to Malarkey's written installation instructions located on ICC ER 5300 report, the wrappers on its shingle products, this manual, or state and local code requirements.

## 7.7 VENTILATION

Inadequate ventilation of attic areas can cause a build up of moisture and heat.

These conditions can cause:

- Picture framing of the decking
- Accelerated roof weathering
- Deck rot and attic fungus
- Shingle distortion due to deck movement
- Blisters

Ventilation provisions must meet or exceed current FHA or HUD requirements.

FHA property standards require one square foot (0.1 sq.m) of free ventilation to each 150 square feet (13.9 sq.m) of attic area or one square foot (0.1 sq.m)/300 square feet (30 sq.m) if 50% is provided near the ridge.

All roof structures must be provided with through ventilation to prevent entrapment of moisture laden air behind roof sheathing.

The following is a list of Malarkey's requirements regarding ventilation:

- Provide free airflow between the eaves & ridge vents.
- Eaves & soffit vents should not be blocked by insulation.
- Louver and vent openings should not be covered during the winter.
- Vent air from kitchens and bathrooms to the outdoors or to attic roof ventilators.

Vaulted or cathedral roofs can present ventilation problems due to their design. Malarkey recommends that a means to provide ventilation from eave to ridge above the roof deck. This recommendation may include the installation of furring strips of a minimum height of 3/4" that are installed directly to the roof deck with additional plywood or OSB panels attached to the furring strips, or the use of a vented rigid insulation with a factory laminated nailable substrate.

Please see the Rigid Insulation and Venting section below for further details or contact Malarkey for more details.

Continuous ridge vents and soffit intake vents are acceptable to use with Malarkey shingle systems as long as they are designed and tested to be compatible with asphalt shingles.

## 7.8 RIGID INSULATION AND VENTING

Above roof deck insulation can be used under Malarkey shingles, provided that the nailable substrate above the roof insulation can be properly vented.

A minimum air space of 3/4" (or as required by your state or local building official), structurally supported by furring strips, and installed to allow free air travel from the eave and/or soffit intake to the ridge vents.

Malarkey recommends that a thermal barrier (a low permeance underlayment or a gypsum roof utility board) be installed directly to the roof deck, staggered, and secured, before the installation of the rigid roof insulation. This has been shown effective in reducing thermal transfer between the joints/gaps in the decking that cause 'picture framing' of the nailable substrate that is installed on the furring strips.

Contact Malarkey Roofing Products if you have any questions regarding above-roof-deck rigid insulation.

Malarkey will accept no responsibility for damage to the decking, building, or the contents of the building when above roof deck insulation is used.

## 7.9 UNDERLAYMENTS

Underlayments are rolled felts that are applied between the roof deck and the Malarkey shingles.

Underlayments must be allowed to relax before they are fastened to the roof deck.

Malarkey's Right Start UDL™ fiberglass SBS underlayment is suitable for use as a water tight underlayment or dry in sheet for asphalt shingle application as well as other composition applications such as extruded concrete tile, clay tile, specialty tiles, wood shakes, and shingles.

This quality underlayment sheet may be used over various combustible and non combustible decks as the initial ply or multiple plies for a specified roof underlayment system.

If Right Start UDL™ is going to be exposed for an extended amount of time before the installation of shingles, or the project is in a high wind area, increase the side lap to 4" and increase your preliminary fastening.

15# or 30# felts have an organic mat that is saturated with an asphalt coating. Organic felts are used as a shingle underlayment that is installed directly to a roof deck.

Organic felts have a tendency to wrinkle when exposed to moisture.

Underlayments must be installed completely flat with no wrinkles or buckles. When buckles are present, cut the affected area and cover with an additional layer of underlayment.

Excessive amounts of buckles will require detachment and re-positioning of the underlayment, or complete removal and replacement.

Malarkey approves the use of staples, plastic cap felt nails, and E.G (electro galvanized) roofing nails to secure the underlayment to the roof deck. Fastener spacing and pattern will vary. No set pattern has been tested and available for underlayment attachment. Securement to the deck is achieved when the shingles have been nailed through to the roof deck.

Only install underlayments as described in the installation instructions located on Malarkey's ICC ER 5300 report, on the shingle wrapper, or in this manual.

Roof slopes between 2" and 4" must have two (2) layers of underlayment installed over the entire roof deck prior to the installation of Malarkey shingles.

Roof slopes of 4" and greater require the installation of a single (1) layer of underlayment.

Underlayment will be installed over the eave metal and under the rake edge metal.

Malarkey accepts no responsibility for roofs that are installed contrary to the written installation instructions lo-



cated on Malarkey's ICC ER 5300 report, on the shingle wrapper, in this manual, or state and local code requirements.

### 7.10 ICE AND WATER SHIELDS (MALARKEY #170 ARCTIC SEAL™)

In geographic regions that have the possibility of Ice dams (i.e. areas with January temperatures of 30 degrees or less), installation of an ice & water shield, compatible with asphalt shingles is recommended. The installation of the ice and water shield must comply with all state and local code requirements.

Some regions of the United States (Southern California, Arizona, etc.) have mild winters that typically do not require the use of ice & water shield. In these regions, ice & water shield may be omitted from the roof system, provided that this omission complies with local or state building codes.

Ice & water shield must be installed directly to the dry, clean roof deck on all eaves and rake sides of the roof and extend into the inside, warm interior wall of the roof a minimum of 24" or per your state or local code requirements on roof slopes of 4" in 12" or greater.

Ice & water shield must be installed directly to the dry, clean roof deck on all eaves and rake sides of the roof and extend into the inside, warm interior wall of the roof a minimum of 36" or per your state or local code requirements on roof slopes less than 4" in 12".

Ice & water shield must be installed in all valleys, roof to wall, roof to curb or skylight, and around flashings.

In some instances, the specifier may specify ice & water shield over the entire deck (i.e. double sloped construction, mountain regions where ice damming can occur over the entire surface, etc.) In these instances, it may be beneficial to install a slip sheet (i.e. Right start UDL) over the fully adhered ice & water shield.

When ice & water shield is installed at the eaves, underlayment should tie on to the ice & water shield a minimum of 6".

Ice & water shield must extend down the eave sides, below the thickness of the roof deck. Install your roof gutter and/or edge metal over the top of the ice & water shield.

For additional water protection, install a stripping ply of ice & water shield over the metal flange of the gutter and/or edge metal to seal the fasteners used to secure the gutter and/or edge metal.

### 7.11 EAVE & RAKE METAL

Eave & rake metal shall be a minimum of 2"x 2" with a 1/4" drip kick to divert water from the fascia.

Eave & rake metal may have a built-in overhang lap designed to divert water away from the fascia.

Eave metal is required on all Malarkey shingle roofs.

Rake metal is optional on Malarkey shingle roofs.

Eave metals used on Malarkey shingle roofs are to be made of non-corroding metal.

Galvanized, aluminum, plastic or factory painted metal are acceptable.

Gutters with a built in flange that is designed for roof deck attachment do not require the installation of additional eave metal.

Ice & water shield must extend down the eave sides, below the depth of the roof deck.

Ice & water shield will be installed under the eave & rake metal.

Underlayment will be installed over the eave metal and under the rake edge metal.

Secure eave & rake metal with roofing nails, centered on the top flange of the metal at 8" to 10" on center (or as required by local building code).

Install eave & rake metal with a minimum overlap of 2" with no back water laps.

### 7.12 FASTENING SHINGLES

Malarkey recommends the use of nails rather than staples for all applications.

Nails must be galvanized steel 12 gauge with a 3/8" head or the equivalent corrosion-resistant roofing nail.

Malarkey recommends the use of a stainless steel or aluminum roofing nails in coastal areas to prevent fastener deterioration.

Malarkey approves the use of hand driven nails or pneumatically driven nails.

Staples may be used on new construction only and must be galvanized 16 gauge with a 1" crown.

Nail or staple legs are to penetrate a minimum of 3/4" into the decking, or completely through 1/8" beyond the bottom surface of the roof decking.

Roofing staples must be placed parallel to the long dimension of the shingle, and driven flush with the surface of the shingle. Misaligned, over and under-driven staples will invalidate any warranty.

Fasteners must not be overdriven to cut into shingles or under-driven.

Nails should penetrate through both layers (the dragon tooth or patterned part and the laminated shim) of the laminated shingles.

### 7.12.1 HAND SEALING

Malarkey shingles have a special thermal sealant that firmly bonds the shingles together after application when exposed to sun and warm temperatures.

Shingles installed in Fall or Winter may not seal until the following Spring.

If shingles are damaged by strong winds before sealing or are not exposed to adequate ambient temperatures, or if the self-sealant gets dirty, the shingles may never seal.

Failure to seal under these adverse circumstances is not a manufacturing defect.

To ensure immediate sealing, Malarkey recommends hand tabbing each 3-tab shingle with two nickel sized spots of plastic roof cement near the bottom two corners of each tab.

The shingle must be pressed firmly into the cement (avoid excessive use of cement as it may cause blistering).

To ensure immediate sealing, Malarkey recommends hand tabbing each laminate shingle by applying 4 quarter sized dabs of plastic roof cement evenly spaced under each shingle.

The shingle must be pressed firmly into the cement. (avoid excessive use of cement as it may cause blistering).

Note: The film strip on the top of each shingle is to prevent the shingles from sticking together while in the bundle and is not designed to be removed.

### 7.12.2 STANDARD ATTACHMENT OF 3 TAB (DURA-SEAL AND ALASKAN) SHINGLES

Use four (4) fasteners for each shingle.

Fasteners must be placed within the nailing area (1" below the self seal strip), 3/4" to 1-1/4" in from each edge of the shingle, with the remaining fasteners equally spaced (+/- 1/2") on the same line as the end fasteners.

When fastening, butt ends together loosely to prevent buckling.

### 7.12.3 HIGH WIND AND STEEP SLOPE NAILING OF 3-TAB SHINGLES

Regions with wind speeds in excess of 54 m.p.h. or roof decks with slopes of 12/12" to 21/12" require the installation of six fasteners per shingle.

Fasteners must be placed within the nailing area (1" below the self seal strip), 3/4" to 1-1/4" in from each edge of the

shingle, with the remaining four (4) fasteners spaced 1" on each side of shingle cut outs on the same line as the end fasteners.

Roof decks with slopes of 12/12" to 21/12" require two nickel sized spots of plastic roof cement near the bottom two corners of each tab. The shingle must be pressed firmly into the cement (avoid excessive use of cement as it may cause blistering).

### 7.12.4 STANDARD ATTACHMENT OF LAMINATED SHINGLES (HIGHLANDER-CS, NORTHWEST XL & LEGACY)

Use four (4) fasteners for each shingle.

Fasteners must be placed within the nailing area, 3/4" to 1-1/4" in from each edge of the shingle, with the remaining fasteners equally spaced (+/- 1/2") on the same line as the end fasteners.

When fastening, butt ends together loosely to prevent buckling.

### 7.12.5 HIGH WIND AND STEEP SLOPE NAILING OF LAMINATED SHINGLES

Regions with wind speeds in excess of 54 m.p.h. or roof decks with slopes of 12/12" to 21/12" require the installation of six fasteners per shingle.

Fasteners must be placed within the nailing area 3/4" to 1-1/4" in from each edge of the shingle, with the remaining four (4) fasteners evenly spaced on the same line as the end fasteners.

Roof decks with slopes of 12/12" to 21/12" require four (4) quarter sized spots of plastic roof cement evenly spaced under each shingle. The shingle must be pressed firmly into the cement (avoid excessive use of cement as it may cause blistering).

## 7.13 SHINGLE PATTERN LAYOUT

### 7.13.1 3-TAB SHINGLE PATTERN LAYOUT

**Starter Course:** Trim the tabs off all starter course shingles and apply with a 1/2" overhang on the eaves. Cut 7" off the left end of the first shingle applied and then continue across with full-length shingles with tabs removed. Place seal strip at low side of roof (see illustration). Install 4 fasteners 3" in from the eave with one fastener 1" from each side of the starter and the remaining two evenly spaced on the same line as the end fasteners.

