



ROOFING
City of Grand Rapids
Building Safety Division
218-326-7601

www.cityofgrandrapidsmn.com



This handout is intended only as a guide and is based in part on the 2015 Minnesota State Building Code, Grand Rapids 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 Safety Division.

SCOPE

The scope of this handout will be limited to the installation of four types of roofing materials.

- Asphalt Shingles
- Mineral-surfaced Roll Roofing
- Wood Shingles
- Wood Shakes

PERMITS, INSPECTIONS, AND LICENSES

Building permits are required for all roofing projects. Permits can be obtained from City of Grand Rapids Community Development Department.

The Building Safety Division goal is to conduct one inspection during the course of the work and a final inspection. You will receive information at the time you obtain your permit as to the inspection process.

All contractors engaged in residential roofing work must have a state contractor's license and show proof of the license to obtain a permit. Specific questions regarding contractor licenses should be directed to the Minnesota Department of Labor and Industry, (651) 284-5069.

DEBRIS

As you install a new roof on your dwelling, we ask that you exercise courtesy towards your neighbors by regularly policing your yard and adjoining areas for debris that may blow around.

GENERAL

All roof covering materials shall be delivered in packages bearing the manufacturers identifying marks and approved testing agency labels when required.

All asphalt shingles must be either self-sealing or interlocking. Shingles shall be tested in accordance with ASTM D 7158 for wind load and shall meet 90 MPH basic wind speed class D,G, or H. Shingles tested in accordance with ASTM D 3161 are acceptable and shall meet 90 MPH basic wind speed class A,D, or F.

Asphalt shingles shall be fastened to solidly sheathed decks or 1" thick nominal wood boards. Mineral- surfaced roll roofing shall be fastened to solidly sheathed roof decks. Wood shingles and

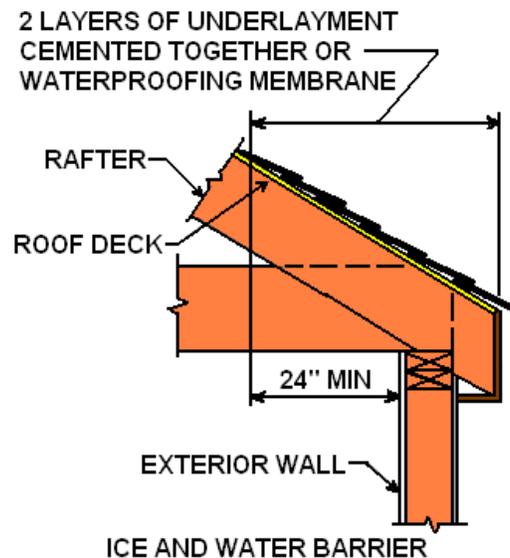
shakes may be applied over solid or spaced sheathing except areas ice and water shield are required. Roof decks that are rotted or unsound must be repaired prior to reroofing.

REROOFING - R907

New roof coverings shall not be installed without first removing existing roof coverings where water-soaked or deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing. New roof coverings shall not be installed over more than one layer of existing roof covering. Existing flashing in good condition may be reinstalled. Any sheathing that is replaced must be installed and fastened according to the code.

ICE AND WATER BARRIERS

An ice and water barrier is required on all roofs except for detached accessory structures that contain no conditioned space. The barrier may be at least two layers of underlayment cemented together or a self-adhering polymer modified bitumen sheet. There are several manufacturers who make materials specifically for this requirement that are marketed under differing trade names. The ice and water barrier must extend from the edge of the eaves to a point **24 inches** inside the exterior wall line of the building. Ice and water barriers are not required along the rakes or in valleys.



VENTILATION

Ventilation of enclosed attics and enclosed rafter spaces is required. Ventilating openings must be provided with corrosion-resistant mesh with openings of $\frac{1}{16}$ " to $\frac{1}{4}$ " inch.

For attics without ceiling vapor barriers, 1 square foot of net free ventilating area should be provided for each 150 square feet of attic area.

For attics with vapor barriers or without ceiling vapor barriers and having at least 40% but not more than 50% of the ventilating area provided by ventilators located in the upper portion of the space to be ventilated and at least 3 feet above the eave vents and the balance of the ventilation provided in the eave vents, ventilation may be 1 square foot of net free ventilating area for each 300 square feet of attic area.

