

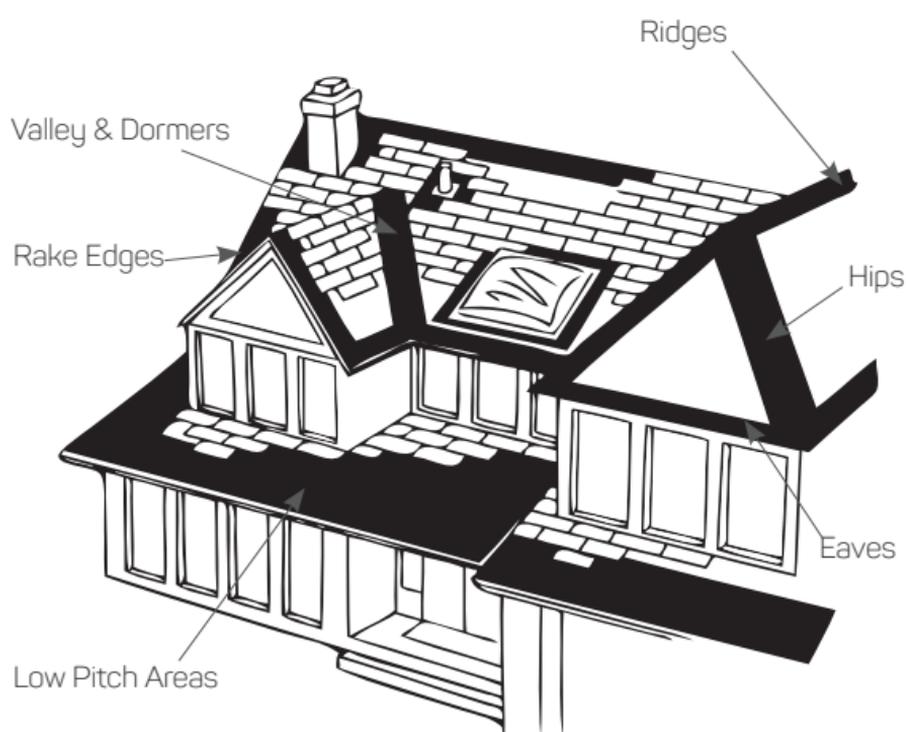


# GUIDE TO GOOD ROOFING

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## Application of 3-Tab and Laminate Asphalt Shingles

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# Important Steps

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Read this entire document before starting your roof.

## **DECK PREPARATION**

A stable roof deck is an essential part of the roof structure. It must be firm, smooth and provide an adequate base for nailing. Applied asphalt shingles to roof slopes less than 2:12 (9.5°, 16.66%) don't have limited warranty coverage.

## **VENTILATION**

Condensation can cause serious damage to shingles, the roof deck and insulation. Attic spaces must be properly ventilated.

**Poor ventilation can cause premature deterioration of the shingles, rotting the wood deck and reducing warranty coverage to 10 years regardless of type of shingles.**

## **FLASHINGS**

Most roofs have joints and breaks such as valleys, dormers, chimneys, vents, etc. Care must be taken that flashings are set in roofing cement to avoid leakage at these danger points.

## **SHINGLE APPLICATION**

Alignment must be accurate and nailing must be performed as directed for asphalt shingles to provide their full potential in appearance and performance.

# Care and Handling of Materials

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Asphalt shingles should be stacked only on smooth, even surfaces to avoid damaging the bottom shingles in the stack. They should be stacked no more than 15 bundles high, as too great a weight on the lower shingles may cause sticking in the bundle and bleeding of the asphalt coating through the granule surfacing. If stored outside, they should be protected from the weather, and in summer from the direct heat of the sun. Please use caution when stacking bundles on sloped roofs.

Roll roofing must always be stored on its end and never be allowed to lie on its side which would cause distortion with flattening of the roll as well as possible sticking in the roll. Care must be taken to avoid damage to the ends of the roll. Before using roll roofing, it must be unrolled flat then cut into convenient lengths of 12' to 18' (3.5 m to 5.5 m) and laid out in a warm place until completely relaxed and flattened out. In cold weather, stand roll roofing in a warm place until pliable before unrolling.

Bituminous roof coatings, cements and adhesives tend to stiffen when cold. Before applying in cold weather, they should be kept in a warm place until readily workable.

# Roof Deck Preparation

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## NEW WORK

The deck must be smooth, firm and dry. Plywood or OSB minimum 1/2" (12 mm) is recommended for best roof performance. Board decks should be covered with a layer of plywood sheathing minimum 1/4" (6 mm) to reduce shingle buckling. Buckling is not covered by our Limited Material Warranty.

### Note:

Unless the roof deck is to be shingled immediately, it should be protected from the weather, as the drying and shrinkage of a roof deck, which has been shingled wet, will buckle and twist the shingles. Use a single layer of underlayment overlapped 2" (50 mm) and nailed sufficiently to hold in place.

## RE-ROOFING

Old asphalt shingles or old roll roofing need not be removed providing the strength of the old roof structure is not impaired and is adequate for the additional weight, and providing there is sufficient nail holding power in the old roof to hold the new shingles. If the old roofing is removed, the deck is repaired and application of the roofing follows that described for new work. If the old roofing remains in place, nail down or cut away all loose, curled or lifted shingles; remove all loose or protruding nails and sweep surface clean. For old roll roofing, slit all buckles and nail down smoothly; remove all loose and protruding nails and sweep surface clean.