**First Course:** Start first course with full-length shingles laid directly over starter course. Begin at lower left edge of roof with lower edge of tabs flush with the lower edge of starter course.

**Second and Succeeding Courses:** Start with a shingle from which 5-5/8" has been cut from the left end. Place the lower



edge of the tabs flush with the top of the cutouts of the underlying shingle. Finish the course with full-length shingles. Start the third course with a shingle from which 11-1/4" has been cut from the left end; the fourth course 16-7/8" cut off; the fifth course 22-1/2" cut off; the sixth course 28-1/8" cut off; the seventh course 33-3/4" cut off; the eighth course with a full length shingle and repeat cycle.

### 7.13.2 LAMINATE SHINGLE PATTERN LAYOUT

**Starter Course--** Start with a full 3 tab shingle of same type (regular asphalt or modified), with the tabs cut off and the factory applied seal down at the eave. Cut 6" off the length of the cut off shingle from the left hand side and apply at the lower left hand corner of the roof.

The starter course should overhang the drip edge 1/4" to 3/8". Continue starter course across the roof with full length shingles with the tabs cut off. Install 4 fasteners 3" in from the eave with one fastener 1" from each side of the starter and the remaining two evenly spaced on the same line as the end fasteners.

**First Course:** Start with a full shingle applied onto and flush with the starter course at the lower left hand corner of the roof and secure with fasteners.

**Second Course:** Cut 5-5/8" from left end of the shingle and apply the remaining 34-3/8" section over the first course shingle, exposing the first course 5-5/8". Butt bottom edge of shingle should be applied to the top of saw tooth of underlying shingle so that there will be 5-5/8" of each shingle exposed, secure with fasteners.

**Third Course:** Cut 11-1/4" from the left end of the shingle and apply the remaining 28-3/4" section over the second course shingle, exposing the second course 5-5/8", secure with fasteners.

**Succeeding Courses:** Courses four through seven are begun with a partial shingle 5-5/8" shorter progressively, establishing the overall diagonal method or stair step effect (Pieces cut from shingle along the left rake, can be used to finish off courses at the right rake).

Next, apply a full shingle to each of the first seven courses to extend the pattern starting with the first course. Courses eight through fourteen, repeat the process beginning with a full shingle and continue succeeding courses with a partial shingle 5-5/8" shorter each time. Succeeding courses also repeat this procedure beginning again with a full shingle. Strike a chalk line about every six courses to ensure straight courses. Note: Shingles may be laid from either left or right hand side. Start at either rake edge and follow layout and cutting instructions as required for proper application.

### 7.14 STEP FLASHING

#### **SHALL BE 26-GAUGE MINIMUM GALVANIZED STEEL.**

Step flashing will be at least 3" high by 4" wide and a minimum of 7-3/4" long.

Step flashing will be used on the sides of chimneys, dormers and walls.

Individual metal step flashing pieces are to be used for each course of shingles.

Nail each flashing piece to the roof at the top edge with two roofing nails.

To allow for possible roof movement, do not nail flashing to the wall or chimney.

Carry a metal counter flashing or the wall siding material down over the step flashing.

Step flashings can be painted with an aerosol metal paint to match the shingle color of the roof. Care should be taken to prevent excessive over spray of the paint on the surface of the shingle.

### 7.15 ROOF JACKS

Shall be 26-gauge minimum galvanized steel or 3 lbs. lead.

Flanges shall be six (6) inches wide and sleeves shall be a minimum of four (4) inches high.

Installation of a storm collar/and or sealant is required to seal all pipe or penetrations to the roof flashing.

A 1/4" minimum gap must be made between the shingle and the vertical bend of all metal roof flashings.

Install a bead of plastic cement on the top surface of all metal flanges and press overlapping shingle courses into the plastic cement to seal.

Flashings can be painted with an aerosol metal paint to match the shingle color of the roof. Care should be taken to prevent excessive over spray of the paint on the surface of the shingle.

### 7.16 APRONS, CHIMNEY SADDLES & ROOF TO WALL METAL

Shall be 26-gauge minimum galvanized steel.

Flanges shall be six (6) inches wide.

A 1/4" minimum gap must be made between the shingle and the vertical bend of all metal roof flashings.

Install a bead of plastic cement on the top surface of all chimney saddles and press overlapping shingle courses into the plastic cement to seal.

Seal all relief cuts and corners.

Install Ice and water shield under all chimney saddles prior to the installation of the metal chimney saddle.

Aprons, chimney saddles, roof to wall metal can be painted with an aerosol metal paint to match the shingle color of the roof. Care should be taken to prevent excessive over spray of the paint on the surface of the shingle.

### 7.17 VALLEY MATERIALS

Metal valley flashing used with Malarkey shingles must be 18" wide and made of 26 gauge galvanized steel, 26 gauge pre-finished galvanized steel, .032" thick aluminum, .032" thick pre-finished aluminum, or 26 gauge stainless steel and formed into a 'W' shape with the center bend not to be less than 1" in height.

Membrane valley will consist of a layer of #350 SBS Modified Premium Fiberglass Roll Roofing.

Right Start UDL™ or an approved alternate and #170 Arctic Seal™ (ice & water shield) shall make up the underlayment under all valleys.

### 7.18 HIGH PROFILE RIDGE SHINGLES - EZRIDGE

Malarkey Rake'N Ridge™ & Pro Design™ installation:

Cut the starter ridge shingle at the front of the dimensional fold and discard front section.

Make sure your ridge shingles are installed with the prevailing wind and not against it.

Install starter shingle at the leading edge of hip or with dimensional fold flush with the ridge edge.

Install the ridge shingles by nailing through the dimensional fold.

The full ridge shingles are then installed with the single layer that comes from the bottom of the fold and extends 1/4" outward past the dimensional fold you just installed.

Looking at the completed installation, the nails are covered and the exposure is 8" with a 1/4" overhang.

If Pro Design™ or Rake 'n Ridge™ are used, Malarkey recommends sealing down each installed ridge shingle with a bead of mastic.

Depending on your location, face nailing through the dimensional fold may not be necessary.

Malarkey EZRidge™ & EZRidge XT™ installation:

Remove ridge shingles from carton and place on roof ridge over installed field shingles.

Overlap all ridges to the cutout (always maintain consistent exposure of ridge at 8-1/4").

Push down on center of shingle and nail to fit exact pitch of roof.

The entire front of the EZRidge™ shingle should be aligned with the underlying cutout.

**CONCEALED NAILS:** Install one (1) nail on each side of the EZRidge™ 3/4" behind the cut out (not on the exposed part of the shingle). Use a 3/8" non corrosive roofing nail sufficiently long to attach the ridge shingle to the roof deck.

**EXPOSED NAILS:** Install one (1) nail one inch back from the front edge of the shingle. Use a 3/8" non corrosive roofing nail sufficiently long to attach the ridge shingle to the roof deck

### 7.19 STANDARD RIDGE (#225 HIP & RIDGE)

Apply Malarkey Hip and Ridge shingles beginning at the bottom of the hip or from the end of the ridge opposite the direction of the prevailing winds.

Use two nails per shingle, with one nail on each side and 1" (25 mm) up from the edge so succeeding shingles conceal nail heads. *Note: when applied in cold weather or windy location, it is recommended that each ridge shingle be sealed down with a quarter-sized spot of shingle tab adhesive.*

Continue installing Ridge shingle with a maximum exposure of 5-5/8" and fastening with one nail on each side and 1" (25 mm) up from the edge so succeeding shingles conceal nail heads

To avoid damage to hip & ridge shingles in cold weather, Malarkey recommends warming shingles sufficiently to prevent damage during installation.

If you are installing shingles featuring the 3M™ Scotchgard™ Algae Resistant Roofing System, #225 SBS Modified Hip and Ridge pre-perforated ridge shingle with Scotchgard™ are required.

Malarkey #225 has a seal down and is designed for a 5-5/8" exposure and is 9-7/8" wide.

### 7.20 3-TAB SHINGLE USED FOR RIDGE

Make shingles for hips and ridges by taking a 3-tab shingle and cut the shingle into thirds.

Cut the 3-tab shingle at a slight inward angle at the cutouts and ends to give the top half of the shingle a slight tapered appearance.

Apply shingles by centering over the hip or ridge and securing each piece with one nail on each side.

Place nails 6-1/2" from the butt edge. This will conceal the nails as each succeeding course is laid.

Start the application of the ridge so that prevailing winds flow over the lap and not against the exposed edge of the ridge shingles.

Manufactured hip and ridge shingles of the same product color are available for all types of shingles and may be used rather than field-cut shingles.

## 7.21 VALLEYS

Four (4) types of valley construction are specified by Malarkey Roofing Products:

- Woven (3-tab only)
- Closed cut (3-tab and laminates)
- Metal (3-tab and laminates)
- Membrane (3-tab and laminates)

### 7.21.1 WOVEN VALLEY (3-TAB ONLY)

Center a valley liner of #170 Malarkey Arctic Seal™ or an equal, in the valley and apply it directly to the roof deck, then lace underlayment into and through valleys from each side of the valley.

Lay first course of shingles along eaves of one roof area and over valley, extending it into adjoining section at least 12".

Lay first course of shingles along eaves of the adjacent roof area and over valley, extending it into adjoining section so that the bottom corner of the 3-tab shingle is positioned in the nailing area of the underlying shingle.

Lay second course of shingles over valley, extending it into adjoining section so that the bottom corner of the 3-tab shingle is positioned in the nailing area of the underlying shingle.

Lay second course of shingles of the adjacent roof area over valley, extending it into adjoining section so that the bottom corner of the 3-tab shingle is positioned in the nailing area of the underlying shingle.

Succeeding courses are applied as described above.

### 7.21.2 CLOSED CUT VALLEY

Center a valley liner of #170 Malarkey Arctic Seal™ or an equal, in the valley and apply it directly to the roof deck, then lace underlayment into and through valleys from each side of the valley.

Lay first course of shingles along eaves of one roof area and over valley, extending it into adjoining section at least 12".

Complete the installation of shingles on that roof section.

Press shingles well into valley and nail no closer than 6" to the center line.

Nail at the end of each terminal strip.

Next, apply the first course of shingles along eaves of the intersecting roof area, extending it over previously applied shingles and trim 2" up from center line of valley.

Crop all tops of each shingle course at a 1", 45 degree cut.

Embed the cut valley shingle in a 3" wide bead of plastic cement.

### 7.21.3 METAL VALLEY

(For approved metal types, see section 7.17 Valley Materials on page 7-8)

Note: Metal valleys are acceptable to use with Malarkey shingles in all regions. However, in warmer regions, the use of metal valleys can generate higher surface temperatures in the shingles. The elevated temperatures will affect the asphalt used in the shingles. The oils that are contained within the asphalt can leach, or bleed out, making the asphalt brittle. This will affect the performance of the shingle and can lead to a premature failure of the shingle.

Malarkey accepts no responsibility for premature failure of the shingle at the valleys when metal valleys are used.

Center a valley liner of #170 Malarkey Arctic Seal™ or an equal, in the valley and apply it directly to the roof deck, then lace underlayment into and through valleys from each side of the valley.

Install metal valley over the underlayment and secure with fasteners no more than 1" from the outside edges of the valley metal at a spacing of 10" to 12" on center. Set overlapping end of the metal valley in a continuous bead of plastic cement achieving a lap of 4". **DO NOT FASTEN THE METAL LAP.**

Lay first course of shingles along eaves of one roof area and over valley, making sure the top of the shingle meets the centerline of the metal valley.

Complete the installation of shingles on that roof section.

After all shingles have been installed in the valley, snap a line that extends out of the center of the metal valley 2" and trim.

Crop all tops of each shingle course at a 1", 45 degree cut.

Embed the cut valley shingle in a 3" wide bead of plastic cement.

Continue installing the next section of roof as described above.

