MINNESOTA DEPARTMENT OF
LABOR & INDUSTRY

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Construction Codes and Licensing Division
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The State of Minnesota adopts a set of construction standards known as the Minnesota State Building Codes (MSBC). The MSBC contains safety requirements relating to structure, mechanical, plumbing, energy, electrical, elevators, manufactured buildings and life safety.

The information in this brochure is for general reference for residential construction projects. Contact your municipal building official regarding permits and specific code requirements for residential construction within your community.

To confirm if your contractor is licensed in Minnesota contact the:

Department of Labor and Industry
Residential Building Contractors
Phone: (651) 284-5069 or 1-800-657-3944
www.doli.state.mn.us/contractor.html
E-mail: DLI.Contractor@state.mn.us

www.doli.state.mn.us
www.mncodes.org

05-07

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Call at least two full business days before you dig.
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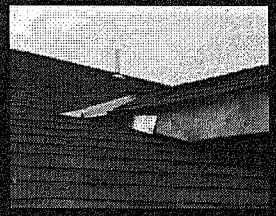
811

ASPHALT SHINGLE ROOFING

Guidelines for planning asphalt shingle roofing.



Before undertaking any re-roofing project there are several 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.

The 2007 Minnesota State Building Code adopts the 2006 International Residential Code (2006 IRC). All "R" code references provided in this brochure pertain to the 2006 IRC.

Do I need a new roof?

How old is it? A roof that has been properly installed, ventilated and has not been damaged can last 20 years or more. An inspection of the roof should be done periodically. Look for cracks, curled or cupped shingles, worn mineral coatings, exposed nails, previous patches, holes and exposed underlayment or sheathing.

Does the roof leak? If the answer is yes, it is necessary to determine why. If you have inspected the roof and it looks sound, your problem could be roof flashing. Many roof leaks are result of bad or misapplied flashing. You should spend time in the attic looking for water stains, particularly around vents, chimneys and vertical wall elements above the roof. A garden hose can help you find the leak. Flashing can sometimes be replaced or repaired without installing a whole new roof.

Do it myself or hire a professional? This is a question only you can answer based on your skill level and time. An asphalt roofing project can be successfully accomplished by the homeowner if you take the time to become familiar with the roofing procedures. Be sure to plan your project around the weather and allow enough time to get a proper cover on the roof before it rains. Steep-sloped asphalt roofs and those with multiple valleys can present special problems, so be sure you have the right equipment and skills before undertaking this type of roofing project. Other types of roofs such as wood shingles, shakes and clay tile are not normally taken on by the "do-it-yourself" homeowner because of the special skills required. Remember, if you decide to hire a professional, be sure the company is a state-licensed contractor or roofer.

Should I overlay the existing roof or tear off the existing shingles? There are two options available for re-roofing installations. One would be to tear off the old roof before applying the new one (tear off). The second would be to lay new shingles over the existing roof (layover). Roofing materials are heavy, so multiple layers can affect the ability of a roof to hold the weight of winter snow. Removal of asphalt shingles is required in areas designated as having moderate or severe hail exposure. New roof coverings shall not be installed without first removing existing roof coverings in the following Minnesota counties: Anoka, Benton, Blue Earth, Brown, Carver, Chippewa, Chisago, Clay, Cottonwood, Dakota, Dodge, Goodhue, Hennepin, Isanti, Jackson, Kandiyohi, Le Sueur, Lincoln, Lyon, Martin, McLeod, Meeker, Mille Lacs, Murray, Nicollet, Nobles, Norman, Olmsted, Pipestone, Ramsey, Redwood, Renville, Rice, Rock, Scott, Sherburne, Sibley, Stearns, Steele, Wabasha, Waseca, Washington, Watonwan, Wright and Yellow Medicine (R907.3). A county map is online at www.doli.state.mn.us/pdf_bc_map_hail.pdf.

An overlay can be the less expensive option. However, it is not necessarily always the best choice. There are advantages to tearing off the old roof before installing a new one. For example:

- If there are any defects in the roof deck, they will be revealed when the roof is torn off. These defects should be repaired before applying the new roof.

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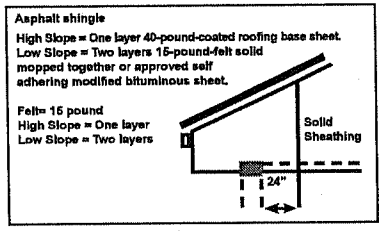
- If condensation problems exist in the attic, they too will be revealed when the roof is torn off. Properly designed attic ventilation can then be installed in order to help eliminate such problems.
- When the old roof is torn off, an ice-protection underlayment must be installed before applying the new roof. This will help prevent against ice damage.
- Tearing off the old roof and starting with a clean deck before re-roofing may result in a smoother finished-roof system.

  Tearing off the old roof will typically result in a longer roof life than when the roof has been laid over. This is because they are installed smooth over sound material and have new underlayment installed.

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).

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 exempt 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-m^2-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.

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.

