



Notes

1. This information is intended to provide general guidance on the installation of water piping and fittings. It is not a complete rendering of all of the materials and methods allowed by the *Uniform Plumbing Code*™ (U.P.C.). Although many materials are allowed under the code, this handout focuses on copper because it accounts for the vast majority of water piping being installed in recent years and the materials are commonly available to the home owner in retail outlets. Plumbing codes may be reviewed in many libraries or at your Building Department. If you are inexperienced in the use of lead free solder, then we recommend that you review Installation Standard #IS 3-93 which can be found in the U.P.C.. If your existing water piping system is galvanized iron, then it may be extended, modified or repaired using galvanized iron pipe and fittings.

2. Interior metal water piping systems must be bonded to the service equipment enclosure, the grounded conductor at the service, grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. Number 6 stranded bonding wire is commonly available and may be used to bond systems up to 200 amps. See Figure 1.

3. All plumbing fixtures are required to have a water supply sufficient to flush them and keep them in a clean and sanitary condition. Water supplies to fixtures must be so arranged as to eliminate the danger of the water supply becoming contaminated. Minimum water pressure of 15 PSI is required at all fixtures, including those that are upstairs or far removed from the source of supply.

4. The final connection of fixtures is often made with light gage malleable metal tubing or plastic fixture supply lines. Provide control valves at each fixture immediately ahead of any slip joint, nonmetallic fixture supply or appliance supply. See figure 2.

5. Copper tubing is made in various weights. The two most commonly seen are Type L, which is marked with a continuous blue stripe, and Type M, which is marked with a continuous red stripe. Type L is the heavier of the two and is required to be used when piping is buried under a building. Type M is the lighter of the two and is the minimum weight allowed inside the building above ground. Type M is also the minimum weight allowed under ground outside the building. Copper piping may be heat treated to achieve a certain softness, which enables it to be rolled or coiled. The stiffness of the piping must not be confused with its weight. Soft Type L tubing is often used under floor slabs because its greater length facilitates installation without buried joints.

6. Copper Tubing that is installed under a floor slab must be

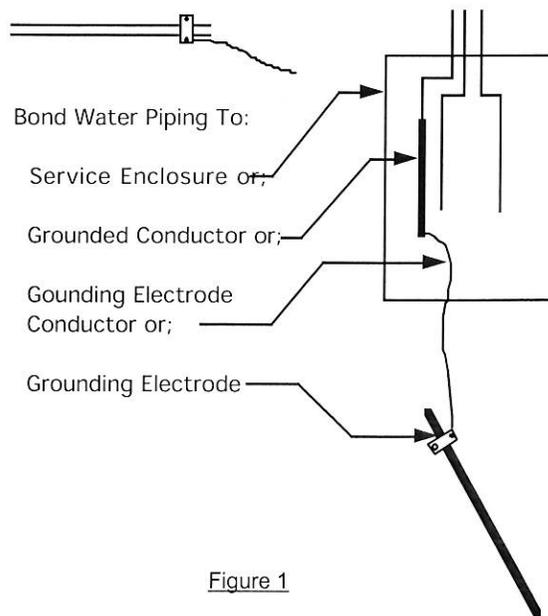


Figure 1

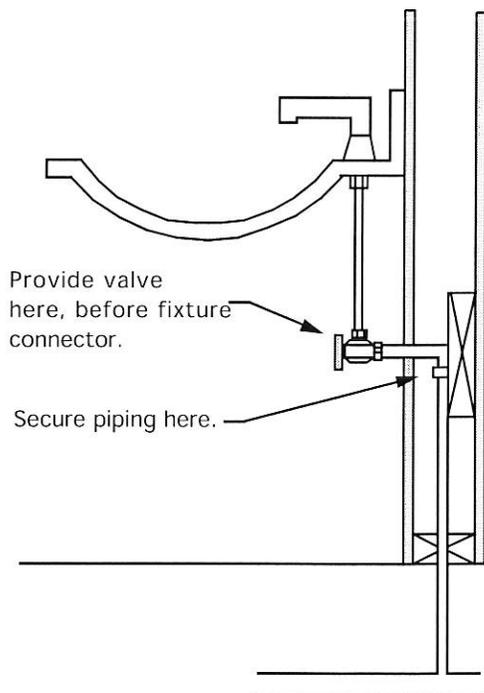


Figure 2

installed without joints where possible. If joints are necessary they must be brazed, not soldered, and wrought copper fittings must be used. Most home owners will wish to avoid installing joints under slabs.

7. Lawn sprinkler piping must be isolated from the potable water supply by use of an approved vacuum breaker. The vacuum breaker, which is usually combined with a control valve, must be installed at least 6" above the surrounding ground and above a sufficient number of sprinkler heads that water in the uphill piping will not create backpressure onto the vacuum breaker below. See figure 3.

8. All of the piping of a system should be of the same material. Connection of copper piping to cast iron piping will hasten the corrosion of the cast iron. If the two metals are separated by a dielectric insulating coupling it will be necessary to bond around this coupling in order to comply with the electrical code thus defeating the purpose of the dielectric coupling.

9. Where a valve controls the water supply to more than one fixture it must not be of a type which restricts the flow of water. Ask for "fullway gate valves" in these situations. Provide a fullway valve to shut down the entire water system. Provide a fullway valve in the cold water supply to the water heater.

10. Maximum water pressure of a domestic supply is 80 PSI.

11. Provide a pressure relief valve somewhere in the system. Most of the time the water heater will be equipped with one and this will be sufficient. If you have multiple heaters, solar water heating, multiple storage tanks etc. consult the U.P.C..

12. To size pipe for a modest house with two baths, laundry, dish washer and two hose bibbs proceed as follows: Provide 1" building supply. Extend 1" pipe to the point where the water heater branch connects. Provide a dedicated 3/4" branch supply to the water heater. Extend and branch piping system using 3/4" pipe wherever the pipe will serve more than one fixture. Extend and branch the system using 1/2" pipe wherever the pipe will serve just one fixture. This method is much simpler than the method contained in the U.P.C.. It will provide a generous supply which exceeds the minimum requirements of the code in a situation where water pressure is quite low (30 to 45 PSI) and where the furthest fixture is quite far from the supply (80'). If your furthest fixture is closer to a supply with higher pressure, or have one bathroom and cost is very important, consult the U.P.C..

13. Hose outlets, sometimes called sill cocks or hose bibbs, may siphon contamination back into the potable water supply and must be equipped with unremovable vacuum breakers. The outlet so equipped must be 6" above the ground.

14. Support and secure copper tubing every 6 feet.

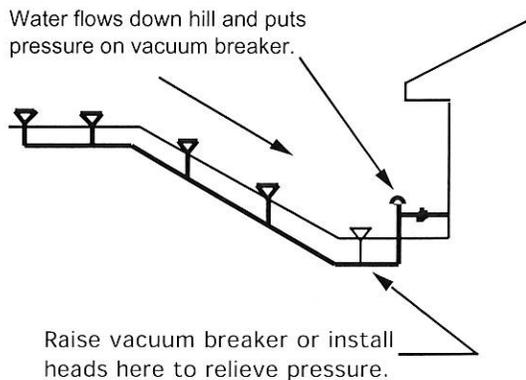


Figure 3