



Chapter 6

Plumbing Contractor

The plumbing contractor affects energy efficiency of a building by selecting the hot water heater and fixtures and by making plumbing penetrations.

PURCHASING AND INSTALLING WATER HEATERS

Water heating accounts for 25 percent of energy use in a typical residence. In Super Good Cents homes, the water heater often is the largest single user of electrical energy. An energy efficient water heater reduces energy use and water heating costs.

Water heaters and other appliances are tested and rated by a national program to improve appliance efficiency.

Super Good Cents Electric Water Heater Performance Standards

1994 LTSGC 2.7

The 1994 Super Good Cents program requires that water heater energy efficiency exceed federal minimum performance standards. Your Super Good Cents representative can supply you with the most current list of acceptable water heaters. To meet 1994 Super Good Cents specifications, water heaters with a 0- to 59-gallon capacity must have an energy factor of 0.93; 60- to 120-gallon water heaters must have an energy factor of 0.91.

Electric Water Heater Installation Requirement: Insulated Pad

Electric water heaters on uninsulated concrete slabs and water heaters on uninsulated platforms in garages must have a non-compressible insulating pad of R-10 or better below them. Make sure the pad is onsite before the tank is ready to be plumbed in.

The R-10 pad is typically 2 inches of extruded polystyrene foam insulation (typically the colored foam insulations—blue, pink, and green). If you use expanded polystyrene (beadboard), you will need a 3-inch pad since beadboard has a lower R-value per inch. Most beadboard has less compressive strength than extruded polystyrene and may provide less stability than the blue, pink, and green products. However, beadboard with a density of 2 lb per ft² has compressive strength comparable to extruded polystyrene and is suitable.

It is recommended, but not required, that water heaters be located within the heated space.



Combustion Water Heaters

1994 LTSGC 2.6.2

The Super Good Cents program does not have performance standards for combustion water heaters, but important indoor air quality standards affect the type of combustion unit that may be used. Its location determines what type of unit the Super Good Cents program allows.

Combustion water heaters located inside the living area of the home must be the sealed combustion type. They have outside combustion air ducted to the firebox. They also must be directly vented to the outside with no possibility of combustion products mixing with indoor air.

Combustion water heaters located outside the living area (in a garage, for example) do not have to be sealed combustion units. However, recent research shows that leaks at furnace cabinets in garages can pull pollutants from garages into homes. Using a sealed combustion unit, or at a minimum, an induced draft water heater, is a good idea even in garages.

EXHAUST AIR HEAT PUMPS

Exhaust air heat pumps (EAHPs) are heat pump water heaters that recover heat in stale exhaust air to heat household water. They also ventilate the home. EAHPs are usually installed by heating/cooling contractors, but they have special plumbing needs. If house plans call for an EAHP, contact the general contractor for plumbing requirements before you complete your bid.

SHOWERHEADS

Efficient showerheads are a highly cost-effective way to conserve water and water heating energy, and are the perfect complement to an efficient hot water tank. The 1994 Super Good Cents program does not specify efficient showerheads because, in general, they are required in Northwest building codes.

The flow rate of a showerhead has a major influence on the amount of energy used to heat water. Efficient showerheads use 2.5 gallons of water or less per minute.

Flow rate information is available from the distributor or manufacturer. Although many showerheads have low flow rates, not all showerheads are highly rated by consumers. Ask around or consult consumer tests for the most popular models.



PIPE INSULATION

High levels of floor insulation in the Super Good Cents program allow less heat loss from living areas to the crawl space. A cooler crawl space means a greater chance for pipes to freeze. Pipe insulation or other methods of freeze protection are not always required by the Super Good Cents program, but they are a good idea (and may be required by local codes).

The best way to prevent pipe freezing is to locate pipes directly under the subfloor so that floor insulation is between the pipes and the crawl space. That way heat from the house keeps pipes warm even in the coldest weather.

Keep pipe runs in exterior walls to a minimum. Pipes are less likely to freeze if high R-value insulation is placed between them and the exterior wall.

AIR LEAKAGE CONTROL

Plumbing walls contain penetrations to the crawl space for water and drain lines and penetrations to the attic for the vent stack. The penetrations create hidden air leakage routes. They are called "thermal bypass routes" because they can create cold chimneys in interior walls for airflow between the attic and crawl space. Air leakage through plumbing walls bypasses the home's insulation system.

