

How to Be a Flashing Success



photos by Henri de Marne

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As with virtually everything in life, in most phases of construction there are right and wrong ways of doing things—and usually more wrong ways than right. That applies to roof flashings as much as anything else.

With this in mind, let's look at some of the most common problem areas and examine how to prevent (or cure) them with as few headaches as possible.

Chimneys

It probably goes without saying that chimney flashings must be done in two parts. But I've seen many single-piece flashing systems in my consulting and inspection business, and they spell trouble.

By single-piece chimney flashing, I mean

metal flashing embedded in the mortar joints that steps up the chimney and bends under the roof covering. As a result, water running down the chimney is led directly underneath the shingles and eventually into the house. This problem is aggravated by the fact that the house shrinks but the chimney doesn't, so the metal lifts the shingles or slates and bends down, creating a perfect slope directing the water under the roof covering.

The first rule is that all chimneys perforating a roof below the ridge and entirely surrounded by the roof must have a cricket on the uphill side. (Again, you may yawn with boredom, but I've seen a lot of them without one.)

For those who don't know what a chimney

cricket is, we're not talking about the types that chirp in the lawn. A cricket is a small "A" roof behind the chimney that directs water away from the chimney, preventing water pools and the buildup of snow and ice that eventually leads to leaks.

Although crickets often are covered with shingles, it's safer to cover them with soldered metal in cold climates. The cricket must include a vertical flashing leg extending up the chimney wall, along with apron flashing on the lower side of the chimney that also has a vertical leg against the chimney and covering the shingles.

As the shingles are nailed, step flashing-metal pieces bent at a 90-degree angle—is installed over each shingle course and nailed



Phase 1 of a new valley-repair technique. At left, the old valley is cut with a masonry knife. Above, with the old valley cut, a new piece of flashing is inserted on one side.

only at the top. Each row of flashing is covered by the next course of shingles, and the flashing's vertical leg is set against the chimney.

To allow for movement, none of the vertical legs should be nailed to the chimney. Counterflashing should be embedded in the mortar joints as the chimney is built to cover the vertical legs of the step flashing, apron, and cricket. It should be made in several pieces, each of them set in increasingly higher brick courses.

The counterflashing must overlap at all corners, following the travel of water, and it must not be nailed to the bricks through the lower flashing pieces.

Walls

Where a lower roof meets a wall, a piece of step flashing should be installed at each shingle course. (Siding or a frieze board can act as counterflashing, but all too often it is set in contact with the roof, which leads to paint peeling and eventual rot.) In addition, there always should be a one-inch clearance between the roof and the bottom of wood members.

Plumbing

The flashing boot at plumbing stacks often is installed incorrectly, with the sides nailed over the shingles. (Sometimes the top of the boot's flange is nailed over the shingles as well—with only roofing cement to stop water incursion.)

In the case of strong winds, water can be driven under the sides of the boot and penetrate into the living space. Similarly, shingles applied over the boot on all four sides can trap water on the bottom, leading to the same result.

The proper way to install stack flashing is to have both sides and the top covered with the roof covering while the apron of the boot is over the shingles.

Valleys

Valley flashing is another common problem area. Improper installation can cause early failure and serious problems that are expensive to correct.

When made of a single piece of metal and/or nailed along its entire length, the metal will fatigue and buckle as it moves in response to temperature changes. This is even more of a problem when thin-gauge metal is used.

Valley flashing should be installed in more than one piece, with the number of pieces depending on the length of the valley. Each piece should be nailed only at the top, and

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it should be held in place along its length with clips to allow for contraction and expansion.

The edges of each piece should be hemmed, and the hem should face up and not be closed so that it can catch and stop any water that gets under the shingles.

When a large roof is intersected by a smaller one and the volume of water from it is likely to overpower that generated by the smaller one—or when strong prevailing winds pose the possibility that water may be driven under the shingles—it's wise to install a valley with an inverted "V" in the center.

Valley Repairs

It's relatively easy to correct flashing problems associated with plumbing stacks, chimneys, and wall/roof connections, but valleys present a different challenge. In many cases, the only apparent solution is to remove the shingles from approximately three feet on each side of the valley. There is another option, however.

