

TAME YOUR UTILITIES



Organized, Efficient Plumbing & Mechanical Systems

by Susan Conbere for the PATH Partners

When you're thinking about building a new home, the location of the plumbing, heating and cooling systems probably isn't the first thing that comes to mind. Or the second. But if easier maintenance, greater comfort and lower energy bills sound appealing, it's worth giving some thought to where these systems go and how you'll gain access to them.

Heating and Cooling Systems PLACE DUCTS IN CONDITIONED SPACE

Location, location, location. It applies to ducts too. In many homes, the ducts that carry heated and cooled (conditioned) air run through attics, garages, crawlspaces and basements – spaces that aren't heated or cooled and often reach extreme temperatures. This affects the temperature of the air in the ducts. And if improperly sealed, ducts can draw moist, dirty air into your home. Ask your builder to run ducts through conditioned spaces instead, and be sure they are well sealed.

This should be planned during the design phase. (Ask your builder to calculate the requirements using Manuals J, S, and D, published by the Air Conditioning Contractors of America.)

Placing ducts in conditioned spaces may cost a little more, especially if the builder has to make minor alterations to accommodate the ductwork, but you could save up to 20 to 35 percent on your energy bill. You may also be able to reduce the size of the heating and cooling system and cut the cost of materials and duct installation. Note that extra interior space could be required to install bulkheads, chases or other structures to hide the ducts from view.

Placing ducts in conditioned space and sealing ducts against air leakage:

- * Reduces energy bills
- * Reduces equipment costs
- * Improves indoor-air quality
- * Improves comfort

ADD SMART ZONING CONTROLS

"I'm so hot. We've got to turn down the heat!"
"Don't touch that dial – I'm freezing!"
How many times have you had that argument?

You can end the heat wars with a "smart" zoning control system. This system divides the home into different zones, each having its own thermostat. This means you can set a different temperature in each zone of the house, so your husband can chill out in the family room while you stay warm and cozy in the den.

There are three different kinds of zoning. You could have two or more completely separate heating/cooling systems, each with air conditioner, furnace and thermostat. One system might supply conditioned air to the downstairs while the other handles the upstairs. Or your home could be zoned using a single comfort system equipped with sensors that monitor the temperature in the zones and motorized mechanical dampers that control air flow. The third way is a combination of these two methods.

The cost of an installed zone system ranges from about \$1,200 to \$2,000 or more, depending on options and labor. Properly installed, the system can reduce your energy bill by 10% to 20%.

Smart zoning controls:

- * Reduce energy bills
- * Improve comfort

BELOW AND RIGHT: Suspended or “drop” ceilings like this one from Armstrong are a good choice for finished basements because they attractively cover exposed floor joists while permitting access to pipes, ductwork and wiring. photos courtesy of www.Armstrong.com

OPPOSITE LEFT: Bensonwood’s Open-Built® second floor system provides an open cavity for the installation of ductwork. photo courtesy of www.Bensonwood.com

OPPOSITE RIGHT: Pipes and wires are neatly organized above a finished ceiling panel in Bensonwood’s Open Built® second floor system. photo courtesy of www.Bensonwood.com



Plumbing Systems
CONSIDER PEX PIPING AND A PLUMBING MANIFOLD

Sprung a leak? With a traditional plumbing system, you’ll have to turn off the water to the entire house while you try to find it.

Days later, you’ll be wishing you had a plumbing manifold.

In most plumbing systems, shutting off the water to one leaky pipe means shutting off the whole system. “Home run” plumbing systems allow you to shut off the water to a single fixture within the home from a central

source. With a centralized shut-off valve at each supply line, plumbing emergencies, repairs and upgrades are much easier to handle. The system includes a manifold (which is like a circuit breaker for your plumbing system) and plastic PEX (crosslinked polyethylene) supply lines that get hot water to the faucet faster than a standard system.

Most plumbing leaks and system failures occur at the joints in fittings, like the elbows and tees common in conventional piping. Since PEX requires few (if any) fittings, it is less likely to leak. The flexibility of PEX pip-

ing also allows it to expand and contract more than other types of piping, so it’s less likely to burst if the pipes freeze. This is good news if you forget to drain the water pipes in your summer cabin before you close it up for the winter.

