

Having the right or wrong rough-in dimensions on a bathroom or kitchen remodel can make or break a job. Chipping out tile, hacking out drywall, butchering a cabinet, or yanking on Romex are sometimes the only ways to correct poorly located rough-ins.

Unfortunately, a bad rough-in usually remains undiscovered until near the end of the job, when the painter is finished and the tiler has collected his check. That's when the plumber finds out that the shower wall mortar was floated too thick and it's impossible to get the fixture knobs on. A tightly planned, two-week bathroom remodel can suddenly expand to a three- or four-week job — not good news to a client who has been living with one less bathroom.

Key Characters

There are several key elements that contribute to a successful kitchen or bath rough-in.

Lead carpenter. Invariably, a general contractor will take on full responsibility, but won't always have time to meet with the subs on the job. So information ends up getting passed through one or more workers. The result is usually a disaster. To avoid problems, assign one worker who has a well-rounded knowledge of all aspects of construction to the task of overseeing the layout and making sure subcontractors accurately place the rough-ins. Spreading this responsibility over more than one person multiplies the potential for errors, and adds a lot of unnecessary communication.

Good plans. A detailed set of plans is essential to locating dimensions. If good plans don't exist, I draw them myself. If a drawing differs from the site dimensions by more than 1/2 inch, I get out a notebook and redraw the plan accurately, or make note of it on the plans. I've seen a fraction-of-an-inch error in a plan cause a door casing to be scalped around a countertop overhang or a switch plate to be cut down to fit

next to a cabinet. This is not a pretty sight.

Spec sheets on site. Whenever possible, have the appliances and fixtures on site. At a minimum, have the manufacturers' specification sheets available for all appliances that must be built in. It's helpful with whirlpool baths, sinks, mixing valves, cooktops, and range hoods to have the fixture itself on site before rough-in begins.

Good client communication. Some rough-in locations are fixed according to the appliance or fixture requirements — a range, for example. No need for client input there. But the height of a shower head is usually of interest to the user. Asking your clients' opinions will make them happier with the job, even if you end up telling them how high you think the shower head should

go, or how high *everyone else* plumbs their shower head.

I've discovered that clients often have high expectations for under-sink storage. Unfortunately, under a three-basin sink with P-trap, garbage disposal, and instant water heater, the homeowners are lucky if they can get even a small wastebasket on the cabinet door. Make sure clients understand that the more appliances they have, the less storage space there will be.

Good subcontractor communication. I try to get all the subs together for one meeting before the job starts. It's helpful to have a contractor who does both heating and plumbing, since it isn't uncommon to have a DWV line conflict with a vent duct. Having the electrician there at the same time is helpful, just in case one of those ducts interferes with a

recessed can light. Though hashing through these details with so many subcontractors at the same time is chaotic, it's the best way to troubleshoot problems and come up with economical solutions.

Don't be shy about making things crystal clear to a sub. Post-it notes, ink markers, and spray paint are all helpful in directing subs.

Make a checklist. Once the demolition is done, a lead carpenter must visualize what the finished room is going to look like, even when the walls are nothing but open studs. To make this easier, I make a checklist of key rough-in dimensions. Making the checklist is a helpful way to consider each appliance location beforehand (before it's too late). Referring to the list during the course of the job ensures that I won't have to call subs back once they've been there.

Bathroom Rough-In

Here is a list of typical bath rough-ins, and some important considerations for each one.

Toilet. Most toilets have standard rough-in dimensions (see Figure 1). Nearly all require the flange to be centered a minimum of 12 inches from the finished wall surface. With a typical drywall interior, I center the flange 13 inches from the framing, giving me 1/2 inch for drywall and 1/2 inch additional clearance. One plumber told me this additional clearance is essential for accommodating the inconsistencies in porcelain castings. If there is to be tile with a mortar bed on the wall around the toilet, another 3/4 inch is needed.

