Flashing The Tricky Spots

A bead of asphalt cement behind the step flashing provides extra protection at this roof/wall juncture.

A little planning and the right materials can prevent a lot of leaks

by Lloyd and Greg Hitchins

Flashing often gets too little attention in the design process, particularly in residential work. Blueprints end up vague on the flashing details, and contractors end up doing a make-shift job with roll stock and roofing cement.

But that's asking for trouble. You can do beautiful work on the big expanses of siding or roofing, but water is going to get in where things intersect. And the designs we've been seeing lately aren't short on intersecting planes.

The only way to make sure the structure is weathertight, and will remain that way, is to take the time to review tricky flashing situations on a job-by-job basis with your carpenters and roofers. Here are six tough areas we see often, and the way we flash them.

Garage/House Corner

Where the roof on a one-story attached garage butts into a two-story wall, you'll need more than a straight flashing running from the garage's eaves to ridge. Where water running down the garage roof spills off the edge, it damages the siding and saturates the wall behind it. Even gutters don't always intercept the flow, particularly if the gutter is clogged.

The best solution is to have a sheet-metal or roofing contractor make up a flashing to fit this corner, or if you own a sheet-metal brake, you can try it yourself (see Figure 1). Use a heavy gauge metal, such as 16-ounce copper or baked enamel galvanized sheet metal.

The corner flashing, which is the piece you install first, is cut from a square piece of metal as shown in the Figure 1 inset. The square is cut into two pieces which you solder together to form the flashing.

At the job site, make one change from your standard procedure. Use a simple gutter apron, rather than a style-D drip edge. Place the corner flashing on top of your gutter apron and black paper. Make sure you're using nails compatible with your flashing. Galvanized nails will corrode copper flashing, though they are fine if you're using galvanized flashing. Also, get your step flashing in the same metal as the back-up flashing. Flashing is always going to be damp or wet, and electrolytic action between different metals will create pin holes in no time.

You can install the corner flashing behind the fascia, or the corner flashing can overlap the fascia if it's already in

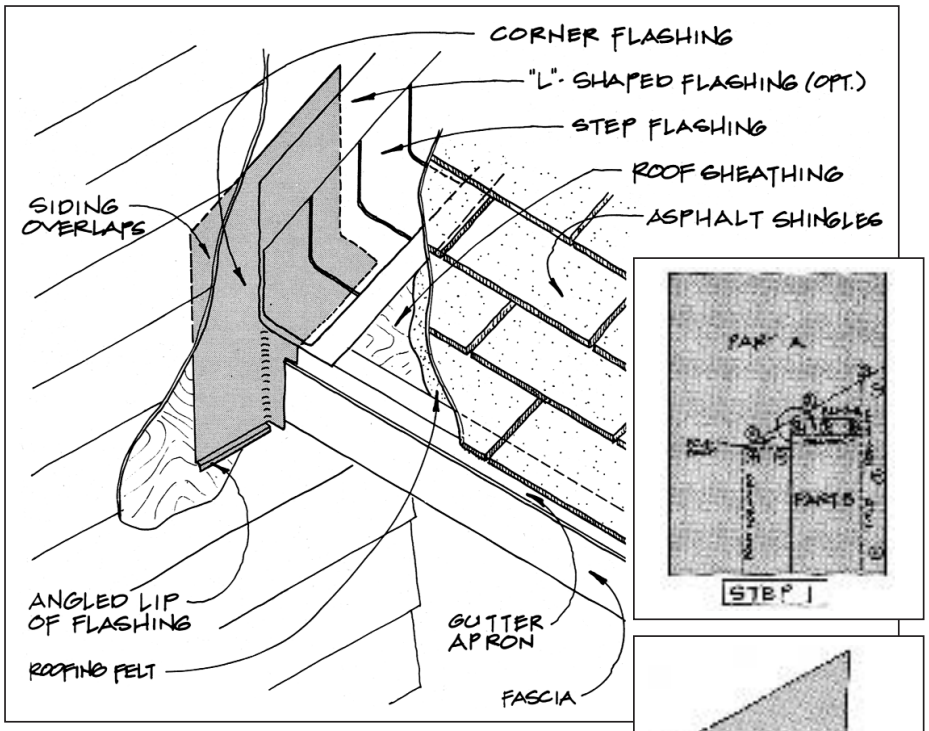
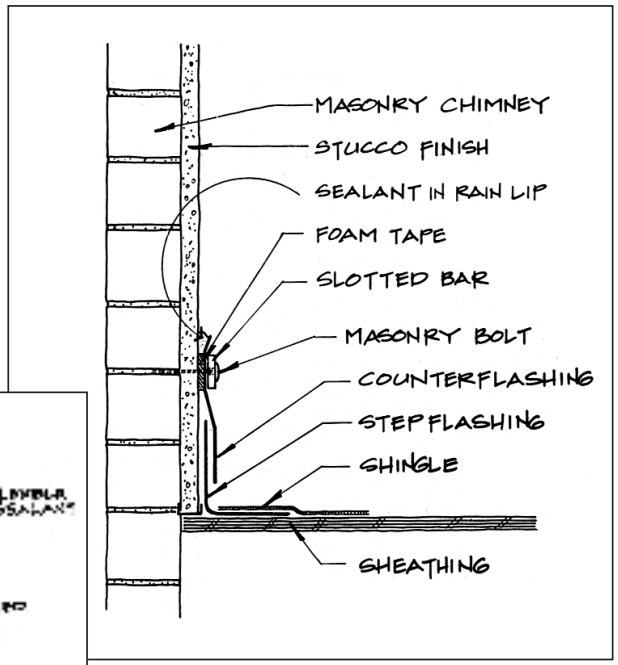


