



Placement or Replacement of Roofing

Requirements: Asphalt Shingles and Rolled Roofing, IRC 2018

1. R803.1 Sheathing Requirements. Asphalt shingles shall be fastened to solidly sheathed decks. R905.2.1 minimum net thickness of sheathing 5/8 inch, for 24" spacing.
2. R905.1.1 (2) Asphalt Roof /Slope. For roof slopes from two units vertical in 12 units horizontal 2:12 or greater, up to four units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner: Apply a 19" strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36" wide sheets of underlayment. Overlapping successive sheets 19". Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4" and shall be offset by 6'. **For roof slopes of four units vertical in 12 units horizontal (4/12) or greater**, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6'.
3. 905.5.2 Rolled Roofing shall not be applied on roof slopes below one unit vertical in 12 units horizontal (8 percent slope). R905.5.
4. R905.10 Metal Roofing /Slope. Metal roof panel shall comply with the provisions in this section. R905.10.1 Deck requirements. Metal roof panel roof coverings shall be applied to solid or spaced sheathing. Except where the roof covering is specifically designed to be applied to spaced supports.
5. R905.10.2 Slope. Minimum slopes for metal roof panels shall comply with the following.
 - i. The Minimum slope for lapped nonsoldered seam metal roofs without applied lap sealant shall be three units vertical in 12 units horizontal 25%.
 - ii. The minimum slope for lapped nonsoldered seam metal roofs with applied lap sealant shall be one-half vertical in 12 units horizontal 4%. Lap sealants shall be applied in accordance with the approved manufacturers installation instructions.
 - iii. The minimum slope for standing seam roof systems shall be one-quarter unit vertical in 12 units horizontal 2%. Attachment-Manufacturer's recommendation.

6. R905.2.8 Flashing. Shall be applied according to the asphalt shingle and metal roof systems manufacturer's instructions. See R905.2.8.1, R905.4.6
7. R905.2.8.5 Drip Edge. Drip edge shall be provided at eaves and rake edges of shingle roofs. Underlayment shall be installed over the drip edge along eaves and under the drip edge along rake edges.
8. R905.2.6 Attachment. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four fasteners per strip shingle. Fasteners see 905.2.5. manufacturer recommendation.
9. R905.1.2 Ice Barrier. The ice barrier shall consist of not less than 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 lowest edges of all roof surfaces to a point at least 24 inches inside the exterior wall line of the building. The ice barrier shall also be applied not less than 36" measured along the roof slip for the eave edge of the building. Exception: Detached accessory buildings.
10. R806 Roof Ventilation. 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 by ventilating openings protected against the entrance of rain or snow. See R806.1
**The minimum net free ventilating shall be 1/150 of the area of the vented space. See Exception.*
11. P3103.1 Sewer Vent Requirements. Sewer pipe must be a Minimum 12 measured on the high side of the pitch. Open vent pipes that extend through a roof shall be no less than 6" above the anticipated snow accumulation.
12. All other roofing materials, See codes R905.6, R905.16.3, R905.10
13. R908 Reroofing & Roof Replacement R908.3. Roof replacements shall include the removal of existing layer of roof coverings down to the roof deck.
14. R908.3.1 Roof Recover. The installation of a new roof covering over existing roof covering shall be permitted where any of the following condition occur.
 - i. Where the new roof covering in installed in accordance with the roof covering manufacturers approved instructions.
 - ii. Complete and separate roofing systems, such as standing seam metal roof systems. That are designed to transmit the roof loads directly to the buildings structural system and do not rely on existing roofs and roof coverings for support shall not require the removal of existing roof coverings.
 - iii. Metal panel, metal shingle and concrete can clay tile roof coverings shall be permitted to be installed over existing wood shake roofs were applied in accordance with sections R908.4.

- iv. The application of a new protective roof coating over an existing protective roof coating, metal roof panel, metal roof shingle, mineral surfaced roll roofing, built up roof, modified bitumen roofing and spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.

15. 908.3.1.1 Roof Recover Not Allowed. A roof recover shall not be permitted where any of the following conditions occur.

- i. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
- ii. Where the existing roof covering is slate, clay, cement, or asbestos cement tile.
- iii. Where the existing roof has two or more applications of any type of roof covering.