#### 7.21.4 MEMBRANE VALLEY

(For approved membrane types, see 7.17 Valley Materials on page 7-8)

Center a valley liner of #170 Malarkey Arctic Seal™ or an equal, in the valley and apply it directly to the roof deck, then lace underlayment into and through valleys from each side of the valley.

Install a layer of #350 Premium Fiberglass Mineral Surfaced Roll Roofing SBS Membrane, centered in the valley and secure with 1" cap head fasteners, 1" from each side of the membrane.

Whenever possible, install membrane in the valley in a single piece to eliminate end laps. If end laps are needed, set overlapping end of the membrane in a continuous bead of plastic cement achieving a lap of 6". DO NOT FASTEN THE MEMBRANE LAP.

Lay first course of shingles along eaves of one roof area and over valley, making sure the top of the shingle meets the centerline of the membrane valley.

Complete the installation of shingles on that roof section.

After all shingles have been installed in the valley, snap a line that extends out of the center of the membrane valley 2" and trim.

Crop all tops of each shingle course at a 1", 45 degree cut.

Embed the cut valley shingle in a 3" wide bead of plastic cement.

Continue installing the next section of roof as described above.

#### 7.22 MANSARD OR STEEP SLOPE

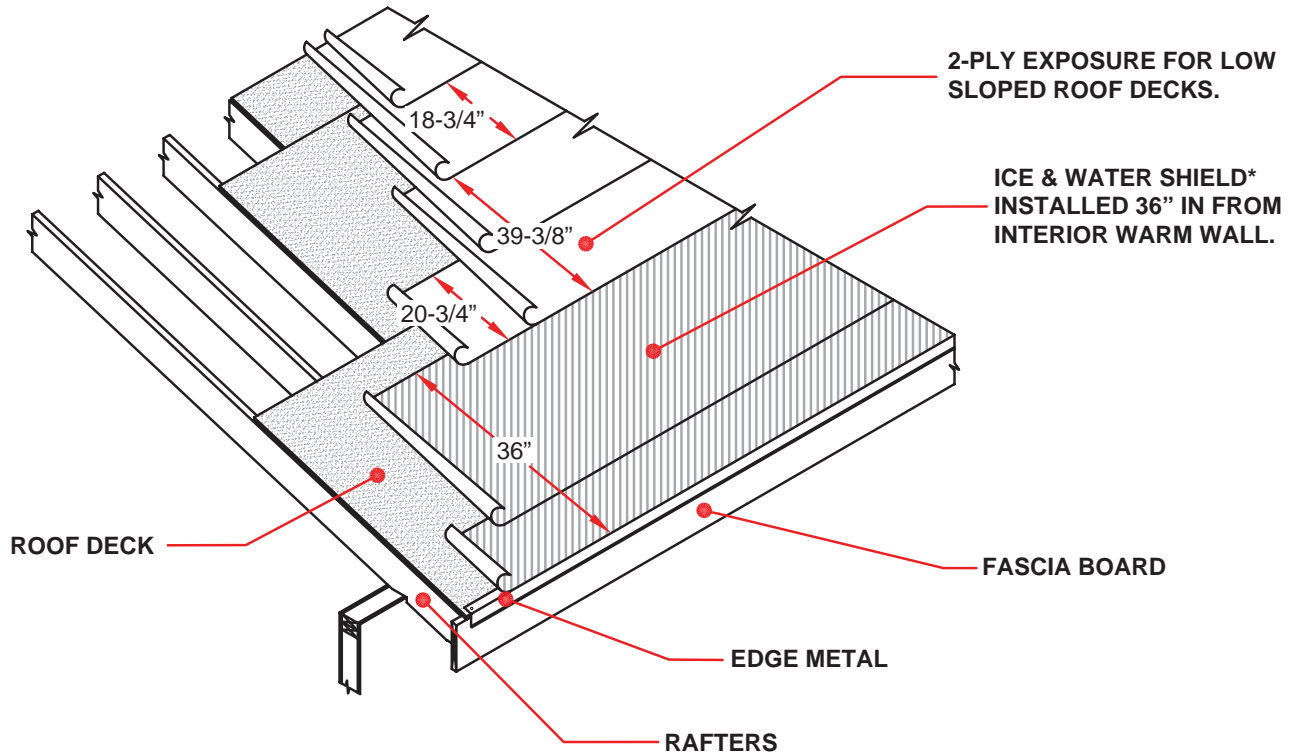
FOR SLOPES EXCEEDING 12" PER FOOT, SIX (6) NAILS MUST BE USED TO SECURE EACH SHINGLE.

Nails must be placed just below the self seal strip, 1" in from each edge of the shingle, with the remaining four (4) nails spaced 1" on each side of shingle cutouts on the same line as the end nails.

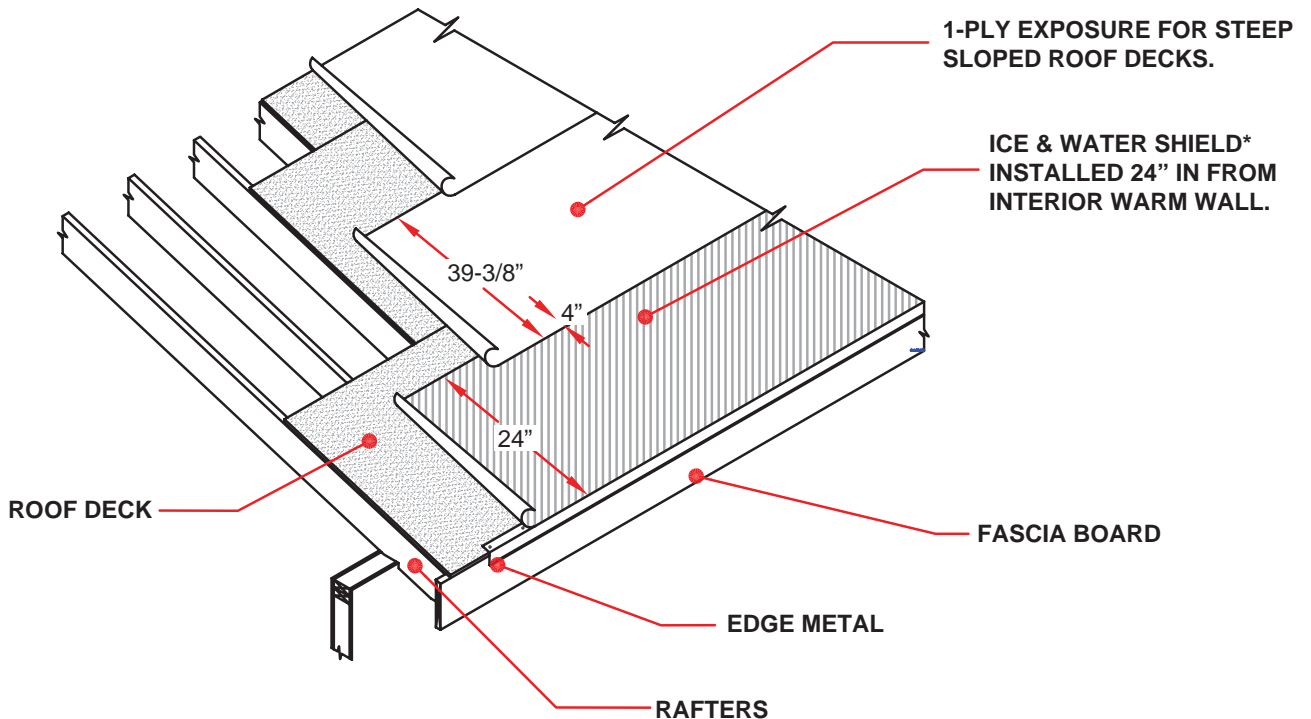
To prevent wind damage prior to shingles self sealing, Malarkey requires hand tabbing each individual shingle by applying two (2) quarter-sized dabs of plastic roof cement near the bottom two corners of each tab. The shingle must be pressed firmly into the adhesive.

The shingle tab must be laying flat.

