

## MUNICIPAL DEPARTMENT

### CAUSES OF DEFECTIVE SIDEWALKS.\*

By A. W. CAMPBELL, C. E.

The advisability of replacing old plank sidewalks in very many cases with the more permanent concrete has been frequently urged, and a specification was included in the report of this department for 1898. In so doing, however, it has not been advocated that an inferior quality of concrete would be preferable to a good quality of plank walk, the comparison being, in every case between good quality of both plank and concrete.

The first cost of plank walks is about five cents a square foot. The life may be extended to about fifteen years, but for the last ten years repairs will have been many. Each repair requires that a man be sent with material so that the patching process is very expensive in proportion to the first cost. The result is to about double the first cost of the work in a term of fifteen years, making the cost ten cents a square foot.

Cement concrete walks are being laid for eleven and twelve cents a square foot, although the circumstances of some cases, the difficulty of obtaining broken stone, gravel, or sand, may require a slightly increased outlay. The life is indefinite for we really do not know how long concrete work will endure, but we do know concrete structures of the Romans, built 2,000 years ago, are still in existence. It is not too much to expect that the concrete walks now being laid will do service for fifty years if laid as they should be. The cost after a term of fifteen years is very little more than that of plank walks, so that their life beyond a term of fifteen years is a practical saving to the municipality.

The use of concrete is far from being properly understood by those who have charge of side-walk construction in some municipalities, and the result has been in many instances, that most unsatisfactory work has been attained.

Cement concrete in walks, culverts and other structures of a like nature, is lasting and serviceable, when properly mixed and rightly put in place, is in the best sense economical. But defective work shows itself quickly. Wherever there has been careless or "scamped" work, it is very likely to show itself after exposure to a winter's frost and dampness. Work which stands for two years without signs of cracking, shaling or crumbling is likely to be permanent, its life conditional upon the actual wear which it receives.

\* From the fourth annual report of the Provincial Instructor of Road-Making for Ontario.

Among the most frequent causes of poor concrete is the use of an inferior brand of cement. A cheap sidewalk obtained by the use of cheap cement will, in the end, prove exceedingly costly. Cement is a material of widely varying degrees of excellence, and experiments should not be tried by the smaller municipalities. There are good and reliable brands of Canadian Portland cement which have proven their qualities in large Government works, and in other extensive contracts, and to go beyond these is unnecessary and in many cases entirely unsafe.

Just as to how cement can be of poor quality is not understood by many, and it may be pointed out, as one example, that the presence of free lime causes what is known as "blowing" in the finished concrete, and rapidly results in decomposition of the sidewalk.

Again among causes of inferior side-

walks is the use of gravel and cement form the entire work, in place of a proper mixture of sand, cement and stone. In the composition of concrete, first prepare a mortar of sand and cement with just sufficient water to make a plastic mass; this mixed with a quantity of stone in such proportion that the mortar will completely fill the voids between the stones, with a proper excess of mortar for safety. There are certain definite proportions of cement, sand and stone which must be uniformly mixed in producing a good quality of artificial stone.

(To be Continued.)

Mr. George F. Keefer, C. E., has been appointed resident engineer of the Dominion public works department in British Columbia, to succeed Mr. J. R. Roy, C. E., who was recently appointed secretary of the above department.

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