## METAL DRIP EDGE

For efficient water shedding at the roof's edges, particularly when no eavestrough is used, it is suggested that a metal drip edge be installed directly on the wood deck at eaves and over the underlayment along the rakes. This should be of corrosion resistant sheet metal with a 2" (50 mm) to 4" (100 mm) roof flange and bent downward over the edges of the roof. It should be set on the deck into a band of asphalt roofing cement and nailed along the back edge of the flange at not more than 16" (400 mm) intervals.

# Cementitious Board Deck

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Although IKO recommends installation of its asphalt shingles on suitable wood decks, in certain areas such decking materials are not readily available, and in those cases local installers have successfully installed shingles on cementitious board decks. The boards, if used should be further treated to limit water absorption. IKO approves the installation of its shingles on such panels, providing the following requirements are met;

- The boards must meet the local national material standard, and be at least 10 mm thick.

- The boards must be installed according to local building code requirements, with corrosion-resistant screws, and sufficiently supported to accommodate all anticipated roof loads during shingle installation and subsequent roof loads.
- The deck must be fully covered by an IKO-approved roof underlayment material.
- Since the boards do not receive conventional roofing nails well, the shingles may be stapled with proper roofing staples (See page 11 for Staple Application)
- Screws may also be acceptable, providing the head thickness is < 2 mm and the screw penetrates at least 8 mm into the board. Screws must be approved in advance by IKO.
- A minimum of six staples or screws must be used per shingle, located as per the six-fastener location shown on Figure 6.
- Provisions must be made to limit moisture exposure including appropriate attic ventilation, proper flashing around all roof penetration, drip edges on the eaves and step flashing at sidewalls.

Where IKO asphalt shingles are installed on cementitious boards, our IKO Asphalt Shingle Limited Warranty (Export) will remain in effect – see the Warranty for details on coverage, and conditions/exclusions. However, any problems arising specifically due to the use of cementitious boards, will not be covered. Note that installation of IKO shingles on cementitious boards is currently not approved for installations in Canada or the United States.

## **Concrete Decks**

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In certain regions suitable wood decking materials are not readily available, and with certain local building practices, concrete structures, including pre-cast or cast-in-place concrete decks, are used for sloped roof systems.

IKO approves the installation of its shingles on such concrete decks, providing the following requirements are met;

- The deck/structure must meet the local national material standard and all local applicable building code requirements.
- The deck must be sufficiently supported to accommodate all anticipated roof loads during shingle installation and subsequent roof loads.
- The concrete deck must be covered by a smoothing layer of mortar, 25 – 30 mm thick, comprised of a nominal ratio of cement:sand of 1:3.

- The mortar must be covered by two coats of an asphalt-based waterproofing primer, which must be allowed to dry thoroughly (typically 1 – 2 days) before shingle installation.
- Shingles shall be installed with zinc-coated steel roofing nails, long enough to penetrate at least 19 mm into the roof deck (mortar), with nominal 9 mm diameter heads, and barbed shanks. IKO recommend nails of 1" or 25 mm length for Marathon shingles and 1 ¼" or 32 mm for Cambridge and other laminate shingles. Please note nails will not touch the concrete and only penetrate on the mortar.
- All other IKO shingle installation requirements must be followed, including nail location/amount, drip edge use, valley construction, etc.

Given the density and thermal mass of concrete decking, ventilation is not required in the air space beneath the deck.

Where IKO asphalt shingles are installed accordingly on concrete decks, our IKO Asphalt Shingle Limited Warranty (Export) will remain in effect – see the Warranty for details on coverage, and conditions/exclusions. However, any problems arising specifically due to settling or cracking of the deck, will not be covered. Note that installation of IKO shingles on concrete decks is currently not approved for installations in Canada or the United States.

## Ventilation

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Excess attic heat generated during the day from plants, animals, humans, cooking and bathing will condensate during the cooler nights, creating a build up of moisture that could cause wood decks to rot and damage concrete board decks resulting in premature deterioration of shingles. Proper ventilation must be installed to prevent moisture build up in the attic. The net free area of ventilation should be at least 1/300th of the horizontal projection of the roof area or 1/300 of attic floor area. (Some roof designs i.e., low slope roofs and cathedral ceilings may require a 1/150 ratio). For maximum effectiveness, the ventilation system should be balanced. Half of the net free ventilating area should be located in the soffits. The other half should be at or near the ridge. Venting at the soffits and at the ridge should be spread as uniformly as practical. Ensure ventilation airways are not obstructed by insulation, and that ventilation meets local building code requirements.