Figure 1. *Roof/wall juncture. Where a one-story roof butts into a two-story wall, start with a custom-fabricated corner flashing. Then add L-shaped pieces up the slope, and step flash the rest as usual. The corner flashing can be made out of a square piece of heavy-gauge metal, cut into two pieces—Part A and Part B (inset). Cut along solid lines and bend along dotted lines on a metal brake. Solder parts A and B at the overlapping flaps.*



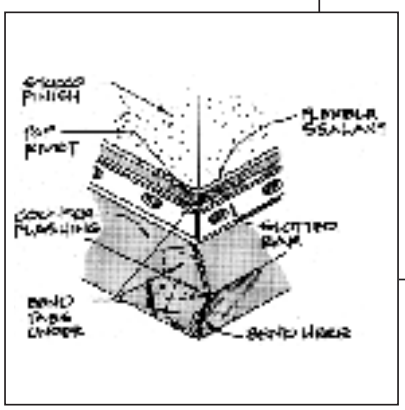


Figure 2. *Sealing to stucco. A surface-mounted counterflashing can be used on stucco walls and chimneys. Use a 20-year flexible sealant at the rain lip to keep the counterflashing watertight. An adhesive-backed foam tape makes a backer for the sealant. At corners (inset), snip back 3/4 inch at each brake line. Bend the snipped corners around the chimney corner, and pop rivet the rain lip to the adjoining piece.*

place. Overlapping the fascia (as shown in Figure 1) looks best if you use a baked-enamel galvanized flashing because you can match the paint color.

Let the bottom edge of the corner flashing run long until you see where your siding falls, then trim the bottom edge, and create a narrow, angled lip with a hand brake. Place the flashing over the lower piece of siding, then install the siding over it. This routes any water that gets into this area to the outside.

If you want a little extra protection behind your step shingles (which you might, if you use an off-the-shelf step shingle), put in pieces of L-shaped back-up flashing that are 8- to 10-inches high. Each length of L-flashing should overlap the preceding piece by 8 to 10 inches. The L-flashing is formed on a metal brake.

Now you're ready for step flashing. I prefer a 5-inch-high by 4-inch-out shingle for the extra protection it gives, and you could leave out the L-shaped flashing if you use these larger step shingles.

Stucco Chimney or Walls

It's possible to flash a stucco chimney the same way you'd flash a brick chimney, but running a saw through stucco and watching the sparks fly off the mesh is a real headache. When I flash to stucco, I prefer to use a surface-mounted counterflashing so I don't have to cut in joints or carve out a long reglet.

