Engineering Department

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Vitrified Brick.

An ideal paving material for all purposes has not yet been discovered. Asphalt is too costly, except for large cities and on streets where traffic is heavy, and a clean, quiet pavement very desirable. In laying it, and keeping it in repair, an expensive plant is required, so that unless a large amount is laid, the outlay in this respect becomes disproportionate.

Its principal substitute for the business streets of smaller towns and cities is vitrified brick. The cost is much less than that of asphalt, and neither expert labor nor an expensive plant are needed in laying it. In Ontario, outside of Toronto, vitrified brick has been laid on the business streets of St. Thomas and Chatham. In Toronto, it is used chiefly on residential streets, but for this purpose is objected to on account of the noise. Vitrified brick, as commonly constructed, has been found a noisy pavement, this being its most objectionable feature. In other respects its merits are many, and its more general adoption for the main streets of the larger towns would be a decided improvement upon the roadways now commonly found.

The pavement consists of:

(1) A properly excavated and graded sub-soil thoroughly compacted with a heavy roller.

(2) A foundation of broken stone, or of gravel, of broken stone and gravel combined, or of concrete. This foundation in thickness, is usually a foot or so of broken stone or gravel are used, and from four to six inches in thickness if concrete is used.

(3) A layer of sand about one inch in thickness.

(4) The vitrified brick laid on edge, the joints filled with sand and grouted with cement mortar.

Along the edge of the pavement, when the bricks are being laid, a board is placed on edge. When the brick are in the board is removed and the space filled with a mixture of tar and sand. This permits the pavement to contract and expand under varying temperatures, and prevents any "arching" of the brick, which is believed to be, to a considerable extent, the cause of the pavements reputation for noisiness.

The cost of brick paving is, of course, not constant. It varies with the extent of the work, with the cost of labor, of material and with the locality. In Toronto common labor costs 18 cents an hour in all city contracts. In smaller places, 15 cents an hour, or even less is an average wage. The cost of brick, and of Portland cement, varies from season to season. In no two towns is the cost of broken stone, sand, or gravel likely to be the same, varying largely with the length of haul. Freight charges vary with the distance from the manufacturer's yard. The cost of laying a street crossing of vitrified brick will manifestly be greater per square yard of surface, than for the average square yard of a pavement.

What has been done in one place is therefore not a certain index as to what can be done in another, but affords a basis for an approximate estimate. A pavement laid on Talbot Street, St. Thomas, in 1898-99, on a broken stone and gravel foundation, cost $1.50 a square yard exclusive of curb. The paving of King Street, Chatham, on an eight inch concrete foundation cost $1.80 a square yard, exclusive of curb. The cost in Toronto for vitrified brick on broken stone varies from $1.55 to $1.64 a square yard, and from $1.80 to $2.00 on concrete. The price of labor in Toronto is not favorable to a low cost of pavement and smaller places could, as a rule, do work of any extent, for a less average cost.

A Good Roads Report.

The sixth annual report of the commissioner of highways for Ontario, recently issued, contains a considerable amount of information which should be of interest to all township and county councillors, and to all others who feel interested in obtaining good roads. The terms of the recent "Act for the Improvement of Highways," under which one million dollars has been appropriated to road improvement, are discussed in some details. County and township road system are commented upon, and numerous recommendations as to systematic supervision are made. Reports from many townships are given, showing a general trend toward reformed methods of road management. The actual work of roadmaking is dealt with including the making of gravel, broken stone and dirt roads, road drainage, road machinery, concrete culverts and abutments, wide tires, the use of highways by electric railways, and many other phases of the road question.

The report shows that about sixteen per cent. of the townships have made radical changes in their systems of road management, the chief points of the improved methods being:

Statute labor is commuted at a fixed rate per day, and the amount is collected at the same time as the other taxes, by the township tax collector.

The township, if desired, is divided into a convenient number of road divisions for road purposes, usually two, three or four, and a road commissioner is appointed over each.

The duties of the road commissioner are:

(a) To supervise all work and repairs done on the roads and bridges within his division.

(b) To acquaint himself with the best methods of constructing and maintaining good roads, and of operating graders and other road machinery, used by the township.

(c) To employ, direct and discharge all men and teams required to carry on the work, and to purchase necessary materials.

(d) To see that all washouts, drains and culvert obstructions, bridge failures and other unforeseen defects are repaired or protected, with the least possible delay, so as to prevent further injury to the road, or accident to the users of the road, and to otherwise act promptly in all cases of emergency.

(e) To report to the council early in each year as to the work required the coming season, and to carry out the instructions of the council with regard thereto, and to perform such other services as may be required of him from time to time, under the written instructions of the council.

(f) To collect the poll-tax in his road division.

(g) To keep an accurate record of the men employed and the work done, and to furnish this written form to the reeve at proper intervals in order that the reeve, upon being satisfied of the correctness of the statement, may issue cheques for payment thereof.

(h) To stake out all works and see that they are undertaken systematically, so that no time will be lost in taking men, teams and machinery from one part of the township to another.

The usual road appropriation is made from the general funds of the township, this to be used for the purchase of tools, machinery and materials, or for small jobs and contracts.

The residents of the township are employed to do the work, provided they come properly equipped, and will do a fair amount of work.

Work is paid for in cash, if desired, but preferably by cheque; payment to be made in accordance with the pay-roll submitted by the road commissioner or overseer, accompanied by necessary vouchers and such information as may be considered necessary.

A general plan for road improvement should be laid down by the council for the commissioner to follow.

This plan should specify the width to be graded, width and depth of road metal, character of drainage, etc., of all roads.

Roads of importance should not be less than twenty-four feet between the inside edges of the open ditches. No roads should be of less than eighteen feet.

All roadmaking machines should be under the care of the road commissioner.