

# — Traditional — ROOFING

Issue #5  
Fall, 2006

## Senior Slaters

*How SEXAGENARIANS with  
No Prior Experience  
Installed Their Own  
SLATE ROOFS*

**Also in this issue:**

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*and How to Install Them*
- ✦ **Hurricane Force Winds**  
*and What They Do to Slate Roofs*
- ✦ **A Day in the Life of An Irish Roofer**
- ✦ **The Slate Quarries of Ireland**
- ✦ **Start it Right—Starter Courses**
- ✦ **What's in a Hole?**
- ✦ **SRCA - What's New**
- ✦ **Graduated Slate Roofs—UK Style**
- ✦ **Readers Write**  
*and more!*



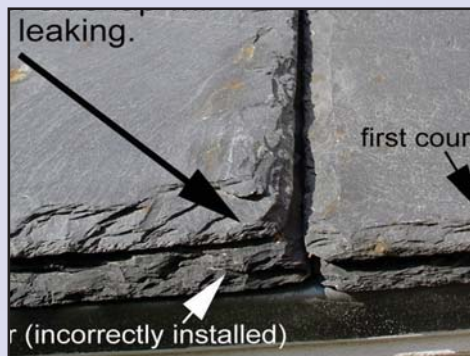
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Photo contributed by Art Gerbig

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All Uncredited Photos by Joe Jenkins

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## On the Cover:

Dr. David Clark, a licensed practicing psychologist in Covington, Louisiana, installed his own slate roof in his spare time at age 68 after reading the *Slate Roof Bible*.

Cover photo by Joseph Jenkins.



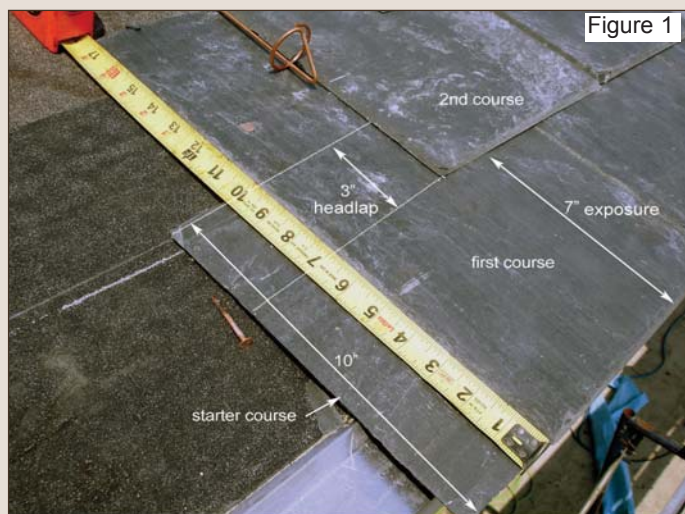
# Slate Starter Courses

Joseph Jenkins

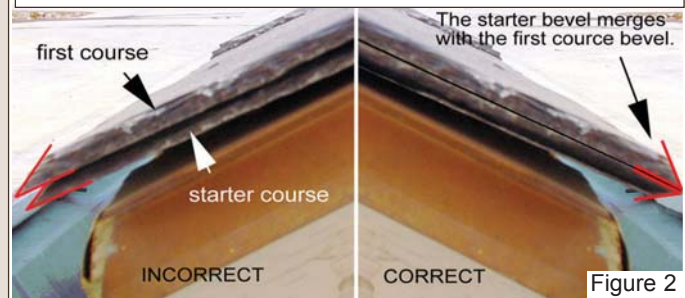
## 1) The starter course is incorrectly installed face up.

One can tell immediately if a slate installer is experienced or not by looking at the starter course. If the starter course is laid with the face side up, the installer is inexperienced and it's likely there could be additional mistakes in the roof installation. The starter course slate is the only slate on the roof that is supposed to be installed with the face down and the back up (Figure 1). All other slates on the roof are installed with the face up in order to expose the beveled edges of the slate (the face of the slate is the side that shows the beveled edge — the back doesn't). The reason the starter course is laid face down is because the drip edge of the starter slate then merges flush with the drip edge of the first course of slate (Figure 2). It just looks better. This is a traditional stylistic procedure that doesn't have any practical effect on the long term functionality of the roof system.

Furthermore, when ordering roofing slates from the quarry, it is advantageous to order the starter slates separate from the field slates (rather than use the field slates as starter slates). A good slate supplier will make sure the starter slates are punched for nail holes only along the top of the slate and the holes will be punched on the front of the slate (rather than the back as is done on the field slates). This allows the slate to be laid face down and the nail-head countersinking to be on the back of the starter slate.



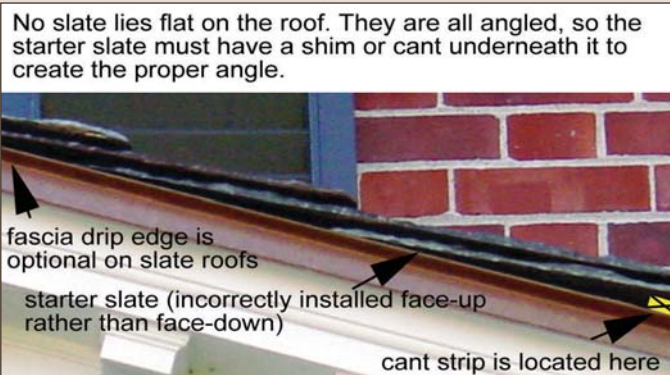
The starter course is supposed to be laid with the back side of the slate (the side without the beveled edge) facing upward, as shown above, and below right. When installed correctly, the drip edge bevels merge to a point, as shown below in Figure 2, right side. When installed incorrectly, as shown below left, it's an indication of an inexperienced installer and does not bode well for the rest of the installation.



## 2) The proper cant or shim strip is missing.

The starter course must be angled on the roof in order to match the angle of all the other slates in the field of the roof (Figure 3). No slate lies flat on the roof because every slate is overlapping other slates. Since the starter course does not have any other courses of slate underneath it, something must be installed to create the proper angle on the starter course. Traditionally, this has been done by nailing a cant or shim strip made from wood under the bottom edge of the starter course, usually the same wood that is used to create the roof deck (Figures 4 and 5). Alternatively, the fascia board can be raised slightly in order to raise the bottom of the starter course. Also, if a metal drip edge is used, the drip edge can be formed with an inverted "v" groove that functions in the same manner as a cant or shim (Figure 6). Other types of shims have also been employed over the years, such as cedar shakes, plaster lath, etc. In any case, if the shim is left out, the slates will not lie cor-

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# SENIOR SLATERS

by Joseph Jenkins



"It's not rocket science," Dave tells us. His handiwork included a band of hand-rounded slates across the roof, flashing around dormers and skylights, plus ceramic tile ridges. The force of the winds that battered his home is evident in the photo below, which shows only one of the many trees that succumbed to Katrina's massive assault.



Photos this page by Joe Jenkins

THEY SAY THE ROAD TO HELL IS PAVED WITH GOOD INTENTIONS, but the road to Dr. David Clark's house north of New Orleans must have been paved with fallen trees after hurricane Katrina turned the place into a living hell. Huge tree trunks were stacked like Lincoln Logs fifteen feet high, mile after mile along the rural highway I was driving six weeks after the hurricane had committed her massive assault. I was on my way to view a newly installed slate roof that had been unfortunate enough to lie in the hurricane's direct path. But that wasn't the only thing unusual about this roof. It was installed by a sixty-eight year old practicing psychologist who had no prior experience with slate roofing. And he did some unusual things — according to conventional roofing wisdom.


When I arrived at the scene, there were dozens of huge trees that had blown over, snapped off, or were uprooted. They had fallen like dominos all around the house, but none had scored a direct hit. Dave reported that winds in excess of 150 m.p.h had battered his home and it had taken him two hours on foot to get one mile down his road after the hurricane passed over, due to downed trees. Yet, not a single slate had blown off his roof. He only lost a few slates where flying debris had bounced off the roof on the back of his house. This was a miracle in itself, yet, when

I asked Dave how he had fastened the slates to the roof, his answer made my jaw drop. He had simply drilled holes into the slating battens for the slating nails, then pushed the slating nails into the wood with his fingers. He did not "nail" any slates to the roof with a hammer. Any slate could be lifted off by hand.

Then why didn't the slates blow off? Were these some kind of super slates? Hardly. They were "saved from the dumpster," as Dave tells it. The slates originated in Brazil and were being installed on a roof in New Orleans prior to Katrina. The owner noticed "iron and sand" in the slates, saw some "weak" slates and said *no way are these going on my roof*. He made the roofing contractor take them off. That's when they were headed for the dumpster, until Dave got word of the, uh, windfall. He struck a deal with the roofer to haul away the seven tons of slates — enough to roof his entire house, free for the hauling.

For a roof deck, Dave used standard lumber-yard 2x4s ripped down the middle to make 1.5"x1.75" slating battens. He got the idea to drill holes and push the slating nails into place from the Slate Roof Bible, which shows photos of old Welsh slate roofs that were installed with wooden pegs hung over wooden lath. In fact, Dave had found the Slate Roof Bible online, ordered a copy, read it, then the gears in his head began rolling. He also ordered a slate cutter and a ripper from [slateroofcentral.com](http://slateroofcentral.com). He used galvanized nails for the slating nails. "It was fun cutting the circular slates," Dave said, pointing out the rounded-bottom slates he had installed in a pattern on his roof. "The feel of the slate creates an earthy type experience," he explained, contrasting slate roof work to office work. "Straddling the ridge was neat — the view, the sounds of birds. My most memorable moment was when I fell off," he added, quite seriously, but with a laugh. He had failed to secure the hooks on his ground ladder one day and "the ladder slid down and I went with it." Dave broke his foot in the process and had to put his tools down for a couple months until it healed. This was particularly frustrating to Dave because he's also a marathon runner, running 4 or 5 marathons a year, even coming in 2nd at the Buffalo, NY Marathon of 2004. "The hurricane knocked a year off my schedule," explains Dave. So what another couple of months?

Dave's sage advice: "Don't drink too much wine when doing slate roofing."

Continued on Next Page 



MANY HOME OWNERS TODAY complain that they can't find a competent roofing contractor who can install a slate roof. Or if they do find a contractor, he screws up the job. Maybe they're just looking in the wrong age group. Albert Gerbig of Skillman, New Jersey, for example, had been an AARP member for ten years and was 60 years old before he started installing his first slate roof. A retired food technologist and consultant, his background didn't prepare him for the arduous task of stone roofing. However, with local roofing contractors charging \$3,000.00/square (\$30/square foot), or more, to install slate, Mr. Gerbig said, "What the heck? I can cross this off my list of things I always wanted to do!"

Mr. Gerbig, determined to install his own slate roof, prepared himself with knowledge and inspiration by reading the Slate Roof Bible. Then he ordered the appropriate tools, equipment and materials. His roof jacks came from [slateroofcentral.com](http://slateroofcentral.com) (ph: 866-641-7141). Other tools and equipment were procured from various sources and included a platform lift and scaffolding. The 10x14 Vermont black slate was purchased from Camara Slate Company in Fair Haven, VT.

Al began by stripping off the old cedar shingle roofing, which was the original roof on the house, and at only 20 years old it already needed replacement. He also removed the old spaced sheathing and replaced it with new solid sheathing. The project, still ongoing at the time of this writing, has taken about three and a half months, with three or four weeks lost to rain days. A professional sheet metal contractor is helping with the lead-coated copper flashings, which include drip edges and fascia flashing.

Ready to start ripping off the old cedar shakes.



Photos this page supplied by Albert Gerbig

Costs for the project added up to over \$40,000.00, including slate, sheathing, dumpster costs, tools, snow guards, copious quantities of leaded copper, and structural enhancements to the load bearing capability of the building. The new slate roof, however, should easily last a century. Al's grandchildren will be able to admire his craftsmanship — as adults.

In this day and age, when the popularity of slate roofing is soaring and natural roofing is experiencing a renaissance of sorts, it can be disheartening when the average roofing contractor does not have the time or the motivation to learn the basic skills required for such an endeavor. It's *not* rocket science. A simple search on the internet will yield a wealth of data about slate roofs, including books, information, instructions, sources of tools, materials, and slates.

Many times, a handy-person or property owner will ask, after searching in vain for a competent roofing contractor, "Can I install my own slate roof?" With the proper information, tools, supplies, safety equipment and determination, and thanks to the efforts of sexagenarians, the answer is a resounding, "Yes!"



Al and his handiwork



The slates arrive from the quarry.



Al's Solid board sheathing makes a perfect deck for a slate roof.



Good ladders, a ladder hoist, pipe scaffolding, roof jacks and planks make the job a lot easier and safer.



# A MORNING IN THE LIFE OF A "LIVING ON THE PREMISES" SMALL U.K. ROOFING CONTRACTOR/TRADESMAN

*This article is not intended to be a factual minute by minute resume of events. It is, however, based on events that have happened to me.*

JOHN BALL • Illustrations by Len Ball

*I know there must be many proprietors or even employees of small roofing and indeed many other building related businesses who I hope will understand and can identify with some of the types of problems that we can all encounter in our day to day businesses. The article is intended to be light hearted and amusing even if based on true situations. I hope the reader enjoys reading it as much as I have enjoyed writing it. J.J. Ball*

7AM. on a winters morning.

Thank God it's time to get up. Didn't sleep a wink all night. Rain pelting off the tin roof of the lath store. Those hip ridges we bedded with sand and cement yesterday afternoon, just got the job finished, ladders down and tidied up before the rain came on. 50° pitch roof, natural slates, what a mess that lot will be in.

Were the planks tied on the scaffold on Jon's Job? What about the job Len and his squad felted and fly lathed, at least 18 miles away, but I could swear I heard the felt flapping till it tears.

Don't want to disturb Angeline, the missus. I recall, as I got into bed, she told me she had a headache. Might be able to get my corn flakes before the phone starts ringing.

The phone goes. It's an old lady from the other side of town, she says she is a friend of a friend and she knows we will help her, she heard a bump in the night, there's water coming in through the ceiling rose and dripping off the light bulb and the electricity has gone off. Could I please come round first thing or even send someone? She's afraid of the house catching fire via the electrical system. I jest to her that the rain would probably put it out but she doesn't think it's at all funny and begins to cry. She easily persuades me into promising that I will call round as soon as possible (when it stops raining).

One of the boys rings up to tell me the battery is flat in his car and it won't start and he wants to know what I can do about it. On hearing my suggestion re his battery and his car he retorts that if that's the way I want it he will just go back to bed.

