The author installed contrasting floor and wall tile, grab bars, and a skylight above to make this tub area pleasing and functional.

Installing Jetted Tubs

A step-by-step guide from rough-in to tile

by Gene Fleisch

Jetted tubs are a popular item in bathroom remodels, and often the most costly. Along with the high price tag comes high client expectations. If the tub installation is not what my customer had in mind, I probably won't get any referrals from the job — despite an otherwise perfect bath remodel.

A jetted tub, often referred to by the brand name "Jacuzzi," is a bathtub that massages the user with water circulated through a pumped system. Unlike spas or hot tubs, jetted tubs are emptied after every use, so they don't need a filtration system. I've installed dozens of jetted tubs in the past 12 years and, over that time, have developed an installation approach that satisfies even the fussiest clients.

In-House Design/Build

We work only from our own designs, and unlike most companies, we use virtually no subcontractors. This gives me full control over the project from the first meeting with the homeowners. Also, I know that my two workers and I will be the only ones who step into the tub during construction. If you have plumbers, electricians, painters, and other subs all stepping into the tub, you'll undoubtedly find damage, even to the most well-protected tub.

Doing in-house design also helps me educate the customer about the realistic cost of a project before the final plans are drawn. A jetted tub with enclosure typically costs over $5,000. In addition, the home often needs a second water heater near the new jetted tub. The cost of the new heater and creating space for it is significant, but an outside designer may overlook it.

I can also figure out the best way to position a tub to allow clear access to the motor and pump for maintenance, and not have a hatch in an unsightly place.

Once we have a rough plan and budget, I go with my clients to a reputable bath showroom. I offer advice about materials, accessibility, noise, heaters, and other options, but leave to them the final decision of which tub to buy. I've worked with acrylic tubs from Jacuzzi, Pearl, Kohler, and several other reputable companies and have had no problems with the materials or pumping equipment (see list of manufacturers, page 43). Once my

Figure 1. *Most customers choose a raised surround, which is safer than a sunken tub, particularly for children. The glass block window, at right in photo, provides privacy and easy maintenance.*

clients have selected a tub, I sit down with them to resolve several key issues before drawing the final plans.

Tub accessibility. What good is a large jetted tub if it's difficult to get into or out of? Usually I install the tubs so they are raised a couple of feet off the floor, but I've also installed them level with the floor, creating a sunken look. Most clients are more comfortable with raised tubs. Also, these are safer in homes with small children (see Figure 1). I strongly recommend installing grab bars where possible to help with moving into and out of the tub and to prevent slips.

If the tub is also used as a shower, it's important to discuss enclosure options. On many units I install a single swinging door, rather than the more common sliders (Figure 2). A swinging door at the shower end of the unit makes it easy to bathe children. And with the door swung open, soaking in the tub is a much less claustrophobic experience. I typically use a door made by Majestic Shower Company (1795 Yosemite Ave., San Francisco, CA 94124; 800/992-9342).

Tub size and color. Clients generally prefer large tubs that comfortably hold two people. It is important to let them know, however, that larger tubs can cramp a bathroom's floor plan, not to mention that it can take forever to fill. I almost always recommend a white or beige unit, because the soap and mineral buildup isn't as obvious as with darker colors. Colored models need to be wiped down almost daily.

Noise. All jetted tubs make noise, both during filling and when the pump is running to circulate water. Most tubs I install are acrylic, which tends to magnify the sound. The installer can take steps to minimize this, which I'll discuss below, but the noise is often noticeable in adjoining rooms and in the room below. It's best to let your clients know about this in advance.

Windows and skylights. When designing a bath remodel, I pay careful attention to creating a feeling of openness around the tub. If the tub goes against a wall, a window helps with this. I recommend glass block because it is practical and attractive. Patterned glass block offers privacy and blends in nicely with the geometric pattern of the ceramic tile. Also, it is a lot easier to clean than the sliding metal windows commonly used here, and is less vulnerable to decay than wood windows.