ROOF EDGING, GUTTERS, DRAINAGE

Roof edging and gutters are not required by the code. Application of roof edging should be in accordance with the shingle manufacturers written instructions. Gutters may be useful in directing water away from buildings reducing erosion, settlement, and wet basements. Lead-outs on downspouts should extend far enough from the building to result in positive drainage.

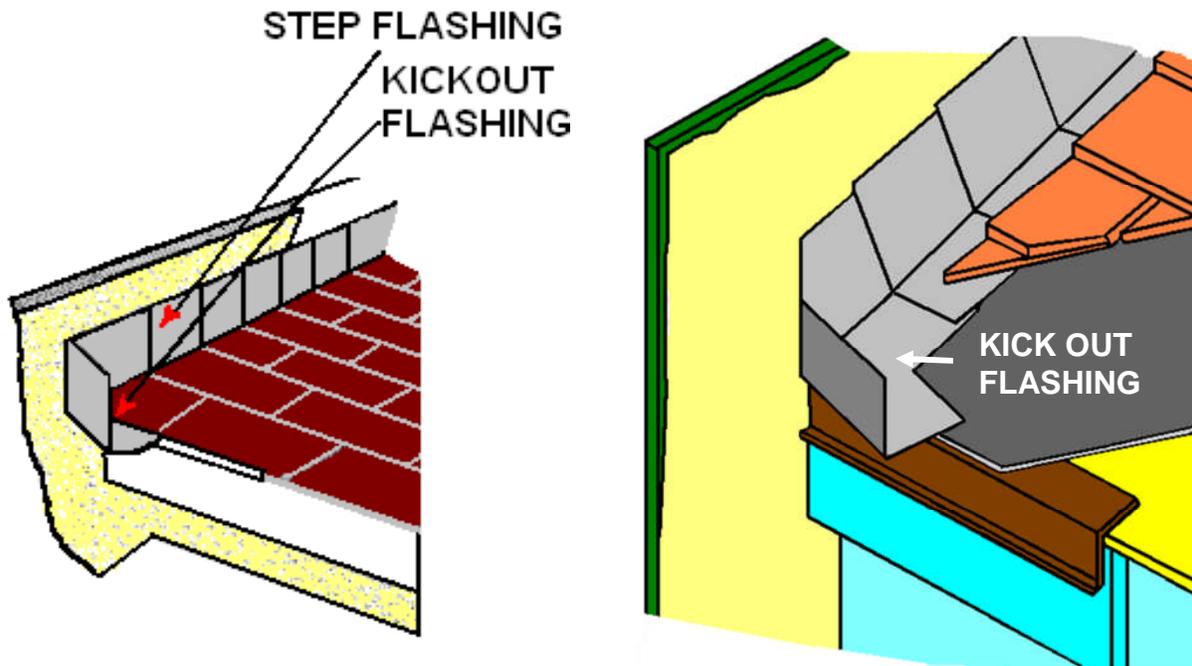
FLASHING

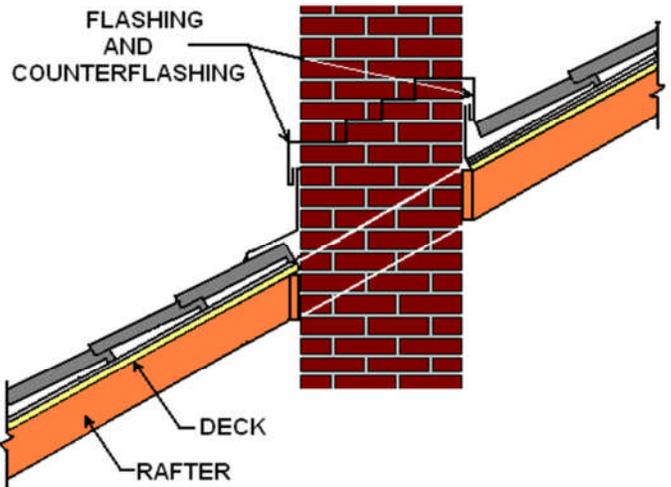
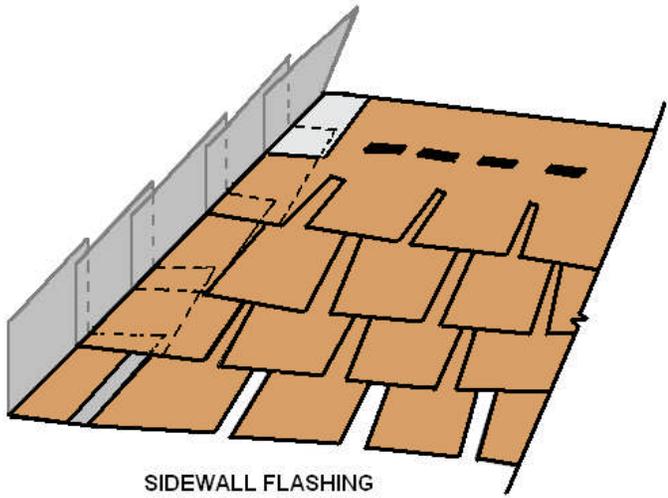
Flashing is required at all wall and roof intersections, wherever there is a change in roof slope or direction, and around roof openings. When flashing is metal, it must be corrosion resistant metal with a thickness of not less than 0.019 inch (No. 26 galvanized sheet) (R905.3.8).