Insulation in the floor or ceiling does not stop air currents moving through the plumbing wall. Only specific air sealing measures can stop air leakage.

Care by the plumber can significantly reduce air leakage at plumbing penetrations.

Big holes are hard to seal. Cut holes for plumbing penetrations carefully to closely match the size of the pipe. It makes air sealing easier.

Sealing the Tub Penetration

It is hard to seal the tub penetration. But in energy efficient homes, it can be the largest single leak in the whole building. Figures 6A and 6B show ways to seal the tub penetration.

Air sealing the tub penetration cuts off a significant air path from the unheated crawl space into interior plumbing walls. If the tub is mounted on an accessible platform, with the p-trap above the floor, the tub penetration is much easier to seal.

Sealing Vent Stacks

Vent stacks tend to expand and contract because of temperature differences along the stack. Flexible gaskets are the most effective seals for stack penetrations.



Place gaskets over the hole, seal them to the top plates, and cut them out to fit snugly against the stack. In some cases you may just slip gaskets over pipes as you plumb the area. The air tightening specialist or general contractor can complete sealing.

Figure 6C shows how to seal a vent stack penetration to the attic.

Other sealants for stacks include oakum and elastic, flexible sealants, and caulks that will not break the air seal as the stack expands and contracts.

TIP: Gaskets are cleaner.

Other Plumbing Penetrations

Most other plumbing penetrations are small. They can be adequately sealed with caulk or expanding foam. Sealing penetrations helps eliminate air leakage bypass routes and improves comfort and energy efficiency of the home.