Skylights also help create an open feeling and give bathers something more appealing than a blank ceiling to look up at. An operable skylight also offers quick natural ventilation for steam.

Trims and accents. People soaking in a jetted tub have plenty of time to examine details. Every hour my clients spend in the tub is an opportunity for me to show off my design skills and craftsmanship. Whenever possible, I budget for extra attention to trim and finish details.

Framing and Rough-In

Installing a jetted tub is not much different from putting in an ordinary tub. But because they are typically deeper and heavier, and have electrical hookups, jetted tubs do have a few special requirements.

Floor support. Following demolition, I check out the floor framing where the tub is going to sit. With up to 400 pounds of water (50 gallons) plus two people in a jetted tub, I have to be sure the floor can handle over 800 pounds of weight distributed over a small area. For a typical installation, this works out to a load of about 60 pounds per square foot.

As a quick-and-dirty test, I jump up and down on a floor to see if it has a lot of deflection. If so, I add solid blocking or beef up the joists by sistering on 2xs. Sometimes, the floor joists have been notched for the

Figure 2. *For tub/shower combinations, the author prefers Majestic's single swinging door to sliders. The swinging door provides better access and feels less claustrophobic to bathers.*

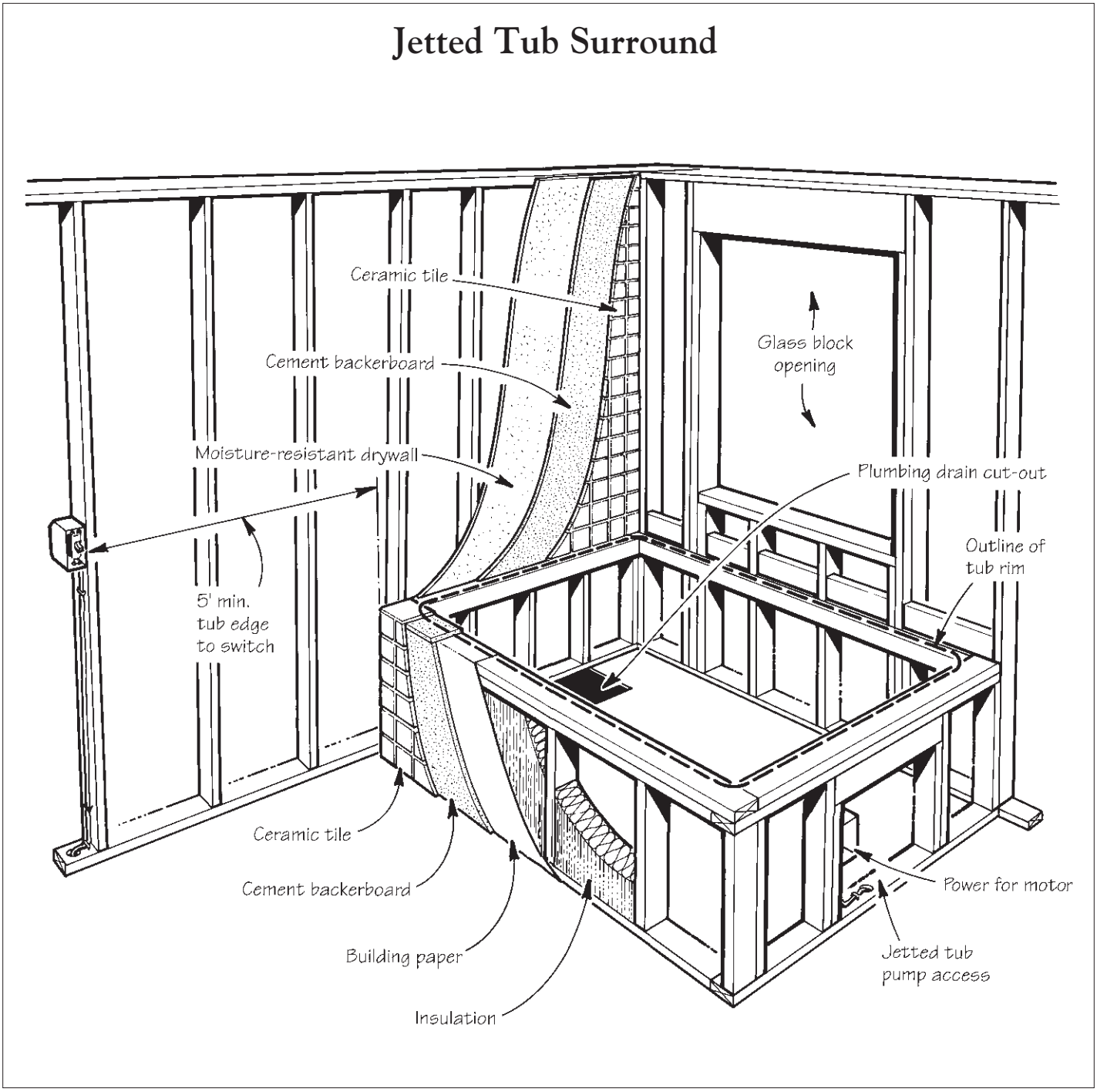

Figure 3. *A typical tile tub surround, by the author, has sturdy 2x4 framing and is insulated to reduce heat loss and noise. Make sure you leave a convenient access panel for maintenance and repair of the pump system. Also, keep electrical switches at least 5 feet from the tub.*

drainage of an existing tub. In that case, I strengthen the cut joists by sistering on solid lumber. If the structure is too flimsy, or is seriously compromised by notching, you should get an engineer's opinion.

The floor should be close to level. If it's not, you'll need to adjust the framing of the surround so that the tub sits level.

Plumbing rough-in. New plumbing should be routed to the approximate drain location of the jetted tub. I prefer cast-iron drainage to ABS because it is quieter. Even with cast iron, I let the client know that the tub is noisy when it drains. Leave an opening in the subfloor large enough to have good access for installing the drain, but not so large as to reduce the support under the belly of the tub.

