

ASPHALT SHINGLE ROOFING

This handout is intended only as a guideline and is based in part on the 2007 Minnesota State Building Code, East Bethel City ordinances, and good building practice. While every attempt has been made to insure the correctness of this handout, no guarantees are made to its accuracy or completeness. Responsibility for compliance with applicable codes and ordinances falls on the owner or contractor. For specific questions regarding code requirements, refer to the applicable codes or contact your local Building Department.

Before undertaking any re-roofing project, there are questions that should be considered to ensure a successful project and make it go smoothly. You should familiarize yourself with all aspects of the re-roofing process before you begin. The fact is, there are various conditions about your roof that may limit your product choices or affect the cost of your roofing job.

What is roof slope and does it limit the choice of shingles?

Asphalt shingles shall only be used on roof slopes of two units vertical in 12 units horizontal (2:12) or greater.

The slope of the roof is measured by the vertical rise of the roof to the horizontal run and is expressed as a fraction. A “4/12 roof slope” means the roof rises 4 feet for every 12 feet of horizontal roof span.

Roof slopes between 2/12 and 4/12 can use shingles, but require roof application techniques to take into account a greater potential for ice dam water backup. Slopes of 4/12 and above can use standard asphalt roofing applications (R905.2.2).

**THIS IS A GUIDE WITH MINIMUM CODE REQUIREMENTS.
ALWAYS REFER TO THE MANUFACTURER'S APPLICATION INSTRUCTIONS.**

Roof ventilation is required. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of the roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilating openings shall be provided with corrosion-resistant wire mesh, with 1/8 inch (3.2 mm) minimum to 1/4 inch (6.35 mm) maximum openings.

Minimum area: The total net-free ventilating area shall not be less than 1:150 of the area of the space ventilated except that the total area is permitted to be reduced to 1:300, provided at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) 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 1:300 when a vapor barrier having a transmission rate not exceeding one perm (57.4 mg/s-m²-Pa) is installed on the warm side of the ceiling. It might be necessary to add ventilation with your new roof to meet these standards.

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. The 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.

What function does shingle underlayment serve?

An underlayment, commonly known as roofing felt, will:

Protect the roof deck from moisture prior to shingle application.

Provide a degree of back-up protection in the event water gets under roofing shingles.

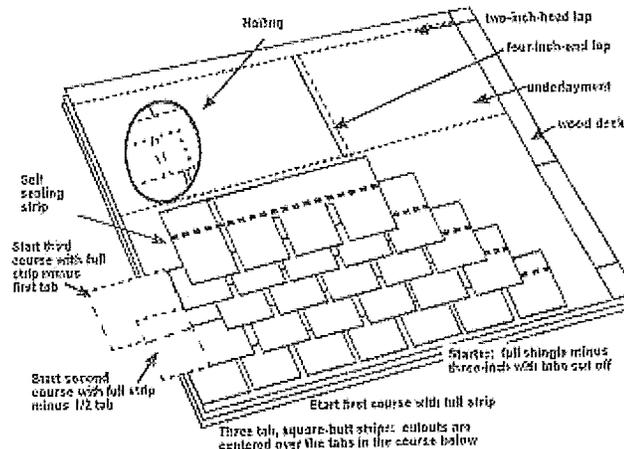
Protection against ice dams can be obtained by using a special waterproof shingle underlayment at the eaves or lower edges of the roof, in addition to installing adequate ventilation and proper insulation in the attic. The code in Minnesota requires this special waterproof shingle underlayment at the eaves or lower edges of the roof.

How can you determine if the roof is properly ventilated? An attic needs to breathe. An effective ventilation system will help prevent attic heat build-up, attic moisture and condensation, ice dam build-up, and weather infiltration such as drifting, snow, and wind-driven rain.

Research has shown that proper ventilation is necessary if the shingles are to last their design life.

Code requirements for asphalt shingles

A typical installation of asphalt shingles is illustrated below for use on roofs 4/12 and greater. However, the code also permits application on a roof that has a slope of less than 4/12 if the low-slope-roofing procedures are used.



Fasteners for asphalt shingles shall be galvanized steel, stainless steel, aluminum or copper roofing nails, minimum 12 gage [0.105 inch (2.67 mm)] shank with a minimum 3/8 inch (9.5 mm.) diameter head, and a length that will penetrate through the roofing materials and a minimum of 3/4 inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than 3/4 inch (19.1 mm) thick, the fasteners shall penetrate through the sheathing. Fasteners must comply with ASTM F 1667. Staples are not permitted for shingle application unless specifically noted in the manufacturer's installation instructions on the shingle package.

The code requires that **underlayment** of one layer of non-perforated Type 15 felt lapped two inches horizontally and four inches vertically to shed water. In addition, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall be used in lieu of normal underlayment and extend from the eave's edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Valley linings shall be installed in accordance with manufacturer's installation instructions before applying shingles. Valley linings of the following types shall be permitted.

1. For open valley (valley lining exposed) lined with metal, the valley lining shall be at least 24 inches wide and of any of the corrosion-resistant metals (typically 26 gauge) in Table R905.2.8.2.
2. For open valleys, valley lining of two plies of mineral surface roll roofing, complying with ASTM D3909 or ASTM D6380 Class M shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys (valley covered with shingles), use a valley lining of one ply of smooth-roll roofing complying with ASTM D6380 Class S Type III, Class M Type II or ASTM D3909 and at least 36 inches wide or a valley lining (as described in Items 1 and 2 above) shall be permitted. Specialty underlayment complying with ASTM D 1970 may be used in lieu of the lining material.

A cricket or saddle shall be installed on the ridge side of any chimney greater than 30 inches (762 mm) wide. Cricket or saddle coverings shall be sheet metal or the same material as the roof covering.

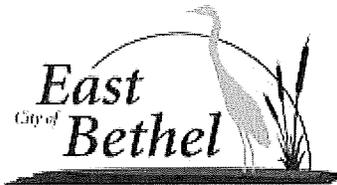
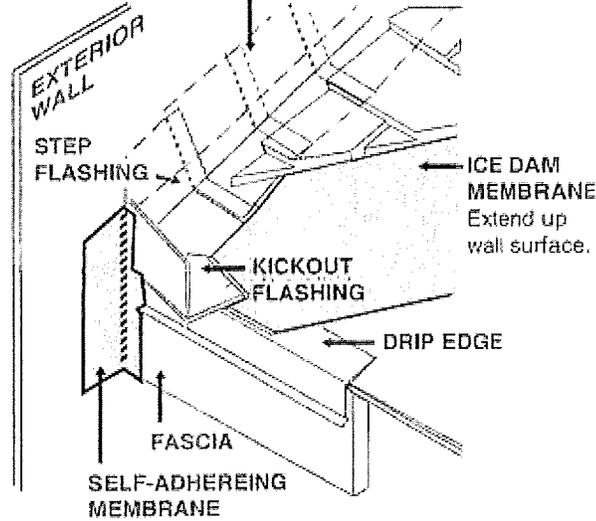
Sidewall flashing against a vertical-sidewall shall be by the stepflashing method.

Kick-out flashing shall be installed where the lower portion of a sloped roof stops within the plane of an intersecting wall cladding, in such a manner as to divert or kick out water away from the assembly.

Other flashing, such as flashing against a vertical-front wall and the soil stack, vent pipe and chimney flashing, shall be applied according to asphalt shingle manufacturer's printed instructions.

Kick-out flashing

WATER RESISTIVE BARRIER/HOUSEWRAP
Place over Step Flashing.



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