



## The Rest of the Story

### Part 3

BY BRUCE BARKER

**ONCE AGAIN THE WORD INVITES YOU** to travel into the dark realm of subjects that are sometimes misunderstood by home inspectors. The Word hopes you will find this trip informative and maybe a little entertaining.

This month we finish reporting on (as Paul Harvey used to say) **the rest of the story**. This is the story about what The Word and his wonderful wife learned while remodeling our 1980 ranch home in Cary, NC. As inspectors, we usually just do our thing, collect our fee and move on to the next inspection. Rarely do we get to see what happens after we leave. The rest of the story can be interesting and instructive in terms of what we might want to look for and report, or at least mention, to our clients.

Last time, we discussed air sealing and insulating the attic and crawlspace. This time, we'll get into a potpourri of issues we encountered while tearing things apart and putting them back together.

#### The Chimney

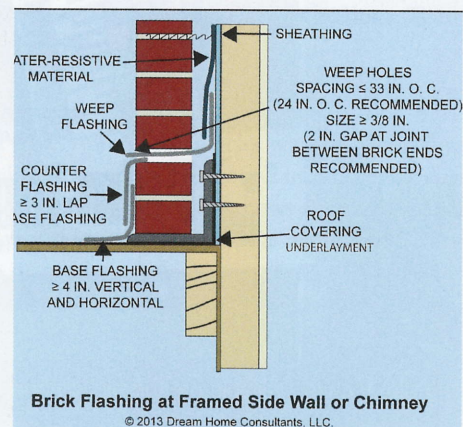
The fireplace encroached on a large part of the living area and kitchen. We wanted that space, especially in the kitchen, so despite the cost, mess and time, the fireplace and chimney had to go. The Word congratulates the home's builder. The fireplace and chimney were built to survive anything short of a direct nuclear blast and were not easy to remove. What we



Photo 1



Top: Photo 2 — Bottom: Photo 3



Brick Flashing at Framed Side Wall or Chimney

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Figure 1

discovered while removing them, however, provides some important lessons about how to inspect chimneys.

There were obvious signs of water entry in the attic on the framing around the chimney. See photo 1. Our inspector, Bruce Ramsey, and I assumed the water was from poor chimney flashing. The existing flashing wasn't too bad, but it also looked recently repaired. See photo 2. No doubt most of the water entry was due to flashing issues, but not all of it. When we started removing the chimney, we found that the masonry was also wet above the roof line. See photo 3. Some of the water was apparently entering through the chimney cap (crown).

#### Chimney Flashing

There's only one recommended way to flash a chimney that's built or faced with bricks: install base and counter flashing. This is the only flashing method that allows the chimney to move independently from the structure (which it will do). Other flashing methods might work for a while, but they will all fail over time. Correct flashing is essential because people don't (and in many cases shouldn't) get up close and personal to check their chimney flashing.

Flashing in contact with masonry should be galvanized steel or copper. Aluminum will corrode. Base flashing should extend at least 4 inches up the chimney and 4 inches over



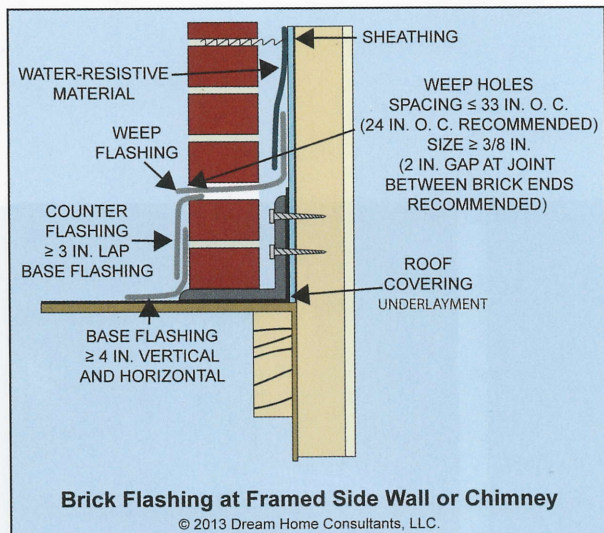


Figure 2

the roof covering underlayment (for shingle roof coverings). Counter flashing should be inserted into a notch cut in the mortar and sealed in place with a high-quality caulk or with mortar. The counter flashing should be flush with the base flashing and overlap it at least 3 inches. Photo 4 shows an acceptable chimney flashing job. The fasteners aren't good, but it looks like the counter flashing is inserted into a notch as it should be.



Photo 4

Apron flashing should be installed on the low (base) side of the chimney if the roof extends past the chimney on the low side. Apron flashing should be installed as base and counter flashing. The apron (base flashing) should extend several inches down the roof from the chimney. The counter flashing should overlap the base flashing at least 3 inches and should turn back on both sides of the chimney.

Flashing a wood-framed chimney chase faced with brick is similar except that additional drainage flashing (also called weep flashing and through-wall flashing) should be added and integrated with the water-resistant barrier covering the chimney. The drainage flashing

should drain through weep holes. This flashing method also applies to vertical sidewalls above roofs as shown by Figure 1.

## Jiminy Cricket

Whether you call it a cricket or a saddle, a chimney that is more than 30 inches wide perpendicular to the roof slope needs one. A cricket helps turn water away from what would otherwise be a flat wall. Without a cricket, water could run up and over flashing.

