

WINDOWS



Flashing Recessed Windows Lessons in how to avoid costly mistakes when waterproofing complex window openings

BY GENE SUMMY

I have been researching, developing, and testing different flashing methods for recessed windows since 1999. I consider myself lucky to have been hired to investigate thousands of recessed-window leaks over the last 16 years, as it has afforded me unique opportunities to develop effective methods of detailing windows with the materials used commonly on jobsites.

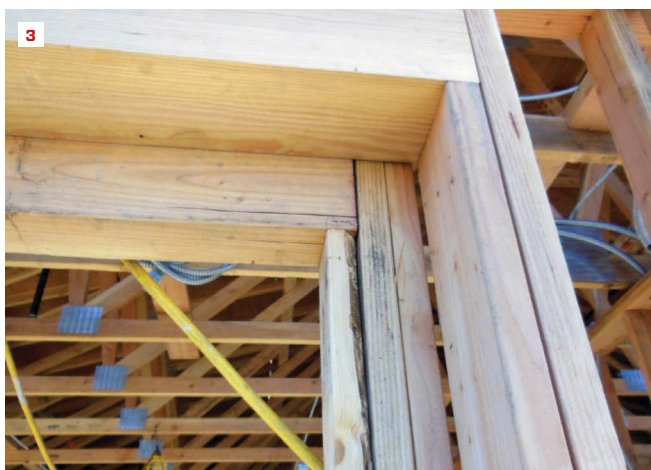
We have a local affluent community here in Orange County called Newport Coast. Since 2000, this area has been a mecca for anyone with money. Most of the area sits on a hill overlooking the Pacific Ocean, and for most of these homes, it's perfect for good views.

For those of us in the water-management community, the beautiful views are not the first thing that comes to mind when we look at homes here; the storms are. They come in off the oceanfront, bringing plenty of driving rain and the need for effective waterproofing. Early in my testing career, I walked on "the Hill," as ev-

eryone calls it here, with architect Fernando Laullion through a vast neighborhood under construction. We noticed that 100% of the windows on the homes were recessed. The depth of the recesses varied from 3 to 12 inches. There were no flush-mount windows whatsoever. Recessed windows were written into the CCRs by the land developers.

And Fernando and I were astonished by what we saw. We observed 10 different teams of installers flashing the recessed window openings on 10 different homes, and we did not observe any of the teams following, or even attempting to follow, published guidelines. Why? Guidelines were simply not available.

We were fascinated to observe that a right-handed installer flashed the right side of the window differently than he flashed the left side of the same window. One side, usually the side of his dominant hand, was done better than the opposite side. In many



Recessed windows are used as step stools (1) and are also often damaged by tools and materials that are passed in and out of the opening during construction. For this reason, the author calls for installing an extra layer of black paper on the bottom area of the recess.

This window (2) was torn apart after the windows on a new home started leaking. Without a good flashing design provided on the plans, the installers simply applied peel-and-stick to the outside face, without bothering to first bend pieces into the corners or use pre-fit flashing corners.

The lumber used to pack out this recessed window opening (3) will be covered by the weather barrier and flashing tapes, and the trades that follow will have no way of knowing there's a major void in the backing due to wane along one edge. A lath or trim nail puncturing the flashing over this void would more than likely leak.

locations, the opposite side was a mess; it was hard to believe that the same person had done both sides.

We watched for a while, then we went and spoke with the installers. They told us that they had never been trained and had never been given step-by-step procedures to follow; they were simply trying to do their best. I believe they wanted to do the right thing but honestly didn't know how. That was the day I decided to tackle this problem.

In the coming years, I have been fortunate that my company has been the one that has responded to many of the rain-related leaks in this same area. We were able to see first-hand the effects of the poor installation practices on the very same recessed windows we'd seen installed. In most of the cases, we investigated by water-testing the windows that we knew leaked in natural rain events. This was a great learning opportunity, and we took advantage of it as best we could. We applied generally accepted methods of testing and isolation to precisely identify the sources of water intrusion. In

many cases, fixing the leaks was also part of our scope of work, and the methods we devised are central to this article.

