

ASPHALT SHINGLE ROOFING

Guidelines for planning asphalt shingle roofing.



Kandiyohi County Roofing Handout

Before undertaking any re-roofing project there are several questions that should be considered to insure a successful project and make it go smoothly. You should also 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.

Do I need a new roof?

- 1. How old is the roofing?** 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.
- 2. 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.
- 3. Should I do it myself or hire a professional?** This is a question that only you can answer based on your skill level, and the time you have available to complete the project. 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.
- 4. Should I overlay the existing roof or tear off the existing shingles?** Kandiyohi County falls within the severe hail exposure area and removal of asphalt shingles is highly recommended. New roof coverings can only be installed over existing roofing materials if specifically allowed in the shingle manufactures installation guidelines. There are many advantages to tearing off the old roof before installing a new one.

For example:

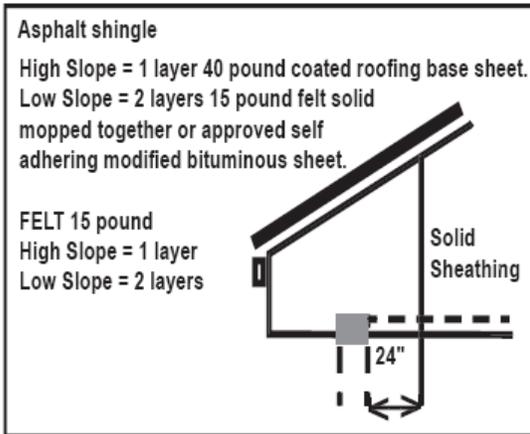
1. If there are any defects in the roof deck, they would be revealed when the roofing material is torn off. These defects could then be repaired before applying the new roof.
2. If condensation problems exist in the attic, they too would be revealed when the roofing material is torn off. Properly designed attic ventilation can then be installed to help eliminate such problems.
3. When the old roof is torn off, an ice-protection underlayment could be installed before applying the new roofing material. This will help prevent water from entering the substructure if ice damming occurs at the eaves during winter months.
4. Tearing off the old roof and starting with a clean deck would result in a smoother looking finished roof system.
5. Tearing off the old roof will typically result in a longer roof life than when the new roofing has been laid over the existing. Because they were installed over a smooth surface, over sound material and having new underlayment installed.

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

Asphalt roofs have a code requirement of 2 units vertical in 12 units horizontal roof slope or greater. For non-asphalt shingles follow the 2015 Minnesota Residential Code as detailed in Section R905. Also see the manufacturer's installation guidelines for potential warranty related issues. 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 inches for every 12 inches of horizontal roof span. Roof slopes do limit the choice of finish materials that can be used and how the underlayment must be applied. For example: A roof slope below 2/12 (low slope) may allow ice and water to back up under the shingles.

ROOFING Continued

Roof slopes between 2/12 and 4/12 can use shingles, but require low-slope 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. Always refer to the manufacturer's application instructions.



Asphalt shingle

High Slope = 1 layer 40 pound coated roofing base sheet.
Low Slope = 2 layers 15 pound felt solid mopped together or approved self adhering modified bituminous sheet.

FELT 15 pound
High Slope = 1 layer
Low Slope = 2 layers

Solid Sheathing

Always refer to the manufacturer's application instructions.

ROOF VENTILATION

Ventilation is required. Enclosed attics and enclosed rafter spaces formed where ceilings are directly applied to the underside of the roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Ventilation openings shall be provided with corrosion-resistant wire mesh, with $\frac{1}{16}$ inch minimum to $\frac{1}{4}$ inch maximum openings.

Minimum area: The minimum net free ventilating area shall not be less than 1 square foot per 150 square feet of the area of the space. Except that the total area is permitted to be reduced to 1 square foot per 300 square feet, provided that at least 40 percent and not more than 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the rafter space. Upper ventilators shall be located no more than 3 feet below the ridge or highest point of the space, measured vertically, with the balance of the required ventilation provided by eave or cornice vents. A vapor barrier having a transmission rate not exceeding 1 perm must be installed on the warm side of the ceiling. Even if you feel you have had satisfactory ventilation performance with your old roof, it might be necessary to add ventilation with your new roof to meet these standards. **See the 2015 MRC section R806.5** for requirements for the installation of non-vented attic systems.

What function does shingle underlayment serve?

An underlayment, commonly known as roofing felt, will:

1. Protect the roof deck from moisture prior to shingle application.
2. Provide a degree of back-up protection in the event water would get under the finished roofing materials.

