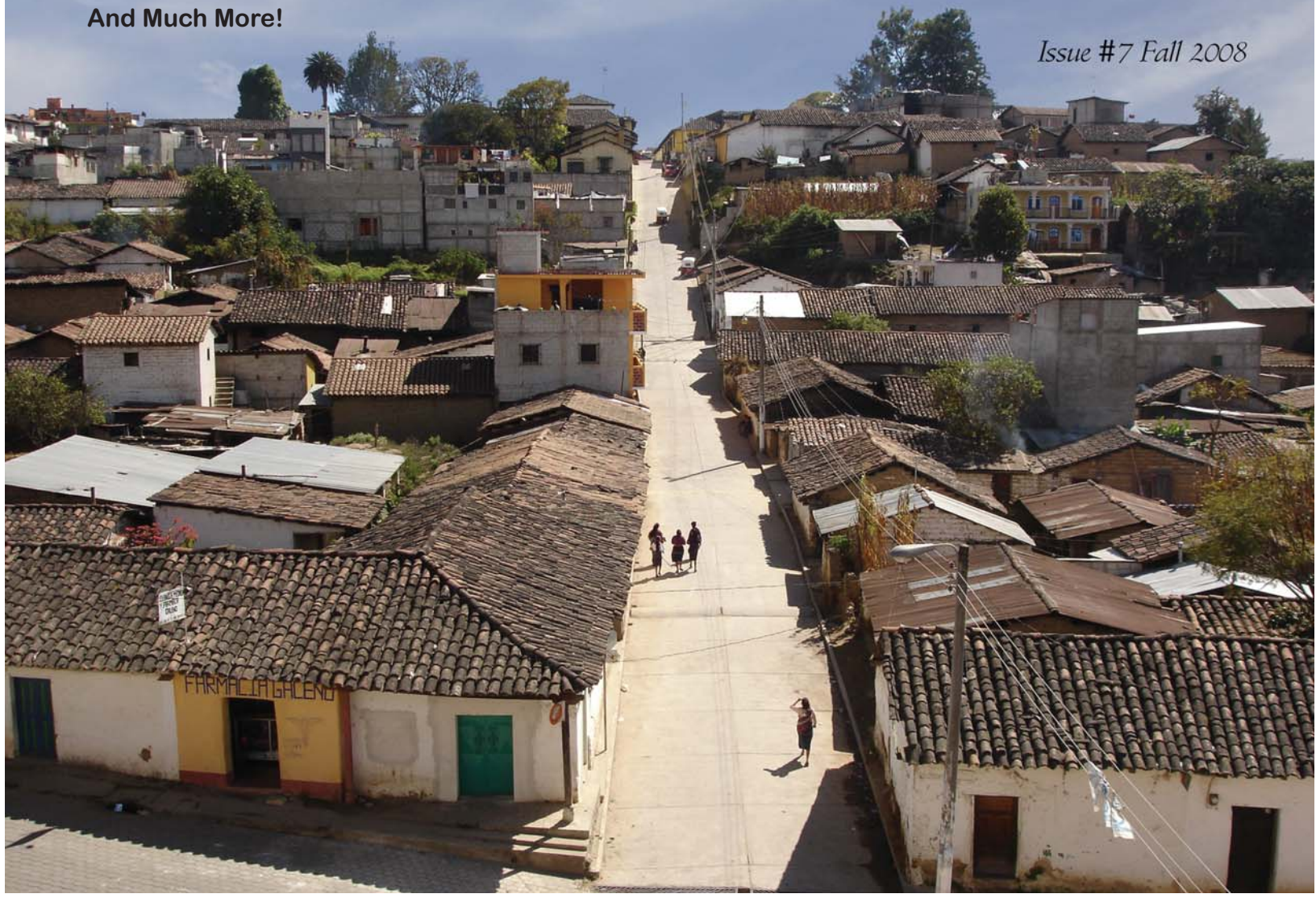


Traditional **ROOFING**

Traditional Tile Roofs of Guatemala
Lord Härringtón's Château Woda Nymphée
Stone Roofing of Norway
Industry Spotlight: Three Brothers in Mass.
Slate Roofs: 21 Contractor Errors
The Slate Industry's Civic Heroes
Slate Roof Repair: Dos and Don'ts
And Much More!

Issue #7 Fall 2008





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TR7 2008 **IN THIS ISSUE:**

TRADITIONAL ROOFING MAGAZINE

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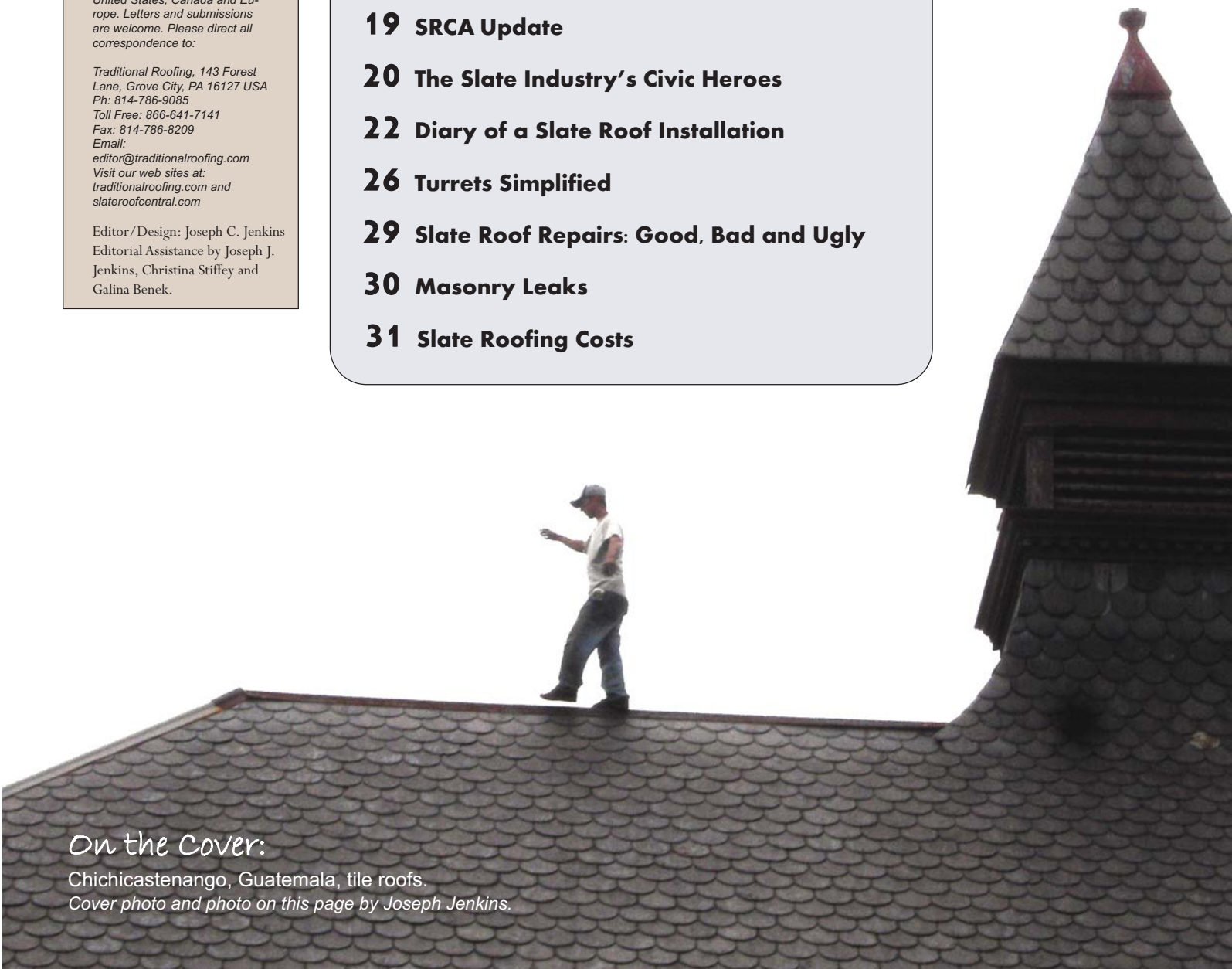
Special Thanks To:

Lord Harrington
Pete Papay
Mike McLaud
The Menezes Bros.
Terry Hughes

On the Cover:

Chichicastenango, Guatemala, tile roofs.

Cover photo and photo on this page by Joseph Jenkins.



LORD HÄRRINGTON'S CHÂTEAU WODA NYMPHÉE

The *Olde World* has come to Texas!

And yet another owner-builder has installed a beautiful slate roof that would be the envy of any professional roofing contractor. Lord Harrington's elegant slate and copper roof on the Chateau Woda Nymphée, near Fort Worth, Texas, was a four man job: "One Englishman, one Yankee, one boom lift, and the Slate Roof Bible."

Lord Harrington, an artist, fine-art photographer and architect, designed the roof himself, or as he describes it, "I designed it as we went, sort of as Antonio Gaudi did with his architecture, in a sort of synthetic organic manor. That and plenty of Johnny Walker Scotch whisky as fortification."

Chateau Woda Nymphée means "water nymph" in a Baltic tongue and was named in honor of Lord Harrington's wife. It took months to install the roof. "How long did it take me and how long should it have taken are two different things entirely. I worked upon it with one man and one machine at a time. I believe it took 4-5 months. We kept having problems with rented boom lifts breaking and leaving us down for over a week at a time here and there, and with my schedule. I eventually bought an eighty-five foot snorkel lift, and told the rental place to stick their rubbish...."

An aluminum lion, air-bushed with Emron paint, perches on a brick pedestal at the peak of the roof, designed from the fam-

ily coat of arms. The finial on the "Witches Crowne" turret is also made of aluminium, with a 2" steel bolt running through a series of centre compression rings and bolted inside the turret. This powder-coated adornment was machined at a local sheet metal shop to drawings and specifications provided by Harrington. The turret is covered in 16 oz. copper panels installed in a diamond pattern. An ornate, stainless steel Eagle spreads its wings over the Witches Crowne. The eagle is fabricated by international sculptor Bernie Jestrabek-Hart of Caldwell, Idaho, from drawings supplied by Harrington.

The roof was made up of about 60 squares of Vermont 1/4" slate intricately designed in patterns of purples, greens and reds.

Twenty-ounce copper was used to make the valleys, ridges and eaves. The ridges were nailed and screwed with stainless steel screws. The finials are copper and stainless steel, lag bolted into place with stainless steel lag bolts.

The slate is installed with a 3" headlap and 3" sidelaps, although Harrington admits, "On the very top third of the south

side we got off course a bit and the headlap may approximate 2 1/2" to 2" on a few courses." The roof pitch is 24/12 on the main body of the building, so 2" of headlap should work nicely anyway. The slating nails were 1 3/4" to 2" copper.

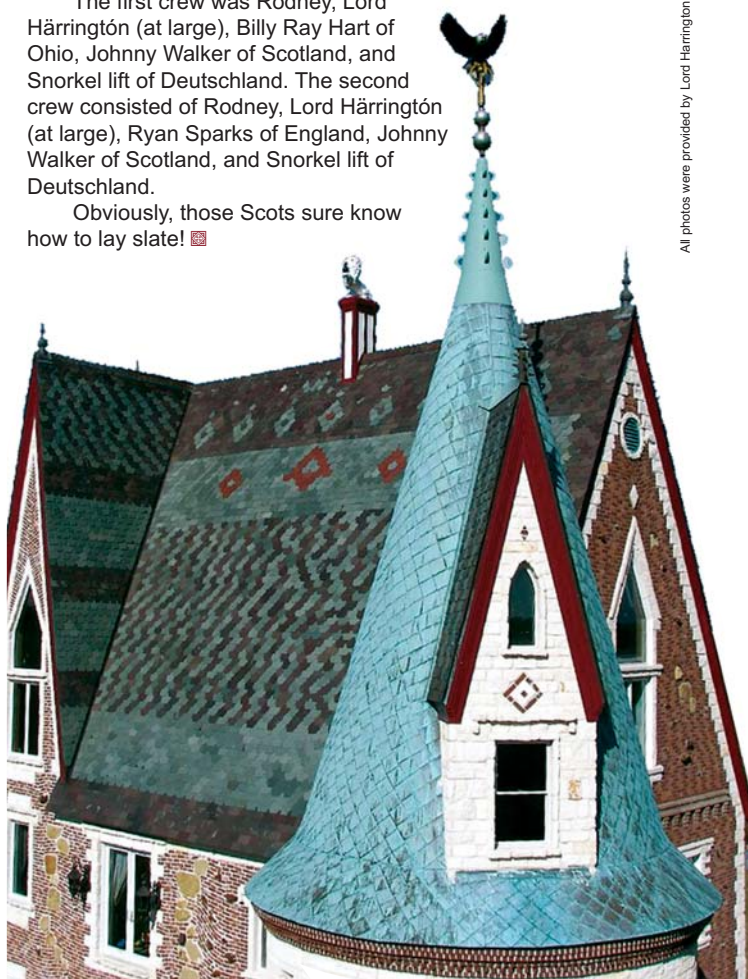
Harrington confesses that, "There is an occasional piece of copper showing on the side lap (particularly on those slates we dragon-scaled). This is due to the slate side laps being very close to 2" or 2 1/2" and I not wanting go down and get another damn slate that should work better. It was twenty-seven degrees Fahrenheit, with the wind blowing 25 miles per hour and we were 65 feet in the air on a boom lift!"

The roof sheathing is 3/4" tongue and groove plywood, glued, screwed and nailed with galvanized ring shank nails. This decking material was "recommended and 'preferred' by the slate quarry themselves. I know your opinion and I agree, yet that's the way they directed me. Due to ignorance on my part, I listened to them. I had not read your book [*The Slate Roof Bible*] as yet." [Editor's note: We strongly recommend solid lumber boards underneath slate roofing, not laminated or glued wood materials.]

90 lb. roll roofing with a galvanized comb and tarred seams were used as underlayment. "I knew this project would take an unknown amount of time to finish due to the heights and it being we are two bands of merry men."

The first crew was Rodney, Lord Härrington (at large), Billy Ray Hart of Ohio, Johnny Walker of Scotland, and Snorkel lift of Deutschland. The second crew consisted of Rodney, Lord Härrington (at large), Ryan Sparks of England, Johnny Walker of Scotland, and Snorkel lift of Deutschland.

Obviously, those Scots sure know how to lay slate! 🏴󠁧󠁢󠁥󠁮󠁧󠁿



All photos were provided by Lord Harrington.

TO TAR OR NOT TO TAR — THAT IS THE QUESTION

A PICTURE SPEAKS A THOUSAND WORDS — BY LIAM TOWER, SLATE AFFAIR, INC.

Why in the world would anyone do that to a masterpiece slate roof? What idiot did this?

These pictures don't illustrate my best slate roofing moments. Just look closely and ask, "Should you tar or should you not tar?" Slate roof installers use various adhesives that have been produced and promoted by suppliers, designers, and architects. I've installed slate using silicone and red tar, all recommend by architects. Now, however, my company, Slate Affair Inc., has stopped this practice because of staining and running issues on our masterpiece "wild slate roof." I've taken the time to observe and think this through, and now I understand how to use simple knowledge, architecture, and fasteners when installing slate roofs. This allows me to do away with the need to use any adhesives.

Various adhesives are used by builders, general contractors, and architects to provide, for example, a hurricane-proof slate roof perimeter. Typical commercial adhesives are silicone, Bull Dog Roofing Cement, liquid nails, and Geocel, to name a few. These adhesives, and others not listed, will not last as long as a correctly installed slate roof. While working as a young slater with different companies, I became introduced to the use of adhesives in the installation of slate roofs, even though most old slate roofs required no adhesives at all. Our typical applications would include silicone on the bottom corners of the slates in valleys, drip edges, eaves, hips, and any other potential penetration points.

I became familiar with Red Roofing Cement while working in Massachusetts. You can see this product in the photo. When using this cement, a lot of problems can happen, from dropping a small drip of it or knocking a can off the staging onto the slate and surrounding materials. Repairing slate that has this stuff on it is not a lot of fun. You start by sliding your slate ripper up under the slate to be repaired, only to pull out a red slate ripper. It's like you're one of King Arthur's knights stabbing an infidel with your broadsword and pulling it out bloody. You end up with red cement all over the place: your clothes, hair, face, and arms. Yes, that's right, you forgot to look at your feet and you just put a nice big red tar stain all over the floor of your company truck. It's not fun working with red roof cement — it's messy stuff, applied with a trowel.

When left with a mess, you learn the dos and don'ts of cleaning red tar stains from a slate roof — the roof doesn't clean itself. After about four days hanging out of a basket lift or stuck on ladders, our roof was finally cleaned of all the tar stains. One thing is sure, a stain is best cleaned as soon as it falls on a piece of slate rather than waiting till the end of the day. The best methods for cleaning the tar seem to be scraping, scrubbing with a citrus cleaning solution, or use of a pressure washer with a lot of hose. It's mostly time and patience until all the stain has been removed. With the scraping, I used a variety of tools — chisels, paint scrapers, razors, and the slate hammer. The hammer seems to be the quickest and best tool for removing a variety of stains. Its downfall is the groove made in the slate by the scraping action, so I only use it higher on the roof where it is less likely to be visible. Scrubbing with a brush and citrus cleaner is time consuming and is best used on lower roofs where people can see the roof from windows or from



the ground below. The citrus cleaner works best when left on the slate for long periods then rinsed with a pressure washer to remove the tar. Be careful with the use of a pressure washer on any slate roof; it's a great tool for removal of a stain, but only when set to a low setting and used with a citrus cleaner and brush. The pressure washer can cause the slate to flake apart.