We often need to add a large water heater near the jetted tub. Since the average tub holds about 45 gallons when filled, I recommend a 50-gallon water heater as a minimum size. I also plumb both the hot and cold water supply lines with 3/4-inch copper. Half-inch supplies don't provide the rate of flow needed to fill a tub quickly. I make sure the copper pipe is secured to the framing with plastic clips, which help to reduce noise.

Jetted tubs have several options for mounting the faucet on the wall or deck. I'm careful to not rush my clients about where to locate the controls, the shower head, or the tub spout. I encourage them to get in the

Shopping for a Tub by Tom Harrison

Choosing a jetted tub is far more complicated than choosing a standard bathtub. There are at a dozen manufacturers offering different sizes and shapes of tubs composed of various materials and with numerous options. A visit to a tub showroom can be a bewildering experience for a contractor, not to mention the client.

Here are the factors to consider when making your selection.

Acrylic tubs. The contractor wants a tub that can be cleaned up to look like new at the end of the job. The client wants a tub that will be easy to maintain years after the installation. For both of these purposes, I believe acrylic is the best choice.

An acrylic tub is actually an 1/8-inch-thick acrylic sheet which is heated and molded to the shape of a tub, then laminated to a fiberglass structure. Because the acrylic is 1/8 inch thick, even deep scratches can be sanded out with 400 or 600 grit sandpaper, then buffed with baking soda. This can easily be done by the contractor or homeowner, saving the expense of a tub repair specialist.

Gel-coated tubs. It's important not to confuse acrylic tubs with gel-coat tubs. A gel-coat finish is an acrylic-resin combination that is sprayed onto the fiberglass structure. The sprayed finish is just 125 mils thick. The thin finish produces a more economical tub, but scratches are difficult to remove. Also, the gel-coat finish is far more porous than the acrylic type, making it nearly impossible to keep stain free. For example, a watercolor marker applied to this finish can never be completely removed.