Kick-out flashing must be installed in new construction 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. "Kick-out flashing may be either factory made or field fabricated. **Kick-out flashing is not required for reroofing unless re-siding and reroofing are being completed simultaneously.**

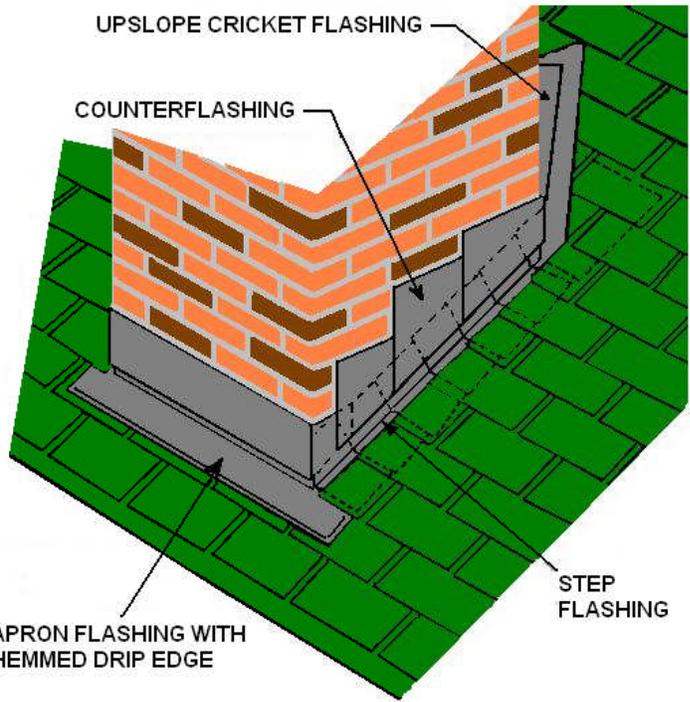
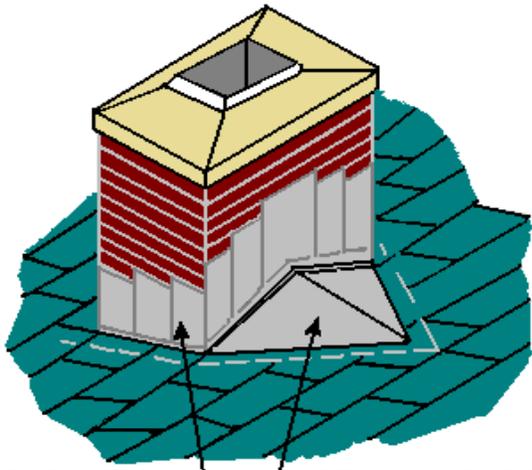
Flashing against vertical front walls, soil stacks, vent pipes, and chimney flashing must be in accordance with the asphalt shingle manufacturer's printed instructions. Sidewall flashing shall be continuous or step flashing minimum 4 inches in height and 4 inches in width, and is required whenever wall and roof intersections occur.

Crickets or saddles are required on the ridge side of any chimney greater than 30 inches wide. Cricket or saddle coverings must be of sheet metal or of the same material as the roof covering.



