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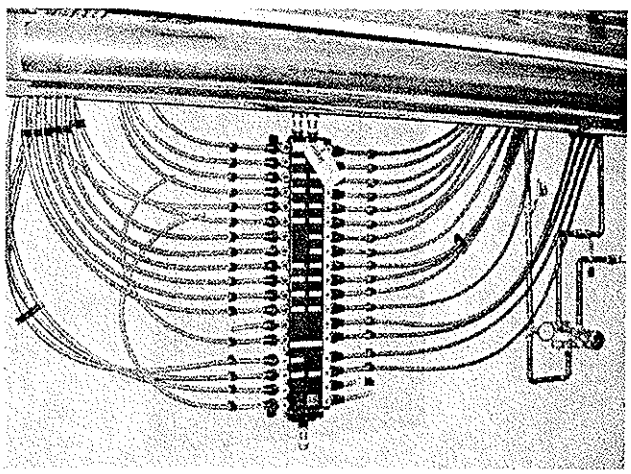
Eric Helton: Building Science

Home-Run Plumbing

Home-run plumbing systems are gaining popularity in new construction for lots of great reasons, but plumbing changes in an existing house are sometimes very challenging. However, it can be a significant improvement in performance in some cases if some small changes can be made.

There are several issues at hand here. Home-run plumbing relates to the design of the piping network supplying hot and cold potable water to the various fixtures and end points around the house. Choice of material for the piping is also a consideration.

Historically, the piping systems in houses use one or several larger pipe runs to service smaller diameter pipes which branch off to the various fixtures as it the main supply pipe winds through the house toward the furthest fixture. In a home-run piping network, each fixture (or sometimes a set of fixtures) have their own set of hot and cold water supply pipes. A central manifold supplies water to each set of pipes. This may end up using more pipe by length, but it has some advantages that outweigh that drawback in some cases.



An example of a home-run piping manifold

Because each pipe services very few fixtures, the pipe diameter is typically smaller than in other designs. This means that there is less of a wait for hot water to get to the shower and less water is wasted doing so. This saves both energy and water. Also, in some cases, it can also reduce the effect of toilet flushing on the water pressure at other fixtures (like the shower). Manifolds are typically installed with valves for each pipe. This makes future work very simple and less disruptive for the household, as each run has its own shut-off.

Typically, the piping in a home-run system is done using cross-linked polyethylene, known more commonly as PEX. PEX is code-accepted pretty much all over the US, though I hear it's not allowed in some areas. In some places, it is preferable to copper due to corrosion issues. For the builder, it takes less time to install than copper or PVC. As a material, it can also be less expensive.

In my recent bathroom renovation (yes, I'm bringing it back around to that), we chose to add a manifold in our basement and bring two pairs of PEX pipes up to the bathroom on the second floor. The original copper pipe is undersized for servicing the shower, toilet, and vanity without serious drops in flow when any two were used. It was also run in an exterior wall, which runs the chance of freezing in the winter in a cold climate. While the PEX is reputed to be more tolerant to freezing, we chose to run the new pipes through an closet in the first floor into the floor of the bathroom above. Now, our bathroom piping is completely within the conditioned envelope of the house. One pair of pipes serves the shower. The second supplies the vanity, soaking tub, and toilet. We felt combining those end-uses was reasonable.

The manifold in our basement currently only feeds the bathroom. As time permits, I intend on replacing certain other plumbing strategically with feeds off the manifold. My house has a very simple and straightforward floor plan. However, the plumbing in the basement looks like a plate of spaghetti, as fixtures and pipes were added haphazardly over the life of the house. The house and its systems were modified and adapted to the changing size of family, usage patterns, and fixtures.

I've been happy with the system overall. When you wash your hands, you can hear the change in water flow in the toilet as it refills, but there is no effect on the temperature in the shower when the toilet is flushed. Yay! My only complaint is that there is a slight taste in the water when I start to brush my teeth in the morning, after the water has sat in the pipes all night. I'm told this will wane with time.

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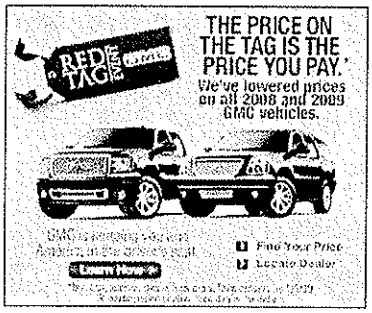

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