I'm part way through the cornflakes when the postman arrives. He won't get out of the van because the dogs are out so he blasts the van horn and I have to run out into the rain with a donkey jacket over my pajamas (haven't had time to get my clothes on yet) and my feet half into a pair of heavy safety work boots. Postman Pat smiles and bids me good morning as he pushes a bundle of mail through his very slightly open van window while the dogs playfully chew the lower leg of my pajamas.

I run back in, sorting the mail as I go. I push aside all the envelopes with windows, throw an assortment of mail from computer firms, mail order businesses, newspaper bingo cards and the like into the bin and I am so eager to open the only interesting one, that as I tear a strip along the edge of it I neatly tear a half inch strip off the bottom of the only cheque in the post, removing both the banks official number and obliterating the signature, and the cornflakes have gone soggy.

At least the grey dawn is breaking. It is at this stage I notice a strange car in the yard and the employee who couldn't get his car started is showing two respectable looking gentlemen the three pallets of second-hand slates that some months ago, I bought off a gypsy, who having completed the cash deal with me, shot off in an awful hurry. I really was rather apprehensive at the way he left looking over his shoulder. I was torn between pushing them into a dis-used quarry hole (fear of the law) or selling them off to another contractor at a vast profit. Looks like it's too late for either now! The law has tracked down the slates?

Another two cars arrive with a few more of the boys. They are rather late because it's raining as they drive slowly past the unlit window of the yard office towards the house. I move smartly towards the bedroom to get dressed, since I believe it lowers the morale of the men if they find me in my pajamas after 9 am, neither am I in form for the certain sarcastic jibes!

As I go, I leave Angeline to give the men their detailed written instructions, carefully written out by me over a few hours the previous night. However, the main contents of these are now irrelevant since, due to the weather, the work cannot be done. Schedules will have to be re-arranged, since some work, which was not so urgent, has now to be given top priority due to the effects of the bad weather. Priorities will change throughout the day according to which irate customer is on the phone at any given time.

I have just kicked off my pajama bottoms when I have to reach for the phone again. It's the man with the hip ridged roof we finished yesterday. There's a sickness in the bottom of my stomach, but all he's telling me is how pleased he is to have the job finished and how well it all looks, and by the way, we left a ladder and plastic container of funny looking green liquid behind. The label got washed off in the rain. I give a great sigh of relief, some of the boys must have thought to put accelerator into the mortar. Those ridges are probably alright. The boys are not so bad after all, and the gloom lifts slightly.

I have one leg in my trousers then the phone goes again. The local offices of an international company, with offices in Hong Kong, Sydney, New York, and Greater Wallop (according to their very impressive upmarket and extremely expensive looking business literature) wants me to re-consider our quotation for supplying and fixing roof tiles on a new office block.

Their client has decided to install a 1.75 million pound sterling computer designed and controlled heating, ventilating and insulation system. They have also substantially upgraded their internal decor, carpeting and furnishing, and the project is now costing an enormous lot more than they had budgeted for. As our contract had not yet been signed, if we cannot find a way to cut the roofing costs drastically, then they may have to consider another roofing contractor.

I wish them well and put my other leg into my trousers. I hop about on one leg, pulling on my socks with the phone tucked under my chin as one of the squad leaders



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# TRANSFORMATION

by Cherie Downey

**I**F YOU'RE AIMING TO MAKE A BIG CHANGE in the appearance of a home, installing a slate roof is one sure way to accomplish that. A home built in the mid-50s in Upper Arlington, Ohio is in the process of utter transformation due to an addition which features a slate roof where shingles had been previously installed. The house was plain and not at all exciting as it appears in the picture taken before work had begun.


The original shingle roof was removed from the entire house,

symmetrical arc. Koren's innovations met with approval. According to the homeowner, "It was exciting to see the transformation. I never could have imagined how great the custom slate pattern would look. The final Bill designed is the perfect finishing touch. The turret looks like it was always a part of the house."

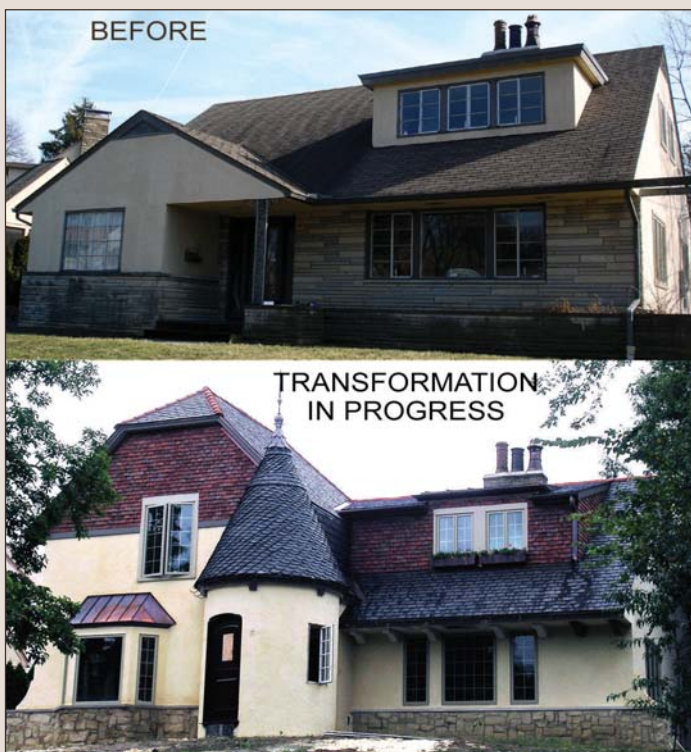
Koren said that making the turret slates curved on the bottom with a tapered top helped the slate to lie flatter toward the top of the turret. Nevertheless, he found that he needed to tie in adjacent rows several times as he progressed. When asked how he kept the slates even and the pattern uniform, Koren replied, "It was laid freeform without chalking a single line. Each slate was nailed with three nails rather than two. It was supposed to be free-flowing and not necessarily perfectly uniform. I wanted it that way because it fit the organic nature of the design."

What is Koren's advice for anyone who might wish to attempt a similar installation? "Take your time; you can't rush it. I would put a slate on and sometimes I'd have to take it off because it wasn't laying right. Sometimes I had to remove a whole row and re-lay it. I was up and down the scaffolding a lot, looking and making sure it was right."

Koren's custom design for the copper finial was greatly influenced by the slate installation. The turret was finished first, and the finial was made to compliment it — the petal shapes continue the organic theme. According to Koren, "It's nice when you get the creative freedom to fabricate something like that — when you have a homeowner who's willing to trust you and you can express yourself."

And how does the owner of this property feel about her home's new look? "I'm just thrilled with it. Every time I see it, I smile." 

Cherie Downey is Director of Public Relations for The Durable Slate Company, an SRCA member and prominent restoration contractor. She documents and makes known the company's accomplishments in the fields of historic restoration and traditional building practices.

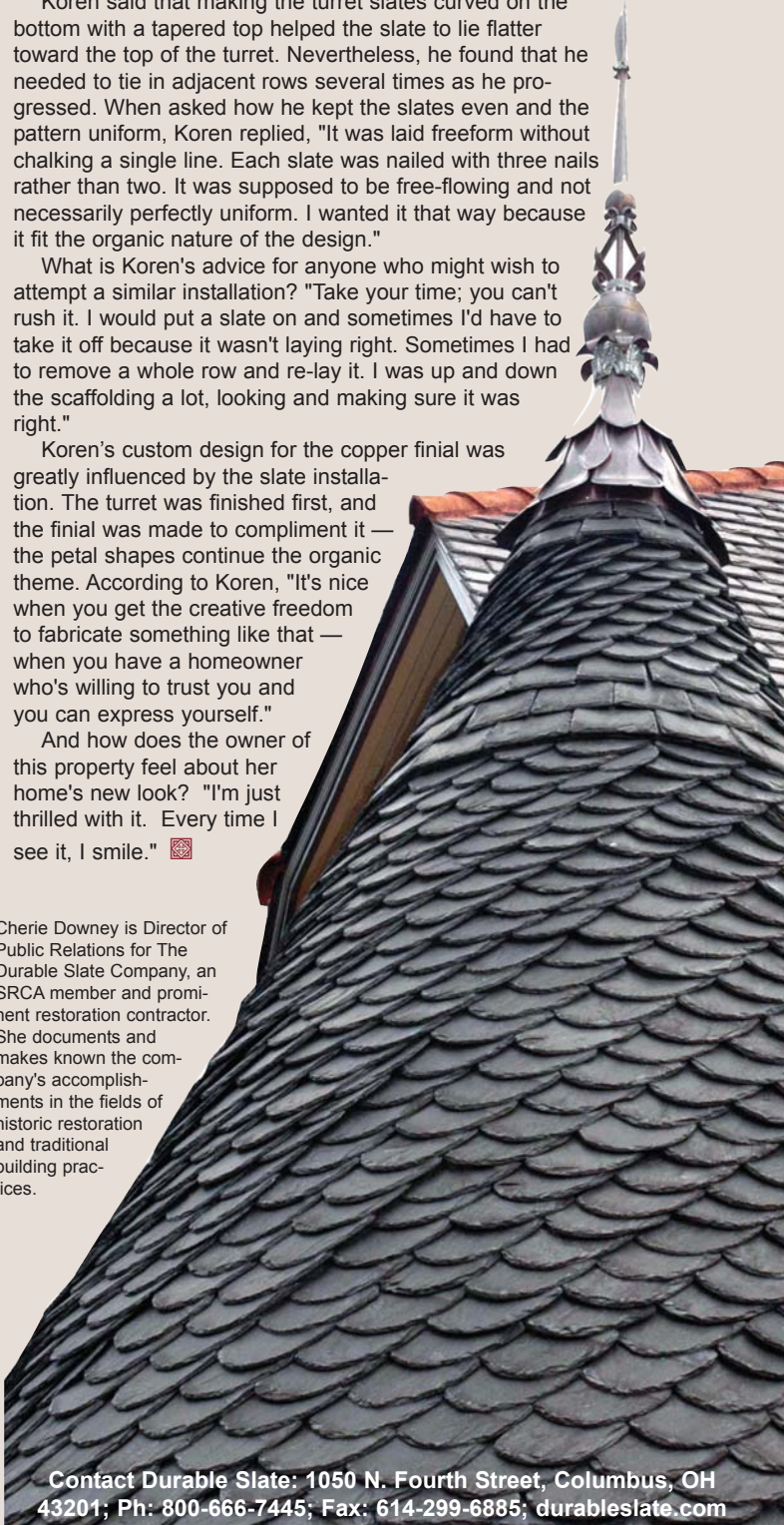


and the second floor was extended to provide additional living space. A new turret entry was built, and an original design was created for installing the slate on this roof. Salvaged Virginia Buckingham slate was installed on the roof, while a veneer was installed just above the foundation and French tile was installed on the exterior wall of the upper floor.

The slates were laid according to a standard installation in the field of the roof. The turret roof pattern was created by Durable's Bill Koren, the craftsman who installed it. Slates were cut with an oblique curve on the lower edge and were laid in a Dutch-lap spiraling pattern which resembles fish scales. When asked how he came up with this one-of-a-kind pattern, Koren said, "Both the homeowner and I wanted it to look organic because the house is already asymmetrical and straight lines wouldn't have worked. Also, everything on the exterior is all natural materials - the stone, stucco, slate, cedar - which goes with the organic effect. I knew that I wanted to do something really different, and I made five or six different pattern pieces and came up with one that I liked."

The homeowner had suggested a scallop shape for the slate, but Koren aimed for something more unique. "I kept trimming it until I could make it work and it would roll all the way up the turret." The result is a slightly asymmetrical curve for the slate's bottom edge — neither a straight line, nor a uniformly

All Photos by The Durable Slate Company



Contact Durable Slate: 1050 N. Fourth Street, Columbus, OH 43201; Ph: 800-666-7445; Fax: 614-299-6885; [durableplate.com](http://durableplate.com)



# The Slate of Ireland

Joseph Jenkins

**W**HO KNOWS ANYTHING ABOUT IRISH ROOFING SLATE? Even when I was attending the International Federation of Roofing Trades Congress in Dublin, Ireland a few years ago, no one there knew anything about Irish roofing slate, nor could anyone produce one for me to look at. It wasn't until Mary Lou Willits of the Slate Valley Museum in Granville, NY showed up on the scene that this mystery became solved. Mary Lou and her architect husband, David Wright, independently researched the slate quarry region of southern Ireland, located the old quarry sites, sought out the old-timers who knew about the industry (now virtually defunct), then led a tour through the countryside, villages, quarries and pubs they had discovered and mapped out. The tour was in September of 2006. I tagged along, and this is what I found.

At one time, hundreds of slate quarries operated in Ireland, but the Irish potato famine in 1847 helped undermine the Irish slate industry when many Irish emigrated to the U.S. Today there is only one working slate quarry in Ireland — the Valentia quarry on Valentia Island off the southwest coast. Valentia, now a small operation (two men were working there when we dropped in) no longer produces roofing slate.

There were several other working slate quarry areas in southern Ireland at one time, including Ormonde, Victoria and Killaloe — three now defunct quarry sites that we visited during the tour (see map).

The Ormonde and Victoria quarries are located in the same valley in southeastern Ireland, northwest of Waterford near Tullaghought. The Ormonde quarries (Figure 1) are in County Kilkenny and were worked until approximately 1935. This "slate valley," extends 2 1/2 miles to include the Victoria quarry in County Tipperary (Figure 5). Both produced a black slate of high durability — a slate which can still be seen on many of the local houses and buildings.

Our tour took us through rich farmland, past herds of beef cattle, potato fields, hills covered in purple heather, yellow gorse, wild foxgloves, and red fuschia growing wild in the hedges. Blackberry thickets laden with plump fruit were everywhere. The heavy rains during our visit swelled the rivers. Abandoned ruins of castles dotted the landscape —

some were still inhabited. The mild climate in this part of the world rarely causes frost. Even palm trees were growing in the southern extremes of Ireland. Large Celtic crosses dating back to the 700s remain upright in rural graveyards. Our bus traveled many a narrow, winding road lined with tall hedges. Stone walls criss-crossed the open countryside.

