

Standard-sized slate is fastened with two nails. All roofing slate should have a minimum of two nails. However, slate that is subject to high-wind conditions and/or 3/4 inch (19 mm) and thicker should be fastened with four nails.

Holes are punched from 1/4 inch to 1/2 inch (6 mm to 8 mm) the length of the slate from the upper end, and 1 1/4 inches to 2 inches (32 mm to 50 mm) in from the edges. Where four holes are used, it is typical to punch two additional holes approximately 2 inches (50 mm) above the two regular holes.

When attaching slates, nails should not be driven tight against the slate as if to draw the slate tight to the deck. Slating nails should be driven so that a nail's head just touches the surface of the slate so the slate hangs on the nail. See Figure 8.

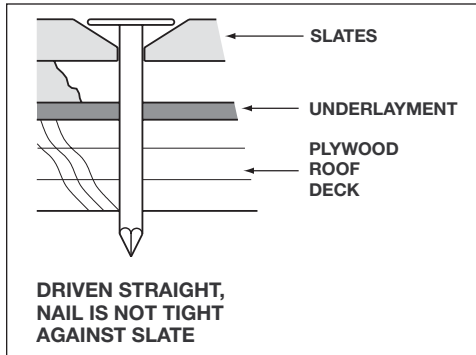


Figure 8: Example of proper nailing of slates

In high-wind areas, a 1 inch (25 mm) dab of flashing-grade roof cement, roofer's cement or polyurethane sealant placed under the exposed part of the slate near the leading edge can help secure it.

Other methods of attaching/affixing slate in certain situations are with slating hooks and wire tie systems.

3.5 Exposure and Appearance

The exposure of slate is the portion of the slate shingle that is not covered by the course above and is, therefore, the length of the slate roofing unit exposed to the weather. The proper exposure for a particular length of slate is obtained by deducting the 3 inch (76 mm) headlap from the total length of the slate then dividing that number by two. For instance, the proper exposure for a 24 inch (610 mm) slate is:

$$24 \text{ inches} - 3 \text{ inches} = 21 \text{ inches}; 21 \text{ inches} \div 2 = 10\frac{1}{2} \text{ inches}$$

$$(600 \text{ mm} - 75 \text{ mm} = 525 \text{ mm} \div 2 \text{ mm} = 263 \text{ mm})$$

Table 4 shows the proper exposures for various lengths of slate if all are to be set with a 3 inch (76 mm) headlap.

Length of Slate	Slate Exposure
24" (610 mm)	10½" (265 mm)
22" (560 mm)	9½" (240 mm)
20" (510 mm)	8½" (215 mm)
18" (460 mm)	7½" (190 mm)
16" (410 mm)	6½" (165 mm)
14" (360 mm)	5½" (140 mm)
12" (300 mm)	4½" (115 mm)
10" (250 mm)	3½" (90 mm)

Table 4: Slate exposures with a 3 inch (75 mm) headlap.

Slate can be installed to graduate by thickness and/or size. Thicker and/or longer slates are laid at eaves graduating to the thinner or smallest size at ridges. A typical graduation by thickness is 1/2 inch (13 mm) to 3/8 inch (10 mm) to 1/4 inch (6 mm). A typical graduation by size is 20 inches (500 mm) to 18 inches (450 mm) to 16 inches (400 mm) to 14 inches (350 mm).

When multiple colors are used, the percentage of each color to be used throughout the roof system should be specified. An example is 40 percent unfading green, 40 percent weathering green and 20 percent purple. With regard to weathering slates, some quarries can reasonably predict the percent and intensity of color change from the base color to weathered color.

3.6 Starter Course

Before the first course of slate is installed, a row of starter slates is applied along the eave of a roof system to serve as the starter course. The starter course's primary purpose is to shed water that may migrate through the joints of the slates in the overlying first course.

The lower edge of the starter course should extend beyond the downslope perimeter (eave) approximately 2 inches (50 mm) to assist in directing runoff away from the fascia board and other underlying building components. When gutters or eave troughs are used, the overhang may be reduced to approximately 1 inch (25 mm) or less. Slates should be installed to extend approximately 1 inch to 2 inches (25 mm to 50 mm) beyond the rake edge.

Starter slates may be applied face down. This allows the smooth backs of the starter course and first course of slate contact each other.