Gel-coat finishes nearly killed the jetted tub industry a decade ago, as homeowners complained that their tubs were deteriorating in appearance soon after they were installed. Even a gel-coat tub straight out of the package will have a "wavy" finish because of the sprayed-on manufacturing process.

With few exceptions, both contractors and clients should steer away from this material. One important exception is with extra-deep tubs (approaching 3 feet), where the acrylic sheet finish will not work. Here, a gel-coat tub may be the only choice. Also be aware of manufacturers' efforts to hide the bad name of "gel-coat" by using more technical language.

Cultured marble tubs. Cultured marble has a history of being temperature sensitive. If you've seen cultured marble sinks with "crazing" and discoloration around the drain, you've seen what can happen to a cultured marble tub. The damage occurs when very hot water hits the bottom of the tub, which is a lot cooler on the outside surface. The temperature differential produces hairline cracks, which fill with dirt or mineral deposits, resulting in an ugly finish. One tub manufacturer combats this problem by insulating the outside of the tub, but I'm not yet convinced that this works.

Other tubs. Cast iron tubs with a porcelain finish are offered in a limited selection by a few manufacturers. These are high quality products, but the larger tubs are very heavy. Also, scratches and chips almost always need to be dealt with by a specialist.

Tub material, jet location, and pump placement are key considerations when selecting a jetted tub.

Self-leveling tubs. Don't believe it. When a manufacturer mentions their tub is "self leveling," all it means is that some kind of level base is adhered to the bottom of the tub. The base is usually plywood, with foam filling the gaps. While this is more substantial than the typical plastic pan, the floor must still be level under the tub for this installation to work. Also, in some cases, the base isn't perfectly parallel to the rim of the tub. I recommend these "self-leveling" tubs be installed like other tubs — with about a half dozen pyramids of wet mortar underneath the tub belly. And don't get in the tub or fill it with water until the mortar has dried.

Quiet tubs. If noise is a big concern, look for tubs that have flexible hoses leading to and from the pump. This helps dampen vibration between the pump and the tub. Also, I often recommend removing the bolts that connect the pump to the plastic pan under the tub. This allows the pump to freely vibrate on the surface of the pan instead of shaking the whole pan with it.

A word on jets. Jets, whether installed by the manufacturer or by a tub retailer, should not allow standing water between uses. In California, tub retailers that do their own custom jetting are required to use IAPMO-labeled jets and be on the approved installer list of Underwriters Laboratory or another testing authority. Building inspectors in our area are trained to check these credentials. Check to see if tub retailers in your area follow similar guidelines.

Choosing jet locations in a tub requires clients to decide whether they want a jetted massage experience or a swirling pool. The former requires jets

located near areas on the body that the client wants massaged, like the lower or upper back, hips, or legs. If the client just wants a swirling pool of water that lightly massages the surface of the body, then the jets should be high and to the sides. In either case, it's best if the customer can get in a tub and try it out before buying.

I like tubs with recessed back jets. With the jet recessed, the user's back can rest directly against the tub without an annoying protrusion.

Pump location. When ordering the tub, there is one option that the contractor will be very interested in: pump location. Most tubs come with the pump opposite the fill and drain end of the the tub, tucked into the area created by the sloped backrest. Some manufacturers will allow you to request one of the corners for pump location, while other manufacturers just center the pump unit. Plan the pump location for clear access for maintenance and repair.

If the access door needs to be on an exterior wall, preprimed metal-hinged doors, some of which are designed to receive stucco on the surface, are a good solution. These doors come in a variety of sizes and are more durable than a site-built wood door. One supplier I've used is Karp (5454 43rd St., Maspeth, NY 11378; 800/888-4212).

