A New Way to Install Slate Roofs

by Ron Waite

This batten and clip system reduces the slate required to cover the roof by nearly half

I've been a builder for 16 years and have specialized in roofing for the last five. I do mainly asphalt roofs, but like most roofers in northern New England I've also done my share of traditional slate roofs and slate repairs. So I was interested when a salesman for a new slate-installation system, Nu-lok, invited me to look at doing a job with the product (Nu-lok Roofing Systems, 800/946-8565, www.nu-lokusa.com).

That was three years ago, and since then I've done several more Nu-lok roofs. From now on, if anyone asks me to do a slate roof, I will recommend this system.

Advantages of Nu-lok

The method is easier and faster than traditional slate roofing, plus it provides a ventilation space under the entire roof, which dramatically reduces ice buildup (I've been able to observe this on local jobs I've done).

Figure 1. A Nu-lok slate roof looks virtually identical to a conventional slate roof. One slight difference is the extra height of the copper edge flashings (below). In the photo at bottom, the front building has a nearly completed Nu-lok roof; the two buildings in the background have traditional slate roofs.

Less slate. A Nu-lok roof requires about half as much slate as a traditional slate roof, because it uses a double rather than a triple lap. Not only does this save on the cost of the slate, but it dramatically reduces the weight of the roof. There's no reason to beef up the roof structure: Any roof built to handle the ordinary dead load of an asphalt shingle roof can handle the weight of a Nu-lok roof, which is around 6 psf. In addition to the slate, materials in one of these roofs include underlayments, flashing, wood strapping, Galvalume battens, and the "link channels" that hold the slates and shed water between them.

Safer. A Nu-lok roof is also safer to install than an asphalt roof. Once the horizontal battens are in place, they act like a ladder; it's like having permanent roof cleats in place every foot up the roof.

Looks the same. After the roof's installed, you'll be hard-pressed to tell the difference from a traditional slate roof (see Figure 1). Visually, there are two differences, however. One is the larger reveal — 12 inches on a 16-inch slate — vs. around 7½ inches on a conventional slate roof. The other is the taller drip edge, used to close off the ventilation space. We usually use copper for all the flashings, which darkens and blends in with the slate. Even though I work in an area known for its old slate roofs, no one — neither customers

nor anyone looking at the finished jobs — has ever commented on these differences.

Easy repair. We often put on the top two rows of slate early in the job so we can finish capping the ridge without having to fight our way up the slate roof to get to the peak. We can also leave a walking path to anywhere we need access to (Figure 2), because the Nu-lok system makes it easy to remove and replace any slate on the roof. You don't need any tools: You just slide the spring clips to the side and pull the slate out. To put the slate back in, you reverse the process. This makes repairs easy, too.

Materials

We use 16-inch-long by ¼-inch-thick random-width slate, which comes from Greenstone Slate Co. in Poultney, Vt. (800/619-4333, www.greenstoneslate.com). The slate is available in several colors and shades, which vary in expense depending on availability. Mottled and colored slates typically cost more than plain gray ones.

Although Nu-lok was developed for use with natural slate, it also works with man-made ceramic slate.

Battens and link channels. The heart of the Nu-lok system is the horizontal Galvalume

Figure 2. Because slates slip in and out easily on a Nu-lok roof, it's a simple matter to leave a "walking path" to access a work area (above). To remove a slate, you slip the support clip to one side (above right) and slide the slate out (right).

battens and link channels that support the slate (Figure 3). The metal battens get installed over 1x3 wood strapping nailed through the sheathing to the rafters. This creates an air space under the entire roof, which helps to keep icing to a minimum. It also allows any water that blows or seeps up under the slate to drain down and out at the bottom edge of the roof.

The link channels are vertical pieces, also Galvalume, that are slotted to fit onto the battens; stainless steel clips at the bottom of each link channel support the slate. There's a link channel between every two field slates. The surface of the link channel acts like a gutter, draining water down onto the surface of the slate below. Both the link channel and the stainless steel clip have a black finish, so they pretty much disappear when you look at the roof from the ground.

We always try for the look of a traditional roof, keeping the butted edges of slates as close to the center of the course below as possible. But the fact is, even if the link channels practically lined up from course to course, you still wouldn't get a leak.

We buy the battens, link channels, and clips through Greenstone Slate. The clips come separate, so you have to spring them into the link channels before you use them. This takes a few seconds per clip and is easy. I happen to pay my grandchildren to do it, but it's also a good filler job for a laborer.

We purchase our copper flashings and other materials from our usual suppliers. All told, the cost to the client for a Nu-lok slate roof averages around $850 per square. A simple gable roof might cost less, but a complex roof cut up with dormers, hips, and valleys could run as high as $1,100 per square. It's like any other major acquisition: The customer is paying for long-lasting quality, and the cost gets added to the property value.

