QUALITY EDGE®

ROOFER'S POCKET GUIDE

Integra® ROOF SYSTEM

A quick reference guide to roofing basics and how to install Quality Edge roofing accessories.

TURNING THE ROOFING MARKET UPSIDE DOWN

QUALITY EDGE®, AMERICA'S LEADER IN ROOF ACCESSORIES, BRINGS YOU NEW SALES OPPORTUNITIES LIKE NEVER BEFORE.

Imagine a world with over 70 innovative roof accessories. A world where colors match perfectly. Welcome to Quality Edge. We'll turn your world upside down with the largest selection of roof accessories in 100s of designer colors—to match the leading shingle and siding colors. Give yourself a powerful new edge on the competition—with Quality Edge.

QUALITY EDGE ELEVATES ROOFING TO A NEW LEVEL

As a professional roofer, you can count on Quality Edge for innovative roofing accessories that make all the difference in the finished job. Quality Edge is an industry leader in metallurgy and high performance alloys. No other manufacturer offers you a more extensive line of roof accessories. All made of premium quality aluminum and steel, and all designed to enhance the roof's performance.

THE LARGEST SELECTION OF ROOFING ACCESSORIES IN COORDINATING COLORS.

Quality Edge brings you over 70 roofing accessories with the greatest color selection to blend beautifully with today's leading shingle and siding products.

Quality Edge lets you offer your customers a beautifully color-matched roofing system. Our valleys, drip edge, and gutter protection all come in colors to match or complement your roof to give the roof a totally color coordinated look– see the full color availability in our Spec Guide.

INTRODUCING THE ROOFER'S POCKET GUIDE

We've brought together a wealth of information on how to install Quality Edge roofing products and ensure a high-quality roofing job. From the basics of shingling to the finishing touches, it's all here. It's all about helping you build a better roof, and raise your level of knowledge at the same time.

Your feedback and input into this guide will help make future editions even better. Please call us with your suggestions:

1-888-784-0878

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THE IMPORTANCE OF ROOF FLASHING

The most likely place for a leak to develop is anywhere the roof joins with walls and chimneys. To help prevent leaks, corrosion-resistant metal flashing is typically applied. Metal flashing is very effective, and when properly installed, can help accommodate roof, chimney, wall, or structural movements due to settling, expansion, and contraction.

Roof flashing works like shingles—it overlaps and sheds water. Flashing is constructed in a system to work with the effect of gravity. When correctly designed and installed, it can only be defeated by water running uphill – which can happen in the presence of snow, ice or wind-driven rain.

All flashing systems should be reviewed by installers with an eye to local weather extremes. The best backup security for flashing systems at this time is the presence of waterproofing shingle underlayment beneath it. However, local experience may call for other flashing modifications to withstand weather-related conditions.

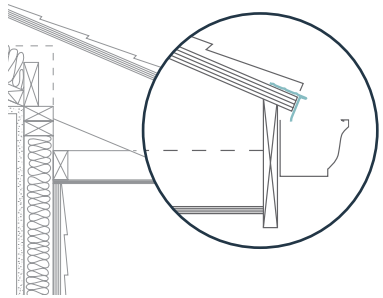
Flashing typically consists of: "step" flashing which is attached to the roof, "cap" flashing which is attached to the chimney or a wall , "drip edge" flashing and "valley" flashing. Step flashing is sometimes called "base flashing" and cap flashing is sometimes called "counter flashing". Often, exterior wall siding serves as cap flashing.

PERIMETER EDGE (DRIP EDGE) FLASHING

Experts agree that metal drip edge is the ideal way to keep water away from roof edges. Drip edge is installed along the roof rakes and eaves to shed water away from the edge. It flashes the natural point of separation where the roof deck, fascia and rafter tail meet.

The roof deck is most vulnerable to leaks where it meets a vertical wall, at penetration sites such as a soil pipe or chimney, or at changes in slope such as at a valley, saddle, mansard, hip, or ridge. This vulnerability is due to:

- Deferential movements, (e.g. the roof deck moves but the chimney does not).
- An accumulation of turbulent water (e.g. in valleys and on the high side of chimneys).
- An accumulation of melting snow or ice (e.g. in valleys and on the high side of chimneys).
- Breaks in overlapped shingles (e.g. at hips and ridges).

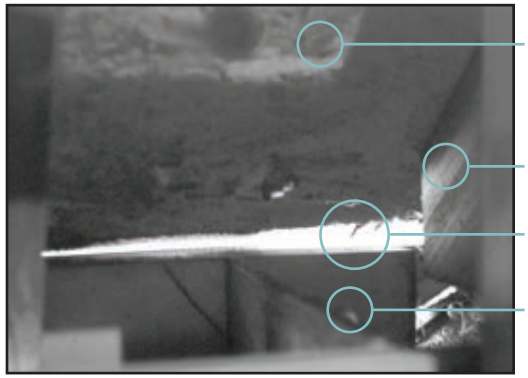


Flashing is installed at these locations to bridge adjoining structures and prevent water penetration. Flashing materials include sheet metal, cements, caulks, sealants, and flexible sheets such as waterproofing shingle underlayment. At hips and ridges the cap shingles, not normally called flashing, serve the same function. Leaks are most likely to originate at a flashing that has failed or was improperly installed.

Corrosion-resistant metal flashing (aluminum or galvanized steel) is the ideal flashing since it offers long-lasting performance and can withstand structural movements as the result of settling, expansion and contraction.

Quality Edge Drip Edge comes in profiles including: T-style, C-style, Siders Edge, Asphalt Drip, Gravel Stop, and Gutter Apron. Many drip edge profiles are offered with hem in 10' and 12' lengths.

HOW TO INSTALL DRIP EDGE



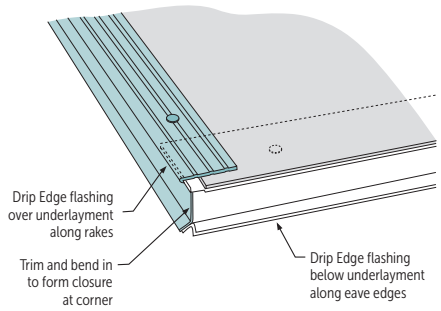
View of a 4,000 sq. ft. custom home from inside the attic.

1. Drip Edge should extend back from the roof edges to provide a suitable surface for water runoff.

2. Nail one in the middle and one on each end of a 10 ft. piece (approximately every 5 ft.) as overnailing can cause buckling.

3. ON RAKES: install drip edge on top of the underlayment to stop wind-driven rain from getting underneath.

4. ON EAVES: install drip edge below the underlayment so the water will shed efficiently off the roof if it gets under the shingles.



FOR SEVERE WEATHER CONDITIONS

In extreme ice dam areas, a good option is to install waterproof underlayments under the drip edge and down the fascia at the eave. Make sure the waterproof underlayment is not exposed to the sun.

PORCH FLASHING

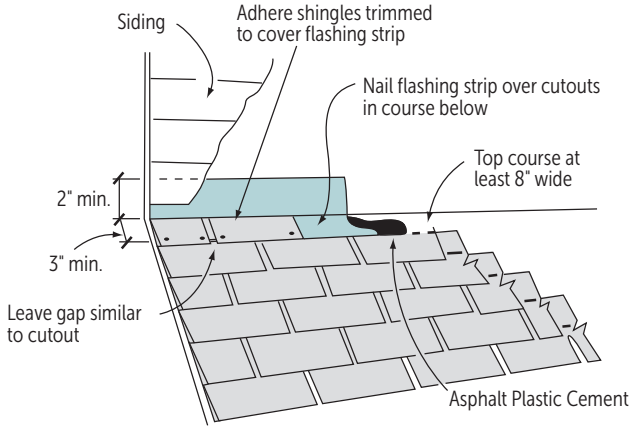
HOW TO FLASH AGAINST VERTICAL FRONT WALLS

To apply base flashing against a vertical front wall:

1. Apply the shingles up the roof until a course must be trimmed to fit at the base of the vertical wall. By planning ahead you can adjust the exposure slightly (and evenly) in the previous courses, so that the last shingle is at least 8" (vertically) wide. This allows a minimum 5" exposure of the top course and a 3" headlap.

2. The metal flashing strip should be bent, using a metal brake, to extend at least 2" up the vertical wall and at least 3" onto the last shingle course; that is, to the top of the cutout.

3. Apply the metal flashing, which can be 8 to 10 feet in length, over the last course of shingles. Embed the metal flashing in asphalt roofing cement, or another appropriate adhesive, and nail it to the roof every 12". Nail the strip to the wall, not the roof deck.



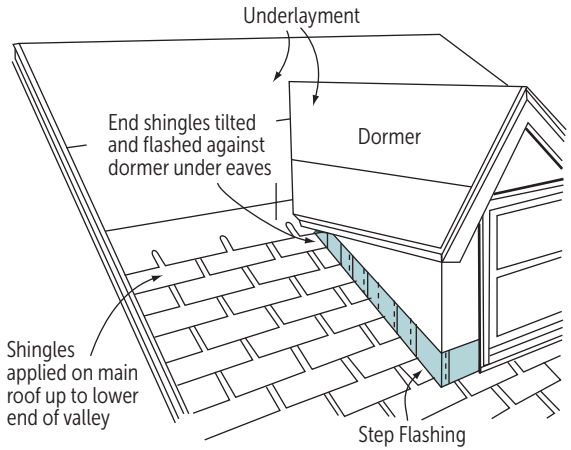
Front wall flashing.

4. If side laps are necessary, overlap the pieces at least 6". Do not fasten in this joint area.

5. Apply an additional row of shingles over the metal flashing strip, trimmed to match the vertical width of the metal flashing strip on the shingle surface. Fasten shingles with face nails sealed over with a small dab of roofing cement.

6. Next, if there is siding, bring it down over the vertical part of the step flashing to serve as cap flashing. Do not nail the siding into the vertical flashing.

7. If the vertical front wall meets a sidewall, as in dormer construction, cut the front flashing so that it extends at least 7" around the corner. Then continue up the sidewall with step flashing as described earlier. A good quality caulk, or asphalt roofing cement, may be useful to fully seal behind corner, if they will not be soldered.



Front/sidewall flashing.

CHIMNEY FLASHING

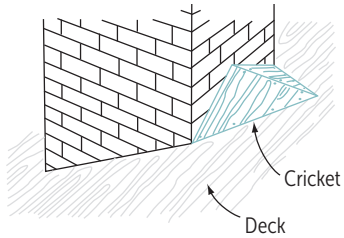
Because chimneys are usually built on an independent foundation that is separated from the main house foundation, the chimney can move independently of the rest of the house. To allow for chimney/deck movement, the base flashing is secured to the roof deck and counter or cap flashing is secured to the chimney. When movement occurs, the step-cap flashing system will act as a moveable joint.

In moderate to severe climates that experience heavy snow, ice or high winds, waterproofing shingle underlayment is recommended for installation around the base of the chimney.

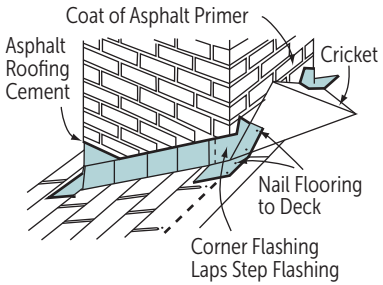
1. Prime the masonry surfaces and run the waterproofing underlayment up the sidewall 3" or 4". It is a flexible material that will accommodate the differential movement of chimney and deck.

2. For chimneys projecting through the roof surface, we recommend that a "cricket" be installed at the intersection of the uppermost face of the chimney and the roof deck. The cricket, sometimes called a wood saddle, is an important element in preserving the integrity of the flashing that will be installed because it prevents the build-up of ice and snow at the rear of the chimney and diverts water runoff around the chimney. It also prevents water from "ponding" and backing up under the shingles during winter freeze/thaw periods.

3. The cricket should be in place before roofing installation begins because all roofing materials, from the felt underlayment to the roofing shingles, are applied over it. A cricket consists of two triangular sections of plywood joined to form a level ridge that extends from the centerline of the chimney back to the roof deck.



Chimney through the roof deck.

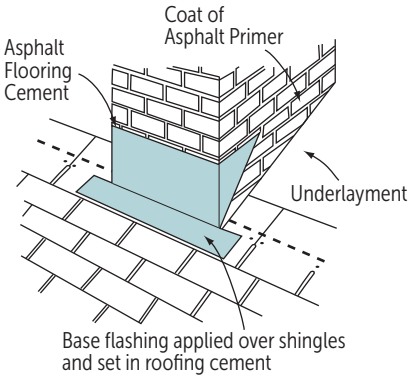


Applying corner flashing.

4. Nail the sections to the deck and to each other along their meeting edge, customizing as necessary to get a tight fit.

5. Crickets are recommended when a chimney is wider than 24", the roof pitch is 6/12 or greater, and where snow and ice accumulations are likely.

6. Apply shingles up to the front vertical edge of the chimney. Apply base flashing against the front vertical wall. Apply step flashing to the side and back walls as described previously for side walls.



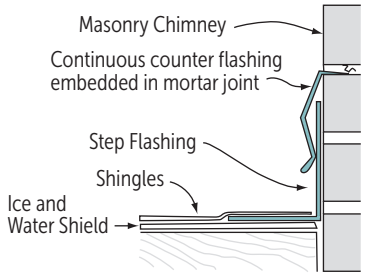
Chimney base flashing application.

HOW TO DO CAP FLASHING

Cap flashing techniques will vary with the type of chimney finish, such as stucco or brick.

1. In general, for positive exclusion of water from the chimney joint, begin by setting the metal cap flashing, typically copper, aluminum, or galvanized, into the brickwork. This is done by cutting out a mortar joint to a depth of 11/2" and inserting the bent edge of the flashing into the cleared joint.

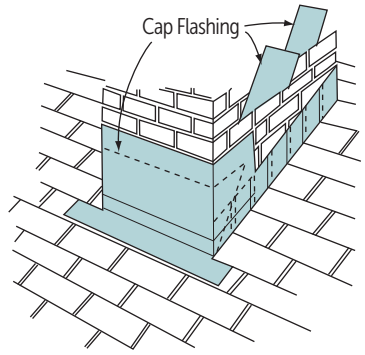
2. Once in place and being under a slight amount of spring tension, the flashing cannot be dislodged easily. Refill the joint with Portland cement mortar, silicone, caulk, or use a soft metal wedge and polyurethane sealant.



Through-wall metal counter flashing embedded in masonry.

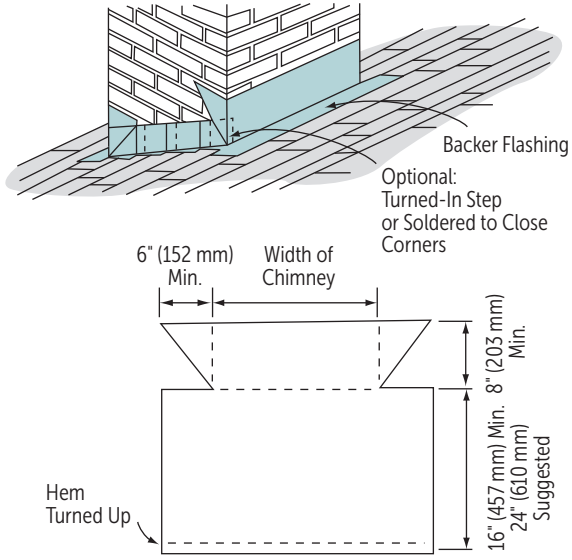
3. Finally, bend the flashing down to cover the base flashing, or pre-bend it so it will lie snugly against the masonry.

4. Use one continuous piece of cap flashing on the lowermost and uppermost sides of the chimney. On the sides of the chimney, use several pieces of similar-sized flashing, trimming each to fit the particular location of brick joint and roof pitch. Start the side units at the lowest point and overlap each at least 3" side-to-side. If the sides of the chimney have continuous surface, such as a stucco finished chimney, use a continuous piece of cap flashing.



Applying cap flashing.

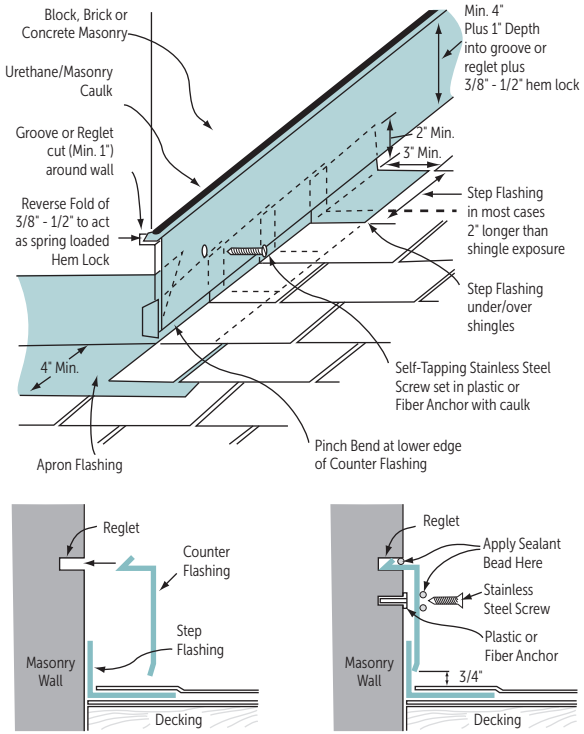
5. If a cricket is not used, the vertical sidewall base flashing should be pre-bent and extend up the chimney at least 6" and up the roof deck at least 18", with appropriately formed sides and corners. The first course of shingle material to cross the roof deck on the uppermost side of the chimney should be trimmed back a minimum of 2" from the chimney vertical flashing bend and set in asphalt plastic cement. This 2" setback allows quick water drainage, prevents water from working up under the shingles, and promotes natural cleaning of debris from the high side of the chimney.



Example of sheet metal back flashing from upslope portion of masonry chimney.

HOW TO DO CONTINUOUS COUNTER FLASHING

This optional counter flashing technique uses a continuous metal piece instead of the typical (stepped) counter flashing along the side of a chimney or wall with mortar joints. It is an alternative to stepped counter flashing, which can lead to water leaks along the vertical joints in high wind or permit the entry of wind-driven, fine grained snow. With continuous counter flashing, the apron flashing is continuous over the shingles and up the masonry wall. The vertical wall portion is then covered with counter flashing.



