BY TED CUSHMAN

Photos: Ted Cushman

Installing Windows in a Deep Wall

As a specialist in meeting the stringent Passive House energy-efficiency and air-tightness spec, Boston design/build company Placetailor aims for extremely high-level performance. But as a developer, the company often has its own money on the line, so it can't afford to invest in labor or materials whose cost won't be earned back.

In that business environment, Placetailor must come up with designs that work effectively but are simple and cheap to build. And since many of the company's key personnel are both architects and hands-on builders, it's common to see designs evolve on the fly during the construction process. "We won't change a facade or a floor plan without consulting everybody and getting buy-in all around," says development director and company co-founder Declan Keefe. "But if the project managers want to modify an assembly for practical reasons, they might just do it."

The project shown here is a two-family townhouse in the Fort Hill neighborhood of Roxbury. Placetailor's deep wall system is simple: a 16-inch-thick double stud wall framed with 2x4 studs, connected with gussets at mid-stud height **(1)**. With dense-blown cellulose insulation, the wall is calculated at R58. The window openings are boxed out with bucks made from Zip System panels, and the wall sheathing, taped at the seams, forms the building's air control layer. The builders expect to hit the Passive House air-tightness standard of 0.6 ACH50.

The home's rainscreen siding detail is also simple but robust. The Zip System sheathing and joint tape form the weather-resistive barrier. To hold the vertical shiplap board siding off the wall and create a space for drainage and air-drying, Placetailor uses strapping made from corrugated plastic signboard, bought for a few

dollars a sheet at an office supply store and ripped into strips **(2)**.

TAPING THE SEAMS

Because the air control layer of the building is at the exterior skin, including the windows, all of the seams in the window buck and window opening are taped using Siga Wigluv tape. The outboard window faces are taped to the OSB—tape is applied first to the sill **(3)**, then to side jamb joints **(4)** and the head jamb **(5)**. Strips of tape are also applied in the window buck at joints and in corners **(6)**. Finally, a small patch of tape is applied over the complicated corner intersections of the sill with the jambs and the wall sheathing **(7)**. Everything inboard of the window plane, including the inner part of the window bucks, is left untaped so that the wall can dry to the inside.

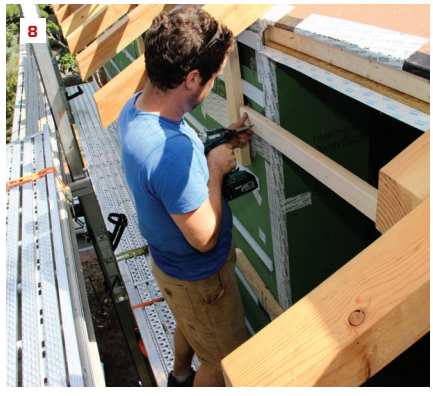
BLOCKED IN PLACE

Before the windows are set (Placetailor is using European-made, triple-glazed Schuco tilt-and-turns), temporary 2x3 rails are fastened across the window opening to serve as positive stops that hold the window flush with the wall sheathing **(8)**. Inside the house, each window is lifted into the opening **(9)** and positioned tightly against the 2x3 rails, where it is secured with two temporary blocks screwed top and bottom to the window buck side jambs **(10)**.

FASTENING

The temporary 2x3 rails and blocks hold the window in plane while the crew fine-tunes the window's placement. First, the window is roughly centered at the head jamb with shims, then it's precisely centered at the sill by measuring off the window buck **(11)**. The crew fine-tunes the hinge jamb using pry-bars and shims **(12)** and makes a final check for plumb **(13)**. They repeat the process at the sill, first checking for level **(14)**, then fine-tuning with shims **(15)**.

Schuco windows are held in place by self-tapping lag screws supplied with the units and driven through holes predrilled in the frame. This window gets eight screws: three through each side jamb **(16, 17)**, and two through the top rail.



The bolted connection is quick and simple to make and has the advantage of holding the window in position front to back as well as from side to side (the positive thread connection means the windows couldn't rack—even without the shims). Also, the bolts don't get in the way of air-sealing and insulating: The crew will first inject foam sealant into the gap, then trim the foam on the inside and tape the window face to the inside buck before drywalling the opening.