Code requires a minimum of 15 inches of space on either side of the toilet, and 24 inches in front. I've found that additional space on the sides is helpful on at least one side for a wastebasket and toilet paper holder. I used to put the toilet paper holder on the back wall if the toilet rough-in had minimum side clearance, until an occupational therapist alerted me to the risk of back injury that occurs when twisting 180



ROUGHING-IN FOR Kitchens & Baths

A SUCCESSFUL ROUGH-IN STARTS WITH A GOOD LEAD CARPENTER, DETAILED PLANS, AND APPLIANCE SPEC SHEETS ON SITE

BY JIM HART

degrees to reach for the toilet paper.

With a linoleum floor, I usually rest the toilet flange directly on the subfloor. If the floor has tile on a mortar bed, I build up the flange $\frac{1}{2}$ to $\frac{3}{4}$ inch with a plywood ring so that the flange isn't recessed too far below the finished floor. Otherwise you need two wax rings, which creates a risky seal. However, installing the flange too low is better than placing it too high.

If the cold water supply comes through the wall, it must be below the tank and above the baseboard, but not so close that the escutcheon is hanging half on the baseboard and half on the wall. I aim for the pipe to be 6 inches to the left of the toilet's center, and at least 5 inches above the subfloor. When it comes through the floor, place it 6 inches from the toilet's center and 2 inches from the wall.

Bathtub with shower. I don't attempt to precisely locate a 2-inch drain until after the bathtub is installed. But I do need a rough idea of the drain location when framing the floor. I usually cut a 12x12-inch cutout in the subfloor to give the plumber room to install the P-trap and the drain overflow, and this cutout must fall between joists. Because tubs are usually 32 inches wide, I often have to deviate from a standard joist layout if the joists run parallel to the tub.

For shower controls, I frame a standard 16-inch stud bay, centered on the width of the tub (Figure 2). I also install a piece of $\frac{3}{4}$ -inch plywood between the studs in this bay as a base for the faucet body. Plywood won't crack as easily as a 2x block with the many screws used to fasten the faucet body.

As I mentioned earlier, I leave the decision of where to locate the faucet body and shower head to the client. Before soldering in the faucet body, put all the escutcheons and handles on, and make sure the handles don't hit each other. I've discovered that the more expensive shower fixtures tend to be larger and require more space than economy models.

Deciding the depth at which to place the faucet body (and the plywood block) is largely determined by the thickness of the faucet body itself and the thickness of the wall surface. Most drain bodies give you at least $\frac{3}{4}$ inch to play with in relation to the faucet. Many manufacturers have faucet extensions available, too, but don't depend on it. Grohe's (241 Covington Dr., Bloomington, IL 60108; 708/582-7711) newer faucets, which I install frequently, have an incredibly large range — close to 3 inches — that allows me to place the faucet just about anywhere within a wall, and not have problems getting the finishes on.

Sink. For a pedestal sink, the $1\frac{1}{2}$ -inch drain must be centered exactly.

For a vanity cabinet rough-in, jogging the P-trap over 2 to 4 inches to one side of center is desirable (Figure 3, next page).

To quickly and accurately space the hot and cold supply lines the required 8 inches apart, I use copper straps with $\frac{1}{2}$ - and $\frac{3}{4}$ -inch holes at regular intervals. The copper pipes are then soldered to the strap for support.

Fans. I've rarely moved a ceiling joist to make room for a bath fan, unless it's a light/fan combination and the homeowner wants to center it in the room. I usually rough-in the bath fan near the bathtub/shower, but not inside. Make sure you position the fan with the louvers facing away from the bathroom entry, so that people can't see into the mechanical part of the fan when they come in the door.

Vanity lights. Symmetry is critical with vanity lights. In order to rough-in the electrical box, you often need to know the mirror or medicine chest height. I've often reframed a wall and even moved plumbing to make room for a recessed medicine chest. Strip vanity lights are nice because they usually allow you to rough-in the electrical box anywhere along the length of the fixture, as long as the height is accurate.

