

Contemporary Bathroom Addition



A stepped footprint makes the most of space left by a property easement

The original master bath in our client's house had only 36 square feet of floor area, barely enough room to turn around in. Though we sketched out some preliminary designs that would provide more space, we had to shelve them when we discovered our proposed addition would straddle a 10-foot-wide utility easement that included a major sewer line for a nearby housing development. Staying within the existing footprint and expanding into an adjacent guest bedroom wasn't an option, so instead we overlaid the easement onto the site plan and designed within the space left inside the county's required 5-foot setback (see Figure 1, next page). The result was a 115-square-foot six-cornered addition, with each corner no closer than 5 feet to the sewer line. The "stepped" design is a little unusual, but our clients love the way it dresses up the rather nondescript gable end.

To give the interior a contemporary European look, our staff architect designed the room so that nothing touches the floor. The maple cabinets hang from the walls, and even the toilet sits up off the floor, thanks to a hidden wall-mount system. The radiant tile floor is also a key part of the design; it's laid over Wedi backer panels, which simplified installation of the radiant tubing and construction of the curbless shower.

Before

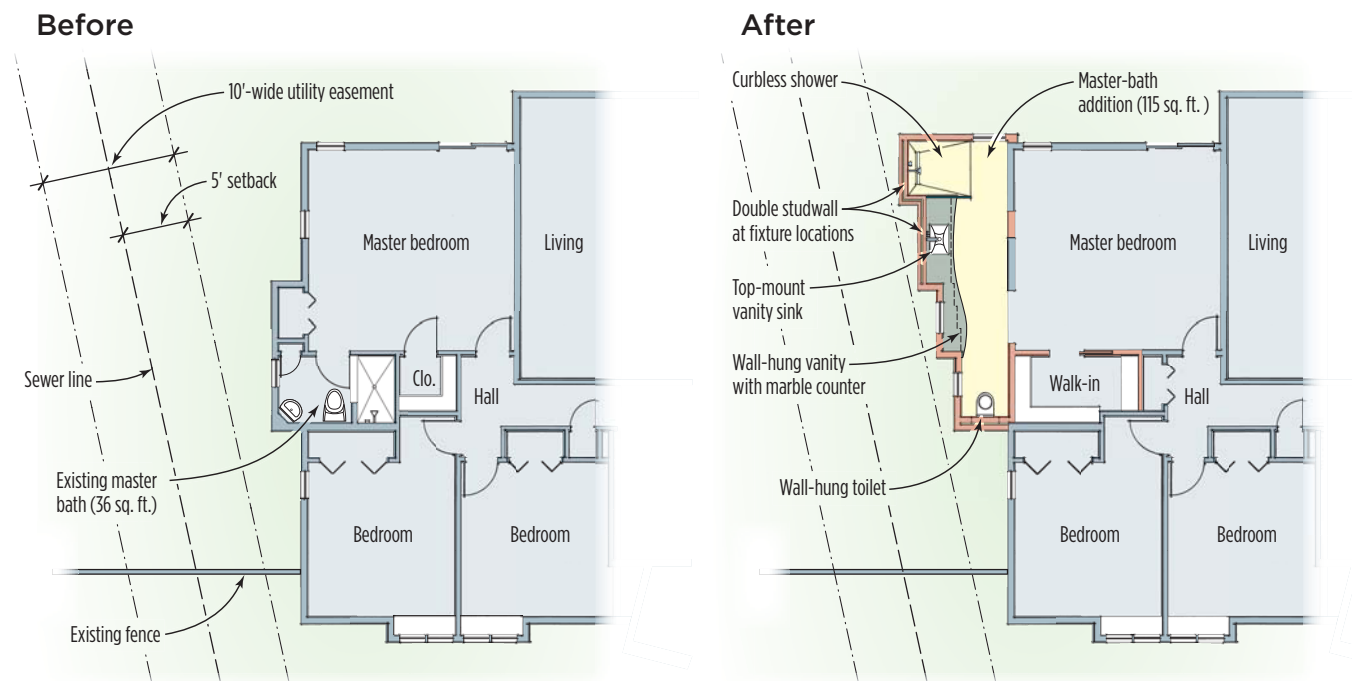


After



by David Hanson

Maximizing Available Space



Tucked into a corner of the master bedroom, the original master bath was uncomfortably cramped at 36 square feet — even with extra space from a shallow bumpout. The author replaced the bumpout with a 115-square-foot addition that, to avoid encroaching on a drainage easement, has a stepped footprint. A large new walk-in closet occupies space left from the old bathroom and a tiny closet.