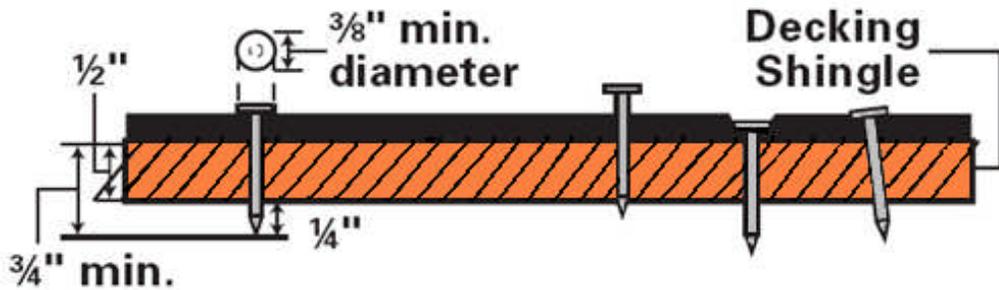


Cricket or Saddle required if chimney is more than 30 inches wide



Properly Driven

Improperly Driven



FASTENER SCHEDULE FOR ROOFING

Asphalt Shingles	Mineral-surfaced Roll Roofing	Wood Shingles	Wood Shakes
<p>Fasteners for asphalt shingles must be:</p> <ul style="list-style-type: none"> • galvanized steel • stainless steel • Aluminum • copper roofing nails • minimum 12 gauge shank with a minimum 3/8" diameter head and of a length to penetrate through the roofing materials • minimum of 3/4" inch into roof sheathing or when roof sheathing is less than 3/4" thick the fastener shall penetrate through the sheathing 	<p>Roll roofing must be installed in accordance with the manufacturer's installation instructions.</p>	<p>Fasteners for wood shingles must be:</p> <ul style="list-style-type: none"> • Corrosion-resistant with a minimum penetration of 1/2" into the sheathing. • For sheathing less than 1/2" in thickness, the fastener shall extend through the sheathing. • A minimum of two fasteners per shingle are required. 	<p>Fasteners for wood shakes must be:</p> <ul style="list-style-type: none"> • Corrosion-resistant with a minimum penetration of 1/2" into the sheathing. • For sheathing less than 1/2" in thickness, the fastener shall extend through the sheathing. • A minimum of two fasteners per shake are required.

ASPHALT SHINGLES - R905.2

Asphalt shingles may only be used on roof slopes of two units vertical in 12 units horizontal (2:12) or greater. For roof slopes from 2:12 to 4:12, double underlayment is required. Underlayment must conform to ASTM D 226, Type I; ASTM D 4869, Type I; or ASTM D 6757. For slopes of 4:12 and greater, underlayment must be applied shingle fashion. Laps must be a minimum of 2-inches. End laps must be offset by at least 6 feet.

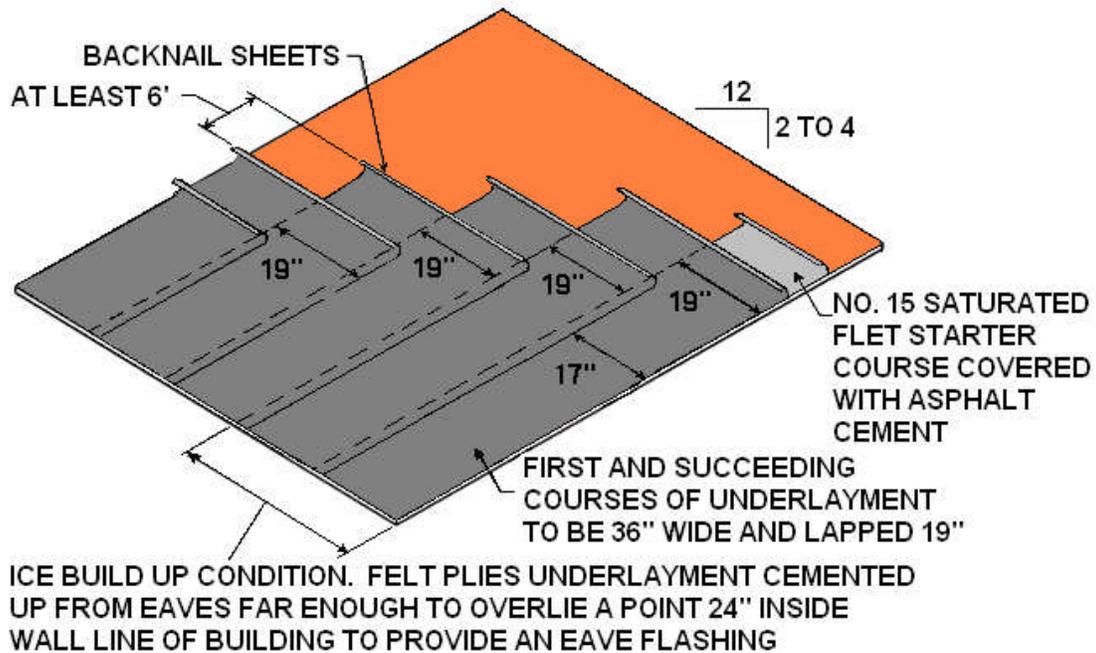
For normal application, strip shingles must be fastened with a **minimum of four nails**. For interlocking shingles, two nails are required. See the manufacturer's installation instructions.