Continuous counter flashing against Masonry chimneys and walls.

BEFORE CUTTING THE "REGLET"

1. Mount a guide or ledger on the side of the chimney or wall to be cut.

2. With a dry masonry or diamond wheel on a circular saw or grinder, cut a groove (also known as a "reglet" or "raggle") in a straight line parallel to the roof slope. The groove should be a minimum of 1" deep into the masonry (1¼" to 1½" is preferred).

3. Apply shingles and step flashing to the roof at the joint with the masonry chimney or wall. Pay particular attention to any metal corner bends and joints.

4. Choose the appropriate length and width dimensions of metal to be used for continuous counter flashing. Plan your sequence of bends in advance, and form the metal. A metal brake is preferred for accurate bends. Also, don't forget to allow extra length to accommodate each bend (obviously, this depends on the thickness of the metal used).

5. Run a bead of sealant or caulking into the reglet prior to installing the counter flashing. Choose a sealant/caulking that is specifically designed for use with masonry. Urethane-based materials are well-suited for masonry/metal applications.

6. Set the continuous metal flashing into the reglet with the pre-applied sealant/caulk and allow to cure. After this sets up, run a final bead of sealant/caulk on the exposed area of the reglet to seal the metal-to-masonry joint.

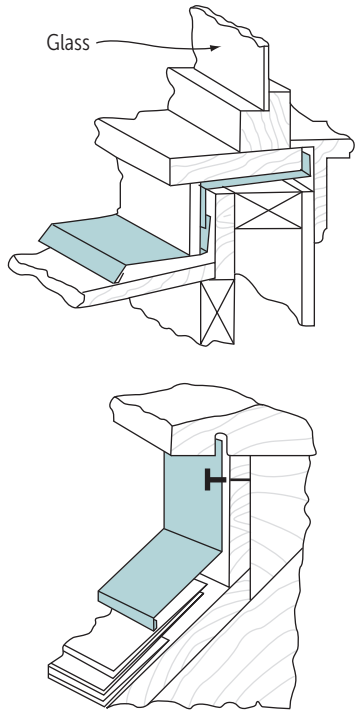
IN FORMING THE METAL CONTINUOUS COUNTER FLASHING, PAY PARTICULAR ATTENTION TO:

- The reverse fold 3⁄8" to ½", which will act as a spring-loaded hem lock in the groove.
- The depth of the metal into the groove.
- The pinch bend, which will ensure a tight fit against step flashing and add rigidity to continuous metal counter flashing.

DORMER FLASHING

HOW TO DO DORMER FLASHING

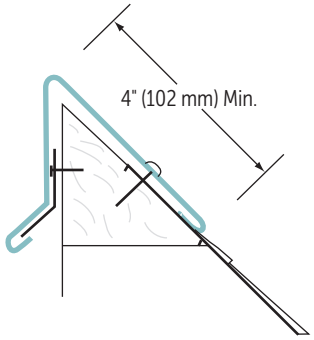
The junction of a dormer with a sloping roof requires a base or apron flashing below the window sill. The figures below illustrate the two systems that are usually encountered.



Two examples of base flashing below the window sill of a dormer.

HOW TO DO SINGLE PITCH RIDGE FLASHING

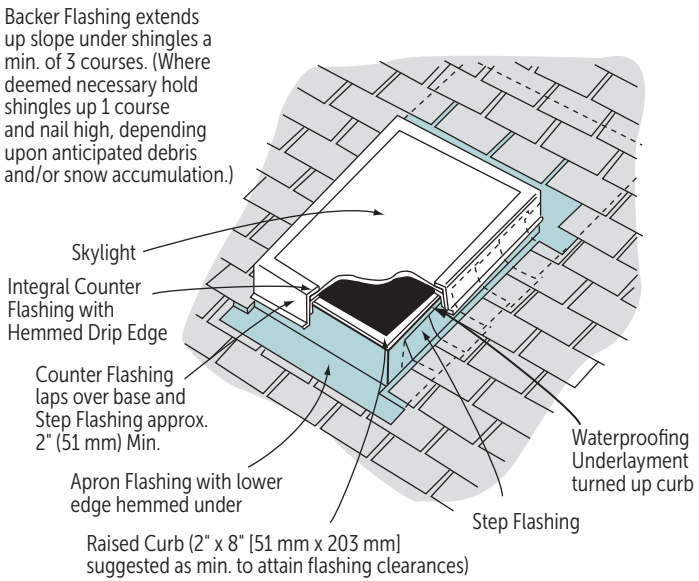
Occasionally, shingles are installed on a single pitch ridge. The figure below illustrates how to finish off flashing on a single pitch ridge.



Topping flashing on a single pitch ridge.

SKYLIGHT FLASHING

Many skylight designs are being sold. Most provide their own instructions for flashing the curb on which the skylight is mounted. The skylight curb is flashed much like a chimney. Install adhered waterproofing underlayment around the entire deck and bring the underlayment up onto the curb. An apron flashing with a hemmed lower edge is installed on the base. Step flashing is installed on the sides; base flashing is installed upslope, holding one course of shingles away from the curb to encourage rain to wash away dirt and debris. The skylight itself provides the counter flashing or cap.



Basic sheet metal components used at skylight.

STEP FLASHING

HOW TO FLASH AGAINST A SIDEWALL

There are three things to keep in mind when installing flashing.

1. Don't fasten the cap or counter flashing to the roof deck or to the step flashing, since they move independently of each other to accommodate any structural movement.

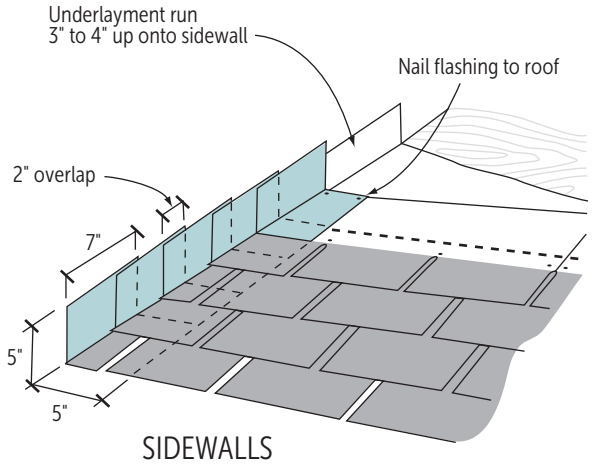
2. Each metal step flashing piece (sometimes called a flashing shingle) is to be placed slightly up the roof from where the exposed edge of the next overlapping shingle will be located (that's why it's called step flashing). This will help keep the flashing out of sight while maintaining a water-tight fit.

3. The material used for step flashing must be corrosion resistant.

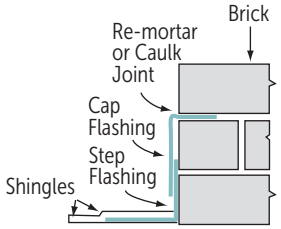
The following minimums apply for most shingles:

- The width of the step flashing on the deck must be at least 3" wide.
- The height of the step flashing installed against the vertical surface must be at least 2" high.
- For a step flashing application, the pieces of flashing must overlap each other by at least 2".
- The length of the step flashing pieces depends on the type of shingles being applied.

NOTE: As a general rule of thumb, the minimum length of flashing should be 2" more than the shingle exposure. For instance, metric shingles installed with a 5⅝" exposure require flashing of at least 7⅝" in length. ARMA recommends that step flashing be 5" high and 5" wide, while NRCA recommends that step flashing be 4" high by 4" wide. However, a minimum requirement of 2" x 3" provides full protection against normal water back-up.

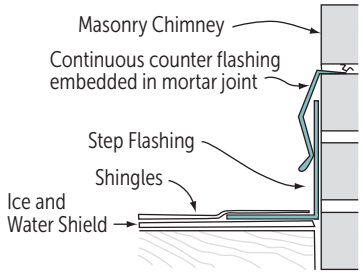


Sidewall step flashing.



HOW TO FLASH AGAINST A VERTICAL SIDEWALL

1. When installing step flashing against a vertical sidewall), place the first flashing piece over the end of the starter strip and, finally, position it so that when the tab of the end shingle in the first course is applied, the flashing will be covered completely.
2. Fasten the part which sits on the roof with one nail.
3. Next, apply the first-course shingles up to the wall.
4. Position the second step flashing piece over the first-course shingle and against the wall, 5" up from the bottom edge of the first-course shingle. This will permit the tab of the shingle in the second course to cover it completely. As before, only fasten that part of the step flashing piece which sits on the roof.
5. Step flashing fastener(s) should be placed in the uppermost 2" area of the step flashing piece, to avoid leaks.
6. Continue up the roof or sidewall area in a similar manner until complete.

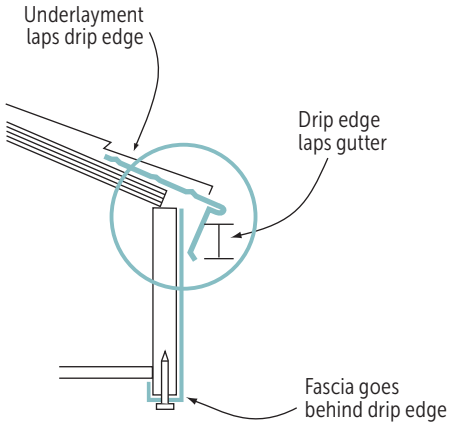


Sidewall step flashing.

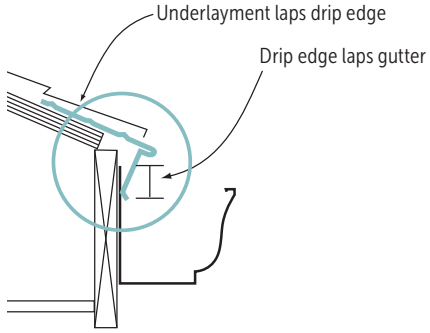
DRIP EDGE FLASHES FASCIA

Fascia goes behind the drip edge.

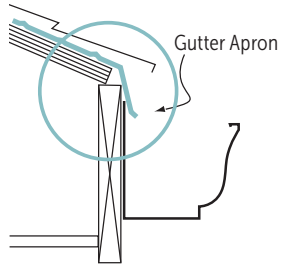
- It sheds water over the top of the fascia.
- It allows for proper installation of fascia.
- Without drip edge, fascia needs to be face nailed which causes buckling and oil canning.



DRIP EDGE FLASHES GUTTER



Gutter goes behind the drip edge (or gutter apron).



Without drip edge, water will get behind the gutter and promote rot and mold.

THE NEED FOR VENTILATION

WHAT IS VENTILATION?

Ventilation ensures a continuous supply of air through the attic space.

It consists of 50% intake under the eaves and 50% exhaust near or at the peak of the roof.

The exhaust must be at least 3 feet higher than the intake system.

WHY VENTILATION IS ESSENTIAL TO PREVENT HEAT BUILD-UP

In summer, ventilation reduces attic temperatures by as much as 30°F—extending shingle life and reducing energy bills.

Heat in an unventilated attic can cause temperatures to exceed 150°F, causing damage to the shingles and roof sheathing and possibly radiating to the living area.

Ventilation rids the attic of excess moisture:

- Dampness contributes to mold and mildew growth which can lead to major health problems
- Condensation can damage wood, plaster, paint and insulation

In winter, ventilation helps to keep the roof uniformly cold to prevent ice damming.

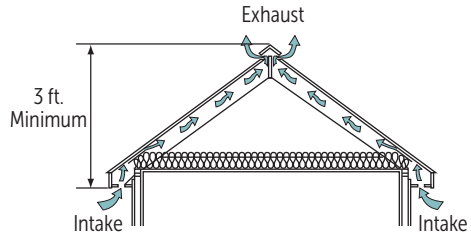
By ventilating, you are preventing moisture problems and extending the life of shingles, insulation and other building components.

NFA

You will find that most codes will specify a net-free area (NFA) of:

- 1 sq. ft. for each 150 sq. ft. of ceiling area (if the ceiling has no vapor retarder).
- 1 sq. ft. for each 300 sq. ft. of ceiling area (if the ceiling has a vapor retarder).The ventilation area should be divided 50/50 between high and low vents (preferably soffit and ridge vents).

Since these specifications were written before today's concerns for energy conservation and resulting trends towards tighter house construction, they may not be sufficient for every structure. Always check the manufacturer's recommendations for proper use of ventilating systems and vapor retarders.



"Proper ventilation" consists of 50% intake under the eaves, and 50% exhaust near or at the roof peak, at least 3 feet higher than the intake system.

VENTILATION:
THE VITAL FACTOR IN ROOF PERFORMANCE

HEAT: A NATURAL ENEMY OF ASPHALT

Heat, along with ultraviolet light, causes asphalt shingles to age through chemical changes that stiffen the asphalt. Initially, shingles are protected from ultraviolet light by the granules embedded in their surface. As long as the asphalt stays flexible the granules will stay in place. Eventually, however, the shingles become brittle and the granules break loose and gradually wash away.

Excess heat accelerates this aging process, causing the shingles to become prematurely brittle and show all the signs of aging, such as cracking and curling. The aging shingles lose their granules at a faster and faster rate and subject them to even more rapid deterioration from ultraviolet light.

Fortunately, accelerated shingle aging can be slowed by reducing the heat from directly below the roof deck. Proper attic ventilation is the best way to achieve this objective and is therefore a key component of the shingle roof system.

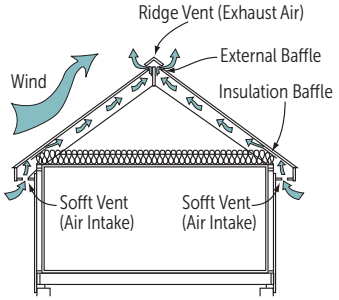
WHAT VENTILATION DOES

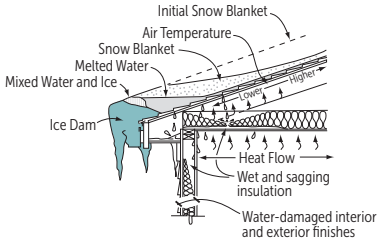
Ventilation is a system of intake and exhaust that creates a flow of air. Effective attic ventilation provides year-round benefits, creating cooler attics in the summer and drier attics in the winter, protecting against damage to materials and structure, helping to reduce energy consumption and helping to prevent ice dams.

With poor ventilation, summer sunshine can cause a terrific build-up of heat in the attic space. In a home with poor ventilation, the heat in the attic may eventually reach 140°F on a 90°F day. If the unventilated attic is heavily insulated, that heat will stay there much of the night, perhaps slowly migrating to the home's interior. An overheated attic, combined with moisture, can also be damaging to roof decking and roofing shingles, causing them to distort and deteriorate prematurely.

In the winter, again in a house with poor ventilation, moist, warm air from the lower portions of the home will tend to rise through the ceiling area into the attic, especially through bypasses where electrical and plumbing fixtures are installed. In a cold attic, the warm, moist air condenses on the cold surfaces of the rafters, the nails and other metal, and the attic side of the deck. This water can create several problems.

First, the condensation can swell the deck, causing waviness and buckling of both the deck and the shingles. Second, the water can rot the roof deck, destroying its ability to carry loads (like a roofing crew) and its nail-holding capability. Third, severe condensation can drip onto the insulation, reducing its effectiveness and possibly seeping through to the ceiling below.





ICE DAMS

Another winter problem caused by poor ventilation is the formation of ice dams. Ice dams form in cooler climates in the winter when heat collects in a poorly ventilated and/or inadequately insulated attic. Built-up attic heat combines with the sun's warmth to melt snow on the roof, even though outside temperatures may be below freezing. Then the flow of melting snow refreezes at the eaves and gutters. This freeze-thaw cycle can result in a pool of water that can back up under roof shingles and behind fascia boards, soaking roof decking and wall sheathing, damaging exterior and interior walls, peeling paint and ruining ceilings. Soaked lumber and building materials lead to secondary problems: wood rot, bug infestation, mold and degradation of structural integrity.

EXHAUST VENTS

Exhaust vents are designed to permit an efficient, unobstructed outflow of attic air. These units must be designed to prevent (or at least minimize) rain and snow infiltration. Exhaust vents must be used with intake vents to provide proper high/low balance and thus an adequate flow of air through an attic.

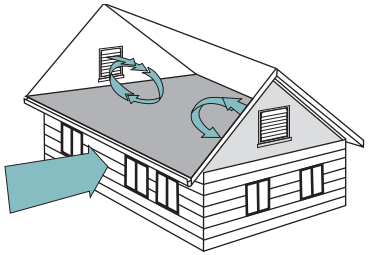
Exhaust vents are available in different designs:

GABLE LOUVERS

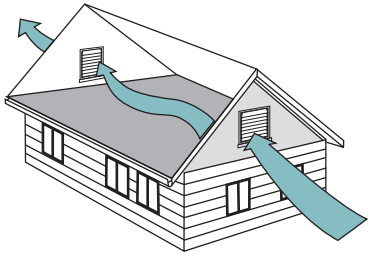
Gable louvers are typically installed in the gable ends of the house.

The gable-louver vent, an exhaust vent, allows unwanted air to flow out of the attic.

NOTE: Sometimes louvers are installed in opposite gable ends, without intake venting, in the mistaken assumption that a good "cross flow" of air can provide adequate ventilation.



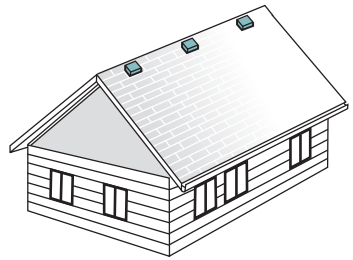
With wind blowing perpendicular to the ridge, the louvers act as both intake and exhaust vents.



With wind blowing parallel to the ridge, airflow dips toward the attic floor leaving the hottest air still on the underside of the roof sheathing.

ROOF LOUVERS

Roof louvers (also called roof pots) are installed as close to the roof ridge as possible to allow maximum release of moisture and overheated air. Because they're installed near the ridge, they provide a continuous airflow along most of the underside of the roof sheathing. The airflow pattern isn't uniform, however, so for maximum effectiveness, vents should be spaced equally along the roof.