Figure 1. Both the stepped stem wall for the new addition and the old bumpout are visible at left. The author's crew framed the addition walls with engineered studs — which are straighter than sawn studs — to speed wall tile installation (above).



Figure 2. Double-wall framing behind the toilet allowed the waste pipe to be moved out from the foundation wall and made room for extra insulation.

Foundation and Framing

The addition sits on a conventional poured concrete frost wall. Because the small footing required only 2.5 yards of concrete — a short load in our area — it was more cost-effective for us to mix it ourselves, even though it took 38 80-pound bags. After forming the 48-inch-high stem walls, we called in a pump truck to fill them. We insulated the walls from the inside with 2 inches of EPS foam, covered the ground with a 6-mil poly vapor retarder that we taped to the insulation, then backfilled to grade with dirt.

Framing. Whenever we're working on a job that will have a lot of wall tile, we frame with engineered studs. Though more expensive than standard framing lumber — around here, a standard 2x6 stud costs about 40 cents per foot, while 2x6 TimberStrand LSL (888/453-8358, woodbywy.com) studs cost about \$1.50 per foot — engineered framing is straight and defect-free, which makes it much easier to get a good-looking tile job. The \$420 or so it added to the cost of materials was somewhat balanced by the savings in both waste and time that we'd otherwise have spent correcting the framing.

Even though our zone 5B climate isn't particularly severe, I still don't like to put plumbing in exterior walls and run the risk of freezing pipes. To provide room for additional cellulose insulation, we framed double walls in the shower and toilet areas. This allowed us to easily meet energy code requirements in our

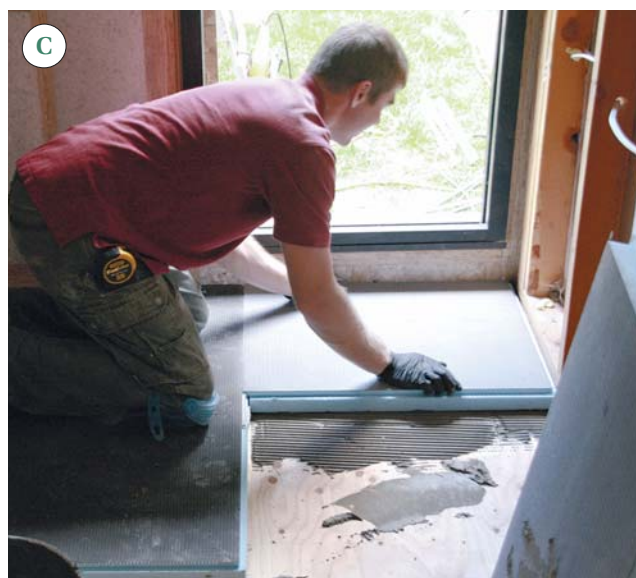


Figure 3. The Wedi shower base has an integral drain with a rubber-flanged fitting that slides into the floor-mounted PVC trap (A, B). The waterproof base is installed with thin-set mortar, and can be enlarged with interlocking base extensions (C).