Tub accessories. According to budget and preference, there are many options available to the client. About half of the tubs I sell have heaters to help maintain the temperature of the water during a long bath. Jets that can be turned on and off individually are becoming more popular. Built-in grab bars are important to consider, but clients may not know they need one until they stand up after soaking in hot water for nearly an hour. Cushions and arm rests are also popular items to add to a tub.

Finally, before picking up the tub and taking it to the job site, make sure that it has been water tested. It's better to find a problem in the warehouse than after the tub has been installed. ■

Tom Harrison has sold jetted tubs for 15 years. He owns Tubz in Fremont, Calif.

CAROLYN BATES

Figure 4. *After lifting the tub into place to test the fit, the author lifts it out again to lay wet mortar under the base.*

tub and imagine taking a shower or bath, and always emphasize ease of use over aesthetics. After the tile goes on, changes are expensive.

Tub walls. A jetted tub needs short walls framed under the rim wherever it's not against a wall (Figure 3, page 39). I build this support structure out of 2x4s and size it to hold the bottom of the tub about 1 1/2 inches above the subfloor. This leaves room for a mortar base (explained below). In designs that have an extended deck, I put a plywood top on the platform.

When building the platform, make sure you plan for good access to the pump. I've hidden access doors in vanity cabinets and back walls of closets. Where a hatch needs to be in plain view in a bathroom, I've installed cabinet doors that match the style and finish of the vanity doors.

Where the tub abuts a wall, I prefer to install it directly against the wall framing with the lip resting on a ledger. This allows the tile to come down over the rim of the tub, and eliminates a cavity where soap and water can collect.

After we finish framing the tub support walls, we insulate around the pump and tub with fiberglass batts to cut down the noise. The insulation also helps keep the tub water warm. At the framing stage, you should also install 2x8 or 2x10 blocking wherever you might want to install a grab bar.

Setting the Tub

At least two, and sometimes three, workers are needed to set the tub, which can weigh up to 200 pounds and can be very awkward to handle. With the framing complete, I wrap the adjacent walls and short walls of the tub with building paper, and — if there's a plywood top — cut a hole for the tub to rest in. We then muscle the tub into place and make sure it fits (Figure 4).

Mortar base. Next I mix about a cubic foot of mortar, keeping it thick, and mound it on a piece of building paper underneath the belly of the tub but away from the drain. We then lift the tub back into position, working it into the mortar until the rim sits flush with the deck.

Although manufacturers' installation instructions are not clear on this point, I feel the mortar is essential for a solid base. Some tubs have fittings on the bottom to receive wood shims, and others have an inverted plastic pan on the bottom that screws to the subfloor for support. I use the mortar with these as well for the added stiffness it provides.

Flashing. At least one major tub manufacturer includes a plastic "J" flashing to provide waterproofing around the perimeter of the tub rim. While this seems like a good idea in theory, we haven't found a way to bend the flashing neatly around the tub corners unless the flashing is

