Applying shingles on extreme slopes

by **Dave Flickinger, RRO**

Q: *Are there special installation guidelines for asphalt shingles on extreme roof slopes or near-vertical surfaces (e.g., 24-in-12 [200 percent])?*

A: Application methods for asphalt strip shingles used on extremely sloped roofs differ from those used on more traditional slopes. Figure 1 shows incline angles for various roof slopes and provides equivalents for slopes in percentages and degrees.

There are differing views within the roofing industry concerning the maximum slope at which asphalt shingles may be applied using typical installation methods. For slopes of 18-in-12 (150 percent) and greater, *The NRCA Roofing and Waterproofing Manual, Fourth Edition,* indicates the following:

1. Six nails should be used to secure a shingle to a roof deck. For traditional slopes, much of a shingle's weight is carried by a roof deck. As slope increases to extreme or near-vertical inclines, more of a shingle's weight is borne by nails rather than a roof deck. A shingle's weight, coupled with its increased flexibility in warm temperatures, magnifies the risk of shingle material sagging between nail locations, causing shingles to buckle or tear. For this reason, additional fasteners are needed to stabilize and hold shingles in place. When installing laminated strip shingles, nails should penetrate the shingles' double-thickness portion (i.e., laminate location).

2. Hand sealing of shingles is necessary. Shingles commonly contain adhesive seal strips above nail lines that are activated by temperature and pressure. At an extreme incline, shingles' overlapping courses are less likely to provide the necessary pressure (i.e., weight) to activate a seal strip because of the roof covering's near-vertical orientation. Hand sealing, or tabbing, refers to the process of manually applying sealant (i.e., roof cement) under each shingle tab. For noncutout or laminated shingles, four equally spaced dabs of sealant are applied under a shingle's leading edge.

However, the 18-in-12 (150 percent) slope guideline should be used with caution. Some manufacturers require special application procedures (e.g., additional fasteners, hand sealing) on slopes of 12-in-12 (100 percent) and greater.

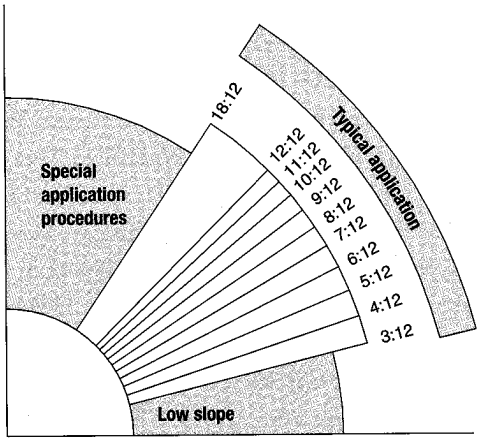
Requirements for hand sealing asphalt shingles also vary. NRCA recommends that three dabs of sealant be applied to a three-tab shingle with each spot centered at the bottom of each shingle tab. The Asphalt Roofing Manufacturers Association recommends a spot of sealant at both corners of each shingle tab; therefore, six dabs of sealant for a three-tab shingle are needed.

It also is important to note that building codes (e.g., *Uniform Building Code, Standard Building Code, The BOCA* [Building Officials and Code Administrators International Inc.] *National Building Code*) require that a manufacturer's specific application requirements be followed when asphalt shingles are installed on mansards or more extreme inclines. NRCA suggests roofing professionals verify application requirements with specific shingle manufacturers.

For asphalt shingle applications on extreme roof slopes, installing additional fasteners and hand sealing each shingle can help minimize material slippage and buckling and improve asphalt shingle performance. PR

Each month in this column, one of NRCA's technical services staff members will answer readers' technical questions. If you have a specific question you would like answered in this column, send it to Professional Roofing *magazine, 10255 W. Higgins Road, Suite 600, Rosemont, IL 60018-5607.*

Rise:run	Percent	Degrees
1:12	8	4.8
2:12	17	9.5
3:12	25	14
4:12	33	18.4
5:12	42	22.6
6:12	50	26.6
7:12	58	30.3
8:12	67	33.7
9:12	75	36.9
10:12	83	39.8
11:12	92	42.5
12:12	100	45



Rise:run	Percent	Degrees
13:12	108	47.3
14:12	117	49.4
15:12	125	51.3
16:12	133	53.1
17:12	142	54.8
18:12	150	56.3
19:12	158	57.7
20:12	167	59
21:12	175	60.3
22:12	183	61.4
23:12	192	62.5
24:12	200	63.4

Figure 1: *Incline angles for various roof slopes and their equivalents in percents and degrees, unless manufacturers' requirements dictate otherwise.*