Outlets. Homeowners usually want outlets along the longest stretch of cabinet. Through-the-backsplash outlets require careful consideration of cabinet, substrate, tile, and backsplash dimensions. Set the outlet boxes far enough out to accommodate the thickness of the backsplash.

Outlet boxes need to be at least $\frac{3}{4}$ inch above the backsplash so the plate doesn't hit the backsplash. If the wall above the vanity is tiled, I try to vertically center the outlet in a tile course. I usually don't worry about the horizontal placement of the outlet in relation to the tiles unless it's a high-end job. Then I'll either center outlets and switches in both dimensions of the tile or center them in the corner of four tiles. But this means you have to know the exact countertop placement, the tile dimensions, and the grout line width when the boxes are placed. If these aren't available (and they rarely are at the framing stage), I may let a wire run wild and cut in my boxes just before setting the tile.

Heating ducts. Whenever possible, I try to rough-in the heat through the kick of the vanity cabinet. Most homeowners don't like the look of a register on the wall or floor of a kitchen or bath. Standard 3x10 duct works best in a kick space, but getting a custom sheet metal boot to make the right angle is often difficult. In my area, it is permissible to seal the kick cavity with caulk to make a wood plenum. Then I cut a simple $2\frac{1}{2}$ x14-inch rectangle out of the cabinet base for the register.

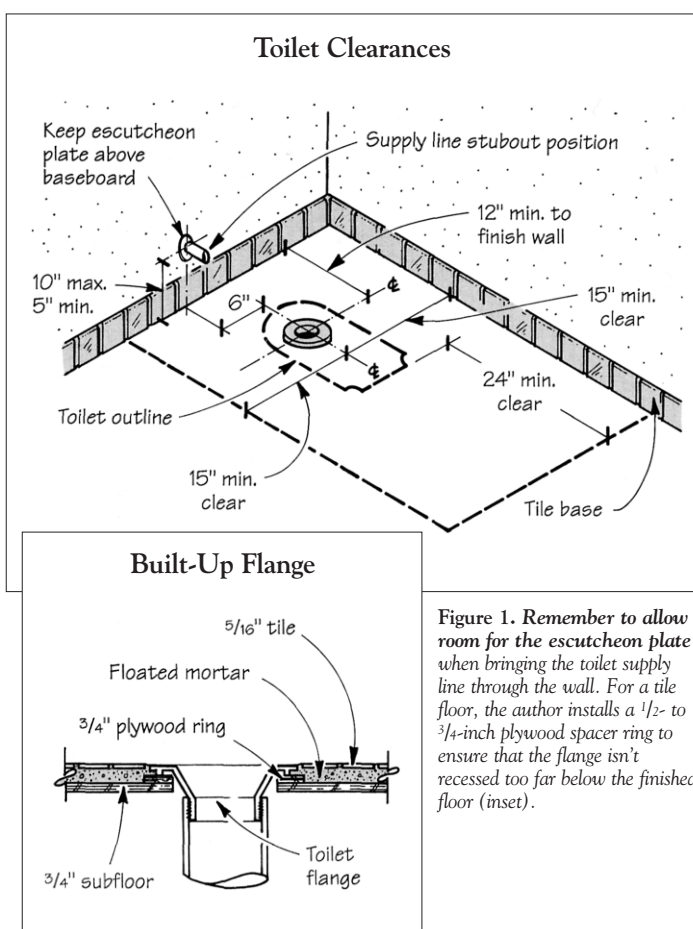


Figure 1. Remember to allow room for the escutcheon plate when bringing the toilet supply line through the wall. For a tile floor, the author installs a $\frac{1}{2}$ - to $\frac{3}{4}$ -inch plywood spacer ring to ensure that the flange isn't recessed too far below the finished floor (inset).