Waterproofing Details

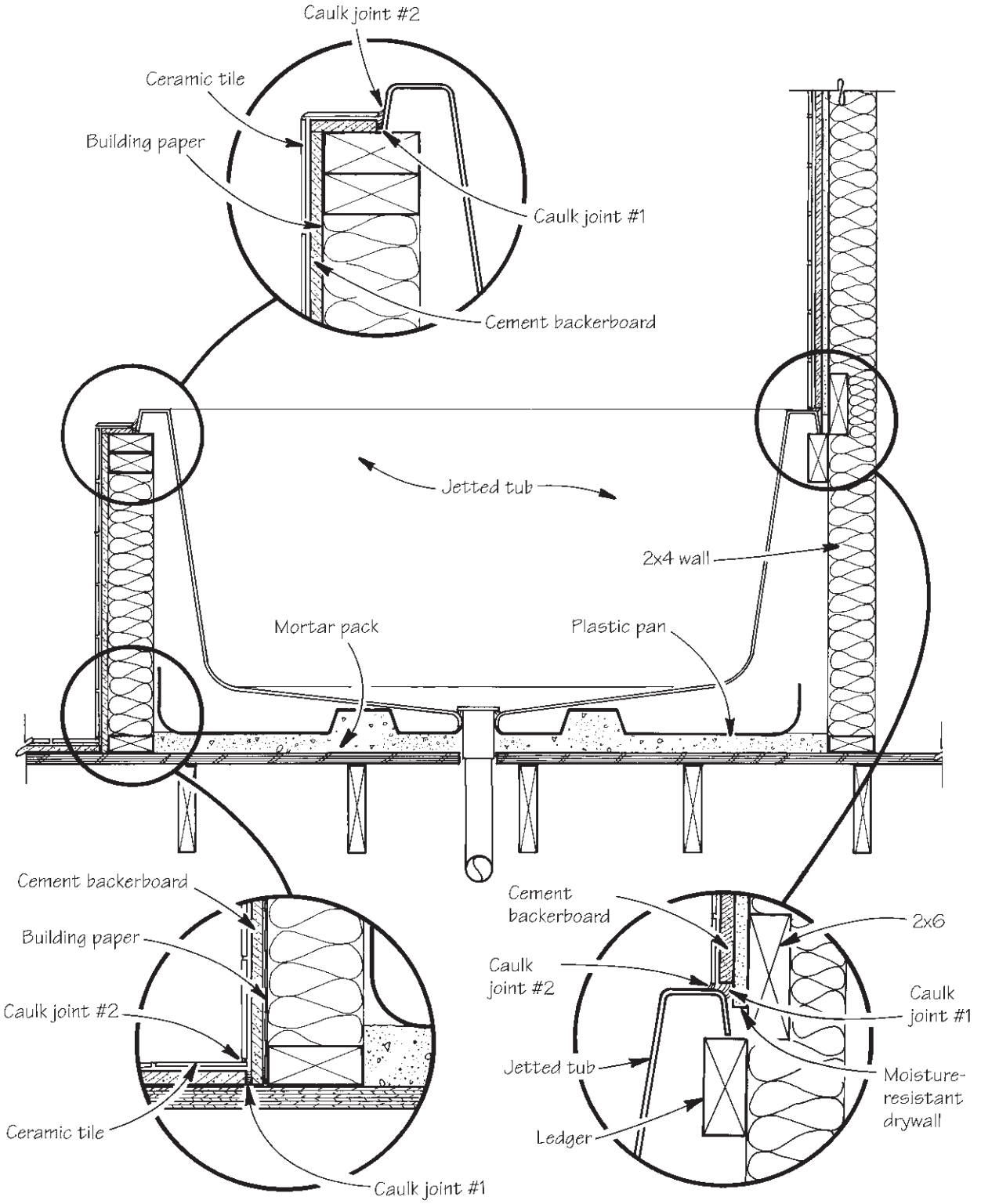

Figure 5. *For a long-lasting watertight seal at the tub lip, the author makes a double caulk joint — backerboard to tub and tile to tub — using 50-year silicone sealant. At the wall, the tub generally goes directly against the framing so there's no space for soap and water to collect. Wet mortar packed under the base of the tub provides rigidity.*

scored with a knife, which undermines its purpose — to keep water from leaking onto the deck. I discard the flashing and seal the unit as described below. Other builders I've spoken with do the same.

Plumbing connections. You should never seal the drain flange with standard plumber's putty because it's not compatible with acrylic tubs. Acrylic tub instructions recommend the use of silicone sealants, which can be matched to the color of the tub. A word of warning, however: When threading on a brass drain, make sure you select a sealant that does not react with brass. I generally use Dap 50-year silicone.

After the tub is in place, the drain overflow assembly can be installed. I prefer the air-activated pop-ups over the manual type. The manual types are clumsy to adjust and noisy, while the air-activated ones are easy to adjust and operate smoothly.

