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No. Z-14

WATER SUPPLY SOURCES FOR METROPOLITAN BOSTON  
 Frank E. Winsor, Chief Engineer  
 Metropolitan District Water Supply Commission, Boston, Mass.

The Metropolitan Water District includes 20 cities and towns with 1,500,000 population. The present sources include the following reservoirs: Lake Cochituate, first supplying Boston through Cochituate Aqueduct in 1848, but now seldom used; the so-called Framingham reservoirs on the Sudbury River, built 1870-1899, consisting of Reservoir No. 1, also Nos. 3 and 5, the latter known as Sudbury Reservoir and both being on the North Branch directly above No. 1, also Nos. 2, 4, 6 and 8, the three last names known as Ashland, Hopkinton and Whitehall Reservoirs, respectively, on the South Branch above No. 1. These were all built by the City of Boston, before the formation of the Metropolitan Water District, except that Sudbury Reservoir was completed in 1898 by the Metropolitan Water Board, which took over the system in that year. Shortly thereafter the Board constructed Wachusett Reservoir further west, on the South Branch of Nashua River, first filled in the Spring of 1908. Water from this reservoir flows through Wachusett Aqueduct into Sudbury Reservoir and thence follows the existing aqueducts and pipe lines to distributing reservoirs at Chestnut Hill and Spot Pond.

In 1903, to supplement Sudbury Aqueduct, Weston Aqueduct was built from Sudbury Reservoir to connections with Chestnut Hill. A direct connection to Spot Pond was made in 1926. The water from Ashland, Whitehall and Hopkinton flowed through Nos. 2 and 1 until in 1927 Whitehall and Hopkinton were diverted into Sudbury Reservoir and Ashland into Sudbury Aqueduct, and water from Nos. 2 and 1 no longer used. The supply is chlorinated at the intake to Sudbury Aqueduct, on the Weston Aqueduct at Weston Distributing Reservoir, and at Chestnut Hill and Spot Pond pumping stations.

The extension of the sources of supply to Ware and Swift rivers was commenced by the Metropolitan District Water Supply Commission late in 1926. Quabbin Reservoir is being constructed in the Swift River valley, principally in the towns of Enfield and Greenwich, with a storage capacity of 415 billion gallons, six times that of Wachusett Reservoir. The total shore line will be over 175 miles long, including over 100 islands. About 39 square miles will be flooded, 18 miles long and of 150 feet maximum depth. The water will flow by gravity to Wachusett Reservoir through Quabbin Aqueduct, a 24.6 mile tunnel through solid rock, twice as long as the Simplon Tunnel under the Alps. This tunnel passes directly beneath the Ware River at Coldbrook in the town of Barre, and since completion of the Intake Works in March, 1931, flood flows from the Ware River have been dropped into the tunnel and diverted about 13 miles easterly to Wachusett Reservoir, to an extent limited by the present storage capacity. They will also be diverted westerly into Quabbin Reservoir upon its completion. Two earth dams are now under construction to impound the waters of Quabbin Reservoir. At the main dam, a stream control tunnel diverts the Swift River past the site, a caisson core wall has been constructed 125 feet deep from the original river bed to sound ledge, and the embankment has been started. The finished dam will be 2640 feet long and 170 feet above the river bed. At the second dam, or dike so-called, a caisson core wall 129 feet deep from brook bed to sound ledge has been completed, and the main embankment is being constructed by the method of hydraulic sluicing. It will be 2140 feet long and 135 feet above the brook bed.

Twenty-six miles of relocated State Highway have been completed to replace existing highways in the reservoir area, and additional mileage is under construction. The high tension transmission line of the New England Power Company crossing the reservoir site has also been relocated. Sixteen miles of the Athol Branch of the Boston & Albany Railroad were located in the area to be flooded and the tracks have been removed for the entire distance between the Main Dam and Athol. A new cemetery, Quabbin Park Cemetery, has been completed in the town of Ware, below the dike site, in which more than 5000 bodies buried in the area affected by Quabbin Reservoir are being reinterred. Work has been started on clearing the entire area to be flooded. The completion of the reservoir will necessitate relocation of boundaries of 6 towns and 3 counties, eliminating the towns of Enfield, Greenwich and Prescott.

No. Z-15

FOUNDATIONS AND EMBANKMENTS OF QUABBIN DAMS  
 Stanley M. Dore, Associate Civil Engineer  
 Metropolitan District Water Supply Commission, Boston, Mass.

Introduction. Quabbin Reservoir (415 billion gallons capacity) is now being constructed by the Massachusetts Metropolitan District Water Supply Commission in the valley of the Swift River to serve as part of an addition to the water supply of metropolitan Boston. (For more complete descriptions of the entire project see "Boston Metropolitan Water Supply Extension" by Karl R. Kennison in Journal of the New England Water Works Association, Vol. XLVIII No. 2, "Boston's New Water Supply" by Frank E. Winsor in the June 1934 edition of "Civil Engineering", and "Design and Progress on Construction of Dams for Quabbin Reservoir", by Stanley M. Dore in July 1935 edition of Journal of Boston Society of Civil Engineers.) The storage basin is formed by the construction of two earth dams; one, called the Main Dam, containing over 4,000,000 cubic yards of embankment above the original surface, and the other, called the Dike, containing about 2,500,000 cubic yards, the former being 2,640 feet long and the latter 2,140. These dams are 170 feet and 135 feet high respectively above the original surface. The foundations for them are wide basin-shaped rock valleys, which are generally smooth and sound and are filled to depths of about 125 feet in each case with porous glacial materials consisting mainly of hard, durable sands and gravels which are structurally strong, firm, and stable enough in each case to support the weight