

# Residential Roofing

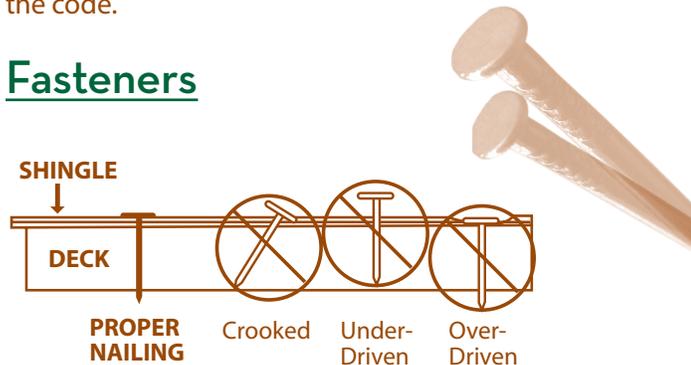
**BUILDING PERMITS** ENSURE THAT GOLDEN VALLEY MEETS LOCAL, STATE, AND FEDERAL BUILDING STANDARDS AND CODES. THEY ALSO HELP PROTECT THE HEALTH, SAFETY, AND WELFARE OF THE COMMUNITY.

## Tear-Off

Completely remove existing shingles, underlayment (including the ice protection membrane), flashing (if rusted or in bad condition), etc and install roofing as if it is new construction. According to the National Roofing Contractors Association (NRCA), the existing ice protection membrane can remain in place if a second layer of membrane is applied over it. Roof sheathing must be checked before re-roofing and repaired or replaced if rotted or unsound. Replacement sheathing must conform to the requirements of the Building Code. Overlaying of sheathing may require approval by a Minnesota registered engineer.

Overlay of existing shingles is no longer allowed by the code.

## Fasteners



Fasteners for asphalt shingles must be galvanized steel, stainless steel, aluminum, or copper roofing nails with a minimum 12-gage (0.105 inch, or 3 mm) shank and a minimum 3/8-inch (10 mm) diameter head. They must be long enough to penetrate through the roofing materials and a minimum of 3/4 inch (19 mm) into the roof sheathing. Where the roof sheathing is less than 3/4 inch thick, the fasten-

ers must penetrate through the sheathing. Fasteners must comply with ATSM F 1667.

*Note: Use of other types of fasteners must be approved by the City Inspections Department.*

## Roof Slope

Do not use asphalt shingles on roofs with less than a 2:12 slope. For roofs with slopes less than 4:12, asphalt shingles require special application procedures. Always follow manufacturer's instructions on package.

## Underlayment

### **For roof slopes of 2:12 to less than 4:12**

Apply ice protection membrane according to manufacturers instructions to a point at least 24 inches inside the exterior wall line (see ice protection membrane requirements). Overlap the ice protection membrane 19 inches horizontally with 15# felt. Lap each subsequent layer of 15# felt 19 inches horizontally shingle fashion to peak. End laps shall be offset by six feet.

### **For roof slopes of 4:12 and over**

Apply ice protection membrane according to manufacturers instructions to a point at least 24 inches inside the exterior wall line (see ice protection membrane requirements). Overlap the ice protection membrane a minimum of two inches horizontally with 15# felt. Lap each subsequent layer of 15# felt two inches horizontally shingle fashion to peak. End laps shall be offset by six feet.

## Valley Underlayment

Before applying shingles, install valley linings per the manufacturer's requirements.

OVER →

## THREE INSPECTION MUSTS

1. **Post** the inspection report card on the job site until the final inspection is completed.
2. **Notify** Inspections when the ice protection membrane is ready for inspection.
3. **Schedule** a final inspection at least 24 hours in advance (please have your permit number available).

**You can reach the Inspections Department between 8 am and 4 pm at 763-593-8090.**

## Valley Flashing

Valley flashing shall consist of not less than No. 26-gauge corrosion-resistant, galvanized sheet metal. The metal must extend at least 12 inches from the center line each way. Sections of flashing shall have an end lap of not less than four inches. Alternately, the valley may consist of woven asphalt singles or closed-cut style applied in accordance with the manufacturer's instructions.