CAUSES OF LEAKS

The following are the basic categories of the leaks we observe frequently on jobsites:

Poor "origami." Leaks due to the complex cutting and folding of the waterproofing materials are common. Let's face it, cutting and folding sticky, thick material is no easy process. Even the most experienced guys will struggle. Towards the end of a day, the temptation to simply "karate chop" the materials into place often takes over.

Damage from trades. The recessed edges of the openings are vulnerable to abrasion from tool bags and heavy building materials being passed through. We've also observed trades using the lower edge of the windows as a step stool (1) and as a tool locker. The lower edge is often damaged by the heavy, steel-toed boots of

tradespeople climbing through the opening or reaching up onto the wall.

Poor design. Architectural plans are notorious for having sketchy details when it comes to recessed flashing. Often, the architect simply says something like “apply bituminous products to lower edge.” He draws a side view that has dotted lines where he wants the waterproofing membrane to layer, with no mention of the corners and transitions. The result is that the installers will simply lap the outside face with peel-and-stick and not actually follow the contours of the corners (2).

Incorrect or missing materials. We have discovered many openings where the window installer simply installed traditional window flashing around the window, assuming the next trade would waterproof the recessed opening. The window installer’s logic was simple: “I flash the window; someone else waterproofs the wall system.” The contracts often do not specify anything about the recessed windows.

In this article, I’ll cover most of the details I’ve worked out over the years to prevent problems with recessed windows. If you do these things, you will sleep like a baby during the rainiest nights.

PREPARING THE OPENINGS

Sloped sill. Provide slope to the lower recessed edge of the window—the more slope, the better. I suggest at least 2 inches per foot to readily guide water down and out.

Solid backing. All areas within the recessed opening should have solid backing. Provide at least two trimmers on the sides of the window (for at least 3 inches of solid backing) and at least 4 inches above and below the window. This is important because you need room to work with the sticky material. If the area is too tight, the installer does not have the necessary room to correctly apply the materials. If you have any doubts about this, pick up some flashing tape and go flash some of these conditions yourself. You will quickly see what I mean.

No shiners, no wane. It is difficult for tradespeople to know where the backing is after the weather-resistive barrier (WRB) has been installed. If the home is fully sheathed, do not allow excessive gaps between the sheets. Gaps should be 1/8 inch wide, or the width of the shank on a 16d nail. Gaps larger than that not only leave a void behind any membrane applied over the gap, but are also a magnet for shiners, which are ready leaks waiting to happen. Make no mistake about it: Shiners usually leak.

Also, never allow waned lumber to be used as backing in the recessed opening (3). Face all waned lumber to the inside, where it may give the drywall installers a headache, but won’t create an expensive leak. When facing the outside, wane creates huge voids behind the flashing membrane. When subsequent trades—stucco lathers or the exterior-trim crew—come through, their nails will not self-heal against a void and will result in window leaks.

FULL DISCLOSURE

I recommend using a flashing system from a manufacturer that publishes guidelines on how to deal with recessed openings. This

makes life easier for installers and contractors: You can largely stay out of legal hot water if you simply do what they tell you to do.

Two companies we have worked for that have thought out these issues are Fortifiber and DuPont. In the interest of full disclosure, I admit that I have worked for both. While I started out as a window contractor, I now run a company that trains window installers, mostly for large franchise builders. In the course of this work, we’ve helped test and advise on the development of the Fortifiber and DuPont guidelines. They both incorporate pre-formed flashing corners, and both offer in-field support. It’s worth contacting the local rep, as he or she will usually visit your jobsite to train your employees.

GENERAL GUIDELINES

Regardless of the system you use, these guidelines will keep you out of trouble most of the time.

Work from bottom to top. This is obvious to a lot of folks but bears repeating. You have to work from bottom to top to make sure top layers lap over bottom layers.