How do I provide a long-lasting, wind-proof slate roof without using adhesives? Most slate roofs we install need no adhesive protection at the perimeters. Adhesives may be justified in areas prone to high winds such as a hurricane area or along the coast where wind damage may be common. Traditionally, there was nothing extra done to slate roofs for wind protection; typically it was left to an architect to design the roof with the wind in mind, among other things. A correct design for a slate roof included a steep roof slope and one-inch thick decking for good fastener connection. The way we build houses today has changed and so has the correct application of available building materials. The use of slate on low slopes makes it easier for wind lift to damage the roof.

There are some design considerations you can incorporate into a slate roof, without using adhesives, to alleviate wind uplift problems. One is to "dog ear" or clip the outside bottom corner of the slates running up a rake. As you can see in my pictures, all my slates are round, lessening the wind lift not only on the rakes, but on the roof as a whole.

Another way to avoid using adhesives involves nail placement. I have found that when nailing in wind-prone areas that a diagonal nailing pattern works better to keep the slate in a long-lasting position. Also, it is recommended to take the extra time to install thicker and nicer pieces of slate in the wind exposed areas. This will create an overall heavier weight on the roof's perimeter, thereby helping with wind issues and minimizing future repair problems. For wind protection and snow problems, instead of adhesives, there are other fasteners that can be used. Slate hooks, for example, are used in this way. Hooking the bottom of your slate helps to prevent wind lift. Others include copper wire and stainless steel hurricane clips (similar to slate hooks) to name a few.

I'm not trying to convince you to do anything. I'm just another slate roofer with photos to show you why not to use adhesives on a slate roof. What it comes down to is this: how easy was it when you did your first slate repair on a house when no adhesives were used? Or did you find the repair difficult and time consuming because adhesives were holding down the slate? No, it was a nice, easy slate repair without the adhesives, and when it was completed, the end product was a beautiful slate roof. That's why slate shingles should be installed without tar, glue, silicon or other adhesives in order to provide a beautiful, rugged, long lasting, and easy to repair stone roof.

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Joseph Jenkins

When a professional roofing contractor travels the world, he looks at roofs — even when he's on vacation he can't help himself. I have looked at traditional roofs around the planet on several continents, but I found the tile roofs of Guatemala to be particularly interesting.

Perhaps it's the simplicity of the roof system that is most extraordinary. Clay is rolled out like a pie crust into flat shingles and then tapered, one end slightly wider than the other. The slabs are then formed into curved tiles — pan tiles and cover tiles. These are fired to create a hard, durable roofing material. The tiles are then laid in courses up the roof with the pan tiles underneath and the cover tiles on top. No fasteners, no underlayment and very little wood is needed in this incredible roofing system. And guess what — the roofs last indefinitely.

But tile roofs *have* to have underlayment! That's what everybody says, don't they? Where's the ice and water stuff? Clearly, some types of tile roofs can last for decades, generations, maybe even centuries with nothing but clay and wood as the necessary ingredients. I've witnessed the same sort of simple tile roof systems and their extraordinary longevity in Europe. It seems the roofs were created before there were underlayment salespeople.

But what happens when a tile breaks or slides out? Well, you can just slide it back in or lift out the broken one and put a new one in its place. Guatemala is famous for its earthquakes,

yet these roofs are found everywhere, intact. It's worth taking a close look at this traditional roofing system just to understand how simple, natural and long-lasting a roof can be.

Figure 1 shows how the roof is assembled. The slight taper to the tiles allows them to overlap each other — the pan tiles are wider at the top and narrower at the bottom while the cover tiles are wider at the bottom and narrower at the top. They fit together simply and ingeniously to create an elegant roof. Figure 2 shows the actual tiles, front and back, including the overlap marks. There are no nail holes, notches, cleats or ribs. The tiles sit on top of each other and are apparently held in place by gravity — nature's glue. Figure 3 shows the underside of a roof. Wood members are spaced just right to allow the pan tiles to nestle in between them. The friction fit seems to be enough at that relatively low slope to keep the tiles from sliding down the roof. The cover tiles lie on top of the pans. Again like pieces to a jigsaw puzzle, the shape of the tiles prevents slippage while creating a roof without fasteners.

I managed to get a close enough look at the roofs to confirm that there was nothing holding the tiles in place other than their own weight. Some of them looked ancient. Someone came up with a pretty good idea ages ago and it has become a long-standing tradition in Latin America.

Pretty impressive. 🏡

Continued On Next Page ➡

Photos this article by Joseph Jenkins.



Figure 1



Figure 2



Figure 3

"Confessions of a Sissy Roofer"

James Godsil, President, Community Roofing & Restoration, Inc., Milwaukee, WI

I love my sissy roofer self.
Sissy roofers are a very good thing!

Sissy roofers wear gloves while working,
So their hands don't turn to hooves.

Sissy roofers wear knee pads while kneeling,
So their knees don't fail them before they're 40!

Sissy roofers send their friends to AA
Or family therapists,
Instead of tying one on with the bubbas
And whining about their lot.

Sissy roofers loathe Rush Limbaugh,
Preferring NPR. They voted for
Adalai, JFK, LBJ, Jimmy,
And now tilt toward Obama.

Sissy roofers partner with strong women,
And look forward to the day
When the corporate boys wake up and
Offer 50 pound bundles, so
Women, elders, and small bodied peoples
Can ply our noble trade.

Sissy roofers are like the harpooners of Moby Dick,
Except they would never wish to harpoon a whale these days.
They would rather ride whales, in the sea and on the land.

Sissy roofers read the mystic poets of all of God's children,
To help them deal when a comrade falls to brain injury or death.

Sissy roofers are obsessive about the use of time...
And attention to detail.
If you waste time, you make no money.
If you can't create a roof
That's like a 100 page manuscript without one typo,
You make no money.

Sissy roofers read the Greek tragedians,
To find support in facing up to this highly painful world of being.

Sissy roofers have a chance to climb high on the roofs at 60.
Macho roofers are done for, in the main, around 40.

Sissy roofers drink fair trade coffees at cyber cafes
And waft e-mails to sweet ones to bring closer the day
When the people awoken to the Holy City
They made of Milwaukee over the course of
A mere 5 centuries.

Sissy roofers have more fun.
They make more money.
They win respect.
They respect themselves.

If they ever get too old to climb
Sissy roofers will return to the ground
Work with radiant wastes and worms, and
Bring heavenly food to kitchen tables
Working with rather than warding out
The waters of the heavens.

Viva, Sissy Roofers!
Viva, Sissy Roofers!

Stone Roofing Of Norway



Mike McLaud has a history in stone. McLaud began his career in Seattle as a manager in a stone yard, then moved into the slate valley of Vermont. There he became a salesman at Vermont Structural Slate Co., a well known and respected slate producer in Fair Haven, where McLaud learned the ins and outs of roofing slate. His most recent interests include quartzite and phyllite roofing, leading to the founding of the Natural Slate and Quartzite Co., LLC, of Meadville, PA.

Few people realize that Norway is a producer of roofing slate and roofing stone. Nor do they realize that Norwegian stone roofing can be imported into the U.S. today via Mike's company. Mike has toured all the quarries in Norway as recently as this year. He's also been to Spain numerous times visiting slate quarries.

Norway has three principal towns which produce a natural stone roofing material: Otta, Oppdal and Alta, all visited by McLaud in recent years. Otta is a small town of about 2,750 inhabitants in central Norway nestled in a mountain valley at the confluence of two rivers. Its stone is a

semi-weathering phyllite material called "Otta" (Figure 1). The Norwegians have commercially produced phyllite stone for a century, according to

McLaud, where it is used for exterior panels, paving, interior flooring, and architectural products. It's also a common roofing material in that area. Phyllite roofs 100 years old or older are still in excellent condition, weathering to rusty, golden, copper or brown colors over time.

ors over time.

Both Oppdal and Alta stone, also named after the towns where they're quarried, are unfading quartzites, known for exceptional longevity, or, as McLaud says, "I've seen it on buildings over 300 years old." Alta stone, commonly formed into "beaver tail" shapes (Figure 2), is quarried in the arctic circle near the Alta River, one of Norway's premier salmon rivers. Oppdal stone roofing is characterized by untrimmed shingles (Figure 3). Both quartzite and phyllite are unlike slate in that they cannot be split on a grain, but have to be split along existing fissures.

Norwegian quartzite roofing comes pre-slotted for nailing and is typically shaped in "beaver tails," or as square shingles, 13"X13", 15"X15", 18"X18", and 21"X21". Natural Slate and Quartzite Co. can import Norwegian roofing for

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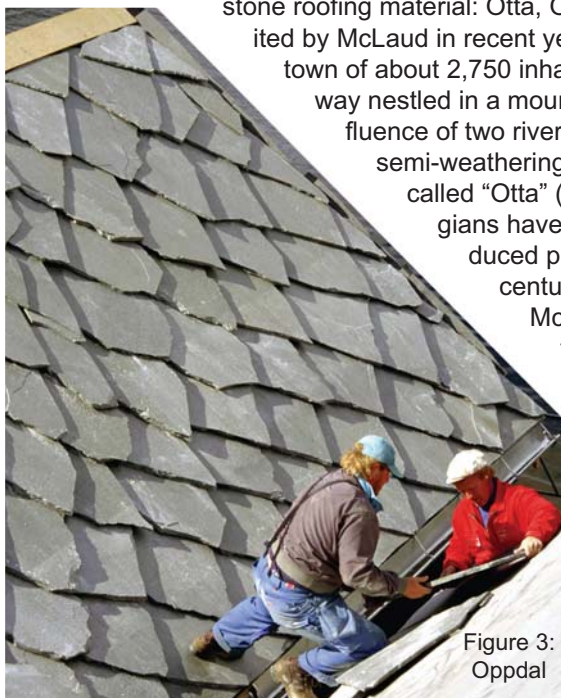


Figure 3:
Oppdal



Figure 1
Otta

Figure 2: Alta



customers who can order in container quantities. The roofing slabs will ship in three thicknesses: 25% Thins (8-12mm); 50% Medium (12-16mm) and 25% Heavy (16-20mm). They can also import Franvisa Spanish black slate and Verde Lugo Spanish green slate in container lots for interested customers. McCloud also sells soapstone for counters, Spanish sand-

stone for walkways, Vermont slates for any purpose, Pennsylvania slate, wall stones, and Norwegian stone roofing.

Contact: Natural Slate and Quartzite Co., LLC, Michael McCloud, PO Box 721, 548 Beers Avenue, Meadville, PA 16335; Ph: 814-547-5740; Cell: 814-853-7832; Fax: 814-807-0273; www.natslateandquartzite.com.

Photos and logo for this article were provided by Mike McCloud and used with permission.

**MINERA
SKIFER**



McCloud displays a variety of imported roofing shingles.



Review by Joe Jenkins HORSHAM STONE ROOFS

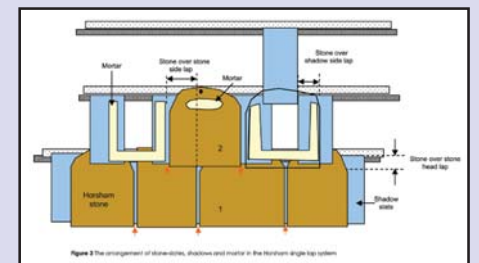
Stone Roofing Association 2008 —<http://www.stoneroof.org.uk/Horsham%20guide.pdf>

Here is an interesting, downloadable 16 page PDF document about stone roofing techniques that aren't discussed very often. Of particular interest to me was the use of "shadow" slates underneath heavy stone shingles, where thin slates are utilized in a manner similar to bib flashings on heavy stone roofs. I have seen this technique used on only one slate roof — a graduated roof with massive lower slates where thin, 3/16" slates were inserted under the vertical butt joints of the largest slates in order to fortify the water-shedding ability of the roof. *Horsham Stone Roofs*, among other things, illustrates a technique similar to this. This booklet was developed during a series of meetings and discussions with people experienced in the use of Horsham stones and it describes the state of the art.

Excerpt: "There are two systems of roofing with Horsham stone — the 'normal' double lap system and single lapping which is unique to Horsham stone roofs. Both systems use random sized slates which are arranged on the roof with the largest laid at the eaves and gradually diminishing to the smallest at the ridge. Traditionally, in both systems, each stone-slate was top hung with wood pegs on split wood laths. Top hanging was essential when thin split laths were used, but the usual modern practice is to nail them to substantial sawn battens. It is conjectured that the earliest Horsham roofs — predating the 19th century — always used the 'normal' double lapping system, where course three overlaps course one, four over two, etc. This is the system which is almost always used for sandstones, limestones and slates throughout the UK. In the Horsham single lap system, the slates only overlap the slates immediately below — course two overlaps course one and so on. This leaves a gap along the perpendicular joints. This is weathered with pieces of metamorphic (Welsh) slate, known as shadows or shading, and these and the Horsham stone slates are bedded in mortar." [see illustrations below]

Contact: Terry Hughes
Stone Roofing Association
Ceunant, Caernarfon LL55 4SA 01286 650402 terry@slateroof.co.uk; www.stoneroof.org.uk

Photos used by permission of Terry Hughes.



READERS WRITE

HEAT TAPES — *What is your opinion of heat tapes and slate roofs?* M.Y., MA

TR — Heat cables can be effective where needed, if installed properly. We install them by drilling a small hole (3/16") with a masonry bit on the bottom corner of the slate, then running a copper or stainless steel wire through the hole to tie the cable to. Heat cables are rarely needed, but if you do need them and can install them without damaging the roof, they will keep ice from building up along eaves and in gutters and valleys.

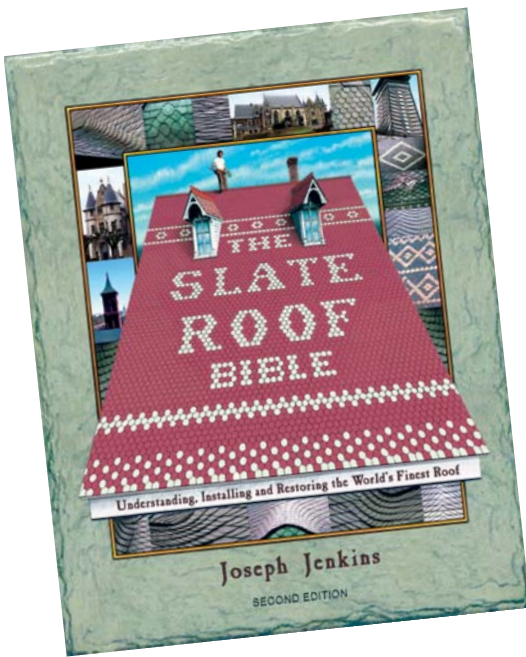
GERMAN SLATING — *I am a roofer from Germany and I'm interested in slate all around the world. Here in Germany we have a lot more slate styles to work with — the old German style for example. No one can learn this from reading a book; you have to exercise many years and still you will learn even more on every roof. I'm always glad to have someone with me from the old school. Here are some pictures of the old style. If you are interested in more, or if you want more information, just let me know, or maybe we can start a discussion on the slateroofcentral.com message board. My English is terrible, but by that way I can get some exercise.* M.Z., Germany



TEDDY ROOSEVELT'S CHURCH — *I took this photo for you [right]. The original exterior of this church was clapboard and at some point in the past they applied a stone veneer over the clapboard. What you see at the edge of the roof is how they wove the slates in horizontally to extend the field of the roof out over the veneer. I have never seen this before. This is on Teddy Roosevelt's church on the North shore of Long Island. We hope to be doing masonry restoration work in future on another area of the church.* Ken Follet

CONTRACTORS VS. DIYERS — *I am finding the debate in TR over roofing contractors vs. DIYers entertaining. I am an architect and have been involved in construction since I was a kid. I have heard claims that as much as 90% of all construction lawsuits involve roofs. Certainly, the largest single area of problems I have had to deal with is roofs. And somehow the roof always leaks over the custom wood parquet floor in the owner's office. There are some very good roofers out there — they are not the norm. It is very easy to get into the roofing business, generally requiring less skills, and experience.*

About 10 years ago we rebuilt a 200 year old church after it was nearly destroyed by fire. They had a beautiful slate roof, but could not afford to replace it. We selected a concrete fiber ersatz slate that is popular in Europe as the most affordable alternative at that time. Within two years "slates" were sliding off the roof, the contractor who had originally put the roof on persuaded the congregation that the problem was with the concrete fiber shingles the architect had selected and offered to replace them with asphalt. Since this was an obvious design error, the architect should have to pay for it. Concrete fiber shingles are frequently used by roofers with experience in real slate in Europe without difficulty all the time. Most manufacturers of concrete fiber shingles in the U.S. — in fact most manufacturers of almost all innovative roofing materials over the past four decades have left the U.S. market due to lawsuits.



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WRITERS DIGEST: "The author's obvious love for the subject comes through in all aspects of the book, from the text's dense information to the scores of wonderful photos throughout the book. The craftsmanship of the book itself is very professional. All in all, a very good read."

MIDWEST BOOK REVIEW: "...a not-to-be-missed specialized reference. Packed with over three hundred color photos, the Slate Roof Bible is the core reference of the slate roof industry, covering everything to know about installing, restoring and maintaining a slate roof. Highly recommended."

WRITERS NOTES BOOK AWARDS: "The Slate Roof Bible was the first book to grab our attention and hold it. It's more than just a handbook. It's a great read and a thorough reference volume in one, a rare combination of fact and experience that creates learning and appreciation — a reference book that becomes literature."