**7-A LOW SLOPE (2"-4") UNDERLAYMENT LAYOUT**



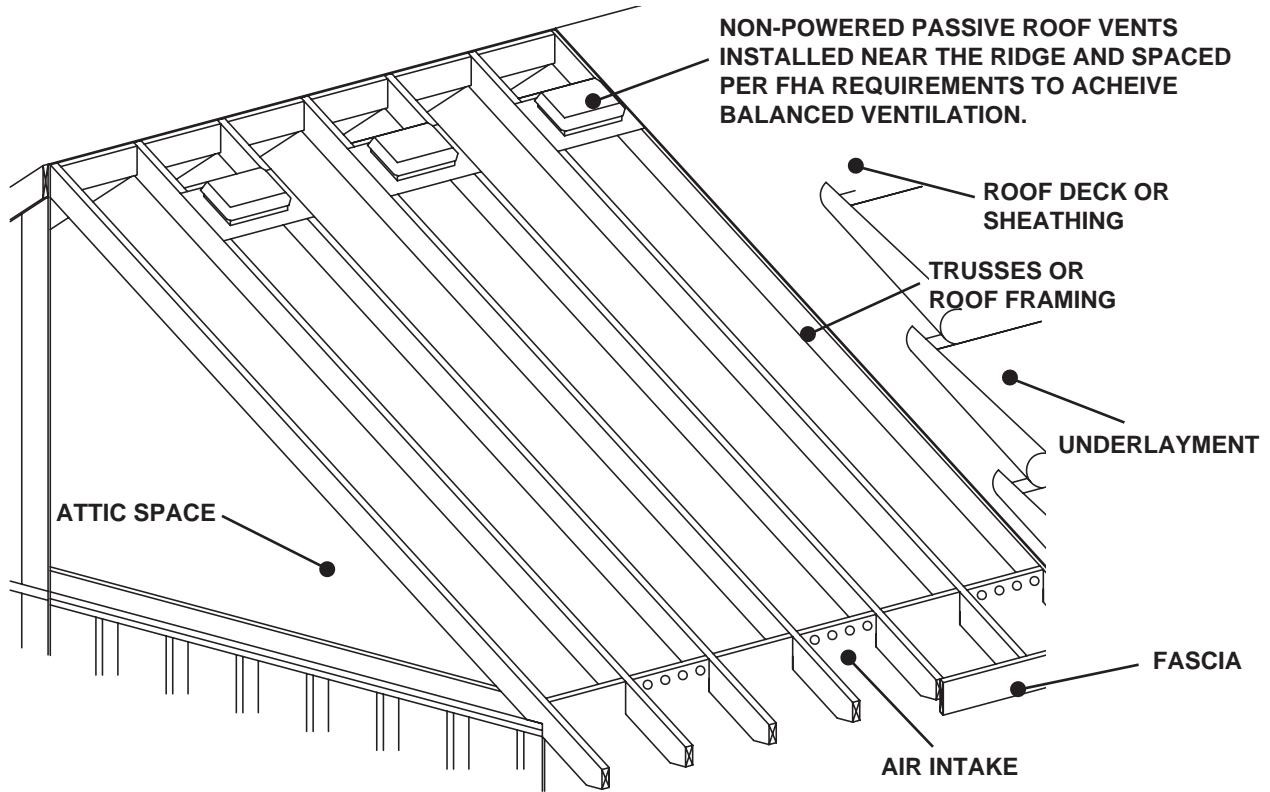
**7-B STEEP SLOPE (4" +) UNDERLAYMENT LAYOUT**



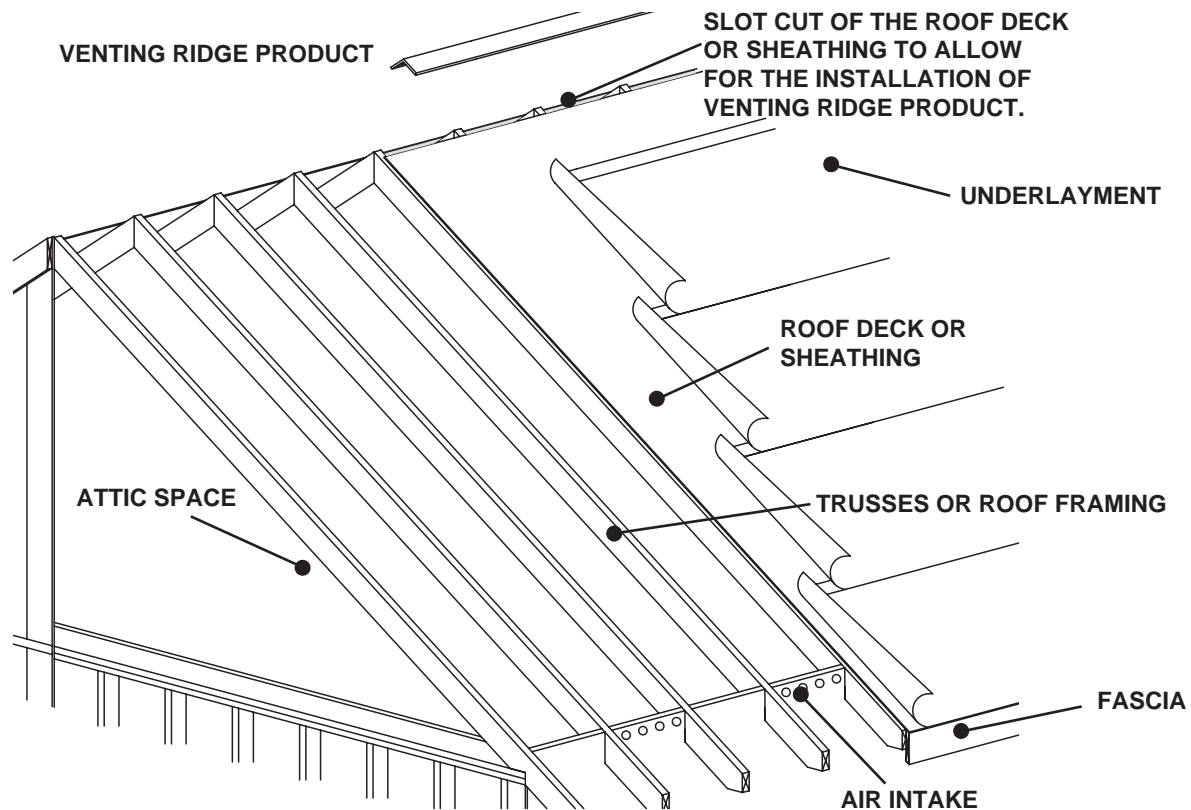
\*REFER TO THE NRCA STEEP SLOPE ICE DAM REQUIREMENTS.



**7-C STANDARD VENTING AIRFLOW**

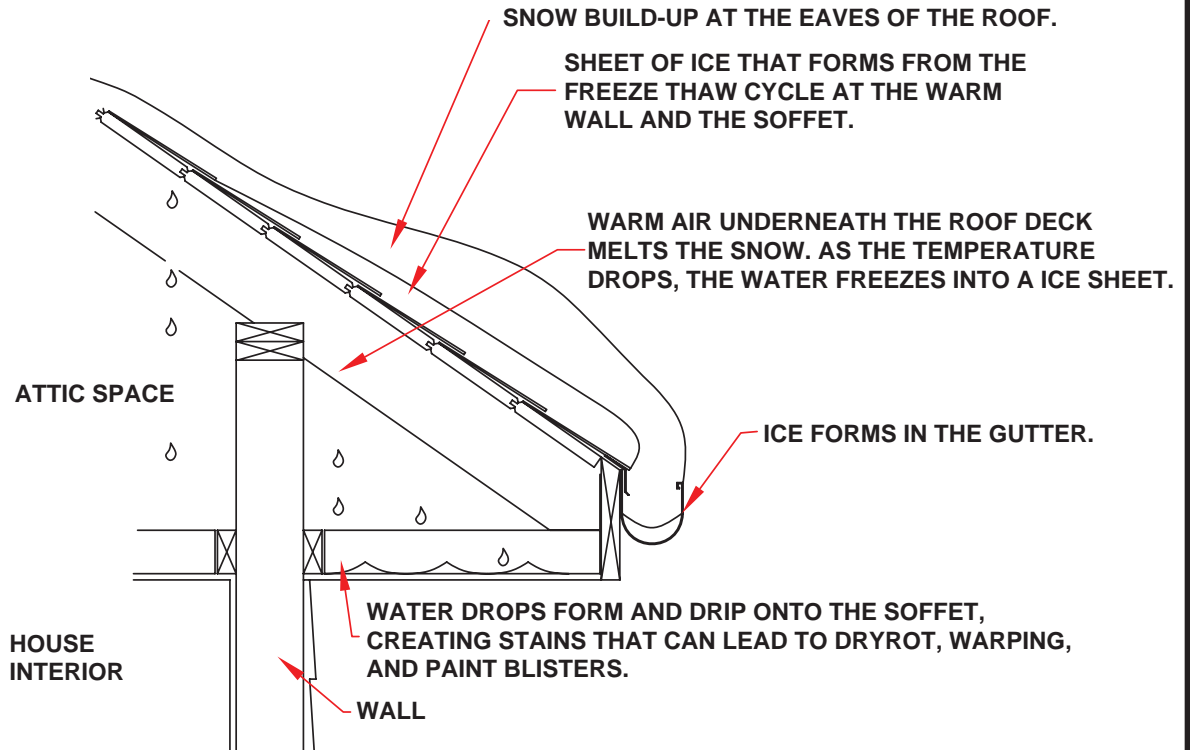


**7-D RIDGE VENTING AIRFLOW**

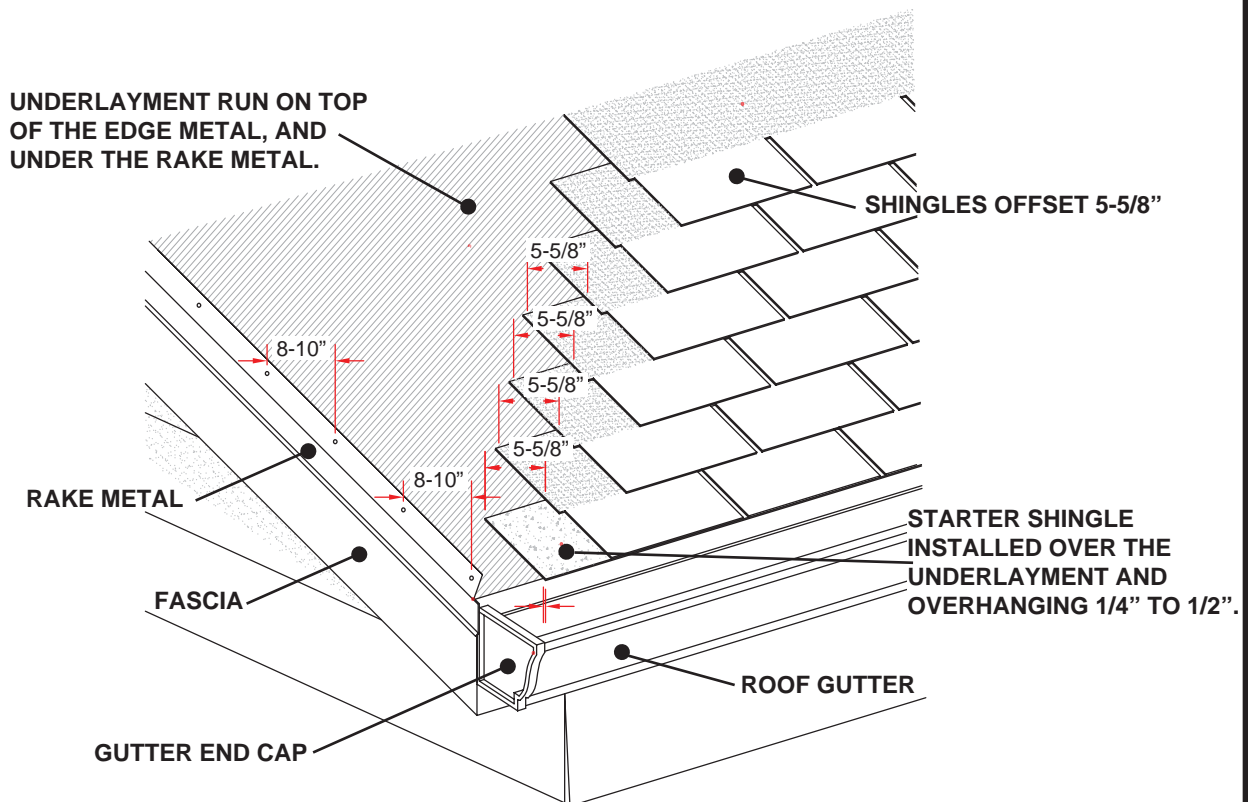




### 7-E ICE DAMS



### 7-F ROOF EDGE AND RAKE METAL



CORRECTLY DRIVEN NAIL

INCORRECTLY DRIVEN NAILS

BOTTOM OF THE NAIL HEAD IS FLUSH WITH THE TOP OF THE NAILED SHINGLE

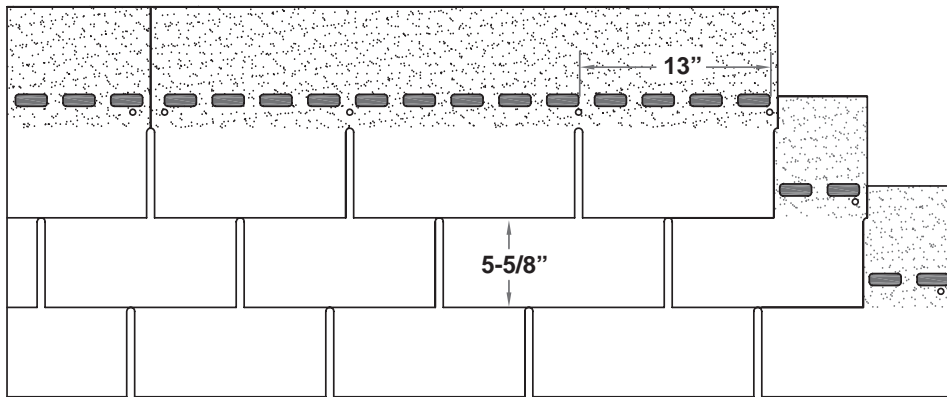
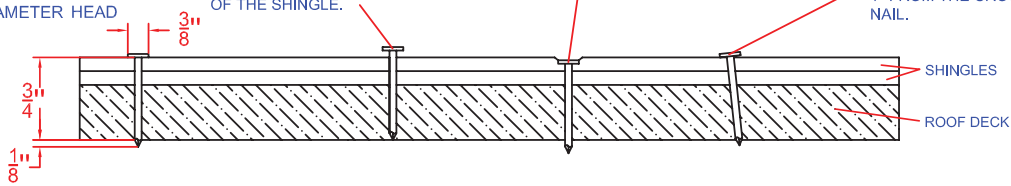
UNDER-DRIVEN: MUST HAMMER NAIL FLUSH WITH THE TOP OF THE SHINGLE.

OVER-DRIVEN: INSTALL A NEW NAIL 1" FROM THE OVER-DRIVEN NAIL.

