

MUNICIPAL DEPARTMENT

PAVEMENTS.

The City Engineer of Toronto recently prepared a report regarding the various classes of pavement. It shows that heavy asphalt, at \$2.80 per square yard, costs nothing for repairs for the first ten years, and 30 cents a yard for the next five years. At the end of this time it is worn out, and costs \$1.70 per yard to put in good repair, making a total cost of \$4.80 per yard for 15 years. Light asphalt has the same wearing qualities, costing \$2.30 originally and \$4.10 altogether, after 15 years of wear. Scoria on 6 inch concrete costs \$4 per yard to put down, needs no repairs, and is in fair condition at the end of 15 years. Granite on 6-inch concrete costs the same and wears a little better. Brick on 4-inch concrete costs \$1.80 to put down and 10 cents per yard to keep in repair for the second five years and 25 cents for the third five years. At the end of 15 years the pavement is worn out and will cost \$1.20 per yard to repair, making a total cost of \$3.25. If laid on broken stone, brick costs \$1.55 to put down, 15 cents to repair during the second five years, and 30 cents to repair during the third five years. After 15 years the pavement is worn out and costs \$1.20 to repair, making a total cost of \$3.20 per yard. Both classes of brick are fit for residential streets only, and are guaranteed by the contractor for five years, as the asphalt is for 10 years. Hence there is no charge for repairs during these periods.

Macadam costs \$1.60, \$1.25, or 90 cents per yard, to put down, according to grade. At the end of 15 years it is in good condition, but the cost of keeping in repair is rather high—40 cents for the first five years, 50 cents for the second five years, and 50 cents for the third five years. The cost of repairs is the same in each grade. The total cost of macadam for 15 years is, first grade, \$3 per square yard; second grade, \$2.65; third grade, \$2.30.

As for cedar blocks, if laid on 4-inch concrete, they cost \$1.60 per yard to put down, and 75 cents for repairs during the second five years. This includes the cost of renewing once in seven years. The same charge has to be met in the next five years, two renewals being made in 14 years. This leaves the pavement in good condition at the end of 15 years at a total cost of \$3.10 per square yard. Under the same treatment cedar blocks laid on boards cost \$2.20 to put down and \$2.70 altogether, in 15 years. If relaid on gravel the blocks cost 60 cents a yard to put down and \$2.10 altogether. With the exception of this last class of block, any class of macadam appears to be the cheapest pavement at the end of 15 years

WATER SUPPLY IN HALIFAX.

Water meters have been strongly urged by City Engineer F. W. Doane, of Halifax, N. S., as by far the best solution of the water problem in that city. The low-service district is supplied from Chain Lakes, and the supply is strained to its utmost day and night in winter. Any pumping from it to higher districts would be fatal to its efficiency. The high-level section of the city is supplied from Spruce Hill Lake through a pipe line large enough to deliver all the water collected in a dry year, and an addition to the supply will cost \$1,000,000. The consumption, waste and leakage in this section is so great that some houses are without water and fire hydrants are empty. The last inspection showed hundreds of places in which water was running to waste unnecessarily. Inspection has been found to do no good and the adoption of meters seems to be the only cure; for, if the waste is stopped the supply is ample. When a meter was placed on a wharf, for instance, it registered 1,400,000 gallons the first month, but only 12,000 gallons since then. At a stable the first month's reading was 40,000 gallons and is now 4,000. A water closet wasting 1,000 gallons a day when the meter was put in now requires only 6 gallons for its operation. Mr. Doane states that if the water running into Halifax were used at the same rate per head as in Fall River, the supply from the high source alone would be sufficient for the whole city. In the face of this it seems absurd to talk of an expenditure of \$1,000,000, besides the neces-

sity of tearing up the streets to alter the distribution pipes so that more water could be brought in.

TREATMENT OF SEWAGE.

A novelty in sewage treatment has been recommended for Chester, England, by Major H. Tulloch, late engineer-in-chief to the Local Government Board. The volume of dry-weather sewage to be treated is about 1,250,000 imperial gallons. It is pumped from a screening well at the end of an outfall sewer into a channel along eight precipitation tanks holding about 68,000 gallons each. The clarified effluent from these is run through eight roughing filters having a total area of 388 square yards, and then passes to circular aerobic polarite filters 50 feet in diameter and having a combined area of nearly 3,500 square yards. Before passing to these the sewage is collected in a small chamber from which, when a certain height has been reached by the surface of the liquid, the latter is discharged over the filtering bed. The chamber holds enough sewage to flood the filter to a depth of 2½ to 3 inches, and is emptied automatically. The filters are placed in two tiers, and double filtration is thus possible. The effluent from the upper tier drives a small turbine and fan which draws the carbonic acid gas from the bottom of the filters, allowing air to enter freely the pores of the lower part of the bed.

Mr. L. J. Marien, superintendent of the Montreal waterworks, died on October 31st, from typhoid fever.

PORTLAND CEMENT

HIGHEST GRADE

SOLE AGENTS



Largest Makers in the World.

Bellhouse, Dillon & Co.

30 St. Francois Xavier Street

MONTREAL

BELLHOUSE, DILLON & CO., 30 St. Francois Xavier St., Montreal

Sole Agents for the Compagnie Generale des Asphaltes de France (Rock Asphalt).

PORTLAND CEMENT NORTH'S CONDOR

Paving and Fire Brick a Specialty

"DYCKERHOFF" and "WHITE CROSS" Brand

NORTH'S "CONDOR" BRAND AWARDED FIRST PRIZE AND GOLD MEDAL AT THE ANTWERP EXHIBITION

Portland Cements...

HIGH GRADE GERMAN BRANDS FOR GRANULITHIC AND ARTIFICIAL STONE SIDEWALKS.

Sewer Pipes, Best English Cements. Best Belgian Cements.
Culvert Pipes, &c. W. McNALLY & CO., Montreal.

MUNICIPAL DEBENTURES BOUGHT

ÆMILIUS JARVIS & CO. (Toronto Stock Exchange) 19-21 King St. West, TORONTO