



## A 'METHOD' TO OUR MADNESS

Since plumbing went indoors, there has been a focus on the features and benefits of the various piping material and methods best suited for installation of these potable water systems. Residential construction has traditionally provided one of the best opportunities for

test marketing new products and supplies. As we moved from lead pipe, to galvanized pipe, to copper pipe, and now on into polymer piping products, the emphasis has largely remained on the attributes of the pipe/fitting system.

In this article, we take a fresh look at the three most prevalent residential piping methods and compare the features and benefits of each one. Under consideration are:

1. The "standard" or "branch-tee" method.
2. The "manifold" or "home run" method.
3. The "combination" or "remote" method.

### SAMPLE INSTALLATION

For discussion purposes, let's consider the installation of cold water lines in a small, wood frame, detached, single-family dwelling (as illustrated). This home, in our example, is connected to city water, with a one-inch water service.

Sizing of the water supply and potable distribution piping are prescribed by the National Plumbing Code (NPC). The code's tables stipulate sizing requirements by the assignment of "fixture units" to the variety of point-of-use fixtures connected to the system.

It is intended that this method anticipate the probable maximum demand

and, along with it, the size of the supply piping to accommodate this load—further limited by maximum flow velocities within the system (which could differ between hot and cold service). From this information, pipe sizes are determined for the system.

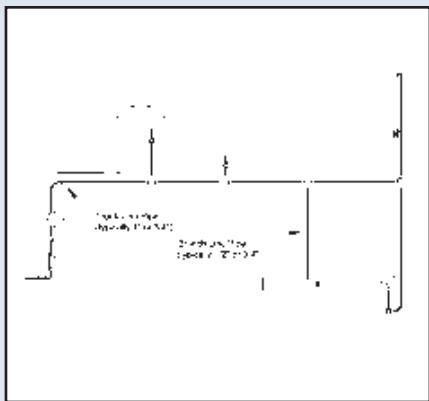
It is important to note that this method of load calculation applies equally to the total requirement, i.e. the size of the water service, for each of our illustrations. Any variations would only be relevant to distribution within the piping grid.

### DOOR ONE, TWO OR ...

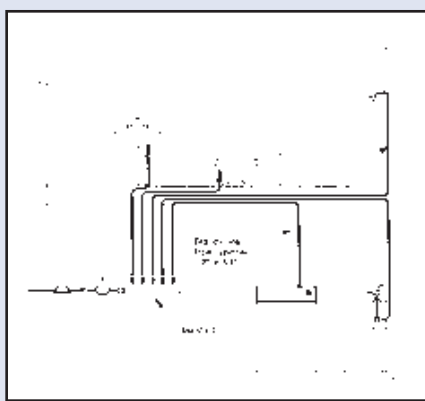
So, for all the marbles, which method would *you* choose from the three illustrations? Before you decide, let's ponder some other questions:

1. Since we are installing this in a

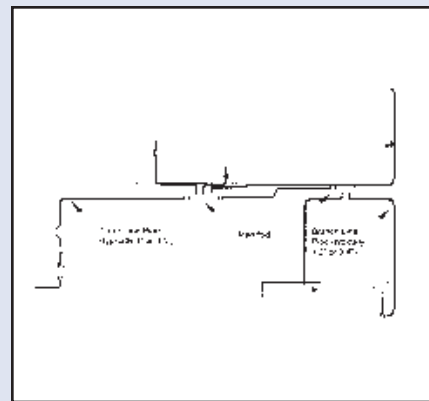
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**Figure 1 Standard Method:** The one-inch service is connected to the pressure relieve valve (PRV) and then continues as a trunk line at that same pipe diameter. In this case, we could reduce the one-inch line to 3/4" after the tee that would supply the clothes washer. At the terminus of this 3/4" line would be a 1/2" by 3/4" "bull head" tee with the two 1/2" connections servicing the tub and laundry sink, respectively.



**Figure 2 Manifold Method:** The one-inch water service is connected to the PRV and then continues as the inlet connection to a manifold that maintains the one-inch diameter. Each point-of-use fixture is served independently by an uninterrupted 1/2" line that is dedicated to this purpose. The 1/2" lines would meet the fixture unit sizing requirements of these fixtures in every case.



