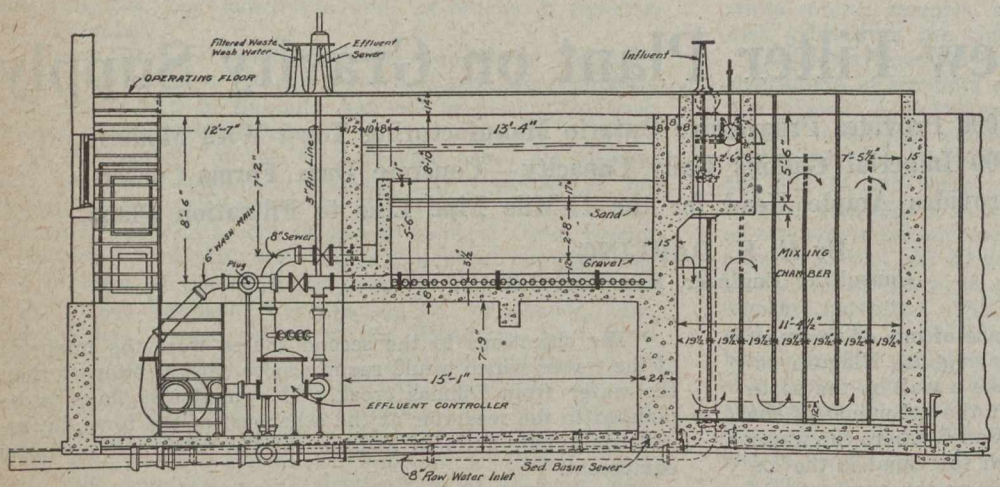
The original purpose of the dam was to give the necessary head to carry the water through the pipe line over the brow. It is 23 ft. high from the creek bed to the bridge floor and 100 ft. long over all. The crest is 17 ft. 6 ins. from the bed, and provision is made for stop logs by means of which the crest may be raised 3 ft. 6 ins. in the future. The banks and bed of the creek are limestone shale which was blasted



LONGITUDINAL SECTION THROUGH PART OF FILTER BUILDING

out for a depth of one to two feet for the foundation of the dam. It formed an ideal site and no trouble whatever was encountered in construction. The spring freshet of a year ago, which was unusually high and carried ice 18 ins. to 2 ft. thick, took out three other dams on the creek but this dam came through safely, although the water at one time reached a height of five feet above the crest. Under ordinary circumstances the flood rarely reaches a height of 3 ft.

The supply pipe line is 12 ins. diameter for a distance of 500 ft., 8 ins. for 8,000 ft. to the brow of the escarpment, and 6 ins. from there to the reservoir. The grade of this 6-in. pipe is about 10%, the total drop to the reservoir being 200 ft., and the water flows down it as in an open channel and not under pressure.

The sill of the sluice gate of the dam is 10 ft. above the high point of the supply pipe line at the brow of the escarpment, which is just sufficient head to give a flow of about 400,000 gals. a day under present conditions. With sluice closed by stop logs, a head of 20 ft. 6 ins. is obtained, and the flow is increased to over 1,000,000 gals. a day. When the present pipe becomes inadequate to meet the demand, it will be rebuilt as occasion requires.

With the steady growth of population and manufacturing, the old filter plant of 250,000 gals. daily capacity became altogether inadequate, and its efficiency dropped so low in the fall of 1916 that the Provincial Board of Health insisted upon conditions being remedied despite war-time prices. In the meantime, as a safe-guard, a Wallace and Tiernan chlorinating apparatus was installed to treat the water after passing the old filter.

The commission favored a scheme for a sedimentation basin and filter having a capacity of one million Imperial gallons a day, and designs were worked up on this basis. This would have involved the building of a sedimentation basin to hold 170,000 gals., and alterations and additions to the old filter to increase its capacity to 900,000 gallons a day. When this filter capacity became inadequate, a new filter could be built equal to the capacity of the sedimentation basin.

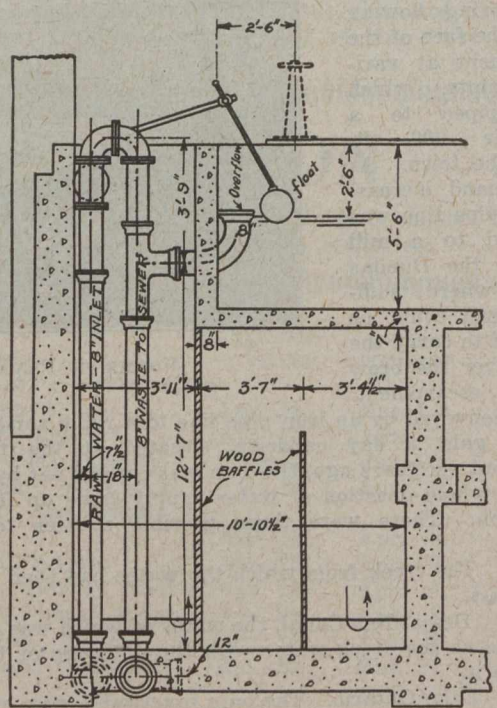
The cost, however, of this work, together with the difficulty of securing a suitable site at a reasonable figure, lead to a reconsideration of the scheme. It was finally decided to build an entirely new plant which would be a complete unit in itself and to which additional units could be added as required. The capacity of the unit was fixed at 700,000 gals. a day, which would probably meet all requirements for several years and yet would work in with a larger scheme without any part of it having to be scrapped.

The new filter is located close to the western edge of the old reservoir, which is utilized as a clear-water basin. A connection is also provided for running the filtered water directly into the town main if desired. This connection, together with the extension of the raw water pipe and the wash water drain for a distance of 270 ft. to connect with the new filter, was all the new piping required.

The new work had to be built on the side of the clay fill which forms the embankment of the reservoir. It was therefore necessary to drive piling to ensure a safe foundation; so 30-ft. piles were driven "to refusal" at 3 ft. centres under all walls.

In order to obtain the necessary head to operate, the sedimentation basin had to be built two-thirds out of the ground, as shown by the accompanying cross-section, and as a protection against frost it is enclosed in a 9-in. brick wall, leaving an air space which is broken up vertically at intervals to stop air circulation.

For this reason, and because available room was limited, the whole work was designed in reinforced concrete. The sedimentation basin proper, which is the most interesting part of the reinforced concrete design, is 16 ft. deep, 22 ft. wide and 60 ft. long, inside measurements, and is divided into two compartments by a longitudinal wall. This long, narrow shape is not usually the most economical to construct, but it gives a splendid section for sedimentation purposes; and the limitations of the site, having in view the unit principal, left no option in this particular.



PART SECTION THROUGH MIXING CHAMBER, SHOWING RAW WATER INLET AND CONTROL VALVE

The problem of reinforcing these long vertical walls against hydraulic pressure was worked out as indicated by the accompanying cross-section. Horizontal ties were provided at the top of the basin and at a point about one-third from the bottom. These ties act as abutments for