Installation Starts With Underlayment

We first apply Grace Ice & Water Shield to the eaves and valleys, and around skylights and plumbing vents. We use the Ice & Water in addition to the boot flashing or any metal flashing that comes with the skylight. On shallow roofs — 4/12 and under — we'll cover the entire roof.

Figure 3. Horizontal galvalume battens support and retain the link channels that shed water between slates. Stainless clips, which spring-fit into the link channels, support the slate. According to a Nu-lok representative, the metal parts have been successfully tested for corrosion resistance in coastal environments.

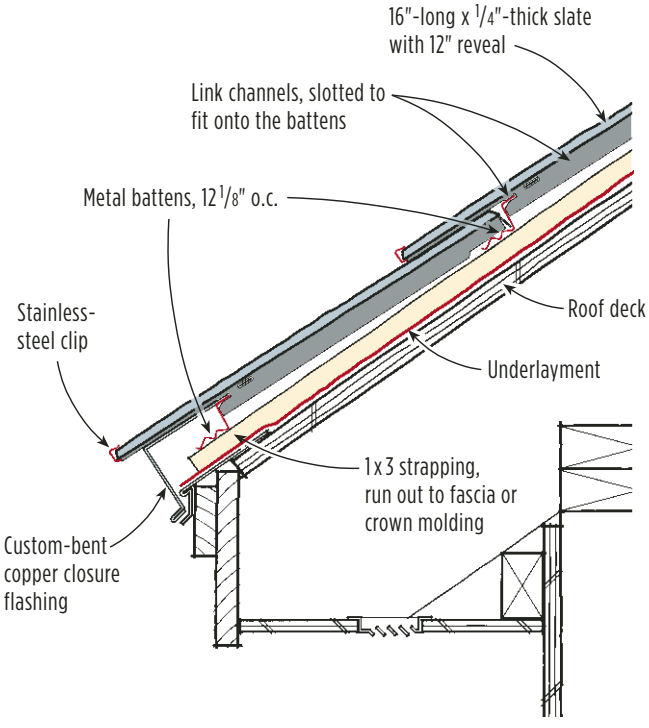
Next we lay down Grace's Tri-Flex 30 underlayment over the rest of the roof. We use a Bostitch cap stapler to make this go faster.

At this point, we measure to make sure the roof is square so that we can make up any irregularity with the drip edge. It's important to have an accurate, square layout with Nu-lok; it's harder to fudge once slate installation has begun.

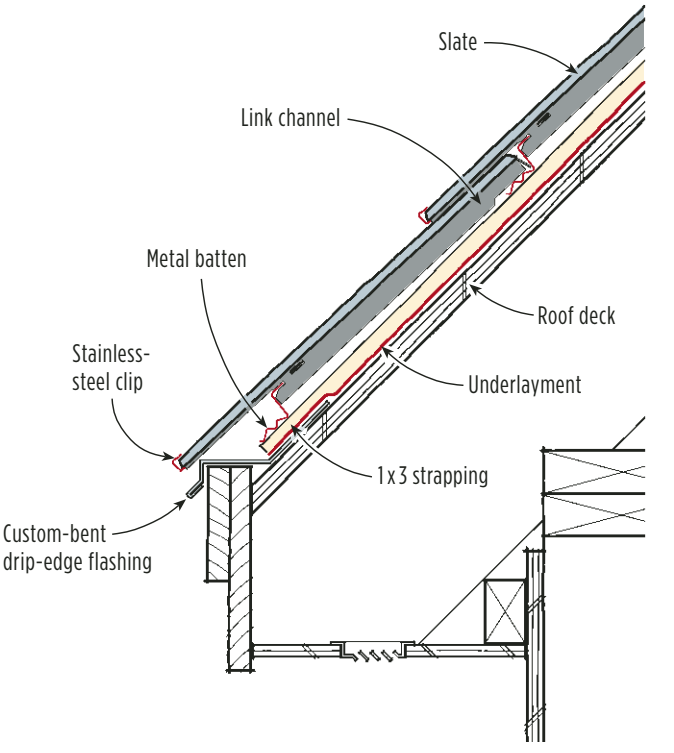
Strapping

Next, we nail 1x3 strapping vertically up the roof at each rafter. We typically use 8d galvanized ring-shank nails for this, but we've also used stainless nails or screws when the architect requested it. Depending on the overhang detail, we run the strapping out as far as the fascia or crown molding. As with any roofing job, it's important to have the fascia and crown in place if possible before the roof goes on. This is even

Nu-lok Eaves Detail



Eaves Detail for Steep Roofs (12/12 and over)