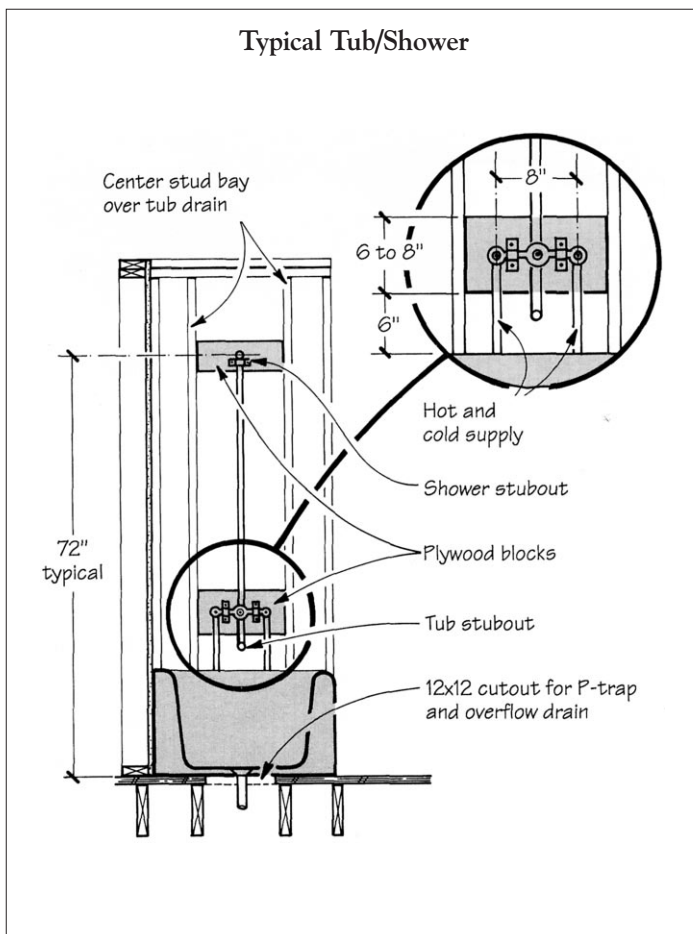


Figure 2. Though most plumbers place the shower head and controls at standard heights, the author always consults with clients on this since many have individual height preferences.

Vanity Rough-In

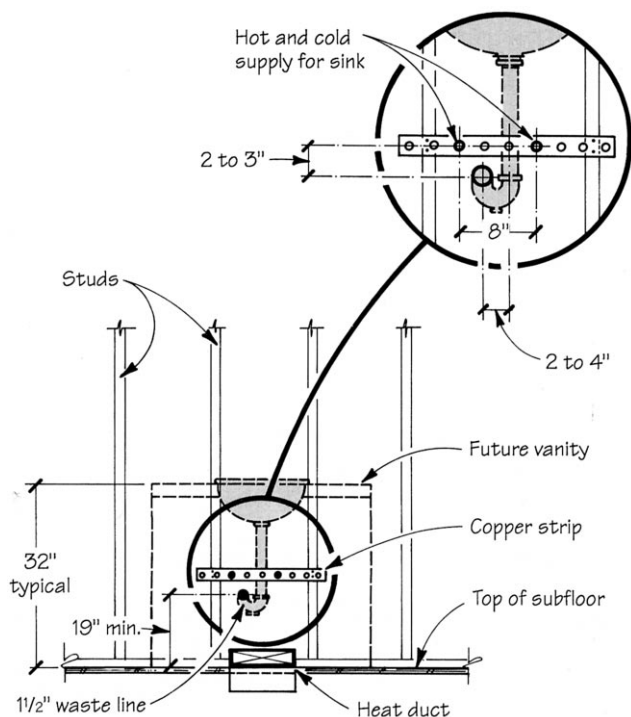


Figure 3. Place the vanity sink drain 2 to 4 inches off center to allow room for the trap. Use copper strap to secure the hot and cold supply lines.