Valleys must be lined in accordance with the shingle manufacturers written instructions. In addition, valleys may be of any of the following:

- For open valleys lined with metal, the valley lining must be at least 24 inches wide and of galvanized steel of at least 26 gage or other approved materials.
- For open valleys, two plies of roll roofing may be permitted. The bottom layer must be at least 18 inches wide and the top layer at least 36 inches wide.
- For closed valleys (valleys covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380 and at least 36 inches wide or one of the two methods listed above may be used. Ice and water complying with ASTM D 1970 shall be permitted in lieu of the lining material.

MINERAL SURFACED ROLL ROOFING - R905.5

Mineral surfaced roll roofing may only be applied on roofs with a slope of 1:12 or greater. Mineral surface roll roofing must conform to ASTM D 3909 or ASTM D 6380, Class M. Mineral surface roll roofing must be installed in accordance with the manufacturer's installation instructions.



WOOD SHINGLES - R905.7

Wood shingles must be installed on slopes that are at least 3:12 or greater. They must be made of a naturally durable wood of grades 1, 2, or 3 approved by the Cedar Shake and Shingle Bureau. A label of an approved grading or inspection bureau or agency must identify each bundle of shingles.

Wood shingles must be installed in accordance with the manufacturer's instructions and the following. Wood shingles must be laid with a side lap of not less than 1 ½" between joints in courses and no two joints in any three adjacent courses shall be in direct alignment. Spacing between shingles may not be less than ¼" nor more than ⅜". Weather exposure may not exceed what is specified in the accompanying table. Wood shingles must be attached to the roof with two fasteners per shingle. Fasteners should be not more than ¾" from the edge of the shingle and not more than 1" above the exposure line.

WOOD SHINGLE WEATHER EXPOSURE AND ROOF SLOPE				
Roofing Material	Length (Inches)	Grade	Exposure (inches)	
			3:12 pitch to < 4:12	4:12 pitch or steeper
Shingles of naturally durable wood	16	No. 1	3 ¾	5
		No. 2	3 ½	4
		No. 3	3	3 ½
	18	No. 1	4 ¼	5 ½
		No. 2	4	4 ½
		No. 3	3 ½	4
	24	No. 1	5 ¾	7 ½
		No. 2	5 ½	6 ½
		No. 3	5	5 ½