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SLATE ROOFS

AVOID THESE 21 CONTRACTOR ERRORS

Joseph Jenkins



Figure 1: These photos of existing slate roofs attest to the durability, beauty, and longevity of this natural roofing system.

and 150+ years, depending on the type of slate. The best slate roofs use a good quality slate of known origin and proven performance, fastened with corrosive-resistant fasteners such as copper, stainless steel or hot-dipped galvanized nails, attached to decks of solid wood at least 3/4" thick. Pretty simple. So what goes wrong? Well, here are some examples, in no particular order:

1) SIZE OF SLATE: The smaller the slate shingle, the more that are required to cover one hundred square feet of roof — a "square." For example, the largest standard size, 14" X 24", requires 98 shingles per square. The smallest standard size, 6" X 12", requires 533 shingles per square. Since each shingle is attached to the roof deck with two nails, obviously the smaller slate will require much more labor during installation. If a contractor is not aware of this fact, he may choose to purchase small slates simply because they may be less expensive. In one case, this proved to be a dire error — the contractor bought 6" X 12" slates for a re-roof on a 12 story building in Kansas, probably trying to save money on materials, then he went bankrupt halfway through the job, no doubt because his labor costs were sky-high.

2) TYPE OF SLATE: Ideally, the slate selected for a project is a tried-and-proven material with many decades of outstanding performance in the field, manufactured by a company that takes pride in its product. Most American and Canadian slates fall into that category. However, there are many foreign slates entering the American market these days with little or no history of performance. In one recent case, a very large two-year-old roof installed with Chinese black slates *faded*, or changed color dramatically to create a splotchy, unpleasant black/white appearance. The entire roof had to be removed and reslated at great cost. This is not to suggest that all Chinese black slates will do this, but obviously some will. Selecting the correct slates can be very tricky when the slates come from an-

other continent and you can't trace their origin back to any particular hole in the ground.

Some Spanish black slates are known for their pyrite content, which will bleed red rust stains down the roof. Figure 2 shows such a slate taken off a residence in Florida after only one year on the roof. This large residential roof had to be completely reslated, again at great expense. The owner of the residence selected this slate because he liked the shade of black, not understanding that some slates can change in appearance with exposure to weather. When selecting Spanish slates, it is important to know whether those being considered are pyrite-bearing, a condition that may or may not be obvious by visual inspection. In a recent case on the east coast, an entire church roof had to be reslated because the new Spanish black slates were bleeding rust down the roof and the church people did not like the way it looked. Again, this is not to be construed as a condemnation of all Spanish black slates, as some are quite good.

In another case, Spanish black slates were ordered for a large roof, but they were not all from the same origin. Although they looked the same sitting in the pallets on the ground, once they were installed on the roof, they created a slightly mottled look that was unacceptable to the property owner. It's hard to say who to blame this mistake on — the supplier, who should have known they were not sending the same material to the job site, or the contractor for not rejecting the slates due to obviously different pallet markings suggesting slates of different origins. The contractor could also have prevented the unsightly, patchy mottling of the roof by thoroughly blending or shuffling the slates before installing them. This would have allowed for a uniformly mottled effect that is pleasing to the eye.

3) OPENING PALLET: Even if the slate is all from the same source, different pallets can contain different shades of

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Figure 2: This Spanish black slate leached rust stains down the new slate roof after only one year.

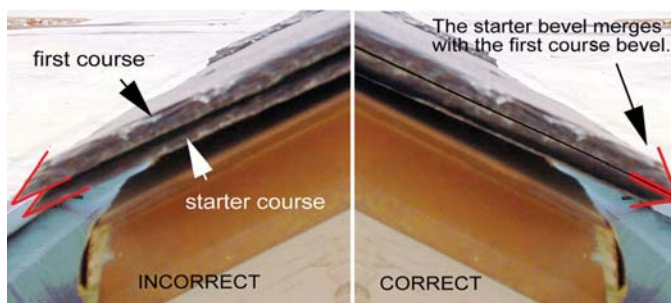


Figure 3: Even domestic slates can rust. These Vermont slates on a high-rise apartment were poor in quality and should have been screened for pyrite inclusions.



Figure 4: Traditional slate roofing systems, despite their incredibly successful performance, are being largely abandoned in favor of plywood roofs with peel and stick underlayment.

Figure 5 (right): The starter course should be flipped over and laid up-side-down as shown on the right in this illustration. This creates a clean drip edge and allows for correct nail counter-sinking.



slates due to the location of the rock strata or other factors related to the quarrying of the material. Therefore, when the slate is delivered to the site, all of the pallets should be opened from the outset and slates taken simultaneously from each pallet in order to blend the entire inventory and create a pleasant appearance on the roof. It is a mistake to start with one pallet, install those slates, then open another pallet, install those slates, etc.

4) CULL OUT BAD SLATES: Poor quality slates can originate from any quarry. This may be due to the manufacturer not culling out rejects, for example. Shoddy quality control can lead to rusting pyrites on even the best American slates. Figure 3 shows Vermont slates badly rusting down an apartment building roof. This is unusual and indicates a commercial source of roofing slate that should have been avoided, or a bargain slate that wasn't worth the money, and/or a contractor who should have culled the defective slates out, but didn't know what a bad slate looked like.

5) BUY FROM A CONSCIENTIOUS SOURCE: There are other nuances related to the manufacture of roofing slates that can affect quality and longevity. Direction of grain and nail hole placement are two examples. A good manufacturer will be aware of these nuances and strive to produce top-quality slate. It pays to buy from such a slate source.

6) DON'T REINVENT THE WHEEL: Styles and methods of slate installation can vary greatly, but one important point needs to be emphasized: if it's *longevity* that's desired, then the installation system should be based upon known methods and materials that have proven themselves. A solid, not laminated, wood roof deck, with the emphasis on correct slate and flashing installation and not on underlayment, has proven to provide exceptional longevity. Such traditional methods and materials can easily be replicated today, yielding the same degree of success. Figure 1 shows a number of existing slate roofs that have stood the test of time despite being made only of slate, wood and fasteners.

Figure 4 shows a 150-year-old slate roof being replaced in Boston. Although the roof was still functioning at the time of replacement, and the existing roof system, made of slate, 1" boards, 30 lb. felt, and nails, had demonstrated a 150 year performance, the contractors who replaced the roof completely abandoned the existing system and replaced it with one that had no proven longevity, emphasizing underlayment and completely eliminating any chance of air transpiration. The original 1" roof board deck, still sound, was covered with 1/2" plywood, then peel and stick, then 30 lb. felt, then slate. Will this new roof system last 150 years? Time will tell, but why reinvent the wheel? A chain is only as strong as its weakest link. Traditional slate roofing systems have already proven themselves, are less expensive, are more environmentally friendly, and take less time to install. If one wants to guarantee that a slate roof will last a century or two, traditional methodologies should be followed.

7) GET THE STARTER COURSE RIGHT: The starter course is the very first row of slates to be installed. Starter slates are invisible once the roof is completed because they're hidden underneath the



Figure 6 (above): No slate lies flat on a slate roof. Every slate is angled, which is why they should not be walked upon and why the starter course requires a cant.

first course of slate. The starter course slate should be installed face down, unlike all the other slates on the roof, which are installed face-up. This is the traditional installation method as it allows for a clean drip edge where the starter slate meets the first course (Figure 5). Inexperienced installers often put the starter course face-up.

Often, the cant or shim strip is missing underneath the starter course. Starter slates must be angled on the roof in order to match the angle of all the other slates in the field of the roof (Figure 6). Typically, this was done by installing a wood strip (Figure 7), but it can also be achieved by using a metal drip edge with a cant formed into the metal, or even by raising the fascia.

Another common mistake on starter courses is a lack of headlap, especially when the field slates are turned sideways and used for starter slates. An example of a starter course lacking headlap is shown in Figure 8. Read more about starter courses in TR 5 (traditionalroofing.com).

8) GET THE HEADLAP RIGHT: If the headlap is missing or inadequate, the roof is probably going to be condemned. Headlap is the overlap on each course of slate by the second course above it (Figure 9). This overlap is what prevents the roof from leaking. Three inches is standard, but headlap can vary according to the slope of the roof. Figure 10 shows a shopping center roof in Louisiana, newly installed, with about an inch of headlap on the field slates. The overlap should be 3". There is no fix for this inadequacy other than to rip off the entire roof and start over.

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Figure 7 (above): Note that the starter slate is laid back-side-up and is propped up by a cant strip.

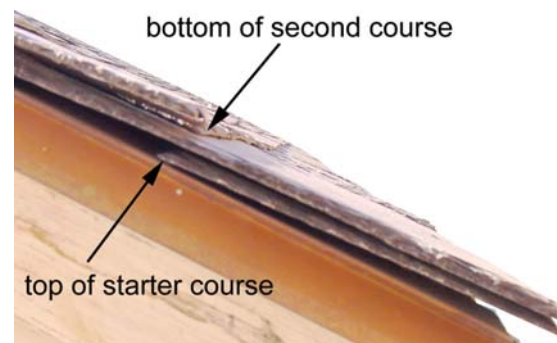


Figure 8 (above): The starter course should be overlapped by the second course by at least three inches. In this case, it is not overlapped at all. This is a serious, but common mistake. Note also that the starter slate is incorrectly laid back-side-down. This is an indication that the installer was inexperienced in laying slate.

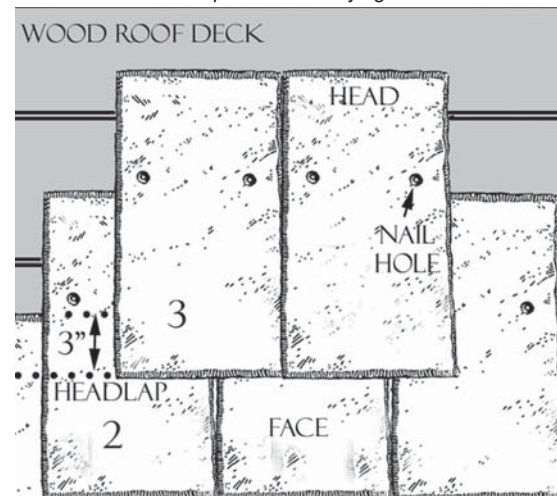


Figure 9 (above): Headlap is a critical detail on a slate roof. Lack of headlap will cause an entire roof to be condemned. Read more about headlap in TR6.



Figure 10 (right): This is an example of inadequate headlap (about 1") on a shopping center in Louisiana. There is no solution for this poorly installed new slate roof other than to remove it and start over.



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Figure 11: When the slate courses are spread too far apart vertically, negative headlap can result, creating holes all through the roof.

Negative Headlap



Figure 11 shows a university building with a new slate roof — and, incredibly, *negative* headlap. This is the same as having holes all through the roof. It's hard to believe that roofing contractors can make such drastic mistakes, especially on institutional buildings, but seeing is believing. Read more about headlap in TR 6 (traditional-roofing.com).

9) WATCH YOUR LATERAL OVERLAPS:

Lateral overlaps, or sidelaps, should also be 3" minimum. However, don't be surprised to see slates with no lateral overlap at all, as shown on an historic building in Georgia (Figure 12). Incorrectly placed sidelaps can leave the butt-joint directly over the slating nails, as shown on an historic Pennsylvania State Park building in Figure 13. This will allow direct water entry through the nail holes.

10) AVOID OVER-NAILING AND UNDER-NAILING: Another common installation mistake is the overnailing and undernailing of the slates. Slate nail holes are meant to be crater-shaped to allow the nail head to sit down inside the slate (Figure 14). Otherwise, the nail head will protrude above the slate and rub against the overlying slate, eventually creating a hole (Figure 15). When the nail isn't driven far enough, this is known as undernailing. Overnailing, on the other hand, is when the nail is driven too far and breaks through the back of the boards and splinter out the wood, reducing the board thickness where the nail is located and undermining the effective holding power of the nail (Figure 17).

11) USE THE RIGHT NAIL LENGTH: Nail length is an issue that is commonly off the radar screen of the average roofing contractor. The slating nails should barely penetrate the roof deck boards. If the nails are too long, they break through the back of the boards and splinter out the wood, reducing the board thickness where the nail is located and undermining the effective holding power of the nail (Figure 17).

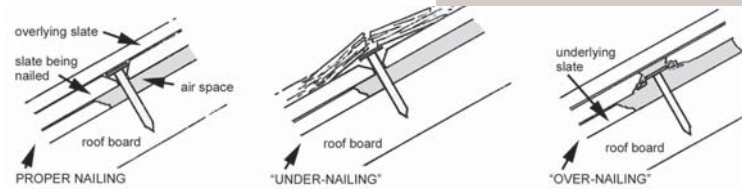


Figure 14 (above): A good slater has no problem nailing slates correctly. When properly nailed, the nail head just sits down inside the slate. When undernailed, the protruding nail head can damage the overlying slate over time. When overnailed, the slate being nailed will crack, break, or cock awkwardly on the roof.



Figure 15: A protruding nail head eventually wears a hole in the overlying slate.

new slate roof installations is what I call the Bigfoot Syndrome — roofers walking on the slates during installation, as shown in Figure 18 on a new bank building in Kansas. An experienced slating crew will make every effort to keep off the slates during installation by staging the roof correctly (Figure 19). When Bigfoot walks all over the slates, the shingles

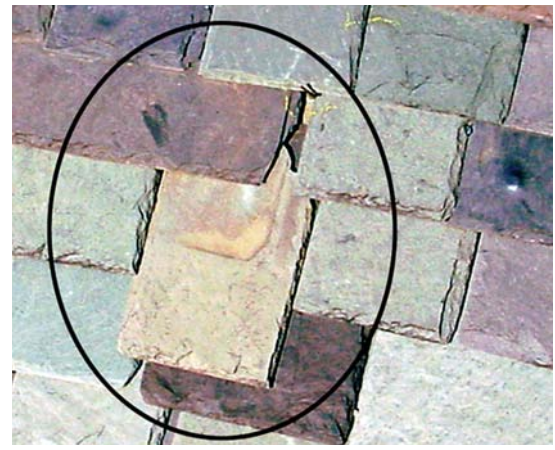


Figure 16: This slate was nailed so tightly that the nails broke through the slate and the slate is sliding out.



Figure 17: When the slating nails are too long, the back of the roof decking breaks out. This reduces the effective holding power of the nail. A longer nail, therefore, does not mean more holding power. The best nail length just barely penetrates the roof deck, if it penetrates at all.



Figure 18: It is a mistake to walk on a slate roof during installation.



Figure 19: A correctly-staged slate roof will enable the roofers to install the slate without the need to walk on the shingles.

Continued On Page 14

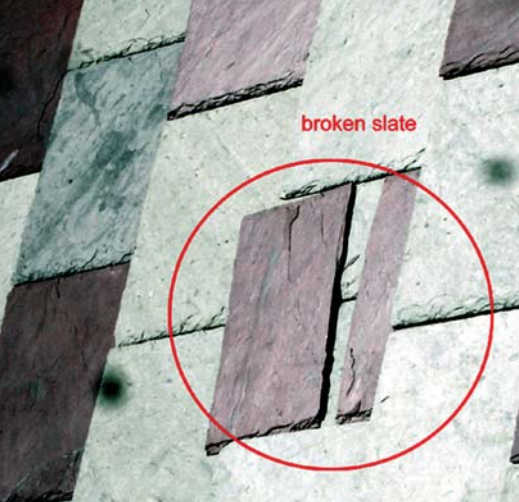


Figure 20 (above): Slate roofs that are walked on during installation will shed slates after the roof has been installed, perhaps for years.



Figure 21 (above): Uphill flashing should always lap on top of downhill flashing. Negative overlap, as shown, will leak.

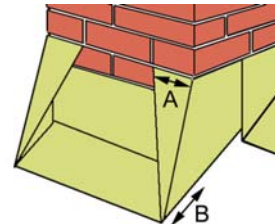


Figure 23 (above): This chimney corner flashing (left), although folded, was installed incorrectly and will surely leak. A properly folded corner flashing must account for the water that runs down the chimney as well as the water that runs down the roof. In effect, the flashing should create a mini-roof over each corner.



Figure 24 (above): This is a case where the corner flashing is neither folded nor soldered, leaving a large hole in the roof.

Contractor Errors —
Continued From Page 13

crack and break (Figure 20). They may not fall apart immediately, but I have seen a hundred slates fall off a new slate roof within five years after installation due to the Bigfoot Syndrome.



Figure 25 (above): Box gutters require expansion joints, otherwise the solder joints will crack under pressure. This is evident by solder joints that have been covered by roof cement, a common sight on box gutters, new and old.

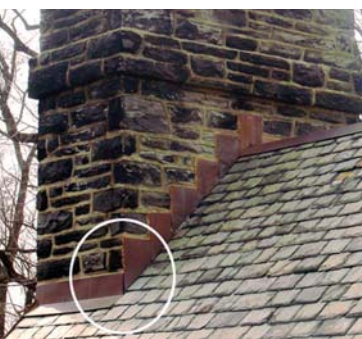


Figure 22 (above): Chimney corners flashings should either be folded or soldered. If neither is evident, then the corner is either sealed with sealant, or with nothing. In either case, this is a leak waiting to happen.

13) INSTALL FLASHING CORRECTLY: Flashings provide all sorts of opportunities for error. Negative overlap, for example, is sure to leak. Figure 21 provides an example of negative flashing overlap. Uphill flashing should always lap on top of downhill flashing. When lower flashings lap on top of higher flashings, water can enter the roof. Corner joints on roof penetrations are also commonly flashed incorrectly — chimneys provide a perfect example. The corner flashings must either be correctly folded, or else soldered in order to prevent leakage there. If a corner isn't folded or soldered, as shown in Figure 22, then the only thing keeping it from leaking would be caulk or sealant, which does not have adequate longevity. An incorrectly folded chimney corner is illustrated in Figure 23. This is a leak waiting to happen. Dormers also often have corners that need to be flashed. Without the knowledge of folding corners or soldering, a dormer corner can be left wide open and waiting for the first good rainstorm (Figure 24).

