lime added to the weight of the cement was used. The entire inside perimeter of the standpipe is plastered with ½ in. of cement mortar mixed 1:1, with 2 per cent. of Medusa Compound added to the weight of cement. The plaster to a height of 30 ft. is painted with waterproofing compound.

Forms were constructed in three sections, the lower section being transferred to the top each day, one day's work consisting of one lift or section of 30 ins.; in one instance, however, two lifts were placed in one day.

Horizontal steel bars or hoops varying in size from 1¾ ins. to ¾ in. were held in place by 14 latticed steel columns.

The tank is roofed with a Gustavino dome, outer covering of which is plastic slate. Dome has a rise of 8 ft. The standpipe was designed and built by Simpson Bros. Corporation, Boston, Mass.; contract price, $19,288. There have been no items of repair or maintenance since the work was completed.

There is more or less seepage apparent at times, which shows at joints or where one day's work ends and another begins. Many places where seepage has occurred in the past are now entirely free from it, which leads us to believe that the structure is improving with age.

We are well pleased with the standpipe and consider it as near an approach to a permanent structure as it is possible to obtain. We feel, however, that if we had made the placing of concrete continuous, or nearly so, we would have eliminated the cause of seepage. Instead of depreciation, as is the case when other materials are used in similar structures, we consider that this one is improving. As stated above, there has been no item of maintenance to date, and there is every reason to indicate that this item is practically eliminated.

Topsham, Me.—Mr. Chas. L. Bowker described the design and construction of the Topsham standpipe as follows:—

The Topsham standpipe of the Brunswick and Topsham Water District is 97 ft. inside diameter, with a conical bottom, the incline from the bottom to the beginning of the wall being 3.25 ft. rise in 10 ft. The foundation rests on solid ledge and was filled with rubble masonry laid in Portland cement mortar. The wall at the base is 3 ft. thick, and at the top 16 ins. The water line is 46.25 ft. from the floor; 18 ins. more to the roof. The roof is a concrete slab 7 ins. thick, sloping ½ in. to the foot, supported by nine concrete piers, eight of which are 18 ins. in diameter, and the ninth, having an 8-in. overflow pipe embedded in the concrete, is 24 ins. in diameter. The top of each pier is cone shaped, the top being 5½ ft. in diameter and having a rise of 24 ins. An iron ladder is fastened to the outside of the wall. There is no ladder inside, neither is there a manhole in the wall. The 16-in. intake pipe is embedded in concrete and is elevated 12 ins. above the floor. There is an 8-in. flush pipe connected in the gatehouse with the 8-in. overflow, operated by opening an 8-in. gate, and the opening of this pipe is about an inch below the floor of the standpipe. There is a ventilator at the peak of the roof, with four ports, and numerous 4-in. holes for ventilation in the wall, close to the roof. All openings are screened.

In the construction of the standpipe particular care was taken to remove all loose rock under the foundation. In the centre, considerable blasting was done. The bottom of the standpipe was built in two layers, each 6 ins. in thickness, after first levelling to the proper grade, the second layer being reinforced with ½-in. round iron. The floor was troweled to a smooth surface, the finishing coat being cement mortar, 1:2 mixture, with the addition of 5 per cent. of hydrated lime, the same amount of lime also being added in the second layer of concrete.

The wall was reinforced horizontally with iron rods of various diameters, from 1¼ ins. at the base to ¾ in. near the top, supported on lattice work which was built into the wall. The proportion of the concrete mixture for the wall was 1:2:3.5, with 5 per cent. of hydrated lime. A "T" iron, 6 ins. by 12 ins., was built in the foot of the wall, circling the standpipe, reinforcing rods anchoring this to the floor of the standpipe.

TABLE I.—Data on Reinforced Concrete Standpipes.

Location.	Inside Diam. in Feet.	Height of Tank in Feet (Shell).	Capacity in Thousand Gallons.	Date Constructed.	Total Cost.
Little Falls, N.J.[1]	10	43	25	1899	
Milford, Ohio	14	81	93	1903	
Fort Revere, Hull, Mass.[2]	20	50	118	1903	$4,000[3]
Attleboro, Mass.	50	102	1,500	1904	35,000
Waltham, Mass.	100	37	2,000	1906	26,000
Bondsville, Mass.	70	20	576	1908	
Empalme, Senora, Mex.	30	90	475	1908	
New Haven, Conn.	50	25	375	1908	
Lenoir, N.C.			500	1908	
Bridgewater, Mass.	30	78	413	1909	
Manchester, Mass.	50	72	1,060	1909	30,291
Lisbon Falls, Me.	50	62	911	1909	19,288
Westerly, R.I.	40	70	650	1910	18,722
Rockland, Mass.	46	104	1,300	1910	36,300
Cherry Valley, Mass.	40	21′ 4″	195	1910	4,976[4]
Rochdale, Mass.	40	21′ 4″	195	1910	4,976[4]
Kensington, Conn.	50	21	300	1910	5,100[5]
Niagara Falls, Ont.	75	71¼		1911	
Key West, Fla.	78	40	1,500	1911	24,950[6]
Laconia, N.H.	28	46′ 1″	200	1911	6,575[7]
Brockton, Mass.	160 each	26′ 6″	3,760 each	1911	82,200[8]
Western, Mass.[9]	50	38	441	1911	6,706[4]
Waverley, Ohio	16	82	120	1911	4,500
Ashland, Mass.	40	32′ 2″	298	1911	5,810[4]
Northbridge, Mass.	25	28	90	1911	2,899[4]
Suffern, N.Y.	69	20′ 6″[10]	559	1911	6,500
Berlin, Ont.	50	41	600	1912	23,500
Lexington, Mass.	30	104′ 6″	550	1912	19,900
Belton, Tex.	24	75	254	1912	6,000
Winchester, Mass.	29	43′ 6″	200	1912	8,000
Penetanguishene, Ont., Can.	50	21	300	1912	
Austin, Minn.	40	29′ 8″	300	1912	
Topsham, Me.	97	47′ 9″	2,500	1913	38,000
Fulton, N.Y.	40	100′ 4″	940	1913	24,335
San Francisco, Cal.	60	35′ 10″	750	1913	
St. Louis, Mo.	153′ 6″[11]	33	4,250	1913	51,850
Chelmsford, Mass.	40	20	188	1913	5,180[4]
West Falmouth, Mass.	30	45	238	1913	9,800[4]
Woonsocket, R.I.	79	45	1,600	1913	23,514[4]
Sioux City, Ind.	142	33′ 1″		1913	
Duxbury, Mass.	40	35	328	1914	7,115[4]
Webster, Mass.[12]	46	20	249	1914	5,260
Jamestown, R.I.	35	50	350	1914	10,010[4]
Halifax, N.S.	160	29	3,250	1914	56,000

[1] Inside filter house. [2] Inside concrete, brick tower. [3] Excluding tower. [4] Contract price. [5] Construction only. [6] Including roof, $5,000. [7] Excluding foundation. [8] Two tanks, cost of both. [9] Partly below ground surface. [10] Lower half is constructed below ground. Earth backing for retaining wall. [11] At top, 23′; below top diameter = 151′ 6″. [12] Protected by earth bank.

The method of building the wall was by placing the concrete in movable forms, the forms being held in place by bolting one section to the next, depending on the bolts entirely to hold the outside forms in place. An elevator