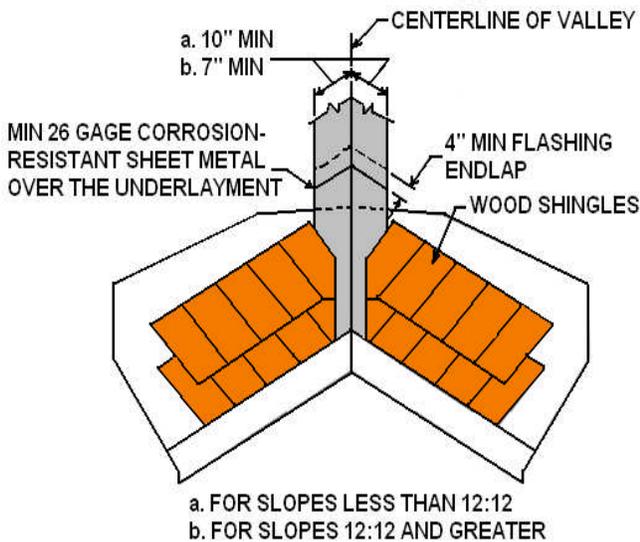
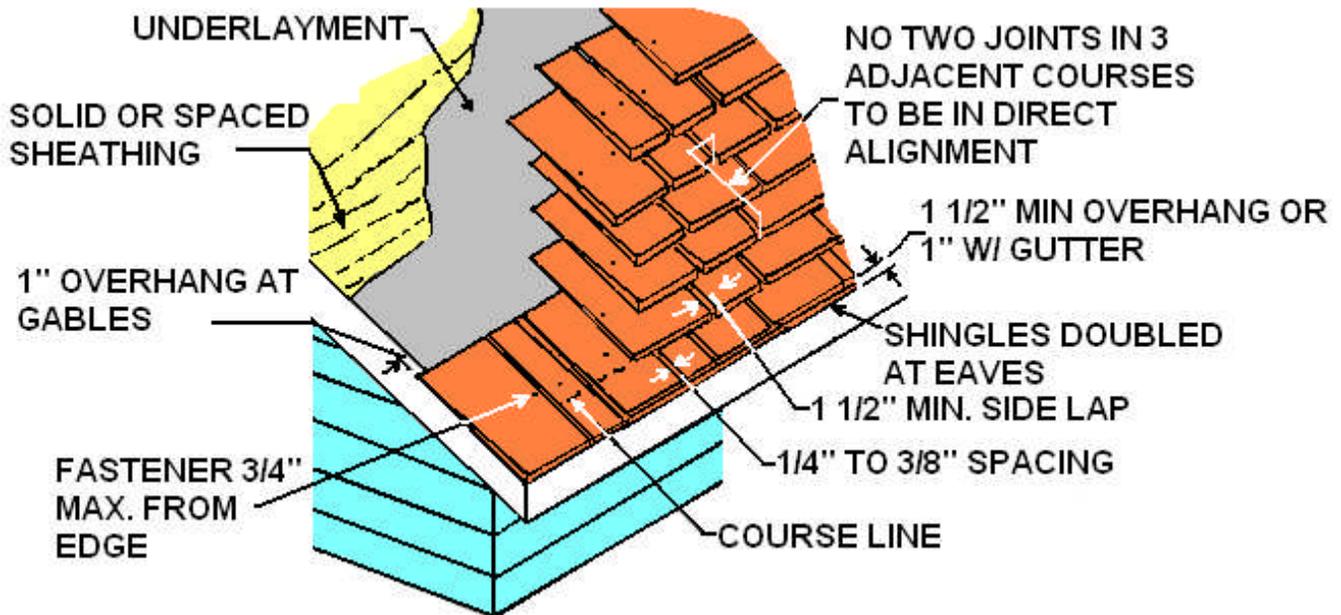


Figure R905.7.4
WOOD SHINGLE GRADE DESCRIPTION AND EXAMPLE LABEL

WOOD SHAKES - R905.8

Wood shakes must be installed on roof slopes of 3:12 or greater and must be installed in accordance with the manufacturer's installation instructions and the code. Wood shakes must be laid with a side lap of not less than 1 1/2 inches between joints in adjacent courses. Spacing between shakes in the same course must be between 3/8 inch and 5/8 inch for shakes and taper sawn shakes of naturally durable wood and **3/8 inch and 5/8 inch for preservative taper sawn**

shakes. Fasteners for wood shakes must be corrosion resistant. Shakes must be attached with two fasteners per shake. Fasteners must be positioned not more than 1 inch from each edge and not more than 2 inches above the exposure line.

The starter course at the eaves must be doubled and the bottom layer may be 15-inch, 18-inch, or 24-inch wood shakes or shingles. Fifteen-inch or 18-inch wood shakes may be used for the final course at the ridge. Shakes must be interlaid with 18-inch-wide strips of No. 30 felt shingled between each course in such a manner that no felt is exposed to the weather by positioning the lower edge of each felt strip above the butt end of the shake it covers a distance equal to twice the weather exposure. Underlayment must comply with ASTM D 226, or ASTM D 4869, Type I or II.