14) ALLOW FOR METAL EXPANSION: Common on many slate roofs are built-in gutter systems. "Box gutters" require expansion joints, but they're often installed without any allowance for expansion whatsoever. This becomes evident by the failure of the solder joints (Figure 27), which are often roof-cemented after they start leaking in order to alleviate water penetration (Figure 25). Expansion joints (Figure 26) can be added after the gutters are installed, but it's a lot easier to install them correctly in the first place. Read more about expansion joints in TR 6 (traditionalroofing.com).

15) USE COMPATIBLE METALS: A common sight on new slate roof installations is metal incompatibility, often steel and copper used together (Figure 28). The copper will "eat" the steel, causing steel fasteners to degrade at an accelerated rate.

16) THROW OUT MAGNETIC RIVETS: Many roofing supply outlets sell copper rivets with copper-plated steel mandrels. When



Figure 27: This is a perfect example of a new built-in gutter showing failed solder joints because not a single expansion joint was installed in the gutter system.

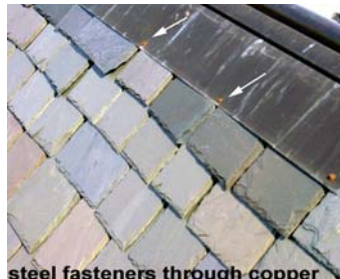


Figure 28: Steel fasteners on copper, as shown, will deteriorate.



Figure 26 (above): Expansion joints allow built-in-gutters to move when expanding and contracting, thereby relieving the stress on the solder joints and prolonging the life of the gutter.

Continued On Page 16

It was with great interest that I came across a copy of the new book, *Historic Slate Roofs — With How-To Info and Specifications*. Although no author is named, it is published by Schiffer Books of Atglen, PA, and was produced in collaboration with the existing National Slate Association, according to the Foreword and Acknowledgements. In a nutshell, the book is a reproduction of the classic, *Slate Roofs*, published by the original National Slate Association in 1926. *Historic Slate Roofs* includes a front section of 19 color photographs, "A New Preface to an Expanded Classic." These photos were included in order to "update this book with images of an actual installation."

Full disclosure: I am the author and publisher of the *Slate Roof Bible*, publisher of the *Traditional Roofing Magazine*, founder of the Slate Roofing Contractors Assoc. of North America, Inc., former Board Member of the National Slate Association, and an international slate roofing consultant with decades of direct involvement in the slate roof contracting field. I still maintain a slate roofing contracting business, powered by the son (both of them), and am a slate roof consultant.

Before I start critically examining this new book, let me say this: should you buy it? Yes. It has a hardcover, the price is good, it's well made by the Chinese (who are good book producers), the photos are excellent quality, and you get an exact copy of the original 1926 classic, *Slate Roofs*. If it were only a copy of *Slate Roofs*, it would have been a better book — most of the misinformation comes with the added material. Having said that, however, the original *Slate Roofs* had its share of misinformation as well. The publication of *Historic Slate Roofs* provided an opportunity to correct some of that original erroneous material, but the errors remain intact, which is disappointing.

The original *Slate Roofs* is a worthy reference resource to have on hand. It's full of good information. However, I find fault with some of the practices suggested, such as bedding hip and ridge slates in mastic. This practice may be fine for the installer, but when the restoration or repair contractor must come back later and repair the roof, the glued slates won't come apart without breaking. They weren't thinking about this when the book was published back in 1926, but now that we're doing a lot of restoration work here in the U.S., slates glued down with mastic are a big headache. Luckily, most installers did not follow the instructions in *Slate Roofs* and most hips and ridges are free of mastic and can be taken apart and put back together. Slaters back then were an experienced bunch who could figure out the proper way to do things. What makes me cringe is the thought of the new hips and ridges that will be installed with mastic by inexperienced roofers following erroneous instructions being published today.

There are numerous other examples of questionable information and inaccurate illustrations in *Slate Roofs* that I could cite, but won't, due to a limitation in space here. I must however point out, as I have done many times in the past, including at NSA Committee Meetings, that the photo of the roof brackets in *Slate Roofs* on page 15 of the original publication is

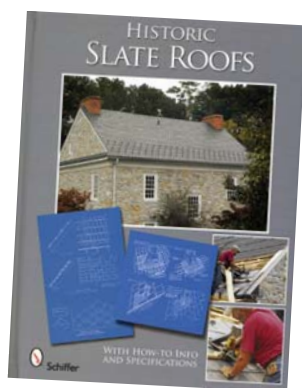
BOOK REVIEW

HISTORIC SLATE ROOFS

With How-To Info and Specifications

2008; \$25.99 (add \$5 for S&H) Schiffer Publishing, 4880 Lower Valley Rd., Atglen, PA 19310 ; Ph: 610-593-1777; info@schifferbooks.com

Reviewed by Joseph Jenkins



upside-down, reproduced without correction in *Historic Slate Roofs* (Figure 1). The correct orientation for this image would be 90 degrees clockwise (Figure 2). If an unsuspecting person were to install the roof jacks according to the published illustration, the roof scaffold would immediately collapse. When one considers the inherent danger of the slate roofing trade, every effort should be made to ensure safety. There is no excuse for publishing an incorrect image of this nature, over and over again (some quarries also re-publish *Slate Roofs*, without corrections). OK - now that I have that out of my system, let's move on.

The use of 19 photographs of a new slate installation in the beginning of the book was a good idea. It's unfortunate that they show bad practices. For example, the photos clearly show each course of slates being installed with a layer of peel and stick glued over the top of the slates. The peel and stick is then covered with felt (Figure 3). The slates are then chalked on the slate face to align the next course. Once again, this is an installation technique that assumes the roof will never need repair or restoration, because trying to repair a slate roof that has the slates glued down with peel and stick is impossible. Even just felt paper installed on top of the slates is an awful practice, one that may be appropriate for cedar shakes, but not for slate. Why not? Try to slip a slate ripper underneath a course of slates where felt paper lurks between the slates. The paper interferes with the ripper — it bunches up and prevents the ripper from accessing

the slating nails, making repairs a giant headache. This is the voice of experience speaking here. Laying paper on top of slates is a mistake. Installing peel and stick over top of slates is a disaster.

The headlap was shown correctly, but it would have been helpful if the roofers were shown using a slate hammer rather than a drill to put holes in slates, or even a slate hammer being used to install the slates themselves rather than a carpenter's hammer. It would have been better to show a replacement slate being installed on the new roof with a slate hook rather than with a nail and bib. I would not recommend these photos as reference material for anyone wanting to install a slate roof.

Page xiii is a "Roofing Slate Detail and Specification Sheet." The specifications call for a cant strip "1 inch in thickness at the lower side and 2 in. or more in breadth..." However, standard thickness slates require a cant that is about 3/8" in thickness (1/4" to 1/2" will work), not one inch. The specifications also call for 40 lb asphalt felt, which is not easy to come by these days (30 lb is typical). They also call for "16 ounce soft rolled copper flashing 24 in. wide fastened at the top only" for open valleys. In fact, the width of the valley copper depends

on the exposure of the valley — 24" is excessive under most circumstances. Fastening only at the top is not a good idea either. Furthermore, 20 ounce partially hardened copper is far more preferable than 16 ounce soft copper in valleys, where longevity and durability are important. Regarding ridges, the specifications state, "that the three top courses of slate shall be laid in elastic cement..." a slate roof restoration contractor's nightmare. And for hips, "All hips shall be... embedded in elastic cement..." an issue I have already discussed, with ample chagrin.

If the reader suspects that I am intentionally trying to pillory this new book, I am not. As a published slate roofing educator, however, I do take umbrage at the thought that the misinformation I have been trying to clear up these past eleven years, since I published the *Slate Roof Bible* in 1997, continues to be published and disseminated with the full knowledge of professionals in the field. Buy the book, put in on your shelf as a reproduction of a historical document, but don't rely on it for correct slate roof installation specifications. ☒

Figure 1 - upside down brackets

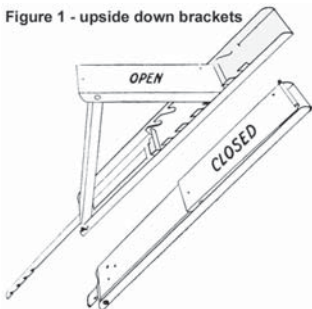


Figure 14. A Satisfactory Scaffold Bracket

Figure 2 - correctly rotated

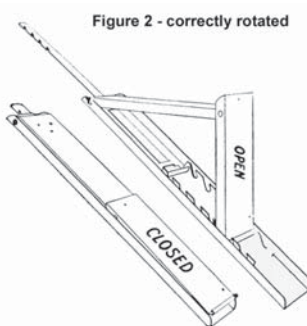


Figure 3



NEW RIVET RUSTING

Figure 29: Copper rivets with steel mandrels will rust almost immediately, even through a solder joint.

RUSTING THROUGH SOLDER

the rivet is installed, the steel mandrel breaks off inside the rivet, lurking there to eventually rust and create a hole in the flashing (Figure 29). These rivets *look* like they're made of copper, but they aren't. Check them with a magnet to be sure. Copper is not magnetic, but steel will stick to a magnet like glue. Copper rivets should have brass mandrels, not steel. If they're magnetic, pitch them.

17) DON'T SOLDER WITH AN OPEN FLAME:

Open-flame torches should never be used to solder flashings, so if you see a worker on a slate roof soldering a box gutter, for example, with an open flame plumber's torch, *say something*. The flame is too hot and will ignite the substrate, be it felt paper or rosin sheet, which will then smolder underneath the metal, perhaps unnoticed until it's too late. If the smoldering is noticed, panic will ensue because there is no way to get to the fire without first ripping out the flashing. The correct tool for a soldering job is a closed-flame soldering device, or a heavy-duty electric soldering iron. Open flame devices can be used on external copper gutters, however, because the metal is not in contact with the roof.

18) HANG GUTTERS BELOW PLANE OF

ROOF: Speaking of gutters, they're often hung too high. The outer edge of external gutters should be below the plane of the roof (Figure 30) in locations where snow or ice could slide down the roof and knock them off. The gutter in Figure 31, for example, will not last long.

19) USE ENOUGH SNOW GUARDS: Snow retention systems are another source of problems when they're installed incorrectly. One of the tricks for a proper snowguard installation is to use enough of them. Otherwise, they won't be able to hold the weight of the ice and snow and will rip out, taking slates with them. A poor snowguard installation is shown in Figure 32. The lack of snowguards on this large roof caused many to rip out during an icy winter. Follow the manufacturer's guidelines when installing these popular slate roof elements.

20) USE THE CORRECT TOOLS: Incorrect tools can be the downfall of many a would-be slater. Slate roofing has its own unique set of tools and equipment. For example, slates should be cut with, you guessed it — "slate cutters." A slate cutter will leave a beveled edge on the shingle, allowing it to match all the other shingles on the roof, all of which have beveled edges. If a diamond blade is used to cut the slates, a square edge remains, which can stick out like a sore thumb and get a roofer into trouble if the property owner doesn't like the look of it. Figure 33 is a perfect example of square edges exposed at the wrong place on a slate roof. These square edges could be dressed with a slate hammer and stake to give them the proper appearance, but one has to first have these tools in the tool box. When the proper cutter is not on hand, a roofer will resort to drastic measures to try to cut slates, as shown in Figure 34, where it looks like the slates were chewed off by Bigfoot himself. This brand new roof, by the way, also had to be completely removed and reslated, causing the property owner much expense and grief.

21) INSTALL UNDERLAYMENT UNDER SLATES: I looked at a new slate roof where a first-story section had been installed with self-adhering underlayment (ice membrane) pasted over top of each course of slates before the next course was laid. You couldn't see the underlayment because it was covered. That winter was a bad ice year and an avalanche fell on the first-story roof, damaging the slate. I was asked how to repair it. "Rip it all off and reslate it," was my advice. There is no way to repair a slate roof that has been glued together like that. The beauty of traditional slate roofs is that they are like cars, you can remove any part and replace it, and in so doing, you can keep such a roof alive for centuries. Glue the roof together, then try to

take it apart for later repair or restoration. It isn't gonna happen.

Hopefully, you've gained some knowledge from this little sampling of slate roof mistakes. Yes, there are others, but there are only so many pages in this magazine. Slate roofing is not rocket science, and any reasonably intelligent person who takes the time to become informed about the topic will be able to successfully install a roof sure to last for generations. There are plenty of slate roof resource materials available both in print form and on the internet. A couple hours of research can save a roof installer a lot of headaches, prevent high blood pressure and ulcers, and keep him out of litigation. I long for the day when every slate roof I survey is free of major defects. In the meantime, I won't be holding my breath waiting. 🍷



Figure 32: Snowguards must be installed in adequate quantities, or else they will get knocked off in the first bad ice storm and will damage the roof in the process.



Figure 33: Diamond blades cut a square edge on slates, making them stick out like a sore thumb.



Figure 34: Slate roofing requires the correct tools to do the job right. There is no excuse for the sort of work shown above.

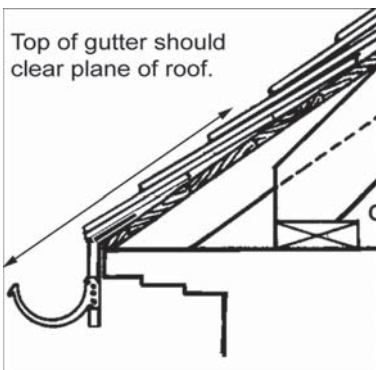


Figure 30: Ideally, the outer edge of external rain gutters should be hung below the plane of the roof to prevent damage to the gutters from sliding ice and snow.



Figure 31: This gutter is just waiting for a snow avalanche to knock it off.

Greenstone: More Than Quality Vermont Slate



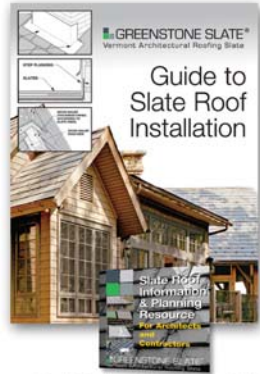
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INDUSTRY SPOTLIGHT

Triple M Contracting, North Billerica, MA

Three brothers in North Billerica, Massachusetts, just north of Boston, are keeping the slate roofing trade alive through their company, Triple M Contracting, Inc. Having two grandfathers who were expert carpenters, the Menezes boys (pronounced "ma-knees") had a solid foundation on which to develop a specialty roofing trade. Kevin Menezes, 54 (below, right), runs the office end of the business with his wife's help, operating from a wing of their 1890 farm house, which includes a sheet-metal shop. Brothers Keith, 50 (below left) and Frank, 43 (below, center), do the ladder and roof work. They're helped in the field by Jeremy Antonuk and John Ganley.

Triple M's specialty roofing business began in 1987, incorporated in 1988, and focuses on slate, tile and copper, with an emphasis on restoration contracting. Considered one of New England's

of the SRCA (Slate Roofing Contractors Association of North America, Inc.).

Unlike many roofers these days who look for the cheapest approach to a roof situation, Triple M emphasizes quality and craftsmanship in their work. "If you want to pay peanuts," Kevin reminds us, "you will get monkeys." The old adage, "you get what you pay for," rings especially true in slate roofing workmanship. When someone pays for bad workmanship on a slate roof, they usually have to pay again to have it redone. In many cases, it's the next property owner who's stuck with the expense of reversing bad workmanship on their roofs. That's why it's important for slate roof owners to seek out contractors who specialize in slate roofing.

One service Triple M offers, for example, is the lining of wood gutters with copper, as shown at top right. Frank is holding a section of copper gutter lining to demonstrate how it fits in the wood trough. The lining greatly increases the lifespan of the gutter system.

Frank also demonstrates the unique, hand-crafted roof brackets used by the firm, shown at right, center and bottom. The brackets are made from 1X8 rough-sawn local lumber and measure approximately three feet in overall

length, including the copper tongue. The tongue itself has four center holes for nails and extends 9" above the wood frame. It slides under the slot between two slates and is nailed in the slot. When removed, a bib is installed in the slot. The horizontal platform part of the bracket is 20" long. The back board is 26" long.

There are still a few fine roofers in the Boston area keeping tradition alive. The brothers three of Triple M Contracting have made it a family affair. ☐



premier roofing contractors, Triple M serves the greater Boston area. "We believe that the best way to gain the respect of our customers is to take the time to educate them on the right and wrong ways that roofing projects are done. We have found by using this approach that many customers who have found cheaper quotes from others have known how to compare the work, known the questions to ask, and have ultimately chosen us for our commitment to craftsmanship and honesty," explains Kevin. Triple M is fully insured and licensed and all their work is done by their own employees, never subcontracted. They are charter members

For more information, contact: Triple M Contracting, Inc., 148 Treble Cove Road, North Billerica, MA 01862-2212; Contact: Kevin Menezes; Ph: 978-671-9523; Fax: 978-667-5873; Email: kevin@triplemcontracting.com; www.triplemcontracting.com

[See Triple M ad, page 24]

All photos this article by Joseph Jenkins.

Slate Roofing Contractors Association of North America, Inc. Update, 2008

The SRCA, initially established in March of 2005, incorporated as a non-profit entity early this year. By-laws have been developed and are available for viewing on the organization's web site at slateroofers.org.

