CHAPTER 6

SERVICE CONNECTIONS

6-1. Tapping of water lines.

a. Ductile-iron pipes. In most circumstances, ductile-iron pipe can be tapped for building service connections while under pressure; consequently, this type of pipe is well suited for applications where future tapping may be necessary.

b. Asbestos-cement lines. Asbestos-cement pipe can be tapped either wet or dry using standard waterworks equipment. The largest size corporation stop which can be tapped directly into asbestos-cement pipe is 1 inch. Larger outlet sizes up to 2 inches can be secured by using service clamps or bossed sleeves. Tapping sleeves and valves can be used for making taps larger than 2 inches in asbestos-cement pipe under pressure.

c. Concrete lines. New service connections on existing concrete pipelines can be made with or without interruption of service. Concrete pipe is more difficult to tap than other pipe materials; and the cost of pressure tapping the pipeline is considerably greater than incorporating outlets for future connections during pipe manufacture. Fittings are available for making threaded connections from 1/2 to 2 inches in diameter for the various types of concrete pressure pipe. Flanged outlet taps can be made under pressure for branch lines with diameters as large as one size smaller than that of the pipe to be tapped. Step by step procedures for small and large pressure connections are available in most manufacturer's literature.

d. Steel lines. Service connections to steel pipe can be readily made with commercially available equipment. This includes service connections both dry and with pipe under internal pressure. Small service connections consist of threaded couplings welded to the steel pipe surface and drilled through with standard drilling equipment. Large diameter service connections are normally made under pressure utilizing a flanged service outlet, a tapping valve, and a standard drilling machine. The service outlet may be either a bolted-in-place service saddle or a fabricated steel service saddle that is welded to the pipe.

e. Plastic lines. Plastic pipe can be direct tapped wet or dry, using standard waterworks equipment, for insertion of corporation stops. However, a special tool has been developed which will minimize PVC shavings and retain the coupon. The largest size corporation stop which can be tapped directly into the pipe is 1 inch. AWWA threads are recommended for all direct taps. Larger outlet sizes can be obtained by using service clamps, saddles, or bossed sleeves. Maximum outlet size recommended by these methods is 2 inches. Tapping sleeves and

valves can be used for making large taps, under pressure, size to size, i.e., 8-inch outlet in 8-inch pipe, etc. Tapping sleeves should be assembled in accordance with the manufacturer's directions.

6-2. Service connection materials.

a. Copper. Copper has been the most widely used material for service piping due to its flexibility, ease of installation, corrosion-resistance, and its capability to withstand high pressures. Although the cost of copper pipe has risen rapidly in recent years, it is still well suited for service connection use. Copper is a strategic metal so its use for services should be limited to dire emergencies.

b. Plastic. Plastic pipe is frequently selected because of its relatively low cost and easy installation. The capabilities of plastic pipe to withstand maximum internal and external loadings and temperatures should be carefully examined before use.

c. Galvanized steel. Galvanized steel pipe has been used for service connnections for many years. The main advantage of galvanized steel pipe is its relatively low cost. However, since galvanized steel pipe is rigid and requires threading, it is not easily installed. Also, galvanized steel service connections may have relatively short lives if placed in soils in which corrosion is likely to occur. Galvanized steel pipe is generally not used for 2-inch or larger service connections.

d. Other materials. Ductile-iron and asbestos-cement pipes are not generally available in the small sizes required for most service connections but could be considered for service connections to large water users for which pipe sizes of 3 inches or larger are needed.

6-3. Sizes. The size of the service connection needed in any particular situation should be the minimum size through which water can flow at the maximum required rate without excessive velocity or head loss. A maximum velocity of 10 fps is commonly used. In general, head losses through service connections during maximum flows should be small enough to insure that a residual pressure of 25 psi is available for water distribution within the plumbing of each building. Head losses of 15 psi or greater through service connections are considered excessive, even if the 25-psi residual criterion can be met. Although 1/2-inch service connections can be used for facilities requiring very small flows, the minimum size for most installations should be 3/4 inch.

6-4. Installation. Service connections will be installed in as direct a path as possible from the distribution main to the building served and will enter the building on the side closest to the distribution main. Service connections will be installed below the frost depth. If the size and wall thickness of the main are adequate, smaller service

lines may be connected to the main by direct drilling and tapping. This can be accomplished with special machines while maintaining water pressure in the main. Larger service connections (greater than 2 inch) may necessitate the installation of tees or special branch connections into distribution mains but may be made with the main under pressure with a tapping machine, tapping valve, and sleeve in most cases.

6-5. Service connections at airfields. Water-service connections are required for servicing aircraft at airfields. These connections will be located adjacent to the parking apron at nondispersed stations or adjacent to the servicing apron at dispersed stations.