A roof vent is an exhaust vent located near the ridge.

RIDGE VENTS

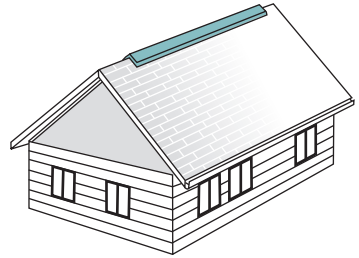
Ridge vents offer unique advantages compared to other types of exhaust vents.

Maximum efficiency ridge vents are designed to draw heated air from an attic regardless of wind direction or force.

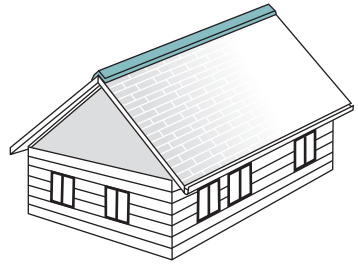
In addition, when little wind force exists, ridge vents take full advantage of the thermal effect to maintain air circulation across the underside of the roof sheathing. Warm air rises to the ridge and exhausts through the vent.

That allows a continuous flow of cooler air to enter at intake vents. Only ridge vents use thermal effect efficiently and effectively, because only ridge vents provide continuous and uniform air movement along the full length of a roof.

NOTE: For best results, intake venting should be divided equally along both sides of a structure.



Ridge vent shorter than the ridge length presents an unattractive "broken" appearance.



RIDGE VENTS CONTINUED...

Uniform Air Movement:

Because ridge vents run the entire length of a roof, they provide a uniform flow of air along the underside of the roof sheathing. That air movement helps eliminate "hot spots" that can develop with other types of exhaust vents – even powered vents. No other exhaust vents provide this type of airflow pattern.

Maximum Visual Appeal:

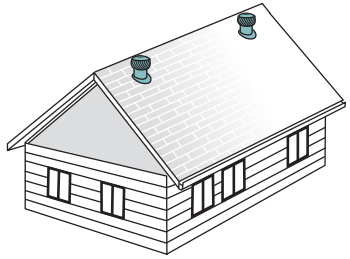
Most ridge vents offer a low-profile design that minimizes its appearance on a roof. Shingle-over designs allow optimum blending with other roof materials.

WIND TURBINES

Wind turbines use a moving part to help exhaust from an attic. That moving part consists of a series of specially shaped vanes that turn wind force into a rotary motion. As the spinning vanes gain velocity, they create an area of negative air pressure. That negative pressure, in turn, pulls air from an attic.

Although not as effective as ridge vents, wind turbines provide a low-cost alternative in areas where consistent wind speeds of at least 5 mph are typical. Without that minimal wind speed, wind turbines act essentially as roof louvers.

When the wind is blowing, however, wind turbines can be effective air movers.



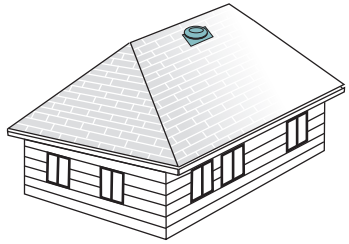
Wind turbines are located near the ridge and are used to exhaust air from the attic.

POWER ATTIC VENTILATORS

Like a wind turbine, a power fan uses the rotary motion of blades to draw hot air from the attic. But instead of using wind power to drive the blades, power fans use electricity to drive high-efficiency motors.

Unlike a wind turbine, however, the effectiveness of a power fan isn't dependent on wind force. Instead, a power fan is turned on and off as needed, automatically, with thermostat and humidistat controls.

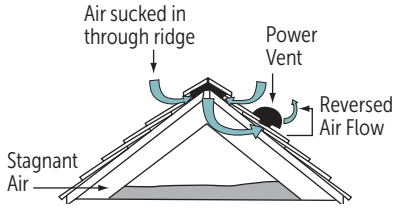
Although a power fan can move a large volume of air, typically a single unit cannot "vacuum" all hot air from an attic. Usually, to provide uniform air movement along the underside of roof sheathing, a series of power fans must be spaced equally along a roof.



Power fans are used to move large volumes of air – a good option for hard-to-vent hip roofs.

NEVER MIX TWO TYPES OF EXHAUST VENTS

When ridge and soffit ventilation is added to an attic with other vents in place, such as gable end vents, box or turbine static vents, or power fans, you must remove or block off the other ventilators. When installed properly, ridge and soffit systems draw air in the bottom (soffits) and out the top (ridge). Other open ventilator holes in the roof or gable will shortcut the low-to-high draft and diminish the ventilation effectiveness.



CAUTION: RIDGE VENTS & POWER VENTS DO NOT MIX

Power vents can actually pull air into an attic through a ridge vent, making it act as an intake. This reversed airflow could bring moisture into the attic and make the ridge vent ineffective.

SOFFIT VENTILATION

WHY YOU SHOULD INSTALL FULLY VENTED SOFFIT

- The more ventilation area you provide, the more effective the home will be at venting moist air.
- Soffits should be fully vented for maximum airflow.
- The intake of fresh air through the home allows moisture and excess heat to escape.
- Condensation occurs when air contacts a cold surface.
- By preventing trapped moisture, vented soffits help prevent moisture problems like rotting, mold and ice build-up.
- Maximum air circulation also improves indoor air quality to prevent problems like Sick Home Syndrome.

HOW TO INSTALL SOFFIT

HOW TO BEGIN

Soffit is the name given materials used to enclose the underside of eaves and porch ceilings. The installation of soffit will determine the positioning of the inside and outside corner posts. It also is necessary to complete the soffit, or install the soffit moldings, before the final course of siding is installed on the wall.

NOTE: Proper attic ventilation is important for any home. Consult a local building official for the appropriate requirements for a specific geographical area, and use vented soffit or other vented products as necessary.

PREPARATION

1. Inspect and plan the job in advance. For residing application, nail down any loose panels, boards, or shingles. Check surfaces for straightness and fur when necessary. Surfaces should be uniform and straight from various viewing angles.
2. The procedure used to install soffit depends on the construction of the eaves. There are two different types of eaves:

- OPEN EAVES with exposed rafters or trusses are typical of new construction. Open eave installation procedures are also used when removing damaged soffit during a residing project.
- ENCLOSED EAVES (eaves with a wood or plywood soffit already in place) are typical of residing projects.

NOTE: In most new construction application the existing soffit area will be an open area with exposed rafters. In most remodeling situations a solid wood soffit will be present.

INSTALLATION OVER OPEN EAVES

There are several ways to install receiving channels for soffit. You can use accessories such as J-Channel or Frieze Channel (F-Channel). The best approach is to select a method that works most effectively with the construction techniques used to create the eave.

1. Examine the eaves illustrations and find one that most closely resembles the construction methods used on your particular projects (Figures 1 through 4).

2. Install the receiving channels following the details shown in the illustrations. Nail channels every 5 ft. positioning the nail in "pre" drilled holes – see detailed instructions.

3. Fasten channels, just snug to take out excessive play. Do not overdrive fasteners.

NOTE: Recommended nailing for soffit panels is 16" on center, however, if the eave span is over 18", nailing strips must be installed (Figure 4). In areas with high wind restrictions, nailing should not exceed 12" on center.

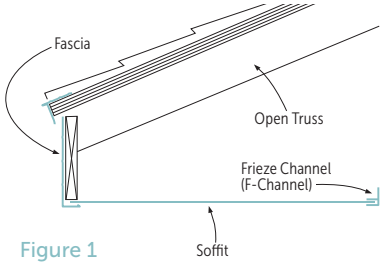


Figure 1

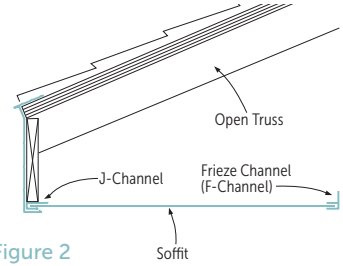


Figure 2

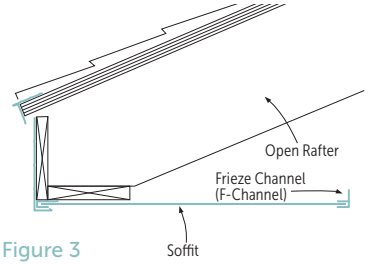


Figure 3

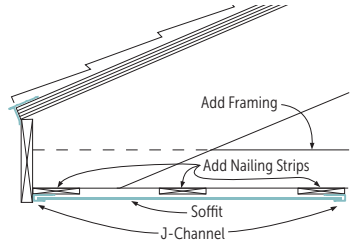


Figure 4

INSTALLATION OVER CLOSED EAVES

The procedure used to install soffit over enclosed eaves is almost identical to that used for open eaves. The major difference is the installation of the J-Channel at the wall line rather than F-Channel (Figures. 5 and 6).

Determine the preferred method of installing soffit at the fascia board.

NOTE: If the existing soffit is rotted or damaged, remove it completely before installing soffit, then use the instructions for open eaves.

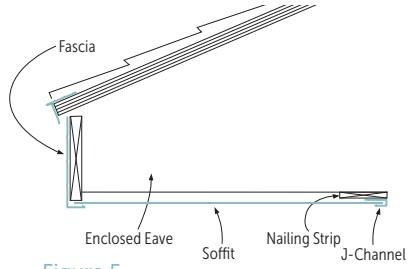


Figure 5

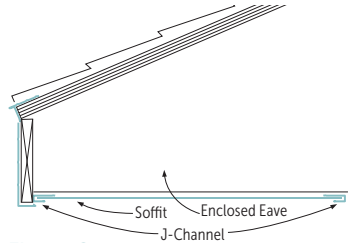


Figure 6

SOFFIT INSTALLATION

1. Along the wall, strike a chalk line (Figure 7) that is parallel and level with the bottom of the existing wood sub-fascia board.

2. A receiving channel must be installed along the chalk line making sure to allow for the depth of the soffit panels. In all of the options listed, receiving channels should be attached every 16". In most situations you will not be required to install a receiving channel on the fascia board.

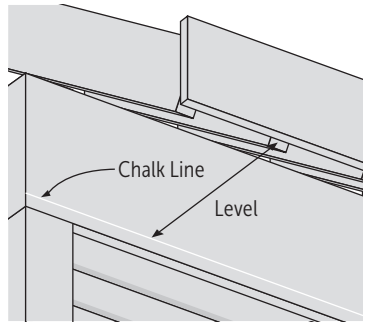
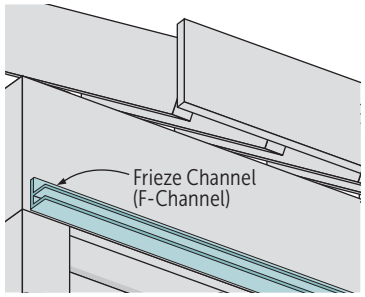


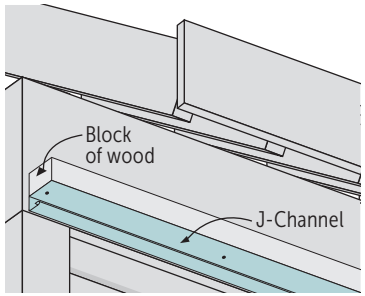
Figure 7

FOR NEW CONSTRUCTION

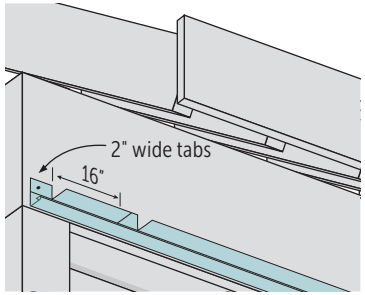
Frieze-Channel (F-Channel) can be used to receive the soffit panels.



A wood block can be used as a nailing surface for a J-Channel.

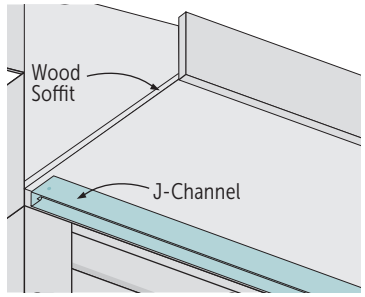


J-Channel can also be modified by cutting 2" wide tabs in the nailing flange. Bend these flanges back and nail to the wall.



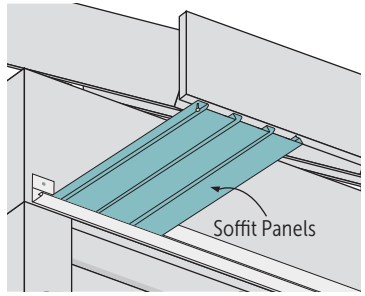
FOR REMODELING

J-Channel can be attached directly to the existing wood soffit.



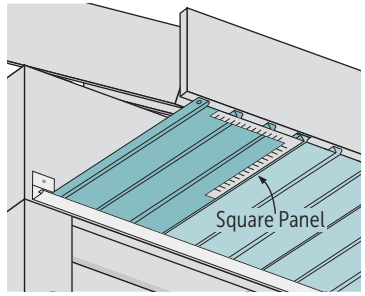
FOR BOTH

Cut the soffit panels to the required length minus 1/4" to allow for movement.



Insert panel into the wall channel making sure it is fully engaged into the lock of the preceding panel.

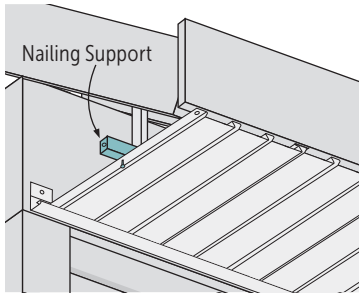
While nailing the panel into the bottom of the fascia board, make sure panel is square.



WIDE SOFFIT INSTALLATION

An intermediate nailing support should be used when installing panels over 24".

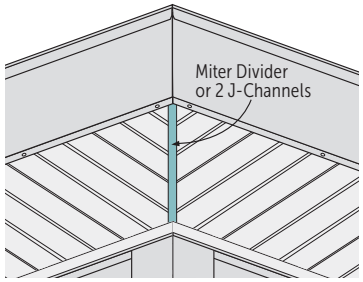
Nail panels at the center of the panel and at the nail flange.

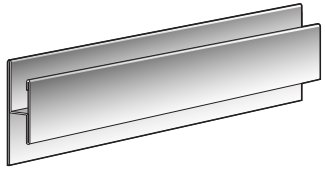


TRANSITIONS

When a soffit changes direction, such as at inside and outside corners, install a transition channel by using pre-formed Miter Divider, or two pieces 1/2" J-Channel placed back to back.

Miter soffit panels to fit.





Miter Divider

J-Channel

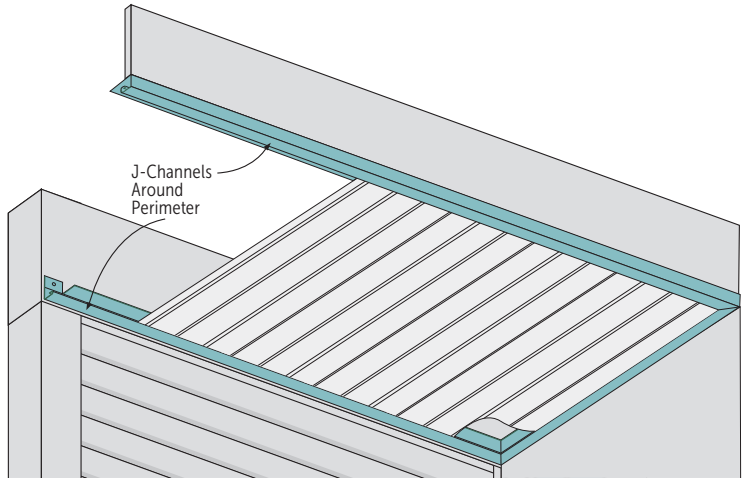
PORCH CEILING INSTALLATION

NEW CONSTRUCTION

- J-Channels should be installed around perimeter of porch area.
- Intermediate nailing supports need to be used at 24" on center.
- Nail panels 24" on center at the nail flange and in the V-Grooves.

REMODELING

- J-Channels should be installed around perimeter of porch area.
- Panels can be installed directly onto existing wood ceiling substrate.
- Nail panels 24" on center.

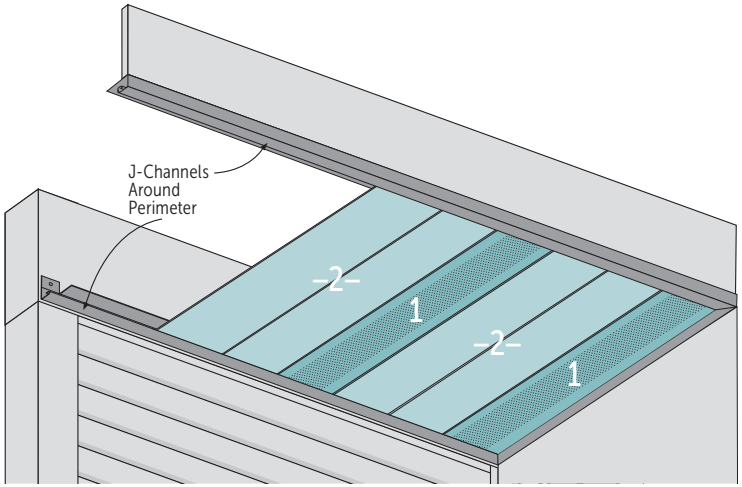


PLANK SOFFIT INSTALLATION

NOTE: The NFA is based on 1 vented panel in a 12 inch square in order to achieve the stated 11.4 NFA

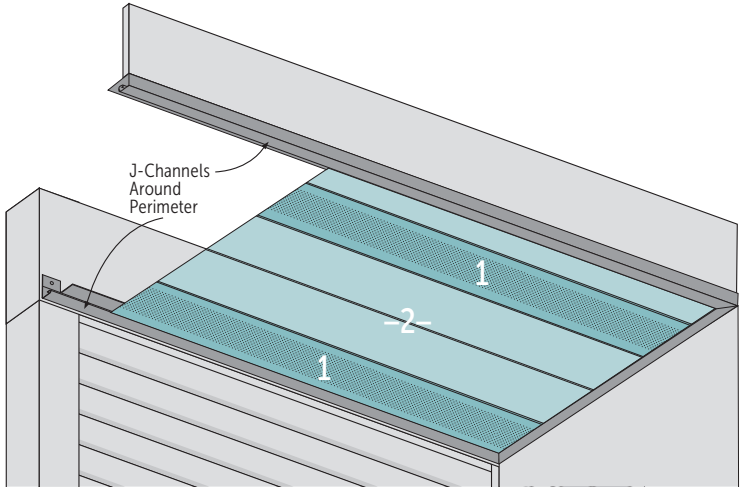
PERPENDICULAR INSTALLATION

- Plank soffit pattern for perpendicular (normal soffit) to the siding is 1 vented row, 2 solid rows, repeat.
- The 1,2,1,2 pattern provides 1.5 vented panels for an 18 inch soffit (common depth).