You can buy aluminum surface-mounted flashing from roofing supply houses, and it comes with a slotted bar for reinforcement as shown in Figure 2. If you don't have a roofing supplier who handles this type of counterflashing, you can have a shop make up a surface-mounted flashing out of 24-gauge galvanized with a baked enamel finish. I prefer a shop-made flashing 3-inches wide over the off-the-shelf, 2-inch-wide flashing. I also like to match the color of the stucco as closely as possible. The brake lines on shop-made flashings strengthen them enough so you don't need the slotted bar reinforcement.

Once you have the flashing in hand, installing it is a piece of cake. You run your step flashing up the wall, then place the counterflashing against adhesive-backed foam tape, and anchor the flashing to pre-drilled holes. I use "Pin Bolt Drive" (PBD) anchors or "Tap It" concrete screws to anchor the counterflashing.

Cut the flashing that runs along the sloped sides of the chimney about 2 inches longer than the chimney. Then snip back the corners 3/4 inch at each brake line, turn each snipped flap around the chimney corners, and flatten them against the chimney as shown in Figure 2 inset. Next, install the counterflashing, which is cut to the width of the chimney, at the top and bottom of the chimney. With all four pieces anchored, you can pop-rivet the rain lip at the corners and add the sealant to keep it weathertight. The rain lip has a 1/4-inch kick-out to serve as a sealant trough. Use a high quality, 20-year silicone or urethane caulk in this trough because the metal will move, and you want a caulk that stays flexible. Also don't over-tighten the masonry anchors (if you're making up the flashing yourself, you'll need a washer behind the head). Drill the hole going through the flashing a little large so the flashing can move without tearing.

Wood Chase

Water can enter a wood chimney chase at the back, at the bottom, at the sides, and even on the top. So to keep

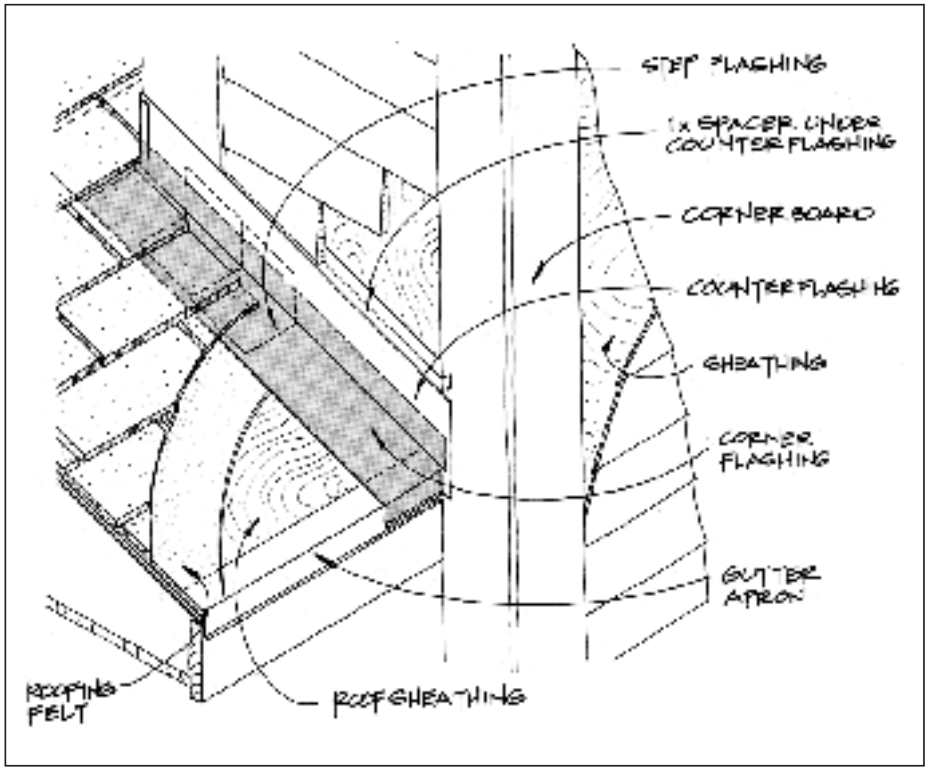


Figure 3. *Wood chimneys. On the sides, use a 1x wood spacer as backing for the step flashing and counterflashing. The counterflashing extends past the face of the down-slope corner board to protect it from water.*

water out, you need a multi-pronged approach.