The Killaloe Quarry, north of Limerick, just east of Lough Derg near Lackamore, dates back to 1014 and was the largest slate quarry in Ireland in the 1920s to the 40s. Some of the slate was exported to Scotland, some to Holland, but most was used in Ireland. According to an oral history given to us by Fin O'Driscoll, a blind octogenarian, the Killaloe quarries were once operated by his father, who began the operation in 1923. He had learned about slate from his father. In the 1930s, the slate operation had approximately 180 workers and worked the slate to a depth of 230'. A major landslide caused by a storm closed the quarry in 1956. Today, 17 million tons of waste slate lie in small mountains scattered through the old slate area, now overgrown with shrubs and trees. The quarries today are only deep, turquoise, cliff-lined lakes.

The Valentia Quarry, on Valentia Island off the southwest corner of Ireland south of the Dingle Bay, was first opened in 1816 by the Knight of Kerry. Most of the slate was processed in

The Irish Slate Quarry Tour was sponsored by the Slate Valley Museum, 17 Water Street, Granville, New York 12832 (phone: 518-642-1417). The tour included all transportation, more than enough food, all lodging and lots of fun. The tour stopped at Bunratty Folk Park, McKernan Handweavers, the Village of Cobh, the City of Cork, Ballyboy Farm (for tea), the Cliffs of Moher, Tire National Folk Theater (for a performance), Liscanoor Stone area, the Ring of Kerry, Kerry Woolen Mills, lots of pubs, and four slate quarries. Their previous tour included the slate quarries of Wales. Future tours are planned. For more information, contact the museum.

Below: The tour group in the Valentia Mine.

Left: Quarry tour after-hours street frivolity, as seen in the national newspaper *Irish Examiner*.

Figure 1: Haunting and lonely, an Ormonde slate quarry pit now remains only as a deep lagoon ringed by slate cliffs.



All Photos by Joe Jenkins except dancing couple.







Figure 2: Lisacannor stone is not slate, but it still makes a dramatic roof.

Knight's Town on the northeast corner of the island. The quarry's name is derived from an anglicized Gaelic term meaning "flat land at the mouth of the river." It began as an open hole and eventually developed into a mine that extended about 200 meters into the mountainside. The slate is dark gray with a purplish hue, looking black on a roof and referred to as "blue-gray" by the manufacturers. It is very durable and long-lasting, but with a coarse grain that makes economical roof slate production difficult. Roofing slate only ever comprised about 20% of the production of the quarry, with the remainder being made into structural slate, hearths, mantels, garden furniture, gravestones, celtic crosses, etc. Up to 500 people were employed in the quarry operation in the 1840s. By the 1860s, 2,000 tons of slate were produced, but production declined in the 1870s when Welsh and American slates flooded the market. The quarry continued to decline, then closed in 1884, but reopened in 1900 only to be closed again by a cave-in at the mouth of the quarry in 1911. The rock-fall seemed to ring the death knell for the quarry, leaving it lying dormant for many years. Eventually, interest again developed in reopening the Valentia site. In 1999, production renewed at the quarry, now a gaping triangular hole in the mountainside. Today, Valentia slate production is modest, with approximately 10 people employed at the site. Although no roof slate is produced, vast reserves of slate rock remain, with great potential for expansion should the investment capital and business interest develop.



Figure 3: Valentia slate still graces the local roofs on Valentia Island, in Knight's Town.

There are many buildings in southern Ireland and elsewhere throughout Ireland and parts of Europe that remain roofed with original Irish slate. Although some of these old roofs need repair and restoration, the durable slate itself is showing no signs of giving up or even slowing down. At least one roof slate salvage operation is in business in southern Ireland in the form of Killoran Slate Quarry, Ltd, in Nenagh, County Tipperary ([irishslate.com](http://irishslate.com)), which is also a broker for new roofing slate, but not a quarryier. Killoran salvages original Irish slates, retrimms them, then sells them for restoration purposes.

Although this is obviously not meant to be a comprehensive report on Irish slate, it nevertheless shines a light on a long neglected topic. If you go looking for the quarries, pack an umbrella, but don't worry about getting thirsty — a cozy pub will only be a stone's throw away. 🍷

Figure 4: Valentia Quarry.

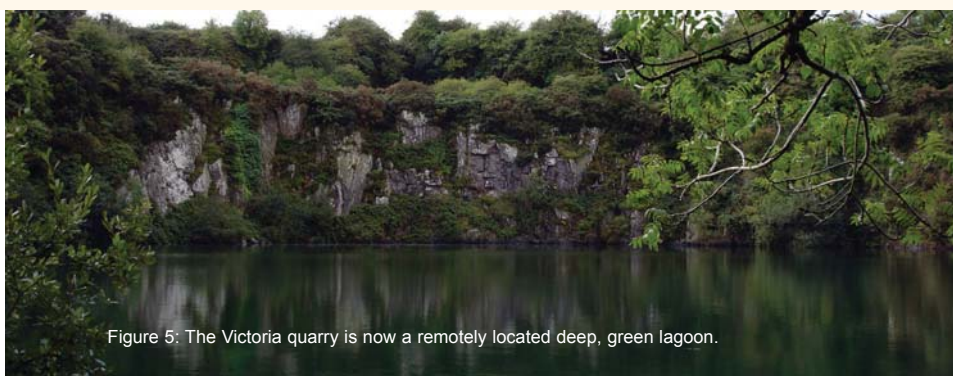
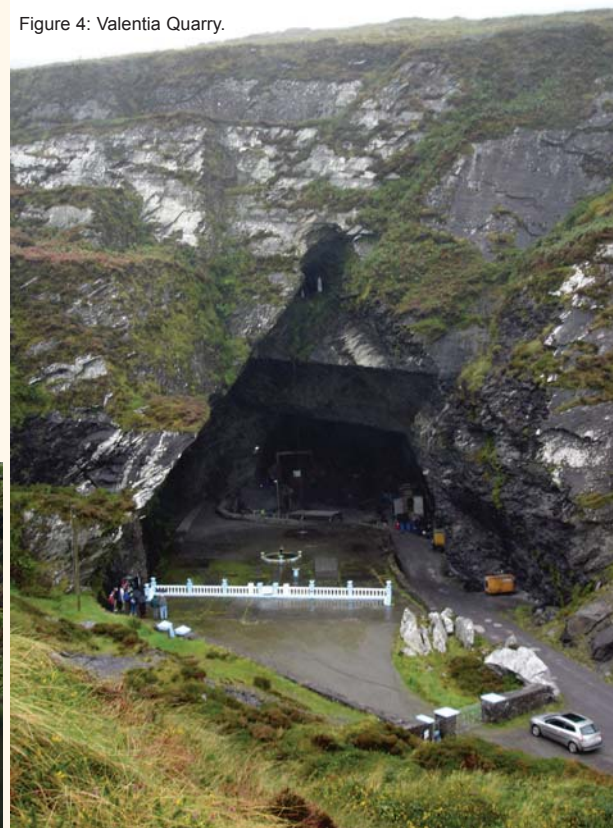


Figure 5: The Victoria quarry is now a remotely located deep, green lagoon.



# Readers Write

The following comments and questions are presented by readers to Joseph Jenkins, author of the Slate Roof Bible and editor of Traditional Roofing Magazine:

*Normally I do not bite the hand that feeds me, and your organization has been kind enough to send me your magazine which I read. However I am moved to write concerning the comments made in your Spring 2005 issue's Top Ten Mistakes article.*

*The characterization of "many roofing contractors" as "somewhere between cretin and ex-convict" is incorrect unwise and counterproductive. Your continuing description of roofers as "pathological liars, inept, unintelligent, ignorant, naïve and drunks" is damned uncalled for.*

*I have never known a good business person that insulted his customers; or a poor one that did and got by with it for long. I have never known a teacher who insulted his audience and got much of his point across.*

*I was taught not to sell negative. It does not work well and it reflects poorly on the seller. You may feel that tearing down contractors in general builds confidence in your listed contractors; it cannot but cast doubt on the process and your association. I will match the quality of our industry people with any.*

*The problems in the slate roofing universe are no different than those of the general roofing business and construction. Working to improve the industry does not include wholesale condemnation of the industry or its players.*

*Years ago I asked my father how he ended up as a roofing contractor: he answered "Just lucky!" If you keep this kind of commentary up, you will not remain so lucky.*

TR: Being a roofing contractor myself since 1970 (I started contracting at the age of 18), and still working on slate roofs at the age of 54, I'm allowed to poke fun at the trade. Too much of the work my company does with slate roofs involves the removal and replacement of substandard work that had been done by previous "roofing contractors." Being a nationwide slate roof consultant, I see too many slate roof projects going into litigation. In the past year I have been involved, either as a consultant or an expert witness, in nine slate roof litigations and I have looked at several other slate roofs that are not far from the courtroom. In most cases, the roofers are at fault. Some of them belong in jail.

Having said that, I also am aware that there are many intelligent, conscientious, respectful and responsible roofing contractors, such as myself and yourself. We are people who want to advance the trade. But when any Tom, Dick or Harry can get laid off from the factory and pick up a hammer and call himself a roofer, quality control becomes a problem. Perhaps this isn't such an issue with asphalt shingle staplers, but we slaters make roofs that last a century or two, and workmanship, tradesmanship and integrity are of utmost importance to us. When we install a slate roof, we know our great-grandchildren will very likely be around to see it — as adults, long after we have died. Slate roofing is a serious undertaking that should be practiced by conscientious craftspeople. When I see slate roofs being slapped on by uneducated and inexperienced asphalt shinglers who just want to get their money and walk, I see the slate roofing industry being damaged and it gets my hackles up.

I'm currently working toward the establishment of a slate roofing training center in western Pennsylvania. I also help teach slate roofing courses at the new Slate Technology Center in Vermont, plus I speak nationally on the topic of slate roofs to architects, home inspectors, roofing contractors and others. Training and eventual certification are sorely lacking in the slate roofing trade today (unlike other types of roofing where manufacturers provide application training). In time, the roofing trades in the United States should be as respectable as in Europe where extensive training via established roofing schools is required prior to employment. But we have a long way to go.

*In our local towns almost all state roofs have 2" head lap, and have worked well for 150 to 200 years. What is the point in 3" head lap? My dad's been roofing for 48 years. I've been at it 15 years and we would like your reason for 3" or more head lap.*

TR: Three inch headlap is considered standard these days for new slate roof installations when the slope is greater than 6:12. When 6:12 or lower, 4" headlap is recommended. Many older slate, tile and asbestos roofs (usually with 10:12 or more slope) have only 2" headlap and have done fine for a century or more. Better to err on the side of caution and stick with a 3" headlap rather than a 2" when installing new slate roofs.

*I was wondering if you know the following statement to be true or false: Underlayment is recommended by all slate tile manufacturers and the National Roofing Contractors Association Roofing and Waterproofing Manual, and so it follows by the International Residential Code in R905.1 and R905.6. It is also a requirement set by Underwriters Laboratories when assigning a fire rating to slate or any other shingles.*

TR: Underlayment is recommended in the United States for use on new slate roof installations as a protective waterproofing material to keep the building dry until the slate is installed. It's also a good surface to chalk lines on when installing slate. Once the slate is installed, however, the underlayment is effectively obsolete — it's punctured full of nail holes and is expected to deteriorate beyond effective use over time, well before the slate has worn out. Some people want to argue that because underlayment is recommended, it must be an important element of a slate roof and therefore the thicker, beefier and more expensive, the better. A lot of slate roofs have been installed with no underlayment whatsoever and are still functioning quite well a century later. It's pretty hard to argue that underlayment is critical on a slate roof when you look at one installed 150 years ago, still in good condition, with no underlayment whatsoever. It's anybody's guess why underlayment would be required for fire-rating purposes. It's very flammable.


*Do you have experience with ridge venting when installing a slate roof? Is this necessary with a slate roof?*

TR: Ridge ventilation is necessary to ventilate roof systems that do not allow air flow and have no other means of ventilation, such as via gable vents or attic vents. Traditionally, American slate roofs are made of lumber boards covered with 30 lb. felt underlayment (or no underlayment at all). This roof assembly, which is easily reproducible today, allows air transpiration without additional ventilation in most cases, which is why you rarely see ventilation systems on older slate roofs. The advent of plywood roof decking, peel and stick underlayment, and asphalt shingle roofs has created roof assemblies that prevent air transpiration and therefore require ventilating systems.

Ridge venting on slate roofs can be achieved by purchasing ventilation systems designed for slate roofs, such as TopSlate™ from Castle Metal Products (ph: 847-806-4540). Alternatively, a low-profile ridge vent can be achieved by using a plastic vent installed underneath the ridge slates (see Figure1, page 19).

*As a general rule, is it true that roof nails should be long enough to fully penetrate through the roof deck? I checked a slate quarry website and found the following installation spec: "All slate shall be fastened with two large head slaters' hard copper wire nails...of sufficient length to adequately penetrate the roof boarding." Without full penetration, the nails do not have complete "bite" into something, and risk getting pulled out.*

TR: As a general rule, the length of the slate nails should be twice the thickness of the slate plus 1" (it is assumed that the roof sheathing will be approximately 1" thick). This will give the nail a 1" bite, which may or may not show through the underside of the roof

Continued on page 19 



# What's In a HOLE?

The Size, Type and Placement of Nail Holes in Roofing Slates Do Matter — by Joseph Jenkins

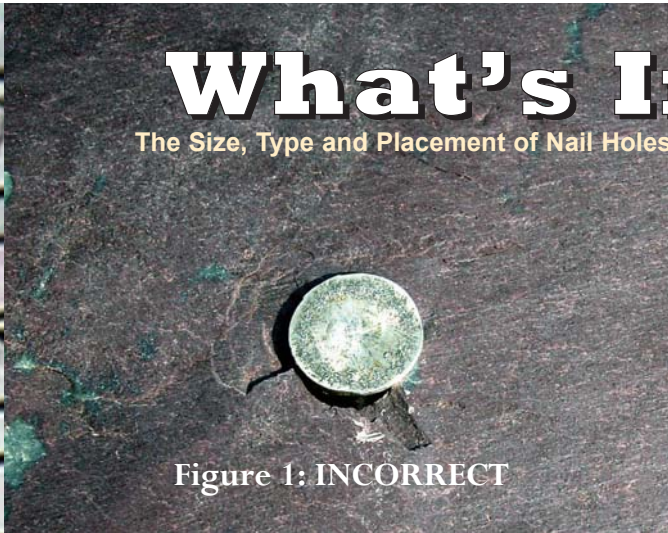


Figure 1: INCORRECT

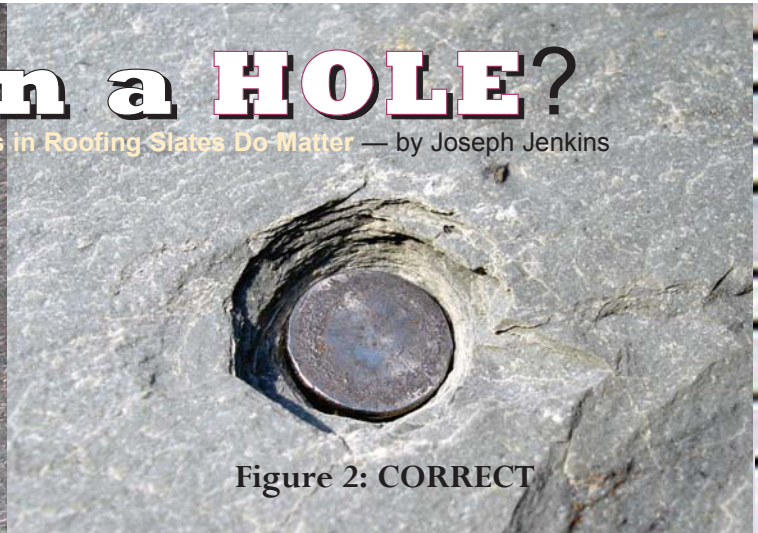


Figure 2: CORRECT



THE SLATE ON THE LEFT (FIGURE 1) SHOWS THREE MISTAKES.

