READERS WRITE

I need to find some method to reliably penetrate a slate roof with a vent flashing.

Traditional Roofing: First, find the exact spot on the underside of the roof in the attic and drive a 16-penny nail through the roof, right through the slate, from inside out. Then go on top (use a hook ladder, if needed) and find the nail. Push the nail down and then pull the slates off the immediate area, using a slate ripper, until the wood roof deck is revealed. Pull off enough slates to make the job easy — they're easy to pull off and to put back (you may need to remove 6-10 slates depending on the size of the slates, maybe more). Cut the hole in the wood just big enough to allow the pipe through — use a hand-held hole saw or a cordless circular saw. Insert the pipe through the roof from inside. Begin to nail the slates back down from the bottom course up, cutting them with a slate cutter to fit around the pipe. If there is a hole needed only in the center of a slate, draw a circle with a nail on the back of the slate, then punch along the line with the pointed end of a slate hammer to perforate the line, then break out the hole. If you need extra nail holes to nail a slate back into place (such as two nail holes on one side of a slate) punch the extra nail hole above the existing hole with the slate hammer. Fit the pipe flashing over the pipe before the top courses of slate are installed so the slates will overlap the flashing properly, then trim the top slates to fit around the flashing as you nail them into place. The very top row of slates can be installed with either slate hooks or bibs and nails. The pipe flashing can be a standard aluminum/neoprene or copper/neoprene flashing or a custom made lead or copper flashing (avoid all plastic or all rubber flashings). Lead pipe flashing fabrication is illustrated in the second edition of *The Slate Roof Bible*. The tools, the book and the copper/neoprene flashings are available at slateroofcentral.com or by calling the phone number at the bottom of this page.

****

I am an architect building my own home using a slate roof. Virtually every roof detail I can find on slate roofs is for unvented roofs. The Slate Roof Bible as well as the documents linked by the Jenkins web site make numerous references to slate over rough sawn lumber as a "breathable roof." It seems reasonable to me that water vapor is not going to get trapped underneath a traditionally framed slate roof. Is this presumption correct? Can you provide appropriate references regarding the appropriate venting of a traditionally framed slate roof system? Is it going to need ridge vents, soffit vents, or an air cavity between the roof deck and the insulation?

Traditional Roofing: The issue of traditional slate roofs being “breathable” roofs lies in the fact that such roofs are typically installed on board decks. Each board has an air space between it and the next board. That space may be 1/8” to 6”, depending on the installation method used. A stone roofing system nailed over a board deck allows some air penetration through the roof, but not water penetration. It is water-tight, but not air-tight. Thirty pound felt underlayment initially acts as an impediment to air flow, but does not block it completely. This is why century-old slate roofs with no specific roof ventilation system, insulated or not insulated, function quite well, provided that standard principles of insulating are followed (i.e. warm air is not allowed to contact cold surfaces). Contrast this to plywood roof decks covered by self-adhering asphalt roll-roofing and self-sealing asphalt shingles. There is little opportunity for air to breathe through this sort of roof system, hence, roof ventilation systems are imperative.

Generally, you should leave an air space between roof insulation and the roof sheathing (assuming the insulation is installed between the rafters) to allow for air flow through that air space so the space maintains the same temperature as the outside air. In addition, you should install a vapor barrier *interior to the insulation in cold climates* to prevent moist, warm air from coming in contact with a cold outer surface such as the underside of your roof decking. Condensation inside roofs is caused by warm, moist interior air infiltrating to the underside of the cold roof sheathing. This is prevented by the aforementioned vapor barrier, proper insulation, and proper ventilation of the roof space. Ventilation is most often achieved by gable-end vents or low-profile roof vents, but can also be achieved by ridge vents when there is no gable wall available. There is information illustrating the installation of vented slate ridges at slateroofcentral.com (click on “How to Install a Slate Roof,” then look for the next link). It should be pointed out that there are many thousands of century-old slate roofs in the U.S. that never had any ventilation system incorporated into their design, and that these roofs are still functioning quite well today — after a hundred years. This seems like a rather strong testimonial on behalf of traditional roofing methods and materials, i.e. board roof decks, 30 lb felt, and stone roof coverings.

****

I am curious to know if you would consider it a good or bad practice of setting all hips and ridges in a solid coating of a high quality flashing cement.