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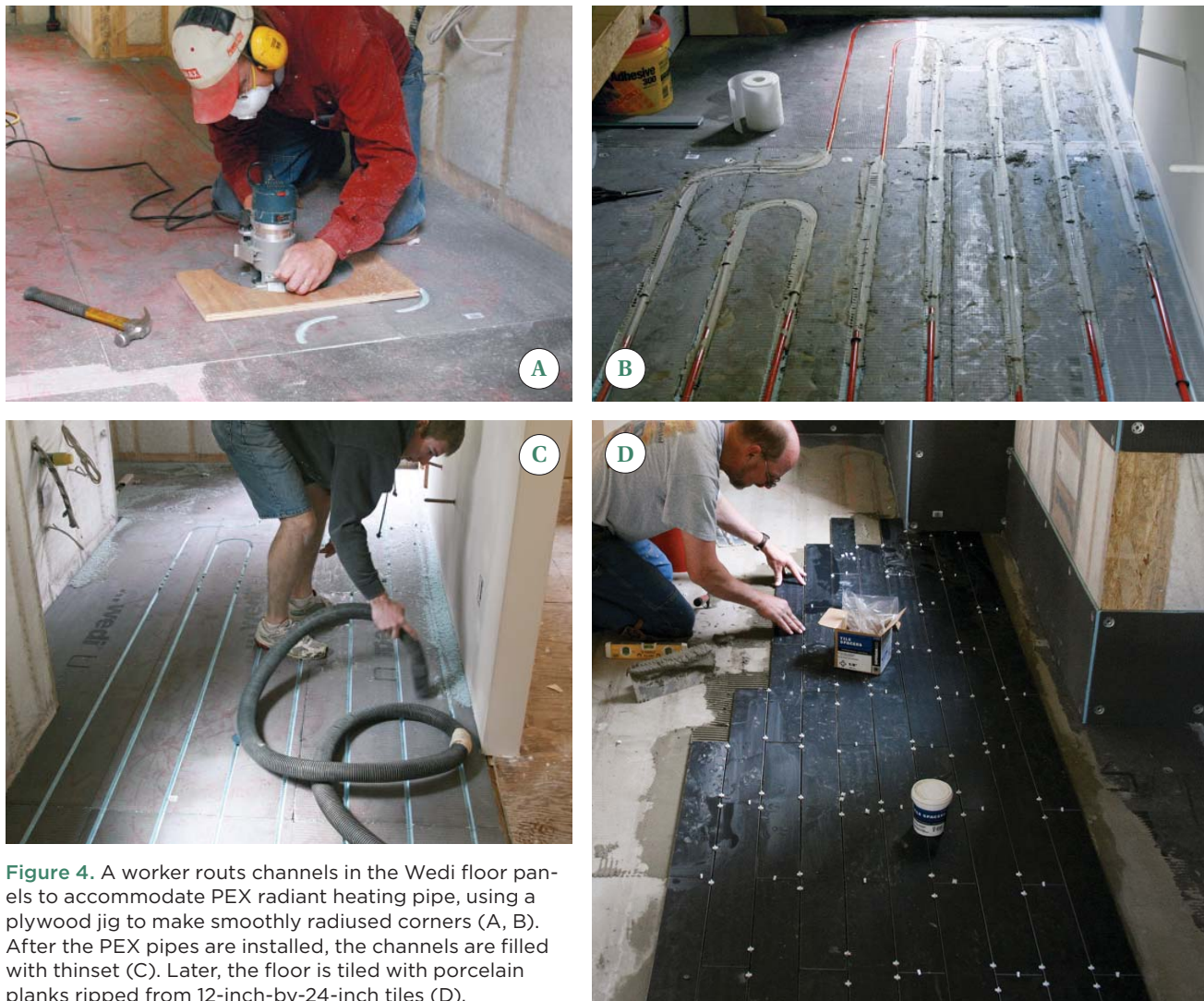


Figure 4. A worker routs channels in the Wedi floor panels to accommodate PEX radiant heating pipe, using a plywood jig to make smoothly radiused corners (A, B). After the PEX pipes are installed, the channels are filled with thinset (C). Later, the floor is tiled with porcelain planks ripped from 12-inch-by-24-inch tiles (D).