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 to start at the eaves or lower edges of the roof and must extend a minimum of 24 inches beyond the exterior wall line. (Measured horizontally not diagonally up the roof slope)

How can you determine if the roof is properly ventilated? A roof needs to breathe. An effective ventilation system will help prevent attic heat build-up; attic moisture and condensation; weather infiltration, drifting snow, wind-driven rain, and prevents ice dam build-up. Research has shown that proper ventilation is required if the shingles are to last their design life.

CODE REQUIREMENTS:

Asphalt shingles, roof slopes 4/12 and greater. A typical installation of asphalt shingles is shown in the illustration and is for use on roof slopes 4/12 and greater. However, the code also permits asphalt shingle application on a roof slopes of less than 4/12 if the low slope roofing procedures are used.

Shingles: Shingles must be fastened with corrosion resistant nails, 12 gage with a $\frac{3}{8}$ inch diameter head and long enough to penetrate thru the roofing materials and a minimum of $\frac{3}{4}$ inch into the roof sheathing. Where the roof sheathing is less than $\frac{3}{4}$ inch thick, the nail must penetrate through the sheathing. Shingles normally require 4 nails per 36 to 40 inch shingle and two per 9 inch to 18 inch shingle. Shingles must always be fastened in accordance with the manufacturers installation instructions as indicated on the shingle package. Staples are not permitted for shingle application unless specifically noted in the manufacturer's installation instructions provided on the shingle packaging. Not following the installation instructions could possibly void your warranty.

ROOFING Continued

Underlayment: The code requires that underlayment of one layer of non-perforated Type 15 felt lapped 2 inches horizontally and 4 inches vertically to shed water on roof slopes 4/12 and greater. 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. Roof slopes from 2/12 up to 4/12 require the underlayment be half lapped for added protection. Underlayment unless otherwise noted shall conform to ASTM D226 Type I, or ASTM D4869 Type I, or ASTM D6757. Self-adhering polymer modified bitumen sheet shall comply with ASTM D 1970.

Valleys: 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 the corrosion-resistant metals in Table R905.2.8.2.
2. For open valleys, valley lining of two plies of mineral surfaced roll roofing, complying with ASTM D 3909 or ASDM D 6380 Class M, shall be permitted. The bottom layer shall be 18 inches and the top layer a minimum of 36 inches wide.
3. For closed valleys (valley covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380 and at least 36 inches wide or 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.

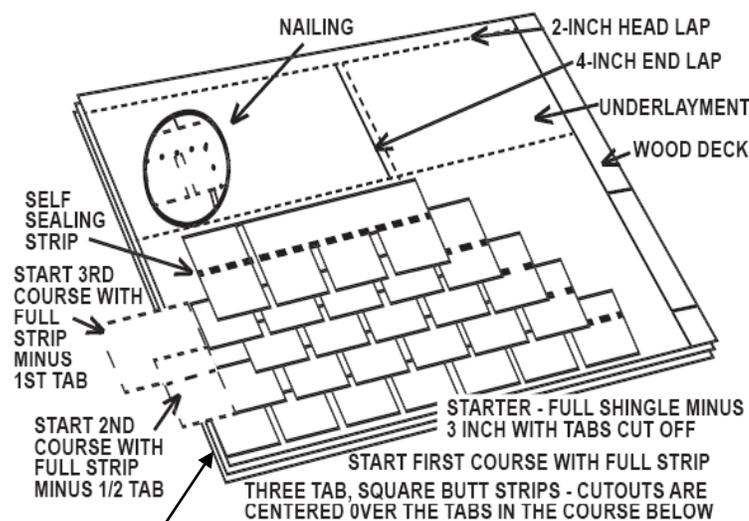
Crickets and saddles R1003.20: A cricket or saddle shall be installed on the ridge side of any chimney greater than 30 inches (762 mm) wide where it does not intersect the ridgeline. Cricket or saddle coverings shall be sheet metal or the same material as the roof covering. **See figure R1003.20 and Table R1003.20.**

Sidewall flashing: Flashing against a vertical sidewall shall be by the step-flashing method.

Other flashing: Flashing against a vertical wall, as well as soil stacks, vent pipes, and chimney flashings shall be applied according to the shingle manufacturer's printed instructions.

Kick-out flashing: 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. **(R903.2.1)**

Shingle installation detail



Ice barrier is required except in non-heated detached accessory structures

Kick-out and step flashing detail