The Board of Directors has so far consisted of volunteers, including Liam Tower (Slate Affair, Inc., Enosburg Falls, VT), Chris Paulin (The Paulin Slate and Copper Co., Akron, Ohio), Barry Smith (Smith Slate Roof Restoration, Union City, PA), Joe Jenkins (Joseph Jenkins, Inc., Grove City, PA), James Warden (Milligan Construction, LLC, Providence, RI), John Mahan (Mahan Slate Roofing Company, Springfield, MA) and Robert Ruddy (Mountain State Slate Roofing, New Milton, WV).

Elections for Directors are to be held as this edition of TR goes to print. The above named Board volunteers are expected to be elected to formal posts in the organization at that time.

The purpose of the SRCA is to provide the public with access to reputable slate roofing professionals and to advance slate roofing trade skills, knowledge and practices. Keep updated about SRCA conferences and other activities at www.slateroofers.org.

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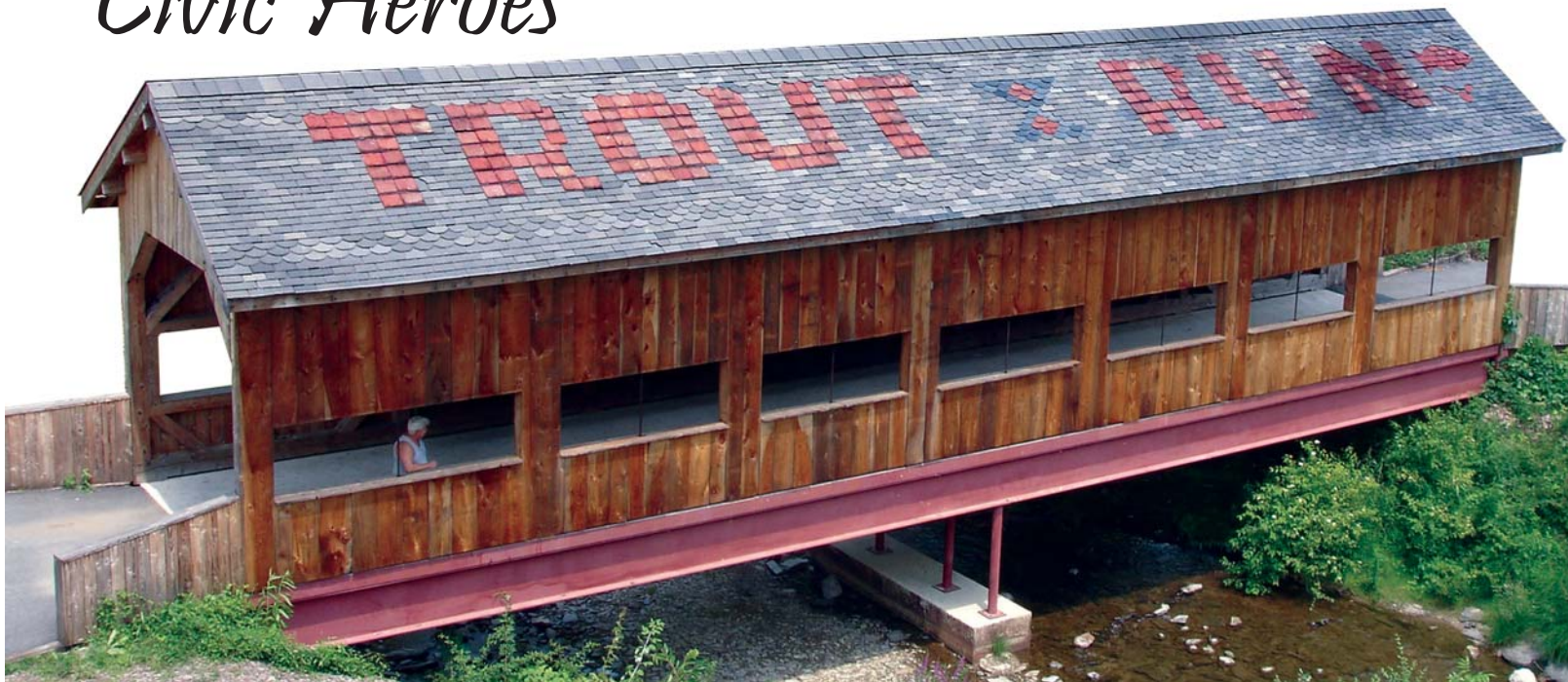
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Civic Heroes



Business owners in the slate roofing industry can be among the most generous when donating time and materials for civic projects. There is a long list of such "civic heroes," including Camara Slate, Williams and Sons, Black Diamond, Sheldon Slate, Greenstone Slate, and many others.

Pete Papay, of Penn Big Bed Slate Company in Slatedale, PA, went above and beyond the call of duty when a rails to trails project required civic leadership — he volunteered to be Chairperson of the Northern Lehigh Historical Society Rails to Trails Committee. The old railroad beds that once served the slate and coal industries have faded into disuse over the past several decades, but are now being revived as trails that are perfect for biking, hiking and horseback riding. Pete's trail starts in Slatedale and extends 3.3 miles to the Lehigh River where it ends at an old railroad depot in Slatington.

The trail, which parallels Trout Creek (also called Trout Run) the entire way, will eventually be black topped, with completion expected in about two years, maybe longer. The Northern Lehigh Historical Society, founded as a non-profit organization around 1996, took on a big project when it decided to build a covered bridge over Trout Creek on the bike trail. Volunteers and donations brought in \$90,000.00; grants exceeded \$200,000.00, and local politicians added their clout to raise even more money for the bridge.

The structure was designed by Mr. Papay, approved by engineers and, starting in 1999, was built by volunteers on original bridge abutments where the old railroad bridge had once sat. The abutments were reconditioned, then five new steel I-beams, each 73' long and 26" high, spanned the creek from abutment to abutment. The bridge itself was built of local hemlock, rough sawn and stickered to dry before assembly. Construction continued until 2004, when a concrete deck completed the inside of the bridge and a roof was added to keep out the rain.


But not any old roof. Pete designed the roof using 10"x12" Pennsylvania gray slate with Indian silver gray and New York red slate used in the inscription design. The slate roof was the final crowning jewel on the bridge, with the last slate being nailed into place by Pete himself in 2004 during a dedication ceremony attended by 2,000 people. The ceremony has now become an annual event, taking place on the first Saturday in October — a "fall festival" complete with fireworks, food, live music, kids activities, beverages,

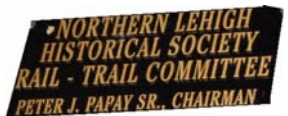
and fundraising.

Crowds that size need facilities with water and toilets, so of course, Pete rose to the task, designing a facility with materials he knew best: slate.

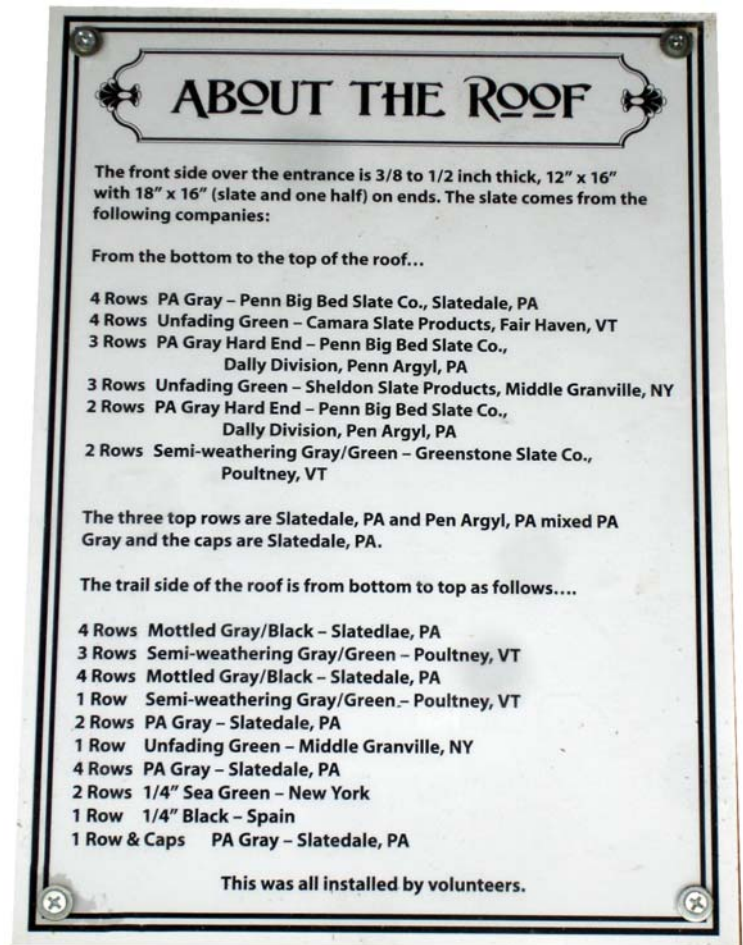
The "slate house," completed in 2006, is constructed of solid slate walls from the Penn Big Bed slate quarry, eight inches thick. The interior partitions are also solid slate, four inches thick. The building's primary purpose is to provide toilet facilities for both men and women, including handicap access stalls. Volunteers clean the facility and supply necessities. "We don't know who supplies the toilet paper, but somebody's doing it," Pete explains.

The roof of the slate house is built of local, rough-sawn hemlock lumber, the traditional style of construction that has produced so many area roofs that have lasted a century or more. Again, roof slate graces the building, donated by Penn Big Bed, Camara Slate, Sheldon Slate and Greenstone Slate Company. "The purpose of the roof is to show people there are slates from other parts of the country," Pete adds. Two different beds of Pennsylvania "hard end" slate from Slatedale were used, plus slate from Pen Argyl, PA, plus slate from Vermont, all 3/8" thick and 12"x18" in size. A second restroom is scheduled to be built at the end of the trail by the Slatedale ballfield when all is said and done.

If you happen to be near Slatedale in October and are working up a thirst for a cold beer, or maybe just want to gaze at the fall foliage or listen to a trout stream gurgle past as kids play nearby, you know where to go. Take your bike and really squeeze the most out of the experience. And as you glide down the trail, holding onto your handlebars and gazing at the sun streaming through the golden and yellow canopy, you will fully appreciate the contribution of many generous volunteers, including some the slate industry's civic heroes. 



Penn Big Bed Slate Company, Inc., PO Box 184, 8450 Brown St., Slatington PA 18080; Ph: 610-767-4601; Fax: 610-767-9252



Photos by Joseph Jenkins



How I Installed My Own Slate Roof

and What I Learned — By Daniel Ernst

I'm in the process of designing and building my own residence, in North-Central Arkansas. To manage costs and learn various building trades, I am attempting to perform all of the labor myself (contain costs by not subcontracting jobs that I can learn to do myself). Below is a summary of my recent slate roof installation, showing costs, labor hours, methods, supplier information, etc., along with some editorial comments.

This forum [slateroofcentral.com] has been a wonderful source of information for my project. I'm hoping that somebody out there will find this review helpful. First, the facts:

Cape Style House — 9:12 Pitch. The roofing field dimension is 54' 5" X 20' 10". The roof has four items that break-up or penetrate the main gable roof: a front entry gable, two skylights, three DWV vent pipes, and a masonry chimney.

DATA: Roof Field Square Footage — 2,267; Ridge — 54' 5" (main) & 7' 8" (entry gable); Valley — 12' & 12' (entry gable); Decking — 2" X 6" Center Matched T&G Southern Yellow Pine; Underlayment — #30 Organic Felt; Fasteners — 1 1/2" 11 Gauge SS (304) Nails & SS Slate Hooks

COSTS: 2,240 Square Feet SYP T&G Decking = \$2,476.80; 26 Squares Vermont Royal Purple, Random Width = \$8,450.00; Slate Shipping, >1,400 miles = \$1,700.00; Stortz Slate Ripper, GT Pro Cutter, Stortz Euro Hammer = \$175.00; 58 lb. SS Nails, 2 lb. SS Hooks = \$316.00; 90 Sq. Ft. 20 oz. Copper Flashing = \$588.40; TopSlate Ventilated Ridge = \$962.50.

Total: \$14,668.70; Material Cost / Square = \$647.05

NON-LOCAL SUPPLIERS — Slate: Camara Slate Products, Inc.; Copper Ridge: Castle Metal Products; Tools, Fasteners: Joseph Jenkins, Inc.

LABOR — Slate Installation: 20 Days X 9 Hours = 180 Hours; Ridge/Chimney Flashing: 3 Days X 8 Hours = 24 Hours.

I completed the installation largely by myself. My wife helped set roof scaffolding, snap chalk lines, and cut the top course of slate. I spent twenty days installing the roof, three days installing the ridge metal and chimney flashing. This included sorting the slate, building, installing, and removing roof scaffolding, plus assorted other chores that come with the job.

BACKGROUND — I was interested in installing a natural roofing material, a durable roof. Research led me to consider three options: concrete tile, clay tile, and slate.

Concrete tile has the lowest price. We found a local supplier of the Monier® brand, who quoted \$98.00 per square + shipping. Concrete tile is the newest of the three options, having only been produced for the last 100 years. The concrete tiles have an absorption rate that ranges from 5% to 12%, depending on the tile and the manufacturer. For our climate this seemed problematic, due to the large number of freeze/thaw cycles we experience each winter. And although some manufacturers offer a 50 year "warranty," you can also find the same warranties from some asphalt shingle manufacturers. Simply put, it does not have the history of either vitrified clay tile or slate. (Note: Concrete tiles are either integrally colored or slurry coated. Although both will fade, looking washed out over the years, the slurry coated tiles have caused the most problems for homeowners.)

Clay tile prices are comparable with slate. We priced a standard Ludowici® interlocking tile at \$375.00 per square. Prices go up from there. Clay tiles have a tremendous history and heritage. Durability is excellent. Absorption rates are typically lower than the concrete tiles (Ludowici advertises less than 1%). Interlocking tiles are the most economical and popular today; however, they are less weatherproof than the shingle types (side lap is different). If you were to purchase a tile with the same headlap and sidelap as slate, the cost would be substantially higher, like more than \$500.00 per square.



Photos by Kopper Ernst

So concrete was unproven, sometimes problematic. Clay tiles had many advantages, but a tile with a standard 3" headlap and sidelap would cost substantially more than a historically proven slate. So we opted for slate, with both trepidation and delight. The cost of the roof was going to challenge our financial planning for the house, but we chose to invest in quality exterior components, with a view of life cycle costs.

Also, I need to mention that S1 quality slates typically have an absorption rate of less than 0.5%. This meshed well with our need for a freeze/thaw proof roofing material.

INSTALLATION

I had worked on asphalt, metal, and cedar shake roofs before. Slate was new. I used the Slate Roof Bible as a primary guide, the Jenkins Forum [slateroofcentral.com/messages] for answering questions that remained unanswered through my reading and internet research (see end for a list of resources).

Installing the slate is not complicated, at least no more than any other roofing material. But you have to take care at all transitions. It seemed to me that flashing roof transitions and penetrations was the most tedious and difficult part of the job.

Although not surprised at the amount of preparatory work, I spent half of my time getting ready to install slate, the other half actually installing. Sorting slate, hauling them up the roof, installing roof scaffolding, keeping the ratio of sizes correct, all took more time than the actual installation.

Roof Decking — I planned to install a board deck on the roof, so I investigated local suppliers. There are a number of small sawmills within a half-hour drive, but I was disappointed with my findings. Generally they wanted \$0.85 – \$0.90 per board foot, at least for 1" stock. Lengths were limited (8' or 9'), and widths were random.

I talked to my local building supplier and it happened that they had several bundles of 14' T&G 2" X 6" decking in stock. They wanted \$0.46 a lineal foot. So I could purchase a more uniform, stronger, easier to install material for about the same price as that found at local lumber mills. Plus, I would not have as much waste. It was a no brainer. Arkansas is a huge southern yellow pine lumber area, so I doubt you'll find such a deal, but it may be worth a look. \$1.10 per square foot for this quality decking was incredible!

Sorting — I sorted the slates into six different categories: heavies, mediums, lights, ultralights, uglies, and broken. Ultralights were those slates that felt too thin to be very durable. They were often a consistent 1/8" thick or less. When checking for cracks I would rap the face of the slate with my palm. Often I could feel the deflection of the slate when doing this to an "ultralight" slate. I attempted not to use the ultralights, except for the very last course.

Uglies were those slates that had horribly inconsistent faces. They were very thick on one end, very thin on another. When split, they did not have a smooth face, but a fractured appearance. Although I wasn't too concerned about the aesthetics of these slates, I was concerned about how they lay with adjacent slates. Many were too rough for installation.

I kept all salvageable broken slates to use for the last course. The rest I set aside for use as roadbase, interior tiles, crafts, etc.

Continued On Page 33

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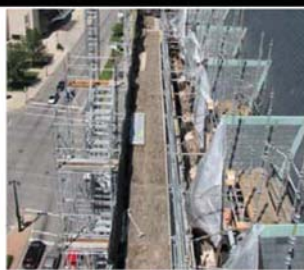


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It is virtually impossible to find an American roofing contractor who does not address everything with a power nailer and roof glop. While there are certainly shoddy manufacturers, innovative new building materials — particularly roofing materials, suffer the double bind of perfecting the material and manufacturing while trying to teach contractors, particularly roofing contractors, new skills. Concrete fiber shingles are not slate. They will not last for four generations, but products from reputable manufacturers properly installed can last many times longer than asphalt.