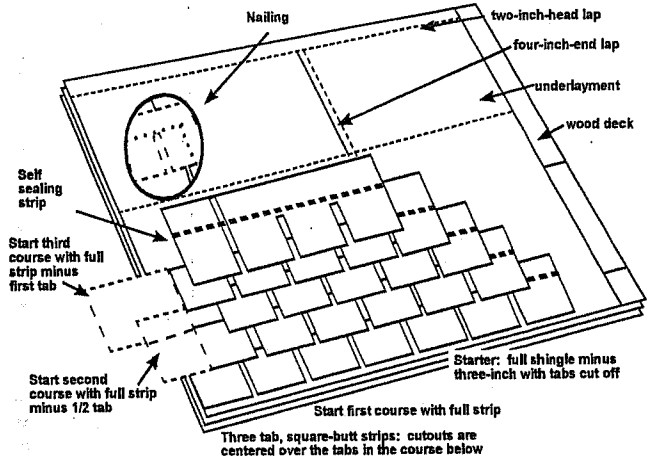
Protection against ice dams can be obtained by using a special waterproof shingle underlayment at the eaves or lower edges of the roof, in addition to installing adequate ventilation and proper insulation in the attic. The code in Minnesota requires this special waterproof shingle underlayment at the 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, ASTM F 1667, of a length to 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 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. Speciality 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 step-flashing 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 REQUIREMENTS

- Install the siding panel, making sure the lugs (from the snap lock punch) lock into the utility trim (Fig. 42).

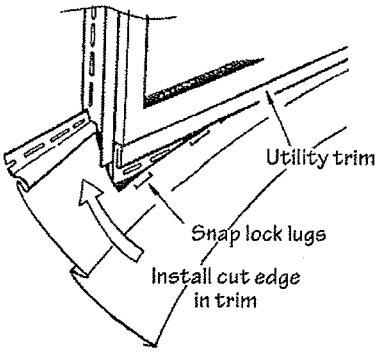


Figure 42.

Sidewall Flashing at Roof Lines

- Run the siding until the last full course under the roof area.
- Cut a diverter from aluminum trim sheet, making sure it sits on the nail hem of the last full course (Fig. 43). Make sure the diverter is placed inside the receiving pocket of the vertical J-channel and is tucked behind the nail hem of the J-channel following the roofline for best drainage.
- If a water-resistive barrier is present, a cut should be made in that barrier to allow the diverter to slip behind the roof step flashing and the J-channels. That cut will need to be sealed with tape (approved by the housewrap manufacturer) once the diverter is installed.
- As an alternative to the diverter, create a "kickout" from metal flashing, as shown in Fig. 44.

NOTE: "Kickout flashing" (Fig. 44) is an additional flashing strip that extends beyond the edge of the fascia that is required in some cold-climate localities.

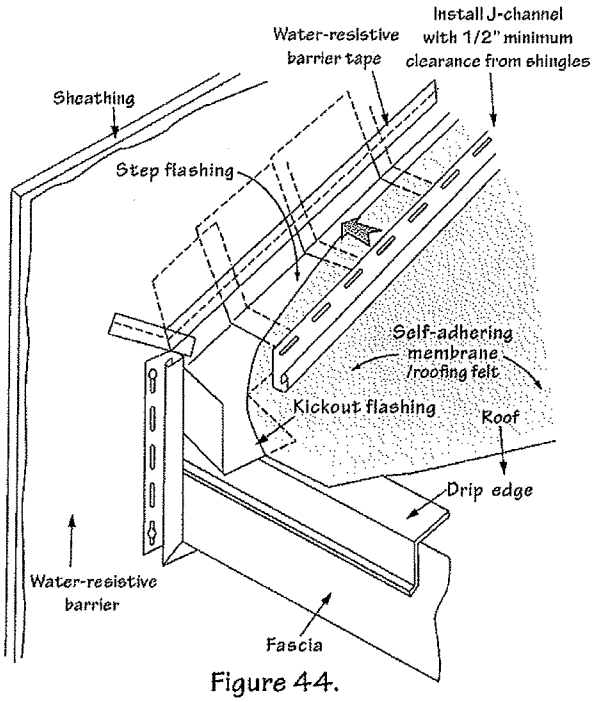


Figure 44.

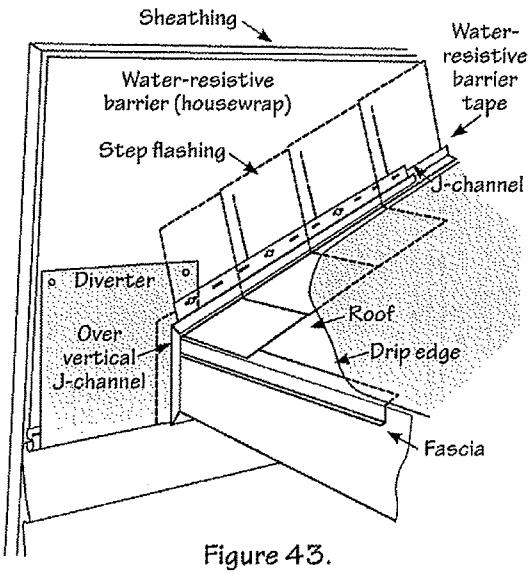


Figure 43.