Figure 6B
BOXED-IN TUB PENETRATION

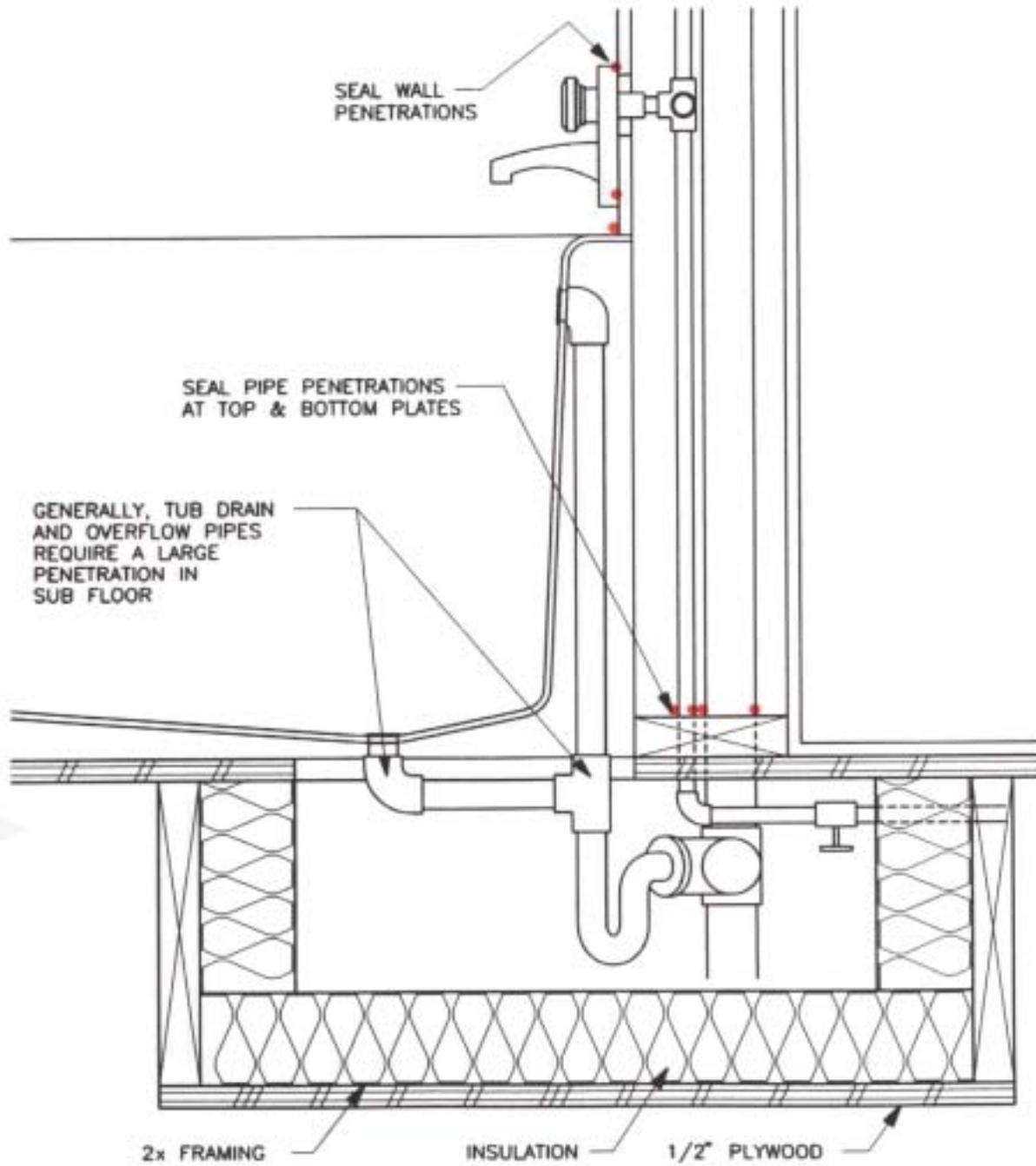
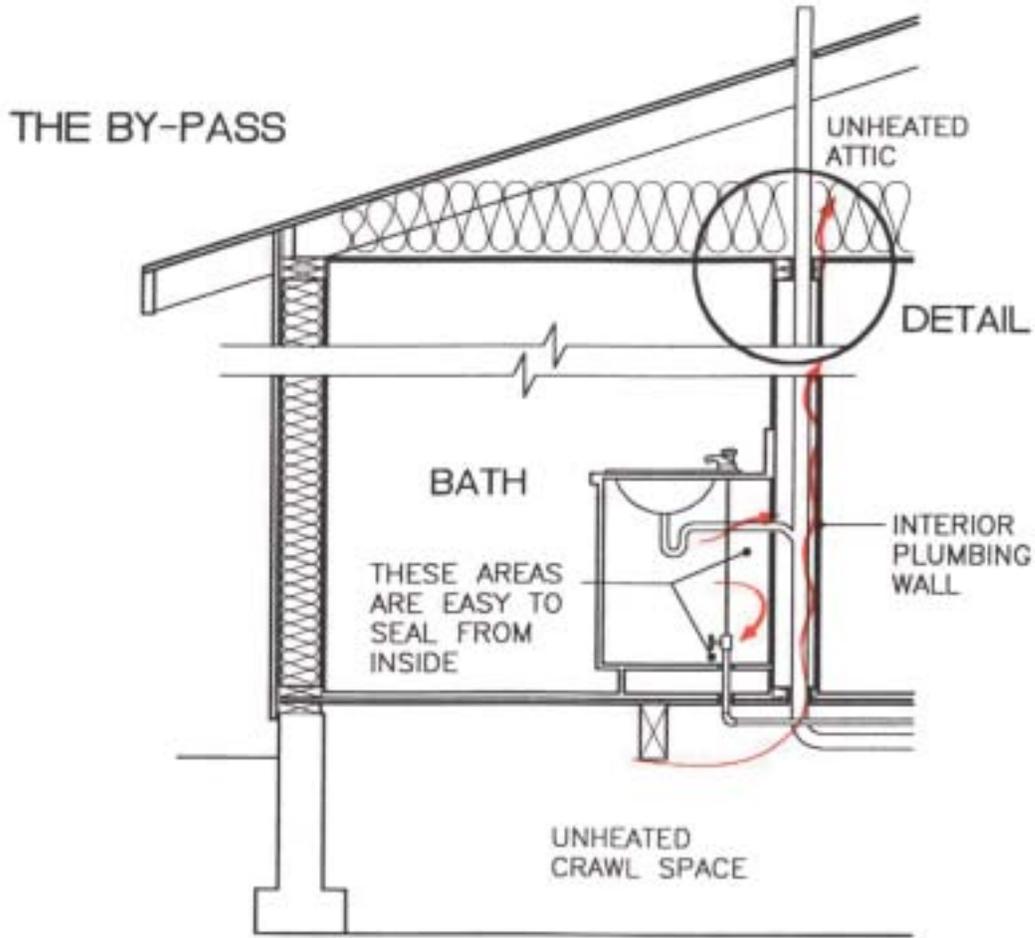




Figure 6C
GASKET AT VENT STACK PENETRATION TO ATTIC



THE SOLUTION

