

CHAPTER 8

SLATE ROOFING

Section I. DESCRIPTION AND GENERAL DISCUSSION

8.1.1 Description

Slate is a natural rock which was formerly much more widely used as a roofing material than at present. Consequently, most slate roofs that are encountered are old ones, on permanent structures. Some of the oldest roofs in the country are of slate, slate roofing having been produced for more than 200 years. Slate colors are designated Black, Blue Black, Gray, Blue Gray, Purple, Mottled Purple and Green, Green (fading and unfading), and Red.

8.1.2 Availability

Most roofing slate has been produced in two counties in eastern Pennsylvania, although the colored slates from western Vermont and eastern New York, and the gray (Buckingham) slates from Virginia, have also been used widely. The quarries that produced the earliest, and possibly the most enduring, slates on the Pennsylvania-Maryland border (Peach Bottom) are no longer operated for roofing slate. The eastern Pennsylvania slates are classed as "fading" slates, in that they change color on long exposure, the most common form of fading being that where the sides and bottom of the exposed portion of the slate changes to a light gray or tan, which will eventually spread over the entire exposed surface. This change may start in a

relatively short time, 10 to 12 years, with slates of poor quality. It is usually accompanied by a partial disintegration of the faded portion. However, many such roofs that have rendered from 50 to 60 years of satisfactory service are known. The New England and Virginia slates generally are nonfading (except New England fading green) and render excellent service, roofs of these slates more than 80 years old being not uncommon.

8.1.3 Characteristics

Roofing slate is quite brittle and becomes more brittle on exposure. It is produced in a variety of sizes and is usually laid by the American method. Roofing slate is normally 3/16-inch thick, but on monumental jobs, may range in thickness from 3/16 to 2-inches for architectural effect. Slate roofs may vary in weight per square from 650 to 8000 pounds, depending upon the thickness.

8.1.4 Fire Classification

Roofing slate is not classified as to fire resistance by the Underwriter's Laboratories, Inc., but a reasonable classification would be one similar to that for asbestos-cement shingles, since they are fireproof.

Section II. ROOF DECKS FOR SLATE ROOFS

Wood decks for slate roofs should be of well-seasoned sheathing lumber, not less than 1 inch in thickness, not more than 6 inches wide, and, preferably, tongued and grooved. Specifications formerly suggested 8 or 10 inch widths, but the narrower boards cause less breakage.

Sheathing boards should be fastened to each rafter with two nails to provide a smooth, even surface. Roof decking may also be plywood with exterior glue. The deck should be covered with 30-pound asphalt-saturated felt prior to laying the slates. The roof deck should be kept dry at all times.

Section III. STORAGE AND HANDLING OF SLATES

Roofing slates should be handled carefully to avoid breakage. They should be stacked on edge, preferably on planks, to give a firm, level support. Tiers of slate should be separated by wooden lath

placed 1 inch from the outside edges of the slates. Slates should normally not be stored more than 6 tiers high. When stored outdoors, they should be covered, particularly in freezing weather.

Section IV. DETERMINING TREATMENT OF SLATE ROOFS

8.4.1 General

As with asbestos-cement roofing, mechanical damage, such as that from hail, traffic, limbs of trees, warping of the roof deck, etc., and failures of fasteners, constitute the principal causes of maintenance and repair work on slate roofs. Actual failure of the slate due to weathering will occur eventually. With slate of poor quality, this may happen in less than 25 years. With slate of good quality it may be after more than 100 years of exposure and usually after the slates have been relaid because of the failure of the original fasteners.

8.4.2 Replacement or Reuse

If only a few slates are broken, they should be removed and new ones applied. If a large percentage are broken (25 percent or more), all slates should be removed and a new roof applied. The age and condition of the undamaged slates should

determine whether those salvaged from the old roof should be reused.

8.4.2.1 Criteria. No definite criteria can be given for determining whether a slate should be reused. However, if the part that has been exposed is not faded appreciably and shows no disintegration; and if the slate gives a sound "ring" when it is held between thumb and finger by one corner as lightly as possible and struck a sharp blow by the knuckles, it may be safely reused.

8.4.2.2 Fastener Failure. When the failure of a slate roof is due to failure of the fasteners, the failure is usually a general one, and, as with asbestos-cement roofing, piecemeal repair is futile, and it is best to remove the whole roof. Whether the old slate should be reapplied must be determined by its age and condition. A case is known where slate applied originally about 1870 was removed because of failure of the nails and successfully reapplied during World War II.

Section V. MAINTENANCE AND REPAIR METHODS—SLATE ROOFS

8.5.1 General

No sharp distinction can be drawn between maintenance and repair work in slate roofing. Maintenance and repair methods are therefore treated under one heading.

8.5.2 Replacing Broken Slate

In replacing a broken slate, remove the broken slate and cut the nails with a ripper. Insert a new slate of the same color and size as the broken one and nail

it through the vertical joint of the next course above, driving the nail about 2 inches below the butt of the slate in the second course above. Force a 3- by 6-inch or larger strip of copper under the course above the nail and bend the strip slightly concave to hold it in place. The strip should extend about 2 inches under the second course above and cover the nail and extend 2 inches below it (fig. 37).