I developed an alternative method that was tested and proved by Sal Alfano, owner of Alpha Design & Construction in East Calais, Vt. As I took pictures and offered oc-



A carpenter inserts replacement pieces on one side of the old valley.

casional advice, Sal and his outstanding crew slit the old, leaky and heavily asphalt-coated valleys down the middle with a masonry blade set for a shallow cut, then inserted the replacement valley pieces, which had been fabricated by a local metalsmith to my specifications.

The replacement consisted primarily of a set of pieces shaped with a vertical leg about one inch high for one side of the valley, and a flat portion measured to cover half of the valley and to extend a few inches under the shingles without interfering with the nails holding the existing shingles. This flat piece terminated with a half-inch upward hem left slightly open.

The pieces for the other side of each valley had one difference: the top leg continued with a one-inch flat top bent at 90 degrees. The idea was to bend the flat top of these pieces over the adjacent sister pieces to lock the system and rivet the components together.

Once the valleys were slit, the replacement pieces without the flat tops were inserted easi-

ly under the existing valley, then the set with the flat tops was inserted next to the first one. Flat bars, wood blocks and gentle hammer blows were used.

Then the process of bending the flat tops and locking them in place with three-inch ViceGrip pliers took place, but we quickly discovered that this was awkward, slow and difficult compared to the earlier steps. I had anticipated being able to shape the old aluminum valley so that it could remain flat on top of the new one, but the process of insertion had distorted the pieces enough to make this task difficult.

Time for a quick field decision to remedy the problem. With the crew's blessing, I rushed to the nearby metal shop and had the man make us pieces shaped like a thin "U" but with flared legs.

While I was away, the workers completed bending over the flat tops, so when I returned they were ready to put the caps on, drill them in a few places, and fasten them to the valley replacement pieces with a few aluminum pop rivets. This went very quickly.

The flared legs pressed the old flashing down while covering part of it, thus creating an additional seal. This is definitely the way to go, we discovered. There is no need to have the flat top on one set of replacement pieces.

At the top, where the two valleys meet, a piece of lead flashing was inserted beneath the upper roof shingles and shaped to cover the new flashing.

The accompanying photos illustrate some of the phases of this process, which was completed by three men in four hours. Using this system, two people should be able to handle the job in half a day, and someone certainly could do it alone in a day.

Gutters and Spouts

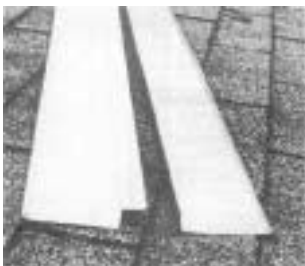
A discussion on flashing and roof problems would not be complete without something on gutters. In northern New England, gutters and spouts present a real



The completed job, with lead flashing at the joint of the two valleys and the U-shaped valley cap in place. The old, tar-coated valley is still visible.

problem in winter. They fill with ice, get bent out of shape and experience popped seams, and sometimes the whole system comes crashing down. This can be a source of considerable expense every spring.

As a result, many houses do not have gutters—a practice I favor since it's easy enough to divert roof water from most sites simply by sloping the grade around the foundation at least one inch per foot. In addition, setting rectangular flagstones into the soil at the roof drip line prevents erosion and causes most of the water to splash away from the



Standard two-piece replacement valley. Omit the upper flat lip of left piece and use inverted-U cap instead. Note the open hem to catch water, stiffen the valley and make insertion easy.



With the new inverted-U cap in place, a carpenter squeezes the pieces shut while another worker drills a hole for a pop rivet.

foundation.

But there are cases when gutters and downspouts are desirable or already in place and in need of repair. In these situations, you might want to try a solution I came up with a number of years ago. It has worked very satisfactorily, and a number of my clients use it regularly.

At the end of November or thereabouts, cover gutters with regular metal drip edge, and slip the apron under the shingles or slates. (This is much easier to do than you might think.) Place the drop leg inside the gutter's outside edge after notching as necessary to accommodate the fastening system.

The overhang of the drip edge covers the outside edge of the gutters, acting as a metal ice belt during the winter. If it rains during the winter, the water will fall on frozen ground without causing any damage.

The covers should be removed in late March and stored until the following November. This way, the gutters and spouts can start working again without having suffered winter's damage. ■

For more information on the proper way to shingle and flash roofs, two good references are the Steep Roofing Manual and the Roofing and Waterproofing Manual, published by the National Roofing Contractors Association, 8600 Bryn Mawr Ave., Chicago, Ill. 60631. Both publications have been updated recently.