## Other Flashing

All other flashing and roof vents shall be checked and, if rusted or in bad condition, replaced. Replace flashing with not less than No. 26-gauge corrosion-resistant metal. Roof vents and other flashings must be installed according to manufacturer's instructions. Any replacement of flashing at masonry chimneys must be properly cut in and re-tuckpointed or caulked with an approved product.

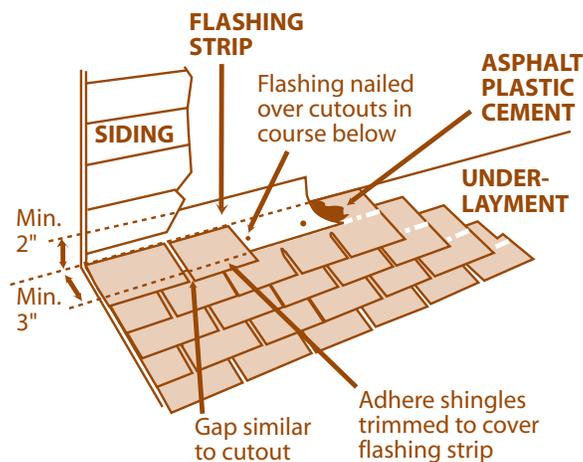
## Vertical Wall Flashing

### (26-Gauge)

Apply shingles up the roof until a course must be trimmed to fit at the base of the vertical wall. Plan to adjust the exposure slightly (and evenly) in the previous courses, so that the last shingle is at least eight inches wide (vertically). This allows a minimum five-inch exposure of the top course and a three-inch headlap.

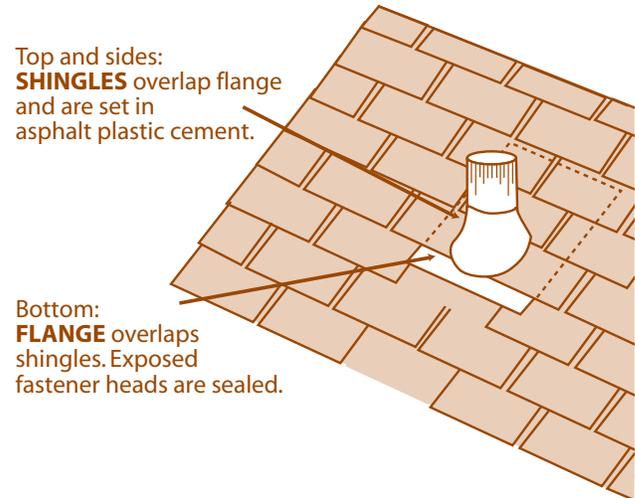
The flashing strip should be bent, using a metal brake, to extend at least two inches up the vertical wall and at least three inches onto the last shingle course (that is, to the top of the cutout).

Embed the flashing in asphalt plastic cement or another appropriate adhesive, and nail it to the roof every 12 inches. Do not nail the strip to the wall.



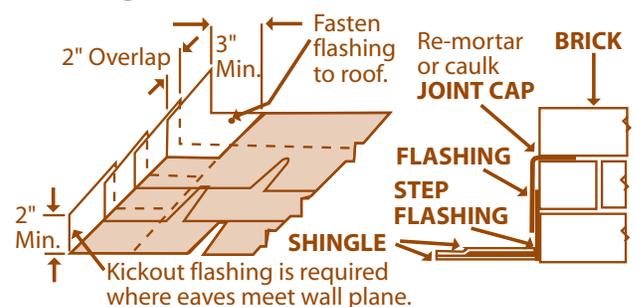
If side laps are necessary, overlap the pieces at least six inches. Do not fasten in this joint area.

## Shingle Application Around Flashing



## Sidewall Flashing

### (26-Gauge)



## Exhaust Vents

Care should be taken to ensure that kitchen and bathroom exhaust fan pipes are connected to the appropriate dampered exhaust roof vent with no openings into the attic that would allow exhaust air back into the attic space. Exhaust vents shall be installed the same as other attic vents and vent pipe flashings.

When re-roofing around furnace flues, take care to not dislodge the joints of the flue pipe within the attic or within interior chases this pipe might pass through. If in doubt, consult a licensed heating contractor.