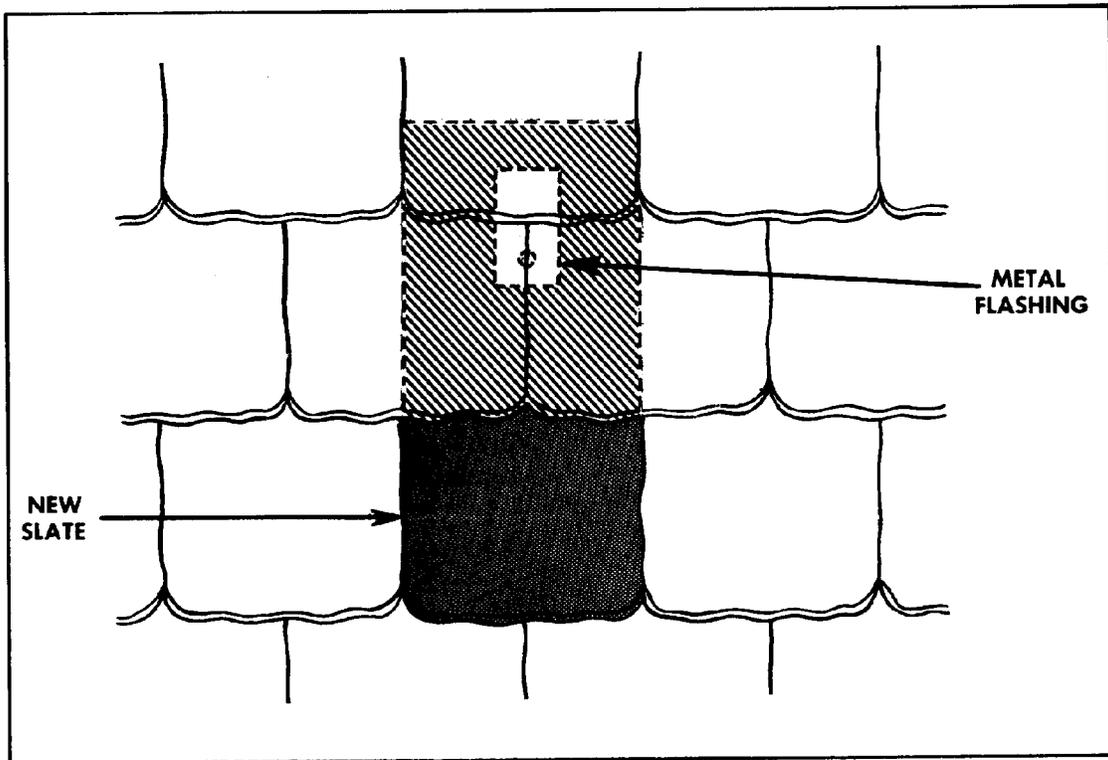


Figure 37. Method of inserting new slate.

SECTION VI. REROOFING WITH SLATE

8.6.1 Preparing Deck for Reroofing

For instructions for preparing the roof deck for reroofing with slate when the existing roofing is removed, refer to paragraph 5.6.2.1 above. When slate is used to replace a lighter material, the roof framing should be checked to determine whether it has adequate strength. As with asbestos-cement shingles, the long service that is normally expected from a slate roof indicates that the better practice is to remove the existing roofing, make the repairs to the roof deck to as nearly "new" condition as practicable and cover with a 30-pound asphalt-saturated felt laid horizontally with a 4-inch head-lap and 6-inch end laps. Secure the felt with large-headed roofing nails as necessary to hold it in place until covered by slate.

8.6.2 Applying Slate Roof

8.6.2.1 Starter Course. Apply a cant strip of suitable thickness, depending upon the thickness of the slate, at the eaves. Lay the starter course over the cant projecting 2 inches at the eaves and 1 inch at the gable. Fasten each slate with two large-headed slating nails. Drive the nails so that their heads just touch the slate. Do not drive the nails "home." The length of the starter course may be

found by adding 3 inches to the exposure being used on the regular slate, while the thickness depends upon the thickness of the slate.

8.6.2.2 First and Succeeding Courses. Apply the first course of slate over the starter course with the butts of both courses flush and the joints broken. Fasten each slate with a minimum of 2 large-headed slating nails. Apply the second and succeeding courses with a headlap of 3 inches and joints broken. Bed all slates on each side of hips and ridges within 1 foot of the top and along rakes within 1 foot of the edge in approved elastic cement and cover all exposed nail heads with elastic cement. Lay slate roofs with open valleys. Only the most durable and permanent nonferrous metals should be used for all flashings for slate roofs.

8.6.2.3 Nails. Nails for slating should be of nonferrous metal and of proper size. Large-headed copper slating nails are satisfactory. For commercial standard slates, 18 inches or less in length, use 1¼-inch nails; for longer slates, 1½-inch nails should be used. A good rule to use in determining the proper size nail is to add one inch to twice the thickness of the slate. Two-inch nails should be used on hips and ridges.