I have used the same concrete fiber shingles that were installed on the church on my own home. I too cannot afford real slate, but was able to pick up many pallets of concrete fiber slate for a fraction of the price of asphalt shingles as those manufacturers left the U.S. markets. I installed it carefully following instructions from the Slate Roof Bible as well as older standard resources such as time-saver standards and graphic standards (resources available to architects for at least 1/2 century). With some modifications (do not get aluminum anywhere near concrete).

I have made a number of mistakes — yet I do not have a single leak on a finished roof. I have never had a shingle come off. Eventually, I found out the shingles I am using are exactly the same ones used on the church. All I can figure is the contractor installed them all with a power nailer. There are a few roofing contractors out there that actually know what they are doing. But they are the exception rather than the rule. There are fewer still that comprehend that there are roof materials besides asphalt shingles, rubber, and builtup, and have the ability to appreciate that installing a different roofing material may prove easy, but may require different approaches, skills, and techniques.

THE MYSTERIOUS STAINS REVISITED — I enjoy getting your Traditional Roofing Magazine very much. Perhaps the following will help explain the stain discussed on page 2 of the 2007 issue. Several clues have been overlooked. The most important clue is that the stain is on the "North" side of the roof. It tells us that within the sun's daily solar arc the North side of the roof is cooler than the rest of the roof and therefore it is prone to condensation that would be dried off on the other three faces of a roof.

Note that the major stain is associated with the juncture of the shed roof addition butted next to the main structure. One would therefore want to look at the venting of this juncture very closely and



determine if there is a forced venting of moisture through the roof at this location.....also note the crisp line of the juncture and that the stain appears to "run" downhill from it. Also note a little further up the roof there appears to be a demarcation line below which there is staining and above which the roof appears relatively unstained. This demarcation line may well be a knee wall in an attic or living space in an attic and thus again, a forced ventilation through the slate layers with resulting condensation. One might well find at 5 am in the morning a good portion of the year that the entire area of the stain is saturated with running condensate.

The south, east and west faces of the roof will be dried out by the sun's warmth if the same building details exist there, and thus no staining.

I suspect the staining itself is an asphalt residue carried onto the roof from the inappropriately installed felt insert strips. Someone didn't have faith in what they were doing with their slates....the same is often found on wood shingle roofs with the shingles warping, buckling and splitting. I suspect the pressure washing will be a short term cure; as the basic physics of the problem has not been addressed, nor can it be, shy of tearing the house or roof apart. The long term prognosis of the roof is that the slates on the north elevation will have nails rusting off much sooner than the other roof faces thus greatly shortening the life of the roof.

SEEING IS BELIEVING — Last fall I stumbled over your website, [slateroofcentral.com] and as a slater through the '90s, I was very impressed with the quality and content found there. I had just recently scanned and downloaded much of my roofing portfolio, and offer to give you a picture of some clowns who thought they'd revolutionize slate installation by attaching the slates with air pallet nailers. D.C.




DIYS VS CONTRACTORS — I have dealt with contractors good and bad all my life. Most new product problems have tended to be just like asphalt shingles and good roofers trying to work with slate — if the methods of working with a new (or old) product do not exactly match what they are used to with typical construction, things will fail. One of the reasons DIY's do better with slate is BECAUSE they do not think they know it all. Despite, all the advice — all the do's and don'ts — most construction including slate is very forgiving — but not infinitely.

If you at least become aware of best practices, and try to follow them, it is highly likely everything will work out — even if you make a few mistakes. But completely ignore the methods for a specific material and treat it like what you are used to, and you can pretty much guaranteed it will not work.

There are a few fly-by-night manufacturers, and there are cases where good manufacturers screwed up, but most materials failures in construction are failures to come even close to following proper installation. One of the reasons you can often get away with a few mistakes if you try to follow best practices is because those techniques usually assume some mistakes will be made. Skilled people with experience know exactly what they can get away with. DIY selfers don't, but tend to take the guidelines as law. The most dangerous person is the installer who is used to a completely different material, but believes he knows what he is doing.

FROM SCOTLAND — I have been a slater/roofing contractor in Scotland for 25 years. I saw your Slate Roof Bible on Ebay and decided to buy it. Flicking through it I was interested in your roof brackets to slate up the roof. I noticed you said when you removed them when the roof was slated that you clip a slate in. To get up the roof we use what we call "Gabbits," which are 30mm wide by 6mm thick pieces of steel bar welded together to form a right angle about 12 inches long each, then we weld a spike to the end of this so when we need to get up the roof, we centre hole the slate above, spin it to the side and drive in the spike to the sarking [roof deck], then repeat this 10 slates or so along the roof depending on the length of your batten.

Continued On Page 34 

CONICAL ROOFING SIMPLIFIED

John R. Crookston, Upright, Inc., Kalamazoo, MI

As a third generation union carpenter, and also a roofer with my father since I was barely old enough to walk, I have been around roofing and building for about 52 of my 56 years. I worked on my first slate job when I was about 23, and we have worked on thousands of tile, slate, metal and shingle roofs over the years. Occasionally of course, some of them have had round or partially round areas to roof and these are always a challenge, but a welcome one. I believe it separates us into a different level of roofer to be able to do this work and do it well, but I feel inclined to give a few tips that I have accumulated over the years that will make the work much easier and less daunting for all of us.

Going over the memory banks, I counted quickly up to about 16 different cones or round roofs I have done and I am sure the total is about 50 if I could remember all of them. These were done mostly in shingles, about half, 4 or 5 in standing seam metal, 4 or 5 in slate and the rest in concrete tile. Two years ago, we were building an addition on a customer's house and I got to build a cone roof as a new entrance to the house that matched the original cone turret we had roofed with concrete tile about 18 years prior. The point is that I have been able to work on all facets and in many different mediums of round roofs and the principles involved in building a round roof also help you when you are trying to roof one.

In the spring, 2005 issue of Traditional Roofing, Joseph Jenkins summed up roofing a cone with slate in a very succinct manner. "The fact that every slate must be trimmed at an angle on a small turret such as this indicates that more time and fiddling around are necessary to get the job done right." The good news is that a lot of this "fiddling" can be done right in your shop out of the weather if you wish, and you only need to know THREE different measurements on any cone roof to do it. This applies to any type of roofing material you may be using, and the pieces will come out exactly the right shape and size and angle to fit the cone. If this interests you, read on as we must first delineate the principles and the logic behind this statement.

Any pitched roof, unless it is just a shed roof, has at least two sides. If you make it a hip roof, it has four. If we assume this building is a square (no matter what size it is) the apex of the different ridges is also the center of the building. If you clip off the corners of the hip roof at a 45 degree angle, you get an "octagon" or an 8 sided building or roof — a "stop" sign. I am sure that many of us have worked on bay window roofs and these are just partial octagons. If you were to break down an octagon roof in half again, you would have a roof with 16 sides and on and on. Basically, a "round" roof is just a straight hip roof with an infinite number of sides on it. To successfully roof a round roof, you



MUST first be able to use and read a tape measure. You have to know exactly where you are on a roof at all times and where you are going. "Ready, FIRE, Aim" doesn't work too well on a cone!

A note on safety is also in order here. Most cone roofs will probably be an accent to a roof and probably will be steep and higher off the ground. If they are, I would highly recommend setting a scaffold around the bottom of the roof so that you can access all of the areas and also give yourself a working platform to store your pieces and to allow you to lean a ladder onto the roof to support yourself on the cone while roofing it. Roofing a cone is more expensive than a regular roof, so add enough into your figures to allow for scaffolding. It is faster and cheaper in the long run and will make the job come out better too.



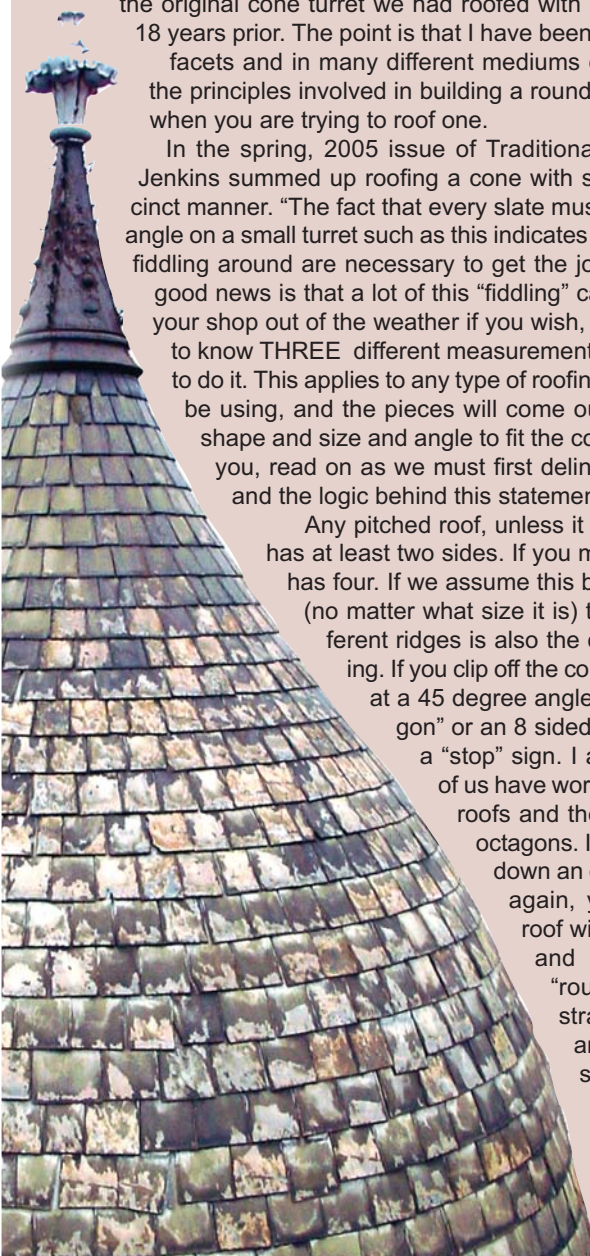
Crookston's Upright, Inc. constructs a new conical roof (top) and restores an old one with slate (above).

THE THREE MEASUREMENTS!!!

For any cone roof, you need to know the: 1) rafter length, 2) the diameter of the cone, and 3) the widest piece of roofing you are going to use to roof it.

If you are using shingles and the roof is a big one, you would probably start with a full shingle. If they are metric laminated shingles, this would be about one meter long. If they are 3-1's the longest piece would be 12 inches as that is the length of one tab. With slate, the widest slate would be around 12 to 14 inches, but it could be less if the cone is a tight radius. The diameter of the cone is used to determine the distance around the bottom of the roof. If you can measure around it, do so. If not, the constant proportion of a circle to its diameter is called pi, and pi is the number 3.1416.....it goes on forever without repeating, but for our purposes if you just multiple the diameter of the circle by 3 and then add a foot or two you will be close enough. You use this number to determine the number of different pieces of each size you will need to go all the way around the cone.

If the diameter is about 20 feet, you would multiply 20 by





3.14 and you would get 62.8 feet. In my previous example we could multiply by 3, which equals 60 and add a couple of feet and be at about the same place. If you are using slate and the widest slate you have is 12 inches or one foot, obviously you would have about 63 slates in each course as you worked up the cone roof. If you are using laminated shingles, the longest piece you want to use will be determined by how fast the roof curves around. The smaller the piece you start with, the "rounder" the finished product will appear.

We are making "PIE" pieces of roofing to cover the cone.

NOW we are ready to make our jig to make our pieces to fit the cone. If the rafter length previously measured was 15 feet, and the widest piece of slate to be used is 12 inches, we would take several pieces of plywood or OSB and lay them end to end on the floor. Measure up 15 feet from the bottom centered on your boards and establish a point. On the bottom from this center line, measure out 6 inches on both sides and strike lines from these marks to your center point at the top. This is the exact shape of one section of a pie that is $\frac{1}{63}$ of your turret. I will normally cut out the triangle with a circular saw and mount the pieces to a piece of 2x6 so that I can place it on a set of saw horses to work at waist height to cut the pieces. The bottom of the jig is the bottom of the slate; including the overhang. If I am cutting shingle pieces, I will also install a piece of drip edge on both sides to give an easy surface to trim the shingles against. Allow for the length of the overhang of the drip edge if you do this.

Next, we mark lines on the jig at the location of either the top or the bottom of the tiles or shingles. If we are using 20 inch slates, the exposure with the head lap would be $8 \frac{1}{2}$ inches so if we were to mark the tops, the first mark would be at $11 \frac{1}{2}$ inches from the bottom of the jig for the starter to allow for the overhang and the headlap, and every $8 \frac{1}{2}$ inches from there. Mark the marks all the way across and number them on your jig from #1 to #21. Now, lay an individual slate to the line and scribe or scratch the sides from underneath using the sides of the jig to guide you. Flip the slate on its back and punch the holes in it before you trim it to size. Depending on the size of the slate used and the pitch you may have to trim

the top shoulders of the slate a bit also to allow the next row of slate to sit flat on the roof. If you are cutting shingles, don't worry about clipping the corners as they will bend to match the roof. In the example shown, we would cut 63 pieces and number them with a crayon as you cut them (#1). Do the same for the second row and so on making sure to number them as you go. They are all close in size and it can get confusing. Make the same number of pieces for each row.

Once all of the pieces are cut, it is a relatively simple process to install them on the roof. I use a string or chalk line tied to a nail centered on the peak as a guide to mark the middles of the slates where the two slates in the next row meet. The angles on the slates cut on the jig will exactly match each other and it is easy to follow the coursing. You may have to adjust the last couple of slates of each row where they meet, but that is relatively simple. As far as keeping everything horizontal, I just use a tape or a string pivoting from the top nail or center point. No matter how steep or long the rafters, that measurement is your radius. I would true the slate to the cone on the first course from the bottom. You want to have a consistent overhang with the starter course and the first full piece of tile. If for whatever reason the cone is not perfect, the second course of tile, radiused from the top center point and marked at the exposure line of the first course will be. You have to make sure that if there is any error in the "roundness" of the turret, that the maximum exposure still allows for the proper headlap.

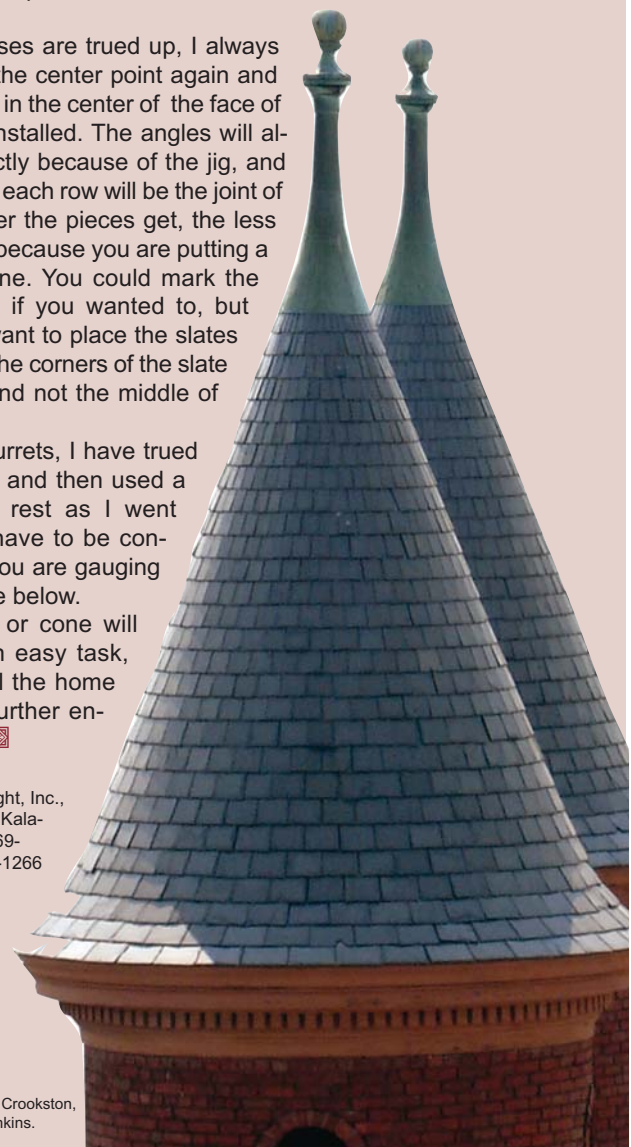
After the courses are trued up, I always swing a line from the center point again and mark the exposure in the center of the face of the slate already installed. The angles will always match perfectly because of the jig, and the lowest point on each row will be the joint of the tile. The smaller the pieces get, the less deflection there is because you are putting a flat piece on a cone. You could mark the tops of the slates if you wanted to, but again you would want to place the slates on the line so that the corners of the slate touched the line and not the middle of the top!

On shingled turrets, I have trued the bottom course and then used a gauge to set the rest as I went around. You just have to be consistent on where you are gauging from on the shingle below.

A metal cap or cone will make the peak an easy task, and I normally sell the home owner a finial to further enhance the "look."

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Center photos supplied by John Crookston,
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HOW I INSTALLED MY OWN SLATE ROOF — Continued From Page 33

had a difficult time finding 20 oz. tempered copper. I finally found a business that was willing to purchase and fabricate the necessary pieces, but the cost was higher than in other areas of the country. It turns out most businesses use 16 oz. soft copper for EVERYTHING. Do your homework on this topic, especially if you are not in a large slate roofing area.

Organic Felt — I've experienced this before, but the weather made it worse this time. Organic felt wrinkles horribly when it gets wet. All of those razor sharp chalk lines turn into a winding mess. I couldn't get it locally, but I would try the newer fiberglass felts. Supposedly they have similar permeability ratings, but lay flat and stay flat.