1) The hole on this standard-thickness (i.e. 3/16" to 1/4") slate has been drilled rather than punched. This forces the nail head to sit above the slate and rub against the overlapping slate, eventually wearing a hole in it. 2) The hole has been drilled too close to the center of the slate (2.5" from the outer edge). Correct placement is 1.25" to 1.5" from the edge. 3) The hole is too big. Note the diameter of the nail in relation to the diameter of the hole.

The slate on the right (Figure 2) shows a correctly manufactured slate. 1) The hole has been punched, which leaves a cratered hole that allows the nail head to hide down inside the slate. 2) The hole is about 1.5" from the outer edge. 3) The hole is the right diameter for roofing nails.

Why 1.25" to 1.5" from the outer edge? The slates in Figure 1 came in a load of random-width slates. The most narrow width was 8". With the nail holes being 2.5" from the outer edges, that only left 3" in the center of the slate between the nail holes. When the next slate course is installed over this slate, even if the overlying slates butt right in the center of the slate, there is only 1.5" of lateral overlap to the nail hole — an insufficient distance which will make a good slater real nervous when installing a roof with this caliber of slate due to the possibility of capillary attraction drawing

water to the nail hole and creating a hidden leak.

What about the diameter of the hole? A precise slater nails his slate along chalk lines that mark the top edge of the slate. When the holes are twice the diameter of the nail, the slates drop slightly away from the line after nailing. Although this may seem like an trivial complaint, it is an unnecessary annoyance on the job site.

Some say that the nail heads protruding above the drilled slate are not really a problem. In the short run, they aren't, but in the long run, they will wear a hole in overlying standard-thickness slates (Figure 3). Furthermore, when standard-thickness slates are drilled, the quality control can take a nose-dive. For example, any knob on a roof slate must be left on the exposed face so it won't interfere with the laying of the slate. Same with thick ends — they must be on the bottom of the slate. When slates are stacked like pancakes and drilled all at once, these nuances of roofing slate manufacturing tend to be overlooked. As an example, the slates on the left generated a full pallet of unusable slates on a 30 square slate roof installation; many had the holes drilled at the wrong end. The slates on the right yielded only a handful of reject slates in a 30 square job. It pays to buy slates from a manufacturer who knows what they're doing and cares about the details.

If you're buying standard thickness slates directly from the quarry, make sure the manufacturer knows you want slates that are punched rather than drilled. [Thicker slates, however, may need to be drilled and are less likely to be damaged by underlying nailheads.] The traditional punching of the nail holes will automatically create the crater effect in the hole as well as make a hole of the correct diameter. Make sure the holes are located 1.25" to 1.5" from the outer edge. These specifications should also be spelled out in your contract documents.

Figure 3: This is what happens to a standard-thickness slate over time if an underlying nail head rubs against it — the nail head eventually wears a hole through the overlying slate!



Footnote: The distance of the holes from the bottom of the slate should allow the slates to be installed with either a 3" or 4" headlap. This would place the holes the distance of the vertical exposure (as calculated for a 4" headlap) plus about 4.5" from the bottom of the slate. For example, on a 20" slate with a 4" headlap, the exposure would be 8" and the nail hole placement would then be 12.5" from the bottom of the slate. This placement would also allow the slate to be installed with a 3" headlap.



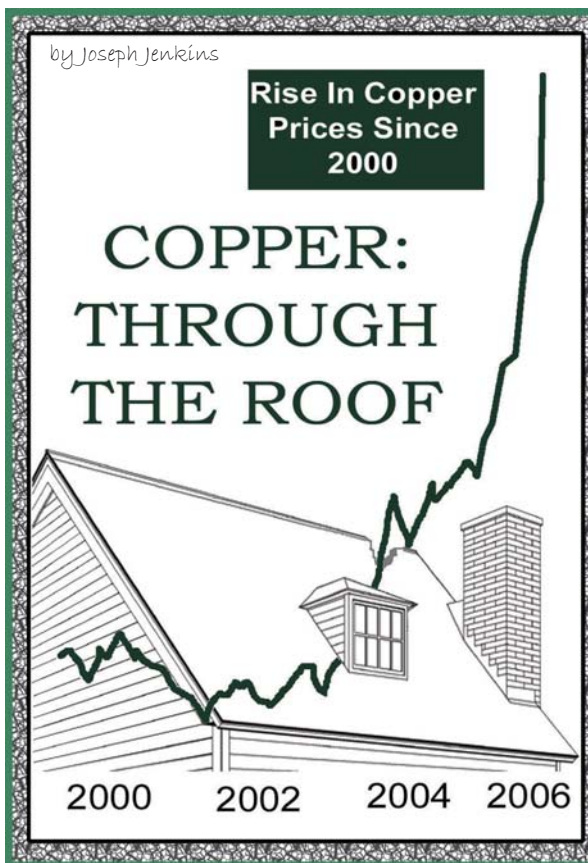
**T**he price of copper has gone through the roof! Prices have tripled in the past three years and doubled in the first six months of this year. What's going on?

Well, in short, the demand exceeds the supply. The world is expected to consume more copper than is produced in 2006 by 100,000 tons. In 2005, world consumption exceeded production for the third consecutive year, by 66,000 tons. The biggest reason for the price increase is China, which consumes more than 10,000 tons of copper every day. China overtook the U.S. as the largest copper consumer in 2002 and it retains a huge potential for continued growth. China is expected to account for 23% of global copper consumption in 2008, which is an increase from just 10% in 1996. Western Europe is expected to consume 22% in 2008, the U.S. 13.4%. India, Japan, and other nations are also showing increased demand. It doesn't look like copper prices will be falling any time soon.

What is copper? Although copper occurs naturally in a pure state, it's primarily mined from the minerals chalcopryrite, bornite, and malachite. Copper ore is extracted from the earth, then converted into copper concentrate, which is then roasted, smelted and converted into refined copper. The resultant metal is widely used for its high electrical and heat conductivity; its malleability; its ability to form alloys with other metals; and its resistance to corrosion. This last attribute is what makes copper so attractive for flashing on durable and long-lasting slate and tile roofs. Copper wire and cable, however, account for half of the world's copper production.

Chile is the world's leading copper producer, producing about 37% of the world's total. Every continent produces copper, yielding a worldwide total production of about 9 million short tons of copper each year. The four largest copper producing nations in order are Chile (37%), U.S. (8%), Indonesia (8%) and Peru (7%).

The U.S. mines 1/5 of the world's



The author at the Erdenet Copper Mine in Mongolia, May, 2006. Here, copper ore is converted into copper concentrate.



The open-pit Erdenet copper mine in Mongolia,

copper, while Arizona produces 2/3 of the copper here. If Arizona was a country, it would be the second largest producer of copper in the world. The Bingham Canyon copper mine in Utah is a half mile deep, 2 1/2 miles wide, 100 years old, and the world's largest human-made excavation. The Chino copper mine in New Mexico covers over 9,000 acres and is 1.75 miles across. This location has been mined for at least two centuries.

Copper has a long history with humans, being the first metal we ever used, dating back about 10,000 years. Sumerians and Egyptians produced cooking pots that date back to 3,900 BC. By 2,500 BC, Egyptians were making copper crowns. Archeologists have dug up copper drain pipes that date back to 3,500 BC, still in good condition. Pre-Columbian Americans used copper for weapons, armor, beads, earrings, bells and other ornaments. The Bronze Age is named after a copper alloy.

The average American uses 1,500 pounds of copper during her lifetime. Our average home contains about 400 pounds of copper, primarily in wiring, plumbing and appliances. The average automobile contains about 50 pounds of copper.

The good news is that copper is highly recyclable. A million and a half tons of scrap copper were recycled in the U.S. last year, saving 85% of the energy that would have been required to produce new copper from ore. In the United States, about 2/3 of all copper consumed since 1864 has been recycled. So don't throw those copper scraps away! Save them up and cash them in at the scrap yard on a rainy day. ☐

Copper concentrate — the final product of the Erdenet mine. The concentrate is shipped to China for refining.





# Random Width Slating In Diminishing Courses — UK Style

by Michael Hill

My experience of random width slating in diminishing courses [graduated slating in American terms] differs from that of American slaters. Here in England the slates arrive in crates of random widths and lengths. The first job is to sort them to size according to length, but leave the widths totally random. As the lengths of slate are not accurate in each size, this needs doing with care. Basically, slates in any length can vary by 3/4" i.e. a 20" slate runs from 19 3/4" to 20 1/2" — this is how it is, a slate can be 1/4" under size or 1/2" over size. The next job is to work out the total width available in each length. To do this, you determine an average width in each length of slate by measuring the width of ten slates, adding them together, then dividing by 10. Then multiply by the number of slates in that size. For example, start with your largest slate, let's say 22", you have 150 of them. Measure the total width of ten slates; let's say it equals 120". Divided by 10 equals an average width of 12". Multiply by 150 slates equals 1,800".

Now carry out this operation for each length of slate, you'll find that the average width diminishes along with the length. As an example, on one job that I did recently the slates ran from 20" to 12" in 1" drops, giving you nine lengths in total. The average width of the 20s was 12 1/2" and that of the 12s was 9". What you end up with in your notebook is a list of slate lengths and their lineal (horizontal) measure in inches. For example, you may have 2,079" of 20" slates, 1,500" of 19" slates, 4,175" of 18" slate, 2,308" of 17" slate, etc.

Using your roof measurements, work out how many courses of each size you have for each slope, and as you allocate them, subtract them from your list. For example, on one slope you will need 805" of 20" slates. You have 2,079" in stock. After subtracting 805", you now have 1,274" remaining for other slopes. A word of warning, Always plan to have a few slates of each size left over as spares.

Now comes the important part, working out the lathing gauge for diminishing courses [Editor's note: In the UK, slate is installed on battens or lath — strips of wood spaced to allow for the nailing the slate. Since the distance between the nailed courses decreases on the way up a diminishing course slate roof, the spacing (gauge) of the lath, must also decrease.] The first thing to do is work out the slate exposure as you would for normal slating [the length of the slate minus the headlap divided by 2 = the exposure]. For example, a 20" slate with a 3" headlap would have an 8.5" exposure [(20" - 3")/2 = 8 1/2"]. This is also the lathing gauge for that course.

Important: If this gauge is less than the previous actual gauge, subtract the difference. Let's say that your next course

Figure 1

## Slates Laid at 3" Headlap

Slates	N/G	A/G
20" . . . . .	8.5" . . . . .	8.5"
19" . . . . .	8" . . . . .	7.5"
19" . . . . .	8" . . . . .	8"
18" . . . . .	7.5" . . . . .	7"
18" . . . . .	7.5" . . . . .	7.5"
17" . . . . .	7" . . . . .	6.5"
16" . . . . .	6.5" . . . . .	6.5"
15" . . . . .	6" . . . . .	5.5"
15" . . . . .	6" . . . . .	6"
14" . . . . .	5.5" . . . . .	5"
13" . . . . .	5" . . . . .	5"
12" . . . . .	4.5" . . . . .	4"
12" . . . . .	4.5" . . . . .	4.5"

of slates is 19" [(19" - 3")/2 = 8" gauge]. This is 1/2 less than the previous gauge, so subtract the difference, making the gauge for the 19" course 7 1/2". Remember, only subtract the difference if it is LESS than the previous actual gauge — do not subtract the difference if it's the same as or greater than the previous actual gauge. Therefore a second course of 19s would go on at its 8" gauge.

Let's see how this works on a typical roof (Figure 1). The slate sizes are in the left hand column, followed by the normal gauge, and then the actual gauge.

This method guarantees two things: the headlap will never be less than the specified headlap, and the lap margins (the visible part of the slate when laid, referred to as *exposure* in the U.S.) will decrease nicely up the slope. One of the worst sights you can see in diminishing course work is a margin [exposure] in one

course bigger than the margin in the course below. All these measurements are written into my notebook on the job. I also use a lath board the same length as the roof rafter to mark each gauge onto it as I work out

the measurements. That way, I know when I've reached the ridge board.

Now you've got all the information you need to install the slate laths to the roof. After that, the slates can be holed and brought up to roof level for laying. [Editor's note: In the U.S., slate roofs are typically installed on solid board decks, not lath, so no lath gauging is necessary, and the slates are "holed" (punched for nail holes) at the quarry when manufactured, so holing on-site

is not needed.]

The above-mentioned method of calculating the gauge works just as well no matter what the drop in sizes may be. I've worked on stone roofs where I've had to drop 5" from one course to the next; it went like this (Figure 2). Now, if you look down the Actual gauge (A/G) column you will see that the gauges are bouncing around all over the place, but rest assured that the margins and laps will be correct. ☐

Michael Hill started an apprenticeship in slating and tiling in 1965. Still working for the same company, he is currently re-roofing the Bowes Museum, County Durham, U.K.

Figure 2

Stone Tile	N/G	A/G
48" . . . . .	22.5" . . . . .	22.5"
43" . . . . .	20.0" . . . . .	17.5"
40" . . . . .	18.5" . . . . .	18.5"
37" . . . . .	17.0" . . . . .	15.5"
and so on.		