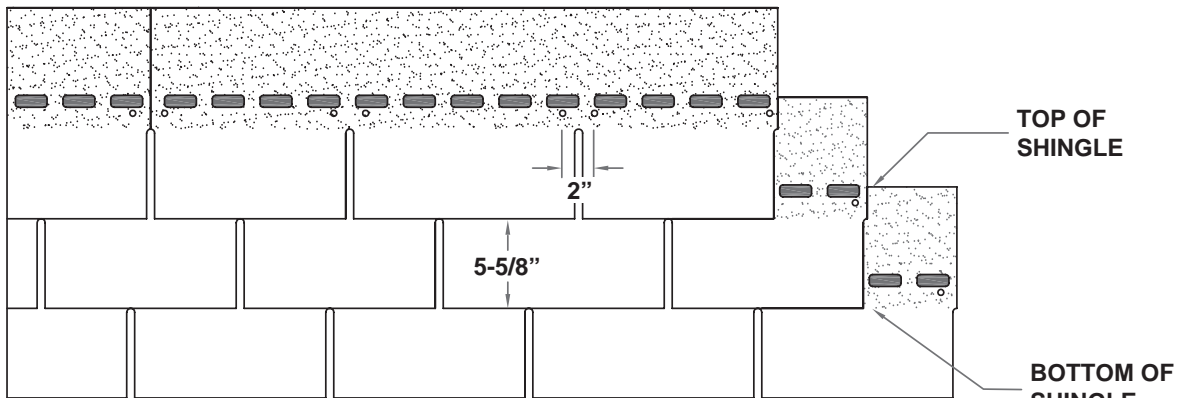
CROOKED: REMOVE NAIL AND INSTALL A NEW NAIL 1" FROM THE CROOKED NAIL.

$\frac{3}{8}$ " (10mm) MIN. DIAMETER HEAD

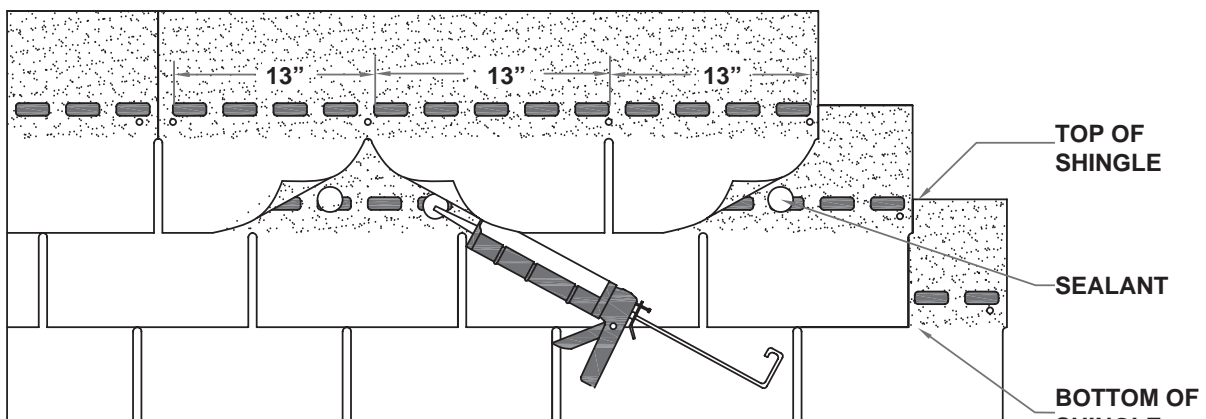
NAIL TO PENETRATE A MIN. OF  $\frac{3}{4}$ " INTO THE ROOF DECK, OR AT LEAST  $\frac{1}{8}$ " THROUGH THE BOTTOM OF THE DECK.



**7-G STANDARD NAILING 3-TAB SHINGLES**

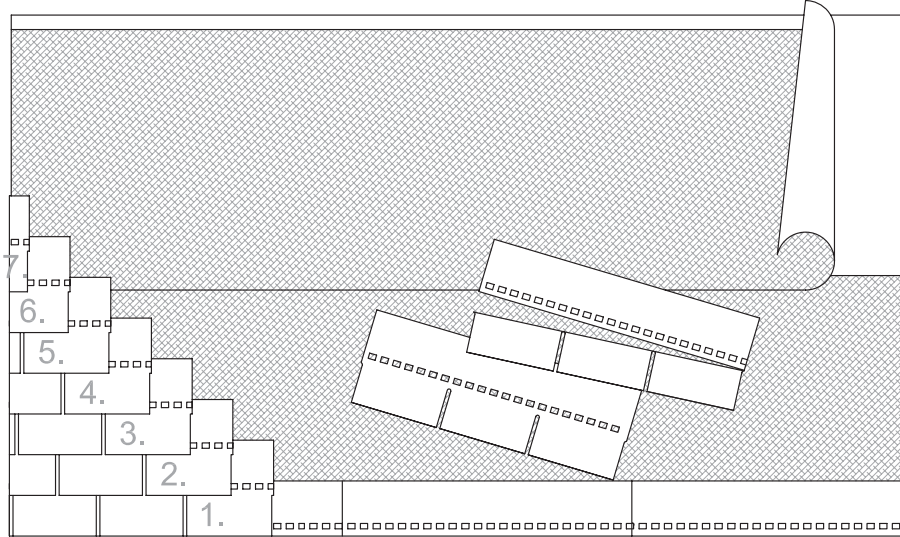


**7-H HIGH WIND & STEEP SLOPE NAILING 3-TAB SHINGLES**



**7-I HAND SEALING 3-TAB SHINGLES**

### 7-J 3-TAB LAYOUT PATTERNS

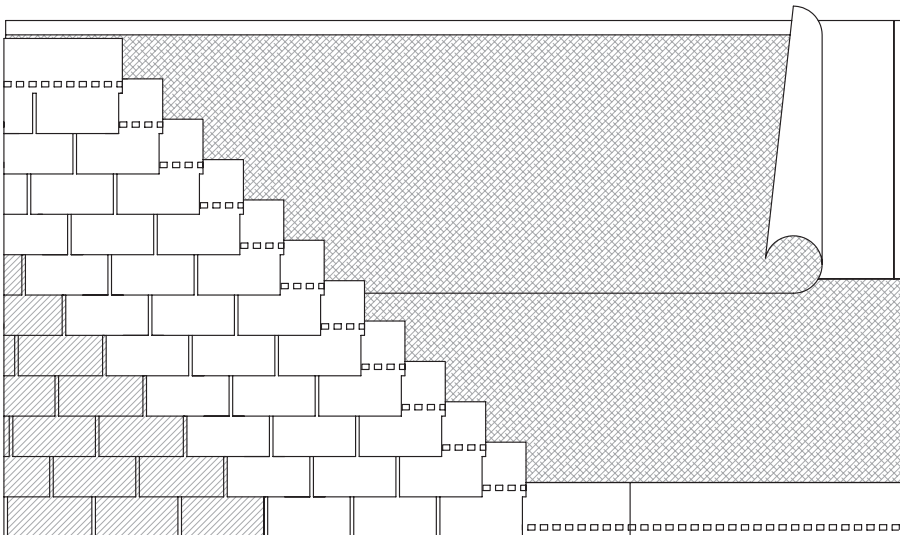


**STEP 1.**

**COURSES 1-7**

**\*ALWAYS BUTT FACTORY EDGE TO FACTORY EDGE WHEN INSTALLING THE STAIR METHOD. THIS HELPS MAINTAIN A STRAIGHT LAYOUT OF THE REMAINING SHINGLES.**

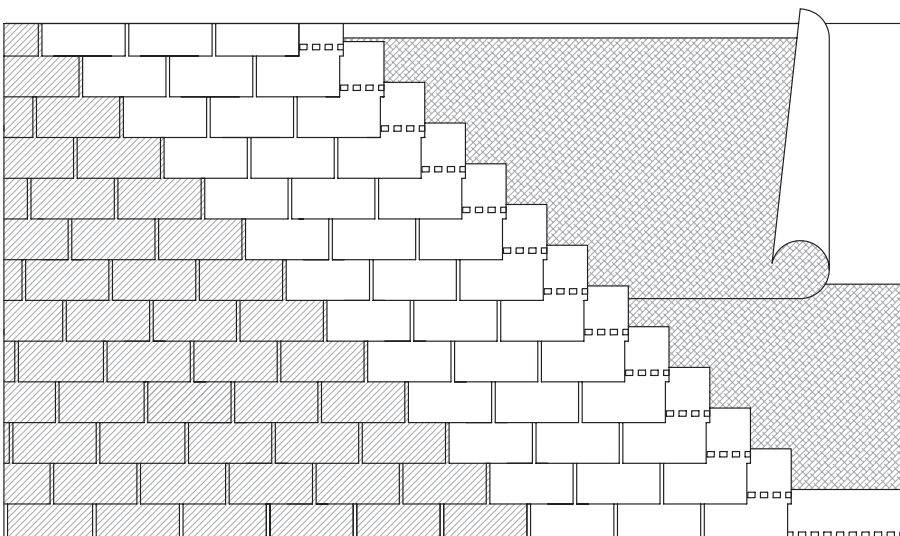
- 1: 39-3/8" LONG
- 2: 33-3/4" LONG
- 3: 28-1/8" LONG
- 4: 22-1/2" LONG
- 5: 16-7/8" LONG
- 6: 11-1/4" LONG
- 7: 5-5/8" LONG



**STEP 2.**

**COURSES 8-19**

**\*APPLY A FULL SHINGLE TO EACH OF THE FIRST SEVEN COURSES TO EXTEND THE PATTERN.**



**STEP 3.**

**REMAINING COURSES**

**\*REPEAT THE PROCESS BEGINNING WITH A FULL SHINGLE AND CONTINUE SUCCEEDING COURSES.**

CORRECTLY DRIVEN NAIL

INCORRECTLY DRIVEN NAILS

BOTTOM OF THE NAIL HEAD IS FLUSH WITH THE TOP OF THE NAILED SHINGLE

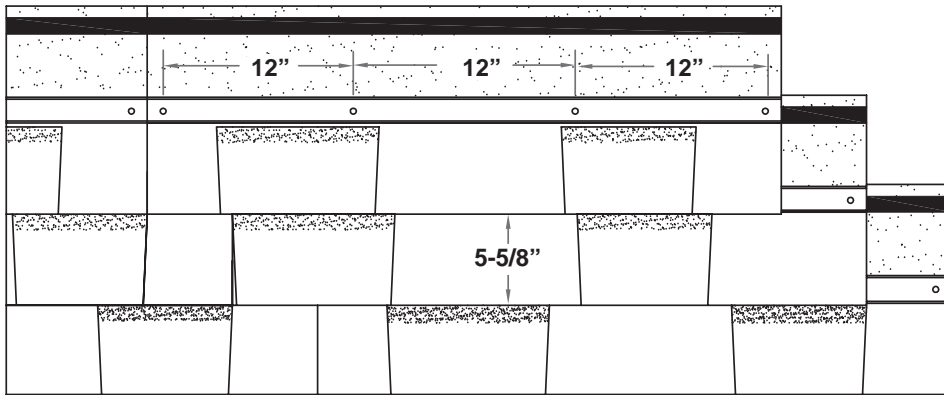
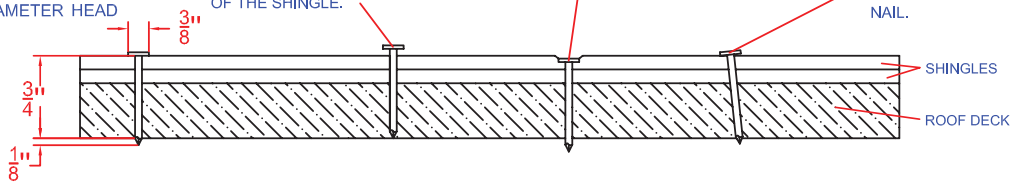
$\frac{3}{8}$ " (10mm) MIN. DIAMETER HEAD

NAIL TO PENETRATE A MIN. OF  $\frac{3}{4}$ " INTO THE ROOF DECK, OR AT LEAST  $\frac{1}{8}$ " THROUGH THE BOTTOM OF THE DECK.