According to Placetailor, the Schuco windows selected were cost-competitive with double-glazed double-hung units from a mainstream U.S. manufacturer. The designers varied the window glazing characteristics to fine-tune the performance of the envelope. Windows on the south face of the building have high solar heat gain coefficients, while east-, west-, and north-facing windows were chosen for low emissivity to minimize heat loss instead of maximizing solar gain.

EXTERIOR TRIM

Setting the windows flush to the exterior sheathing makes it simple to integrate them into the weather-resistive barrier and drainage plane by taping the exterior face of the window frame to the Zip sheathing with Siga Wigluv tape **(18)**. Placetailor trims the window out with a simple custom trim package **(19)**. Where the vertical ship-lap board siding butts against the trim **(20)**, the joints are left uncaulked to promote drying.

Windows that are set this way may allow some conductive heat loss across the framed corners at the outside window edge—in fact, modeling has shown less conductive heat flow around a window when it's set in the wall center. But installing the window to the outside of the opening is closer to traditional practice and makes for simple, economical exterior trim details. Plus, the wide interior sill makes for an attractive amenity.

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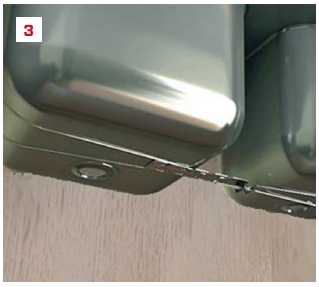

Repairing Cracked Granite at Sink Cutouts

BY JOSEPH CORLETT

I recently repaired two granite countertops that had failed reinforcing rods at the kitchen sink cutout. One was an Uba Tuba top **(1)**, and the other was a Bordeaux top **(2)**. In each case, the cause was a compounding of failures rather than just a single problem: Latex caulk was used instead of silicone between the undermount stainless steel sink flange and the underside of the granite; particle-board scraps glued with polyester adhesive were used to support the flange of the undermount sinks instead of a Hercules Universal Sink Harness **(3)** from Braxton-Bragg (braxton-bragg.com); and plain steel rods, instead of stainless or fiberglass ones, were embedded in the granite with polyester adhesive instead of epoxy, the material recommended by the Marble Institute of America.

Water from activity in and around the sink had leaked past the failed caulk and ponded on the sink flange until the granite absorbed it. It passed through the polyester adhesive to the steel reinforcing rod, causing the rod to rust and expand, which cracked the granite.

In the case of the Uba Tuba top, the homeowner had attempted to repair the crack—or to at least disguise it—by filling it with black caulk, but the only solution for a problem like this (short of replacing the top) is to remove the rusting rod and reset the sink using the proper supports, adhesives, and sealants.

MAKING ROOM TO WORK

To do that, you need access to the rod as well as room to grind the granite from underneath, so I began by removing the face of the cabinet. With frameless cabinets, sawing through the metal dowels holding the cabinet front to the sides of the box does the job **(4)**. The false drawer front also may need to be removed—because the sink behind it restricts access to its screws, I pry it off by wedging two scraper blades between it and the cabinet rail, then driving a chisel between the scrapers. If you don't have scrapers in the truck, you can use two drywall knives—the goal is to provide hard surfaces for the chisel to push against

Photos: Joseph Corlett


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while also protecting the drawer facing from being damaged.

With framed cabinets, I first remove any screws holding adjacent cabinets together. Then I use a hammer and wood block to separate the face frame from the box in a single piece **(5)**; it typically pops off easily, with no damage. You can remove the cabinet door first, but I find that to be unnecessary.

Once the cabinet front is removed, it's easy to see how a leaking sink flange delivers water to the bottom of the rod **(6)**. Tapping a scraper between the sink flange and the underside of the stone will remove the sink without damage to either.

REMOVING THE RUSTED ROD

To remove the rod, I grind away the adhesive on both sides wherever the rod is rusted **(7)**. One deep cut into the stone on one side, then a gentle tap with a chisel between the rod and stone on the uncut side will usually free the rod.

To keep the dust down, I cover the sink cabinet and surrounding area in poly **(8)**, but containing the dust is an uphill battle. Sometime after I had made the two repairs shown here, I bought a vacuum attachment for my grinder (at dustdirector.com). I've also been experimenting with fans to create negative pressure and pump filtered air to the outdoors. But in my experience, no matter what you do, there will be some dust in the air, and I make a point of explaining that to my customers.