Rake Detail

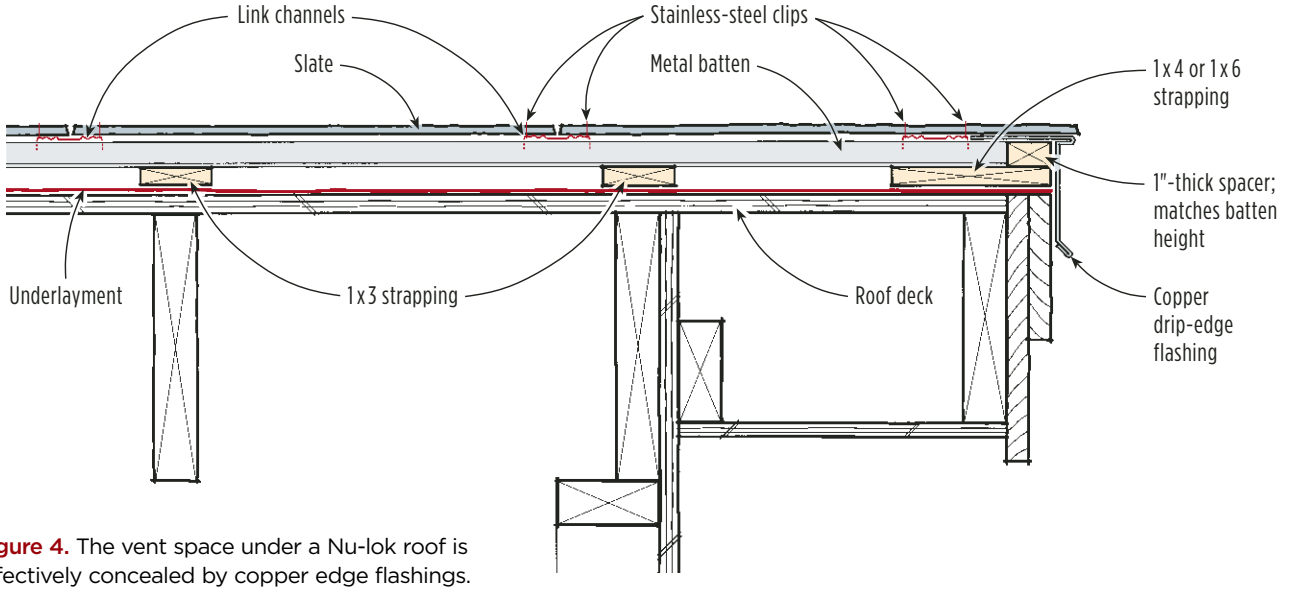


Figure 4. The vent space under a Nu-lok roof is effectively concealed by copper edge flashings. Any water that makes its way under the slates drains out over the high-performance underlayment.

more important with Nu-lok because the drip-edge flashings also double as closures for the vent space, so they need to be custom-bent for the conditions (Figure 4, previous page).

Along the gable ends, we'll use a 1x4 or 1x6 instead of strapping, to give us good nailing in the fly rafter and to get us out over the rake trim. We then nail a rough-cut, full 1-inch-thick 1x4 on top at the outer edge, bringing the height up flush with the battens that we install on the rest of the roof. A copper L-flashing covers the top of the trim (Figure 5).

Installing Battens

Laying out and installing the battens is probably the most critical step in a Nu-lok roof. Do this right and the rest of the job will go smoothly.

The battens get installed at 12 1/8 inches on-center (Figure 6). We use a layout stick — a piece of strapping or plywood drilled with holes every 12 1/8 inches — and hand-drive a series of 4d or 6d finish nails up every other piece of strapping to mark the layout lines (we just leave these in place, since they're well below the level of the slate). We drill the first hole at the bottom of the layout stick 13 1/4 inches from the end. Holding this at the outside edge of the fascia trim gives us a preset overhang of a couple of inches. This may vary from job to job, depending on the building's eaves details, but what's important is that the battens are spaced regularly at 12 1/8 inches up the roof.

We snap lines most every course up the roof; I'd recommend snapping every line for your first job, until you're accustomed to the system. We take some extra time to make sure the initial layout lines are parallel to the eaves and square to the rake trim. If this layout is good, the rest of the roof falls into place.

