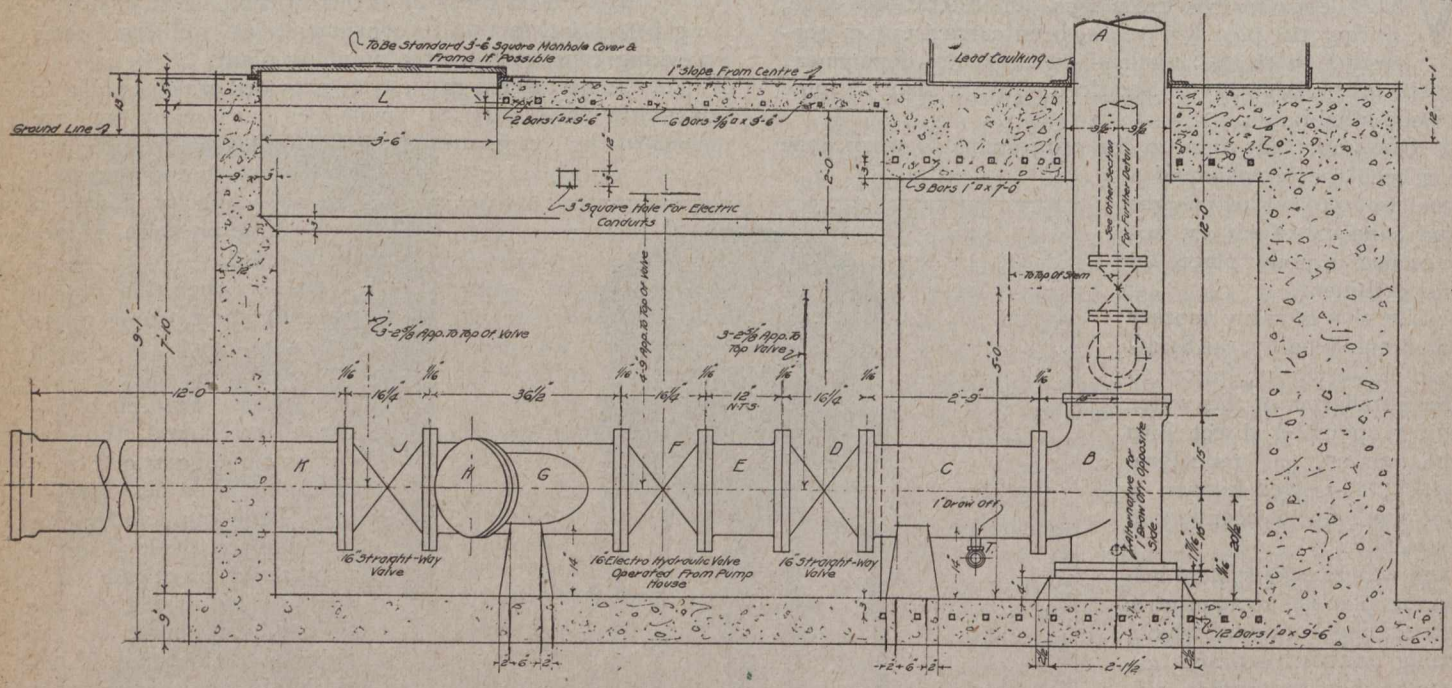
Since the cost of an elevated tank increases more rapidly than its height from the ground, it was evident that the site to be chosen for its location should be as high as possible, so that the actual height of the supporting structure should be a minimum; it was seen also that there would be advantage in having the tank fairly close to the pumping station.

Fortunately, quite near to the station is some rising ground, the summit of which is about 30 feet higher than the station itself and above most of the surrounding terrain.

It was therefore decided to locate the proposed stand-pipe or elevated tank at this spot and, as by this time it had been practically settled that 80 lbs. would be a suitable maximum pressure to be maintained, it was arranged that the actual elevation of the highest water level, when the tank was full, should be $(80 \times 2.31) - 30 = 155$ feet.

Very careful consideration was given to all of these—eleven in all—in order that their relative merits, both as to engineering features and price, might be properly appraised on an equitable basis. The tender of the Canadian Chicago Bridge and Iron Co., Limited, of Bridgeburg, Ont., was the one accepted.

The specifications called for the supply, delivery and erection of one circular steel tank of 500,000 Imperial gallons capacity, elevated on a steel tower so that the level of the water when the tank was full would be 155 feet above the ground at the base of the tower. The diameter of the tank is 54 feet and its depth 39 feet 9 inches; the bottom is elliptical, of such shape that expansion and contraction of the riser drum is effectually taken care of without an expansion joint. This bottom, being much shallower than a hemispherical one, also has the effect of appreciably raising the mean water-level.



Vertical Section Through Valve Chamber and Foundation for Riser Drum

A, length of c.i. bell and spigot pipe; B, special c.i. single sweep tee with blind flange; C, special length c.i. 16" pipe, flanged; D, 16" straightway non-rising stem gate valve; E, same as C; F, 16" electro-hydraulic valve; G, standard 16 x 16 x 12 c.i. Y piece, flanged; H, standard 12" c.i. blind flange; J, same as D; K, length of c.i. 16" pipe, flange and bell; L, manhole frame and cover, 3 ft. 6 ins. square; T, 1" brass angle valve, screwed ends.

The relative merits of stand-pipes and elevated tanks were considered; and since, in the former, a good deal of the water is practically useless owing to the pressure being too low, while the structure to support it must be provided just as in the case of an elevated tank, attention was concentrated on the latter.

The question of capacity was gone into and, after approximate prices on various sizes of tanks had been obtained, it was decided that storage for 500,000 Imperial gallons should be provided, partly because this quantity would be sufficient to meet requirements for some considerable time to come, and partly because the cost of the smaller sizes, per gallon, was found to be much higher than for the larger.

The four primary items of location, height, type of structure (*i.e.*, whether stand-pipe or elevated tank) and capacity having been settled, the question of steel versus reinforced concrete was raised.

Specifications for an elevated water tank were prepared and tenders were invited on both steel and reinforced concrete structures.

The supporting structure consists of eight legs built up of 14-inch "H" section columns with the necessary braces and stays.

The riser drum is of steel and is 6 feet in diameter; the idea of having one of such large size being to obviate the necessity of using any frost casing.

In connection with this large riser drum it was realized that at the bottom of the tank there would be an opening 6 feet in diameter with a sheer drop of some 115 feet down the riser drum to the ground and that this would constitute a serious danger to any workmen who, in repairing or cleaning the tank, might have the misfortune to lose his balance; it was therefore specified that this opening should be protected with a suitable iron grating.

In order that the riser drum might be conveniently connected to the water mains running out from the pumping station the specifications required a 16-inch pipe to be set vertically in the bottom plate of the drum, with an elbow at its lower end; this pipe extends about 5 feet into the drum so that sediment can settle around it at the bottom, a manhole being provided in the riser so that cleaning out may be readily done when required.