Years ago, we always put a cricket on the back of the chimney. This is the best way to handle a wood chase because the cricket sheds water like a mini-roof, diverting it to the sides where it will flow down the slope.

Step flashing should be used on the sides of a chase when you're roofing with three-tab shingles. We often go with at least a 6x7-inch step shingle because it gives us 3 inches up and 3 inches out on the roof. Once the chase is flashed, go ahead and put the siding on, and use it to cover the step shingles.

Contractors in our area sometimes use texture 1-11 siding, and the corners where panels join inevitably leak. (We used over 20 tubes of caulk trying to plug the leaks in one of these.)

A better approach, and one that gives a more finished appearance to the chase, is to use corner boards over the waferboard sheathing. This protects the water-absorbent edges of the sheathing panels. But flashing around and between the corner boards can be tricky.

The best way to do this is to fit a 1-inch-thick spacer around the base of the chimney. The spacer should be the same thickness as the corner boards. The spacer provides backing for the wall flashing and counterflashing (see Figure 3). The corner flashing is installed over the black paper and gutter apron. Step shingles are installed the normal way. The final step is to install a metal counterflashing. This goes up under the siding on the chase and up under the uphill corner board.

When filling in between corner boards with siding, caulk all the joints where the siding meets the corner boards. A wood chase will have maximum exposure to the weather, and the silicone or urethane sealant you use here is the only line of defense.

Capping the top of the chase is the final critical step. A wood chase won't come in the standard masonry dimensions, so you won't be able to buy an off-the-shelf cap. Turn to a roofing contractor or sheet-metal shop for this flashing (see Figure 4).

When we make up a cap, we form a criss-cross brake in the pan so it humps in the middle. At the point, we cut a hole for the flue. We solder on a 2-inch-high sleeve, then slip the cap over the flue. After the cap is screwed in place, we slide a storm collar over it to cover the opening.

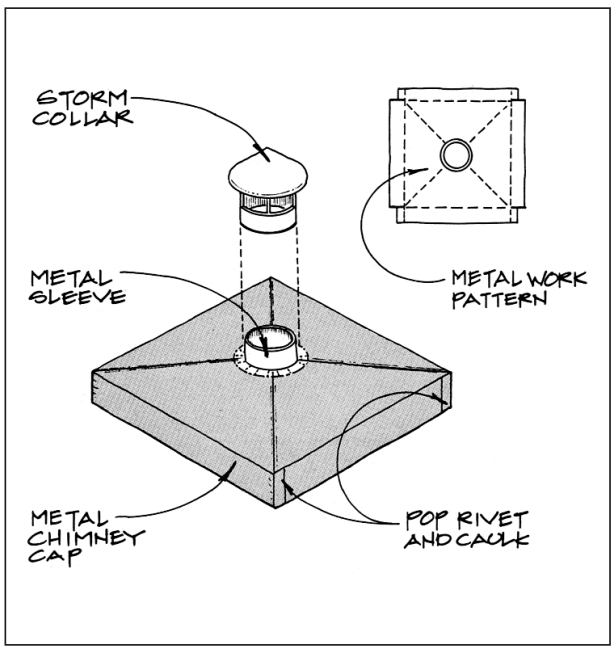


Figure 4. *Metal chimney cap. A metal chase cap can be formed from a sheet of metal. The crossed brake lines in the middle hump the pan so it sheds water. The cylindrical sleeve soldered to the cap gets covered with a storm collar.*

Metal Valleys

Contractors often call asking for "valley aluminum." This is very lightweight roll aluminum, about .015 inch thick, but it is much too thin to last in a valley. Lightweight aluminum will wrinkle. If it does wrinkle it will break from thermal expansion and contraction. Leaks start wherever kinks or buckles occur.

If we do a job with metal valleys, we use .032- or .040-inch aluminum and cut it to 8- or 10-foot lengths (the thicker aluminum comes in a sheet, not a roll). Or we use 16-ounce copper or .015-inch stainless steel.

Depending on the slope, we overlap the valley sections 8 to 12 inches, with

less overlap on steeper slopes (see Figure 5). On steeper slopes we don't seal the overlap to allow expansion and contraction of the metal, but on lower slopes (5/12 or less) we use a silicone sealant to keep blowing rain or snow out.