PARALLEL INSTALLATION

- Plank soffit pattern for parallel to the siding is 1 vented row, 2 solid rows, repeat.
- The 1,2,1,2 pattern provides 1.5 vented panels for an 18 inch soffit (common depth).

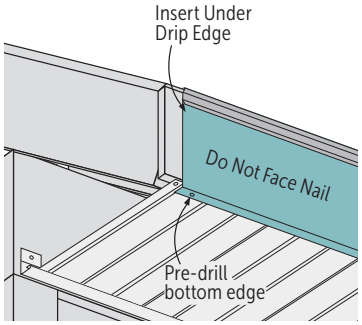


PRE-ENGINEERED FASCIA INSTALLATION

For standard pre-engineered fascia, it is recommended to pre-drill a hole 1/16" larger than the nail diameter in the bottom edge "before" nailing every 5 feet.

DO NOT FACE NAIL

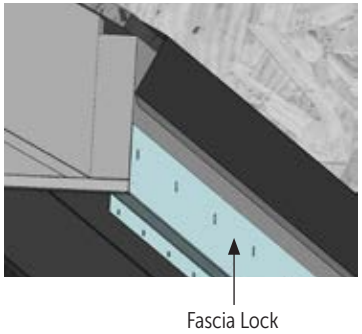
Insert fascia under drip edge and screw into place.



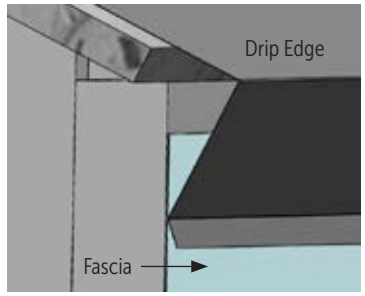
VESTA FASCIA: ARCHITECTURAL FASCIA & LOCK INSTALLATION

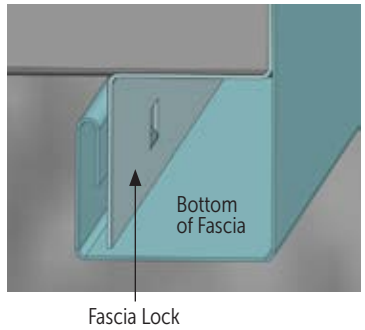
Vesta Architectural Fascia with lock requires a special fascia lock for installation because it extends below a typical overhang.

Position fascia lock on fascia board and nail lock to board with nails placed every 12".

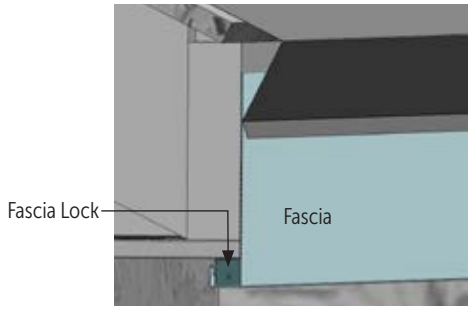


Slide fascia up vertically, so the top end slides under the drip edge and the bottom end snaps into place on the bottom of the lock.





Final assembled fascia and lock position.



VALLEYS

WHY METAL VALLEYS ARE PREFERRED

WHY METAL VALLEYS PERFORM BEST

There are two basic ways to flash a valley: open and closed (also called woven or cut).

The open valley has been preferred for many years. The open valley starts with a layer of metal flashing along the valley. It effectively channels the water to run off easily, and adds strength where it's needed most in the center area of the valley. The smooth surface also ensures that debris will not get caught in the valley.

Metal flashing offers great strength and durability. The corrosion resistance and non-staining performance of Quality Edge flashing, in aluminum or steel, make it an ideal choice for valleys. An extensive selection of colors ensures it blends beautifully with the home's roofing system.

THE PROBLEMS WITH CLOSED VALLEYS

With a closed or woven valley, the roofing material itself acts as the flashing. Sections are interlocked, or woven, to create a seamless appearance. This demands that the roofer cut the material so it will weave together properly. However, over time, there is a higher likelihood of water leakage.

The closed valley, with its interlocking shingles can also attract debris. This can give the roof an unsightly appearance. Trapped debris can also mean that water sits longer in the valley, which can reduce the life of the shingles.

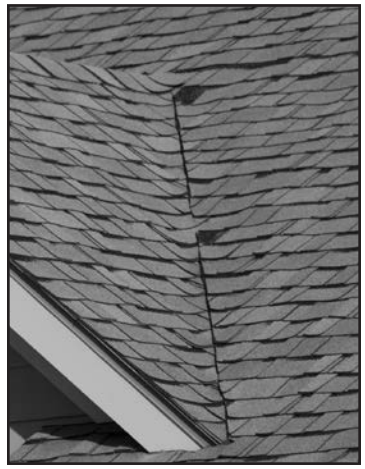
GOOD

Metal Valley

BAD

Closed Valley

Metal Valley



Closed Valley

HOW TO INSTALL VALLEYS

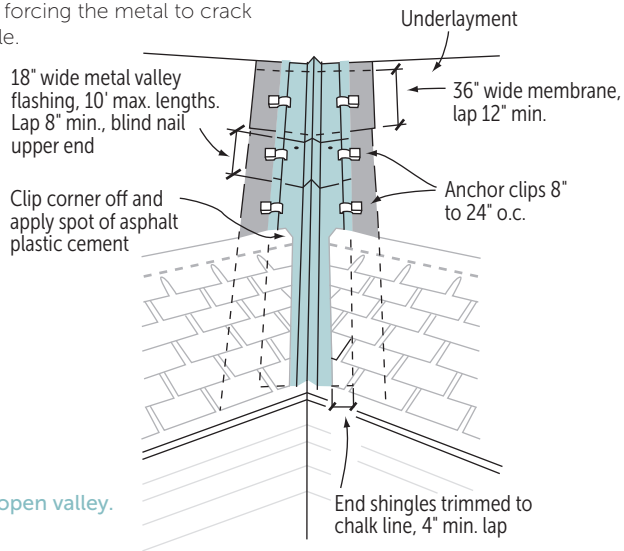
When installing open valleys, only **metal valleys** are recommended. Mineral-surfaced roll roofing is not considered to be sufficiently durable to last for the warranted life of today's shingles. Moreover, there is no warranty on mineral-surfaced rolls.

OPEN VALLEY APPLICATIONS

1. Apply a 36" piece of Waterproofing Shingle Underlayment, or its equivalent, up the center of the valley, applied directly to the deck.

2. Next, apply an 18" - 20" wide sheet of metal valley flashing over the 8 to 10 foot lengths. Use a narrow band of roofing cement to fasten shingles that lap the metal. Preformed "W" style valleys are preferred. The center crimp will help relieve stresses on the metal without forcing the metal to crack or buckle.

3. Secure the metal flashing every 24" along both edges with large-headed nails. If using large-headed nails without cleats, place the shanks immediately adjacent to the metal edge so as not to restrict the movement of the metal.



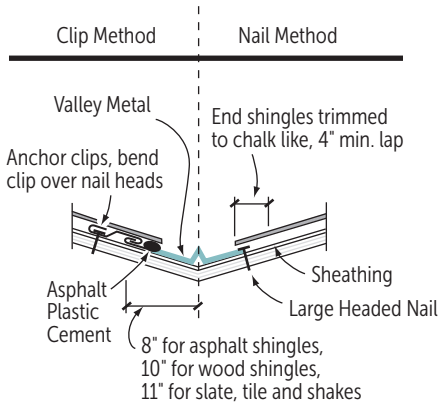
Typical open valley.

4. If you need to use more than one piece of metal flashing for a valley, the high piece must overlap the lower piece by at least 8". Because of expansion and contraction of the two metal sheets, do not drive fasteners through both sheets in the overlapping areas.

5. Strike chalk lines 3" from the valley centerline, on each side of the metal valley. As shingles are applied, trim them back to the chalk lines. Use a buffer beneath the shingles to be trimmed to avoid scoring the metal valley with the knife blade.

6. Set the valley edge of each shingle in a 3" wide band of asphalt roofing cement (ASTM D4586 Type II).

NOTE: There exists some disagreement in the trade about when nails can be driven through valley metal. Everyone agrees that it is never desirable to do so except at the head of the valley, or at the top of a sheet capped by a higher sheet above. But some shingles, cannot be securely installed over a standard 20" valley without driving nails into the metal. One solution might be to make the valley metal wide and over-flash the edge with water-proofing shingle underlayment. However, field testing has not been completed to assure the long-term performance of this solution.



Secure metal valley flashing with clips or large-headed nail.

HOW TO INSTALL GUTTERS

IMPORTANT REASONS FOR USING GUTTERS

- Gutters do best in heavy rainfall areas and on buildings with little or no overhang.
- Gutters should always be used where houses are built on clay and other frost-susceptible soils. Expansive clay soils can crack a foundation simply by being wet.
- Use gutters wherever roof run-off creates a splashback problem that might damage entry steps, decks and siding.
- Gutters can help eliminate basement water that can cause expensive damage to finished basements.

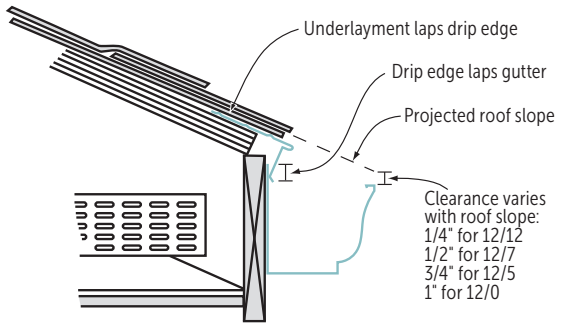
Check your area's building codes for gutter requirements on your job.

HANDLING WATER, SNOW AND ICE

Gutters help manage water flow. Remember, any water not handled at the roof line must be managed on the ground, causing additional labor and potential damage.

All gutters must be installed with the proper clearances. In cold climates, the outside edges of all gutters should fall below the roof's slope so snow and ice can slide clear.

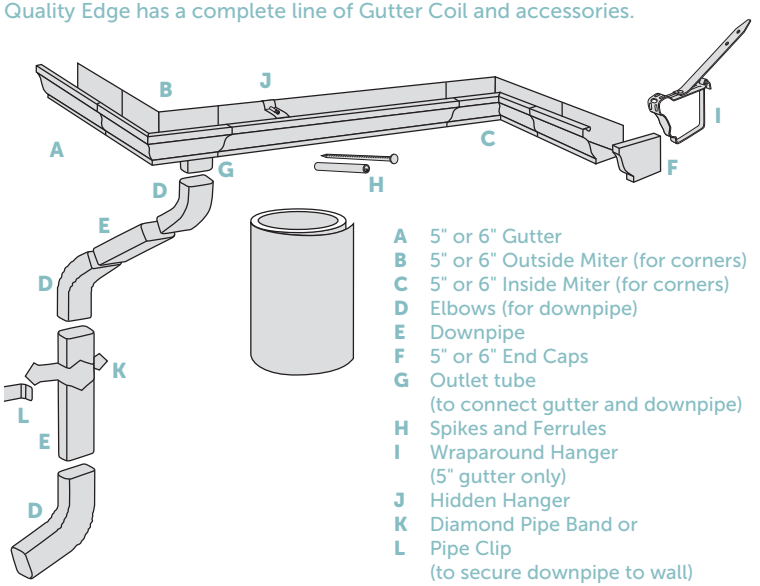
The shallower the roof, the more clearance is needed.



INSTALLATION TIPS

- Aluminum gutter runs should have an expansion joint every 40 ft. of straight run since the gutter will expand and contract ⅛" or more over that span.
- Gutters should slope at least 1/16" per foot of run.
- It's important to move the water quickly away from the foundation with either a subsurface pipe or splash blocks and by sloping the grade at the surface.
- The number of downspouts a roof needs will depend on the size of the conductor pipe. Allow 1 square inch of downspout cross-section for every 100 square feet of roof area.
- Place the downspouts at least 20 ft. apart but no more than 50 ft. apart.

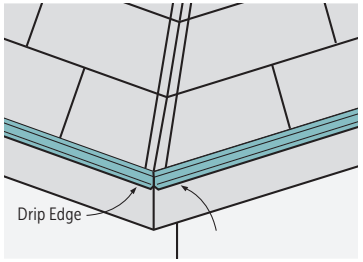
Quality Edge has a complete line of Gutter Coil and accessories.



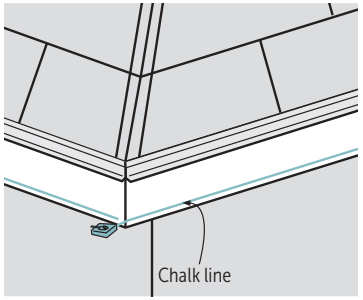
A 5" or 6" Gutter
B 5" or 6" Outside Miter (for corners)
C 5" or 6" Inside Miter (for corners)
D Elbows (for downpipe)
E Downpipe
F 5" or 6" End Caps
G Outlet tube (to connect gutter and downpipe)
H Spikes and Ferrules
I Wraparound Hanger (5" gutter only)
J Hidden Hanger
K Diamond Pipe Band or
L Pipe Clip (to secure downpipe to wall)

GUTTERS INSTALLATION

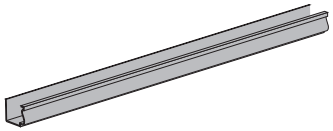
1. If there is no drip edge installed, we recommend you install a Quality Edge drip edge. Lift shingles and push back the drip edge under shingles until edge projects at least ½" beyond fascia.



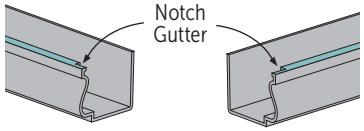
2. To get the proper slope of a gutter, measure the length of the eave, then angle your measurement down ¼" every 10 ft. (or 1" every 40 ft.). Snap a chalk line to mark your place.



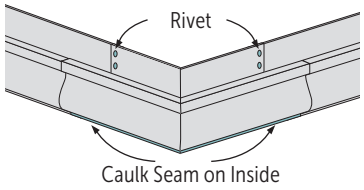
3. Measure and cut the gutter to length of the eave.



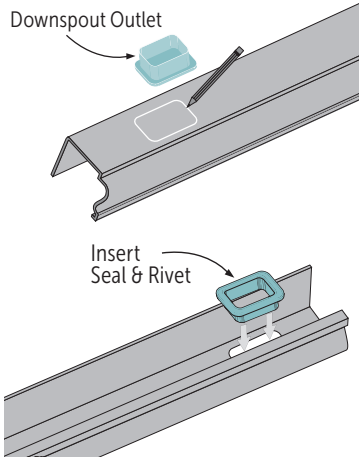
4. Notch the end of both gutters to be inserted into the inside or outside corner brackets (outside bracket shown).



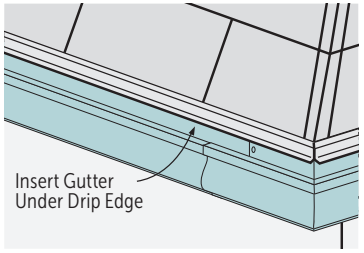
5. Lay a bead of gutter sealant 1½" inside the corner bracket. Hook the front lip of the corner over the notched section of the gutter and snap it over the sealant. Rivet the joint together and caulk the seam on the inside of the gutter with gutter sealant. Also, cover each rivet with a dab of sealant.



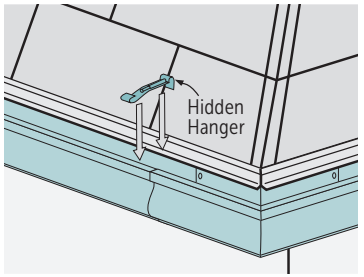
6. Place the downspout outlet over the gutter where you want it located, and trace the outside. Using shears, cut out the traced section 1/16" outside the line. Flip the gutter over. Then insert and fasten the outlet to the gutter with rivets. Use sealant to ensure a waterproof joint.



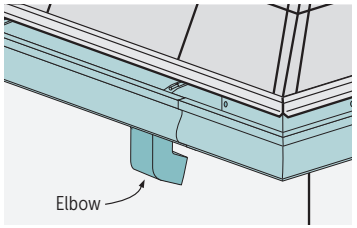
7. Raise to the chalk line and fasten the gutter assembly to the eave.



8. Insert the hidden hangers. Hook the hanger under the front lip of the gutter. Screw the hanger in through the back of the gutter into the eave using the screw provided. Install a hanger every 2 ft.

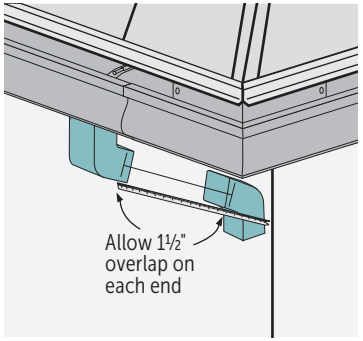


9. Attach the elbow joint to the downspout outlet.

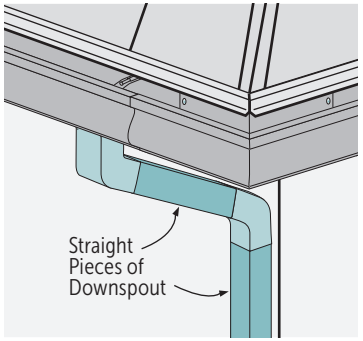


GUTTERS INSTALLATION CON'T

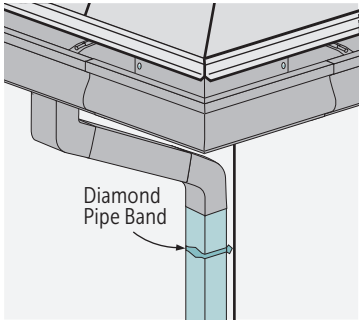
10. Hold another elbow against the wall and measure between them. Allow for a 11/2" overlap on each end.