Traditional Roofing: Bad. Frankly, the setting of slates in roof cement creates a long-term problem related to maintenance and restoration. One unique quality of a slate roof is that it lasts so long, and one reason it lasts so long is because it can be taken apart and put back together — in other words, maintained and restored. When the slates are glued to the roof, or to each other, they cannot be removed without damaging the roof. Every time the slate roof mechanics at Joseph Jenkins, Inc. run into a roof where slates have been glued down with roof cement, they begin

(CONTINUED ON PAGE 8)

READERS WRITE

(CONTINUED FROM PAGE 7)

uttering a long series of profanities that usually lasts until the repair work has been completed. The better approach to the issue of hips and ridges opening up over the years is to install step flashings under the hip and/or ridge slates. This is a permanent, effective solution that allows the roof to be easily repaired or maintained years later when, for example, a tree branch falls on it. In short, we discourage the use of roof cement or other adhesives under slates anywhere on the roof except in unusual situations, such as: 1) exposed gable edges subject to wind damage, and 2) small pieces of slate that require a little extra holding power, which could be a narrow piece on a gable end, a small piece on a tower hip, etc. Routinely using roof cement under slates is a mistake. You can see an example of a slate ridge being installed with copper step flashing at slateroofcentral.com (click on "How to Install a Slate Roof," then follow the links to slate hips and ridges).

****

My concern is the prices of new slate, which, by my opinion, as with many other contractors, is quite expensive.

TRADITIONAL ROOFING: When the price of the material is compared with the expected life of the material, and other considerations are included such as aesthetics, natural vs toxic, etc., then it can easily be argued that slate is not as expensive as the "cheap" stuff (which is short-lived and has to be regularly replaced at increasing cost, creates toxic waste upon disposal, produces environmental toxins during production, looks ugly over its lifetime, etc.). When one considers that almost all average houses in the northeast U.S. had slate roofs on them at one time, back when people were frugal and living by modest means, then one might ask what has changed today. At that time, people bought slate for their roofs without question because they wanted good, beautiful, long-lasting roofs. Now, slate roofs are considered by some to be too expensive. The difference is 1) people today can buy very cheap roofing materials, and 2) people generally don't live in the same house very long and therefore don't care whether the roof will last a long time. I don't think the solution is to try to produce cheaper slates. I think the solution is to market slate roofs to those people who value quality and are willing to pay for it. Remember, *you get what you pay for*.

****

I am in the midst of restoring an 1860s home complete with a slate roof. Unfortunately, the original box gutters were torn out and replaced with plywood and asphalt shingles. I would like to go back to the original design and would appreciate any information you can give me.

TRADITIONAL ROOFING: There are copper sheet metal sources in *The Slate Roof Bible, 2nd Edition*. There is also some information in the book about replacing box gutters, including drip edge detail and installation sequence. Slateroofcentral.com has illustrated information about both replacing box gutters as well as installing a copper snow apron over an area that had once been box gutters but was replaced with plywood and asphalt shingles, like your situation. Go to "How to Install A Slate Roof" and follow the links. Remember, when installing box gutters, expansion joints are required every 30 feet or so. If you are installing expansion joints, end one gutter at a high point and butt the end against the end of the next gutter section (leave an inch or so space), then place a copper cover over the gap. That allows the gutter to expand and contract. This is also illustrated at slateroofcentral.com.

****

Can you tell me what would be the best nail to use for natural slate roofing?

TRADITIONAL ROOFING: Copper nails will outlast galvanized nails and stainless steel nails will outlast both. If the slates are new, you should use either copper or stainless. If the slates are salvaged and not expected to last more than 50 more years, hot-dipped galvanized nails will do. Stainless nails are stronger than copper and may work better on some old, hard oak or yellow pine roof decks. However, stainless nails are also harder than copper nails to pull out when repairing the roof. Copper and stainless steel roofing nails are available from slateroofcentral.com or by calling the phone number at the bottom of this page.

****

Can you tell me if it is customary to use or not use an aluminum drip edge on a slate roof?

TRADITIONAL ROOFING: Aluminum drip edges are not used on slate roofs. They are designed to prevent asphalt shingles from sagging over the edge of a roof. Slates don't sag. In fact, no metal drip edges were ever used on traditional slate roofs — neither on the drip edge nor on the rake edge. The practice of using metal edges on slate roofs is a recent one that has been promoted by asphalt shinglers who typically use plywood roof decks. Metal drip edges do not reflect traditional slate roofing techniques and can be avoided altogether by traditional slaters.