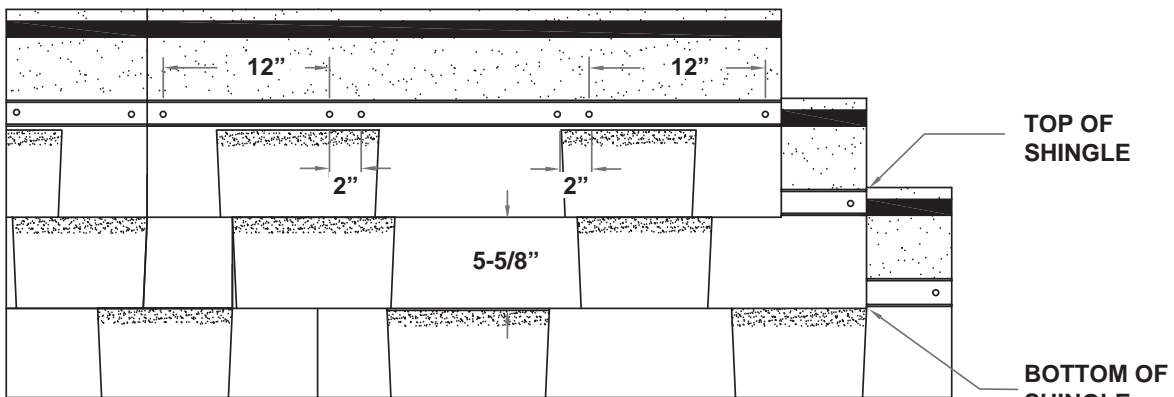
UNDER-DRIVEN: MUST HAMMER NAIL FLUSH WITH THE TOP OF THE SHINGLE.

OVER-DRIVEN: INSTALL A NEW NAIL 1" FROM THE OVER-DRIVEN NAIL.

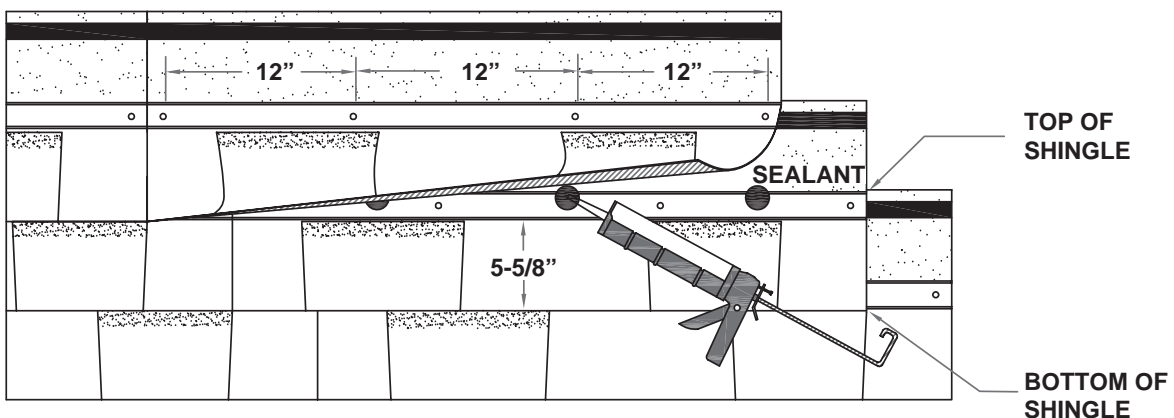
CROOKED: REMOVE NAIL AND INSTALL A NEW NAIL 1" FROM THE CROOKED NAIL.



**7-K STANDARD NAILING**



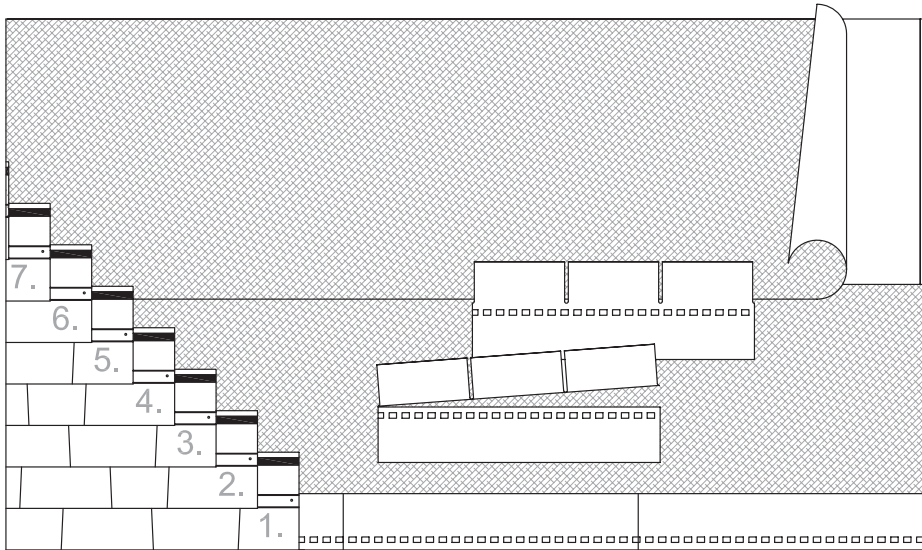
**7-L HIGH WIND & STEEP SLOPE NAILING**



**7-M HAND SEALING**



### 7-N LAMINATE LAYOUT PATTERNS

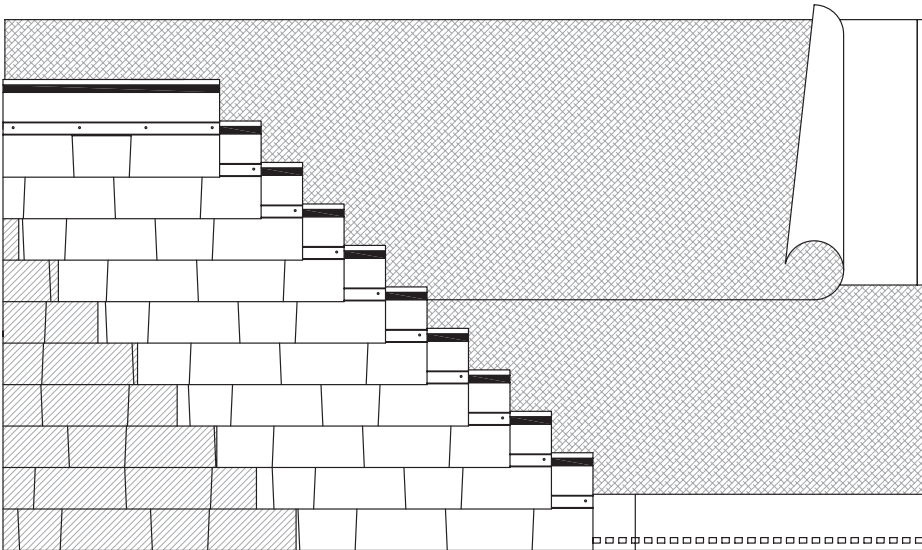


**STEP 1.**

**COURSES 1-7**

**\*ALWAYS BUTT FACTORY EDGE TO FACTORY EDGE WHEN INSTALLING THE STAIR METHOD. THIS HELPS MAINTAIN A STRAIGHT LAYOUT OF THE REMAINING SHINGLES.**

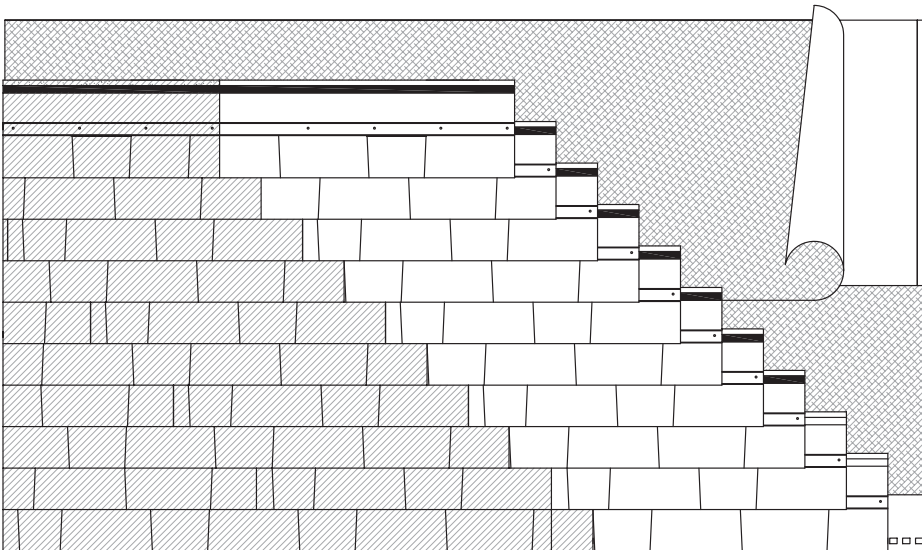
- 1: 39-3/8" LONG
- 2: 33-3/4" LONG
- 3: 28-1/8" LONG
- 4: 22-1/2" LONG
- 5: 16-7/8" LONG
- 6: 11-1/4" LONG
- 7: 5-5/8" LONG



