

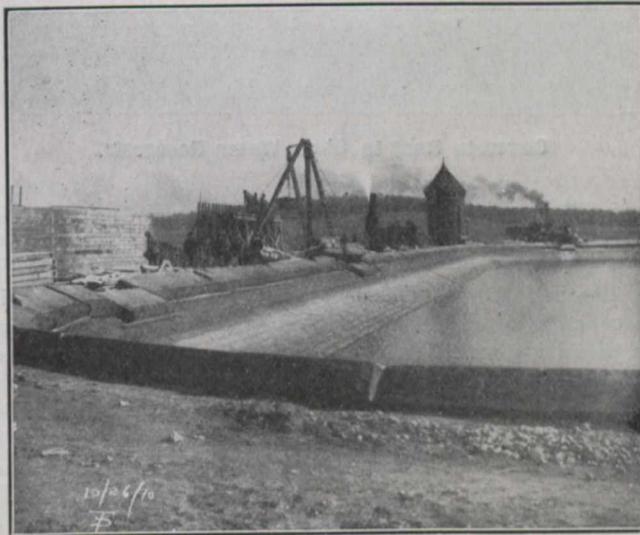
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MINNEAPOLIS MECHANICAL WATER FILTRATION SCHEME.

The city of Minneapolis, Minn., U.S.A., is constructing a large mechanical water filtration scheme at Columbia Heights, Onoka county, Minn., that will cost in the neighborhood of one and a half million dollars. The situation of the plant on Columbia Heights will give the city a water pressure by gravitation of about 90 pounds per sq. inch.

The water is pumped up to the reservoirs from the Mississippi river by an eighty million gallon pump at the north pumping station through a sixty-inch main for seven miles.



North Wall to Settling Reservoir.

The big valves are controlled from the gate houses. Small cylindrical structures of red stone with tile roofs of a lighter shade of red that gives an ornamental touch to the layout.

The method of filtration is as follows: The water will first flow into the raw water reservoir, and receive part of the chemical treatment. It will then pass through the sixty-inch main at intake to controlling chamber No. 1 to the mixing chamber, flowing against long wooden baffles, through controlling chamber No. 2 into the coagulating basins, from thence into the filter beds. The filter beds are rectangular boxes 28 ft. by 53 ft. A thirty-inch layer of sand at the top is supported by three layers of gravel, increasing in coarseness down to the strainer plates beneath.

The water is forced through these filters and passes through a controller to the clear water basins, absolutely safe, and clear as crystal. The filters are also fitted with automatic controlling valves, so that when they become dirty the water is forced up with great rapidity, the top brass screens serving to keep the gravel and sand down. The sediment is then carried away by the wash water drain.

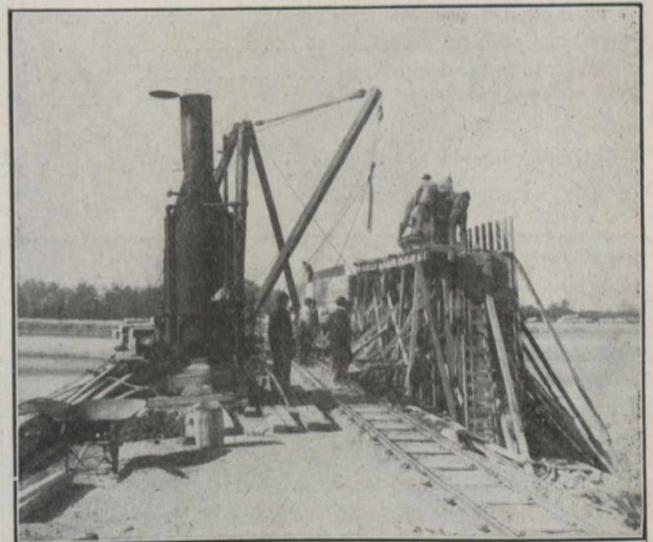
The chemicals used are as follows, sulphate of alumina, two grains per gallon to take out the sediment and collect

the organic matter; hypo-chloride, to kill germ life; alum and lime, to assist in the coagulation process, for, when combined, these chemicals make the soluble, insoluble matter suspended in space. It is sometimes necessary to add material to the water, when clear, to assist in coagulating.

This matter, dead germicidal, vegetable, color and other impurities, together with the chemicals that have been used in this purifying process, is collected by the sand filters and entirely eliminated from the water. The whole of the system is fitted with Venturi meters, which measure the quantity of purifying materials for the quantity of water passing through the valves.

The layout of the plant is as follows: The raw and clear water basins are two immense concrete shells, each half a mile in circumference, and having a capacity of 122 million gallons. The raw water or receiving basin is the old reservoir. Its walls have been built ten feet higher to give head to the plant. These additions have increased the dimensions forty feet each way.

The clear reservoir is an immense covered dish, supposed to be the largest covered clear water reservoir in the world. The dimensions are 900 ft. long, 413 ft. wide, 24 ft. deep, having a capacity of 47 million gallons. The roof is



Heavy Wall Between Reservoirs.

supported by 960 concrete columns, and these columns from a pedestal base of 6 ft. by 6 ft. at 18 ft. centres. The roof is of the groin arch construction and the forms for these are made in sections of four to the bay. These sectional forms have been taken down after ten days and used twenty times with little expense as to repairs. This works out as the cheapest method for groin arch form work. The groins cost per set of four to construct, \$50; but when used twenty times