### Note

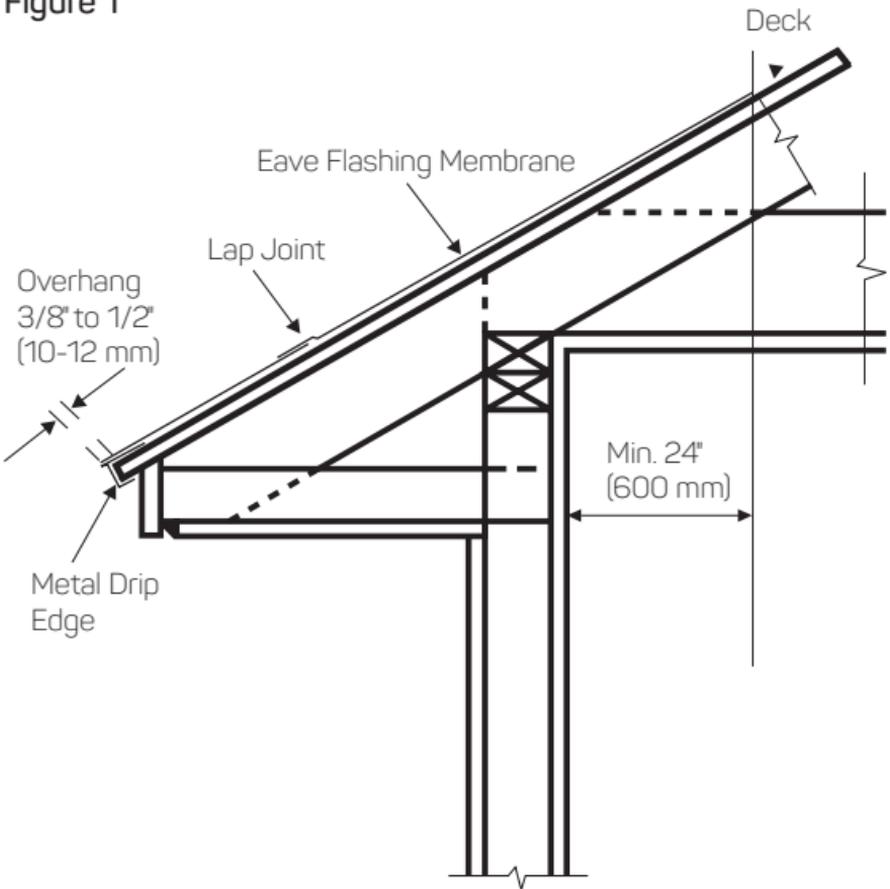
Please see IKO Bulletin about ventilation to learn more about how to calculate and install a ventilation system. Lack of ventilation or inadequate ventilation will reduce IKO Limited Warranty coverage to 10 years

# Eave Protection

For ice dam protection, install an ice and water membrane to cover the roof deck from the eave to at least 24" (600 mm) beyond the inside wall line, or at least 36" (900 mm) from the eave, whichever is greater. One of IKO's Ice and Water Protection products - ArmourGard, Goldshield or Stormshield™ is recommended, applied in accordance with the directions printed on the wrapper.

## Note

Figure 1



Eave protection is not required on roofs over unheated buildings without walls such as carports, porches, kiosks, etc. IN ALL WEATHER THE WATERPROOFING MEMBRANE SUCH AS ICE AND WATER PROTECTOR STORMSHIELD OR ARMOURGARD IS REQUIRED FOR VALLEYS CONSTRUCTION

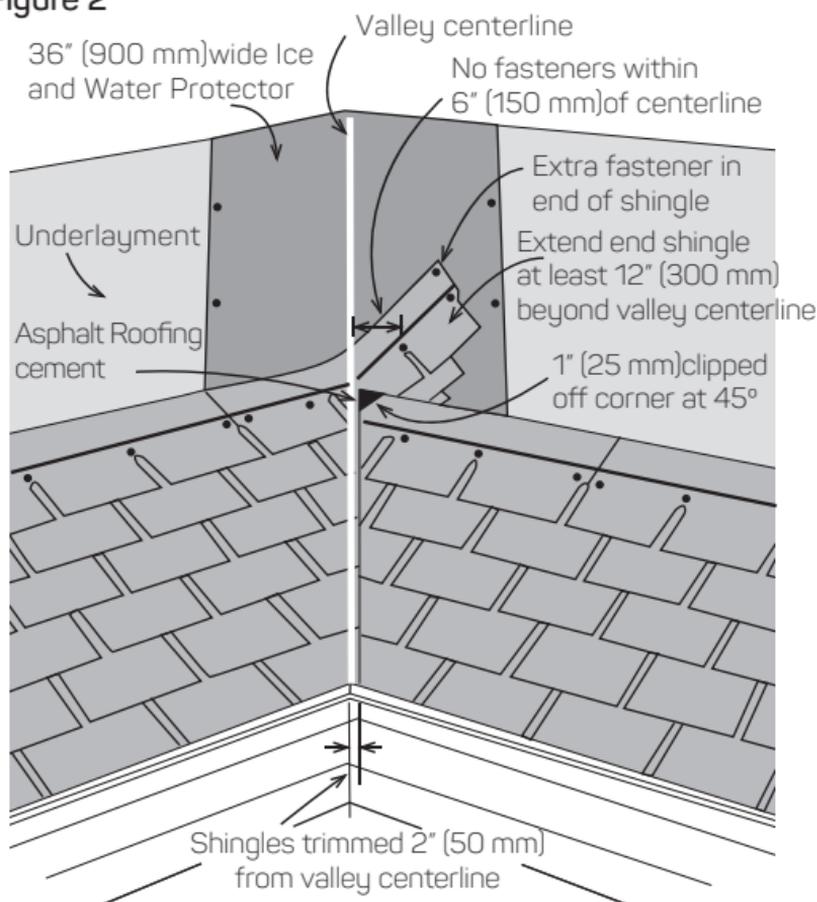
# Underlayment

It is strongly recommended to apply 1 ply of an approved underlayment parallel to eaves over that portion of roof deck not already covered by eave protection or ice and water membrane with a 2" (50 mm) head overlap and 4" (100 mm) end overlap and nail sufficiently to hold in place until shingles are applied.

# Valleys

A valley exists where two slopes of a roof join at an interior angle so that run-off is toward and down the join. Valleys should be constructed after eaves flashing or drip edge, lay of waterproof membrane on the valleys such Stormshield and ArmourGard and underlayment application, but before shingles are applied.

