Water for the World

Constructing a Distribution System with Household Connections

Technical Note No. RWS. 4.C.5

Constructing a distribution system with household connections consists of providing taps and extending service lines from the distribution system to each house. This is a continuation of the construction procedures described in "Installing Pipes," RWS.4.C.1, and "Installing Community Distribution Systems," RWS.4.C.4. Use all three technical notes together.

Useful Definitions

CURB STOP - A valve at the point of entry of a service line to a home or building used to shut-off flow to the point of use.

SERVICE LINE - A water line extending from a tap to the customer's property.

TAP - A point of connection to a water main for a service line.

Connections to the Distribution System

There are two ways of providing a household connection to the distribution system. One method is to install a service tap into the main line as it is being constructed. The other method is to install the main without service connections and then, before the line is backfilled, drill holes in the line opposite each home. Then either thread the hole or install a "saddle" over it.

With the first method, the outlet must be placed at the joints between pipe lengths. This requires a service tee which is expensive. The second method allows the outlet to be located anywhere on the line, but the tap must be made as a separate operation. Figure 1 shows several service tees that can be installed as the system is being constructed. For threaded steel pipe, a reducing "tee" is used. For asbestos cement pipe, a heavy-wall coupling containing a threaded outlet is installed. For polyvinylchloride pipe with slip couplings, a tapped, plastic tee is used. Insert tees can be used with polyethylene pipe.

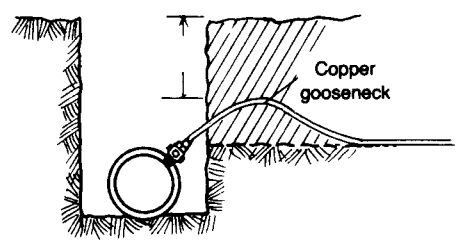
a. Galvanized Steel Reducing Tee

b. A/C Pipe Heavy-Wall Coupling with Threaded Bushing

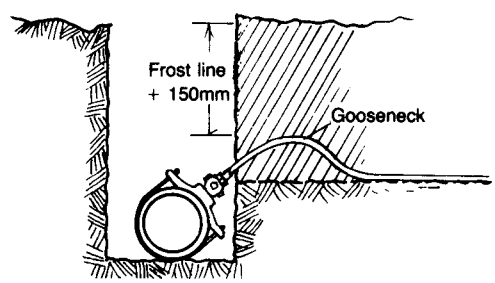
c. Insert Tee for Polyethelene Pipe

Figure 1. Service Tees Installed During Construction

Figure 2 shows methods of tapping a main after it has been installed. A special drill can be used to drill a



a. Pipe Tapped for Corporation Stop



b. Service Clamp for Use with A/C Pipe

Figure 2. Tapping the Transmission Main After Construction

hole in the side of an asbestos cement pipe. The hole can then be threaded or a service clamp installed. Asbestos fibers should not be ingested, so after the pipe is drilled the line must be throughly flushed to remove cuttings before the system is put in service. Rigid plastic pipe can be drilled and a service clamp installed or a special threaded outlet may be solvent welded in place. Insert tees in polyethylene pipe can be either installed when the main is laid or cut in at a later time.

Regardless of the method used to provide an outlet for the service line, it is usually made at an angle that is 20-30° above the horizontal. This allows a bend to be placed in the service line so that pipe movement will not cause a break at the connection. The tap is not placed on top of the pipe because it may be broken off if the line is later uncovered. A corporation stop is then threaded into the outlet on the pipe. This special type of valve does not restrict the flow of water in the main line while installing the service lines. As each service line is installed, the corporation stop is opened. Figure 3 shows details of service connections.