The minimum cricket height (according to International Residential Code 2012 R1003.20) is based on the roof slope and the chimney width and ranges between  $\frac{1}{8}$  of the chimney width for a 3:12 roof to  $\frac{1}{2}$  of the chimney width for a 12:12 roof. We're not going to measure cricket height on an inspection. A high-slope roof will usually direct more water toward the chimney compared to a low slope roof, so the cricket should be high enough to direct water around the chimney.

The cricket should be flashed at the chimney using base and counter flashing, and the roof covering material should be installed on the cricket in a manner appropriate for the roof covering. A metal cricket cover is also acceptable. Picture 4 also shows part of a cricket.

## The Chimney Crown

The chimney crown was typical of those we often see. It was a relatively thin layer of mortar tapering to almost nothing at the edges. Some call this thin mortar layer a mortar wash, which is a more accurate term. It was cracked, but not badly. Water was apparently entering as shown by the dark areas on the blocks in photo 3.

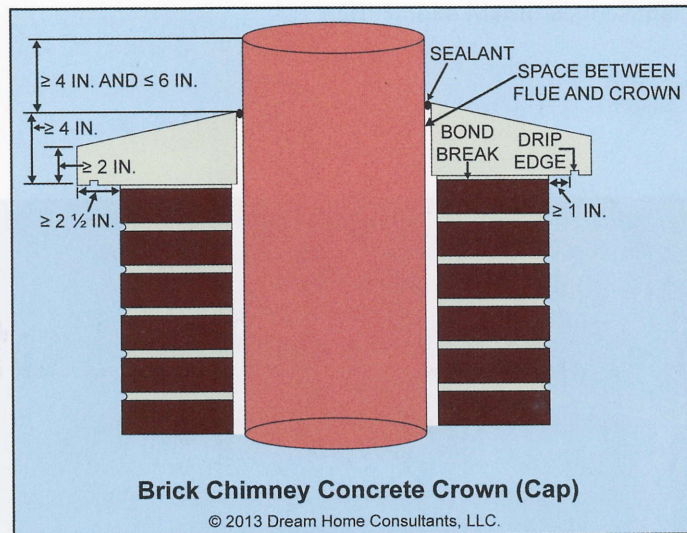


Figure 3

Many chimney crowns are constructed like the one on our home. It was deficient and leaking even though we could not determine this by a visual inspection. Most crowns like ours should be reported as deficient based on failure to comply with industry-recommended installation guidelines.

The first problem is using mortar for the crown. Mortar is not intended for this purpose. A proper crown is made from concrete, either cast-in-place or precast. The second problem is thickness, especially at the edge. Thin concrete and mortar will deteriorate and crack. The minimum crown thickness should be 2 inches, even at the edge. The third problem is ending the crown at the chimney edge. Water will run down the chimney causing the brick and mortar to deteriorate. The crown should extend beyond the chimney at least 2 ½ inches on all sides and have a drip edge on the underside of the crown. See Figure 2.

## Retrofit Skylights

Holes in the roof are a necessary evil, and larger holes have more potential for evil. Skylights are among the worst holes. Skylights can compromise the roof structure, especially when the job is done without a permit as this skylight probably was. Framing problems can be hard to see in a dark attic, but do your best to look for them because there's a chance they exist.

Let's look at the purlins first. The removed braces are obvious as shown in Photo 5 on page 20. What may be less obvious is the fact that the purlins are not properly installed in the first place. Figure 3 shows proper purlin installation.





Photo 5

Purlins let the builder use longer or smaller rafters than would otherwise be allowed. They do this by transmitting some of the rafter load to a load-bearing point, usually a load-bearing wall. The problem in this case is that the purlin support was near the middle of the ceiling joist span, not exactly a load-bearing point. To be fair, after more than 30 years there was no indication that the improperly installed purlins had caused any problems. That said, problems could occur under the right conditions, so you should report improper framing such as these purlins even if there are no visible problems yet.

Photo 6 shows how the skylight was framed. Note that the single header is run between two original single rafters that were almost certainly not designed to carry the additional load. The same condition exists on the low side of the skylight. As for the ceiling joist header, the right side is just hanging there, as it was on the low side of the skylight. Again, there were no visible problems, but this one could cause problems and needed to be fixed.

Frankly, we both missed the skylight framing. Even experienced inspectors don't catch everything. The repair wasn't easy or

inexpensive. Dealing with long lumber when drywall and other framing are in the way isn't much fun. And a well-known joist hanger manufacturer charges a lot for triple hangers. At least we already had big sections cut out of the ceiling for some access.

### The Bottom Line

Remodeling is difficult, even for conscientious contractors who know what they're doing. There are many opportunities for mistakes, especially when the work is done by handymen, the low-bid contractor or by a well-meaning neighbor. Photo 7 shows the damage caused, in part, by the neighbor who replaced a hung door with a sliding door. The improper flashing allowed significant water damage that was only visible when we removed the deck.

***We should be especially vigilant when inspecting homes where remodeling has occurred. The mistakes can be numerous and costly.***



Photo 6



Photo 7

Memo to gods of change: The Word does not reside on Mt. Olympus (just at its base) and welcomes other viewpoints. Send your lightning bolts or emails to **Bruce@DreamHomeConsultants.com**. The thoughts contained herein are those of The Word. They are not ASHI standards or policies. ■



Bruce Barker operates Dream Home Consultants. He has been building and inspecting homes since 1987. He is the author of "Everybody's Building Code" and currently serves as chair of the ASHI Standards Committee. To read more of Barker's articles, go to [www.dreamhomeconsultants.com](http://www.dreamhomeconsultants.com).