Figure 5. The half-inch-thick Wedi wall panels are installed with special washer-headed fasteners (left). To make the assembly watertight, joints are filled with Wedi's polyurethane sealant (above); for wet areas, the manufacturer also recommends fiberglass mesh tape bedded in thinset.



Figure 6. The stained maple vanity cabinet supports an 11-foot-long Kenyan marble countertop with a book-matched front edge (A). The drawers are equipped with LED lighting that turns on automatically when they're opened (B, C). Drivers for the low-voltage LEDs are mounted in the cabinet under the sink (D).

area — which specify at least R-21 walls — and to move the toilet's 4-inch-diameter waste pipe away from the foundation wall (Figure 2, page 41).

New Tile Backer

We've used Wedi building panels (877/933-9334, wedicorp.com) on several projects now, and they've become our tile backer of choice. They consist of a waterproof cement-coated fiberglass mesh facing over an extruded polystyrene core, which makes them very light — a 1/2-inch-thick 3-foot-by-5-foot panel weighs less than 10 pounds — with an R-value of about 4.3 per inch. They're sold in several sizes and in thicknesses ranging from 1/8 inch to 2 inches.

Curbless shower. We also used one of Wedi's prefabricated shower bases, the Fundo Riolito, which is designed to work with a matching linear drain system. There are no membranes or clamping ring drains — you just insert the gasketed drain assembly in the base, tighten it, then glue the 2 1/2-inch-thick base to the subfloor with modified thinset (Figure 3, page 41).

Floor. We used 2-inch-thick Wedi panels on the floor. These can be installed directly over 3/4-inch subflooring, but to raise the panels flush with the thicker shower base we added a layer of 1/2-inch plywood over the subfloor. The edge of the shower base has a shiplap profile, so we rabbeted the edges of the abutting panels to match and installed them with a generous bead of Wedi's elastomeric joint sealant in the rabbets. We then sealed the surface joints with another bead of sealant tooled with a putty knife.

After all the floor panels were installed, we had to make channels every 6 inches on-center for 1/2-inch radiant tubing (Figure 4). Following our Wedi rep's recommendations, we used a 1-inch-diameter router bit to cut the channels, tacking a straightedge to the floor to guide the router in the straight sections and a radiused plywood jig for the curves. Our heating subcontractor thought the channels were too small for effective heat transfer to the tile flooring, so we made a second pass to expand the slots, which were eventually filled with the PEX and thinset.

Walls. We completed the tile substrate by installing 1/2-inch-thick Wedi panels on the walls (Figure 5). These panels cut easily

