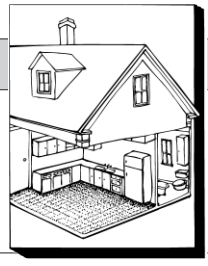
Tying Into Existing Utilities



by Paul Turpin

Adding on to a home can be the best and worst of two worlds for a builder: Some of the work is new construction, some is remodeling the old, and you have to join them so they work together. Add in the electrical and mechanical complexities of kitchen and bath remodeling, and you have a potentially large headache waiting to happen. Bathrooms have more plumbing considerations, kitchens have more electrical considerations, and both rooms have heating, cooling, and ventilation needs that should be addressed at the framing stage. Here are some things to keep in mind when taking on a k&b remodel that can keep headaches to a minimum.

Electrical

When it comes to electrical service, bathrooms are simpler than kitchens, so let's take them first. The big rule is to use GFCI outlets, which have their own built-in circuit breakers for avoiding splash-caused shocks (see "Safe Wiring With GFCIs," 12/92). If you have a shower light or some other fixture that requires a GFCI power source for a wet location rating, you can take the power for it from the load side of your GFCI outlet. Another safety measure I always take is to keep light switches out of the reach of the tub or shower.

A new bathroom's electrical needs can often be met by tying into an existing circuit, but remember that junction boxes can never be covered over or buried in an inaccessible manner.

GFCIs are required in kitchens, too, within 60 inches of the sink (wet location), but this is usually the least of the electrical considerations for a major kitchen remodel. Of much greater concern is the *number of circuits* required in a kitchen. Here in Los Angeles, for example, the city code requires two general-purpose 20-amp circuits for the counter plugs, plus separate dedicated circuits for an electric cooktop, an oven, a dishwasher, a garbage disposal, a trash compacter, or an oversized refrigerator (like a Sub-Zero). I usually go a step further and run separate circuits for microwave ovens and any refrigerator, regardless of size. Range hood fans can usually run on lighting circuits, and electronic-ignition for gas appliances can plug into general-use circuits.

You'll need to keep track of the circuits you're adding, to make sure they don't overload the main panel. Figure the circuit loads according to the formula *watts = amps x volts*. A 20-amp circuit at 120 volts supplies a total of 2,400 watts. To be on the safe side, I always calculate the load at 80% of maximum capacity, which would be 1,920 watts for a 20-amp circuit.

Next, check the total load on the panel. It may be possible to have the electrician add a subpanel to handle the new circuits. If the load is still too great for the main circuit-breaker, see if it is possible to get a higher-rated one to fit the existing panel. As a last resort, you might need to replace the entire panel — which can come as a nasty shock if you haven't budgeted for it at the beginning of the job.

If you're not sure of the loads on the panel, don't just go on the basis of whether or not there are empty slots in the panel. Get a copy of the NEC; there are a couple of different approaches in it for calculating the load on a panel.

Plumbing

Drain-waste-vent (DWV) is the name of the game when tying into plumbing. Water lines can snake almost anywhere, but drains have to run at the proper slope — 1/4 inch per foot. Always plot out where your new drain lines will tie into the existing plumbing, and do everything you can to frame your floor joists so that the drain line can run between them to reach the existing crawlspace and tie-in point. It's worth a little extra framing lumber and labor to ensure an uncomplicated path for your waste lines. If you have a long run, or if there is some other complication, you may have to chip a hole in the existing foundation stemwall to get your new drain line through — something you want to avoid if at all possible.

Always use cast iron for drain lines that run through a living space (as with an upstairs bath); you can vent with ABS and switch back to ABS under the house, but only cast iron will give you silent drains in the living space.

I prefer, whenever possible, to tie vent lines back into existing vent lines in the attic space; this keeps roof penetrations to a minimum, which looks better, is less expensive, and doesn't risk a leak (see illustration, previous page). I always make sure I slope the vents so that rainwater will flow back down the drain; I also put in cleanouts where needed if the tie-in creates an awkward vent configuration. Gravel-roofed houses in particular run the risk of blocked vents if debris is accidentally dropped into a vent pipe, so I make sure all my vent pipes are snake-accessible. Also, in severe northern climates, you should increase the size of smaller vent pipes (2 inches) to as much as 4 inches in diameter where they penetrate the roof. This allows for condensation to freeze around the edges of the pipe without blocking the vent.

Water supply lines pose fewer difficulties. Keep them out of exterior walls if possible, and make sure you have enough water pressure for any lines you are extending. Half-inch supply line is adequate for all residential plumbing fixtures. However, if you are tying into an existing line, you may have to run 3/4-inch pipe up to the tie-in point to ensure adequate pressure.

HVAC

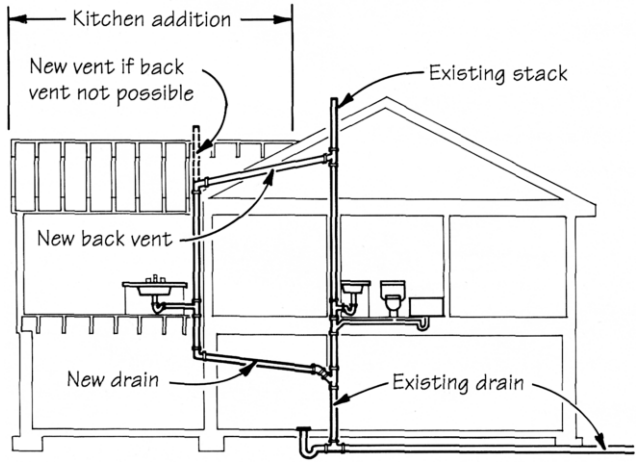
Kitchen range-hood ducts demand the most room, since they must be metal. Next in line are hvac ducts, just because they are big; the new flexible-coil insulated ducts are much easier to install than the old sheet-metal ones, but you still can't squash them flat or bend them too sharply. For ducts that need to go through an attic or crawlspace, you definitely need to figure out chases before you frame, or you're liable to find yourself reframing. Always try to keep ductwork as straight as possible for maximum efficiency.

Joist direction and stemwall height can make life easy or hard, and it's best to know which it's going to be before you start. A down-draft range vent that can run between joists to an exterior wall will have fewer elbows and better air flow than one that has to dip below perpendicular floor joists and come back up to get over a foundation stemwall. You'll want to figure that out before you lay your new joists down; using an electric demolition hammer in a crawlspace is a lot more time-consuming (and more of a pain) than using one in the open air.

If you find yourself in a very tight situation, there are some other steps you can take. Dayton's *Low Silhouette Kickspace Electric Heater* (available from Grainger's, 800/772-7868) can live in either a kickspace below or soffit overhead and eliminate the need for a heating duct. If your overhead range hood can't go through the roof (or through the wall behind it), plan for a soffit that can double as a chase to get the duct to reach an exterior wall. If your vent fan is a down-draft, consider going straight down to a 3 1/4x10-inch transition just above the subfloor, then using the kickspace area under the cabinets to reach an exterior wall. This approach also allows you to use a down-draft over a slab-on-grade where you don't have any under-floor space at all. ■

Paul Turpin is a contractor in Los Angeles specializing in kitchen and bath design and remodeling.

Plumbing Back Vent



When tying into existing DWV lines, the author prefers to run the new vent line through the attic and back to the existing vent stack, whenever possible. This keeps roof penetrations to a minimum.