



THE OWNER-BUILT CENTURY ROOF

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WHEN MY WIFE AND I SET OUT TO BUILD A HOUSE three years ago, our goal was to build a structure that could last hundreds of years. After spending two years logging our own storm-damaged trees, sawing timbers on our portable saw mill, notching beams with chisels, erecting our timber frame, and quarrying our own sandstone, there was little doubt in our minds that slate was the only roofing material that could provide the honesty, beauty, and longevity we sought for our home. But because no one within two hours of our house site was familiar with slate roofs, it looked as though we might have to settle for a more conventional roof.

In the course of seeking a contractor, I stumbled across "The Slate Roof Bible." What my wife and I read there not only made us want a slate roof more than ever, but also convinced us that if we were willing to expend tremendous effort and pay attention to details, we could do it ourselves. Farmers without calculators slated roofs over a century ago and evidence of their work still stands (as with timberframing!). With lots of patience, surely we could do this too.

We were at first enamored with Buckingham slate for its legendary durability, but we found it difficult and expensive to acquire the genuine article. So instead we chose unfading grey and unfading green slate from Camara Slate in Vermont. We reasoned that by ordering a thicker slate (1/4" to 3/8") from a reputable quarry in Vermont, we could have our cake and eat it too... beautiful color and texture, with a service life also possibly measured in centuries, not decades.

When I ordered the slate (45 square without ever nailing or cutting a slate in my life), I figured that staggered butts and random width slates would be the best way to hide my inexperience in slating. But my wife had her heart set on a regular hexagonal pattern. To humor her, I first slated our outhouse in this pattern. It looked fine, but it took me 20 hours to do just over 1/2 square! If she was previously unconvinced to let me do a random style, I had surely convinced her at that point. The outhouse also helped me make another call... uncertain as to whether I should use felt underlayment or not, I slated the outhouse without it. Soon thereafter, I waited inside the outhouse during a driving rainstorm watching for leaks. Not a single drip. That settled it, no felt paper!

With a full 20 hours of slating under my belt, I enlisted the help of two in-laws (my wife's brothers) and one anonymous outlaw. Their previous slate experience consisted only of ripping off slate and putting down asphalt shingles, but they were all good carpenters, had stuck with us through the timberframing, and were eager to learn with me.

For sheeting, we used 1" thick by 3.5" wide boards cut from the same logs that comprise the oak timbers in our

house. Sawing, ripping, and planing all of these boards (most of them already well seasoned!) was an arduous task, so I decided to skip-sheet the roof instead of decking it solid. This required a lot of head scratching, because the spacing of the skip sheeting was dictated by the headlap (3") and exposure (7.5") of the slates that were going to be nailed into them. I had so many aborted chalk lines that I had to switch chalk colors three times. Just how did they do it without calculators?! Another downside of skip sheeting for me was that it made regular length slatehooks useless (and the application of underlayment would be troublesome... if you're into underlayment). However, skip sheeting had one big advantage that outweighed the others... it transformed my roof into a giant chicken ladder. In fact, we quickly adopted a method of nailing slates beside us (rather than above us), and that meant we never once had to use a roof jack. Of course, we still used safety lines.

Driving copper nails into seasoned oak was like trying to push a string up hill, so we used stainless nails to attach the slates. Humidity and higher-than-average fall-out from coal fired power plants take their toll on copper here in the Ohio Valley, so we also used stainless steel flashing for the closed valleys. Bending the 18 and 22 gauge stainless was simply not possible on a standard aluminum roofing brake, so I borrowed an industrial brake at a local race car fabrication shop. For on-site bends, we improvised with a bulldozer and sledge hammer. Driving a nail through 18 gauge stainless is no mean task either. At complicated intersections, such as the cricket behind the tower, I found it easier to weld 18 gauge stainless than to solder it. For the hidden flashing beneath the mitered hip slates, I restored sanity to the job site by finding a local source of easily worked 30 gauge terne coated stainless. On the ridges, I used interlocking copper pieces from Paradigm Shingle. They're meant to be used on copper shingle roofs, but I found that they work fine on slate, and the greatest benefit is that there are no exposed nail heads.

For several weeks, the eyebrow dormer (my wife spec'd it and wouldn't let me beg out!) was the bane of my existence. Slating it was not nearly so difficult as

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All photos this article by Thomas Massie.

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building the wooden structure beneath it. I began by asking my wife to buy a window and I nailed it on the roof. Then I projected the arch of the window horizontally back to the roof sheathing and cut a hole in the interior tongue and groove ceiling. Further up on the roof deck, I drew an upside-down parabola whose legs intersected the legs of the window arch. I then bent some 1/2" green oak boards between the parabola and the top of the window to get an approximate ski-slope shape. These few boards helped me define the shape of the bulkheads (miniature eyebrow shapes that gradually decreased in size) that I then fabricated on the roof to support the rest of the oak boards that made up the dormer surface.

The slates that cover the eyebrow dormer are 8" wide with a few 7" thrown in to keep everything running correctly. The top corners are dog-eared so they will lay flat. Rather than cut the butts of the slates on an angle, I left them alone, which produced a staggered look that matched the rest of the roof. Between each course of slate on the eyebrow, I interlaced strips of terne coated stainless flashing (and 16 oz. copper when I ran out of TCS). A cynic might say that the eyebrow is essentially a stainless roof, with slate to disguise it. Whatever it is, it doesn't leak!

With the exception of the porches, which are not yet built, the roof has been finished for almost a year. The 45 squares of slate cost about \$20,000 and the nails, tools, flashing and ridges were approximately another \$5,000. I would estimate the labor, including nailing on the oak sheathing, to be about 200 man-days spread out over roughly 6 months (we didn't roof every day). If I could have done one thing differently, I think I would have included an attic, instead of cathedral ceilings, underneath my slate roof. I have 2 inches of air between the slates and the aluminum-faced Poly-Iso insulation (R-50), so the roof performs spectacularly, but if a leak ever occurs, it would be hard to track down. No worries though... I am both proud and relieved to report that the roof has not admitted a single drop of water! 🏠

The author (36) and his wife (34) graduated with engineering degrees from M.I.T. and started a computer peripherals/software company in New England. They left the high tech world to raise their four children on a family cattle farm in Kentucky. The self-sufficient home they are building (<http://massiehouse.blogspot.com>) is solar powered and "off-grid." Their plan is "to farm until the money runs out." They hope to finish their house before that happens.