11. Fasten the elbows to the straight pieces of downspout.



12. Fasten the pipe to the wall using a diamond pipe band (3" pipe clips are also available).



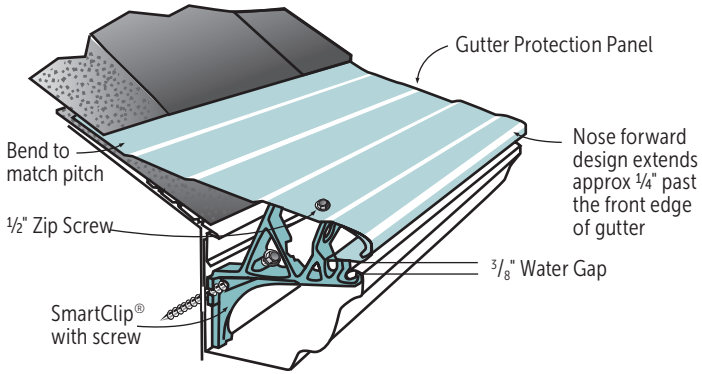
HOW TO INSTALL GUTTER PROTECTION

HOW TO BEGIN

This product is designed to be a closed system. The only opening should be a continuous ⅜" water gap between the gutter lip and the lower panel. Inspect and enclose all other openings, especially behind the gutters and end caps.

Installed panels must maintain a continuous downward slope from the upstream roof edge to the nose. A negative or backward slope, caused by the nose being higher than the rear or upstream edge, will cause pooling and can damage the roof. As a rule the rear, or upstream edge, of an installed panel must be 1" – 1¼" higher than the front edge.

For best performance, the position of the outward-most point (nose) of each installed panel is critical and should extend past the front edge of the gutter by approximately ¼". Use of the patented SmartClip® makes this effortless.



PREPARATION

1. For safety, we recommend working only from a ladder. Always use extreme caution. Make sure ladder is level and footing is stable. Do not climb onto the roof.

2. Remove any screens and attachments to the gutter, such as a splashguard, that may prevent the installation of a gutter protection system.

3. Check the overall condition of the gutters and repair as needed. Re-attach loose areas; reseal all seams, secure and re-pitch gutters as necessary.

4. Clean the gutters and make sure downspouts are clean and free of debris.

5. This product must be installed under the second course of shingles. Check the condition of the shingles by lifting the second full row of shingles and loosen the glue bond with a putty knife or scraper.

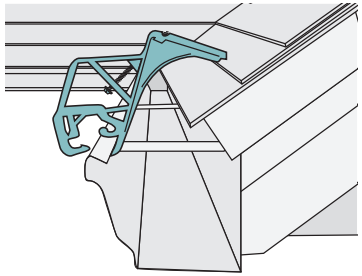
6. Panels can be installed on most roofs with a 4/12 to 5/12 pitch without alteration. For roof pitches below 4/12, check to see if the installed system maintains a continuous downward slope from the upstream roof edge to the nose. A negative or backward slope caused by the front nose being higher than the rear or upstream edge will cause pooling and can damage the roof. If a backward slope occurs, lower the gutters to create a positive pitch or fascia mount the panels (see Fascia Mount Instructions).

7. For roofs with a pitch greater than 5/12, the panel must be modified. The panel must continue at the same angle as the top of the bracket (SmartClip) until it meets the shingle at which point the panel should have a break matching the pitch of the roof. As the roof pitch increases, the break will move forward towards the nose.

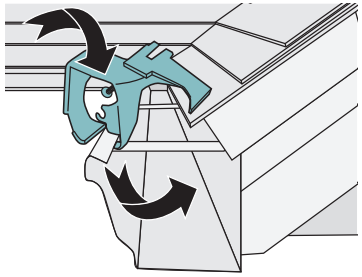
GUTTER PROTECTION INSTALLATION

These instructions provide basic information for installing a professional gutter protection system on most homes. Many homes will require field modification not covered by these instructions for a proper, custom fit. The guidelines below must be followed for all installations.

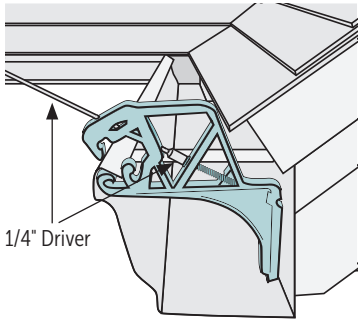
1. Start installation at the end of a gutter run by installing a SmartClip® at the end of the gutter, about 3" from the gutter end cap. (Note: Gutters on 'hip-style' roofs wrap around 4 corners in a continuous run. On 'hip' roofs, begin bracket installation about one foot from a corner). SmartClips have a small bottom hook designed to hook the lip of the gutter.



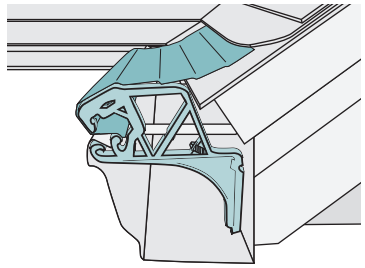
2. Hold the SmartClip so the top of the clip is facing you and slide the bottom hook under the front lip of the gutter. Then pull up to make sure the bottom hook is grabbing the front lip of the gutter. Now turn the SmartClip to the side and set it in place inside the gutter, making sure it is resting on the bottom of the gutter.



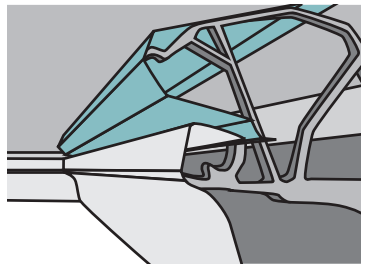
3. Screw in the preset 3" screw with your ¼" driver bit and tighten it snug to the back of the gutter.



4. The panel must start at the beginning of the shingle at the roof edge. If the gutter comes short of the roof edge, start the panel so there is about a ¼" gap between the panel and the gutter end cap.

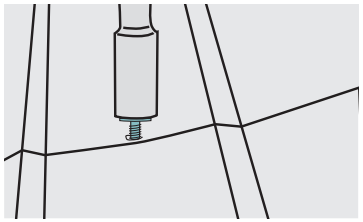


5. Lay the panel where it should start and mark the spot at the end of the panel where the next panel will overlap. This is where you will need to place another SmartClip. There should always be three SmartClips touching each full panel, so you will have to add one clip between the starting clip and the 'overlap' clip, where you made your mark. This should be placed roughly in the middle of the panel. Screw all the SmartClips in.



6. Now take the panel and slide it under the 2nd course of shingles, which you have already loosened, and clip the panel into place. Make sure the bottom lip of the panel is secured into the rear hook of the SmartClip, which will maintain a uniform, preset gap for water entry.

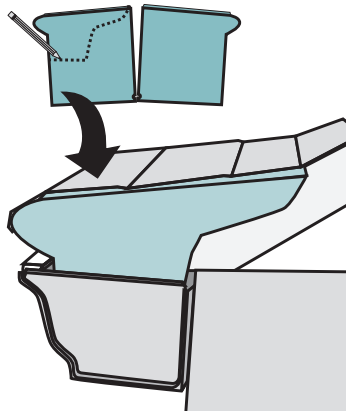
7. Fasten with a color matched ½" zip screw. The screw placement should be toward the front of the panel so the zip screw will bite into the thick upper layer of the SmartClip.and slide the bottom hook under the front lip of the gutter. Then pull up to make sure the bottom hook is grabbing the front lip of the gutter. Now turn the SmartClip to the side and set it in place inside the gutter, making sure it is resting on the bottom of the gutter. Screw in the preset 3" screw with your ¼" driver bit and tighten it snug to the back of the gutter.



8. Repeat this process until you come to the end of the gutter run.

9. As the installation approaches the end of a gutter run, there will probably be an odd length (less than 5 ft.) to cover. There are two installation options: a. Cut the panel to fit about 1/8" short of the gutter end cap and install an end cap. b. If at an outside corner, cut the panel to wrap around the corner and proceed (see Outside Corner instructions elsewhere in these instructions).

10. Install End Caps. The end caps must completely enclose the gutter with no openings at the end or backside of the gutter. Hold the appropriate end cap against the outside end of your gutter. Trace the basic shape of the gutter onto the end cap with a pencil. Allow for bending the extra end cap material to close off any openings behind the gutter, if necessary. Cut the end cap to fit snugly inside the gutter and to conform to the shape of the gutter and roofline.



IMPORTANT: The gutter protection system is designed to be a completely enclosed system. There should be no gap or opening other than the factory pre-set water gap between the front lower edge and the gutter.

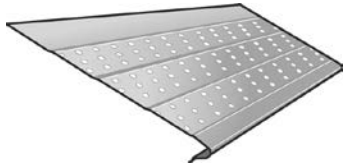
11. Attach the end cap to the panel by screwing two ½" zip screws through the end cap flap and panel. The flap may be positioned above the panel to prevent rain spillover at the end of a gutter run or under the panel for a better appearance.

See special instructions for Perforated Panels, Diverters, Inside Corners, Outside Corners, etc.

PERFORATED PANELS

Rooflines often form valleys that cause concentrated streams of water to empty onto the roof over a straight gutter run and upper level gutters sometimes empty onto the roof above a lower gutter. These conditions may cause rainwater to overflow the gutter protection system and can be a source of callbacks.

1. If the heavy flow area can be identified prior to installation, position and install perforated panels over the problem area by integrating it into the gutter-cover run. Be sure to install a bracket under each end of the perforated panel for additional support.



Perforated Panel

2. If a heavy flow area is identified after installation, install perforated panels into an already completed straight-run by cutting and removing the top ribbed section of the installed panel at the problem area. The nose does not have to be removed.

NOTE: If possible, upper level gutters that empty onto lower roofs should have the downspout extended into the lower gutter. Panels should then be cut to fit around the downspout.

3. Position the perforated panel into place over the cut-out, overlapping at least 1" on each side.

4. Attach the perforated panel to the overlapped panel with ½" zip screws. Be sure to attach the panels under the nose to keep the water gap open. No additional brackets are needed.

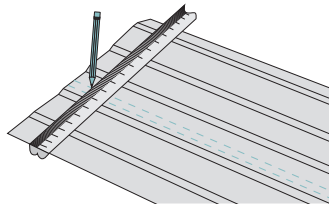
DIVERTERS

Diverters are designed to re-direct water flow and are used on inside corner valleys and other high volume areas to prevent overflow. Cut a small roof diverter from a scrap panel. This can be used on inside valleys and other high volume areas.

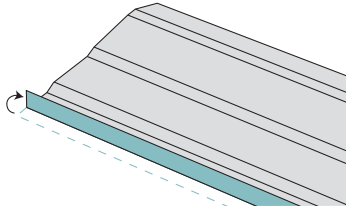
FASCIA-MOUNT INSTALLATION

Fascia-mount installations are ideal for flat or low-pitched roofs and on shake, slate, metal, or other specialty roofs. Fascia-mounted panels do require additional effort and labor, so be sure to allow extra time.

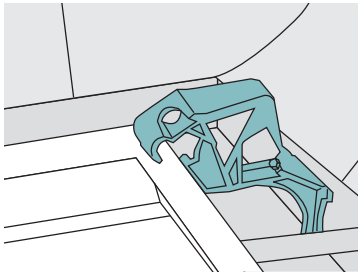
1. To make sure the gutter is set in the right place, set a bracket in the high end of the gutter. Drop the gutter so the top of the bracket sets about ¼" below the drip edge. If you have no drip edge then set the top of the bracket in the high end of the gutter about 1" below the top of the fascia board.



2. To prepare the panel you must have a 5-foot break. Start by measuring 5⅝" from the back of the panel (the end that goes under the shingle) and make a mark with your pencil. Do this at each end of the panel and draw a line across the back of the panel connecting the two marks. This line will be the point at which the break is made. Draw another line ½" closer to the back of the panel (5⅛" from the back of the panel). Put the panel in the break and score the second line (closest to the back of the panel) with a utility knife and break off. Now reset the panel in the break and make a 90° bend along the remaining line on the panel.



3. Insert the brackets the same way as a standard install (three per panel with the two on the ends overlapping with the next panel). Make sure there is enough room above the bracket to fit the ½" 90° bend of the panel under the drip edge.



4. Attach the panel to the installed brackets and screw a 1½" screw horizontally through the ½" vertical panel bend and into the fascia. Use one screw at the midpoint and another at each end.Insert the brackets the same way as a standard install (three per panel with the two on the ends overlapping with the next panel). Make sure there is enough room above the bracket to fit the ½" 90° bend of the panel under the drip edge.

5. Attach the panel to the installed brackets and screw a 1½" screw horizontally through the ½" vertical panel bend and into the fascia. Use one screw at the midpoint and another at each end.

INSIDE CORNERS

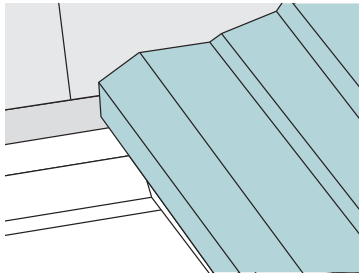
On some homes, multiple roof planes come together in a valley to cause overflow at the inside corner. Factory-engineered inside corner ports are designed to reduce inside corner overflow.

These instructions are written for a right-to-left installation. If installing left-to-right, reverse any right/left notations.

INSIDE CORNERS CON'T

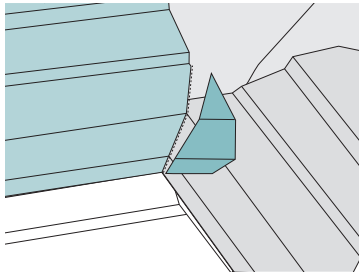
1. Install brackets as near to the corner as possible.

2. Facing the corner, hold the panel to be installed into place over the gutter and brackets to the right (as if the straight gutter run was to continue past the corner). When in position, mark the panel approximately 1" beyond the inside gutter lip at the corner. Cut along this line and install this panel with the 1" overhang extending past the inside lip into the corner.



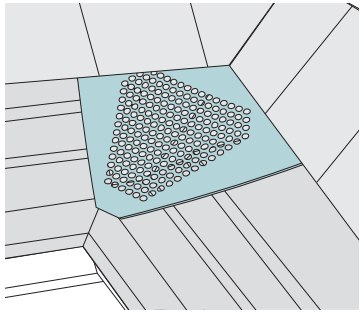
NOTE: On some homes, overflow may be difficult or impossible to control.

3. Move to the left side and cut a 45° notch into the nose of the panel to be installed. The nose profile of the installed panel to the right should fit into the 45° notch, forming a simple corner. Install this notched panel on the left side of the corner. Once installed there will be a pie-shaped opening in the valley, but there should be no gap or space between installed panels.



4. Place the valley port over the gap between the two panels and bend it to fit the contours of the valley. Secure it into place by screwing it to the panels with ½" zip screws making sure there are no gaps.

IMPORTANT! DO NOT SCREW INTO THE ROOF VALLEY.



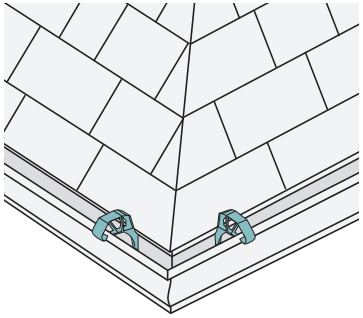
OUTSIDE CORNERS

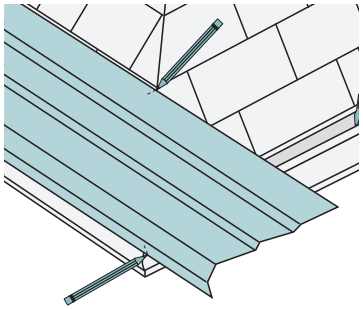
Field-engineered corners are designed to continue a straight gutter-cover run around a corner. If the distance from the edge of the last panel installed, to the corner of the run, is 4 ft. or greater (less than 12" of panel left to wrap) do not continue. Instead, cut and install the corner from the center of a full five-foot panel and 'fill the gap' between the installed corner and the existing run with a cut-to-fit panel.

These instructions are written for a right-to-left installation. If installing left-to-right, reverse any right/left notations.

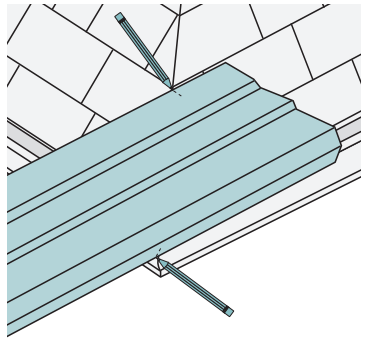
1. Install brackets as near to the corner as possible.

2. Facing the corner hold the five-foot panel to be installed in place over the gutter and brackets to the right (as if the straight-gutter run was to continue past the corner). When in position, mark the panel just above the nose (½" above the outward-most point) and approximately ¼" beyond the gutter lip at the corner where the panel is to be bent around the corner. Place a second mark on the right upstream edge of the panel at a point that is in line with the roof ridge. Draw a line from the nose corner mark to the upstream right roof ridge mark from the right cut line. Do not cut at this time.





3. Move this same panel around to the left side of the corner. Hold the marked panel in place over the gutter and installed brackets (to the left of the corner) so that the corner mark (from #2 above) is positioned approximately ¼" beyond the gutter lip at the corner. **NOTE:** The corner mark indicates where the nose will be bent around the corner. If the line appears to be in the wrong place, re-measure and re-mark. When in position, place another mark on the left upstream edge of the panel that is in line with the roof ridge. Draw a line from the corner mark on the nose (same mark as in #2 above) to the upstream left edge mark (at roof ridge). This line will be the left bend line. Do not bend at this time.