Wiring. A jetted tub may require up to a 30-amp dedicated circuit if it has a heater, as about half of the ones I install do. Besides being GFCI-protected, the motor and pump unit are required in our area to be bound together by a #8 ground wire. Also, when wiring switches around the tub, I make sure to keep them 5 feet away from the rim of the tub, as required by code in my area.

I also install a high-volume bath fan near the jetted tub to help ventilate the room. I've had good luck with the Nutone QT Series fan, which is rated at 110 cfm.

Finishing Touches

Now that the tub is plumbed and wired, I check on the operation of the controls, make sure there aren't any leaks, and test the jets. After everything checks out, it's important to protect the tub. I use cardboard, often provided with the tub packaging, and cover it with a thick canvas cloth taped securely to the tub. We use the blue 3M painter's tape because it doesn't leave a hard-to-clean gummy residue when it comes off.

Tile work. I do a lot of thinset granite and tile work and often set accent strips of contrasting color tile around the tub. Another nice touch we add to many jobs is a recessed niche for soap or shampoo. Both items take more tile cutting, but help my jobs stand out among the competition.

Creating a lasting watertight seal around the rim of a jetted tub is a big concern. Because of flexing caused by the constant filling and emptying of the tub, plus the vibration of the pump, it's important that the seal around the tub rim be flexible.

To accomplish this, I make a double seal at the rim: Using Dap 50-year silicone, I caulk my cement board underlayment directly to the tub around the entire perimeter, and I caulk, rather than grout, the joint between the tile and tub rim (Figure 5). I make a similar seal where the short tub walls meet the floor, because water tends to collect in this joint. I also caulk around all penetrations in the tile wall where water might seep in, including where grab bars screw into blocking.

Trim and wall finishes. I'm a firm believer in oil-base enamels, because they look better and are more durable in the harsh moisture conditions surrounding a jetted tub. All wood trim and drywall surfaces get an oil-base primer and oil-base topcoat. After they are primed, I sand the walls with a #120 sanding screen to improve the bonding between coats and make a smooth topcoat. (The sanding screen doesn't gum up like sandpaper.)

I also caulk all joints between wood trim and the wall with a flexible sealant to prevent moisture from seeping in.

Tub finishes. After the tile is complete, the escutcheon plates, handles, and shower head go on. It's best to keep the tub protection in place for these and other finishing touches, because dropping parts or tools is inevitable. After the protection comes off, the tub will need to be cleaned to remove dirt, adhesives, and grout. Use a nonabrasive cleanser that meets the tub manufacturer's specifications, such as the household cleaners 409 or Fantastic. When the job is done, and for years after, your customers will appreciate the attention to detail you've given to both aesthetics and function. ■

Gene Fleisch is a remodeling contractor in Atherton, Calif.

Jetted Tub Makers

American Standard Inc.
U.S. Plumbing Products
P.O. Box 6820
Piscataway, NJ 08855
800/524-9797, ext. 100

Aquatic Industries
P.O. Box 889
Leander, TX 78641
512/259-2255

Caldera Spas & Baths
1080 W. Bradley Ave.
El Cajon, CA 92020
800/669-1881

HessCo Industries
160 E. Foundation
La Habra, CA 90631
800/854-3465

Hydro Swirl
2150 Division St.
Bellingham, WA 98226
206/734-0616

Hydro Systems
50 Moreland Rd.
Simi Valley, CA 93065
800/747-9990

Jacuzzi Whirlpool Bath
2121 N. California Blvd.
Walnut Creek, CA 94596
800/678-6889

Jason Intl.
8328 MacArthur Dr.
N. Little Rock, AR 72118
800/255-5766

Kohler Co.
444 Highland Dr.
Consumer Affairs Dept.
Kohler, WI 53044
414/457-4441

Pearl Baths Inc.
9224 73rd Ave.
Minneapolis, MN 55428
800/328-2531

Sunset Plastics
6270 Parallel Rd.
Anderson, CA 96007
916/365-5494

Swirl-Way Plumbing Group
1505 Industrial Dr.
Henderson, TX 75653
800/999-1459