In any case, we now have a spanking new slate roof with shiny copper flashings. It is beautiful. None of this would have been possible without the resources developed by Joe Jenkins. I also have to thank several regular visitors to the Jenkins forum: Walter Musson, Peter Crawley, and Ron@Slateworks. My wife took photos of the process. 

RESOURCES

- josephjenkins.com
- http://www.copper.org/applications/architecture/arch_dhb/handbook_table_of_contents.html
- www.buildingscience.com
- www.ornl.gov/sci/roofs+walls/
- www.camaraslate.com
- <http://www.castlemetalproducts.com/topslate.htm>

Daniel Ernst lives in his passive solar, owner-built home in North Central Arkansas. Currently he works at Julian and Sons Fine Woodworking as a craftsman and project coordinator. He welcomes serious inquiries and questions from other greenhorn slate roof installers.

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Slate Roof Repair — Dos and Don'ts

Joseph Jenkins

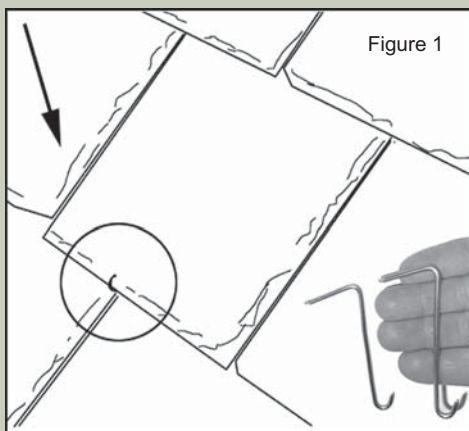


Figure 1

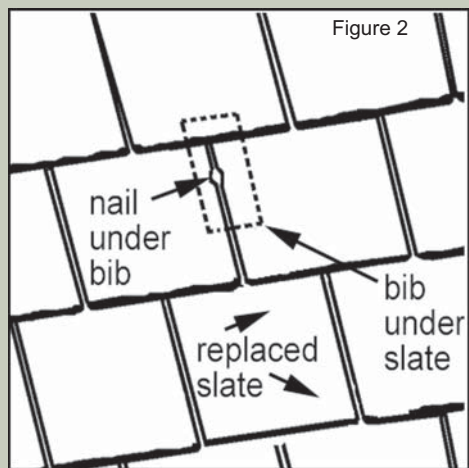


Figure 2

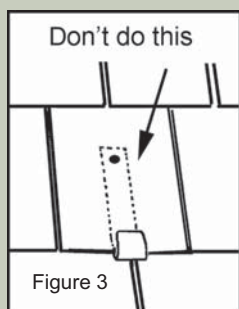


Figure 3

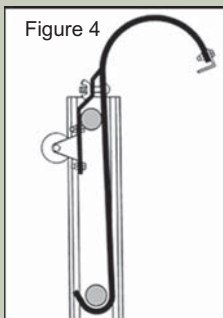


Figure 4

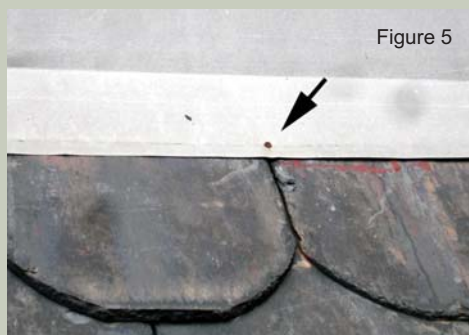


Figure 5

underlayment in the first place. Anyone telling you that you have to replace your underlayment does not know what they are talking about.

Myth #2) The slate ripper, which is the basic tool used to remove slates from a roof, slides underneath the slate and cuts the nails. False. The ripper pulls out the nails; it does not cut them. You do not want to cut the nails because that will leave a nub under the slate which will prevent the insertion of the replacement slate.

Myth #3) Ring shank nails should be used on slate roofs when plywood is used for decking or where a stronger nail grip is required. First, don't use plywood decks underneath slate if you want the best job, even though the

I bought one of the original old journals on Ebay the other day: from 1975. It had an article about slate roof repair that I wanted to add to my collection of slate roofing materials. When I perused the article, however, I noticed that it contained almost the entire list of wrong advice about repairing slate roofs that so often shows up on message boards, in literature and even in videos.

A few weeks before I got the article, I was up on a church roof looking it over for possible restoration. While there, I saw many roof repair errors and I photographed some of them to share with Traditional Roofing readers. I hope this information helps people who need a roof repaired or who are doing the repairs themselves.

Slate roofs need repair for two basic reasons — slates have broken or become damaged, or flashings have deteriorated. Therefore, the repair and restoration of slate roofs requires knowledge about replacing slates and flashings. Just as importantly, however, understanding the source of leakage and finding it is critical to the successful repair of these roof systems. If you don't know what a leak looks like, you will not be able to find it and repair it.

First, let's look at some common myths that are often repeated:

Myth #1) The felt paper underlayment has deteriorated and therefore all the slate must be taken off, the felt replaced, then the slates put back on. This is totally bogus. The felt paper is a temporary underlayment used to keep the building dry until the roof is installed. After that, it's essentially obsolete. Most older slate roofs have no functional underlayment and they do not leak. Many slate roofs never had

slate suppliers will recommend it. They only sell the slate; they don't have to repair or restore the roofs later. Slate salesmen and carpenters will tell you to use plywood. The slate professionals crafting a 100-200 year roof will tell you to use solid boards. Take your pick — it's your money, but for the best longevity, use solid wood decking, not a glued material. It's already tried and proven. Second, ring-shanks are weaker than smooth-shanks and tend to break when you try to pull them out during repairs. That's leaves that nub underneath the slate which is a huge pain in the you-know-what. The last thing a slate roof professional wants to find is a roof installed with ring-shank nails.

Myth #4) Install replacement slates by using copper straps that fold up over the bottom edge of the slate. False. Just because you've "always done it that way" is not an excuse to keep doing the wrong thing. There are two replacement techniques that are acceptable: slate hooks (Figure 1) and the nail and bib method (Figure 2). Exposed straps (Figure 3) look bad and will open up if anything sliding down the roof hits them (like snow).

How are slate roofs damaged? The number one culprit: roofing contractors. You do not want foot traffic on your slate roof, for example. Some contractors will tie a rope around themselves and tromp around the roof, breaking slates. Hook ladders (Figure 4) instead provide the perfect work surface from which to access a steep roof. There is no excuse not to have them. Otherwise, scaffolding or lifts are helpful. Aside from foot traffic, roofing contractors will damage slates by "repairing" them. They will nail through them, tar them, nail them then tar them, tar them some more, caulk them and nail them, screw them, I even saw one duct-taped. The funny thing is that it is easy and simple to properly repair slates. Why improper repairs are so common on slate roofs is anyone's guess. My well-publicized theory is that Neanderthals never became extinct, they just evolved into roofing contractors. Let's look at some of the common issues.

Figure 5 shows a common leak that is often overlooked. The exposed nail head on the apron flashing of the chimney will allow water to enter the building. Caulk the nail head. Next time, install the flashing with cleats (see TR6 for cleat info at traditionalroofing.com).

Figure 6 shows what I call a "hidden leak." There is a nail in the top of the slot where someone used the "nail and bib" method to replace the slate in the past. Figure 7 is a closeup of the nail. There is an old bib flashing there that completely rusted through, exposing the nail head. This allows water to directly enter the roof and shows why you should not use galvanized bib flashings (use copper, aluminum, or stainless). The reason this is a hidden leak is because it's hard to spot. When looking from above, it's virtually invisible, but it will seriously leak water. Remove the nail and bib and replace them with a new nail and a non-corrodible bib.



Figure 6



Figure 7

Continued On Page 32

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MASONRY LEAKS

Stevens Roofing Corp.



Photo by Joseph Jenkins


Whenever it's raining and someone sees evidence of water leaking, the first thing they think of is a roof leak — and they are probably right. However, it can also be a masonry leak. If the leak shows up next to a brick chimney or at an opening in a masonry wall and the flashings above the area are installed properly and in good condition, the masonry is probably the problem.

But first, check for any opening in a wall above the leak; windows especially can be the source of a lot of problems. Is the sill angled properly and is the seal around the window in good shape and tight? Is the storm window in good shape and tight? Storm windows are good if used properly, but make sure the glass is in the top and bottom with the top glass lapped over the bottom glass. A lot of people leave the storm windows open in the summer and this is just asking for trouble. The rain driving in is trapped by the storm window frame and the water will work its way down through any crack or joint in the wood that is not tight. Weep holes in the frame allow the water to dribble out while the rain is pouring in.

If the leak is at a chimney and the flashings are in good condition, the first thing to ask is if they have changed to gas as their fuel source. If they have switched to gas, was a stainless steel flue liner installed? If no liner was installed, they will need to get one. Gas furnaces are so efficient today that the gas fumes are not hot enough to escape the chimney and will start condensing on the masonry. This condensation can be enough to saturate the brick and eat away at the mortar.

If the flashing is tight and gas fumes are not a problem, it is probably the masonry absorbing water.

If an addition has been added onto a house, a flashing leak will show up on the addition side of the wall. If the masonry is a problem, the leak will show up at the opening in the wall.

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SLATE • ROOFING • COSTS

Charles Silva

This essay first appeared on the slateroofcentral.com message board in response to discussions among contractors and customers about the costs of slate roof work. It is reprinted here with permission from the author.

Here's why it costs a lot to have a SKILLED, QUALIFIED, INSURED, and EXPERIENCED contractor fix/repair/replace your slate/tile/flashings/box gutters:

- * Workers Comp Insurance (33-50% of an employer's labor cost)
- * Disability Insurance
- * Liability Insurance
- * Unemployment Insurance
- * Insurance for motor vehicles
- * Payments/maintenance/upkeep for work vehicle(s)
- * Health insurance (God forbid)
- * Retirement savings/401k (you mean you want to retire someday?)
- * State and Federal taxes (plus 12.4% FICA for the employer)
- * Wages for "skilled" slaters (sorry, \$12/hour isn't gonna cut it)
- * Tool/equipment replacement
- * Time and expenses incurred traveling back & forth to give potential customers "free" estimates (and then writing them after dinner!)
- * Cost of copper \$\$\$
- * Cost of slate (and procuring same)
- * Business phone/cellular/website/office supplies/website/etc (you get the point)

Look at all the "costs" I've listed associated with running a reputable business. YOU, as the consumer, EXPECT your contractor to be FULLY insured and pay taxes. You don't like the chain-smoking, scurvy looking guy in the ripped jeans, no shirt and a '78 pickup who uses the f-word in normal conversation. He ISN'T fully insured and, as for taxes, are you kidding? Cash only, baby. No, you like guys in the newer GMC's who wear shirts that say the company name on it (and rightly so.) Well, guess which outfit costs a lot more to operate?

"That seems like you're making too much!"

I had a woman once who called me from work several times to discuss a quote. She sent faxes, emails, etc. In the end, she told me she didn't like the price — she was "uncomfortable with it because [she couldn't] figure out what [we were] making an hour." When I roughly told her (wages + overhead) she freaked out... "How could a roofer be worth that much an hour?"

She was an employee of an enormous state teachers union that represents thousands of teachers. Here she is, at work, on the phone, on the computer, using the resources of HER employer to conduct PERSONAL business. What did she make per hour? Is SHE worth it? Would the inner city and rural teachers that pay hard-earned dues which finance her salary feel that it was money well spent? Why is it that people have no qualms whatsoever calling into question the wages earned by skilled tradespeople?

I can tell you that, as far as cost goes, anyone who does it by the tile, by the square, by the foot is out of their mind. I disagree with even suggesting numbers on this [web] site [slateroofcentral.com/messages]. You can explain, ad nauseum, that there are lots of factors involved (accessibility, pitch, materials, etc.), but people are going to focus on the numbers you threw up here.

A TALE OF TWO ROOFS

Consider this example: Two different roofs — each need three slates replaced. Roof #1 is 15-20 minutes away, a common "sea green" slate, and not very steep. Ladder up, put on a hook ladder at the easily accessible ridge and go. Roof #2 is a less common Monson, Maine, slate. The three replacements are up behind a dormer with a chimney coming out alongside it. To compound matters, there is no ridge to hook onto on this end of the 12/12 [45 degree] roof. Oh, yeah, this roof is 45

minutes away, and it's on a home in a historic neighborhood in a city that requires a permit and historic district commission presentation and approval prior to work.

Job number one was \$250.00. Job number two was \$2,500.00. Both are real examples, too. Both customers were comfortable with the prices because of what was involved. Both also realize the perils involved in working on a steep, smooth stone surface. There's a reason why slaters are hard to find.

SO, HOW MUCH DOES IT COST TO...

...\$1,400.00 for re-flashing a chimney on a slate roof is NOT out of line. Even if it doesn't take a 2-3 man crew all day to do it, they're not going to be able to do anything else that day. And there's travel time, picking up materials, disposal of refuse, set up/break down, etc.

...Don't get all worked up trying to figure out costs and how to save \$12/pc when you're buying \$240 sheets of copper or \$145 copper leaders. How many times has a customer complained because your local supplier was 10% more than some guy "on-line" who is gonna tell you to go bang your head when the leader's dented. When a customer needs to be that involved, right down to the individual material costs and shopping around, walk away. If you, as a consumer, act that way, don't be surprised when a good contractor doesn't want to do the job for you. A good contractor isn't fleecing you to begin with. He's in demand, and he doesn't have time to deal with nonsensical customers who are trying to save \$5 here and \$10 there at his time, expense and aggravation.

...\$1,000.00 to \$2,000.00 per square to replace slate roofing is totally in line. \$1,000.00 is too low. \$1,200.00-\$1,400.00/sq for 10's or 12's is ok, more for smaller pieces. More for cut up roofs with lots of dormers, valleys, turrets, etc. Cost covers "basic" copper. This is where good judgment and fairness come into play. You want to add copper snow pans? Expect to pay. You want rolled copper ridges? You're paying for it.

...Built-in and box-style gutters: Forget about it. You're dealing with wood rot, so there's carpentry involved. You're bending and soldering metal. Slate off and on again. Masonry repairs as you pass chimneys or brick dormers, flashing as you go. You want a price per foot? You're kidding, right? Most built-ins have been neglected for years and are sold to people who want to do the right thing and restore the house. Trouble is, by the time they get in there, the work needed is extensive. Extensive rhymes with expensive. In fact, they're only one consonant apart. Coincidence?

A FINAL THOUGHT ON OWNING THE 'WORLD'S FINEST ROOF'

Slate roofs are generally on fine homes. Older homes. Expensive and historically important homes. Houses with lots of detail. Things like built-in gutters, dormers, turrets. They were built when labor wasn't so expensive, relatively speaking. Skilled tradesmen were plentiful, and hard-working. Times have changed. Upkeep and restoration are expensive. Period. But, if you are looking for the best bang for your buck, the slate roof is the fiscally responsible choice.

You go and buy a little Hyundai or Kia for under \$10k to commute to and from work in. Your expectations aren't grand. When you need some work done you'll go to Midas or JiffyLube. Now imagine owning an exotic car, like a Bentley or classic Jag or Benz. You're not bringing her in to just any garage. The guy touching your baby is skilled and well paid. He's a master of his craft, and you respect him. You've got something of real substance and value—you're going to take care of it.


If you think about it, not a far fetched analogy. 



Figure 8

Figure 8 shows an obvious leak. The slate has split, exposing the underlying nail. Water will enter through the nail hole and through the slot between the slates. The broken slate must be replaced.

Figure 9 shows another leak that is fairly common. The nail head has rubbed against the overlying slate and worn a hole in it. The nail either wasn't nailed down far enough when the roof was originally installed, or else it was nailed into a knot or something that caused it to back out when the wood dried. This illustrates why standard-thickness slates should be punched rather than drilled for nail holes. The punching creates a crater shaped hole that will allow the nail head to sit inside the slate, preventing the rubbing effect that can damage the roof over time.

Figure 10 shows another broken slate, this time where the exposed nail is barely visible. The broken edge of the slate can channel the water directly to the nail hole, creating a significant leak. The solution is to replace the broken slate.

Figure 11 shows a common repair error — the use of roof cement or “mastic” to repair a leak. There may be proper times and places to use roof cement, but on the exposed surface of a slate is not one of them. This sort of repair is unsightly and will remain so for many years. The correct repair would have been to simply replace the broken slate. It is imperative that people who repair slate roofs have a stock of salvaged slate for that purpose or know where to get them (such a directory is available at

slateroofcentral.com). Otherwise, it can be very tempting to just slap some tar on the roof.

Figure 12 shows the sort of shoddy repairs that are commonly seen on older slate roofs. This is the sort of poor workmanship that slowly degrades a roof until it is ripped off by the owner in frustration and replaced with a cheap substitute. Anyone who hires someone who does this caliber of work should have his or her head examined. Unfortunately, slate roof repair work can be very difficult for a client to examine close up. Yet, replacement slates that don't match the original roofing in shape can be seen from the ground. Sometimes, this is the work of do-it-yourselfers or volunteers and is often seen on churches where well-minded but inexperienced congregation members with ladders decide they want to help.

Figure 13 shows another common “repair” that actually causes more leaks than it fixes. The replacement slate was simply “face-nailed,” or nailed through the exposed face of the slate. Then that darned tar came out. It would have taken less time to use a nail and bib or a slate hook and replace the slate correctly.