**Figure 2**



Shingle application in a closed cut valley

## CLOSED CUT VALLEY

With waterproofing membrane (Stormshield or ArmourGard) valley flashing already in place, apply the first course of shingles along the eaves of one of the intersecting roof planes and across the valley. The first course and only the first course of shingles from the intersecting roof surface should be woven with the first course of shingles on the starting roof. For proper flow of water over the trimmed shingle, always start applying the shingles on the roof plane that has the lower slope or lesser height. Extend the end shingle at least 12" (300 mm) onto the adjoining roof as shown on Figure 2. Do not make a joint in the valley. If a shingle falls short, add in a one or two tab sections so that the joint occurs outside the line of the valley. Apply succeeding courses in the same manner, extending them across the valley and onto the adjoining roof. Press the shingles tightly into the valley.

Use normal shingle fastening methods except that no fastener should be within 6" (150 mm) of the valley centerline and two fasteners should be placed at the end of each shingle crossing the valley.

Snap a chalk line 2"(50 mm) from the centerline of the valley on the unshingled side. Then apply shingles on the unshingled side. Trim the shingles as they are being installed to the chalk lines and to ensure a neat installation. Trim 1"(25 mm) on a 45° angle from the upper corner of each end shingle upon installation. This will direct water into the valley. Finally, embed the end of each shingle in a 3"(75 mm) wide strip of asphalt roofing cement.

### **Note**

The first course and only the first course of shingles from the intersecting roof surface should be woven with the first course of shingles on the starting roof.

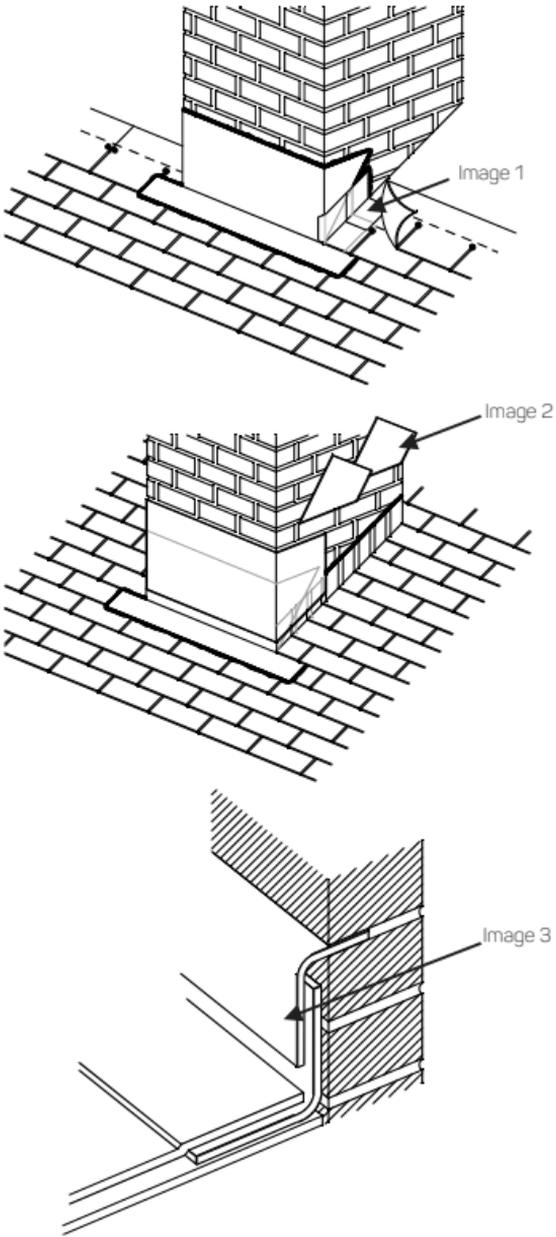
## **Flashings - Chimney**

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Since chimneys are sometimes built on foundations which are separate from the house proper, some differential settlement may occur. To avoid possible fracturing or cracking of materials at this junction, base flashings are secured only to the deck and separate cap flashings are fixed only to the chimney. To direct water around larger chimneys, a wooden cricket or saddle is built on the deck before the underlayment is applied. One of the most common flashings is made of sheet metal. Whether or not a cricket is needed depends on the size of the chimney (see National Building Code).

Shingles are laid up to the chimney. The low-side metal base flashing is applied by concealed cleatnailing the lower portion over the shingles. The upper portion metal base flashing covering the saddle is installed. Side flashings are then applied in conjunction with shingle application (Image 1). As each course of shingles is laid, an 8"x 8" (200 mm X 200 mm) (or larger), metal "soaker" is applied - 4" (100 mm) over the shingle and 4" (100 mm) up the chimney. Nail through the metal and underlying shingle so that the nail head is well covered by the next shingle course. The trimmed shingles overlapping the metal are embedded in a 3" (75 mm) band of asphalt roofing cement. Particular care is taken to make the chimney corners tight against the flow of water. Cap flashing (Image 2) is then installed into mortar joints and down over base flashing (Image 3).

