

that was nearly level, so that there were about 11,500 cubic yards of excavation, and the last 2 feet were so hard as to almost resist the pick.

The walls were 12 feet deep, 6 feet wide at the bottom and 3 feet at the top; they were constructed of rubble masonry, laid in hydraulic cement. The masonry was composed of sound, well shaped and durable stone, found in the vicinity of Penn Yan. No stone was less than 5 inches nor more than 12 inches in thickness. They were laid in full beds of hydraulic cement mortar, composed of one part by measure of freshly burned Rosendale cement, mixed dry with 2 parts of clean sharp sand; afterwards, enough water was added to make the mortar work freely under the trowel, and into all interstices between the stones. The faces of the walls were made true and even by flushing and pointing the joints with mortar.

A bed of hydraulic cement concrete, 1 foot in thickness, was laid on the bottom of the reservoir, and extended 1 foot outside the walls all around, and under the gate chamber it had a depth of 2 feet. The concrete was made of 1 measure of hydraulic cement and 2 of clean, sharp sand, mixed dry, and then just enough water added to make a mortar.

Broken stones, small enough to pass through a ring 2 inches in diameter, free from dust and dirt, were incorporated with the mortar so as to give a surplus of mortar when rammed—the proportion not to exceed 1 of mortar to $2\frac{1}{2}$ of broken stone, the concrete was laid in layers of 6 inches, and was expeditiously rammed and compacted.

The interior surfaces of the walls were plastered to a thickness of 1 inch from bottom to top with Portland cement mortar, composed of 1 part by measure of the best imported Portland cement and 1 part of clean, sharp sand.

The soil of Penn Yan is a sandy loam, so that no rock or hard pan was encountered.

There were 27,500 lineal feet of 4 inch pipe, 17,300 lineal feet of 6 inch pipe, 5,400 lineal feet of 8 inch pipe, 3,000 lineal feet of 10 inch pipe, 7,500 lineal feet of 12 inch pipe, making a total length of 11.5 miles.

The weights per running foot of the cast-iron pipe, including hubs and spigots, were as follows:—

150 net tons	4 in.	c. i. pipe,	20 lbs. per ft.
170 "	" 4 "	" "	22 " " "
140 "	" 6 "	" "	30 " " "
100 "	" 6 "	" "	33 " " "
90 "	" 8 "	" "	43 " " "
120 "	" 10 "	" "	65 " " "
185 "	" 12 "	" "	75 " " "

There were also 15 net tons special castings, 85 double nozzle, 4 in. fire hydrants, 5 double nozzle fire hydrants, 6 in. connection, 10 three way fire hydrants with secondary gate, 6 in. connection.

41—	4 in.	gate valves.
38—	6 "	" "
15—	8 "	" "
9—	10 "	" "
8—	12 "	" "

111 gate boxes and stones.

The engines were built by Worthington; there are two of them, capacity 750,000 gallons per day. Non-condensing engines were used because, from all the figures attainable, there did not seem to be sufficient saving of fuel to warrant the additional cost of condensing engines. In larger sized engines there is of course no question about the advantage and economy of using condensers.

There are two boilers made by Aimes.

The assessed value of Penn Yan, \$1,800,000. The commissioners purposely avoided having a sinking fund, as they did not wish to have