4. Place a mark on the upstream panel edge 6" to the right of the left bend line from #3 above (between the left bend line and the right cut line). Draw a line between this upstream edge mark and the corner mark on the nose (from #2 above). This line will be the left cut line. When installed, the right cut line will overlap the left cut line and align with the left bend line.

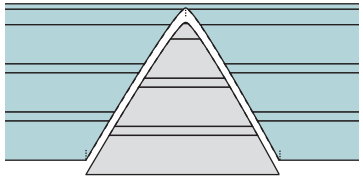
5. The panel will not overlap under the nose, but will form a corner. Draw a vertical line from the corner mark on the nose (from #2 above), straight down and around the lower water drip edge. This line should be perpendicular to both the nose and to the front and back edges. This is a reference line only. Do not cut.

6. Mark a second point along this vertical reference line just under the nose, ½" below the outward-most point of the nose.

7. Measure and mark a point along the lower drip edge 1¼" on both sides of the vertical reference line. Draw a line from both of these lower edge marks to the point just below the nose on the vertical line (#6 above). These lines should form an angle that will form a corner when cut.

8. Cut the panel along the marked cut lines above the nose. Bend the left panel downward along the bend line so the panel 'fits' over the ridge.

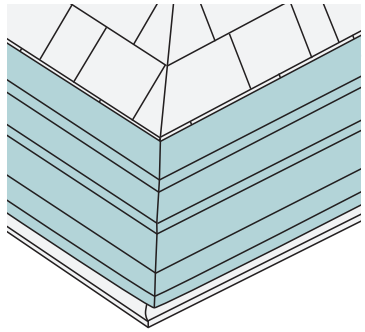
9. Cut the panel along the lower cut lines to form a notch, leaving 1" of uncut panel material at the nose. Bend the panel at the nose to form the corner, aligning the upper right cut line with the upper left bend line along the roof ridgeline.



10. Slide the corner under the appropriate ridge-cap shingle and attach to the existing panel run at the overlap.

11. Attach the corner to the gutter with brackets.

12. Proceed around corner with straight runs.



METAL GUIDELINES

Steel and aluminum both perform well as a roofing accessory material. Galvalume is extremely resistant to corrosion caused by seawater. Exposure testing, has proven that Galvalume is up to three times more effective in preventing rust than galvanized steel material.

Aluminum and steel materials are very lightweight in comparison to other materials. Aluminum is usually the lightest metal used for roofing accessories. Its strength-to-weight ratio is among the highest of the "common" metals. This lightness and thinness also mean aluminum roofing material stores very little heat and also becomes cool quickly once it stops receiving direct sunlight. Both aluminum and steel are two of the best energy efficient roofing materials. Both naturally reflect light and emit heat.

Aluminum is more malleable than steel, allowing it to be configured into more complex profiles. However, especially in simpler profiles, you need thicker aluminum. Steel inherently has more strength than aluminum, and it's more fire resistant without underlayment. Corrosion-resistant metal flashing in galvanized steel offers long-lasting performance and can withstand structural movements as the result of settling, expansion and contraction. Aluminum does not have a Class A fire-rating but the system can achieve a Class A rating with the proper underlayment and sheathing.

If the project is near the ocean and not in hurricane territory, the choice will probably be aluminum. If you're out West building a wide-span storage building and brushfires are a concern, you'll probably want to go with steel.

- SALTWATER CORROSION: Homes or buildings close to the coast often don't qualify for substrate or paint warranties because of saltwater's effect on metal. There are types of metals that work better in coastal environments, includingGalvalume consisting of aluminum, zinc and silicon, but there is no guarantee it will last as long as a roof where there is no threat of saltwater. Make sure to read and analyze the warranty or product specs thoroughly to determine if you're in a location that could be subject to premature corrosion.

- PREVENTING FLAME EXPOSURE: Metal flashings are common for moisture prevention efforts, but it is also found that steel flashing, particularly drip edge, to be very effective in preventing flame exposure or ember intrusion along the exposed edge of the combustible roof decking under the shingles of roofing material.

DISSIMILAR METALS

When certain metals are put together, there could be a negative interaction that causes early corrosion that would not occur otherwise. This most commonly occurs between the metal components themselves and the accessories used to secure them to the building (like screws and fasteners).

Combining different metals on a metal roof system can lead to interactions that could result in early degradation, staining, and potential failure of a system altogether.

For example, Aluminum performs best when not in contact with specific materials, such as copper, bricks, treated lumber, iron, and concrete. If Aluminum is in contact with one of these and is then introduced to an electrolyte, such as water, it'll lead to galvanic corrosion of the anode (the more active material that has its electrons taken away by the less active material and ultimately leads to corrosion).

- Add an insulator between the two materials so they no longer connect. Without that connection, the transfer of electrons cannot occur. Well Nuts are a commonly used fastener to help separate materials that can suffer from galvanic corrosion.

- Use materials with the same potential. Metals with the same corrosion resistance are typically ok to use together.

- If you are in a situation where only one of the materials will come into contact with an electrolyte then transfer of electrons will not occur.

- If there is a coating on the cathode it can prevent the transfer through increased resistance.

- Consider your environment before installing. Choose materials that will work for your environment.

- Coat or paint your assembly (completely) so that the electrolyte cannot make contact with the materials

- Use neoprene EPDM or bonding washers as a barrier in between the metals.

ROOFING GUIDELINES

GETTING STARTED

PREPARING FOR THE JOB

At all times workers should follow safe work practices that help prevent dangerous conditions and possible accidents.

All local building codes and city ordinances should be investigated and complied with.

SAFETY

The best form of accident insurance is accident prevention. Therefore, inspect each job site before the work begins for possible hazards such as overhead electrical lines or unstable ground conditions that might not adequately support ladders or scaffolding. Bring any potentially hazardous conditions to the attention of all workers before the job begins.

Adhere to OSHA safety standards and observe the following general precautions:

- Wear footwear that provides good traction such as rubber-soled shoes with good ankle support.
- Proper eye protection should be worn.
- Do not attempt to work in bad weather or on wet roof decks.
- Do not touch wires crossing over the roof. If cranes are used to raise materials, be sure the operator is aware of overhead power lines or other wires. Keep metal ladders away from power lines.
- Ropes should be used to secure ladders and scaffolding and used as safety lines for personnel.
- Extension ladders should have proper locking devices and be in good condition. Place the ladders at safe angles on stable foundations and properly secure them to prevent movement. Ladders must extend past the edge of the roof by 3 ft. minimum.
- Brace ladders used on the roof deck to the roof structure. Avoid leaning away from a ladder to work. Move the ladder as required to follow the work.
- Do not concentrate bundles or rolls of roofing on the deck. Distribute them over the entire roof surface to spread the load evenly.
- As the work proceeds, keep the deck clear of unnecessary debris to avoid tripping hazards.
- Always use the proper tools for each segment of the work.

REMEMBER
Safe roofing is no accident!

TOOLS

Whether on a new construction or a re-roofing job, applicators require a number of basic tools to ensure efficient and accurate application of asphalt roofing materials.

- FOLDING TAPE MEASURE – for making measurements that will be required for an accurate and neat installation.
- CHALK – for snapping chalk lines that will be used to guide the installation and align the materials over the roof surface.
- ROOFING KNIFE – for cutting, shaping and fitting the various materials for an accurate, tight-fitting installation.
- PUTTY KNIFE, POINTED TROWEL OR BRUSH – for applying asphalt cements of various viscosities.
- CAULKING GUN – for applying continuous beads of asphalt cement.
- BROOM – for cleaning up after the completed roofing application.
- CHISEL AND SAW – for replacing or repairing damaged decking.
- FLAT SHOVEL – for removing shingles on re-roofing applications when existing shingles are so deteriorated they must be removed to repair the deck or comply with code requirements.
- HAMMER, PNEUMATIC GUN OR ROOFER'S HATCHET – for all nailing that will be required. A hatchet may also be used for aligning shingles.
- POWER NAILERS AND STAPLERS – pneumatic nailers and staplers are designed for a wide variety of applications. Not all are appropriate for the application of roofing shingles. Use only a tool specifically designed by the manufacturer for roofing. It is built to withstand the abrasive nature of roofing material and has features to speed and facilitate the roofing material application.

IMPORTANT FACTORS BEFORE SHINGLE APPLICATION

There are a number of key areas that should be considered before starting the roofing project.

PREPARING THE DECK

A good roof demands a good roof structure. The entire underlying structure must ensure a rigid deck surface that will not shift, sag or move under the weight of anticipated loads. The roof deck materials must be installed correctly and be free from excessive knots, warping or resinous areas. All roof decking materials (including type, grade, thickness and installation) must conform to all building code requirements.

EFFECTIVE DRAINAGE

The roof has an important job to do: shedding water. The main roof plus the junctions and breaks created by dormers, gables, wings, vents and chimneys are all part of this critical function. Careful attention must be given to these breaks to make sure they are protected by flashings that are watertight and allow proper water shedding. For effective drainage, you need corrosion-resistant drip edges at the rakes and eaves and proper gutter and downspout placement.

PROPER VENTILATION

Ventilation is essential to the roof's performance. Air must be able to circulate freely under the roof deck to take away water vapor before it can condense and cause moisture problems. Problems with roof leakage often result from condensation that is due to poor ventilation. Effective ventilation in the attic space or under-roof area can eliminate these problems.

For further details, see the section on **The Need for Ventilation** (page 24).

NAILING

Proper nails and nailing techniques are important to ensure a sound roof installation.

The Asphalt Roofing Manufacturers Association and the National Roofing Contractor's Association agree that you will probably have fewer fastening problems when you use nails than you will if you use staples. In fact, most building codes do not even permit the use of staples to fasten asphalt shingles.

MANUFACTURER'S INSTRUCTIONS

Not all shingles, or application procedures, are the same. For optimum performance from any roofing product, be sure to read and follow all specifications and directions provided by the manufacturer. Not adhering to manufacturer's directions could result in improper application which could compromise the performance of the roof or void the manufacturer's warranty.

For further details, see the section on **How to Install Shingles: Correct Fastening** (page 82).

HOW TO PREPARE THE ROOF DECK (UNDERLAYMENT)

SHINGLE UNDERLAYMENT

On slopes below 4/12, down to 2/12, the risk of leaks is great, caused by phenomena like wind-driven rain and capillary action that can make water flow uphill, or by the backup of water behind ice dams.

To reduce this risk, a redundant system – called shingle underlayment by its manufacturers – is applied beneath the shingles. Shingle underlayment, also known as tar paper and roofing felt, is a roll product applied over the roof deck before the shingles are installed.

On the other hand, not all shingle underlayment is the same. There are two critically different grades: water-resistant and waterproof.

WATER-RESISTANT UNDERLAYMENT

Invented to keep the roof decking dry until shingles could be applied. Applying this underlayment is called "drying-in the roof." It was also useful as a separation sheet between the roof sheathing boards and the asphalt shingles before OSB and plywood sheets were used as roof decking. This separation was important because direct contact with resin pockets in the pine planks caused the asphalt to degrade prematurely.

Intact water-resistant underlayment sheds most of the water that falls on it, but its water resistance is temporary. As the sun degrades the exposed asphalt, the material begins to dry out, absorb more moisture, lose its strength and eventually tear. The less asphalt used to saturate the underlayment sheet during manufacture, the shorter its life. Since asphalt is the most expensive component of shingle underlayment, lower-priced materials have less asphalt and a shorter life when exposed to the sun and are also subject to severe wrinkling when wet or even just damp.

Water-resistant shingle underlayment is not warranted by the manufacturer. Much of its water resistance is destroyed during the installation of the shingles by driving hundreds of nails through it. Until recently, only two grades of water-resistant underlayment have been available: Number 15 (standard) and Number 30 (heavy-duty).

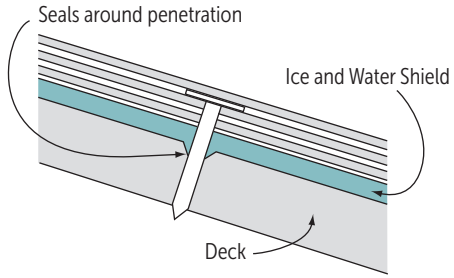
ICE AND WATER SHIELD

An entirely different product that's used in locations such as eaves and valleys that are most likely to leak under extreme conditions such as high winds, heavy rains and ice dams.

Ice and water shield is a long-lasting, self-sticking modified asphalt on a glass mat reinforcement. In all cases the product must be applied to a clean dry roof deck. Ice and water shield is not destroyed when nails are driven through it because it seals around nails as they are driven.

It is designed to seal the roof and prevent water from getting inside a building due to ice dams and/or wind-driven rain.

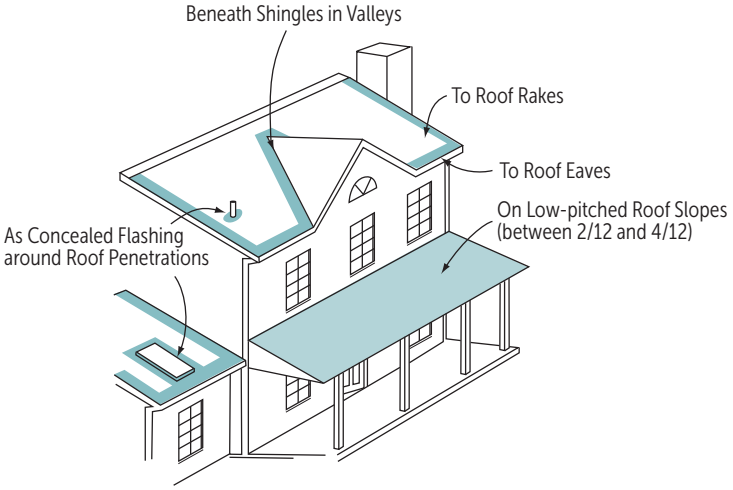
On low slopes where the risk is water running uphill, or in valleys where blockage from storm debris or ice dams can cause trouble, ice and water shield is reliable insurance against leaks when used according to the manufacturers' instructions.



Ice and water shield seals around fasteners.

WHERE IS ICE AND WATERSHIELD USED?

Ice and water shield can be used on both new or existing decks. It is installed beneath shingles, slate, tile, cedar shakes, or metal roofing. Ice and water shield is easy to apply and an excellent underlayment for low-slope shingle applications. It is commonly used to protect against water backup caused by ice dams at the roof eaves. It is also used in critical areas such as concealed flashing around roof penetrations and on rakes. In addition, ice and water shield is very useful on roofs exposed to occasional high winds where wind-driven rain can penetrate beneath shingles.



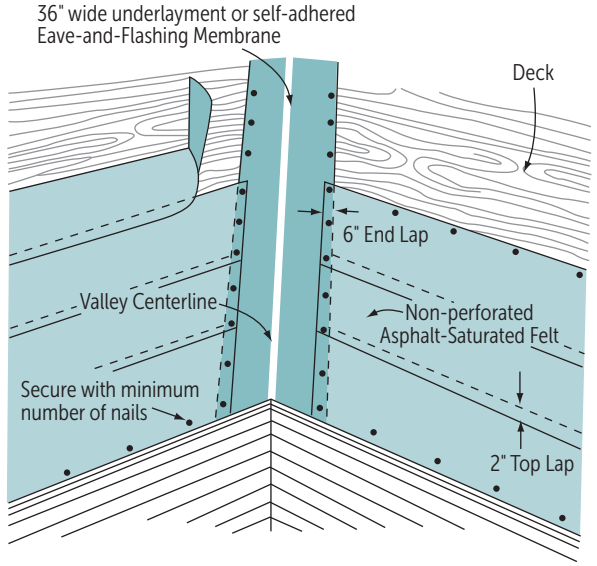
Ice and water shield's many uses.

HOW TO INSTALL THE SHINGLE UNDERLAYMENT

Once the deck has been prepared and is dry, cover it with a non-perforated asphalt-saturated underlayment felt that complies with building standards and local codes.

If there are **valleys:**

1. Run a 36" wide centered strip of underlayment up each valley.
2. Secure it 1" from felt edge with just enough nails to hold in place.
3. If two or more strips of underlayment are needed to cover the entire valley length, overlap the upper piece 12" over the lower and bond it with asphalt plastic cement.

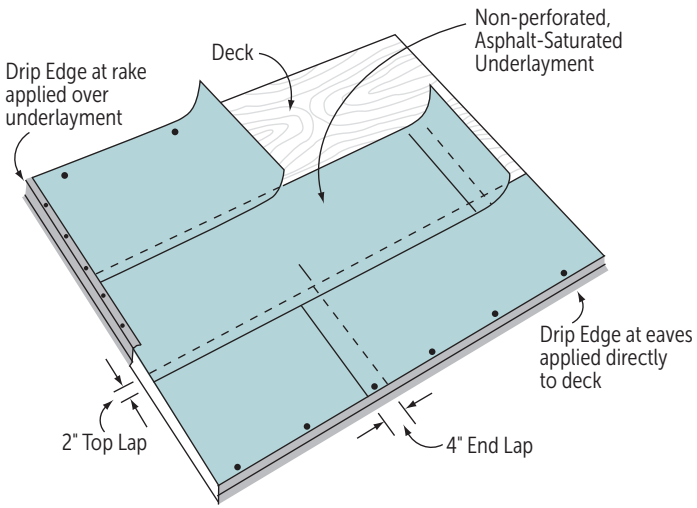


4. With underlayments ready, begin to install the horizontal courses of underlayment felt parallel to the eaves. Lap each course at least 2" over the underlying one (according to manufacturer's instructions). Secure felt with only enough nails to hold. If two or more pieces are needed to continue the course, lap ends at least 4".

5. End laps in a succeeding course should be located 6 ft. or more from the end laps of the preceding course. Lap felt a minimum of 6" from both sides over hips, ridges and any valley underlayments.

6. Where roof meets a vertical surface, continue the underlayment at least 4" up the surface.

7. After installing underlayment, cover with shingles as soon as practical.



EAVES UNDERLAYMENT

Ice dams are created as the result of continual thawing of snow over the warmer sections of the roof and then refreezing over the cold eave.

Ice along the eaves can cause considerable damage, making water and slush back up under the exposed roof material and causing structural damage. Eaves flashing is recommended when applying roofing material to this vulnerable area to help prevent water penetration.