How far we extend the flashing under the shingles has a lot to do with the slope of the roof, but in general, we shoot for 24-inch-wide flashing. This gives us 12 inches up each slope. At the top of the valley, the shingles overlap the flashing 10 inches on each side, leaving 4 inches of valley flashing exposed. We plan our valleys so more of the valley is exposed as we get closer to the eaves. We need more exposure near the eaves because the valley carries more water lower on the roof. Besides, a slightly tapered valley looks better.

To give a valley greater strength and to keep water from rushing down one slope and up the other, we often form an inverted "V" in the center of the flashing. You can have a sheet metal shop form this "V" on a brake. This knocks about an inch off the flashing width, so you have to start with wider flashing. You always want shingles to overlap the flashing by about 8 inches.

On a slate, tile, wood shake, or concrete-tile roof, you should always use the "V." You also have to use flashing with a *water lock*—the edge on each side of the valley is folded back to stop the water. Also, cleats slip over the water-lock edges, and your nails go through the cleats, not the flashing. This makes your valley a trough to contain any water flowing into it.

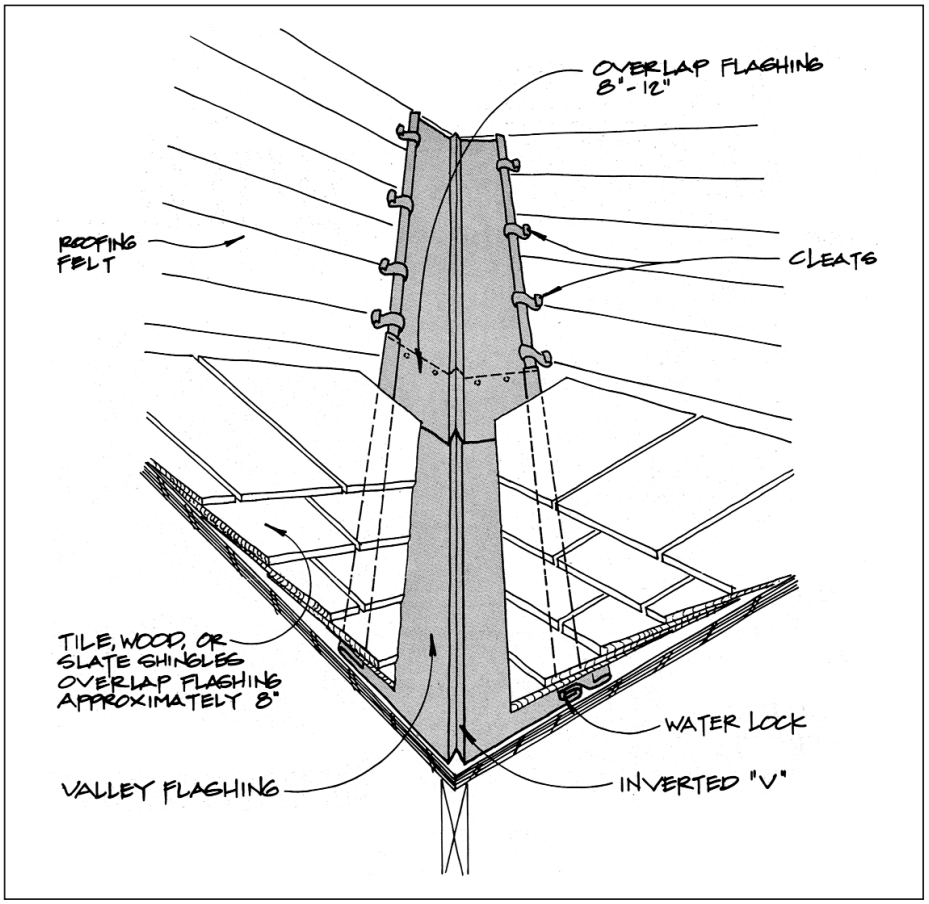


Figure 5. *Valley flashing. An inverted "V" in the middle of the valley makes the flashing stronger and keeps water from rushing up the opposite slope. On shakes, tile, and slate, you'll also need a water lock at the edges.*

Skylights

Flashing skylights can be a big headache, particularly if the skylight is attached to a curb. The traditional way to flash skylights is to use a metal flashing, but lately I've been using a synthetic rubber (EPDM) flashing, and I've found it a lot less expensive and more reliable.