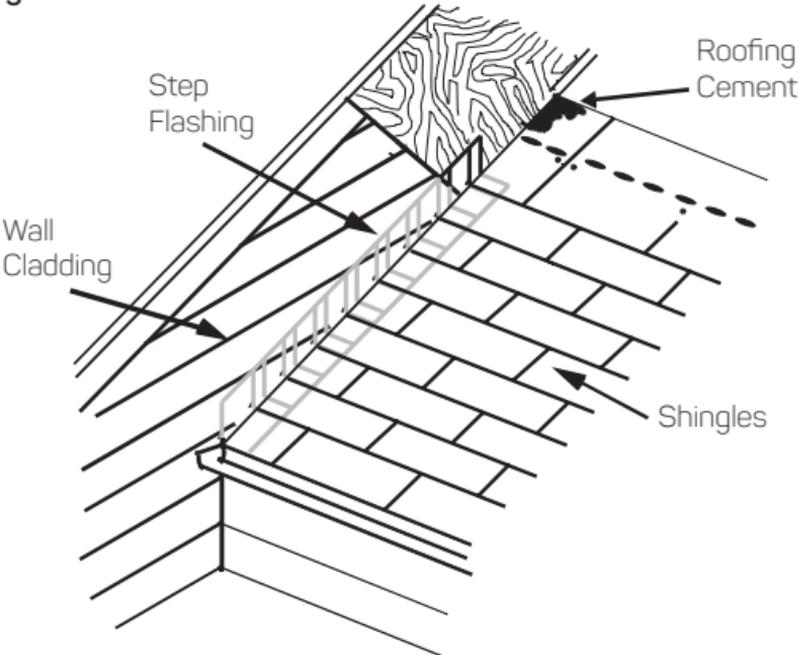
Figure 3



## Flashings - to Vertical Wall

The drawing below illustrates the preferred method. The shingles overlapping the flashing should be well embedded in asphalt roofing cement and the wall cladding should completely cover the top of the flashing.

Figure 4

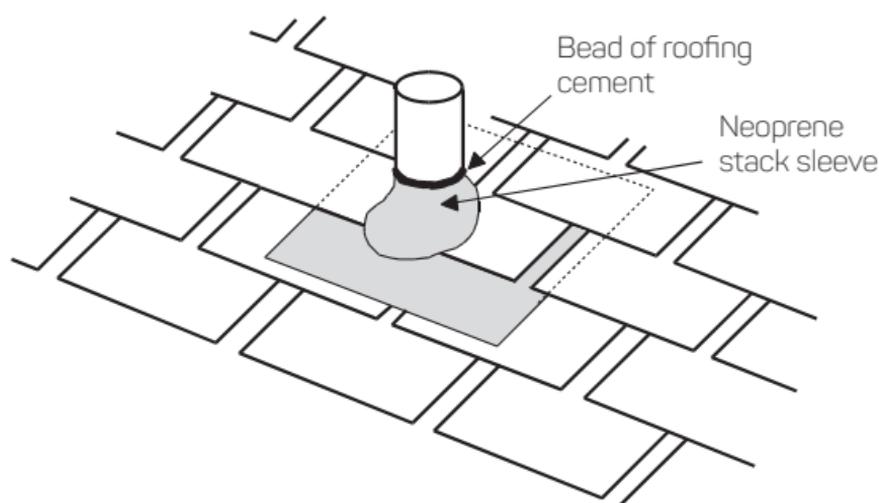


## Flashings - Vent Pipes

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The diagram below illustrates one of the best methods. The flange is set into a thin coat of asphalt roofing cement and nailed sufficiently to hold in place. Shingling is then continued up the roof. Where the flange is covered by the roofing, the shingles are embedded in asphalt roofing cement.

Figure 5



## Shingle Application

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### FASTENERS

For wood deck use ONLY hot dipped, galvanized roofing nails, 10 to 12 gauge, with not less than 3/8" (9 mm) diameter heads, long enough to penetrate at least 3/4" (19 mm) into roof deck. Over wood decks IKO doesn't approve use of screws or staples as fasteners for shingles.

For new work with 3 tab shingles - 1" (25 mm) long, 1/2 lb. (227g)/ bdl.

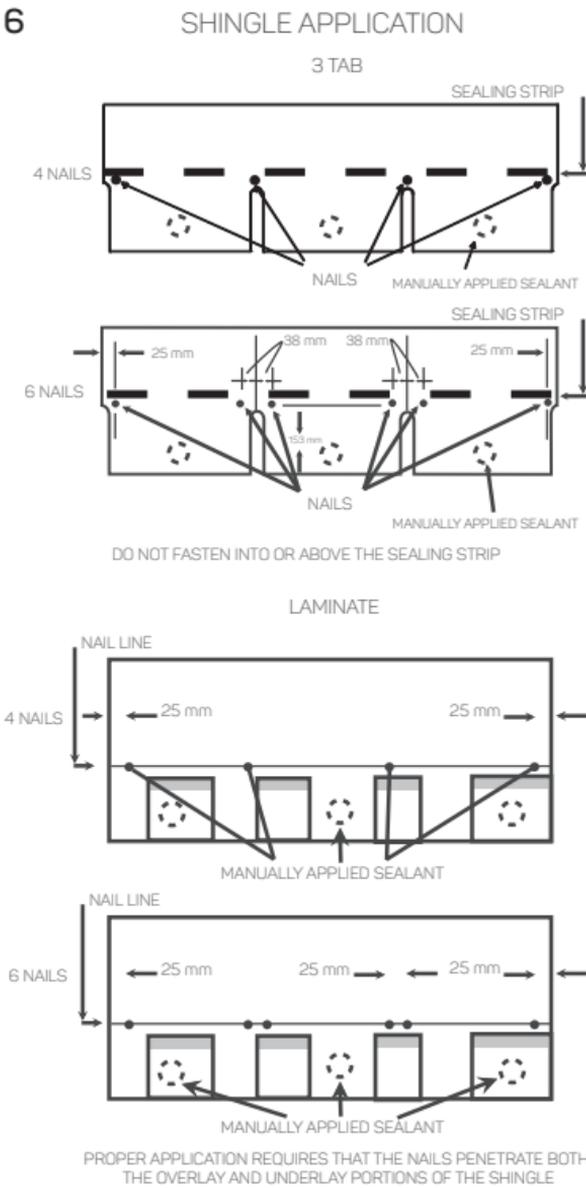
For new work with Laminate shingles - 1 1/4" (32mm) long, 1/2 lb.(227g)/bdl.