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# Quaint Cottage Style Slate Roofs

AN EASY STYLE THAT'S FUN  
AND CREATIVE

by Joseph Jenkins



IT MAY BE HARD TO THINK OF ROOFING WORK AS “FUN,” but slate roofing can be both fun and creative when standard installation techniques are set aside and new ones are employed. Standard American slate roofs include field slates that are all the same length and width and usually the same color. Yet, slate roofing allows for a number of variations, including length, width, shape, color, thickness, and recycled content. All of these variations can be blended on one roof — the combinations are endless.

The technique is simple enough. On a standard installation, say all 18” long slates, the field of the roof is chalked for the exposure on 18” slates, usually with a 3” headlap. That exposure is 7.5”, so the chalk lines are set 7.5” apart up the roof deck. Now, let’s add 20” and 22” slates to the mix. They are also installed on the same chalk lines, but the extra length is left to simply hang down. Because the extra slate length creates extra headlap, these longer slates can also be lifted above the chalk line an inch or two in order to adjust the appearance of the finished roof.

Add a variety of colors, which, in the U.S. include various shades of gray, purple, mottled green and purple, red, “sea green,” various shades of green, and black, in whatever combination suits your desire. And make sure you are using a variety of widths, such as 9”, 10”, 11”, 12” and 14”. If you want to throw some thicker slates into the mix, go ahead. Same for salvaged, weathered slates — they can add some character.

In the end you can obliterate any semblance of uniformity on the roof. Or you can install a more conservative style that retains some uniformity. The advantages of this roof style include a very tight roof due to the extra headlap, not to mention the unique, one-of-a-kind artistic character of the roof. You can also take a mix of sizes and colors of slates that are lying around left-over and make a beautiful roof out of them. You can create a color scheme that suits your needs, matches your house, or just appeals to your sense of artistry.

There is a trick to the system, however — blend the slates on the ground before you send them up onto the roof. Let’s say you’re installing 1/3 18”, 1/3 20” and 1/3 22” slates. Then for every 12 slates sent up to the roof, there will be four of each length. If your 18” slates are two colors, or maybe half new and half salvaged, then, of those four, two are one type and two are the other. Etc. You have to figure

out your blend ahead of time this way, then blend the slates on the ground — a job usually done by the ground worker(s), and an important job as well (Figure 1). The slates are then sent up already pre-mixed so the installers just have to look at each one to make sure they’re grabbing the correct width. Each overlying slate should lap the underlying slate down the center, if possible, although a 3” lateral overlap is permissible. The installers are also looking at the lengths and colors, trying to not lay the same length and/or same color beside each other. In other words, the installer is looking at every slate prior to nailing it. This is what creates the artistry.

For this article, we have installed six such roofs on small buildings using different combinations of lengths, widths, colors and recycled content. Each roof is totally unique in its own way.

Continued next page ➞



The slates are sent up onto the scaffolding pre-mixed.



Figure 1: The slates are blended or “shuffled” on the ground.

All photos this article by Joe Jenkins.



**1) Timberframe Structure**, under construction, at the 2005 International Preservation Trades Workshops, Belmont Technical College, St. Clairsville, Ohio. All new VT slates donated by Camara Slate Company, Fair Haven, Vermont.  
 3 sq. VT sea green: (1 sq. each: 14" random, 16"r, 18"r)  
 1 sq. VT black: (1/3 sq. each: 14"r, 16"r, 18"r)  
 1 sq. VT purple: (1/3 sq. each: 14"r, 16"r, 18"r)  
 3 sq. VT unfading green: (1 sq. each: 14"r, 16"r, 18"r)  
 All are random widths (9", 10", 11", 12", 14"). A few 20" long slates are also in the mix. 8"x16" slates were used to make a saddle ridge. For every 8 slates carried up, 3 were sea green, 1 was VT black, 1 was VT purple and 3 were unfading green, all in mixed widths.



4 types, three lengths, all new

**2) Retreat Center**, under construction (saddle ridge not yet installed in photo), roofed at the Natural Building Colloquium East, 2005, Bath, NY. All new Vermont slates donated by Camara Slate Company, Fair Haven, Vermont.

3 lengths: 14", 16", 18"; 5 widths: 9", 10", 11", 12", 14"  
 3 squares new VT sea green (mixed lengths and widths)  
 2 squares VT black (mixed lengths and widths)  
 2 squares VT purple (mixed lengths and widths)  
 1 square unfading green (mixed lengths and widths)

For every 8 slates carried up, 3 were new sea green, 2 were VT black, 2 were VT purple and 1 was unfading green.



4 types, three lengths, all new

**3) Cottage**, under construction, designed and built by Brent Ulisky, Grove City, Pennsylvania. We hand-rounded all of these slates using GT slate cutters and/or a GB hammer.

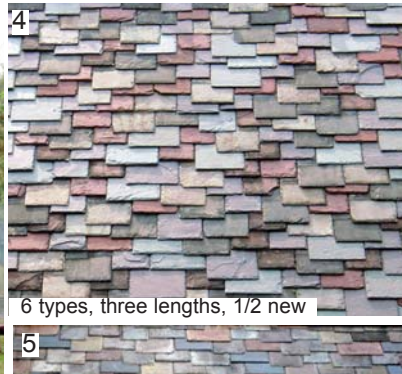
3 lengths: 18, 20, 22, all rounded — front of building:  
 1 sq.: Mottled grn. & pr. (new): 1/2 sq. 10x20; 1/2 sq. 12x18  
 1 sq.: Sea green (new): 1/2 sq. 12x20; 1/2 sq. 12x18  
 1 sq.: Unfading green (new): 12x18  
 3 sq.: Sea grn. (salv.): 1 sq. 14x22; 1 sq. 12x22; 1 sq. 11x20  
 The mix: 6 salvaged sea green (2 from each size), 2 purple (one of each size), 2 unfading green and 2 new sea green (1 of each size) or 12 slates total per handful sent up to roof. Half of these slates are new, half salvaged.



3 types, three lengths, 1/2 new

**4) Picnic Pavilion**, designed and built by the author, Grove City, Pennsylvania. We used a blend of both new and salvaged slates from our slate yard. 3 lengths: 16", 18", 20"

NY red (all 16" long by 8", 9", 10" wide)  
 VT unfading purple (new) 12"x18"  
 VT mottled green and purple (new) 12"x18", 8"x16"  
 VT sea green (new) 12"x20"  
 VT unfading green (new) 12"x18"  
 VT sea green, salvaged, stained, 12"x18"  
 VA Buckingham (salvaged) 12"x20"  
 VT sea green (salvaged) 12"x20", 14"x20"



6 types, three lengths, 1/2 new

**5) Woodshed**, designed and built by the author, Grove City, PA. Here we used only two lengths, half 18" and half 20". All of the slates were sea green, mostly salvaged, from five different old roofs.

1/5 new sea green, 12"x18"  
 1/5 salvaged sea green, 10"x20"  
 1/5 salvaged sea green, 12"x20"  
 1/5 salvaged sea green, 9"x18"  
 1/10 salvaged sea green, 10"x18"  
 1/10 salvaged sea green, 11"x18" For every 10 slates carried up, 2 were 12x18 new sea green, 2 were 10x20, 2 were 12x20, 2 were 9x18, 1 was 10x18 and 1 was 11x18. Note: Smaller slates require more per square.



1 type, two lengths, 20% new

**6) Hunting Stand**, designed and built by the author, Grove City, PA: 1/3 salvaged red, 16" long, 8", 9", 10" wide; 1/3 mottled green and purple, new, 8"x14"; 1/3 salvaged purple, 10"x18", slightly thicker.



3 types, three lengths, 1/3 new



# HURRICANE FORCE WINDS

## AND HOW THEY AFFECT SLATE ROOFS

Joseph Jenkins

KATRINA WAS BEATING ON THEIR FRONT DOOR. She started blowing at 5:30 in the morning, but the worst didn't hit until mid-day. The wind tried its hardest to blow open the heavy front door as trees fell like dominoes around the house. They could hear the trees cracking, see them through the windows bending to the breaking point. The tops snapped off the tall pines while other trees broke at the base or just blew over, roots and all. They huddled first in one part of the house, then another, waiting in stoic terror as the wind howled and the rain pelted. They finally sat under a stout interior doorway hoping for a vestige of protection. It was hours before the hurricane let up. Katrina's visit would never be forgotten.

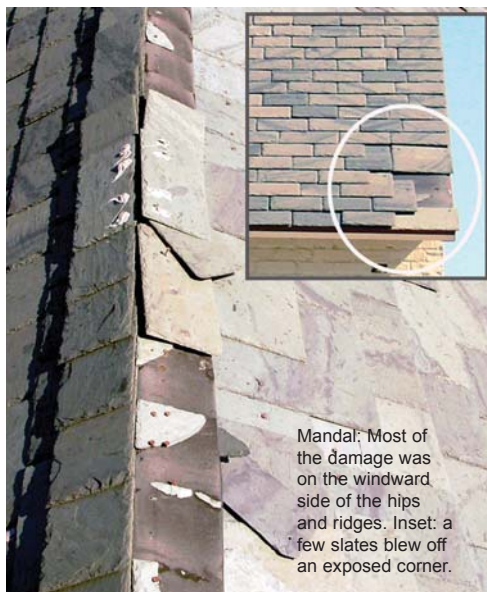
They lost over 72 trees around their house, spending \$130,000 just to remove the ones they couldn't chainsaw themselves. The garage roof was demolished. A tree fell on the house next door. It was five days before they could get out their driveway because of downed trees blocking the road. During that time, they had no water, no electricity, no gas and no phone. In fact, their electricity was off for two months. They got lost in their own yard trying to climb over the demolition to get to the road because it was such a tangled mess of trees and debris.

Ann and John Moores lived through the storm of the century in the direct path of Hurricane Katrina, just north of New Orleans. So did their two year old slate roof. What happened to the roof? Like a miracle, no trees fell on the house. A direct impact on a slate roof during severe winds will surely dam-

age the slate. But what about wind uplift? How many slates blew off? What did it cost to repair their roof?

The roof damage was nonexistent. That's right — there was no damage to the roof by the hurricane. Not a single slate blew off. As a roof consultant, I had thoroughly inspected

the roof the year before the hurricane. My visit after the hurricane confirmed what seems improbable — no damage to the roof. Installed in 2003, the 50 square roof was made of standard-thickness Vermont gray-black slates, 10" wide and 16" long, from Camara and Sons Slate Company. It was installed on approximately a 12:12 slope, with 11 gauge copper, smooth-shank 1.5" slating nails over a traditional board deck.



Mandal: Most of the damage was on the windward side of the hips and ridges. Inset: a few slates blew off an exposed corner.

dence, blowing down thousands of trees in its path, a ship was left sitting in the nearby woods.

The 136 square Mandal roof, installed in 2004, had a slope ranging from 7:12 to 10:12. It was made of 18" random-width, standard-thickness, unfading gray slate from Evergreen Slate Company, with a 4" headlap, 2" copper smooth-shank slating nails, on a 3/4" plywood deck. It did suffer some damage. The main damage was slates that blew off the saddle hips and ridges, mainly on the windward side. The 7"x14" ridge and hip slates had been nailed with 2" nails also. This roof would have benefitted from 1.5" nails in the field because the 2" nails were too long and broke out the back of the roof decking, effectively diminishing the holding power of the nails (see Figure 2, page 19). The hip and ridge slates, on the other hand, would have benefitted from a more typical 2.5" nail, rather than a 2" nail. There was also some damage in the field of the roof from flying debris. Some slates along some windward edges also blew off. In total, about 250 of the 21,000 slates blew off — about 1.19%, a phenomenally small amount of damage after such a massive assault.

The slate roof on the Longue Vue House and Garden Museum in New Orleans also suffered damage from Katrina. Installed in



Longue Vue: The damage was limited to the metal hips and ridges.

1942, the roof is made of 14" long, random-width Buckingham slates, 1/4" to 3/4" thick, with a 4" headlap, nailed to a standard board roof deck on approximately a 7:12 slope with smooth-shank copper slating nails. Although there was virtually no damage to the slates themselves, many of the lead-coated copper ridge and hip coverings blew loose. All of the damage was repairable.

Dr. David Clark's newly installed slate roof also rode out Katrina with minimal damage. This is discussed in greater detail in the *Senior Slaters* article, page 4.

After personally inspecting the roofs in these four case studies, I think it's safe to assume that slate roofing is highly wind resistant. Slate is a rigid material that does not bend or flap under wind pressure. It is a stiff, low-profile roofing shingle that wind has a hard time getting underneath.

It seems that there are four things we can do to maximize wind resistance on a slate roof: 1) Use more headlap rather than less. Four inch headlap in a high-wind area is recommended. 2) Use the correct length nail. A nail that's too short or too long can reduce the effective holding power of the nail. Smooth shank slating nails apparently have adequate holding power. 3) Use a solid wood roof deck, at least 3/4" thick. 4) Use adequate slope. A slate roof would ideally be too steep to walk on.

Although this is not, by any means, a comprehensive study on slate roof wind resistance, it is nevertheless a collection of data taken from the most severe hurricane event ever to hit the United States. As such, it provides us with a rare glimpse of how slate roofs can hold up under the most extreme wind conditions. ■

All Photos by Joe Jenkins



rectly on the roof. This is usually manifested as a gap underneath the bottom of the second to fourth courses of slates (Figure 7).

### 3) Inadequate side laps are installed.

The side laps, or lateral overlaps between the side-butts of the starter slates and the first course of slates, should be a minimum of 3". On a poorly installed starter course, these lateral overlaps will measure an inch or less (Figures 8 and 9). When the side-butts of the first course are too close to the side-butts of the starter course, a path is created for water entry into the building. The photo below shows such a scenario, where there is virtually no side-lap. This is a certain leak. The people installing this slate roof in Arizona were inexperienced and are facing litigation. The starters were laid face-up (incorrectly) and no cant strip was used.



Figure 7

Gapping under the slates is caused by the lack of a cant strip under the starter course. This slate had been removed by contractors who thought installing peel and stick underneath the eaves slates would somehow improve the situation. This, and the fact that they replaced the slates without a cant strip, are an indication the contractors had a poor understanding of slate roofs and how they work. This roof is in Maryland.