There aren't too many things that are more unpleasant than lying on your back under a plastic tent and grinding out a rod using a diamond-blade Metabo while wearing safety glasses, hearing protection, and a respirator. I grind as close to the ends of the rod as I can before the Metabo bumps up against the sides of the cabinets. I have had rods that were short enough to completely remove, some that could be wrestled out by hand on the ends, and some that had to be cut, leaving a small end in place. Fortunately, in these two repairs, the rust didn't extend to the ends of the rods.

After exposing the rod, I cut it off with a grinder and pry it out. Typically, I don't have to pry very hard before the rod pops loose. In one recent repair, for instance, the homeowner called me in just as his countertop had begun to fail, so it was relatively easy to completely remove the rod, clean the slot with acetone, and pack it full of anchoring epoxy **(9)** before filling and polishing the cracked stone surface. But the Bordeaux top had been cracking for a long time, and when I pried on the rod, the granite broke into several pieces and fell away **(10)**. It was my mistake for failing to reinforce the granite, which I usually do by hot-melt gluing blocks to the sink shoulders **(11)**.

REPAIRING THE STONE

After removing the rusted rod, I then had to repair the broken granite at the sink surround. I used the melamine cabinet front I had sawn out—after screwing a 1x4 along its length to create a "T" brace to hold it flat—to support the pieces of granite **(12)**. I coated the melamine with WD-40 so that any epoxy that squeezed out when I glued the granite wouldn't bond to it. Then I glued up the granite, letting the epoxy fill


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any small voids. I used Dani clamps (danicclamp.com) to hold everything together **(13)**. (The photo is actually of a solid-surface repair; for stone, I wrap one clamp around another for more clamping power and use more clamps.)

Having the Bordeaux top fall away happened on the first repair. I learned a valuable lesson from that, and when I started the Uba Tuba repair, I decided that the cracking was extensive enough that prying the rod would risk breaking the granite. So instead I made a sacrificial cut on each end through the bottom and sink edge **(14)**. This approach worked perfectly, breaking the sink-side section of granite exactly where I wanted and exposing the failed rod **(15)**.

Here is the Uba Tuba top after glue-up and clamping, but before grinding and polishing **(16)**. Prior to reinstalling the sink, I cleaned the rod slot with acetone and pumped it full of Quikrete FastSet Anchoring Epoxy. At $20 a tube, the epoxy is pricey, but it's waterproof and strong, and—most important—it will stay put upside-down right out of the tube. It is rock- hard in minutes.

The rod is no longer needed because the cabinet will provide all the necessary strength in tension for the granite. In fact, rods are mainly used to support the granite during transport and installation, but these days rodding is expensive, unnecessary, and old-school. The invention of the Omni Cubed Sink Hole Saver (also available from Braxton-Bragg) has eliminated the need to reinforce most types of granite at sink cutouts.

FINISHING UP

The final step is to polish the repaired area. My goal is to match the existing top, so the repair doesn't always have a super gloss but it blends nicely with the surrounding granite **(17, 18, 19)**. When I publish my work online, I like to use my least-flattering closeups. It keeps me humble, and it also sets customer expectations. I probably could have made these repairs look a bit better, but the meter is running on these jobs and that's always a trade-off. These repairs couldn't be discerned by touch and, while the customers said the tops weren't as good as new, I got HomeAdvisor ratings of 4.5 (out of a possible 5).

Repairing a failed rod is somewhat comparable to fixing a totaled car. The difference is, there are plenty of blue Chevys with nearly the same mileage as the one you wrecked, and finding one is relatively easy. But there may not be many replacement slabs of granite that match a particular damaged top, and finding one may be difficult and take a long time. Therein lies the problem—and the value of rod repairs. Even the $25-per-foot granite countertop guys couldn't have matched and replaced either of these tops for the $1,000 or so I charged for each of these repairs. Repairs that reuse the existing granite are relatively inconspicuous and can't be detected by touch. And unlike with replacements, the finish, particulates, movement, edge profile, and color match perfectly.

Joseph Corlett (josephcorlett.com) has more than 30 years' experience in the cabinet and countertop industries and specializes in surface restoration. His columns appear monthly at countertopiq.com. Email him at loosedeckcannon@gmail.com.