****

I have been told that one can judge the quality of a slate by tapping it with a metallic object. The harder slates have a ring, and softer slates sound duller. Is this an accurate test of (1) the quality of the slate or (2) the useful life remaining in a slate?

TRADITIONAL ROOFING: The answer to your question is complex. There are subtle nuances involved in determining the quality of used slates. The ring is part of it, but many older slates (100 years old) do not ring like new slate does. New slates should always ring well, unless they're cracked. The

(CONTINUED ON PAGE 13)

READERS WRITE

(CONTINUED FROM PAGE 8)

best way to know if an older slate is any good is to know what type it is, what approximate age it is, and then examine it visually for surface delamination and softness. Punching a nail hole in the slate with a slate hammer or cutting it with a slate cutter will reveal the hardness or softness of the slate, although an experienced slater can tell the quality of a piece of slate by simply holding it and looking at it. Even a reputable, old, hard slate with a degree of softness can last many decades re-nailed to a roof. Slates that are notorious for not being reusable when old are some PA black slates (while other PA black slates have quite high degrees of longevity). Some Vermont sea green strains can also become soft after 115 years, although most don't. Generally, if it's salvaged American slate and it looks like a good, smooth piece of dense stone while holding it in your hand, then it will most likely make a good roof.

****

About two years ago, I purchased an 80-year-old home with a Vermont "sea green" slate roof. Last spring I noticed a leak, and as I am not as young as I once was, I decided to look for a contractor. To make a long story short, I was very dissatisfied with the work this company performed. My objective in writing this is two-fold: first to let you know the working ethics of at least one of the companies you recommend on your web site, and second, any pressure you may be able to exert on the roofing company on my behalf will be greatly appreciated.

TRADITIONAL ROOFING: We *do not recommend* any roofing contractors on our nationwide online Directory of Slate Roofing Contractors. We once had a list compiled from voluntary submissions that were simply posted on our website for the convenience of the public. There had never been any charge to any contractor for inclusion on that Directory and none of the contractors were screened in any way. We posted a large, bold disclaimer to this effect right on the top of the Directory.

That said, please be aware *we have discontinued our voluntary contractor directory at* slateroofcentral.com. Instead, we have replaced it with a Directory of **Slate Roofing Contractors Association** members who pay a fee to be included in the Directory and who fill out an extensive membership application revealing their level of experience and other important aspects of their contracting capabilities — information that is posted on the Directory as a Contractor Profile. We are now only listing roofing contractors who are willing to be scrutinized, willing to abide by a Code of Ethics, willing to allow their Contractor Profile to be publicly displayed on the website, and willing to pay a fee for this service. This has knocked out a lot of the dead wood from the old, original Contractor Directory.

****

I hired a contractor to replace my copper valleys. Thanks to your advice I told him I did not want him to slip the new valley over the old valley which he mentioned was an option to save money and time. While he was removing the slate, he was breaking almost every piece. The next day, when I came home from work, I noticed he had done three dormers in the same time it took him to do one the first day. I climbed up on the hook ladder to check out the work and discovered he had given me the VALLEY SLIP and he also broke over 70 pieces of hard Vermont slate. I called him up and told him to get his stuff and get off of the job. He said he used the slip method only because he was breaking too many slates. He told me that at this rate he would have used up my remaining 150 pieces to do 75 feet of valley. How many slates can I expect to replace because of breakage on an average hard Vermont thick slate roof that's 90 years old when an experienced slate roofer is replacing valleys?

TRADITIONAL ROOFING: A hard Vermont slate roof should experience little if any breakage when valleys are being replaced. However, if the valleys are tarred, or if they have been walked on over the years, breakage will increase. Typically, a hard Vermont slate roof may have 5% breakage along a valley, if that. Sometimes there's no breakage at all. Sounds like your contractor had no idea what he was doing. He should have read *The Slate Roof Bible* (which has an entire chapter on valleys and valley replacement) before he dove into that project.

****

My roof expert says that New York has adopted national codes and that self-adhesive asphalt ice shield on a pitched roof is now code. Can you tell me if this is so?

