SOME PHASES OF WORK IN THE DISTRIBUTION SECTION OF THE WATER DIVISION, ST. LOUIS*

By W. A. Foley

THERE are several distinct features of the St. Louis distribution system which do not usually obtain in other municipalities; principal among these may be mentioned the two distinct distributing systems called the high and low. The topography of St. Louis is such that the city maintains these two systems, the first termed high at 125 pounds pressure, the second termed low at 85 pounds pressure.

The low system comprises about 67 per cent. of the pipe mileage, and ranges in size from 3-inch to 48-inch, amounting to 680 miles, supplying approximately 35.4 square miles of area. This system supplies certain districts where the elevation does not exceed 100 feet above the city directrix. It was installed before the confining limits of the city were extended, when the city proper was located on the table land adjacent to the river.

As the city growth pushed forward it was essential that the out-lying districts be supplied with an adequate volume and pressure, and the topography of the land was such that an increased pressure system with high duty pumps had to be installed to meet the demand. The high-pressure district now comprising 330 miles of pipe was decided upon. This system supplies districts in which the elevation exceeds the city directrix by more than 100 feet, and is equal in area to 26 square miles. The two systems are separate and distinct, although there is contiguity in all the mileage, the pipe system being laid out on the gridiron theory. Each is maintained separate and independent of the other by means of valves, which close off one system from the other, thus maintaining the independent pressures. The valves are termed separation valves, being kept closed and tabbed with metallic disks showing the number of each valve and indicative of the valve being shut. In the event a metallic disk is not readily available the cap-nut of the valve is reversed or inverted, which is also indicative of a separation valve.

These valves are not opened except when necessity arises, and in this event the high pressure is allowed to bleed into the low system during the period the occasion demands. They are also opened during the semi-annual inspection of valves, which occurs in May and November, when all valves in the two systems are examined and worked to insure their thorough fitness for any subsequent operation, or as a relief to the crowding of the high service pumps, which occurs during the night, when a few separation valves are opened to relieve the load.

30 to 125 Pounds Pressure

Many of the consumers are so fortunately located that either high or low service is available for domestic supply. The low-pressure extremes range from 30 to 85 pounds, and the high-pressure from 40 to 125 pounds. The business section of St. Louis, being the oldest, is supplied by the low-pressure system, but ordinarily good pressure is obtained, the average for the commercial district, which comprises 483 city blocks or 2⅓ square miles area, being 45 pounds.

Another feature of the St. Louis distribution system is a 36-inch lock-bar steel main in 30-foot lengths with riveted joints 26,700 feet in length, which crosses the heart of the city, and acts as a carrier for either high or low-service feed. This feeder has its origin in the central pumping station and can be operated from an 85-pound head with a delivery of 750,000 gallons per hour, or from an 125-pound head with a delivery of approximately 1,000,000 gallons per hour. The change in this trunk line from high to low service is effected by the operation of a few hand-operated valves immediately in front of the engine house and two hydraulically operated valves at the terminus of the steel main, practically five miles distant, where it is breeched into both systems by means of a Y connection. In times of emergency or excessive draught, this feeder serves as a reserve or reinforcement of either system. Many other communities accomplish practically the same purpose by speeding up pumps in times of fire, but the St. Louis steel line was designed with the purpose in view of acting as a composite carrier on either system, as the need arose.

The essential necessity of present-day distribution is conservative despatch. Mechanical appliances to supplant slow hand labor and the execution of repair work with speed are the chief features of distribution work. Although all water distribution departments have features in common, with reference to the general work, yet each individual system has some little appliance or method of repair which is a special feature of that particular system.

Repair of Broken Mains

Portable pumps driven by air or gas, such as Los Angeles has in service, trench filling by cable drag or auto slip, have been employed in St. Louis, not by the exact method employed by other communities, but by methods which prove more feasible here. During the winter, when frozen soil conditions make the excavation for repairs of broken mains excessive in cost, the St. Louis department has found it practicable to use a blast pan, such as is employed by street repair gangs in asphalt surfacing. This proves an effective method of dissipating the frost and expedites the work of excavation, consequently effecting a saving of both time and labor. In the repair of mains 15 inches in diameter and larger where such repair necessitates the employment of a sleeve, the department finds it expedient to employ what is known as a sleeve-spacer. This simple device is the idea of a local street service foreman, and has proved of great value in such work. The spacer is a sort of turn-buckle affair, which is slipped into position and tightened, so as to prevent movement of pipe when the sleeve is slipped into place, but is serves an ideal purpose in spacing the sleeve so that an even joint can be run around the pipe circumference. Usually four of these spacers are employed in the repair of mains 30 inches in diameter and larger. This device is worthy of adoption, especially where repairs are made in close proximity to a valve and its subsequent closing with its large pressure surface may cause a creeping of pipe at the space where sleeve has been employed.

Constant attention to every detail is becoming absolutely essential for the maintenance of a modern pipe system. Air patrols to release air pockets, constant overhauling of valves and other appurtenances, and absolute attention are the prices demanded in a modern system. Conservation of water by the insertion of valves, so that no great loss of water will result from the scarcity of these necessary valves when shuts are enforced on a distributing system through broken mains, is essential. In St. Louis the practice of lengthy shuts for repairs was common until five years ago. These shuts are generally made in a residential district, and the inconveniences are many. Not

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