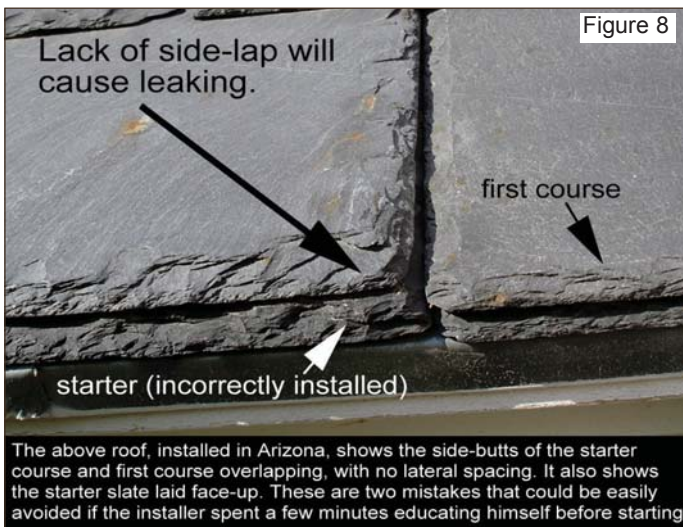


Figure 8

The above roof, installed in Arizona, shows the side-butts of the starter course and first course overlapping, with no lateral spacing. It also shows the starter slate laid face-up. These are two mistakes that could be easily avoided if the installer spent a few minutes educating himself before starting

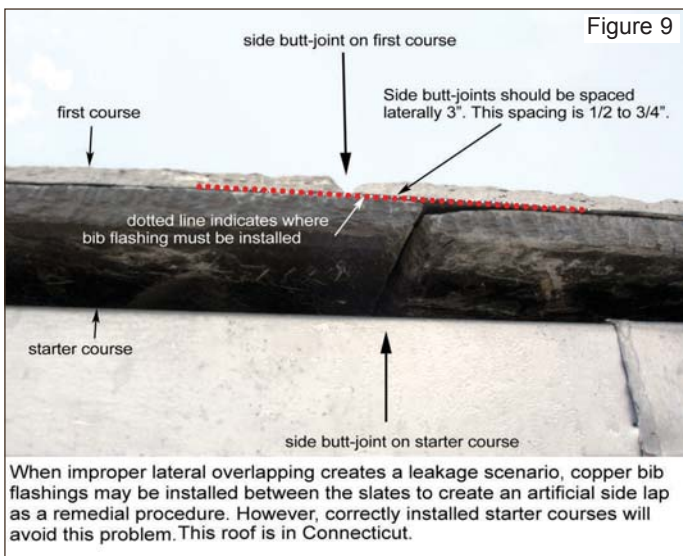


Figure 9

When improper lateral overlapping creates a leakage scenario, copper bib flashings may be installed between the slates to create an artificial side lap as a remedial procedure. However, correctly installed starter courses will avoid this problem. This roof is in Connecticut.

### 4) There is not enough headlap on the starter course.

This is a common mistake made when the field slates are turned sideways and used for starter slates and no adjustment is made on the first course exposure to allow for adequate headlap on the starter (Figures 10 and 12). The height (distance up the roof) of the starter slate must be at least 3" greater than the vertical exposure on the first course of slate (Figure 11). The exposure

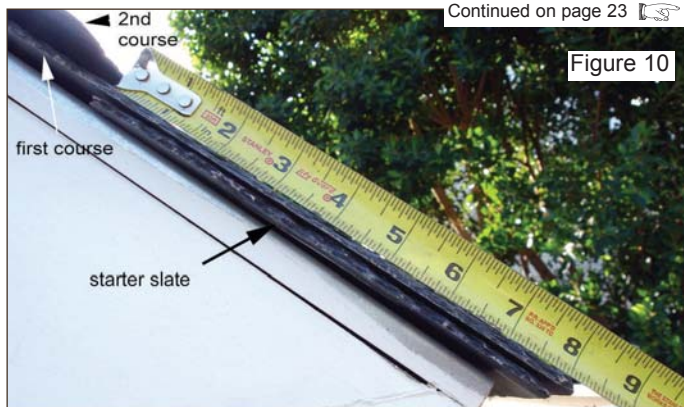


Figure 10

An 8" starter slate and an 8" exposure, as shown here, indicates no headlap at all. A correctly installed starter slate will have 3" minimum headlap. Note that the starter slate is incorrectly laid face-up. The people who installed this slate had no idea what they were doing and ended up in litigation. There is also no cant strip. This roof is located in Virginia.

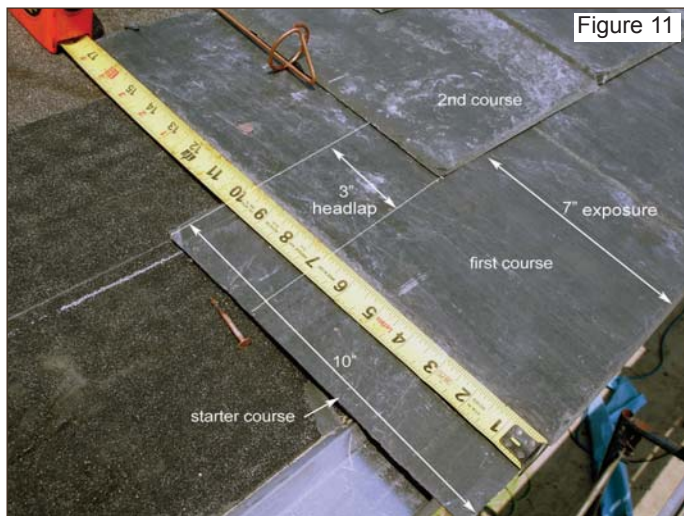


Figure 11

To determine exposure of field slates:  $\text{exposure} = (\text{length of slate} - \text{headlap}) / 2$   
A 20" long slate with a 3" headlap will have an 8.5" exposure  $[8.5 = (20 - 3) / 2]$ .



Figure 12

This slate roof was installed with little or no headlap. It will have to be completely removed and reslated. It is a huge roof.

Continued on page 23



## SRCA UPDATE

RUMORS OF OUR FIRST MEETING have begun to be circulated. It has been suggested that we meet in the slate valley in Vermont in the spring of 2007. We can rent a hall there for formal meetings, Powerpoint presentations, etc., tour the member slate quarries, get our hands dirty, see how the stone is extracted and how it's fabricated into shingles, maybe split some ourselves, have a catered wine and cheese reception at the Slate Valley Museum, and do it all over a long weekend. This would be an opportunity for all SRCA members who haven't been to a slate quarry or seen slate being made to start at the actual hole in the ground and go from there. It would also give us an opportunity to meet face to face, talk shop, and discuss future plans, workshops and educational endeavors. If you want to be part of the planning process, if you have any ideas, suggestions or recommendations, please speak up! Call us at 866-641-7141 or email [joe@joseph-jenkins.com](mailto:joe@joseph-jenkins.com).

## WHAT'S THIS?

Here's something you don't see very often — a bullet embedded in a slate roof. The slug penetrated three layers of mottled green and purple slate from the outside and was resting on the felt paper when discovered by Akron, Ohio SRCA member Chris Paulin.



## THIS ISSUE'S WINNER OF OUR BEST TIP AWARD

is John Ball of Comber, Co. Down, Northern Ireland, who followed up our last issue's article about slating conical roofs with these comments (here paraphrased):

*Use a chalk line attached to a 5" or 6" nail at the apex of the turret and chalk lines every 1/2 slate around the bottom edge of the roof. Then use the chalk lines to cut a template for each course of slates. The slates on each course will be approximately the same shape and size, so they can be cut in advance using the template. However, "in practice the bonds [sidelaps] will creep out or in a little and a little bit of extra trimming or a slightly wider cut will occasionally be required." As you work your way up the roof, you will have to work in a double-width slate course (a "jumper" course) to compensate for the slates becoming too narrow. Care has to be taken to select good slates for this course as the slates could otherwise cock up badly. "On some circular work, depending on the pitch, as the slating gets near the apex, some form of undersoaking strip [flashing], in the UK it was code 3 (thin) lead, is fitted below each narrow upper few courses."*

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## SLATE ROOFING CONTRACTORS ASSOCIATION

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SRCA members donated labor and materials to demonstrate a ragged butt, mixed color, random width slate roof installation at the 2005 International Preservation Trades Workshops at Belmont Technical College in St. Clairsville, Ohio.

(see page 14)



SRCA members involved included Camara, Durable, Jenkins, Milligan, Paulin and Smith.



Members include slate contractors, general roofing contractors, industry associates and any interested supporter of the traditional slate roofing trades. To join call 814-786-9085 or [slateroofers.org](http://slateroofers.org).

## SRCA — FOUNDED, MARCH 2005

Current Member List, October, 2006

- |  |  |
|--|--|
| 01. Slate International, Inc.                | 28. Tile Roof Specialists                        |
| 02. Heritage Roofing, Inc.                   | 29. Old World Craftsmen, Inc.                    |
| 03. GS Restoration Services                  | 30. Coffey Contracting Co., Inc.                 |
| 04. Smith Slate Roof Restoration             | 31. CUPA Natural Slate                           |
| 05. Scottie Ballantyne Roofing, Inc.         | 32. Pizarra's Franvisa                           |
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| 07. Milligan Construction                    | 34. Wagner Roofing Company                       |
| 08. Mountain State Slate Roofing             | 35. Midland Engineering Co.                      |
| 09. Bill Davis Roofing, LC                   | 36. Triple M Contracting, Inc.                   |
| 10. Stevens Roofing Corp.                    | 37. Camara Slate Products, Inc.                  |
| 11. J. B. and Co. Roofing                    | 38. Lowe Restoration Group                       |
| 12. Miller-Thomas-Gyekis, Inc.               | 39. Slateworks Roofing                           |
| 13. The R. W. Stokes Company                 | 40. Mahan Slate Roofing Co.                      |
| 14. C.D. Kaller, Inc.                        | 41. Northeast Slate                              |
| 15. Leeland's Slate Roof Repair              | 42. Tatko Stone Products                         |
| 16. Durable Slate Company                    | 43. Beach Sheet Metal Co., Inc.                  |
| 17. Alluvium Construction                    | 44. Scott Ferrari-Adler                          |
| 18. Perlino Slate Roof Repair                | 45. Renaissance Roofing, Inc.                    |
| 19. 12th Century Slate Roofing Co.           | 46. Dax M Billcheck                              |
| 20. Fania Specialty Roofing Group            | 47. Blackmore and Buckner Roofing, LLC.          |
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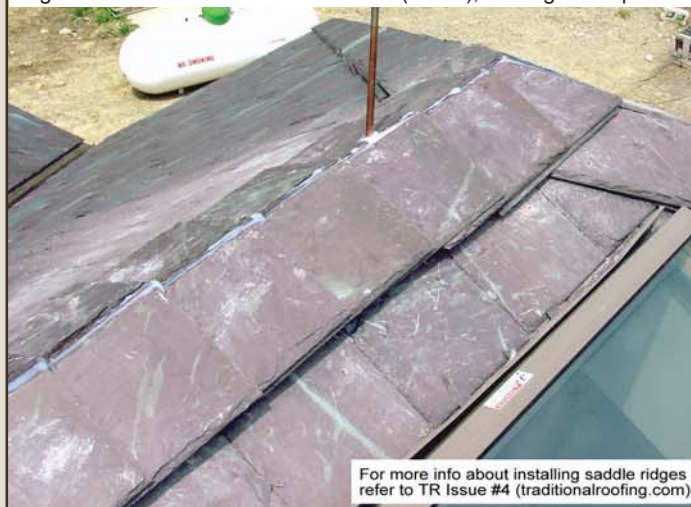


Figure 1

Furring strips are nailed to either side of the ridge opening to allow for nailing of both the plastic vent material and the ridge slates.



Plastic ridge vent available at any building supply store is rolled over the opening and nailed to the furring strips (above). A "saddle" slate ridge is installed over the vent material (below), leaving a low-profile.



For more info about installing saddle ridges refer to TR Issue #4 ([traditionalroofing.com](http://traditionalroofing.com))

All Photos by Joe Jenkins

sheathing. A perfect scenario would have the nail bite through the wood 100% but not penetrate through to the inside.

On the other hand, nails that are too long and stick into the roof space, puncturing the back out of the roof deck boards, effectively decrease their holding potential by decreasing the thickness of the wood where the nail has penetrated (Figure 2, below). Therefore, it is important that the slating nails be neither too short, nor too long.

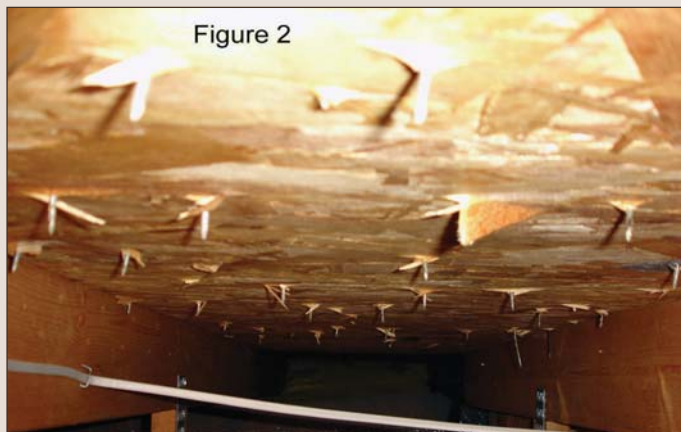


Figure 2

Nails that are too long break out the back of the roof sheathing and reduce the effective thickness of the wood, thereby reducing the holding power of the nail. The roof deck shown is OSB -- a decking material unsuitable for slate roofs due to lack of longevity.

*Why is soldering with torches considered so poorly? Is it that it's often accompanied by poor workmanship, people are neurotic about fire, oxidation of materials when flame is directed towards the open seam, over use of heat annealing the copper, what?*

TR: The problem with open flame torch soldering on roofs is not related to the sweating of the joint, the workmanship, copper annealing, etc. It is simply that the felt paper (or even the wood deck) under the metal being soldered will combust and smolder when subjected to the heat of an open flame torch — a problem not associated with soldering irons. The smoldering combustion may or may not be noticed by the roofer, who may receive a call at three o'clock in the morning that the building is filling with smoke. If the combustion is noticed by the roofer, he may frantically try to put it out, but realize that the smoldering material is underneath the copper and can't be reached. A lot of roofers find this out the hard way, and sometimes it's tragic. Open flame soldering on copper not attached directly to the roof surface, such as on gutters, is OK.

*I am currently taking down a 100 year old slate roof in southeast Ireland. I wish to re-use the slate on a new project, however, someone has tarred the slate roof. Is there any solvent I can use to remove the tar from the slate, or can I sand it off? It seems like a terrible waste of such beautiful slate.*

TR: Your options are limited. Other than trying to remove the tar with a solvent or by power washing (good luck) you can try flipping the slates over and using the back side out. You will probably have to hand trim the edges to reverse the bevel, which is a job in itself.