Kitchen Sink Dimensions

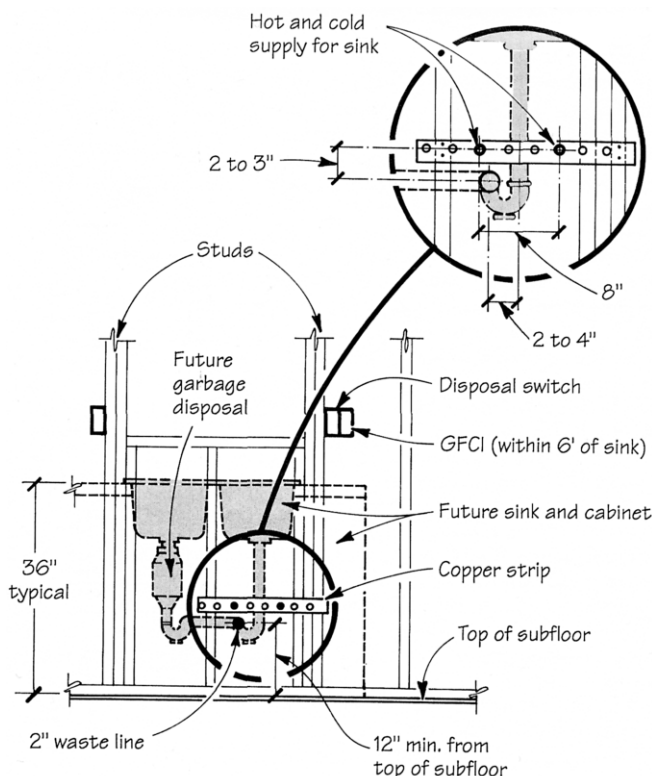


Figure 4. For a double-basin sink with disposal unit, place the waste pipe 2 to 4 inches off center from the sink drain that doesn't feed into the disposal.

Kitchen Rough-In

Kitchens require fewer plumbing rough-ins than bathrooms, but have more appliance rough-ins. When laying out the rough-ins, the cabinets are the main consideration. With the subfloor swept clean, I mark out the location of the upper and lower cabinets. It's a good idea to use an optical level to locate the high and low points on the floor, to see how that will affect the height of the countertop. In general, the countertop will be the cabinet height plus counter thickness. Snapping a line or nailing a 2x4 at the top of the backsplash and the bottom of the lower cabinets is helpful for locating the rough-ins, especially the electrical outlets, on a framed wall.

Kitchen sink and dishwasher. A kitchen sink drain comes through the wall lower than a vanity drain — even though the kitchen sink is nearly always higher — to make room for the garbage disposal (Figure 4). In a standard 36-inch-high base cabinet, roughing in the 2-inch drainpipe 12 to 15 inches above the subfloor works well.

In most cases the dishwasher will drain into the garbage disposal if there is one. The hot water supply to the sink hot water supply, but good plumbers will provide another supply near the dishwasher. This will keep the sink's hot water pressure from falling when the dishwasher is running.

Ranges and cooktops. Freestanding or slide-in ranges require accurately placed gas and electrical rough-ins. Most ranges have a back panel that allows space for the gas valve and electrical outlet. If not placed accurately, the electrical cord or gas line can keep you from pushing the range all the way back to the wall.

With a drop-in range, keep in mind that the cabinet space below is usable unless the range has a down-draft vent. Keep the outlet or gas rough-in just a few inches below the bottom of the countertop.

Hoods. In my opinion, ducted hoods are the most difficult appliances to rough in. There are two basic ways to duct a range hood: through the cabinet or into the wall.

A through-the-cabinet vent is the easiest to install. At worst, a ceiling joist will have to be moved to make way for the rectangular duct. Most clients still want to use what little space is left in this cabinet. It's worth finding out if you can get a piece of 1/4-inch plywood and the correct stain from the cabinetmaker so the duct can be hidden. Then there's usually room for a spice rack.