TRADITIONAL ROOFING: You need to look at the code yourself and see what it actually says. The International Building Code of 2000 states that in areas where the average daily temperature is 25 degrees Fahrenheit or less, a double layer of felt cemented together or a layer of self-adhesive ice shield are required at the eaves. However, traditional slate roofs were never installed in this manner unless there was a particular need for a heavy underlayment, meaning an extraordinary expectation that the roof would leak. Ice damming problems are often caused by a lack of insulation in the roof of a heated building. The ice and snow melts from the roof, then freezes at the unheated eaves causing an ice build-up that can allow water to penetrate the roof at the eaves, especially at weak points. It's much better in ice-dam prone climates to properly insulate the roof and to reinforce the eaves during the roof installation by increasing the headlap there. Beefing up the underlayment is a temporary waterproofing measure that will not last nearly as long as the slate itself. It is unwise to rely on the underlayment to keep a slate roof water-tight. A properly installed slate roof requires no underlayment to be completely water-tight during its lifetime.

****

(CONTINUED ON PAGE 14)

READERS WRITE

(CONTINUED FROM PAGE 13)

I am having my roof installed next week. I ordered the slate myself and ordered random width. Is there anything special the roofer should know regarding installation of random width vs uniform?

TRADITIONAL ROOFING: Random width slates are not hard to install. The slater has to keep an eye on the sidelaps, but that's about the only additional thing. The guy bringing the slates up to the roof has to make sure he's blending the widths according to the proportions available. For example, if you have 20% 8" wide, 40% 10" wide and 40% 12" wide, then he should bring up two 10" and two 12" for every one 8" slate. Other than that, there's not much else to it.

****

My roof was constructed at an 18 degree pitch with 38x38mm battens covered with underlayment and the slate tiles nailed to the battens. It's leaking so badly that there is sagging of the battens. Please correct me if I'm wrong but what I would like to do is, 1) Remove tiles, underlayment and battens; 2) Apply new battens nailed directly to roof trusses; 3) Apply slates tiles to battens with copper nails. Please advise if the above exercise will work, if not please can you suggest an alternative!

TRADITIONAL ROOFING: Minimum slope for slate roofs is 4:12. (around 18 degrees). You must have 4" of headlap on the slate at that slope, or more. If you re-lay the slate with the proper headlap and don't allow anyone to walk on it during installation or after, you should be OK. Replacing the battens with boards will help (you can use 1" rough sawn lumber or 3/4" planed, kiln-dried lumber — either will work fine). 30 lb felt paper over the boards and under the slate, half lapped (i.e. two layers), would also be a good idea at this low slope.

****

I am a professional engineer called upon to determine whether or not a hailstorm caused damage to a slate roof. I should note that it appears to me (from your guidance in "How To Identify Your Slate" at slateroofcentral.com) that the roof is a blend of Vermont greens and gray with a little New York red mixed in. I found a broken piece of slate on the ground (approximately 4" long along the bottom edge by 3" irregular) that has a distinct circular (3/8" diameter) rusty deposit on the underside within 1/2" of the lower edge. Can it be that the nails have pushed out, similar to nail pops in drywall, to cause enough stress to fracture the slate?

TRADITIONAL ROOFING: Vermont slate is pretty resistant to hail damage. Hail damage is indicated by holes with the back of the slate broken out, i.e. the holes have clean edges (not beveled) on the impact side of the slate (the side facing the sky). Holes in slate originating from inside the building (from gunshots, for example), would have the beveled edges showing on the *outside* of the slate. Yes, nails will push against the underside of the slate and sometimes wear a hole in the slate. In this case, the beveled edges also show on the top (outside) of the slate. This phenomenon happens when the slate underneath was "under-nailed," (the nail was not driven down far enough), or when the nail was driven into a knot in the wood (for example) and the nail was then forced back out a little as the wood dried. It's unlikely that the nail stress would have "popped" or broken the slate. Typically, the nail simply wears a clean hole in the slate, as shown in *The Slate Roof Bible, 2nd Edition*, page 220 (which is a drawing made from a photograph). Below is a photo of hail damage on a 75-year-old mixed-color Vermont slate roof which suffered massive hail impact a few years ago. Notice how beat up the metal vent is, but of all the slates around it, only one slate was perforated by the hail. This is what one typically sees when a slate roof is hail damaged — spotty damage to the slate here and there that can be repaired by simply replacing the damaged slates. The bigger issue is whether the flashings need to be replaced. If so, this can usually be done without removing and replacing the entire roof.

Photo by Joe Jenkins

Visit **slateroofcentral.com** for all your slate roofing needs

America's most popular slate roofing web site!