*I have a persistent leak in my slate roof near the eaves. I had it repaired last year, but it still leaks in the same place. The previous roofer had removed the slates from the bottom 3' of the drip edge, installed peel and stick ice membrane, then reinstalled the slate. It continues to leak. What's going on?*

TR: The problem was not a lack of ice membrane. Think about it — why would water be penetrating the slate in the first place? No water should get past the slate and flashings. If slate roofs routinely leaked, they would be failures as roofs and such roof systems

Continued on Page 24



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in the phone tells me they won't be going to work today — it's too wet. I thank him kindly and pull my shirt on, removing the telephone down my left sleeve.

I can hear Angeline talking to someone, the two respectable gentlemen who had been looking at the pallets of slates! (God, I had forgotten about them). My heart is in my feet as I go to the back hall. We exchange feeble hand shakes as Angeline remarks that I am looking rather pale. After some discussion that sounds as if it's coming up 13 feet of 4 inch soil pipe, my numbed brain goes pop and I realize that they want to buy the slates. I shake hands all over again and the morning has taken on a much greater brightness. I am so relieved that I almost give them away and Angeline leads them off to the yard office to type out an official invoice including V.A.T. I feel I have cleared my conscience.

I ring a supplier regarding tiles that did not arrive on a site yesterday. He has been trying to ring me. The tiles are on site at this very moment. The lorry has backed in as far as possible but has got bogged down. Unfortunately, the off-loading grab had developed a serious fault. The next door neighbor who sold off his side garden for the site is hopping mad at the mess the 40' articulated lorry is making of his front lawn.

The builder and his men have gone home. Can I get a squad over right away to "hand ball" the tiles off and bring some planks — there's a foot of mud everywhere.

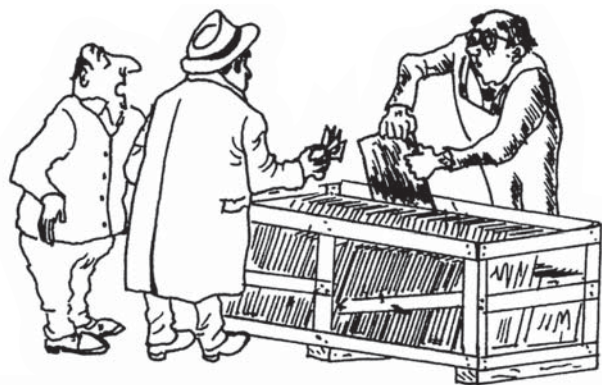
Meanwhile the boys sit round the red-hot pot-bellied stove in the workshop, making colorful remarks regarding my written instructions and drink their 10 o'clock tea.

The phone goes again. The lady with the leaky light bulb wants to know if I had the phone off the hook because she couldn't get through. She thinks she smells something burning. I am tempted to tell her that smells don't normally travel down phone lines and perhaps the seat of my trousers is on fire, but instead I hand the phone to Angeline who consoles her with talk of the flower arranging class on Friday evenings and the latest scandal at the senior citizens Wednesday Club.

I suddenly realize that I haven't yet answered the call of nature. That'll have to wait for a few minutes.

I run down to the work shop whistling as I go (I'm a coward at heart) where the men sit round the stove on boxes of nails, upturned buckets and an old broken deckchair gloating over page three and passing round glossy magazines depicting various bits of female anatomy draped over motorcycles, etc. while the cup of a flask gradually turns into a twisted heap of molten plastic on the stove top.

The apprentice pretends to be cutting eaves slates on a bench in the corner where it is too gloomy to even see the slates never mind cut them. I explain my concerns regarding the wet stormy weather, the old lady's problem and the broken lorry. I don't think they hear me, must be the rain on the tin roof



I realise they want to buy the slates



THE MEN SIT AROUND THE STOVE

and the sizzle of the water running down the hot stove pipe. I raised my voice somewhat and add a touch of color to my words. One of the boys turns his head slightly, rolls his eyes and looks up at the underside of the tin roof. They all nod sympathetically, and with a certain amount of mumbling, all volunteer to go and look at the old lady's light fitting. They are a good bunch of lads, but the weather gets to all of us.

I delegate Len and the apprentice to go and see her. He is to take a miscellaneous assortment of slates, tiles, ridges etc, a bit of lead and a tube of mastic if only to do a temporary job. He also takes half a dozen new laid eggs Angeline has promised her.

The outside phone bell is ringing again. I pack the rest of the boys off, with some reluctance on their part, to unload the bogged down lorry and then to visit their respective jobs and check them out. The customers like to know that at least we are thinking about their work.

I run back up to the yard office to answer the phone (must try to remember where I left the cordless phone, probably sitting on a stack of tiles in the rain. The ringer on it hasn't worked since it fell out of my pocket when I was leaning out reversing the pick-up and I backed over it with the front wheels). It is a builder who is having trouble getting money from a customer. One problem he says is that the roof is leaking. There's water coming down the chimney breast and dampening the wall and adjoining ceiling in the drawing room. It is obvious we haven't done the lead flashing properly or the tiles haven't been cut correctly. Counting quickly up to ten to keep my hackles down I tactfully remind him that I had pointed out when we were doing the job that the lead damp proof tray had been built in three courses of brick too low.

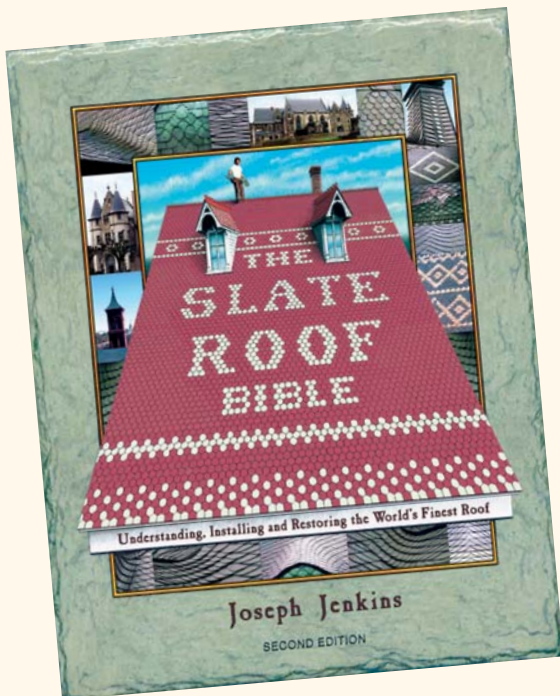
"Oh yes," he says, not sounding very convinced that it's anything to do with some silly idea of lead trays in the chimneys anyway, and knowing that he hasn't paid me yet he asks me what I can do with it. I respectfully suggest he gets in touch with the bricklayer and/or the brick manufacturers who might recommend some form of liquid treatment. Knowing him to be a bit of a wit I suggest he has some liquid treatment himself in the form of a couple of stiff whiskeys before he goes to look at it. I reckon I have put that one back where it belongs. Whatever else he is, he's straight with the money and I'll get paid all right.

While I'm in the office, I fill in the mens' time and materials against their jobs for the last few days and also phone a merchant who delivered lead the day before yesterday, to advise him that I ordered code 5 lead and he sent me double the quantity of code 3. He explains that they hadn't got code 5 but thought that two layers of code 3 would be even better. He has code 5 now but can't deliver until next week. I need it tomorrow.

A lorry drives into the yard with a pallet of nails. Unfortunately, the size and gauge I wanted urgently they haven't got and the ones they

Continued on Page 26





### THE SLATE ROOF BIBLE

3rd EDITION (2016)

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on the first course of slates may be reduced by dropping the chalk line for the top of the second course of slates in order to increase the headlap on the starter course. This little detail is often overlooked by inexperienced slaters. Since the bottom of the roof has more water running over it than virtually any other part of the roof, it is imperative that the headlap on the bottom courses of slate be correct. If anything, the slates on the bottom of the roof should have more headlap than the field slates, not less.

**5) The starter course is incorrectly installed ahead of the first course.**

It is important that the starter course and the first course of slates be installed at the same time, although many installers tend to run the starter course out ahead of the first course (Figure 13). The exception to this rule is when the starter slates are the same width as the field slates (or a factor thereof), and the starter slates are only punched for nail holes on the top edge, then the starter course can be laid out ahead of the first course. In all other circumstances, such as when installing random width slates or using field slates turned sideways as starters, the starter course and the first course must be installed concurrently. This is the only way you can guarantee correct sidelaps and make sure you don't have stray nail holes in the starter slates in the joint between the first course slates, creating a leak (Figure 14). When you lay the starter and first courses concurrently, you can trim each starter slate to the correct length (or to remove stray holes), if necessary, to avoid these problems.

For example, let's say your field slates are 10"x20". For a 3" headlap, you will need an 8.5" exposure on the field slates. However, if you turn the slates sideways and use them for starter slates, you will only have 10" of slate going up the roof on the starter course. An 8.5" exposure on the first course of slates, then, would only leave a headlap of 1.5" on the starter course — a mistake. The exposure on the first course of slate must instead be dropped to 7" in order to create the 3" headlap on the starter course.

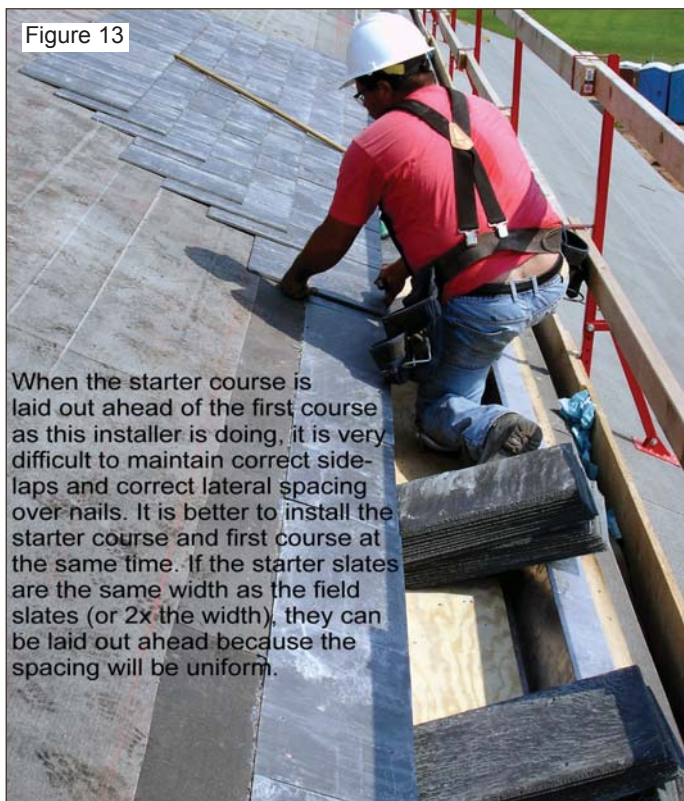


Figure 13

When the starter course is laid out ahead of the first course as this installer is doing, it is very difficult to maintain correct sidelaps and correct lateral spacing over nails. It is better to install the starter course and first course at the same time. If the starter slates are the same width as the field slates (or 2x the width), they can be laid out ahead because the spacing will be uniform.

All Photos by Joe Jenkins

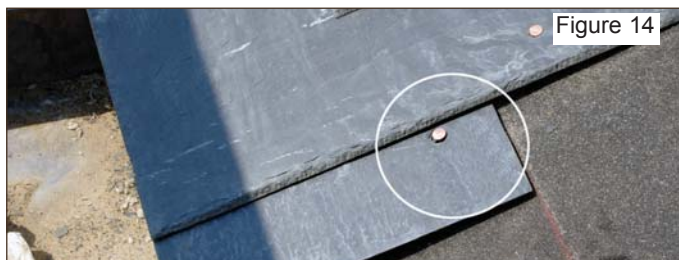


Figure 14

*Note proximity of nail head to side butt joint of first course. The nail is too close to the joint. This could be avoided by installing the starter course and first course at the same time. Although this nail will be covered by the 2nd course headlap, it still creates a weak point that could be subject to water penetration during, for example, ice-dam conditions.*

Alternatively, you could use a 12" high starter slate, thereby guaranteeing a 3.5" headlap on the starter course and an 8.5" exposure on all field slates. In fact, when you ordered the 10x20 field slates from the quarry, you should have also ordered 10" wide and 12" long (high) pre-punched starter slates. That would ensure you an easy, fool-proof job and you could go ahead and lay the starters out ahead of the first course.

In addition, if you use the field slates turned sideways as starter slates, then you have to punch an extra nail hole on one side of each starter slate in order to nail the slate to the roof sideways as all slates on the roof must be nailed with two nails. This will leave you with a "stray hole" (an original nail hole) along the bottom of each slate which can create leaking problems if it falls in the slot between two overlying first course slates. So even though the 20w x10h starter slates are a factor of the width of the 10" wide field slates, they cannot be laid out in advance of the field slates without risking a stray hole falling in an overlying joint. The starters and the first course must be laid concurrently in this situation.

The starter course, even though invisible, is arguably one of the most important courses on a slate roof. If it's done right, you're off to a good start. If it's done wrong, you have created a slate roof with built-in long-term headaches. Some new installations even go into litigation because of problems with the starter course. If you do a little homework, educate yourself, and see and understand these potential problems before you start installing a slate roof, you will be doing both yourself and your roofing clients a big favor in the long run. 🍷

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would have been abandoned generations ago. It makes no sense to think that water will penetrate the slate and therefore what is *underneath* the slate is what really keeps the roof from leaking. When roofing contractors can't find a leak, they resort to desperate measures, such as removing slates and installing ice shield. But it's a waste of time and money.

You will find that your leak is being caused by a specific fault in the slate or flashings. That fault must be identified and repaired. It could be something as simple as a cracked slate, exposed nail head, or even a hidden leak, such as a too-close sidelap and a nail head too closely positioned underneath the lap joint (which would only leak during ice dam conditions or heavy rain, but can be repaired in minutes with a copper bib flashing).

[In this case the problem turned out to be faulty step flashings on a low dormer.] The roofers who looked at and "repaired" the roof probably didn't know how to replace step flashing on a slate roof. They certainly did not know how to diagnose the leak. Furthermore, if water is penetrating a slate roof at the eaves and there are no faults with the slate or flashings, then the headlap along the eaves could be too small. This is a problem that would have plagued the roof from the beginning, however. When eaves leak intermittently at one location, the problem is probably not headlap. For example, if there is a repair slate in the leaking region, say on a 20" slate roof, and they used an 18" slate for the repair, you would not be able to see that the slate is 2" too short and therefore has little or no headlap. That is a type of hidden leak. You need to find an experienced slater to find the problem with your roof. Don't waste your money on red herrings like the lack of peel and stick.