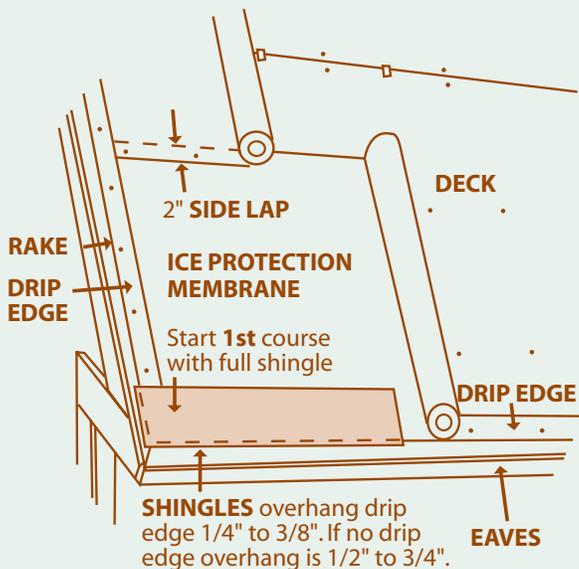
## ICE PROTECTION MEMBRANE

Ice protection membrane is required on all buildings, except unconditioned detached accessory structures. It consists of at least two layers of 15# felt underlayment cemented together or a self-adhering polymer modified bitumen sheet. Ice protection membrane is known by a variety of generic and trade names, including: ice protection underlayment, self-adhered membrane, self-adhering modified bitumen sheet material, WeatherLock®, Ice & Water Shield®, WeatherWatch®, Moisture Guard Plus®, Titanium-UDL™, Titanium-PSU™, Grace Select®, EaveGuard®, and WinterGuard™.

### Installation

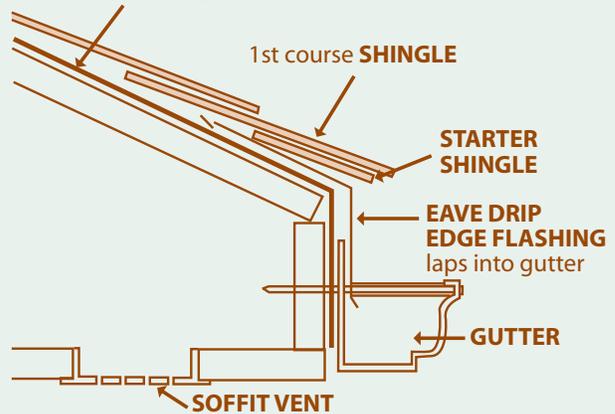
Install ice protection membrane, or its code approved equivalent, according to manufacturer's instructions. The ice protection membrane must extend from the metal or wood drip edge to a point at least 24 inches inside the exterior wall line of the building. Two rows are usually required, but more than two may be required depending on the size of the overhang. The ice protection membrane must extend to the outer edge at all fascia boards.

When applying ice protection membrane, keep the product as wrinkle free as possible. Unroll it parallel with the eaves. The ice protection membrane should go over the eaves' drip edge flashing but under the rake's drip edge flashing.



### Alternate Method

ICE PROTECTION MEMBRANE laps over fascia behind drip edge and gutter.



### Where to Use Ice Protection Membrane

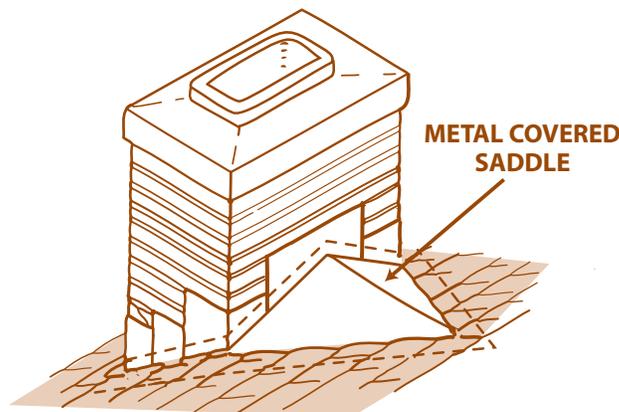
Always follow manufacturer's installation instructions.

The NRCA recommends putting new ice protection membrane over the existing. To prevent any ridge effect, extend it up the roof a minimum of 12 inches (height of one shingle course), past the topmost edge of the existing material. Realistically, this means most contractors will use an additional one-half or full-roll width (18-inch or 36-inch) of material along the eaves.