I think an EPDM flashing beats metal for reliability, and it costs less too. For flashing, you'll want to use *uncured* EPDM, which is material intended to take a shape. Cured EPDM sheets lay flat and are used for large, flat roofs. If you go to a local roofing company and ask for a scrap piece of uncured EPDM flashing and a small quantity of the bonding adhesives, you'll be in business. The four major manufacturers of EPDM roofing market under many trade names, but if you use the generic name "uncured EPDM flashing," you should be able to buy what you need. The EPDM carries a 20-year warranty, and the material costs less than copper flashing.

Synthetic rubber is very simple to work with. You can take a large square of rubber, your shears, and adhesive (bonding adhesive, splice adhesive, and lap sealant) and carry them up to the roof. Sitting on the roof, you cut the rubber into pieces, brush on the bonding adhesive, and make up a fully waterproof skylight flashing. With metal, I have to measure the job, go back to the shop to make up the flashing, then go back and install it.

Use bonding adhesive to stick the EPDM to a 3½- or 7½-inch-high wood curb, but don't glue it down to the roof deck (see Figure 6). Run the EPDM flashing 12 inches out under the shingles, on top of your black paper. At the corners, where you're bonding EPDM to itself, use splice adhesive. It's as easy as patching an inner tube, and if you make a mistake, you can always repair it. When you're done, run a bead of lap sealant along all the patched seams.

Nail shanks from the roofing nails can go through EPDM without causing leaks. I favor rubber for wood shingle or shake roofs because they're hard to flash with metal. You can't use EPDM over skip sheathing, but many shake,

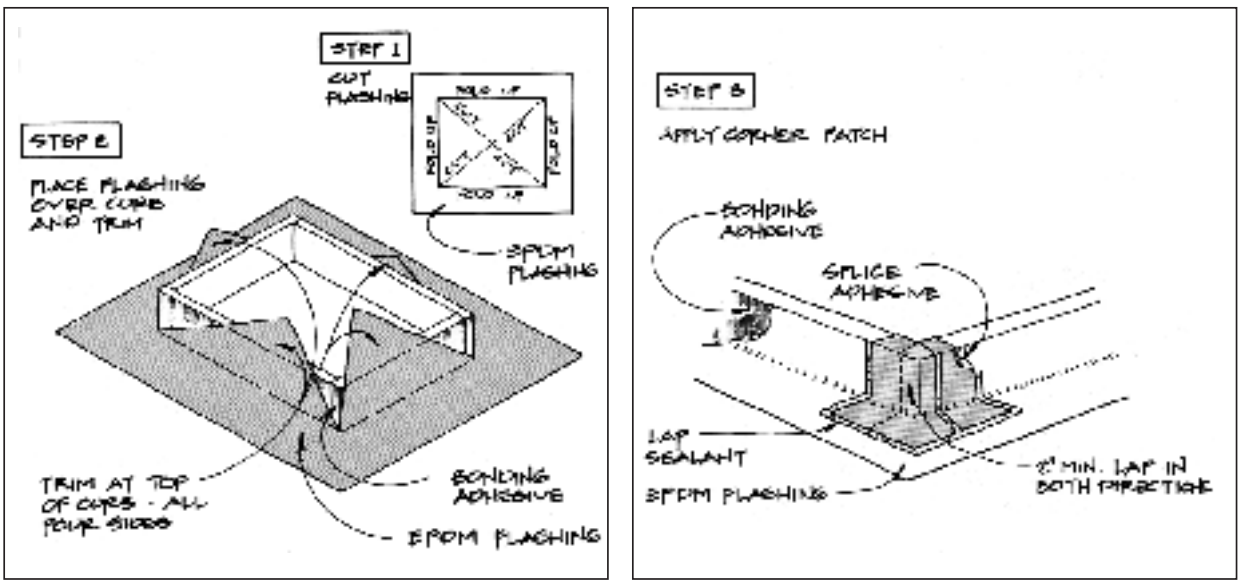


Figure 6. *Rubber skylight seal. Cut a square of EPDM flashing to fit around the skylight. Trim the triangular flaps flush with the top of the curb (left). Bonding adhesive holds the EPDM rubber to the curb. The material is flexible enough to patch the corners as shown (right). Use splice adhesive where pieces of EPDM overlap.*