**STEP 2.**

**COURSES 8-19**

**\*APPLY A FULL SHINGLE TO EACH OF THE FIRST SEVEN COURSES TO EXTEND THE PATTERN.**

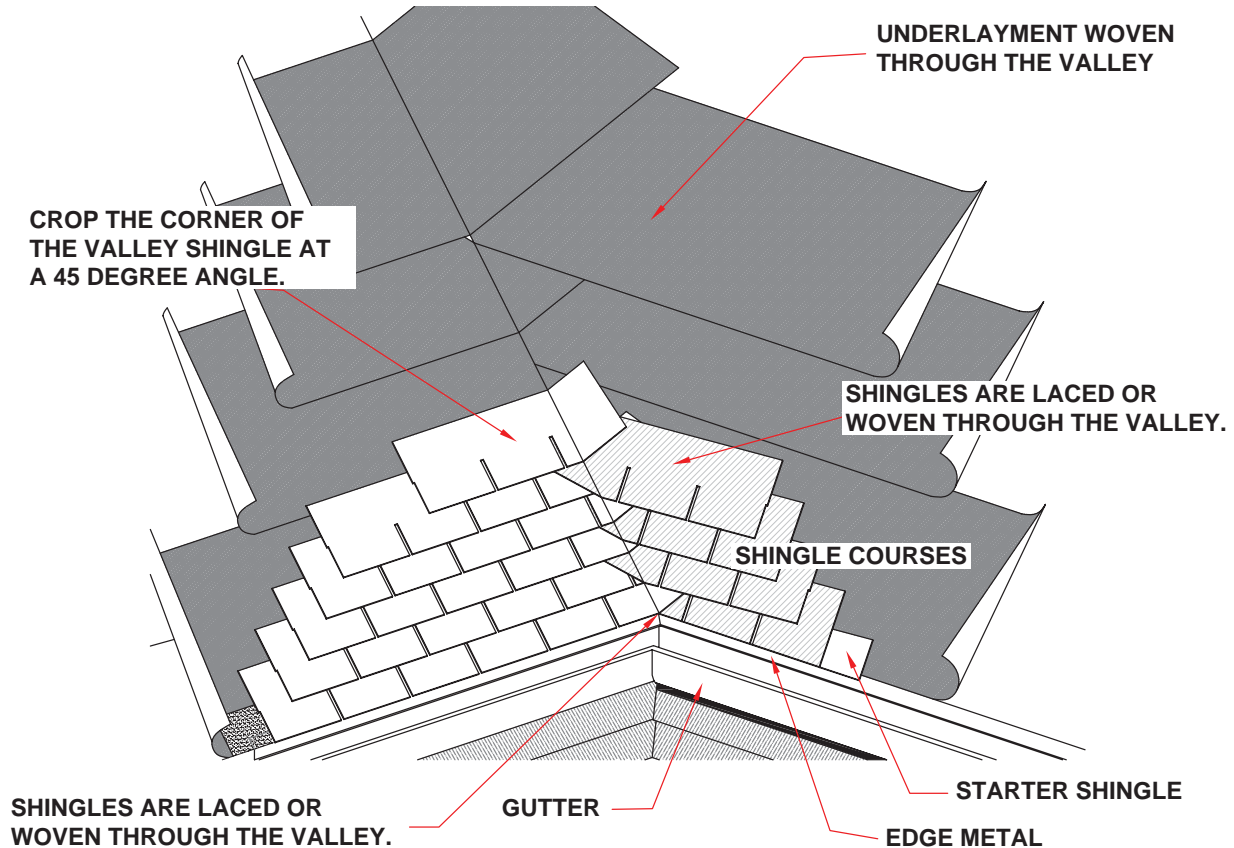


**STEP 3.**

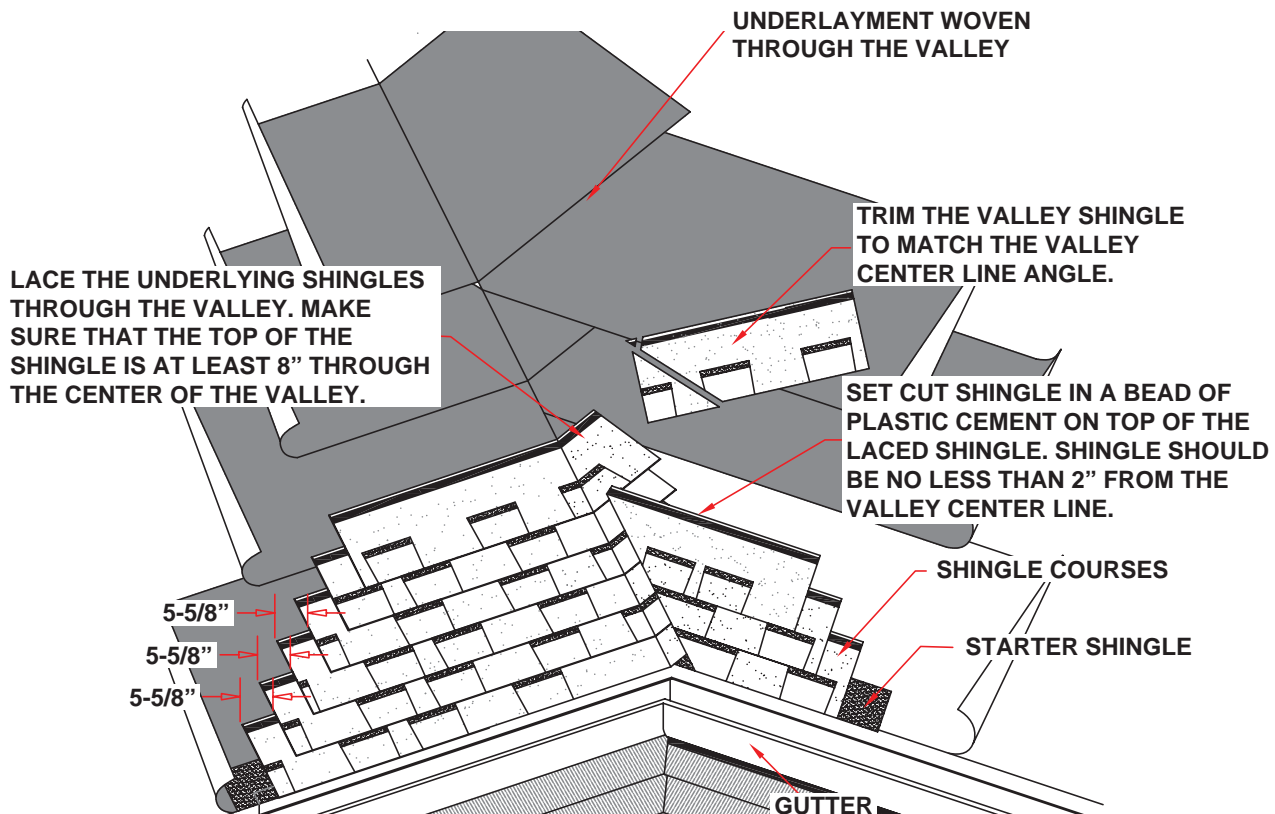
**REMAINING COURSES**

**\*REPEAT THE PROCESS BEGINNING WITH A FULL SHINGLE AND CONTINUE SUCCEEDING COURSES.**

### 7-O 3-TAB WOVEN VALLEY

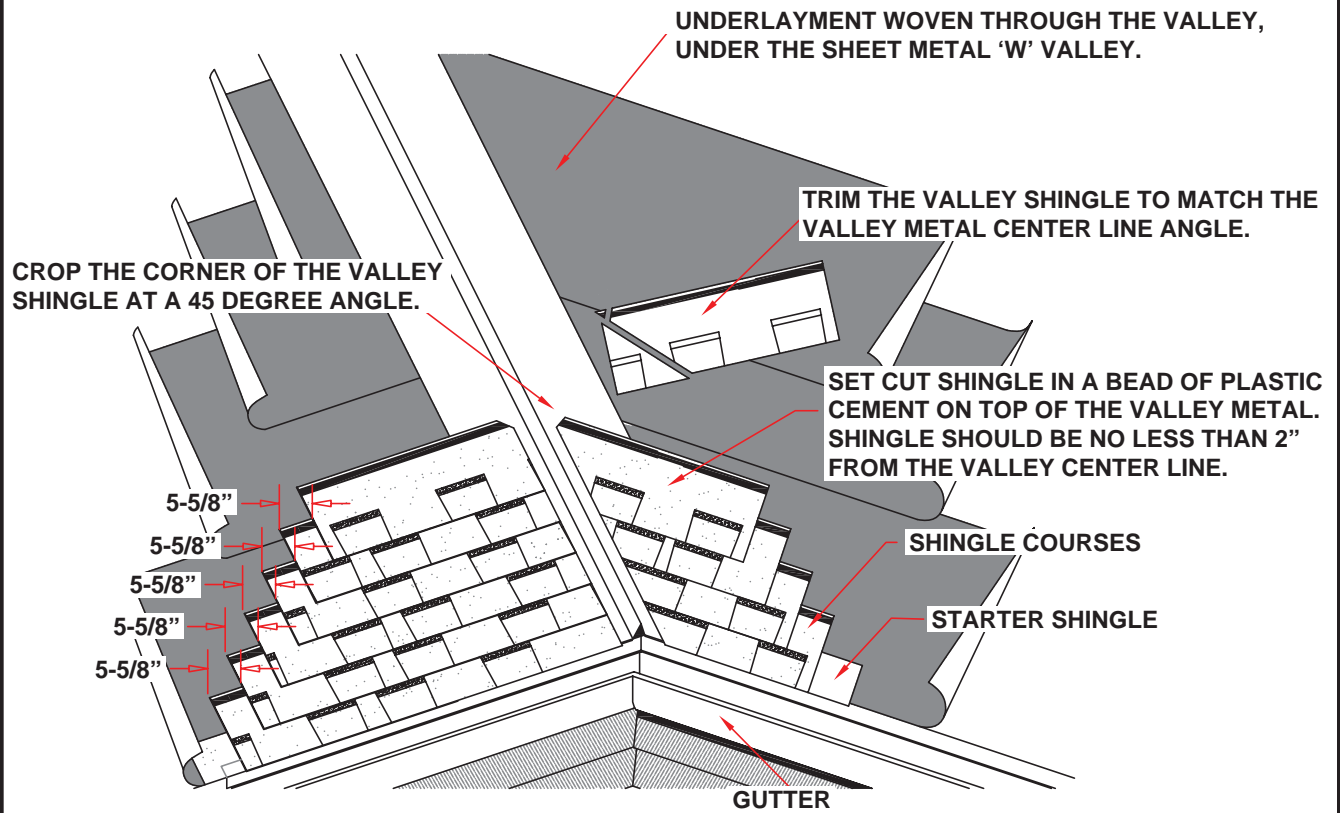


### 7-P CLOSED CUT VALLEY

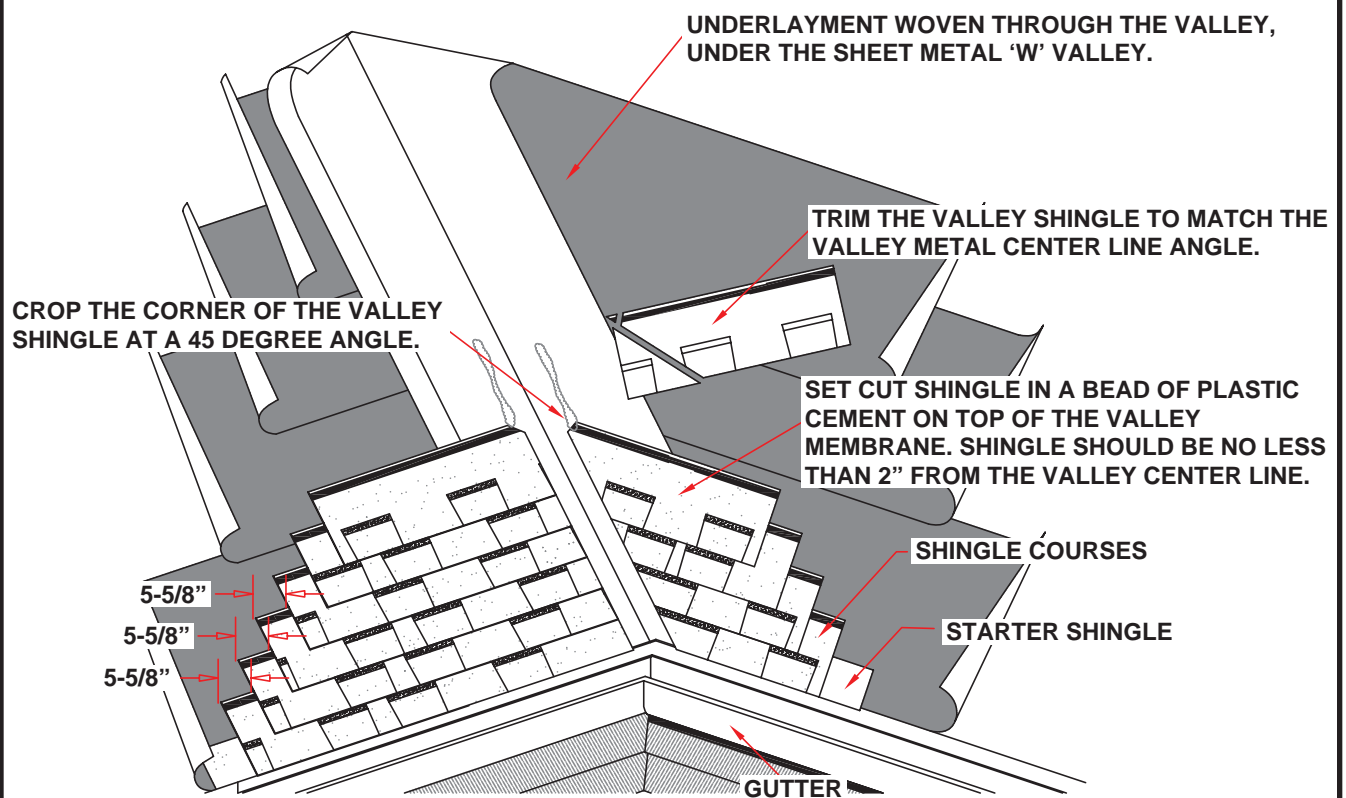




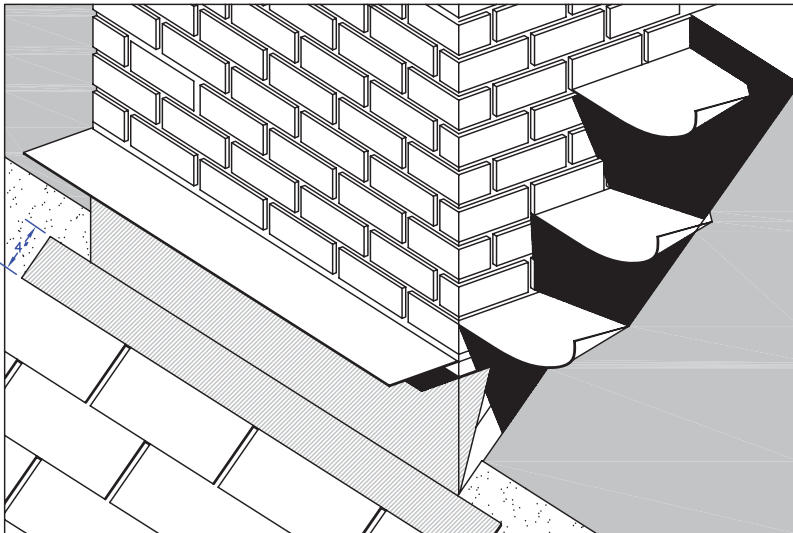
### 7-Q 'W' METAL VALLEY



### 7-R MEMBRANE VALLEY



## 7-S STEP FLASHING FOR CHIMNEYS OR ROOF TO WALL TRANSITIONS

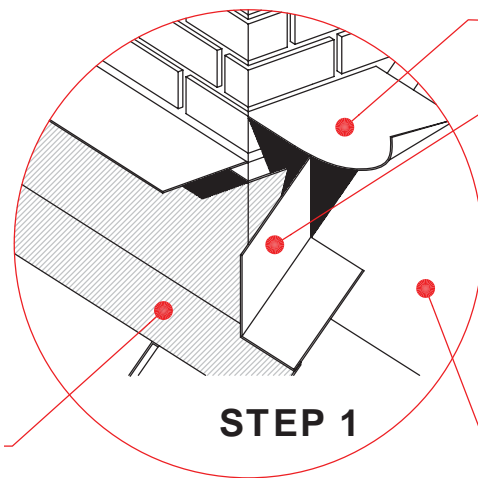


COUNTER FLASHING BENT UP SLIGHTLY TO ALLOW FOR STEP FLASHING INSTALLATION.