**Figure 3 Combination Method:** The one-inch water service is connected to the PRV and then continues as a trunk line to the point of supply to the first "main" manifold. From this point on, each of the three upper floor fixtures is supplied by its own 1/2" line. The trunk continues as a 1/2" line which supplies a remote manifold that would have both a 1/2" inlet and 1/2" outlets. If desired, you could choose to supply this remote manifold with a 3/4" inlet if desired.

wood-framed building, we will have to drill holes to run lines. Which method allows you to drill the fewest holes?

2. Which method seems to indicate that it would use the most total feet of pipe?
3. Which method requires the most total labour?
4. Which method will use the greatest amount of fittings?
5. Which method will provide the most balanced flow?
6. Would any one of these methods allow you to design or calculate the system more simply than the others?
7. Would any of these methods be more or less likely to easily accommodate future expansion of the system?
8. Is any one of these methods more advantageous from a future service perspective?
9. Do you see any of these methods providing you a competitive advantage in the marketplace? If so, why?

**“Is there a one-size-fits-all solution or method? It seems that the varied requirements of different size jobs would lead us to answer with a definite no.”**

As the size and complexity of a given system increases, the answer as to which option is most appropriate may change. For some varied viewpoints, I checked with a few people in the field. Here are their responses:

**Bob Wallace, President  
Part Enterprises, Abbotsford, BC:**

“Each system has pros and cons. The home run (manifold) system uses much more tubing than the other methods and requires more drilling. However, very little planning is involved and the limited number of different items and sizes reduces the likelihood of frequent trips to the supplier. In a more complex installation, I would have to consider the combination system, for many of the same reasons. But not in this case, as the illustrated system is so simple.

“The question is: what system would I choose? I am a plumber from the old school methods. I come from a land far away, where branch tee (standard) sys-

tems were the only systems. I hate drilling holes. I am confident that I will install a system that is leak-free and attractive to look at. Each tradesman you ask will believe in their choice. The branch tee (standard) system would have to be my choice.”

**Randy Rezka, Operations Manager  
Border Plumbing, Osoyoos, BC:**

“As with most plumbers in this business, we started using tee and branch (standard) systems. We then started using the manifold method. However, the amount of pipe involved seemed a bit much. Also, extra labour was involved in drilling all of the joists in order to pull all the supply lines in from the manifold location, which was typically in the mechanical room. Another disadvantage to using the manifold system is the amount of water wasted on the hot supply lines to get hot water to the furthest outlet.

“This is what brought us to the remote (combination) systems, which we use quite successfully today. The hot water lines can be easily fitted with a circulation pump system, with less piping used and the cost of labour is reduced significantly as most of the 1/2” supply lines are very short. Future expansion of the system can be easily accomplished by either installing a tee in the incoming main to accommodate the installation of further manifolds, or by sizing the existing manifolds with extra outlets that can be capped off and used in the future.

“The competitive advantages of this type of system is ease of installation and the use of very few fittings.”

**Peter Graf, Owner  
CL Plumbing, Lethbridge, AB:**

“My father is also a plumber, and on one occasion I remember asking dad why he bent the pipe around the corners instead of sweating in an elbow. He looked at me with his steel blue eyes and said, ‘Because

that’s what real tradesmen do, son.’ He went on to explain that it’s an art form to be able to bend the pipe and do double offsets, and added: ‘You know, I don’t even use a tape measure for most of them.’ Over the next 10 minutes he tried to instill in me the virtues of doing a professional job.

“In my own business, I have moved from the standard method to the manifold method as product technology evolved. We were told that the weakest link in any piping project were the joints. That was an easy one to correct. We just placed a manifold in the utility room and ran a whole bunch of pipes off it to every fixture in the house. And the best part? The homeowner, his friends and relatives all stood around saying, ‘Wow.’ I mean, it looked great with all those valves and the pipes running up the wall in a neat, orderly, spaced row.

“But all good things have got to come to an end. My end came in the form of a lovely lady holding the final payment for the job in her hand and saying, ‘And how can you fix the problem with the hot water taking so long to get to my kitchen sink?’ It took close to a minute before the water became hot at the faucet. It was an unacceptable waste of water and time.

“I learned something on that job: never install a home run (manifold) system in a large house. I now use either the standard method or the combination method, depending on the size of the job.”

**SINGLE SOLUTION?**

So, after, hearing those opinions, let’s sum up. Is there a one-size-fits-all solution or method? It seems that the varied requirements of different size jobs would lead us to answer with a definite no. Each method has its merit in its own right.

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