In climates where icing on the eaves in expected or where the average January temperature is 25°F or less, eaves flashing must be installed to protect against ice dam damage. The selection of flashing material and the width of the flashing will depend on the roof slope and the severity of ice dams anticipated.

Eaves flashing is also recommended in areas where leaves or pine needles are likely to accumulate in gutters, resulting in water backup.

Self-adhered eave and flashing membranes also work well on hips, ridges, flashing and valleys as well as around skylights, dormers and chimneys. Bear in mind that most eaves flashing materials are vapor retarders, so they should not be used beyond recommended areas without proper ventilation. A lack of proper ventilation in these cases will result in the possibility of water vapor condensation under the roof deck.

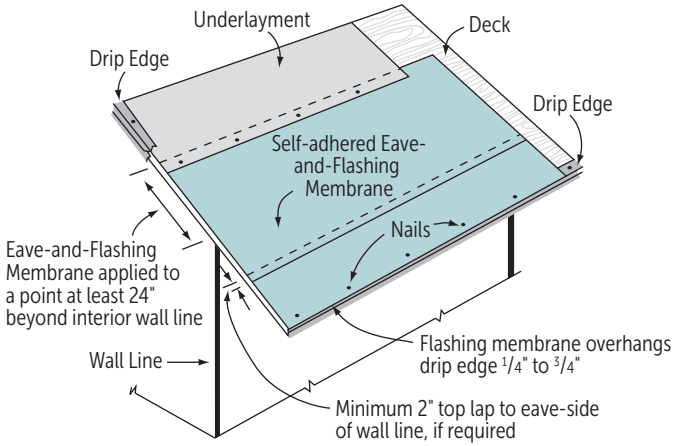
HOW TO INSTALL EAVES UNDERLAYMENT (ICE DAM MEMBRANES)

1. Apply a strip of self-adhered, eave-and-flashing membrane that complies with current building standards directly to the deck to prevent water penetration.

2. The membrane width should be able to extend up the roof from the eaves to at least 24" inside the interior wall line. If it's not wide enough, overlap another membrane strip by at least 2", ensuring the lap joint is on the eave-side of the wall line. Follow the manufacturer's recommendations for installation.

3. For extra protection in heavy snow areas, you may have to extend the membrane to a point 36" inside the wall line.

4. Most self-adhered membranes are vapor retarders, so they should not be used beyond the recommended area without careful attention to ventilation needs. Lack of ventilation can result in water vapor condensation under the roof deck.



HOW TO PREPARE VALLEY UNDERLAYMENT

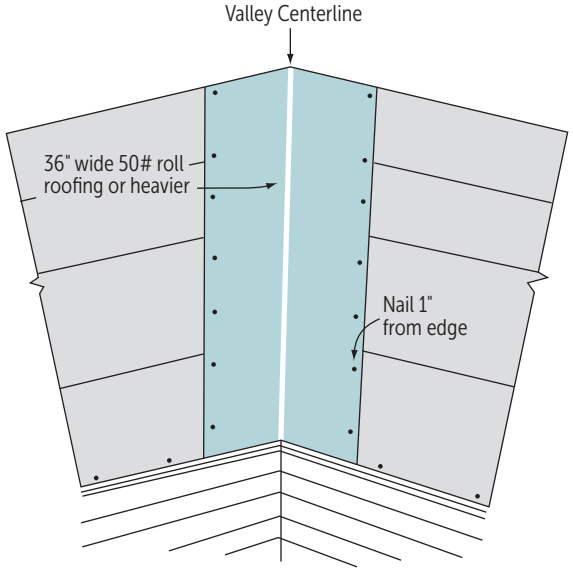
Where two sloping roof planes meet, a valley is formed. These sloping planes direct water toward the valley, concentrating the drainage along the joint making it susceptible to leakage. That's why flashing is very important along valley joints to ensure efficient drainage and prevent water leakage.

1. Use roll roofing and center a minimum 36" wide strip over the valley underlayment.

2. Secure 1" from edges with only enough nails to hold it in place.

3. If two or more strips of roll roofing are needed to cover the valley length, lap the upper piece 12" over the lower, and bond with asphalt plastic cement.

The valley is completed during shingling.



HOW TO INSTALL SHINGLES FOR NEW ROOF CONSTRUCTION

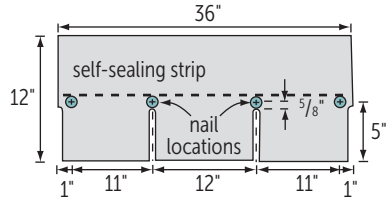
CORRECT FASTENING

General fastening guidelines

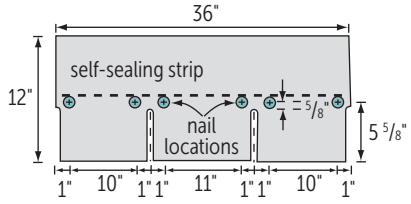
- Proper placement of fasteners is important for shingle performance and warranty protection. Ideally, placement of fasteners should be as specified according to the precise locations shown for each shingle. However, in practice some variation (dimensional tolerance) is acceptable.
- When fastening a typical three-tab, strip-type shingle, it is required that at least four fasteners be used.
- Nails are preferred over staples.

IMPORTANT: For decks ¾" (19 mm) thick or thicker, nails must go at least ¾" (19 mm) into the deck. On thinner decks, nails must go at least ⅛" (3.2 mm) through the deck.

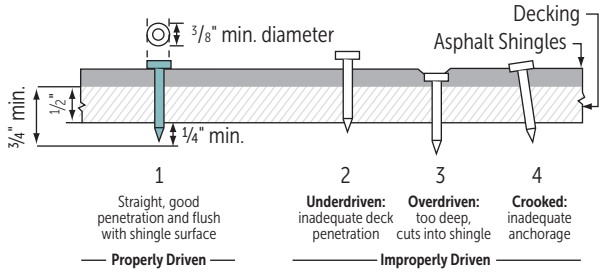
- Nail shanks must be either 11- or 12-gauge roofing nails, corrosion-resistant, with at least ⅜" (9.5 mm) heads, and at least 1" (25 mm) long.
- Nail head diameter must be at least ⅜".
- All nails must be corrosion-resistant; for example, double-dipped galvanized steel, aluminum, copper, or stainless steel.
- Nails with a barbed or rough shank are recommended. Smooth pneumatic nails are acceptable, but have been blamed for nail pops by some installers.
- Nailing locations vary by shingle and by roof slope. It is critical to fasten the shingles in the proper locations in order to achieve designed performance. Improperly fastened shingles may blow off or slip out of place. The use of asphalt roofing cement in small quarter-size dabs to hold the shingle down is required on most shingles when applied to steep slopes exceeding 21/12 (60°). Consult individual shingle application instructions for details on the above, including fastening points.
- The shape of a shingle also makes a difference.



Nail locations for three tab single strip (normal weather conditions).



Nail locations for three tab single strip in high wind regions (6 nail-method).



Proper and improper application of roofing nails.

- Nail shanks must be long enough to penetrate the roofing and then go ¾" into solid wood, plywood or non-veneer wood decking, or through the thickness of the decking, whichever is less.
- Be sure fasteners are driven straight, with nail heads flush with the shingle surface and never cutting into the shingle.
- Fasteners should not go into, above, or between the self-sealing strips. If they do, the shingles may not seal properly and will be more likely to blow off.
- If a nail is underdriven, be sure that it is hammered down flush.
- Seal overdriven nails with asphalt roofing cement and install another nail nearby.
- Crooked nail heads should be flattened with a hammer.
- Fasteners must not be exposed; i.e. visible on the finished roof.
- To prevent shingle distortion, do not attempt to realign a shingle by shifting the free end after two fasteners are in place.

USING PNEUMATIC GUNS

Pneumatic nail guns are widely used. However, in cold weather it can be difficult to keep the pressure properly regulated to drive the nail correctly (flush with the shingle surface). With improper pressure, nails can be driven completely through shingles or underdriven. For this reason, many roofers switch to hand-nailing during cold weather.

In addition to cold weather, numerous factors can affect the air pressure of pneumatic guns; such as temperature changes throughout the day, the number of guns per air compressor, the length of the air hose, etc. It is advisable for installers to periodically check the air pressure and adjust it as necessary for these factors, as well as for the thickness of the roof deck and the particular shingles being installed.

SHINGLE APPLICATION

While the general application procedures for all asphalt strip shingles are essentially the same, differences do exist in applying the first shingle in each course and, depending upon the number of cutouts in the strip, in fastening the shingles. Thus, it is necessary to study and follow the shingle manufacturer's application directions as printed on the shingle bundle wrapper.

1. Before beginning to apply shingles, check that all chimneys are completed and all vent pipes, soil stacks and ventilators are in place. Also make provisions for the additional flashings that will be required as the shingles are applied such as those around chimneys and stacks and at vertical wall joints.

2. If a roof surface is broken by a dormer or valley, start applying the shingles from a rake and work toward the break. If the surface is unbroken, start at the rake that is most visible. If both rakes are equally visible, start at the center and work both ways. On hip roofs, start at the center and work both ways.

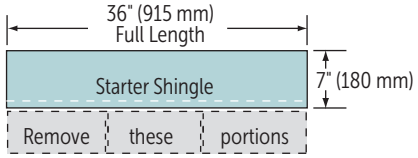
3. No matter where the application begins, apply the shingles across and diagonally up the roof. This will ensure that each shingle is fastened properly. Straight-up application or "racking" may result in less than the recommended number of nails being used because of the manner in which the shingles have to be applied. "Racking" requires that part of the shingles in some courses be placed under those already applied in the course above. Because part of the shingle is hidden, it may be overlooked when the shingle is fastened. With a diagonal application up the roof, each shingle is completely visible until covered by the course above. "Racking" may accentuate shading tendencies.

NOTE: The release tape found on the reverse side of the shingles prevents the shingles from sticking together in the package. It should not be removed during application.

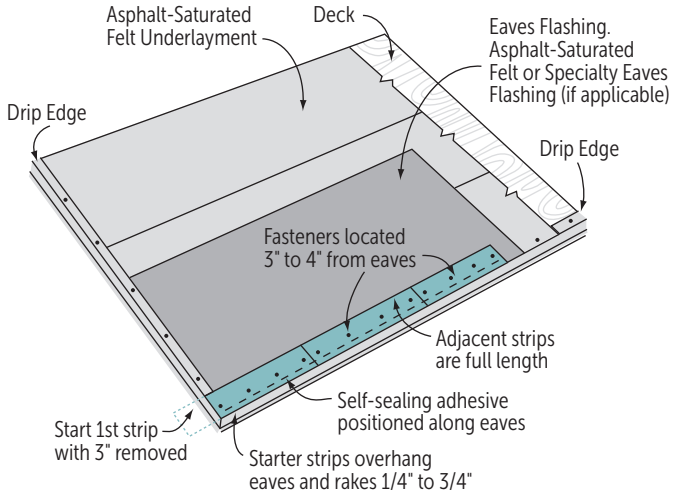
STARTER STRIP

The starter strip may be either a row of shingles trimmed to the shingle manufacturer's recommendations or a strip of mineral-surfaced roll roofing at least 7" wide. The starter strip protects the roof by filling in the spaces under the cutouts and joints of the first course of shingles. It should overhang the eaves and rake edges by ¼" to ¾".

Where the drip edge extends out from the eaves and rakes, the shingles may be cut flush with the drip edge.



1. If self-sealing shingles are used for the starter strip, remove the tab portion of each shingle and position the remaining strip with the factory-applied adhesive face up along the eaves.
2. Trim at least 3" from the end of the first shingle in the starter strip.
3. Fasten starter strips parallel to the eaves along a line 3" to 4" above the eaves.

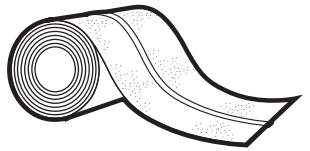


4. Position the fasteners so that they will not be exposed under the cutouts in the first course.
5. If shingles without a self-sealing adhesive are used for the starter strip, remove the tab portion of each shingle and position the remaining strip along the eaves.
6. If roll roofing is used for the starter strip, nail along a line 3" to 4" above the eaves. Space the nails 12" apart. This will ensure that the cutouts of the first course of shingles are not placed over the starter strip joints.

SHINGLE STARTER

Shingle starter saves time and ensures a clean look

This self-adhesive product creates a weathertight starter strip. It seals to the roof deck and the first course of shingles, providing cleaner lines and a more professional look. **It eliminates 66 seams from the average roof!**



Save time and labor and get a clean look with Quality Edge Shingle Starter.

FIRST AND SUCCEEDING COURSES

1. The first course is the most critical. Be sure it is laid perfectly straight, checking regularly during application against a horizontal chalk line. A few vertical chalk lines aligned with the ends of shingles in the first course will ensure proper alignment of cutouts.
2. If applying three-tab shingles or if using roll roofing for the starter strip, bond the tabs of each shingle in the first course to the starter strip by placing a spot of asphalt plastic cement – conforming to a standard such as ASTM D-4586, Type II – about the size of a quarter on the starter strip beneath each tab corner. Then press the tabs firmly into the cement. Avoid excessive use of cement as this may cause blistering and/or shingle slippage.
3. The first course starts with a full shingle while succeeding courses start with portions removed according to the style of shingle being applied and the pattern desired. Do not discard the pieces cut from the first shingle in each course. If full tabs, they may be useful for finishing the opposite end of the course and for hip ridge shingles.

HOW TO INSTALL 3 TAB SHINGLES

To obtain the correct exposure for square-tab strip shingles, align the butts with the top of the cutouts in the course below. Install no-cutout shingles and those with variable butt lines according to the manufacturer's directions to obtain correct exposure.

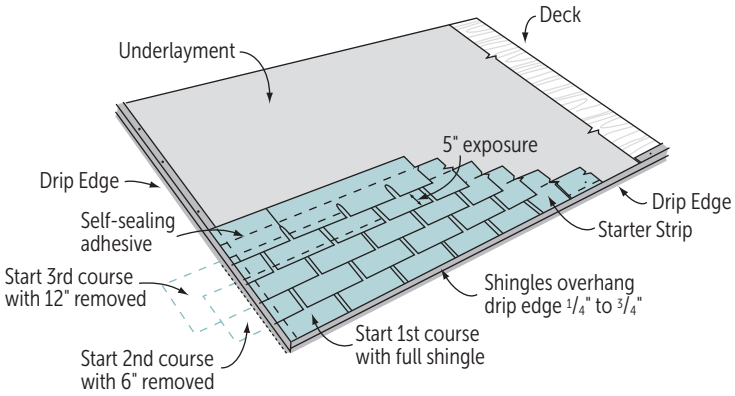
There are three different offset methods of applying three-tab strip shingles: the 6-inch method, 5-inch method and 4-inch method. These methods correspond to the additional amount removed from the first shingle in each successive course to obtain a desired pattern. By removing different amounts from the first shingle, cutouts in one course of shingles do not line up directly with those of the course below.

6-INCH METHOD

This method starts each succeeding course after the first and up to the sixth with a shingle from which an additional 6" has been removed. Thus, the first course starts with a full length shingle.

The second course then starts with a shingle that has 6" removed and so on through the sixth course which starts with a shingle that has 30" removed.

Adjacent shingles in each course are all full length. The seventh course again starts with a full length shingle and the pattern is repeated every sixth course.



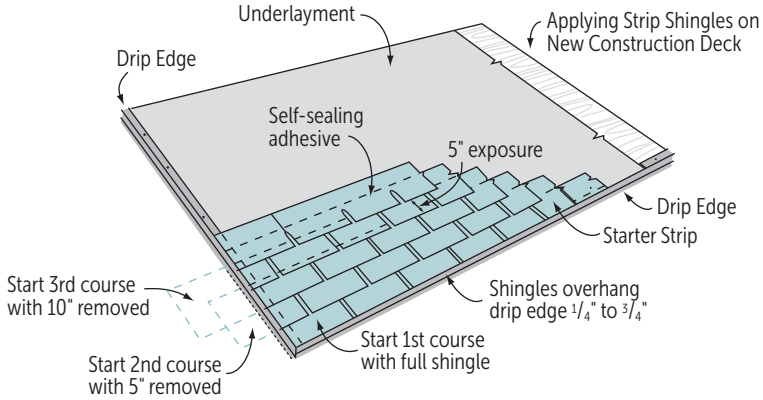
Application of shingles using the 6-inch method.

5-INCH METHOD

With this method of application, first course begins with a full shingle. The second through seventh courses have an additional 5" removed from the first shingle in each course; i.e. the second course starts with 5" removed from the first shingle, the third course with 10" removed from the first shingle and so on through the seventh course which has 30" removed from the first shingle.

Adjacent shingles in each course are full length. Proceed with additional courses to continue the 5" offset pattern. One method calls for starting the eighth course with 11" removed from the first shingle.

NOTE: The eighth course does not begin with a shingle that has 35" removed because the remaining 1" width does not lend itself to proper fastening.



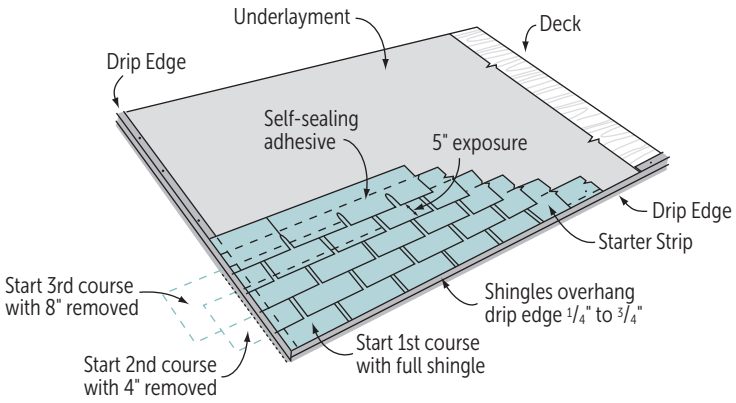
Application of shingles using the 5-inch method.

4-INCH METHOD

For the 4-inch method, start the first course with a full shingle. Start the second course with 4" removed from the first shingle, the third course with 8" removed, the fourth with 12" removed and so on through the ninth course which has 32" removed from the first shingle.

