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Canadian Society of Civil Engineers.

INCORPORATED 1887.

TRANSACTIONS.

N.B.—This Society, as a body, does not hold itself responsible for the facts and opinions stated in any of its publications.

PENN YAN (N.Y.) WATERWORKS.

By Angus Smith, Stud. Can. Soc. C.E.

(To be read Thursday, 13th February, 1896.)

Penn Yan has a population of about 5,000. It is situated at the outlet of Lake Kenka in the western part of New York State, about 50 miles southeast from Rochester.

Lake Kenka is long and narrow, being about 20 miles long by ½ a mile wide, and it is very deep. It is from this lake that Penn Yan takes its water for fire and domestic purposes. At a distance of one mile up the lake from Penn Yan, the banks rise quite rapidly, so that it was easy to get a suitable place for a reservoir at a short distance from the lake, and at an elevation that would give good pressure for fire purposes.

At a distance of about 1½ miles up the lake from the town, it was decided to build a pump house on the shore, and extend an intake pipe out into the lake 550 feet, also to build a reservoir back 1800 feet from the shore and at an elevation of 320 feet above the surface of the lake.

Surveys, plans, specifications and estimates were made by the Engineer, estimating the entire cost for pumps, pump-house, reservoir, trenching, pipes, hydrants, etc., the whole system complete, to cost $60,000, which it did before completed.

The reservoir was located at such an elevation that ample pressure (90 lbs.) could be obtained in the higher parts of the town, for the town was built on an incline, as is shown by the contour lines in the plan.

The capacity of the reservoir was 1,000,000 gallons, which it was computed (in case of accident to the pumps) could be delivered to the centre of the town through the 12 inch pipe in 5 hours; this computation was made from the formulae

$$q = av = 0{\cdot}7854\ d^2 \sqrt{\frac{2gh}{1{\cdot}5 + f\frac{l}{d}}}$$

A 6 inch overflow pipe was put in the reservoir 2 feet from the top of wall, and conveyed the water 75 feet from the reservoir. This pipe was computed to carry off 850,000 gals. daily before the water would overflow the walls.

The following are some of the specifications:—The trenches were 5 feet deep, and, where possible, made in a straight line, were kept dry and made wide enough that the laying and caulking could be properly done, care being taken not to injure gas, water, or sewer pipes already laid.

The boxes for stop gates were placed vertically over and around the top of the gate, and then surrounded for a thickness of about 1 foot with small loose stones or coarse gravel, which was carried up to within 20 inches of the grade of the street. Upon this mass of loose stone or gravel a sufficient amount of fine gravel was then deposited to form a bed for the gate-box stone into which the jacket inclosing the upper portion of the box is suspended.