Topic: Asphalt Shingles

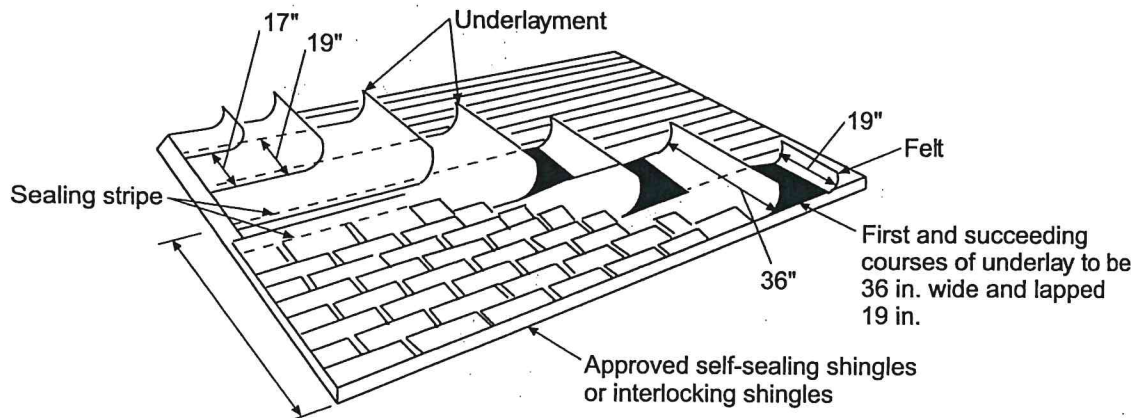
Category: Roof Assemblies

Reference: IRC R905.2

Subject: Roof Covering Requirements

Code Text: *Asphalt shingles shall only be used on roof slopes of two units vertical in 12 units horizontal (2:12) or greater. For roof slopes from . . . 2:12 up to . . . 4:12, double underlayment application is required in accordance with Section R905.2.7. Fasteners for asphalt shingles shall be . . . of a length to penetrate through the roofing materials and a minimum of $\frac{3}{4}$ inch (19 mm) into the roof sheathing. Where the roof sheathing is less than $\frac{3}{4}$ inch (19 mm) thick, the fasteners shall penetrate through the sheathing. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four fasteners per strip shingle or two fasteners per individual shingle.*

Discussion and Commentary: A very common roofing material, asphalt shingles are composed of organic or glass felt coated with mineral granules. For wind-resistance purposes, asphalt shingles must be classified in accordance with the appropriate basic wind speed, and the packaging shall be labeled to indicate compliance.



Note: In areas where there has been a history of ice forming along the eaves causing a backup of water, special methods, rather than normal underlayment, shall extend up from eaves for enough to overlie a point 24 in. inside the wall line of the building.

source NRCA

For SI: 1 inch = 25.4 mm, °C = [(°F)-32/1.8].