Wall-Hung Cabinet Details

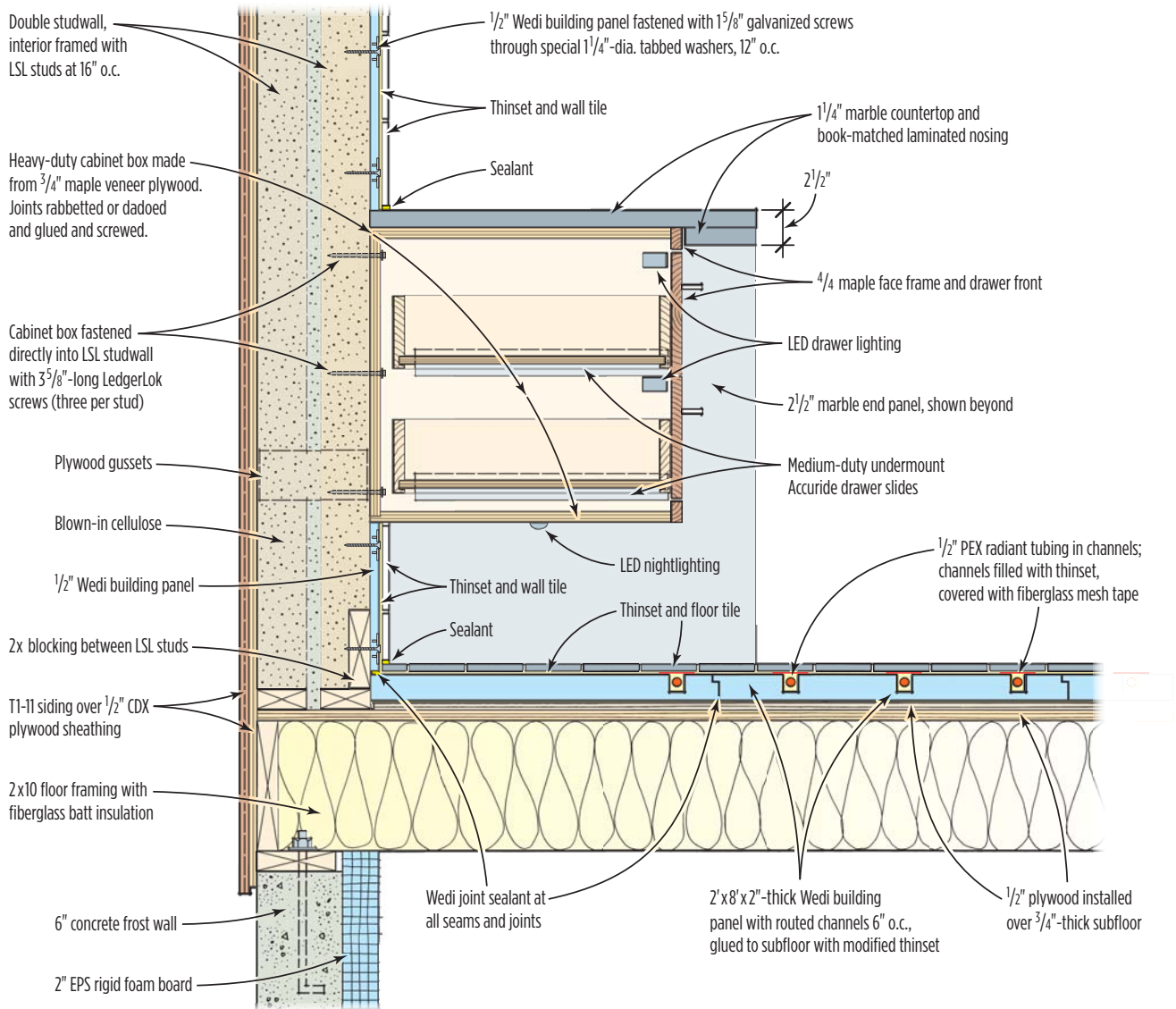


Figure 7. The beefy vanity cabinet was built as a single unit using $\frac{3}{4}$ -inch plywood throughout. It's fastened directly to the wall framing with structural screws. Interior partitions made of double layers of plywood add lateral support to the carcass.

with a utility knife and get fastened directly to the framing with washer-head fasteners about every 12 inches. A waterproof sealant is used at the butt joints between panels. In the wet shower area, we also taped the seams with fiberglass mesh tape bedded in thinset mortar, per the manufacturer's instructions.

Wall-Hung Cabinets

We have a fully equipped shop where we make all our own cabinets. When we know that they will be hung from the wall and will have to support a lot of weight, we build the carcasses like box beams. Even though the vanity in this bathroom was over 10 feet long, we assembled it in our shop as a single unit, using $\frac{3}{4}$ -inch plywood throughout. For additional strength, the interior partitions are double layers that fit into dados in the cabinet back. All of the joints are screwed and glued together (Figure 6, page 43).

We left the framing exposed where the cabinet would be mounted so that we could fasten it directly to the LSLs with $3\frac{5}{8}$ -inch-long LedgerLok screws (Figure 7). These fasteners have oversized washer heads and a lateral design value of 255 pounds in structural composite lumber. We used three fasteners per stud — plenty to support the 400-pound Kenyan marble countertop and heavy cabinet. We've used these construction details and screws in a number of similar installations in the past and have never had a problem with any of our cabinets coming loose or sagging.