Removal of the existing ice protection membrane (which is difficult and ultimately ends in a decision to just remove the decking along the eaves and install new decking) is generally excessive.

## Crickets and Saddles

A cricket or saddle must be installed on the ridge side of any chimney or penetration more than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings must be sheet metal or of the same material as the roof covering.



## ROOF AND SOFFIT VENTS

If necessary, additional roof and soffit vents must be installed.

### Minimum area

The total net free ventilation area shall not be less than 1 to 150 of the area of the space ventilated, or not less than 1 to 300 if 50 to 80 percent of the ventilation is provided in the three feet above eave or cornice vents, with the balance of the required ventilation provided by eave or cornice vents.

As an alternative, the net free cross-ventilation area may be reduced to 1 to 300 when a vapor barrier having a transmission rate not exceeding 1 perm is installed on the warm side of the ceiling.

### Roof Vent Calculation Examples

For a house with foundation (ceiling area) measuring 42 feet x 36 feet (1,512 square feet) and a desired roof vent net area of 50 square inches:

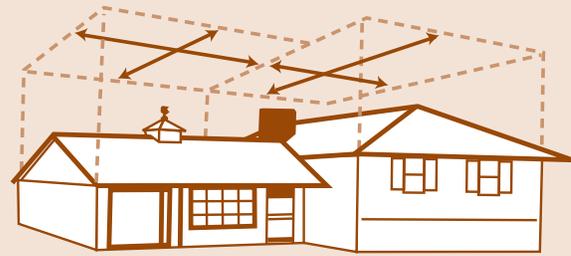
#### 1 TO 150

1. Divide the foundation size (in square feet) by the ratio determined by guidelines above.  

$$\frac{1,512}{150} = 10.08$$
 square feet of required vent area
2. Multiply result by 144 to determine square inches.  

$$10.08 \times 144 = 1,451.52$$
 square inches
3. Divide by the desired roof vent net area.  

$$\frac{1,451.52}{50} = 30$$
**roof vents if no soffit vents**



#### 1 TO 300

1.  $\frac{1512}{300} = 5.04$  square feet of required vent area
2.  $5.04 \times 144 = 725.76$  square inches
3. If both roof vents and soffit vents provided per Code, divide by two.  

$$\frac{725.76}{2} = 362.88$$
 square inches
4.  $\frac{362.88}{50} = 8$ 
**roof vents required with balance of ventilation in soffits**

### Enclosed Spaces

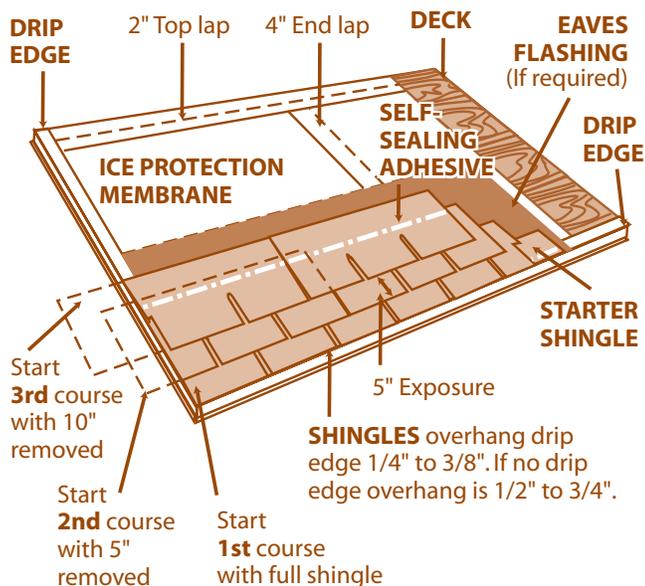
Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space.

### Mechanical Venting Devices

Use of powered roof ventilators, wind turbines, or other mechanical venting devices will allow credit for the size of the *roof opening only* due to the potential for mechanical failure of the device. Re-use of powered roof ventilators requires proof of operation.

## Shingle Application

### Five-Inch Method



### Skylight (Basic Sheet Metal Components)

All dimensions approximate.

**BACKER FLASHING** under shingles minimum three courses. Where necessary (depending upon anticipated debris and/or snow accumulation), hold shingles up one course and nail high.