When installing a new slate roof, if you want to tighten up the roof along the eaves, increase the headlap along the bottom 36" of the roof (Figure 3). You can't rely on peel and stick underlayment (or any underlayment) for long term effectiveness on a slate roof because the stone roofing just lasts so much longer.

*In my area there are many hardwood trees. We are in contact with a local sawyer to apply rough-sawn deck sheathing. What do you think is the most desirable wood and thickness to use as roof decking?*

TR: I have often used hardwood sheathing for roof decking. However, the trick to using hardwoods in rough construction is to use them green (undried). Once they dry, they become very hard, so forget about nailing them without drilling holes for the nails. The most desirable thickness, in my opinion is 1", which also happens to be the most common thickness traditionally used on slate roofs. Any

hardwood will work — tulip poplar, oak, cherry, ash, etc. Oak sheathing has a high longevity, but put it on green. You can air dry it somewhat to get rid of the wetness, but green — right off the stump — is OK too if the lumber is able to dry out in position. If not, air dry it first. My preferred roof sheathing right now is local hemlock or pine, also green, but we do air-dry the lumber when we can. A word of caution: you can *not* use green lumber in buildings that allow no way for the lumber to dry out in place (it will cause mold).

*We are in the first phase of installing our Vermont slate roof. The slater is butting the slate at the hip and ridge and relying on the tar paper underneath the slate to prevent leakage. Should this not be flashed? Also, the valley has 2 foot copper sheets (one foot on either side of the lowest point of the valley) and the slate does not cover that much of the copper. Therefore, a lot of copper is showing — at least more than I think should be. Is there a rule of thumb on how much slate is brought over onto the copper flashing?*

TR: Traditionally, slate was often installed without flashing on the saddle hips and ridges. Flashing does a better job, however, so we usually use it when installing slate hips or ridges. The procedure is shown at [slateroofcentral.com](http://slateroofcentral.com). Your contract documents should detail the flashings that are used. Typically, on residences, valley exposure is 6" (six inches showing), sometimes 8" on larger roofs (assuming an open valley rather than a closed valley). The valley metal should go underneath the slate a minimum of 5" on each side. When you overlap more of the valley with the slate, you're just nailing holes through the metal, which is self-defeating.

*I hope that this question is not the absolute dumbest one you have ever received but.... Is it possible to paint or stain old slate to more closely match some adjacent new slate that was installed after some storm damage? The older slate is in good condition and so the insurance company will not replace the undamaged tiles but there is a noticeable contrast in coloration.*

TR: If the work had been done correctly, the slates used in the repair work would have been salvaged, not new. There is no way to now match the original slates in your situation other than to remove the new slates and replace them with salvaged slates. Painting or staining will only make matters worse.

*We are installing a Buckingham 16" x random slate roof for a client in northern Maine. The rake slates are overhung 1 1/2" past the gable fascia. Could you give me your experienced opinion please?*

TR: A 1" overhang on the gable ends is standard in the trade. 1.5" should be plenty.

*I am planning on purchasing S1 VT weathering Gray 12x8 slate from [X] slate company. Are there any reasons that you are aware of that would cause you to recommend for or against this slate, this slate size, or this company?*

TR: The slate size is very small and the installation will therefore be labor intensive. For a less labor-intensive installation, use larger slates. Make sure the slate is punched for nail holes, not drilled, and contains no iron-bearing inclusions that will leach rust down the roof after installation. You should order the slates with these provisions guaranteed, in writing. Also, see the article on nail holes in this issue on page 11.

*I will be installing symmetrical valleys and I was planning on open valleys using valley flashing because it appears the most basic. What width flashing do you recommend? Do you recommend the V or W for an 8/12 roof where the two roof faces meet at a 90 degree angle?*

TR: An open valley style is fine. You will need 5" of slate overlapping the valley metal, so if you're installing a 6" open valley, you can use 16" stock at that slope. We don't use V or W valleys unless there is a reason for it. We just use flat stock and force it into place to make

Continued on next page



**Figure 3**  
This VT unfading gray slate roof was installed with 4" headlap along the bottom three feet of the eaves (bottom 5 courses), while the remaining field slates have 3" headlap. The difference in exposure is not detectable by eye. This is the correct way to fortify the eaves on a slate roof when ice-damming is a concern. Underlayments do not work in the long run.

Photo by Joe Jenkins



a rounded valley bottom. That was the most common way to install a valley on traditional American slate roofs. “W” valleys are designed for use when two asymmetrical roof planes are draining into each other, or when a large roof plane is draining into a small one. “V” valleys fit nicely into a new roof, but won’t fit well into old roof valleys that have some sag to them. We use 20 ounce copper for valleys which you can buy at [slateroofcentral.com](http://slateroofcentral.com). Pre-fabricated “V” and “W” valley stock in 16 ounce copper is also available there.

*Do you recommend using metal drip edges and if so what size and material do you recommend?*

TR: We rarely use metal drip edges on new slate roof installations. Metal drip edges became popular when asphalt shingles became widely used because such shingles can sag over the edge of the roof and must be supported. This is not an issue with slate, which is why traditional slate roofs rarely use metal drip edges. On the other hand, copper drip edges are becoming more popular on slate roofs for stylistic purposes as well as to protect fragile substrate edges when laminated roof decking is used. You can also form a cant into a copper drip edge, thereby eliminating the need for a wood cant strip (see Figure 6, page 3). Copper drip edges are available via [slateroofcentral.com](http://slateroofcentral.com).

*Can I staple the felt paper or do you recommend nails only in the pattern you describe in your book?*

TR: You could staple it if you’re going to slate over it immediately. Otherwise it will blow off. It can also rip loose when you’re working on it if it’s just stapled.

*What headlap do you recommend using on the roof over a porch that has a slope of 4/12 and a rake length of 9’6”? Will 4” be adequate?*

TR: Four inches of headlap will work, although you need to make sure snow and ice will not be falling off an upper roof onto the porch and damaging the porch slates. Also, if a downspout drains onto the porch from an upper roof, it can create problems by draining too much water onto one spot.

*It may take me a month to finish my roof. Do you recommend sealing over the nails holding the felt? If so, should I use roofing cement or silicon?*

TR: If you seal the nails, use roofing cement — it’s a lot cheaper, it only has to work temporarily, and it can be applied thinly with a trowel so it will not interfere with the laying of the slate later. You may want to consider installing the felt half-lapped (i.e. two layers) for added protection. Then, you may not have to seal the nails if you’re only waiting 4 weeks. However, if you have a valuable interior, you should either seal the nails or slate the roof ASAP.

*Do you recommend copper nails or stainless steel?*

TR: Either/or. Depends on the roof deck. Copper nails are easier to get out later if you have to repair the roof. Stainless nails are easier to nail into harder roof decks. Both are available at [slateroofcentral.com](http://slateroofcentral.com).

*Can you recommend one slate hammer?*

TR: Different hammers have different purposes. For example, German style slating, such as is shown on the turret in the article on page 7, requires the slates to be trimmed on the job site. Therefore, a slate hammer with a slate cutting shank is often preferred by Germans. Such a hammer has a lot of its weight in the shank (Gilbert and Becker, Stortz and GT make such hammers). When the hammer is being used to primarily beat on a slate ripper, pound nails, or punch holes in slate, such as during slate roof repairs or restoration, the weight of the hammer should be mostly in the head. The Estwing hammer is best used

for this purpose. If you are installing slate roofs and have a slate cutter and don’t need a hammer for trimming slate, use either a Stortz European roofing hammer or a similar Freund hammer. These have most of their weight in the head and are ideal for pounding nails and punching nail holes in slate, but are not as heavy as the Estwing hammer, so they won’t wear out your wrist if you’re pounding nails all day long. All of these tools are available at [slateroofcentral.com](http://slateroofcentral.com).

*Is it reasonable to think I can slate my roof using hook ladders, ladder jacks, and wooden ladders or do you recommend roofing jacks?*

TR: You should use roof jacks. They’re safer and they make the job a lot easier.

*Is the slate for the starter course usually sold separately or are the holes not already punched in these?*

TR: You should order the starter slates separately and have the holes punched on the front (not back as is done for the field slates because the starter is laid front side down). The quarry should already know how to do this. They will also supply hip and ridge slates. See the article on starter slates in this issue, page 3. There was an article on hip and ridge slates in TR Issue #4. All articles are posted on the web at [traditionalroofing.com](http://traditionalroofing.com) after the print version has been circulated.

*We are re-doing an asbestos tile roof and are in need of the copper tie-down hooks which are designed to prevent the wind from lifting the tiles. Do you carry this item or would you know a supplier?*

TR: I know of no source (readers?) The copper clip used on asbestos roofs is shown in Figure 5.

Figure 5



*To achieve credits for LEED we need to provide data for the solar reflectivity of slate (it’s ability to absorb and release heat). Do you know if such research has been done?*


TR: We get this question more frequently, however, I know of no data available about this. The solar reflectivity of slate roofing would, I assume, vary according to the color of the slate. Some slate is dark, some lighter. However, on the whole I would think the reflectivity is quite low. My guess is that LEED is concerned about highly-reflective roofing types such as some metal roofing or even white single-ply or white asphalt shingles. I think with slate it’s a non-issue, but as I say, I do not have the hard data to back it up. Slate, being a stone, does absorb heat and releases it back out to the atmosphere as it cools. How this would negatively impact the environmental characteristics of a building, I do not know. If the roof is insulated, the heat does not penetrate into the building. Any of you readers have the answers?

*I am currently reading your book, “The Slate Roof Bible.” The diagrams always show the starter course slates as having only one hole (which would make a lot of sense to me). Is this correct? If instead these starter course slates are just like all the other ones only turned sideways (with 2 holes), how do you keep the second hole near the eave from filling with water during ice backups in winter?*

TR: All slates are nailed to the roof with two nails, including the starter slates. You don’t use the bottom hole if you’re turning a field slate sideways and using it for a starter slate. You punch a new hole in the correct location. It is important that the starter slate course be laid correctly to prevent stray holes from ending up where you don’t want them. See the article in this issue on page 3.

*I know you do not recommend IWS and believe a 4” headlap will protect a slate roof from winter ice creep up under the slate roof. How does that work? It seems to me the ice as it melts creeps up the roof from underneath the slate, so the boards underneath get wet and over time must be replaced. Am I missing something?*

TR: Yes. Obviously, if slate roofs allowed water to penetrate through them, they would be failures as roofs and would have been abandoned long ago. Slate roofs are watertight. The underlayment serves no long-


Continued on next page 



term useful purpose after the slate has been correctly installed. Water does not creep through the slate and wet the boards underneath unless the slate has been improperly installed such as with inadequate headlap or is on an inadequate slope, or if the slate has holes or other faults, or if the slate along the eaves has been damaged by gutter installers or roofing contractors.

*I'm installing a slate roof. Should I use copper nails or stainless steel screws to fasten the slate? My roofer says I should use screws.*

TR: Please don't use screws. The beauty of slate roofs is that they can be taken apart and put back together over time, when needed, for repair and maintenance. Screws will make it impossible to take the roof apart because a slate ripper will not be able to pull them out.

Have questions, comments, rants or raves? Send us mail at Traditional Roofing, 143 Forest Lane, Grove City, PA 16127 USA, or email us at [editor@traditionalroofing.com](mailto:editor@traditionalroofing.com). 

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sent I did not really want until next month, and only ordered them to help make the delivery costs from the mainland more practical. Now we will have to pay for two deliveries. Talk about being too smart for your own good.

At least the rain is easing. Hopefully, I'll be able to get out to finish that little bit of ornamental roofing at the Rectory in the afternoon.

I sort through a few more papers on the desk and throw two bundles of specifications and bills of quantities into the waste paper bin. They're from large national firms who are taking on work in the area. There's such a mass of paper work and documentation I'm supposed to read and understand that this puts me off for a start.


Neither is there any way that I could morally expect my own employees or my sub-contractors to leave a quality job at the price which these management firms will eventually accept. I briefly consider that I should give them a courtesy telephone call and apologize for being unable to tender, on the other hand they don't go wasting their time on courtesy calls to me.

It's now 12:15 and Angeline calls me from the house to remind me I have a provisional lunch arrangement with a technical rep. and friend from a local manufacturer. I call him up on his car phone and make contact after the third attempt. He is 60 miles away up country so we arrange another date. I had been looking forward to an interesting discussion on the pros and cons of some of his products, over the Chef's Special and a glass or two of the 'creatur' (for medicinal purposes of course) at Murphy's Cellars. However I am somewhat relieved since I have a suspicion that if we had kept this date, then the ornamental roof at the Rectory might tend to become another good intention unfulfilled today.

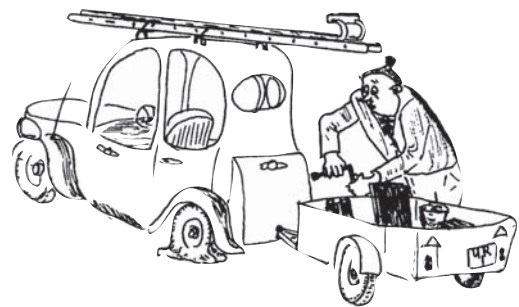
The phone goes off again. The electrical lady says that nobody has arrived yet. I assure her that Len left at 11 a.m. and should have been there.

After calling at the bathroom, I finish off the rest of my soggy cornflakes with a cup of coffee and four corned beef sandwiches. I am pulling on my boiler suit when the phone rings again and Len says he has got a flat wheel, looks like remains of a slate nail, could someone pick up his spare wheel from the local garage and bring it over.

I pick up my knee pads from the kitchen radiator where they have been quietly drying, give Angeline a peck on the cheek, pat the dogs, and as I walk towards the door, the sun breaks through the scudding clouds.

The phone goes off just as I step into the van, complete with the ladders and tools. I close the van door behind me and drive off to pick up Len's spare wheel and then on to 'Utopia,' the Rectory roof, where perhaps I will have a cold but enjoyable afternoon's therapeutic relaxation plying my trade as a roof slater and tiler. 

John Ball won the Gold Medal at the 2000 International Federation of Roofing Trades World Slating and Tiling Championships in Edinburgh, Scotland.



LEN SAYS HE HAS A FLAT WHEEL





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