Over old asphalt shingles - 1-1/2" (38 mm) long, 3/4 lb. (340g)/bdl.

Over old wood shingles - 1-3/4" (45 mm) long, 1 lb. (454g)/bdl.

Drive nails straight with heads in firm contact with the surface of the shingle, but not so hard as to tear or fracture the shingle. Nail consecutively across the shingle or drive inner nails first. Never nail shingle ends first. Use 4 nails per shingle, except for slopes of 56° (18:12) or steeper which require 6 nails per shingle. Use of 6 nails is also recommended for steep slopes and high wind areas or applications in cold weather (10 Celsius degrees or less). With Marathon shingles overlapping of shingles should be aligned with the end of cutouts of tabs and notch on both sides of the shingles covering completely all nail heads. For Cambridge or Dynasty the overlapping shingle should be aligned to the upper horizontal part of the cut that form the dragon tooth, covering completely the nails over the white line paint by factory for nailing.

Figure 6



## STAPLE APPLICATION

IKO recommends roofing nails, however staples are permitted to be used only over cement boards decks providing they comply with the following material and installation requirements:

- Made of at least 16-gauge galvanized steel
- At least 15/16" wide at the crown, of sufficient length to penetrate at least 3/4" into wood decks, or completely penetrate plywood/OSB/cementitious board decks
- Driven by pneumatic staple guns only
- Applied with the crown parallel to the shingle length
- Driven flush with, but not cutting into, the shingle surface
- Located at the correct fastening positions for each shingle respectively

Staples that are crooked, under-driven, or over-driven, are considered improperly installed. As with all other installation requirements, local building codes must also be followed.

Some building codes may not allow the use of staples. It is the responsibility of the shingle installer to verify that the use of staples will comply with all applicable building codes.

Where staples are used to install IKO asphalt shingles, our Asphalt Shingle Limited Warranty (Export) will remain in effect, however, any problems arising specifically due to the use of staples, including wind blow-off, will not be covered.

## **Application on Exterior Walls (not applicable in North America)**

On slopes greater than 56° or 150% or 18:12 and up to vertical, use 6 fasteners per shingle, securely anchored into the substrate, placed as shown below. Ensure that no fastener is within 50 mm of a joint/cutout of the underlying shingle. Manually seal down each shingle at time of application with three 25 mm diameter spots of adhesive placed under the shingle 50 mm above the bottom edge and equally spaced along the shingle. Suitable adhesives include asphalt roofing cement, polyurethane adhesive, and polyether sealant.

It is the applicator's responsibility to select the appropriate fastener for the substrate as well ensure the fasteners used are securely anchored into the substrate. IKO suggests the fasteners penetrate at least 19 mm or 3/4" on the substrate. IKO suggests galvanized nails for wood substrates, concrete steel nails covered with zinc for mortar over concrete walls and for cement boards use screws as per IKO Bulletin # 71.

### **CHALK LINES**

Since slight variations in the dimensions of asphalt shingles are unavoidable, sufficient chalk lines should be struck to ensure accurate vertical and horizontal alignment of shingles. Vertical lines every 4 or 5 shingle lengths are recommended. The number of horizontal lines needed will depend on the skill of the applicator in keeping horizontal alignment straight. Remember that shingle courses on either side of a dormer must meet accurately above the dormer.

### **COLOR MATCHING**

To minimize an appearance of color shading, use shingles of the same production date (this code appears on the side of the bundle), use shingles of the same blend code (letter and two digits appearing immediately after the color on the side of the bundle), intermix shingles from different bundles, following recommended application patterns and avoid blocking. Avoid mixing different lot numbers on any one roof elevation. Also, an appearance of color variation in a newly applied roof, particularly in a dark solid color, can result from the backing material on a shingle having transferred or rubbed off on the face of the next shingle while the shingles were in the bundle. This will wash off naturally with a few rains and sunlight.

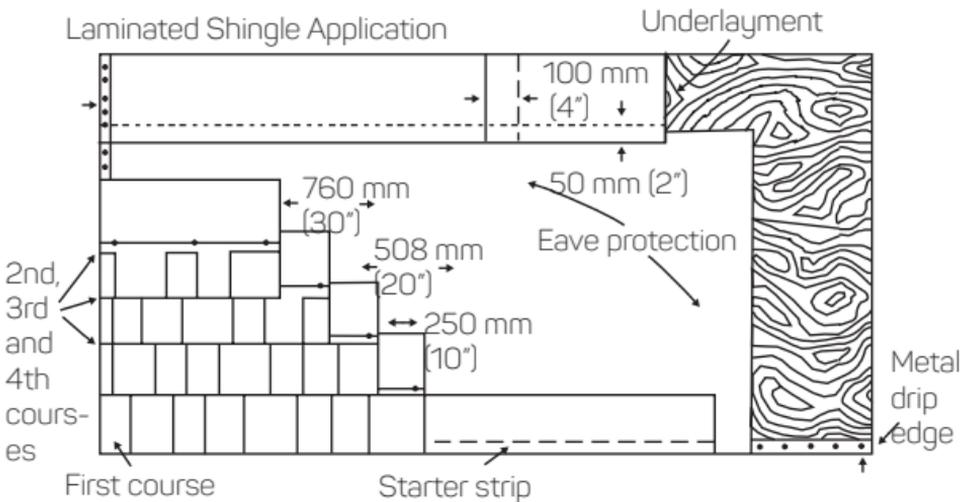
# Where and How to Start a Roof

For a broken roof section, start laying shingles at a rake edge and work toward a valley or dormer. For unbroken sections, start from the most visible rake edge. If each rake is equally visible, and on hip roofs, start at the center of the section and work outwards.

