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REPAIRING A SUBMERGED WATER MAIN

SOME NOTES ON THE EDMONTON WATER SUPPLY SYSTEM AND ON THE REPAIR OF A SUBMERGED PIPE SECTION BY A UNIQUE AND EXPEDITIOUS METHOD.

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THE present domestic water supply for Edmonton is taken from the North Saskatchewan River, which flows through the city. It is subjected to sedimentation, mechanical filtration and sterilization before being pumped into the distributing mains. Prior to 1912 the portion of the city lying to the south of the river was known as Strathcona, and that to the north as Edmonton, but in that year both municipalities amalgamated, assuming the name of the latter city. Before the amalgamation, each municipality had its own pumping plant. Subsequently, the one on the south side was discontinued, and that on the north, being the larger and better equipped, was extended. It, in conjunction with increased filtration capacity, now supplies the entire city. The fact of the pumping and filtration plants being situated on the north side necessitates the supply for the south side being conveyed across the river, this being accomplished by means of two parallel, 20-inch diameter, cast-iron, submerged mains. These mains were laid following the amalgamation, and the execution of the work presented no unusual engineering features. Similar submerged mains are to be found at many points on the North American continent, and engineers are familiar with the recognized methods of construction from articles which have appeared from time to time in the technical journals.

It has already been observed in these columns that the Saskatchewan River flows through a deep ravine,* the bed of which is approximately 200 feet below the tableland on which the principal parts of the city stand. The pumping plant is situated on flats on the north bank, at a level intermediate between the river bed and the tableland. While the normal pressure in the mains on the tableland is about 45 lbs.; in those on the flats it is much higher, and particularly in the submerged mains above referred to, where it is as high as 135 lbs. If necessary, these pressures can be raised to 75 lbs. and 165 lbs. respectively to cope with an exceptional fire, but as a rule any pressure above the normal required for fire purposes is supplied by the movable equipment of the fire brigade.

Strictly speaking, one line of 20-inch diameter pipe would have been ample for all the needs of the south side district, but the city commissioners, on the advice of their engineers, sanctioned the construction of the double line,

it being their opinion that, with such a provision, the possibility of any prolonged interruption to the supply would be practically eliminated. Subsequent events proved that such a margin of safety was not only advisable but necessary.

At various stages in the progress of the work, tests were applied to the mains and satisfactory results secured,

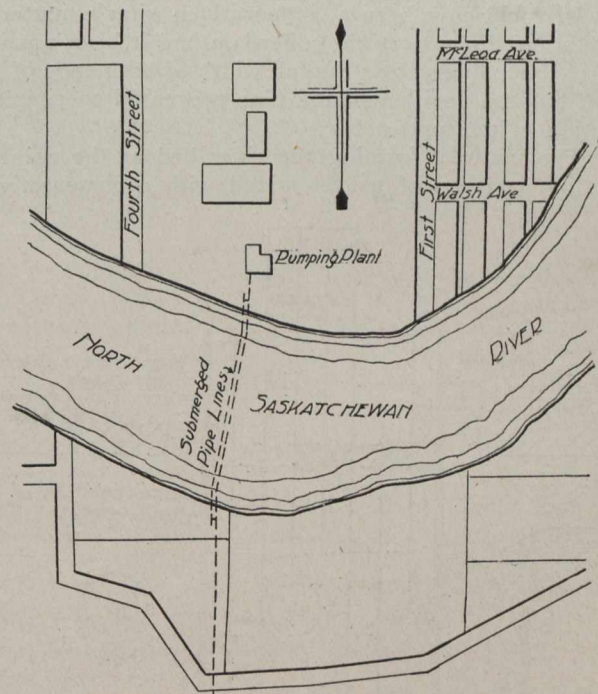


Fig. 1.—Section of Edmonton System of Water Supply, Showing Location of Two 20-inch C.I. Submerged Mains.

but after they were lowered into position and all contingent works completed, the final test under a pressure of 180 lbs. was applied, when the gauge unexpectedly dropped, and it became apparent that a serious leakage had developed in one of the lines. Investigation revealed the fact that one 12-foot length of pipe had burst during the application of the test, the fracture being about 4 feet long and extending from a point within a few inches of one flange, in a direction parallel to the longitudinal axis of the pipe. The location of the failure on the submerged line was about 120 feet from the south bank.

*The reader is referred to an article descriptive of the Edmonton Viaduct of the Canadian Pacific Railway, published in *The Canadian Engineer* for September 9th, 1915.