

MUNICIPAL DEPARTMENT

UNUSUAL FOUNDATION FOR SEWER.

An oval brick sewer has been constructed in Alpena, Mich., which presents some unusual features in connection with its foundation. The sewer is about 7,800 feet long and empties into Thunder Bay river near its mouth, as described by the Engineering Record. The river is dammed about 4,000 feet above the outlet of the sewer, and its water level is raised in this way about 12 feet. As the sewer has a total fall of but 11 feet, and is built along the north bank of the river, it is thus possible to flush it with water from the river, introduced through a suitable connection at its head.

The lower portion of the sewer for about a mile is three feet high and two feet wide. The invert has a radius of 6 inches and the arch a radius of 12 inches, which makes the distance between the centers of these arcs 18 inches. The upper portion of the sewer has a similar cross-section, but is somewhat smaller, being 30 inches high and 20 inches wide. The concrete base for the larger section is 30 inches wide and 8 inches high, and the concrete is carried up half way to the springing line of the arch. The sewer itself is built of a single ring of brickwork and its exterior is plastered with half an inch of cement mortar above the level of the concrete haunches.

The lower half mile of the sewer is about 6 feet below the street grade, which is here about 6 or 7 feet above the water level of the bay. This depth gradually increases to 13 feet near the upper end, where the river connection for flushing purposes is located. The soil along the line is everywhere sand, which becomes a sort of quicksand at a depth of about 5 feet. Hence the special concrete foundation had to be provided, even in the shallowest part of the trench. The concrete was kept in place by means of shallow boxes 12 to 16 feet long and of the same cross-section as the finished base. They were carefully set to grade in the bottom of the trench and then filled rapidly with the concrete. Before the latter had set a depression of about 2 inches depth was made along the center line to receive the ends of the brick forming the invert of the sewer.

The boxes were made of 1-inch hemlock lumber and their ends were butted together in the trench so as to form a continuous mold. The concrete was mixed dry on the bank, wheeled in barrows to a chute, and dumped down this to the box, which was often half full of water. The level of the latter was kept under control by hand pump; during working hours, but allowed to rise at night, for it was found that no injury was done by the water to the concrete after the latter was two hours old.

House connections of 6-inch tile were placed at every lot line and connections

were made for lateral sewers at the street crossings. The cost of the sewer for the lower mile was about \$2.25 per foot, and for the remainder, where the depth of the trench is greater, it has been about \$3 per foot.

ELECTROLYSIS OF WATER MAINS.

Electrolysis of water mains in the Boston Metropolitan District continued at a serious rate during the year 1903, according to the report recently issued by the Metropolitan Water and Sewerage Board. On 90 linear feet of 48-inch pipe in Cambridge uncovered for examination 525 pittings were located, varying from 1/16 to 3/8 inch in depth. Portions of two lines of 36-inch cast-iron pipes crossing under the Charles River were examined by a diver and eleven pittings from 2 to 6 inches in diameter and from 3/8 to 3/4 inch in depth were found. These pipes in the river are being destroyed very rapidly. At several other river crossings the conditions have been found to be favorable for electrolytic action, and at several points damage has been discovered. In the city of Chelsea an examination of a 24-inch cast-iron pipe line disclosed 250 pittings, from 1/16 to 9/16 inch in depth, on 280 square feet of pipe surface. In Lynn at one point 387 pittings, from 1/32 to 7/16 inch in depth, were found on 175 square feet of the surface of a 12-inch pipe line, and at another place 200 pittings on an area of 44 square feet; the deepest pittings were .45 inch in depth, leaving but .24 inch of the original thickness of the pipe. It has become

necessary to replace some of these pipes during the current season. In order to prevent the flow of quite a large amount of electricity from the Metropolitan pipes to the pipes in the city of Cambridge at a connection, an insulating joint, made of a rubber gasket 1/2 inch in thickness placed between two flanges, was used.

C. J. Sharp, contractor, of Portage la Prairie, Man., has purchased a cement block making machine for the manufacture of building blocks.

JOHN GALT, C.E. & M.E.

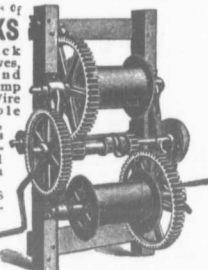
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