The stained maple cabinet has a conversion varnish finish and is fitted with inset doors and drawers. We mounted the drawers on Accuride Eclipse 3132EC soft-closing undermount slides (562/903-0200, accuride.com), which are easily adjustable — a nice feature when working with inset drawers. When the drawers are open, the slides remain concealed, while the interiors are illuminated by automatically switched low-voltage LED lighting.

Mini Mechanical Room

The bathroom shower has multiple showerheads controlled by a remote Moen multi-outlet shower valve (Figure 8). To meet the added demand for hot water, we installed an additional 50-gallon water heater connected in series to the home's original hot-water

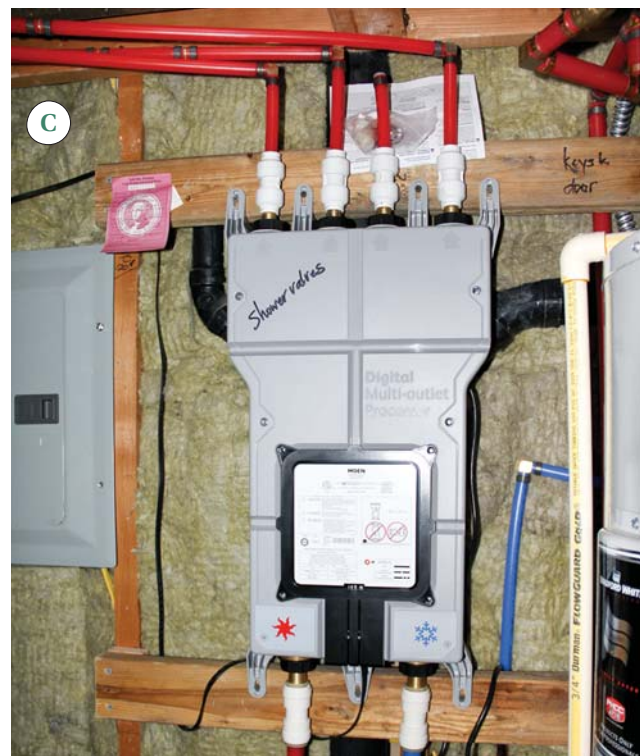


Figure 8. The multihead shower (A) is operated by hand-held remote control (B), so the user can turn it on without getting wet. Water is distributed to the showerheads via a digitally controlled shower valve in the basement (C).

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Figure 9. The author converted a basement closet into a small mechanical room with insulated walls and a secondary solid-core door to block noise (A). A new floor framed over the existing slab provides room for drain pipes and a trap primer (B). The subfloor was lined with a galvanized pan fitted with a drain (C). The closet contains a 50-gallon hot-water tank, a small electric boiler for the bathroom's hydronic heating system (D), and the remote shower valve.

tank. Since the bathroom is heated hydronically, while the rest of the house is heated with a furnace, we also installed a small Electro EMB-2 2.5 kw electric boiler (800/922-4138, electromn.com). We found room for the new mechanical equipment in a spare bedroom closet located in the basement (**Figure 9**).

To block noise, we insulated the walls of the new mechanical room with rock wool and hung a separate solid-core door behind the closet's original louvered bifold door. Inside the closet, we framed a new floor over the existing slab to create clearance for a drain system. We fabricated a galvanized pan for the new floor, equipped the pan with a drain and a trap primer, and tied the floor drain into the existing plumbing. In the event of a leak, water can drain harmlessly out of the closet, but there's also a

floor-mounted water sensor that will sound an alarm to alert the homeowners to a problem.

Cost

The total cost for the 110-square-foot project was about \$120,000, which includes all the new mechanicals for the master bath and the labor and materials to convert the basement closet into a mechanical room. It also includes new flooring in the master bedroom. Hydronic radiant heat accounted for about \$10,000 of the budget.

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