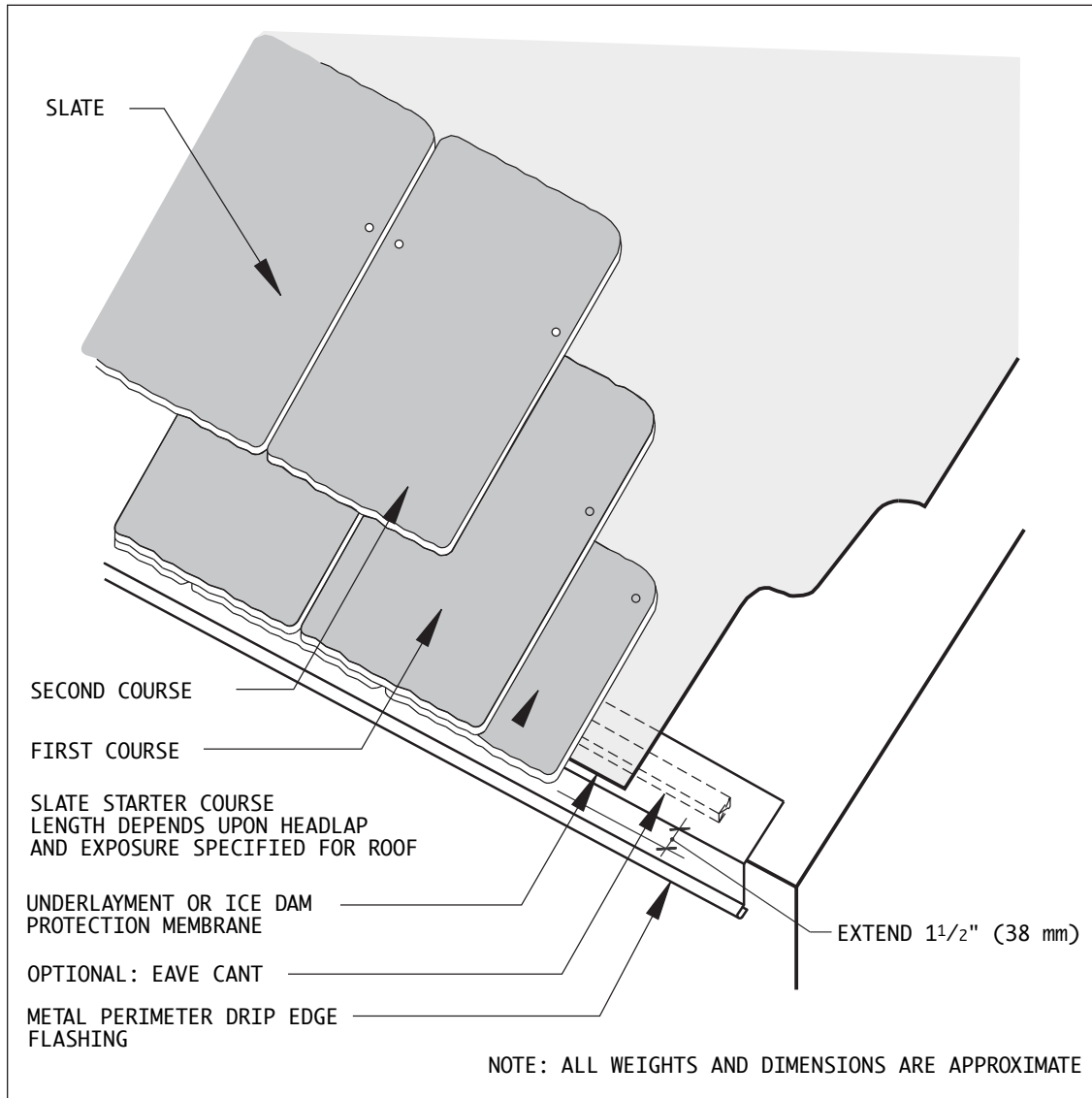


Figure 8A: Example of a starter course of slate.

3.6.1 Eave Cant

An eave cant is necessary to raise the butt edge of a starter and first course of slate the same way the headlap or third layer of slate raises the butt edge of all succeeding courses. The thickness of the eave cant should be about the thickness of the eave slates. A traditional eave cant is a wood lath $\frac{1}{4}$ inch (6 mm) thick and 2 inches (50 mm) wide. It is nailed to a deck and covered with eave flashing metal and underlayments. Beveled boards and raised metal eave flashings are also used.

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3.7 Flashings

Because steep-slope roof systems are frequently interrupted by the intersection of adjoining roof sections; adjacent walls; or penetrations, such as chimneys and plumbing soil-pipe stacks, all of which create opportunities for leakage, special provisions for weather protection must be made at these locations. These components used to control water entry are commonly called flashings. Careful attention to flashing details is essential to successful long-term roof performance regardless of the type of roof construction.

Flashings in this section are divided into the following categories:

- perimeter/edge metal
- penetrations
- valleys
- vertical surfaces

Flashing metals should be made from a material of thick enough gauge to achieve at least the expected design life of the steep-slope roof covering used with it.

3.7.1 Perimeter Edge Metal

Depending on the severity of the climate, anticipated rainfall and freeze-thaw cycling, the use of perimeter edge metal should be considered.

Where climate or roof edge construction dictates the need for perimeter edge metal, the type and minimum thickness of the metal should be commensurate with the anticipated service life for the slate roof system. NRCA suggests metal penetration flashings for slate roof systems be fabricated from one of the following metal types and minimum thicknesses.

- 24 gauge (0.025 inch [0.64 mm] thick) prefinished galvanized steel
- 24 gauge (0.024 inch [0.61 mm] thick) stainless steel
- 16 ounce (0.022 inch [0.56 mm] thick) copper
- 16 ounce (0.026 inch [0.66 mm] thick) lead-coated copper

In some regions, particularly those with mild climates, other types of metal and/or metals of lesser thickness than are shown above may be used successfully. NRCA considers these applications to be area practices. Refer to the Introduction for additional information about area practices.