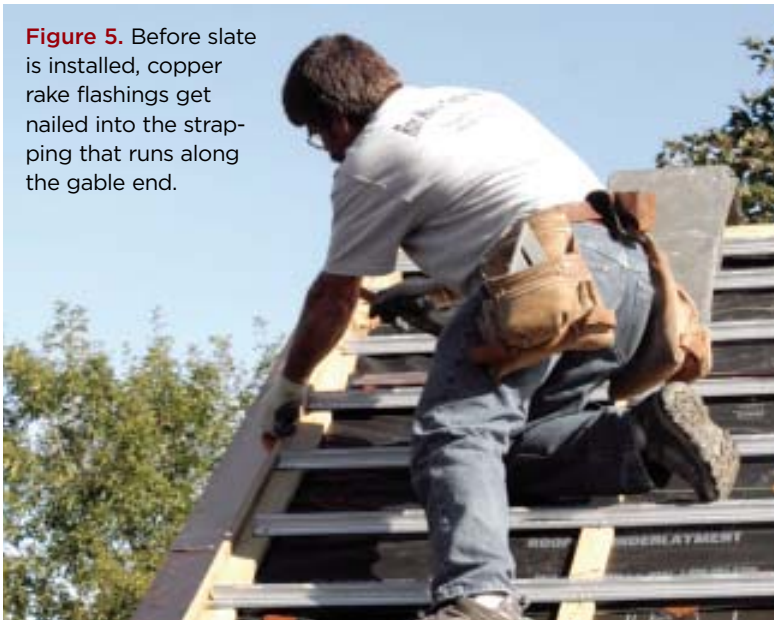


Figure 5. Before slate is installed, copper rake flashings get nailed into the strapping that runs along the gable end.

Figure 6. The metal battens are installed at 12 1/8 inches on-center. To speed layout, the author's crew uses layout sticks drilled with holes, then drives small finish nails at every batten location. When final chalk lines are snapped from end to end of the roof, the nails serve as a cross-check that the overall layout is square and parallel to the eaves.

We'll check the distance to the ridge to make sure we don't get left with an ugly narrow strip at the top. It's possible to fudge the courses slightly tighter by trimming the top end of the link channels. We'll do this for the top few courses if necessary to maintain a nice reveal at the cap.

We nail down the battens with 8d galvanized ring shanks, shooting right through the 18-gauge metal. The battens come in 12-foot 6-inch lengths. If we need to cut them, we've found that a Morse Metal Devil blade in a cordless circ saw works well; it doesn't spark or even heat up the steel the way a grinder does.

Figure 7. Rough-cut 1x4s nailed on top of the strapping at the ridge serve as backers for the ridge flashing and cap slates. The author uses Lexel sealant to seal the nail holes.

Getting Down to Slate

After loading the roof, installing the slate is the easy part. We typically start at the ridge and install a couple of courses there, then work outward from any valleys and hips, filling in the flat field of the roof last.

Ridge. We nail full-dimension rough-cut 1x4s along the ridge on top of the strapping (Figure 7), which comes flush with the battens and gives us nailing for the ridge flashing and cap slates. We use 8-foot sections of flashing, usually 24-gauge galvanized, since it's concealed. We nail the cap slates through the flashing, then seal the holes with clear Lexel. You could also step-flash the ridge.

Because the cap slates are rigidly fixed, we shorten the last course of slates by about ¼ inch so they'll slide in and out a little easier (in case we need to make an adjustment, or someone ever needs to make a repair).

Figure 8. Using full-size 16-by-16-inch slates for the valleys gives maximum coverage without a lot of small triangular pieces.

Figure 9. Galvanized steel counter flashings supported by the slate clips supply extra water protection at the valleys. The metal is cut with hand shears to match the horizontal course lines.

Valleys. We use full-size 16-by-16-inch slates at the valleys, cutting them so as to get as much coverage as possible (Figure 8, previous page). This eliminates small triangular pieces, which clutter up the valley and would be tricky to support. Every slate needs to have a horizontal bottom edge that rests in the clips. While the field slates usually get support from two link channels, valley slates are often supported by only a single clip on one side; the valley side nests in the valley and is held down by the course above.

We also weave in 24-gauge galvanized steel counter flashings up the valley (Figure 9). We bend these on the ground to match the valley angle, then angle them with aviation snips on the roof to follow the bottom edge of the slates on each side of the valley. The flashings rest in the clips along with the slates. We also squirt a bead of Lexel between the slate and the metal for good measure.

Hips. Hips are treated pretty much the same as the ridge, except for the angled cuts (Figure 10). We use minimum–14-inch-wide slates to avoid small pieces.

Starter course. There's nothing special about the starter course on a Nu-lok roof, as long as the batten layout has been done right. There's no doubling — just a single slate.

Figure 10. Like valley slates, hip slates are cut from full-size pieces. To provide support at the narrow edge of the triangular slate, the top of the link channels can be cut down to fit between the top batten and the wooden nailer that runs along the hip.

One Caution

Nu-lok advertises its roof as "walkable," but as with any roof, this should be left to professionals. It's not a good idea to walk in the valleys, and wherever I walk, I use caution, try to stay flat-footed, and put my weight over the battens.

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