

MUNICIPAL DEPARTMENT

CONCRETE CULVERTS.*

By A. W. CAMPBELL.

A great many townships throughout the Province have largely discarded timber as a material for small culverts and sluiceways. Cedar where obtainable has been most commonly used, but all varieties of suitable lumber are becoming scarce, and price is constantly increasing, and the quality now available is far from being equal to that of former years.

Those municipalities which have experimented with vitrified and concrete tile,

*Paper read before the Engineering Society of the Toronto School of Practical Science.

have with very few exceptions been favorably impressed with the new materials. Failure and some dissatisfaction are occasionally reported, but this in every case can be traced to the causes not in any sense condemnatory to the new materials.

Excellent culvert pipe of concrete can be manufactured cheaply in any gravel pit under the immediate direction of the road overseer. The pipes are from two to four inches in thickness, according to diameter, which latter may safely and conveniently reach three feet, in lengths of two and one-half feet.

The implements required are of the simplest kind. The most important are two steel spring-cylinders, one to sit inside the other, leaving a space between the two equal to the thickness of the thinnest concrete pipe. By "spring-cylinder" it may be explained is meant such a cylinder as would be formed by rolling a steel plate into a tube without sealing the joint. With the smaller of these cylinders the edges

overlap or coil slightly; but are so manufactured that the edges may be forced back and set into a perfect cylinder. Accompany these moulds are bottom and top rings, which shape the bell and spigot ends of the pipe.

The two cylinders with joints flush are set on end, the one centrally inside the other and on the bottom ring, which in turn rests on a firm board base. The concrete, made of first-class cement and well-screened gravel, in the proportion of one of cement to three of gravel, is then tamped firmly but lightly into the space or mould between the two cylinders. The tamping-iron used to press the concrete into place is so shaped as to fit closely to the cylinders.

The concrete is allowed to stand in the mould for a short time, when the cylinders are removed; the outer and larger cylinder by inserting an iron wedge into the joint and forcing the edges apart; the inner cylinder by inserting the wedge into

THE CANADIAN INSPECTION COMPANY, LIMITED

Main Office and Laboratories:

146 St. James Street, MONTREAL
SPECIALTIES: Inspection of RAILS and all material for BRIDGES, BUILDINGS, and other structures, cast iron pipe, wood and steel railroad cars.

MANUFACTURE AND ERECTION.

Expert examination and reports, chemical analyses and physical tests of all kinds. Cement Testing.

FIREMEN'S LADDERS AND LADDER TRUCKS

We make the lightest, quickest, strongest and cheapest. Every Town and Village needs them and can afford them. They will save 50 times their price in insurance premiums. Write for circulars and quotations.

THE WAGGONER LADDER Co., Limited
LONDON - ONT.

PORTLAND CEMENT

SEWER PIPES

FIRE BRICKS

FIRE CLAY

ALEX. BREMNER

50 BLEURY STREET, MONTREAL



.. SUBSTANTIAL CONTRACTORS .
FURNISH BONDS OF
The United States Fidelity & Guaranty Co.

A. E. KIRKPATRICK, Manager for Canada.
6 COLBORNE STREET, - TORONTO, ONT.

THE STANDARD Where Cement

IN ALL COUNTRIES is Known.

Yearly Capacity Over Two Million Barrels

WIL

M. Car
WATERW
WO
Reports,
103

R. E.

CONS
Water
Munic
Granol
Electri
Drains
Coal F
Plans,
Constr

Canada

WM. I

M. AM
CONSULT
Foun

RO

Consu
St
Water
Plants,
Estima
80 ST. FR.

E. VOI

Indu
Light
Sewer
Garb
Muni

507 Manni

J. J

B.A
Cons
Ot

E

ELEC

18 KIN

RODE

A.M. Car
CONSUL
Electric
Steam
Powe
Estimu
82-53 Jar
Long Dist
Cable Ad

Speig

Room 405
Field 1

Please r
sp