Figure 14 shows a repair done by an obviously blind roofer. The wrong shape and color of slate were used in the repair. When work is this poorly done, you can bet that the fastening method was off-base as well. Here's a tip: when a roof must be repaired and matching slates cannot be obtained, a section of the original roof can be “cannibalized,” or removed to acquire the needed matching slates. The cannibalized roof section should be one that is not very visible, like the side of a dormer roof on the rear of the building. Once the slates are salvaged, the removed section can be slated with either a salvaged or new slate. This technique also works well on unusual tile and asbestos roofs. A property owner will be happy to have a different shade of black slate, for example, on a rear dormer if the rest of the black slate roof on the building looks good, instead of a mishmash of unsightly repairs scattered across her roof.

Slate repair is pretty straight-forward: you locate the defective slates and replace them with matching slates. Use the correct fastening techniques and the right tools and everything will be hunky-dory. Flashing repair is another story. When flashings wear out, and they will (the slates usually outlast the flashings), they have to be replaced too. This is simply a matter of removing any slates that are covering the flashings, pulling out the old flashings down to the bare roof deck, then replacing the flashings with new metal. Then replace the original slates back into their original positions. This is all routine work for professional slate roofers (who are listed on the internet at www.slateroofers.org).

The cost to completely restore a slate roof is usually about 15% of the cost to replace it. As long as the slates themselves are still good, there is no need to replace the entire roof, but the subject of flashings and roof restoration could take up an entire book. But wait, there's already one in print called *The Slate Roof Bible* (see page 8). And it's a prize winner. So for more information, you know where to go! 📖



Figure 12

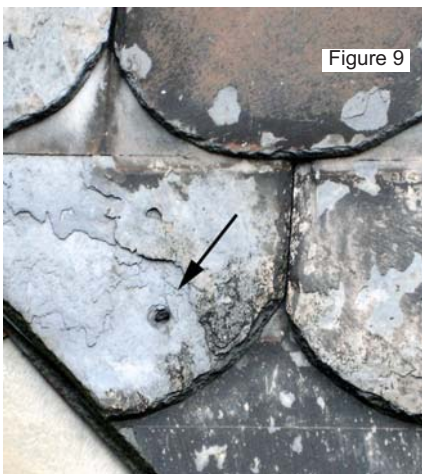


Figure 9



Figure 10



Figure 11



Figure 13



Figure 14

All photos and illustrations for this article by Joseph Jenkins.

Random Width Size/Quantity Ratios — In order to keep myself from running out of any one particular size of slate, I first calculated a size/quantity ratio. To do this, I divided the individual size quantity by the total quantity of slates [eg. (673) 14" slates/4,480 total slates = 0.15]. I moved slate up onto the roof 100 at a time. So every 100 slates I would take 15 of the 14" size. From there I would attempt to use up the entire quantity before bringing additional slate up onto the roof. This didn't work out perfectly, especially since it didn't consider the number of broken and rejected slates. So mid-way through the installation I recalculated the ratio. This procedure kept me balanced throughout the installation.

Roof Scaffolding — I used five sets of roof scaffolding, starting at the third course of slate, stepping every six courses. I spanned the 54' roof line with three 18' 2" X 10" planks (installed with the help of my wife of course!). I supported each scaffolding step with seven roof jacks, one at the end of each plank, one in the middle of each plank. I built the roof jacks on-site with 2" X 4" lumber and plywood gussets. Although suitable only for my roof pitch, they saved a significant amount of money. I nailed the jacks to the roof deck using Walter Musson's method (sheet metal straps nailed to the bottom of the jack); this proved an excellent system. At no time did I ever step on the slate. I would sometimes balance my weight with a carefully placed foot, but I kept the larger portion of the weight on the roof scaffolding. In the final tally, I broke two installed slates with the roof jacks. I attributed this to "rocker" slates, those that didn't lay perfectly flat. This was caused by slates with a thicker top end, or those that were slightly cupped.

Tools — I used the Stortz European Style Slate Hammer, Stortz Slate Ripper, and GT Pro Slate Cutter. Although I don't have much for comparison, I liked all of them. They were of solidly fabricated, had good balance, and worked very well for their intended purpose.

Wearing Knees Down Slowly — Midway into the North roof installation I chanced upon a miracle. My neighbor offered me use of his Skylift forklift (AKA boom forklift, telelifter, etc.) to move the slate onto the scaffolding. He brought it to my site, along with a 4' X 13' work platform that sat on the forks. This saved me quite a few trips up the ladder!

Rate of Installation — I averaged a little over one square per day, installed. On good days, with no roof obstructions or transitions, I could do two squares (six courses across the entire roof). I hit this mark on three separate days. Then again, installing the DWV vents or skylights or valleys slowed my down to less than a square a day. There was also a learning curve to overcome.

SUPPLIER REVIEW:

Camara Slate Products — We chose this company for their good reputation, the quality of their samples, and general service. It's a father and son operation, something that tends to give you a solid feeling about a business. They punch their slate, inspect it just prior to shipment. Their prices were competitive with other suppliers we contacted. To my knowledge Sean Camara fields most of the sales calls. He was personable, informative, and professional.

After finally making a color decision, we placed our order, sent a check for 50% of the order, and waited to hear about the shipping date. We had requested a shipment for the first or second week of January. The slate arrived on January 10th, in what appeared to be very good condition. I only found four broken slates at delivery. They sent a good mixture of 9", 10", 11", 12", 14", and 16" slates, with pallet numbers, sizes, and quantities listed for easy organization.

After making my way through several days of sorting and installing the slates my perspective changed. I came across quite a few cracked slates — often only noticeable by ringing the slates while sorting. I also encountered a fair share of ultralights and uglies. Here are the final figures: 4,480 delivered; 3,960 installed; 326 remaining; 196 broken/discarded.

Of the remaining slates, 276 are in the ultralight and ugly category. I have 50 left that I consider normal slates — to be used for replacements and repairs. So that's a 4.3% breakage rate (not factoring in the broken slates used for the last course) and a 6.2% reject rate. Most of the broken slates were in the 9" size, as were most of the ultralights and uglies. The 12" and 14" slates were the most consistent in thickness, face, and quality.

I'm not sure how to feel about the results. On one hand, Sean Camara stated that they generally see a 2% breakage rate. On the other hand, he and everybody else out there says to order 10% additional slate for breakage and "cutting loss" (I needed 60 cut slates for my open valley). Still, some suppliers even recommend ordering 15% extra, so what I experienced was certainly not out of the ballpark. I guess I was just expecting a few more replacement slates leftover for the next few decades . . .

Castle Metal Products — We chose this company for their ventilated ridge. The house design has a cathedral ceiling in the public area, upstairs bedrooms tucked into the roofline. So I was keen on using soffit/ridge venti-

lation (testing has shown this to be the most effective and efficient form of ventilation).

We requested literature, which came in a couple of weeks. The brochure was nicely illustrated, with facts and figures, and installation drawings. The system appeared to be as advertised. We asked for a reference, talked to a roofing company in Baltimore, MD (Ruff Roofers) who gave the system high marks. It is another family company (brothers) and we dealt with Gary Castle.

I was concerned about the flashing / transition at the back of the chimney, so I asked Gary if they could design a piece to go with the TopSlate product. He agreed this would not be a problem if I could solder the back-flashing. He was supposed to send a drawing, but didn't. The requested ship date came and went. We called to ask about the status of the drawing, only to find out that our order was built and ready to ship. That was unexpected, but fine. So we sent a check and the material shipped.

The package arrived in a damaged pallet; fortunately, the copper was not damaged. But they didn't include a receipt or any other documentation. On top of that, they didn't include the requested chimney backflashing or the drawing. I tried out the system, found that the straps they sent were too small (they sent 10:12 and 12:12 pitch end caps).

I called Gary, who said they would take care of it, no problem. He would call back with some information. No call. We waited several days, called, got the same story. It was ready to ship. We waited a week. No package. We called, found out that the secretary forgot to ship the box. She shipped it. Great! The package shows up. This time the straps are right, but the backflashing makes no sense — and there is NO drawing to show how the pieces are supposed to fit. I call Gary; he is out; he will call back. No call. Again. So I decided to fabricate my own transition flashing, be done with trying to communicate with CMP.

The documentation looked great before purchase. But, further investigation and application led me to conclude that it is inconsistent and contains errors.

The product concept is great. But the devil is in the details. I think that they build a very nice ridge, one without any exposed fasteners or potential leakage points. You pay a high price for their product, so you expect a solid system. But my experience was soured by their service and lax communication. My opinion is that the ventilation option was added as an afterthought. It could certainly be better integrated. Had I to do it over again, I would use the slate ridge, bib flashing method (as shown on slateroofcentral.com's how-to pages). I can certainly see why they recommend using gable vents. They are not problematic like ridges; they are old technology, thus proven; they are less costly.

Joseph Jenkins, Inc. — After determining that we would use slate for the roof, I ordered tools and fasteners from Jenkins' slate supply store. I used the phone method because I had several questions. They fielded my calls twice. They were accurate, professional, and informative. They repeated numbers for verification. They sent confirmation emails. The packages arrived on-site exactly when scheduled. There were no errors or issues.

I attempted to purchase nails straight through Swan Secure Products, having done so in the past. But to my surprise, they were more expensive than Jenkins — at least by the time I included shipping. So not only was the service good, but the prices were good.

Jenkins sent a complimentary copy of the Slate Roof Bible along with one of the orders. Although I already owned a copy, it turned out that my brother had recently purchased a house with a slate roof. So I sent that copy to him, for use in renovating and adding onto his house.

PROBLEMS — The entire process was a big learning experience, frustrating at times, rewarding at others. Along the way I came across a few issues that were difficult to resolve:

Valley flashing — Although both the SRB and the CDA (Copper Development Association) give excellent illustrations on the various valley flashing methods, neither one of them discusses the intersection of the two valleys. It would have been helpful to see some illustrations or pictures in some resource, book, internet page, etc. Of note, although not necessarily an easy job, the SRB gives excellent illustrations and pictures on chimney flashing — including the various options and penetrations points.

Copper Flashing Supplier — Perhaps a symptom of my location, but I

Continued On Page 28

Once the roof is slated you remove gabbit and spin the slate into place which leaves then no need to clip the "missing" slate in.

Re replacing broken slates, I use the ripper to remove one nail from above the broken slate which then leaves this slate ready to spin round, which sometimes can be a pain, but once you get it to move, slip the replacement slate in and you have one hole available to nail.

SLATE SIDING — The slate [in the photo] is all reclaimed roof shingles, mostly Munson slate from Maine along with some Vermont slate.

We originally planned on only doing around the front door, but I found enough to do the entire house almost by accident. Also, the slate cost a lot less than even unfinished wooden shingles and went on a lot faster because the shingles were larger. The carpenters also were very excited about it, because it was something new to them. T.E., Maine



SPRINGHOUSE — I was inspired to slate roofing by your Slate Roofers Bible. I had an asphalt shingled roof on my farm springhouse and my thought was how nice a slate roof would make the building look. I purchased my slate from Vermont and got your book and some tools and went to work. I could not find any local advice and hope my job was at least complementary to the field-stone walls. I used copper nails and peaks, although I did not have a break for crisp bends. Charles Rosamilia



WHAT DO YOU THINK? — We are beginning to see various "batten" or slate

hanger strip systems that appear to be dependent on the self-sealing ice membranes to help keep water out. Since they are held by hangers, these systems do not require a large overlap (claim that they use half as much slate as a conventional installation), do not place as much weight on the roof and do not produce as much waste because there is no nailing. What do the experts at Traditional Roofing think of these systems? Thanks for all your good efforts! K. M., NY

TR — Readers who have experience with slate roofs installed on strip hangers, let us know what you think!

LEAKING CHIMNEY — I am off this afternoon on a roofers holiday (i.e. rain). I was reading your answer to "leaking chimney" on page 25 of TR 6 and thought I could shed some light from my 30 years of roofing. When I am dealing with a leaking brick chimney, the first thing I look at is the top of the chimney. If the mortar wash is old, it can "perk" water. Evidence of this will show up in the mortar joints around the top of the chimney. If the joints are black, it indicates that fungus is growing on the lime substrate. This tells me the cause of the leak is the mortar chimney cap or wash. If we are dealing with a stone chimney, the answer is usually pretty straight forward. East coast stone is porous. When I run into this problem here in central Virginia, I will spray the chimney with Hydrozo Clear 16. It is the only product I have found

that lasts. Silicone sprays do not last. If I have to deal with a new stone chimney, the only way I will guarantee the chimney is to flash the chimney to the liner. Another way to check a chimney leak is to place a plastic tarp over it and duct tape the tarp so it won't blow off when the chimney is not in use. If the leak is still there, then the leak is roofing related. If the leak stops, then the leak is above the flashing on the chimney and not roofing related. When I replace a chimney cap or wash, I use 50% mortar mix and 50 Portland added to the sand. Thanks for letting me add my input to a common problem. David A. Snyder, Rockfish Roofers, Afton, VA; 434-361-1218

PLYWOOD DECKS — We are starting a graduated slate roof on a newly constructed residence next week and have a question which I think you can answer for us. During the pre-bid meeting with the builder, I stressed the importance of using wood plank decking as opposed to laminated plywood. During a site visit last week we found that the rafters are 2"x12" spaced 16" o.c. The roof slope is 9/12 in the field and 12/12 on the dormers. The roof decking is 3/4" CDX plywood. The carpenters are covering the decking completely with self-adhesive ice membrane. I have informed the builder of the need for attic ventilation and he said that he would install gable end vents in an attempt to keep roof penetrations to a minimum. My question is, with the presence of laminated plywood do I need to change from smooth shank to ring shank copper nails when installing the new slate roof? K.F., IN

TR — I don't recommend laminated wood roof decks under slate, as you know. I try to not get involved in plywood-decked roof projects. I know of no reputable documentation regarding ring-shank nails and plywood. I also do not recommend ring shank nails on slate roofs — they're not as strong as smooth shank, they break easily, and they make repairs much more difficult because they tend to snap off rather than pull out with a slate ripper. Solid wood decks and smooth shank nails are the traditional materials that have already been tried and proven and have been shown without any doubt to be capable of lasting a century or two. If the client wants longevity, that's what they should be using.

CALCULATING SLATES PER SQUARE — How do you arrive at the number of slates per square at a 3" headlap?

TR — You figure out what the exposure is for each slate [exposure = length of slate, minus the 3" headlap, then divide the remainder by two], then multiply that by the width of the slate to get the square inches of the exposed face of the slate, and then divide that into the square inches of a square (10' X 10' or 120" X 120" = 14,400 square inches in a square).

So a 24" slate with a 3" headlap would have a 10.5" exposure (which is the height of the exposed face) multiplied by 12" (12" is the width of the exposed face) = 126 square inches (exposed surface area per slate) divided into 14,400 = 114.28 slates needed per square.

SLATE ROOF RESTORATION — Eric Sosa and I restored an old slate roof recently and we wanted to share some pictures with you. The house was around 100 years old and the roof on the addition had leaked for the last sixty years, as shared with us by one of the inspectors who personally knew the family who lived there. We salvaged slate from an old barn that had been damaged severely and subsequently collapsed in a windstorm.

Continued On Page 36

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The house we were working on had two different sizes of slates, and lucky for us the slate from the barn matched the slate that was on the roof of the addition. In the process of stripping back the valleys to put in the new copper, we discovered that when the addition was built, they used the slate that was removed from the original part of the house to start the slate on the addition. We stripped all of the ones that were that size and had enough to cover the spot where the chimney used to be and to keep all of the slate uniform on that side of the valley. We were able to remove the chimney, eliminate all of the leaks, and retain the slate roof. Thanks for writing and publishing the Slate Roof Bible, it was an invaluable source of knowledge and an absolutely necessary tool for the job. Thomas Liberto, Maryland (bottom photo, at left)

STACKING SLATE — I am buying up a bunch of salvaged roofing slate to replace the roof on my home in the coming years. What is the best way to store shingles for several years, as in stacking and maintaining?

TR — Just stack them on edge on boards, indoors or out, covered or not.

ASBESTOS IN SLATE — I have a question that no one seems to know the answer concerning slate roofs. I am British and now live in Vermont. When in England (before retiring) I surveyed buildings for asbestos prior to their renovation or demolition. The very old slate roofs (not pre-formed or cement) very often contained asbestos. It looks in your "Roofing Bible" that this is a possibility.... I would so much appreciate an answer that would keep a very elderly gentleman happy. P. C.

TR — There isn't any asbestos whatsoever in American slate. The term "asbestos slate" is a misnomer. Readers, prove me wrong.

ICE AND WATER BARRIER — Have you seen red mastic essentially melt ice and water barrier? I recently came across another slater doing a job in Brookline, MA. The graduated roof had previously been installed with the larger slates at the top! The ice and water barrier had deteriorated to the point that the plastic top layer was the only material left after only six years. I agree with your perspective that ice and water is unnecessary if the slate is installed properly. G. L., MA

TR — Self-adhesive modified bitumen, also called ice and water barrier and a lot of brand names, is a temporary underlayment and cannot be relied on for the long-term performance that slate roofs require. Therefore, the material should never be considered a necessary component of a slate roof assembly.

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DESIGNS IN SLATE ROOFS

I just wanted to thank you for the photo you sent from the Slate Roof Bible. This is what I came up with. I am working on other original designs as well now since this was successful. The brown spots are pine needles and debris; we had just taken the toe boards down and the roof hasn't been cleaned. The slate is Spanish "Cupa." This house is in Buckhead, GA, and among the first in the community (that we know of) to have a design in the slate. Luc Vandebuerie, D.A.C.A. Roofing; 404-391-3187





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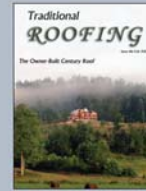
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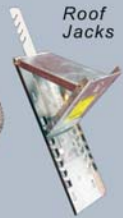


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