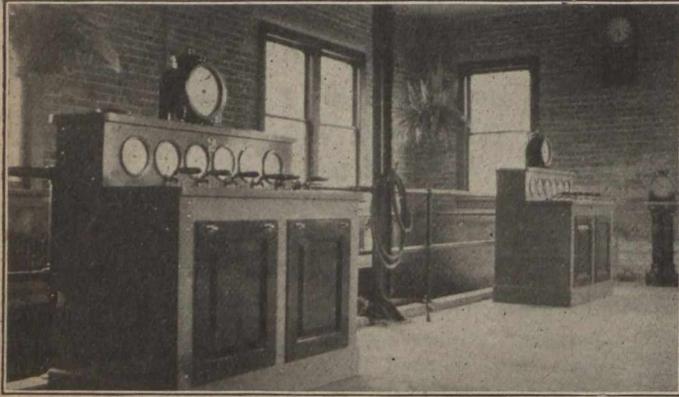


The low-lift pumps take the water from the present suction well and pump same to the inlet chamber of the sedimentation or coagulating basins, the latter being two in number and located at the rear of the filters. These sedimentation basins are provided for the preliminary settling and treatment of the raw water prior to its passing on to the filter beds, and normally will remove from 60 to 65 per cent. of the mud and sediment, it being quite common when cleaning these basins to find three to four



Operating Tables on One Side of Plant

feet thickness of mud in the bottoms of same. Two basins are provided so that one may always be in service when the other is being cleaned; cleaning generally being required every two to five months, depending upon the condition of the raw water. The time required for cleaning, however, is but six to eight hours so each basin is provided with two large blow-off valves, together with flushing lines for hose connections.

The two sedimentation basins have a combined capacity of 500,000 gallons, so that all water passing through these basins normally have a period of four hours settlement before passing on to the filters, the advantage of this longer period of settlement being not only to settle a greater quantity of mud out of the water, but also requiring the use of less coagulant, this resulting in a great saving in the cost of operation.

Coagulation and Sedimentation

As the water passes to the sedimentation basins, a minute quantity of sulphate of alumina as a coagulant is added. The coagulant, as soon as it comes in contact with the natural alkalinity in the raw water, forms a harmless snowlike substance called hydrate of alumina, the most of which, being heavier than water, settles to the bottom of the sedimentation basins, and as it settles collects much of the mud and other impurities in the water, thus aiding in the clarifying of the water. It is desired, however, to have a small portion of the hydrate pass on to the filter with the treated water, where it settles on top of the sand bed, forming a jelly-like coating and together with the sand removes the remainder of the turbidity, and provides a water practically free from bacteria.

In order to insure the full settling capacity of the sedimentation basins, a stilling or diverting wall is placed entirely across these basins at the inlet end, a similar stilling wall being placed at the outlet end, the object of these walls being not only to provide a thorough mixing of the coagulant with the raw water as it enters the basins, but also to insure a lateral distribution of the water across the full width of the basin. Each basin is furnished with sloping floors to facilitate cleaning, an

overflow chamber with connection to sewer also being furnished for emergency purposes.

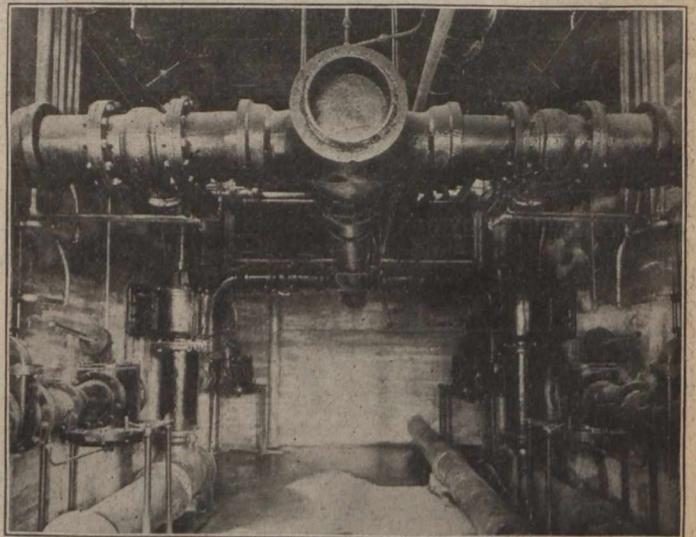
The sedimentation basins occupy a plot about ninety feet square, the depth of water in the basins being about twelve and a half feet. The two basins are constructed entirely of reinforced concrete, the basins also being decked or roofed over with concrete, which in turn is covered with earth as a protection against freezing.

Four Filter Beds

After the settling and treatment in the sedimentation basins, the water flows by gravity on to the filter beds, four in number, and each with a normal capacity of 750,000 gallons daily, or a total of 3,000,000 gallons every twenty-four hours. The filters are arranged in pairs, two on each side of a central operating floor, the valves and other controlling apparatus being located in a pipe gallery underneath this floor. The operating floor as well as the front ends of the four filters are housed over by a brick building, affording ready inspection of the filters at all times, especially desirable when cleaning same. The filters are of the gravity type, each approximately fifteen feet wide by twenty-one feet long, and about seven feet deep. Underneath the four filters and the central pipe gallery is located a reservoir or clear well for receiving the filtered water from the filters and temporarily storing same.

In the bottom of each of the filters, and placed directly on the floor thereof, is located the filter strainer or collecting system. This strainer system is covered by a layer of filter gravel approximately eighteen inches in depth, the gravel in time being covered by the filter sand, a specially selected and uniformly graded material, the depth of sand being about thirty inches.

The strainer system is formed of a grid or manifold of small cast iron pipes, placed at about six-inch centres, and with small bronze strainers located on the under side of the pipes on about 6-inch centres, these strainers form-



Pipe Gallery

ing the collectors for the filtered water after it has passed through the sand and gravel. The strainer pipes or laterals are all connected to larger pipes called manifold headers, which in turn are connected with the outlet or discharge piping leading to the controlling mechanism in the pipe gallery.

On the discharge or filtered water outlet pipe of each of the filters is placed an automatic controlling valve