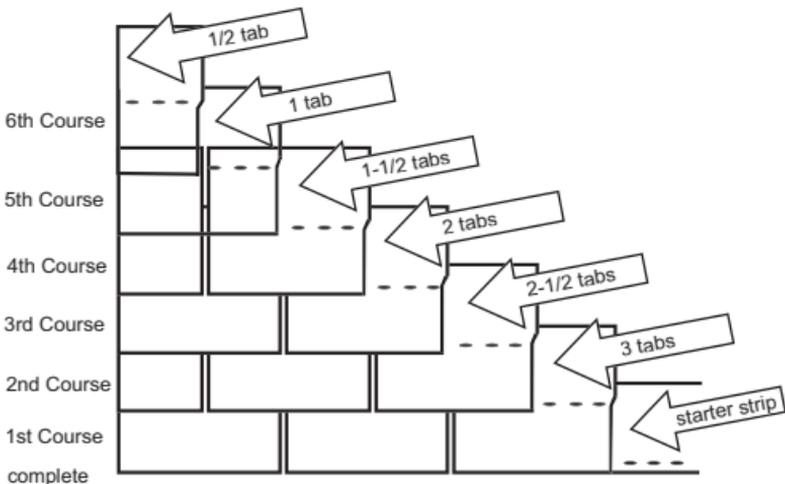
## STARTER COURSE

The purpose of the starter strip is to provide a back-up for the first course of shingles and to fill in the spaces between the cutouts on 3 tab shingles. Cut approximately 3" (75 mm) off the first starter shingle to ensure that the cutouts in first course shingles are not placed over starter strip joints. Remove the exposed tab portion of shingle and apply with sealing strip adjacent to the eave edge, overhanging eaves and rake edges by 3/8" (10 mm) to 1/2" (12 mm) and nail in place. We recommend you use IKO's Leading Edge Plus shingles for the starter course.

Figure 7



3 Tab Shingle Application



## SEALING DOWN TABS

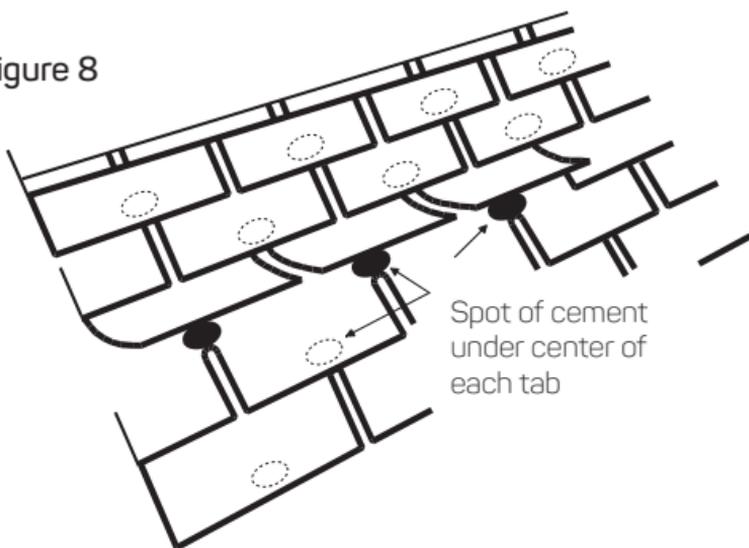
When climate, cold weather or job conditions are such that the asphalt adhesive on the shingles may not be effective and when shingles are used in high wind areas, shingle tabs should be sealed down to prevent damage from repeated lifting and fluttering in the wind. Use a spot of asphalt roofing cement, 1" (25 mm) in diameter applied with a caulking gun or putty knife under each tab, or 3 spots on laminate shingles, located 1" (25 mm) above the cutout in the underlying shingle. Do not use too large a spot of cement, since evaporation of the volatile solvent in the cement could migrate through the shingle tab, dissolving its asphalt content and causing it to blister.

This procedure is especially recommended for all installations in high wind areas to avoid wind uplift.

On slopes steeper than 56° or 150% (18:12) from the horizontal, shingle tabs must be sealed as described above, since contact between the tabs and the underlying course is insufficient for the self-seal adhesive to be effective.

Do not remove the plastic strips from the shingles' underside. Its only purpose is to prevent the shingles from sticking together in the bundle. It serves no purpose once the shingles have been applied and in the contrary it has fabrication code needed in case of samples required for a claim.

Figure 8



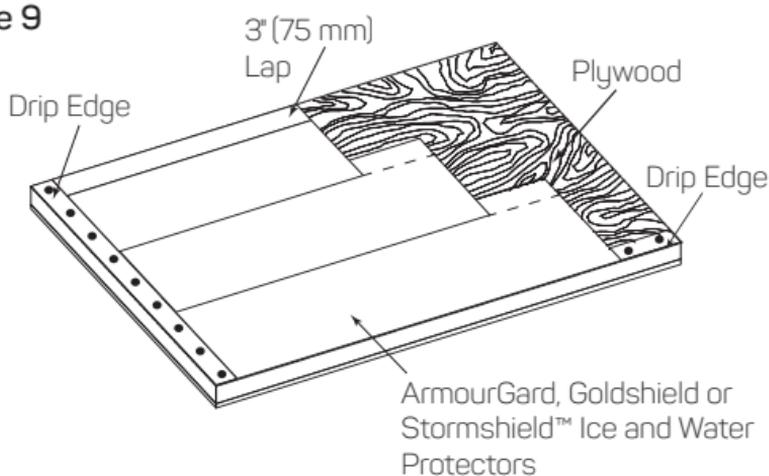
## Low Slope Application

Low slope application is between 2:12 (9.5 degrees, 16.66%) and 4:12 (19 degrees, 33.33%), standard 3-tab shingles and laminate shingles may be applied.