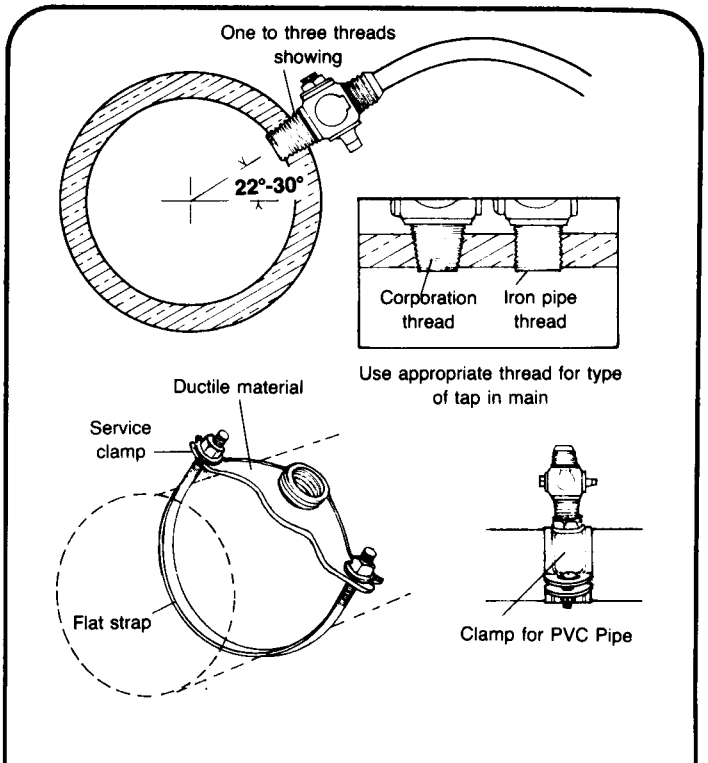


Figure 3. Detail of Service Connections

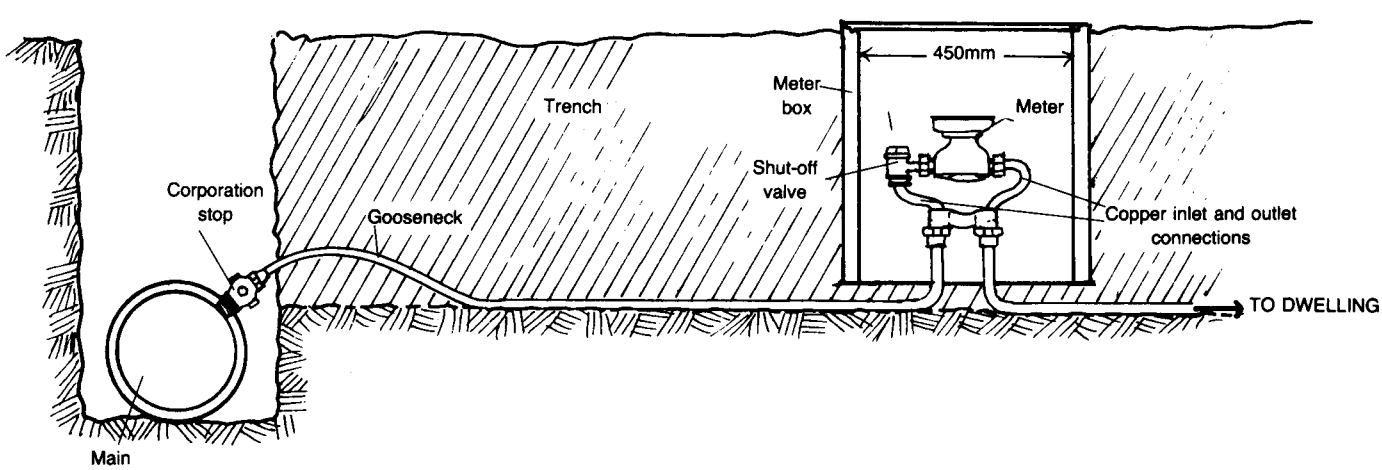


Figure 4. Meter Installation

Installing the Service Line

The service line extends from the corporation stop to the property of the homeowner. Always put a bend or "gooseneck" in the service line to provide flexibility in the event of a load due to settlement or to expansion or contraction of pipe. If a meter is installed, it is usually placed in a meter box near the edge of the property or within the home itself. A meter yolk is used to hold the meter and to provide a means to turn the water off should the meter need to be removed. See Figure 4. If a meter is not used, a shut-off valve should be installed in its place as shown in Figure 5.

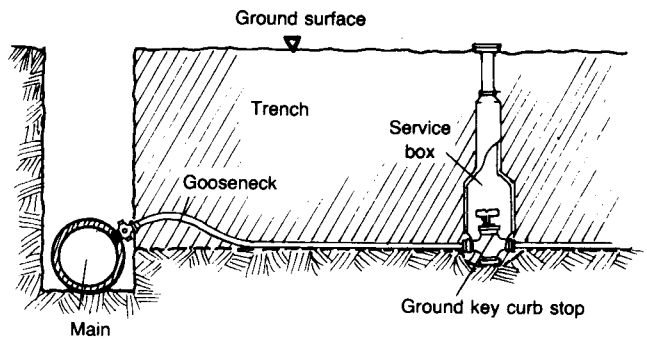


Figure 5. Curb Stop Installation

Service lines are usually made of 20mm copper service pipe, type L or K, or polyethylene. It is essential that the corporation stop, the meter yolk, and/or the curb stop, are the proper type and size for the pipe used. Soldered joints should not be used on buried copper pipe because they will corrode and leak. Instead flair type joints should be used. The same precautions discussed in "Installing Pipes," RWS.4.C.1 and "Constructing Community Distribution Systems," RWS.4.C.4, concerning depth of bury, bedding, and backfilling should be observed when installing service lines.

The construction of line from the meter or curb stop to the house is usually the responsibility of the homeowner but the line may be installed at the same time as the service line. In rural systems, 20mm polyethylene pipe is usually used. A shut-off valve should be provided outside the house so that the occupant can turn off the water to make repairs. The valve should have a "ground key" which requires a valve wrench to open or close.