For an into-the-wall duct, which is preferable to many homeowners because of the storage that's saved above the hood, the rectangular sheet metal boot needs to be precisely roughed in before drywall and

Locating Range Hood Ductwork

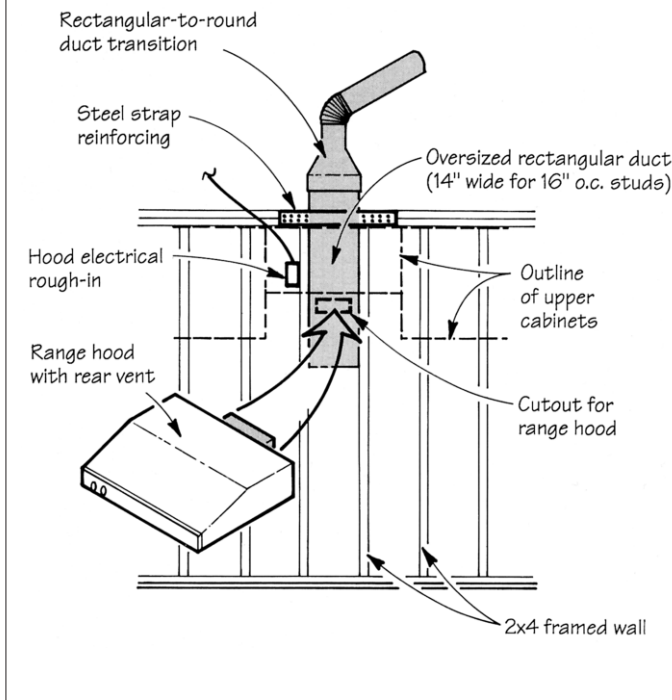


Figure 5. One way to locate the duct for a range hood is to frame a full stud bay in the center of the hood location, then install an oversized duct before drywall goes up. After the cabinets are installed, cut through both drywall and sheet metal to connect the range hood duct.

cabinets are installed. If you're $\frac{1}{4}$ inch off, it might be impossible to get an adequate seal between the hood and the duct.

I have found two solutions: One, I find the hood location to the best of my ability, using cabinet drawings. Then I make sure the duct rough-in falls in a stud bay with enough latitude to move either way a couple of inches. When the duct is installed, I ask the heating contractor not to fasten it in this bay, and to extend it a couple of inches above the plate line in the attic before turning a corner. This allows me to shift the boot a few inches vertically and horizontally after the drywall and cabinets are in place.

The second solution, suggested to me recently by a plumbing/heating subcontractor, is to have the duct built oversized, then drywall over the entire duct. When it's time to position the hood, cut through the drywall and sheet metal at the correct location (Figure 5).

Either solution is better than removing a cabinet and tearing into a wall only to move a duct an inch or two. If you are wrestling with a 50-pound microwave/hood combination over an expensive countertop, you want the connection to be as painless as possible.

Downdraft cooktops are beasts. Most subcontractors won't attempt to rough-in the ductwork for these monsters without having them on site. Often, the duct must run

through the back of the cabinet, underneath the subfloor, and through the exterior wall. If the downdraft cooktop isn't on site, a lead carpenter can spend hours trying to communicate with the cabinetmaker and subcontractors the best way to install it, and still end up modifying a cabinet to make it fit.

Lights. Architects often draw recessed lights centered between upper cabinet doors and above the front lip of the counter. This often means that ceiling joists have to be moved or headed off. Sometimes the top of the can light comes too close to a rafter, which is a more serious problem. In this case I've usually been able to convince the client to deviate slightly from the plans.

Outlets. Above-counter outlets are handled in a similar fashion to bath vanity outlets. The refrigerator, microwave oven, trash compactor, and garbage disposal all need outlets. The garbage disposal also needs a switch. Most clients prefer it to be placed to the right of the sink.

Sometimes I photograph the open walls before drywalling, just in case an outlet gets accidentally covered. This saves me from trying to find the "lump" in the wall. ■

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