For best low slope roof waterproofing performance, IKO recommends covering the entire low sloped area with one ply of one of IKO's Ice and Water Protection products - ArmourGard, Goldshield, Stormshield™, applied with a 3" (75 mm) lap and 6" (150 mm) endlaps. Once the IKO Ice and Water Protection product is laid down over the entire low sloped area, the shingles can be applied according to their

normal application procedures. IKO's Ice and Water Protection products are excellent for this type of application since they seal around the shanks of the penetrating fasteners, preventing leakage which may result from ice backup or wind-driven rain. Caution: IKO's Ice and Water Protection products are vapor barriers, so if used on entire roof areas, thorough ventilation must be ensured to avoid condensation beneath the roof deck.

**Figure 9**

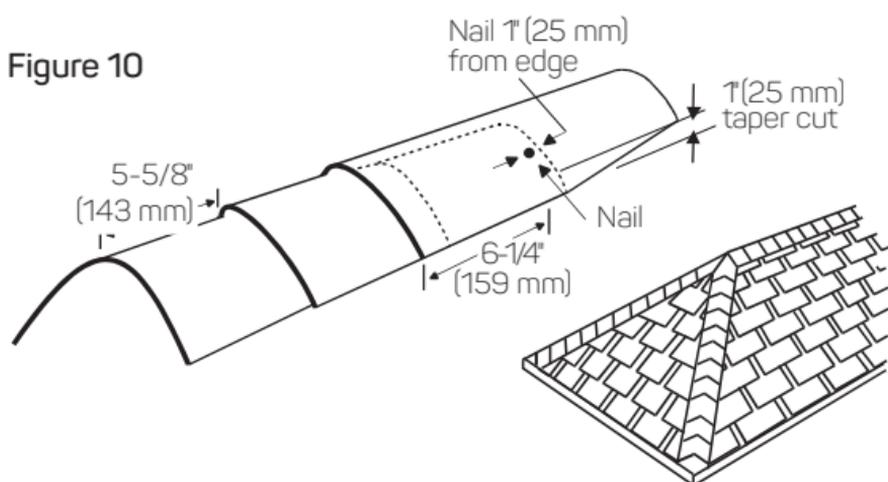


The shingles are then applied over the underlayment in the same manner as described for normal slopes, except that extra care must be taken to ensure that tabs are adequately sealed down, since the angle of the wind against a low slope roof can cause tabs to lift more easily than on a normal slope. (Note. Two layers of No. 15 plain felt is also acceptable as an underlay in low sloped roof areas. The felt plies should be cemented together from the eave up to a point at least 24" (600 mm) beyond the inside wall line.)

## Hip and Ridge Areas

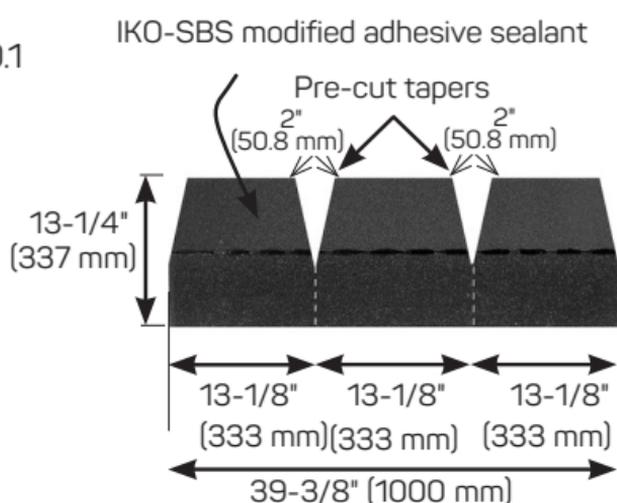
Use individual shingles cut from 3-tab strip shingles by dividing at the cutouts and then cutting the headlap in a 1" taper for a neater appearance. Bend each resulting tab down the center and apply over hips and ridges, exposing 5-5/8" (143 mm) of each shingle to the weather. Nail 6-1/4" (159 mm) back from the exposed end, 1" (25 mm) in from each side. Start hips at the bottom and work up. Start ridge at the end away from the prevailing wind direction and work back. Note: For some products, doubling of ridge caps is suggested; check shingle bundle wrapper application instructions for details.

**Figure 10**



Alternately use one of IKO's hip and ridge accessory products, following installation instructions printed on the wrapper.

Figure 10.1



Note: To install ridge cap shingles, use nails that are at least 1/4" longer than those used to install shingles. This will accommodate the additional shingle layers. The final shingle should be set in cement, and the exposed nail heads of the final shingle should be covered with cement.

## Take Care of Your New Roof

Keep roof surfaces clear of leaves, twigs and other litter. Keep eavestroughs and downspouts clean and unobstructed so that water will drain freely.

Keep the trees trimmed to avoid branches touching the shingles or falling on the roof. Vines should never be allowed to spread onto the shingles.

Avoid walking on asphalt shingles. When necessary to go up on the roof, use ladders or other suitable safety equipment.



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