

(14) Two 6,000,000 gallons pumping units	\$30,000 00
(15) Extension Pumping Station, and foundation for machinery	20,000 00
(16) Reconstruction Pump Wells and connections	10,000 00
(17) Contingencies	6,000 00
(18) Engineering and superintendence	4,000 00
Total	\$70,000 00

Plunger pumps geared to motors would be more efficient than turbine pumps, but the first cost would be materially higher, and this would occupy more floor space.

It is quite probable that you will find it advisable to periodically replace the impellers with new ones, as it has been demonstrated by experience that the efficiency of a turbine pump falls away with use, owing to wearing and pitting of impellers.

Force Mains. The existing force mains, three in number, are of sufficient capacity to convey to the City the present maximum consumption without subjecting them to pressures exceeding the safety limit. As the population increases the demand for water will increase proportionately, and this will increase the pressures, not only on the mains but on the machinery, if the present reservoir be maintained in the City.

If for any reason the 30-inch force main should be out of commission, the extra pressure necessary to force the supply through the two old force mains might cause their failure.

As a matter of insurance against accident to the existing mains, and to meet the immediate demands which will be called upon by the time the new main can be constructed, we would recommend that a 36-inch force main be laid from the Beach Pumping Station westerly along the Beach Road to Ottawa street, thence southerly along Ottawa street to Barton street, at which point a cross connection should be made with the existing 30-inch force main.

The proposed new main, laid along an independent route more or less remote from the existing main, will ensure a proper service if one or more of the present mains were broken, or seriously damaged, necessitating the use of the remaining two mains at present built. There is always a possibility of one of these mains on the pipe line bursting and creating such an excavation as to put the other two mains out of commission. For this reason we have recommended the proposed route mentioned above.

At Barton street the new main may be reduced to 30 inches, and continued at this diameter along Ottawa street to Cannon street, thence westerly along Cannon, Senator and Wilson streets to Catherine street.

From Wilson street the force main should be continued as a 24-inch pipe on Catherine street to Charlton avenue, thence easterly along Charlton avenue to Ferguson Avenue Pumping Station, and westerly to a connection with the existing 20-inch main on James street leading to the James Street Reservoir.

This proposed new force main, with branches to James Street Reservoir and the Ferguson Avenue Station, would immediately decrease the