UNDERLAYMENT WITH OPTIONAL ICE & WATER SHIELD RUN 3" UP THE VERTICAL FACE OF THE WALL OR CHIMNEY.

SHEET METAL APRON INSTALLED OVER THE LAST FULL COURSE OF SHINGLES, CUT AND FORMED TO THE CORNER AND SECURED.

## STEP FLASHING CLOSE UP

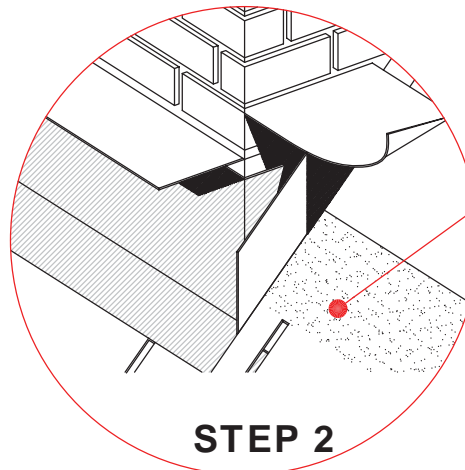


COUNTER FLASHING BENT UP SLIGHTLY TO ALLOW FOR STEP FLASHING INSTALLATION.

3" X 4" X 7" SHEET METAL 'STEP FLASHING' INSTALLED IN SEALANT OVER THE SHEET METAL APRON, LAPPING 1" BEYOND THE CORNER OF THE CHIMNEY.

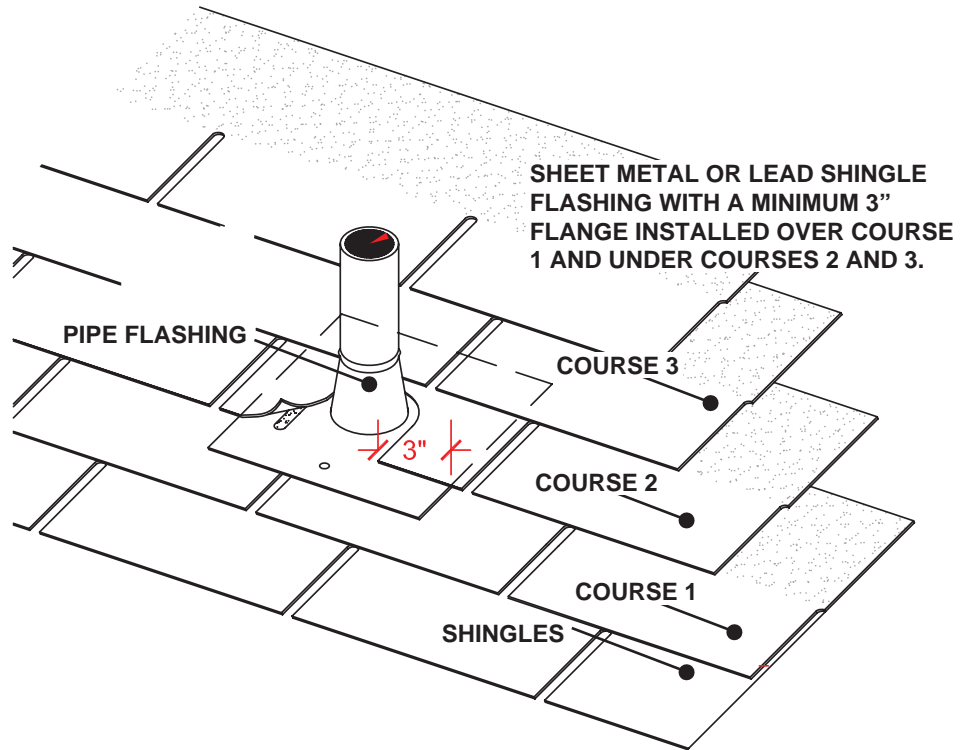
SHEET METAL APRON INSTALLED OVER THE LAST FULL COURSE OF SHINGLES, CUT AND FORMED TO THE CORNER AND SECURED.

UNDERLAYMENT WITH OPTIONAL ICE & WATER SHIELD RUN 3" UP THE VERTICAL FACE OF THE WALL OR CHIMNEY.

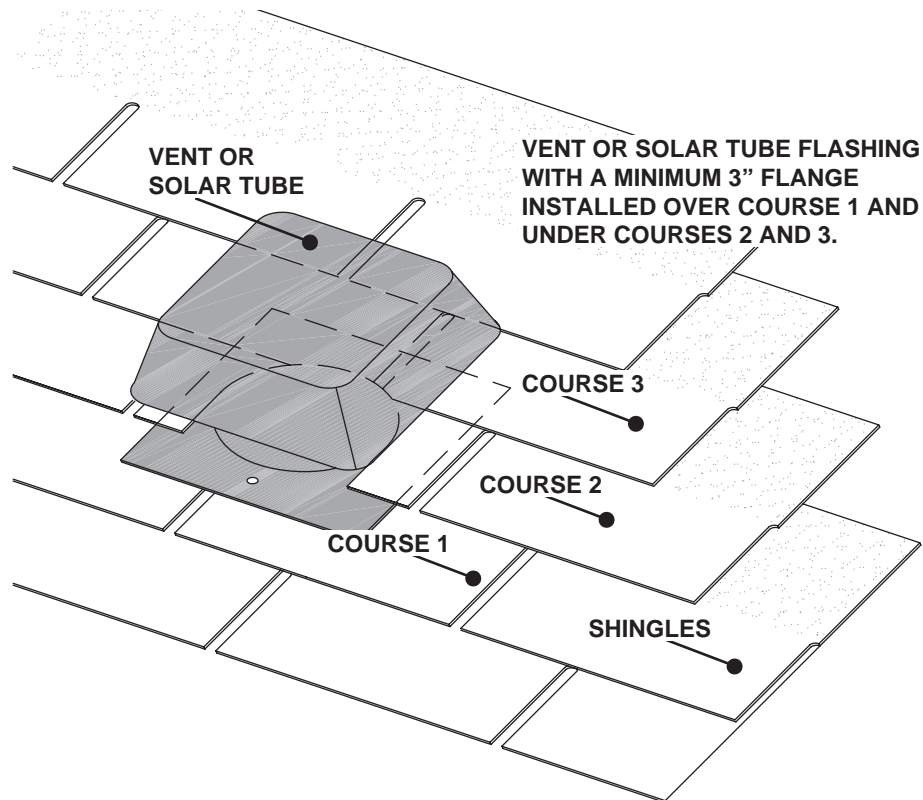


INSTALL NEXT COURSE OF SHINGLES OVER THE STEP FLASHING AND CUT WITH A 1/4" GAP FROM THE STEP FLASHING BEND.

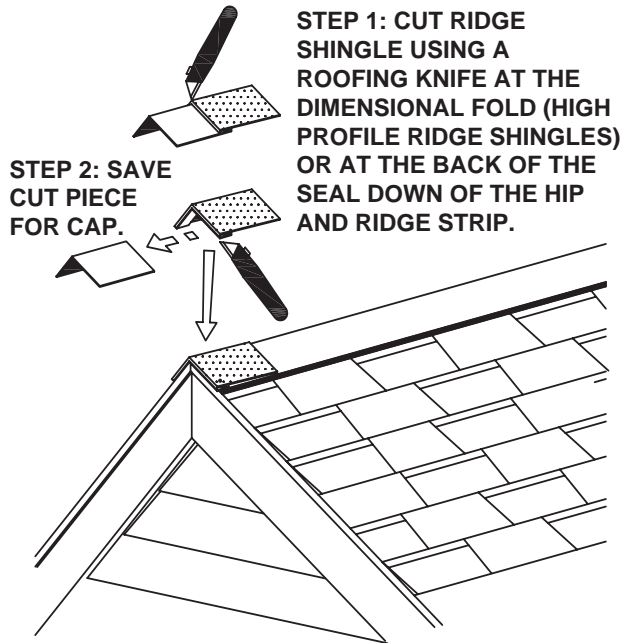
### 7-T PIPE FLASHINGS



### 7-U OTHER FLANGED FLASHINGS



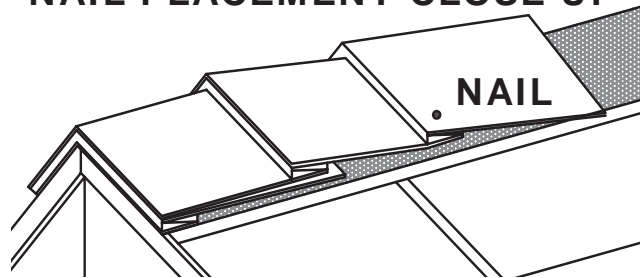
## 7-V RIDGE SHINGLES



**STEP 3: INSTALL THE CUT DIMENSIONAL FOLD RIDGE SHINGLE (HIGH PROFILE RIDGE SHINGLES) OR HIP AND RIDGE STRIP FLUSH WITH THE COURSES OF SHINGLES AT THE RAKE EDGE. USE ONE NAIL FOR EACH SIDE AND PLACE 1" FROM THE BOTTOM AND 1" FROM THE BACK (SEE CLOSE UP).**

**STEP 4: INSTALL FULL RIDGE SHINGLE, OVERLAPPING THE FIRST PIECE A MINIMUM OF 1/4" TO A MAXIMUM OF 1/2". NAIL THE SHINGLE THROUGH THE DIMENSIONAL FOLD (HIGH PROFILE RIDGE SHINGLE) OR JUST BEHIND THE SEAL DOWN OF THE HIP AND RIDGE STRIPS. USE ONE NAIL FOR EACH SIDE AND PLACE 1" FROM THE BOTTOM AND 1" FROM THE BACK (SEE CLOSE UP).**

### NAIL PLACEMENT CLOSE UP



**STEP 5: INSTALL FULL RIDGE SHINGLE, OVERLAPPING THE UNDERLYING PIECE A MINIMUM OF 1/4" TO A MAXIMUM OF 1/2". NAIL THE SHINGLE THROUGH THE DIMENSIONAL FOLD (HIGH PROFILE RIDGE SHINGLE) OR JUST BEHIND THE SEAL DOWN OF THE HIP AND RIDGE STRIPS. USE ONE NAIL FOR EACH SIDE AND PLACE 1" FROM THE BOTTOM AND 1" FROM THE BACK (SEE CLOSE UP).**

**STEP 6: CONTINUE INSTALLING RIDGE SHINGLES AS DESCRIBED IN STEP 5 UNTIL COMPLETED.**