Adjacent shingles in each course begins with a full length shingle and the pattern is repeated every ninth course.

CAUTION: Never use an alignment system where shingle joints are closer than 4" to one another.

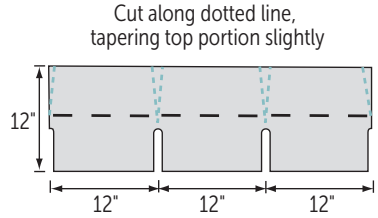


Application of shingles using the 4-inch method.

HOW TO INSTALL HIPS AND RIDGES

1. Apply shingles up to a hip or ridge from both sides of the roof before finishing the intersection. To facilitate finishing, adjust the last few courses so that the ridge capping will adequately cover the top courses of shingles equally on both sides of the ridge.

2. Some manufacturers supply special hip and ridge shingles and specify how they should be applied. Hip and ridge shingles also may be made from 12" x 36" strip shingles used to cover the roof. Cut the strip shingles down to 12" x 12" on three-tab shingles or to a minimum of 9" x 12" on two-tab or no-cutout shingles. Taper the lap portion of each cap shingle slightly so that it is narrower than the exposed portion. This produces a neater job.

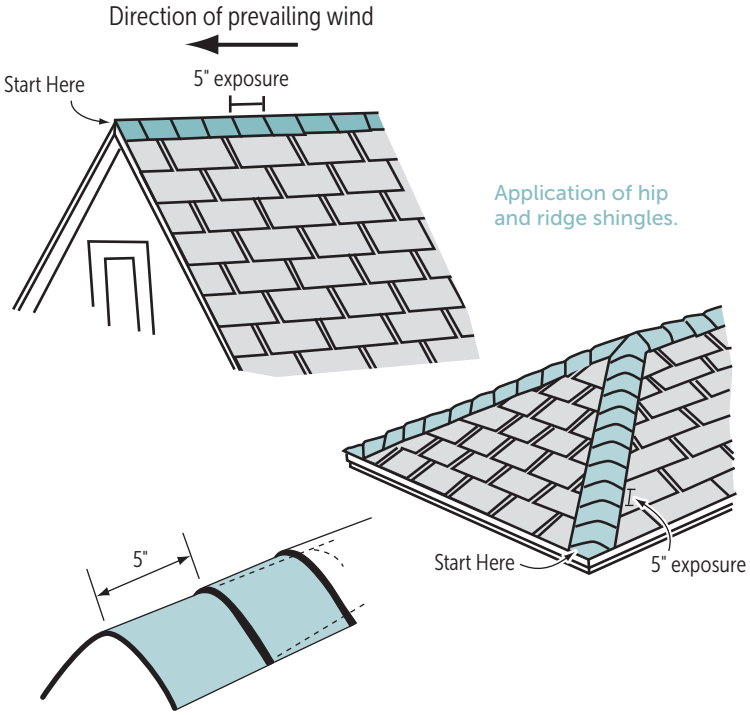


Fabrication of hip and ridge shingles from three-tab strip shingles.

3. To apply the ridge shingles, bend each shingle along the centerline so that it will extend an equal distance on each side of the hip or ridge. Chalk lines may assist in proper alignment. In cold weather, warm the shingle until it is pliable before bending.

4. Apply the shingles with a 5" exposure, beginning at the bottom of the hip or from the end of the ridge opposite the direction of the prevailing winds.

5. Secure each shingle with one fastener on each side, 5½" back from the exposed end and 1" up from the edge. Length of fastener for hip and ridge shingles should be ¼" longer than recommended for shingles.



Application of hip and ridge shingles.

Fastener location of hip and ridge shingles.

HOW TO INSTALL METRIC SHINGLES

Install on new roofs and tear-offs using the following methods:

- SEVEN-COURSE, 5⅝" stepped-off diagonal method (random 5⅝" method)
- EIGHT-COURSE, 5⅝", stepped-off diagonal method.

SEVEN-COURSE

PREPARING THE DECK

1. Apply underlayment as required. A layer of shingle underlayment should be applied. For UL fire rating, underlayment is generally required. Apply flat and unwrinkled.

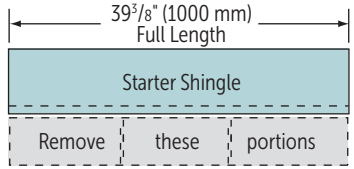
2. Snap horizontal and vertical chalk lines to assure shingles will be correctly aligned. Expose all shingles 5⅝" (141 mm).

STARTER COURSE

1. Use Quality Edge Starter (7.2" x 33.5") or a starter course consisting of the shingles from which the lower tabs have been removed. Remember, the sealant on starter courses should lay as close as possible to the eaves edge of the roof.

2. Next, cut half of a tab off the length of the first starter-course shingle. Install this shingle on the lower left corner of the roof. Make sure there is ½" left overhanging both rakes and eaves if drip edge is being used. If you are not using drip edge, make the overhang ¾".

3. Continue with full-length starter course shingles along the eaves.



Make starter shingles by removing the lower tabs.

1ST COURSE

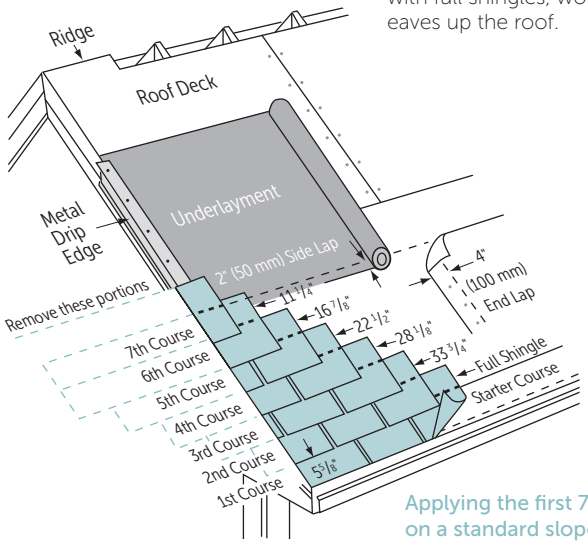
Apply a full shingle at the lower left corner of the roof. Make tabs lie flush with the edges of the starter course. In this way, sealant on the starter strip will adhere to the first-course tabs and help keep them from lifting in high winds.

2ND THROUGH 7TH COURSES

1. Cut 5⅝" off the left side of a shingle and install this 33¾" piece over and above the first-course shingle, in line with the left edge of the starter course.
2. Cut 11¼" off the first shingle of the third course, 16⅞" off the first shingle of the fourth course, 22½" off the first shingle on the fifth course, 28⅛" off the first shingle of the sixth course, and 33¾" off the first shingle of the seventh course. Apply each with its left edge in line with the previous course.
3. Install full shingles flush against the seven applied courses.

SUCCEEDING COURSES

As you go up the rake, repeat the same pattern used to start the first seven courses. Finish the courses with full shingles, working from the eaves up the roof.



Applying the first 7 courses on a standard slope.

IMPORTANT: Do not align end joints of a given course closer than 55⁄8" from one another, and they must be at least 3" from the nails on the underlaying course.

EIGHT-COURSE

STARTER COURSE

1. Use Quality Edge Starter (7.2" x 33.5") or a starter course consisting of the shingles from which the lower tabs have been removed. Remember, the sealant on starter courses should lay as close as possible to the eaves edge of the roof.
2. Cut 3" off the length of the first starter strip and apply at the lower left corner of the roof. This starter strip should overhang the rakes and eaves ½" when drip edge is used, or ¾" when no drip edge is used.
3. Continue with full-length starter course shingles along the eaves.

1ST COURSE

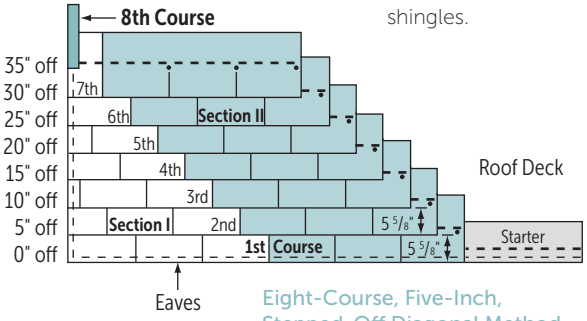
Begin "Section I" by applying a full shingle at the lower left corner of the roof, tabs flush with the starter course.

2ND TO 8TH COURSE

1. Begin the second course by cutting 5" off the left end of a shingle and applying the 343⁄8" piece over the first-course shingle, flush with the left edge of the first-course shingle, and exposing the first course 55⁄8".
2. Each succeeding course, up to and including the eighth course, should start with a shingle 5" shorter (off the left end) than the previous course. Expose each course 55⁄8". This completes "Section I".
3. Install "Section II" using full shingles against the eight courses in "Section I". This must be done before continuing with course nine. These "Section II" shingles are to be butted-up against the "Section I" shingles.

SUCCEEDING COURSES

Repeat the above two-part procedure up the roof. Complete courses across the roof using full shingles.

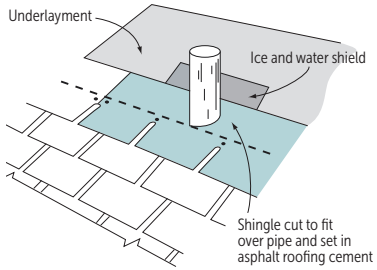


Eight-Course, Five-Inch, Stepped-Off Diagonal Method.

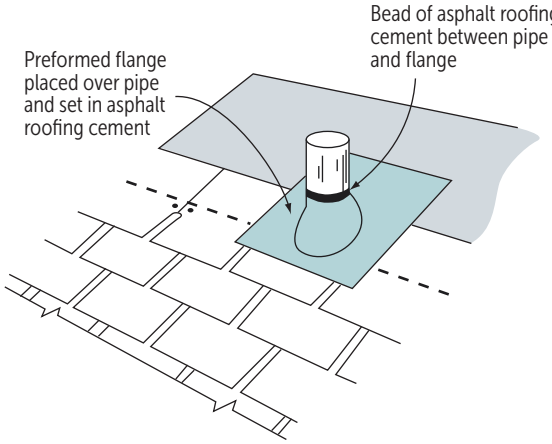
HOW TO FLASH SOIL STACKS AND VENT PIPES

Practically all homes have circular vent pipes or ventilators projecting through the roof.

1. Before installing the flashing, bring the shingles up to the vent pipe.
2. Cut a hole in the shingle that will go over the pipe and install the shingle, setting it in asphalt plastic cement.
3. Next, place a preformed flashing flange, sized to fit snugly over the pipe, over the vent pipe and set it in asphalt roofing cement. Be sure the flange is seated squarely on the roof.

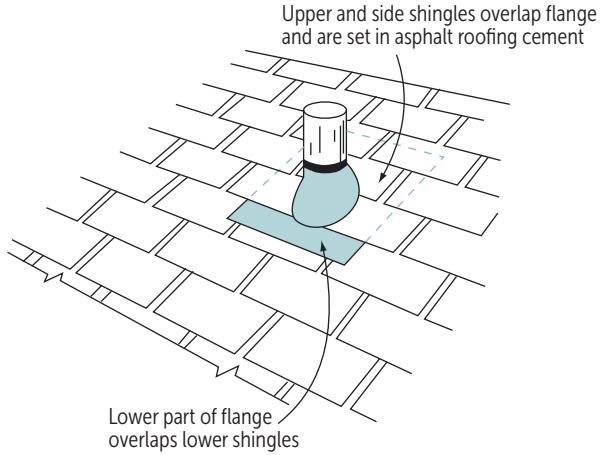


Cutting shingle to fit around vent pipe.



Placement of flange over vent pipe.

4. After flashing is in place, continue applying the shingles. Cut the shingles in the succeeding courses to fit around the pipe, and embed them in asphalt roofing cement where they overlap the flashing flange. The completed installation should appear with the lower part of the flange overlapping the lower shingles, and the side and upper shingles overlapping the flange.



Applying shingles around flange.

Follow the same procedure where a ventilator or exhaust stack is located. If the ventilator, exhaust stack, or soil pipe is near a ridge, bring the shingles up to the protrusion from both sides and bend the flashing flange over the ridge to lie in both roof planes, overlapping the roof shingles at all points. Ridge shingles are then positioned to cover the flange. Embed the ridge shingles in asphalt roofing cement where they overlap the flange.

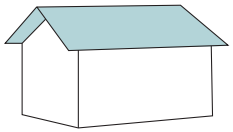
Flexible neoprene boots are also commonly used to flash around vent pipes.

APPENDIX

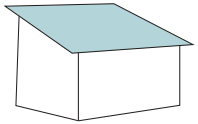
COMMON ROOFING TERMS

There are many different terms used throughout the U.S. to describe the same roofing components. This Roofer's Guide uses the most common roofing terms. Here are a few descriptions and definitions to clarify common terms.

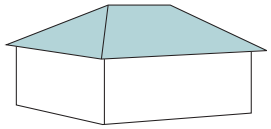
THE GABLE ROOF
The most common type of roof.



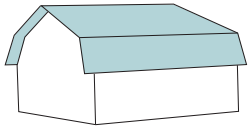
THE SHED ROOF
With a single roof plane.



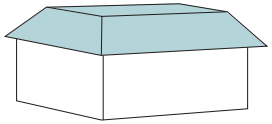
THE HIP ROOF
Features four sides.



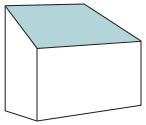
THE GAMBREL ROOF
A variation of the Mansard roof.

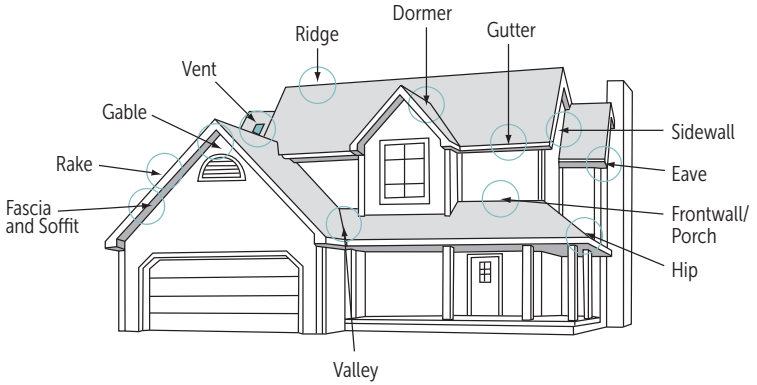


THE MANSARD ROOF
An almost vertical wall ties into another roof plane.



CONTEMPORARY ROOFS
Here, roof planes drop off to open space.





SLOPE AND PITCH

These measure the steepness of the roof plane.

THE SLOPE = The ratio of the roof's rise in inches to the roof's horizontal run in feet.

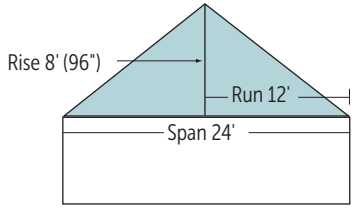
THE PITCH = The ratio of the roof's rise to the roof's span.

The most common use in the field is the roof's slope.

HOW TO DETERMINE THE ROOF'S SLOPE

Slope = Rise (inches) ÷ Run (in feet)

1. Determine the rise in inches.
   8 ft. x 12" = 96" of rise
2. Determine the run in feet.
   ½ of span = Run
   24 ft. ÷ 2 = 12 ft
3. Divide rise by run.
   96 ÷ 12 = 8
4. This is your slope **8"/12"**.



CONTACTS

Helping you stay in touch with the latest information in your area.

Here are just a few of the organizations that provide valuable information to answer your roofing, ventilation and building codes questions in the United States and Canada.

Quality Edge
550 3 Mile Rd. NW
Suite E
Walker, MI 49544
888-784-0878
www.qualityedge.com

RESIDENTIAL BUILDING CODE ORGANIZATIONS

Building Officials and Code Administrators International
4051 West Flossmoor Road
Country Club Hills
Illinois 60478-5795
800-214-4321
www.bocai.org

International Conference of Building Officials
5360 Workman Mill Road
Whittier, California 90601-2298
800-284-4406
www.icbo.org

Southern Building Code Congress International, Inc.
900 Montclair Road
Birmingham
Alabama 35213-1206
205-591-1853
www.sbcci.org

PROFESSIONAL ASSOCIATIONS & RESEARCH CENTERS

American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19428
610-832-9500
www.astm.org

Asphalt Roofing Manufacturers Association
4041 Powder Mill Road
Suite 404
Calverton, MD 20704-3106
301-231-9050
www.asphaltroofing.org

Construction Specifications Institute
601 Madison Street
Alexandria, VA 22314
703-684-0300
www.csinet.org

Council of American Building Officials
Northcentral Technical College
1000 Campus Drive
Wausau, WI 54401-1899
715-675-3331
www.northcentral.tech.wi.us

Home Ventilating Institute
1000 North Rand Road
Suite 214
Wauconda, IL 60084
847-526-2010
www.hvi.org

International Remodeling Contractors Association
17 South Main Street
East Granby, CT 06026
800-937-4722
www.remodelingassociation.com

NAHB Remodelers Council
1201 15th Street, NW
Washington, DC 20005
202-822-0212

National Association of the Remodeling Industry
3800 North Fairfax Drive
Suite 2
Arlington, VA 22203-1627
703-276-7600
www.ebtech.com

National Roofing Contractors Association
10255 West Higgins Road
Suite 600
Rosemont, IL 60018-5607
847-299-9070
www.roofonline.org

Roof Consultants Institute
1500 Sunday Drive, Suite 204
Raleigh, NC 27607
1-800-828-1902
Member Services
www.rci-online.org

Roofing Industry Committee of Wind Issues
13303 U.S. 19N
Clearwater, FL 34624
813-536-0456

Roofing Industry Educational Institute
14 Inverness Drive East
Building H, Suite 110
Englewood, CO 80112
303-790-7200
www.rieiroof@aol.com

IN CANADA:

Canadian Roofing Contractors Association
2430 Don Reid Drive, Suite 100
Ottawa, ON K1H 1E1
800-461-2722
www.roofingcanada.com

NOTES

GAINING THE EDGE
ON THE ROOFING MARKET

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