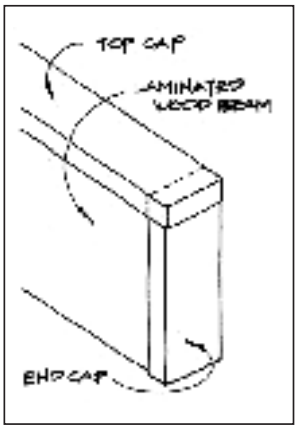


Figure 7. *Beam caps. Cover the ends and tops of laminated beams with flashing to prevent delamination.*

shingle, and tile roofs are installed over solid sheathing.

Projections

Any wood member that projects from the house should be flashed. Cornice returns, glulam beams, and balconies should be protected with flashing.

Glulam or heavy timber beams projecting from the peak or eaves should be capped with metal. Turn down the metal an inch around the sides. You need flashing over the ends of glulam beams to keep the laminations from separating (see Figure 7).

Balconies aren't immune to water damage, even when you build with pressure-treated wood. Water can run back into the house and damage untreated wood. Also, pressure-treated wood eventually decays. We're seeing many relatively new apartment buildings with cantilevered balconies that are rotting off. You can always replace a deck if it decays, but replacing the cantilevered joists is an expensive proposition.

You need to handle balcony flashing carefully because water or snow can pile up on the balcony and creep in under the sill of a sliding door. Water can also run back into the house from dripping balcony joists.

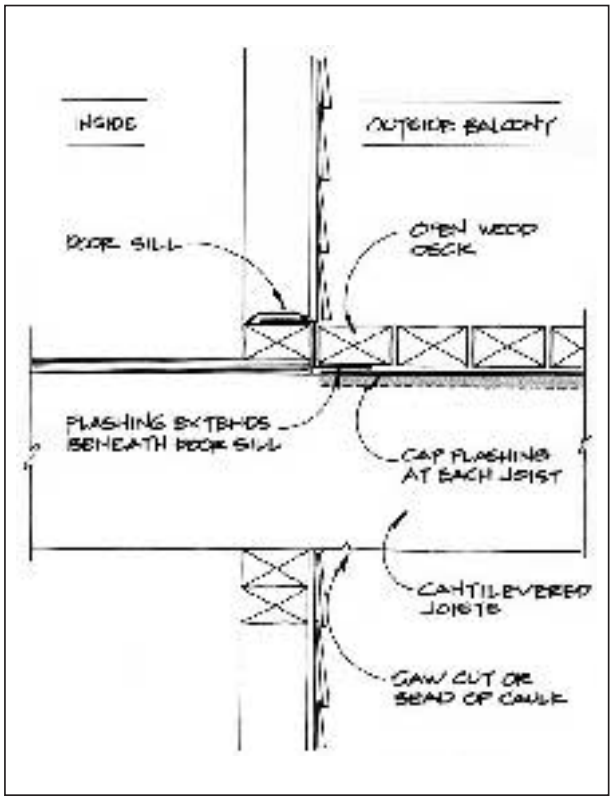


Figure 8. *Cantilevered decks. Flash cantilevered balcony joists and where the deck meets the wall. Run the flashing underneath the door sill and up the walls on either side of the door. A saw cut or bead of caulk on the underside of the joists about 2 inches from the siding will make water drip off the beam rather than run into the building.*

Bring your flashing under the door sill, and if the door is on the same level as the balcony, caulk between the sill and the flashing (see Figure 8). You should also flash the wall where the balcony deck joins the house. Use the same flashing detail where the deck meets the wall, only run your flashing up under the siding.

It's also a good idea to top off your balcony joists with a 2 1/2-inch-wide piece of metal flashing running the length of the joist. Make it U-shaped so it slips down half an inch on both sides.

To keep water from running off the bottom of the joists, we make a saw mark across the bottom of the joists a couple of inches from the house, or we run a bead of caulk an inch from the wall if the client objects to the saw mark. This break causes water to drip off and keeps it from crawling inside. ■

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