Application of asphalt shingle on slopes between 2:12 and 4:12

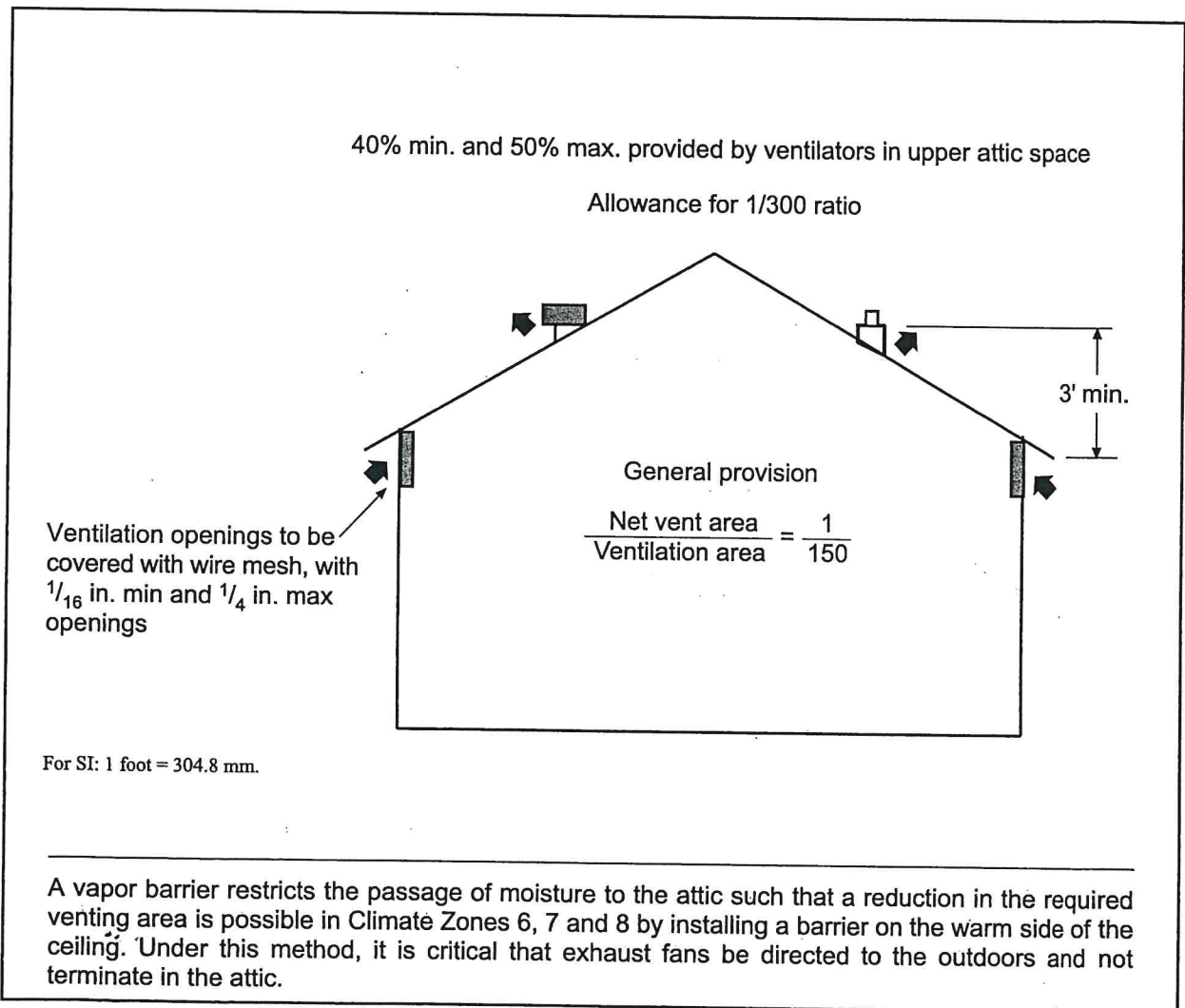
Where asphalt shingles are installed, they are regulated for sheathing, roof slope, underlayment, fasteners and attachment. As with other types of roof covering materials, they must also be installed in conformance with the manufacturer's installation instructions.

Topic: Minimum Ventilation Required
Reference: IRC R806.1 – R806.3

Category: Roof-Ceiling Construction
Subject: Roof Ventilation

Code Text: *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 by ventilating openings protected against the entrance of rain or snow. See exception where ventilation deemed unnecessary due to atmospheric or climatic conditions. The minimum net free ventilating area shall be $\frac{1}{150}$ of the area of the vented space. See two methods that will allow for a ventilating area reduction to $\frac{1}{300}$ of the area of the space ventilated. Where eave or cornice vents are installed, insulation shall not block the free flow of air. A minimum of a 1-inch (25 mm) space shall be provided between the insulation and the roof sheathing and at the location of the vent.*

Discussion and Commentary: Large amounts of water vapor can migrate into the attic and condense on wood roof components. As the wetting and drying cycle continues, rotting and decay are possible. If the attic or enclosed rafter spaces are properly ventilated, water will not accumulate on the building components.



Code Text: *In areas where there has been a history of ice forming along the eaves causing a backup of water as designated in Table R301.2(1), 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 lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building. See exception for detached accessory dwellings that contain no conditioned floor area.*

Discussion and Commentary: Ice dams can form along a roof eave because rain and snow continually freezes and thaws, or frozen slush backs up in gutters. Therefore, the underlayment must be modified to prevent ice dams from forcing water under the roofing where it could cause damage to the residence's ceilings, walls and insulation. Beyond the 24-inch point, such special underlayment is deemed unnecessary as the interior of building provides adequate warmth to prevent ice dams from forming above the heated space.