Cost will depend on the system design, house size, distributor and product availability. But PEX piping and a manifold typically cost less than a conventional plumbing system, when you consider that the plumber will spend a lot less time cutting and soldering or gluing pipe. Because PEX piping insulates a little better than metal pipes, you also won’t have to spend as much money heating water, and the cold water pipes won’t sweat as much on humid days.

PEX piping and plumbing manifolds:

- * Leak less frequently
- * Deliver hot water faster
- * Allow easy repair
- * Are less likely to burst when pipes freeze
- * Reduce energy bills
- * Are attractive (in a plumbing sort of way)

PLAN FOR AIR ADMITTANCE VALVES

Sinks, toilets and bathtubs have a water trap seal that allows wastewater to go down the drain without allowing noxious sewer gas in. The gas is vented to the outdoors. Typically, these vents pass through the wall, ceiling, attic and roof.

Air admittance valves (AAVs) are mechanical devices that eliminate the need for vents through the home’s exterior. Fewer holes in the roof mean less potential for water leaks through these openings. Your roofline will look better, too, because you’ll have fewer pipes sticking through it. AAVs cost about \$25 to \$40 but require fewer materials and less labor for installation than the typical system.

Another plus: AAVs are particularly handy – and easier on the budget – if you want to add or relocate a sink, shower or kitchen island. The plumber can install an AAV instead of running that long vent pipe through the roof, walls and ceilings.

Another advantage may come further down the road. If you ever remodel, you'll find you have fewer pipes running through the walls and the roof, so it may be possible to remove walls without moving the plumbing.

Some local authorities are still unfamiliar with AAVs, but they are allowed by most plumbing codes.

AAVs:

- * Minimize the possibility of roof leaks
- * Clean up the roof profile
- * Allow greater flexibility in the layout of plumbing fixtures
- * Ease remodeling

organized within central pathways in the home, such as chases within the walls or open web joists underneath the floors. The utilities can then be accessed through removable panels in ceilings, walls and floors.

For the builder, this can speed and simplify construction. For the homeowner, maintenance, repairs and remodeling become easier because utilities can be accessed without opening walls, and walls can be moved without relocating utilities.

So let's imagine this: Five years from now, you decide to add a zone-controlled heating and cooling system to control energy costs. Normally, you'd have to rip through walls to access the ducts. With disentangled utilities, all you need to do is remove a few panels.

Disentangling utilities is the Holy Grail in accessible systems. It isn't well known and it isn't always easy, but it is the wave of the future. Why not have it now?

As for cost, you can expect to pay more in the short term. However, a home built with better organized and accessible utilities represents savings over the life of the structure, since remodeling, upgrading or repair will be less costly. That's when you'll be glad that what's behind your walls is as organized and accessible as the rest of your home. ■



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Disentangling Plumbing and Mechanicals: The Holy Grail

Hidden within the floors and walls, your plumbing, heating and cooling systems are usually out of sight and mind – that is, until they need to be repaired or updated. Then homeowners get a good look at pipes and ducts as they peer through holes in the walls and ceiling that the repairmen left behind. A new way of building can help you avoid all this.

It's called “disentanglement.” With this building method, your utilities – plumbing, wiring and heating and cooling system – are

ASK YOUR BUILDER ABOUT THESE THREE METHODS TO MAKE UTILITIES MORE ACCESSIBLE:

1. Use open-web trusses. Trusses provide the structural framework for floors and roofs. Open-web trusses allow for easier routing of utilities.

2. Build in vertical chases, enclosed channels that run through wall space, for wiring, plumbing and ducts. Vertical chases increase accessibility for upgrades and maintenance.

3. Install drop ceilings, which create more unobstructed space for ducts, utilities and plumbing. Removable ceiling panels allow easy access to utilities routed within these spaces.

The Partnership for Advancing Technology in Housing is dedicated to speeding the development and use of advanced building technologies to improve the quality and affordability of America's homes. For more information, visit the “homeowners” section of www.PATHnet.org

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