Pre-formed flashing corners. Pre-formed corners are available from Fortifiber. They’re sold as “Corner Flash A” (for the outer corners of the recess) and “Corner Flash B” (for inside corners). But you can also pre-form corners using DuPont FlexWrap or other flexible flashing material following the DuPont instructions.

Use flashing corners on all corners of the recessed opening, including the four outside edges of the outer face of the opening, as well as the four corners on the wall area in which the window is set. On the bottom of the opening, the corners on the outside edge are installed first, then the corners near the window unit. On the top of the opening, the inside corners near the window are installed first, then the corners on the outside edge. This will ensure that the layers are lapped correctly.

And don’t forget the top corners. A lot of folks are so concerned about the lower sill area, they neglect the top corners of the opening. Those are just as susceptible to blowing rain and water dripping around the top edge and running into a tiny gap.

Protection layer. After the lower recessed edge is correctly flashed, apply a course of building paper to protect this important area from trade damage. Many times, recessed openings are used as tool-holders and stepping stools, which will damage your carefully applied and expensive flashing efforts. Adding a course of building paper or a sheet of nail-on flashing is a cheap insurance policy.

J-roller. The karate-chop method of pushing peel-and-stick into a corner is not enough. Always use a J-roller to smooth the material flat and ensure complete adhesion. Wrinkles and poor adhesion will inevitably lead to leaks.

Little roofs. Think about the recessed areas as “little roofs.” How much time and preparation do we give to our roofs? At least that much attention should be given to recessed windows. A little paranoia is a good thing.

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FLASHING RECESSED WINDOWS



Flashing a shallow recess. At the bottom of the window, first caulk the framing, then apply pre-fit corners to the outside edge of the recessed opening (1). The inside flashing corners go on second (2). Next, apply sill flashing across the exterior face of the wall framing (3). Make two slits at the edge of the opening, and fold the inner tongue of the flashing across the horizontal sill and up the inner face below the window opening, rolling it smooth with a J-roller (4). Cut short pieces of flashing membrane to create end dams on both sides of the recessed opening (5). The author recommends caulking the edges of the end dam and tooling out the sealant. Black paper is installed as a protective layer over the horizontal surface of the recess, and a final membrane “apron” to tie in with the WRB (6) is installed on the face of the framing.



With the side flashings in place (7), the window unit can be installed. (To meet the window manufacturer's requirements, the window flange must be installed in a bed of sealant; see "Installing Flanged Windows," Jan/16.)

Remember that the top corners, not just the bottom of the recessed opening, must also be flashed. Install flashing corners on the inner face near the top of the window first (8), followed by the flashing corners on the outside face of the recessed opening (9). A head flashing, which extends from one edge of the recess to the other (10), is followed by a final membrane flashing applied to the outside face of the wall (11).

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The final membrane flashing is slit at the edges of the opening and folded inwards across the horizontal head and down over the window flange (12), completing the flashing assembly (13).



Flashing a deep window recess. Start by applying the sill apron across the outside face of the wall, and caulk the corner of the recess (14). Flashing corners are applied to the outside edge (15) and folded over the apron. Strips of flashing are first folded along both sides of the recessed opening (16), then slit so the outside edges can fold onto the exterior face of the wall. Next, the inner flashing corners are installed with caulk under them. At the front edge of the recess (17), the author installs a “bridge flashing” spanning between the two flashing strips at the corners.



The end dam is installed next (18), spanning the distance from the window opening to the outside face of the wall. The author always installs a protective layer of black paper (19) to ward off damage to the bottom of the recess during construction. A final sill membrane flashing is applied over the black paper below the window opening.

After side flashings are in place, the window unit is installed and flashing corners are installed above the window (20). Next, the top corners of the recess are flashed, a head flashing is installed over the window flange (21), and flashing corners (22) are installed at the outside of the recess. The final step is to apply a flashing membrane, which is slit at the edges of the opening and folded back over the top edge of the recess (23).