WOOD SHAKE WEATHER EXPOSURE AND ROOF SLOPE			
Roofing Material	Length (Inches)	Grade	Exposure (inches)
			4:12 pitch or steeper
Shakes of naturally durable wood	18	No. 1	7 ½
	24	No. 1	10
Preservative-treated taper sawn shakes of naturally durable wood	18	No. 1	7 ½
	24	No. 1	10
	18	No. 2	5 ½
	24	No. 2	7 ½
Taper-sawn shakes of naturally durable southern yellow pine	18	No. 1	7 ½
	24	No. 1	10
	18	No. 2	5 ½
	24	No. 2	7 ½

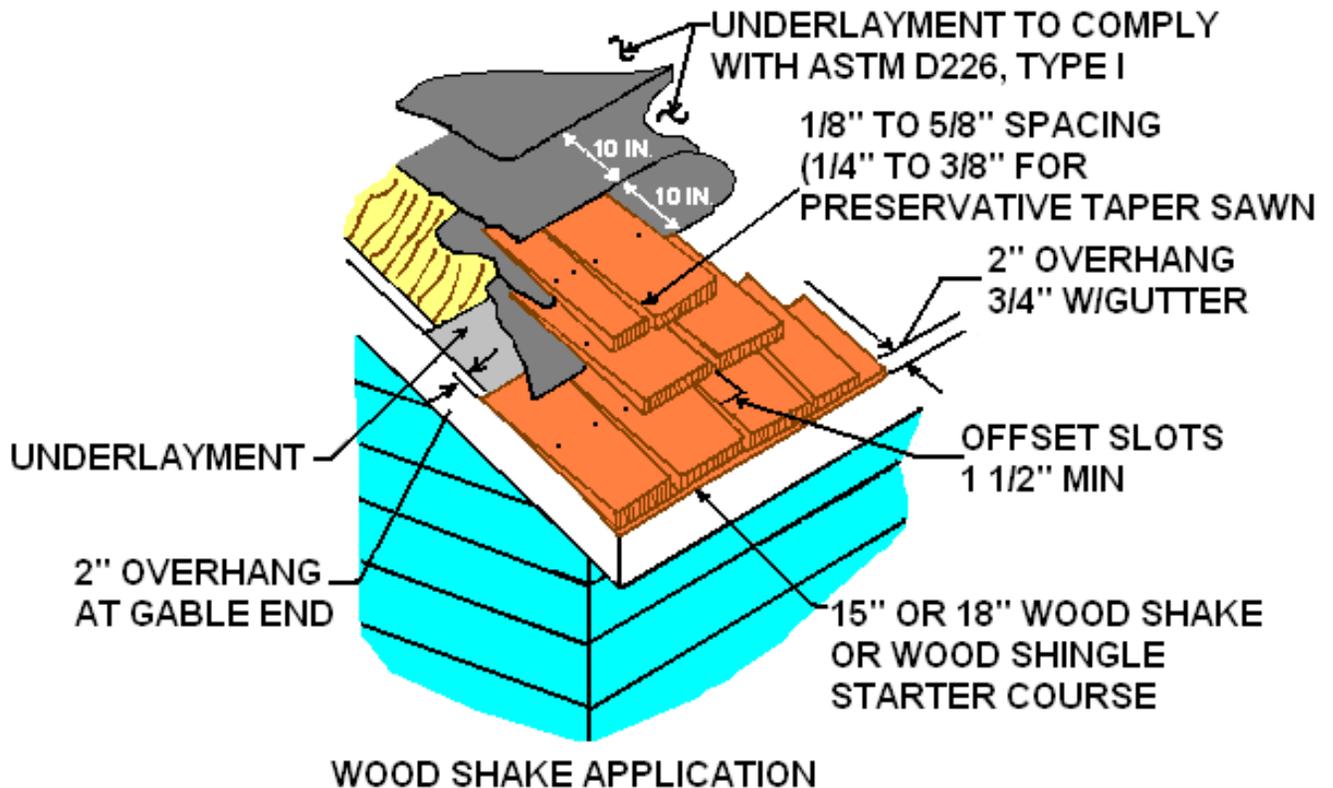




Figure R905.8.9
WOOD SHAKE DESCRIPTION AND EXAMPLE LABELS

CARBON MONOXIDE DETECTORS

Carbon Monoxide detectors shall be installed outside and within 10ft of all sleeping rooms anytime a building permit is issued for a property.