

STREET PAVING IN TOWNS AND VILLAGES*

By E. A. JAMES

Chief Engineer, Toronto and York Roads Commission

ECONOMICAL municipal administration, inexpensive transportation, convenience and cleanliness demand paved roadways in towns and villages just as surely as present-day commerce required railroads. The building of provincial highways to the limits of towns and villages creates a new demand for pavements in the urban districts which must be met.

Unfortunately we have not been planning for pavements as we should. Streets have been graded, sidewalks laid, shop and dwelling entrances constructed without any regard to future paving schemes, and the grade line must be struck if the pavement is to be either economical of construction or easy of travel.

In every town and village in which the writer has supervised paving work, the cost of taking care of improperly constructed sidewalks and haphazard doorsteps has been many times the fee that would have been required to pay for proper plans when the street was first graded or sidewalks laid.

Preparing Plans and Profiles

A survey for pavements should usually cover not only the street to be paved, but the streets intersecting and the drainage area tributary to the street defined. Following this general plan, a detailed survey of the street should be made. In making this survey, the building line, street limits, sidewalks, poles, hydrants, trees and other obstructions should be accurately located. In the roadway itself, sewer, water, telephone and electric light manholes should be located as to position and depth.

Careful measurements should be made of existing water outlets, such as culverts and old drains, and this information carefully plotted to a suitable scale, preferably 40 ft. to the inch. On the profile will be shown the elevation of the doorsteps on both sides of the centre line, the sidewalk elevation and the elevation of intersecting streets. For the profile, levels should be taken every hundred feet, or more frequently if there be a marked change in the elevation



BROKEN STONE BASE FOR BITUMINOUS ROAD, PENETRATION TYPE, MIMICO, ONT., SHOWING DEPRESSED CURB

of the ground, at the centre, quarters, curb line and 2 ft. back of the curb. These levels will, in addition to giving a profile, serve as a basis of calculating the quantities.

Alignment

The alignment of roads in towns and villages is usually within such confined limits as to admit of little variation, the controlling points usually being the telegraph and tele-

*Paper read at the conference of county road superintendents and engineers of Ontario, March 1st-3rd, 1920, Toronto, Ont.

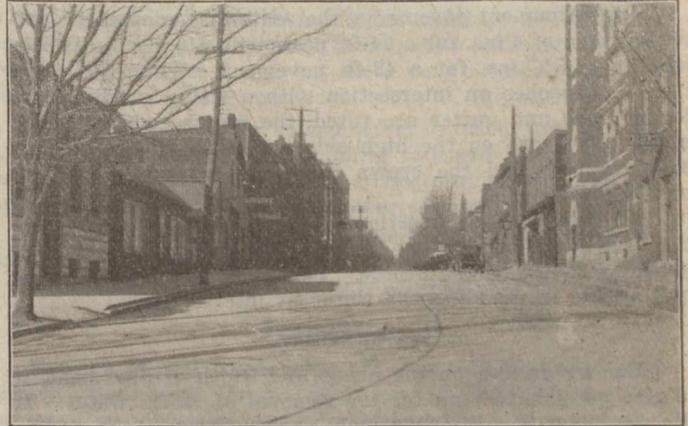
phone poles, electric light poles, fire hydrants and tree lines. With these controlling points fixed, the only consideration is that of safety and the expense of construction.

Of course, when possible, the centre line of the pavement should be the centre line of the street, although on streets which have a different elevation on either side, the centre line of the pavement is sometimes put off the street centre in order to assist in lowering or raising the curb line.

Grades

The grade established on the profile will, in most cases, be governed rather by the elevation of the steps of buildings than the traffic requirements of an economic grade.

Except in unusual circumstances, the maximum grade now used in towns and villages will be found to be 6%.



ORILLIA, ONT.—NOTE ELEVATION OF SIDEWALK AT RIGHT

This grade was established in the days when roads were built for horse-drawn vehicles, and in a rough way the streets were graded to a 6% maximum. The expense of lowering this grade, having regard to land damages, will usually be greater than any saving in transportation charges. It is not yet determined what grade is an economic grade for motor vehicles. The question is being carefully studied, having in mind the fact that the maximum grade for motor vehicles is the steepest grade that can be negotiated with minimum of power. Until motor vehicles are better standardized, there is not likely to be a very satisfactory solution to this problem.

At the beginning and end of all grades where the grade changes abruptly, vertical curves should be used so as to provide gradual change in direction, which is conducive to easy riding. If hauling were the only consideration, a level grade would be the most economical, but where the road surface is comparatively smooth this is not so important, as ordinarily a road surface causes greater resistance to traffic than the grade.

Width of Pavement

Having settled the alignment and the grade, the width of pavement should be the next consideration. The limit of width of vehicles operating on Ontario highways is 90 ins., so it will be seen that two trucks would theoretically pass on a 16 ft. roadway. Practically, however, due to the overhang, trucks might operate on 2 ft. less, so that theoretically an 8-ft. pavement would be sufficient for one line of traffic. When the traffic increases so that vehicles pass or meet one another at a greater rate than ten turn-outs per hour, the pavement should be wide enough for two lines of traffic, or, for safety, 18 to 20 ft.; or perhaps better still, for two-line traffic, an 18-ft. roadway with 3-ft. shoulders on either side.

It is now customary to pave residential streets 28 ft. wide, as this permits two vehicles to be parked on either side of the roadway, leaving a width between sufficient for passing of other vehicles, and this also provides room for turning. Where the blocks are short and the traffic not dense, 24 ft. of pavement is sufficient.

On business streets where space may be required for three lines of traffic, streets are usually paved 36 ft. wide.