

The general construction consists of an earth grade 24 feet wide, stoned or gravelled in the centre to a width of from 8 to 14 feet—the latter being on heavily travelled roads on the outskirts of Hamilton. The ordinary depth of metal is nine or ten inches. About 300 cords of stone is usually provided for an eight-foot road. The metalled portion is given a crown of 1 : 12, and the earth or clay sides fall with a slope of 2 : 12 or 2 : 15.

In some cases the metal has been placed at the side of the grade so as to provide an earth track for summer use, but this form of construction is not a success, as the roads so built cannot be kept in shape to shed water to the side drains, and they are rapidly rutted and destroyed.

Very little gravel is obtainable in Wentworth county, but stone is fairly well distributed, and is used almost entirely. Owing to the absence of gravel, the average cost of roads in Wentworth has been higher than in most counties.

The length of haul in Wentworth is in some cases very considerable. Broken stone has been hauled as far as nine miles, making an average of $6\frac{1}{2}$ miles for several roads. A common haul is from two to three miles. Wagon boxes three feet wide, two feet deep and eleven feet long, are used, holding half a cord. Teaming costs 35 cents per hour, but a day's work is regulated as far as possible by the number of trips. Teams can cover from 20 to 26 miles in a day, so that for a two-mile haul there are six trips a day; for a three-mile haul, 4 trips a day; and for a $6\frac{1}{2}$ -mile haul, two trips a day. In hauling gravel it is found that six or eight teams are more profitable than more, as they are not so apt to crowd in the pit. For stone, the number of teams employed is regulated by the length of haul and output of crusher.

A considerable mileage of the Wentworth county system consists of old toll roads constructed years ago, and since kept in a fair state of repair. As with the majority of roads of this class, the graded and metalled portion is excessively wide for the amount of traffic. In the general treatment of these roads, the practice is to cut off the old shoulders at the side of the road, open the drains and water-courses, and resurface the centre with gravel or stone.

The county owns two steam rollers. One weighs 10 tons 900 lbs. net, carries 1,500 of coal and 250 gallons of water, sufficient to operate for two or two and a half days. The cost was \$2,500 f.o.b., Hamilton. The other weighs ten tons and cost \$2,750. During the year, the county kept in continuous operation four crushers each, with a capacity of from 10 to 14 cords per day. Ordinary wages have been: For labor, \$1.60 to \$1.75 per day; teams, 35 cents per hour; ordinary foremen, \$2.00 per day; crusher foremen, 25 cents per hour; and roller engineers, 30 cents per hour.

COST OF PAVEMENTS

The cost of pavements for one municipality cannot be wholly determined from the cost in another. Conditions as to labor and material are not uniform in different localities, while prices change also from year to year. Slight differences throughout entire works in the various steps of construction—excavation and grading, drainage, class of foundation, method of laying, and many minor details affect the cost as regards not only different towns, but also as regards different streets in the same town.

The first pavement or work of any kind generally costs more than subsequent work of the same class. Experienced contractors can do work for less than contractors to whom the work is new. The amount of competition is a material factor. The distance material has to be transported makes itself apparent in the cost of

freight and wagon haulage. The machinery and implements available affect the outlay. The time of year the work is carried on influences the cost, and bad weather is a factor. The cost of paving every street should be estimated upon its own merits.

The cost of no pavement varies more than does ordinary macadam. There are instances where conditions have been so favorable as to make the outlay as low as twenty-five cents a square yard for very serviceable results. On the other hand, one dollar a square yard has been exceeded. The distance of hauling stone, the cost of crushing, experience, preliminary earthwork and drainage are all subject to the greatest range of cost.

For the higher classes of pavement with a concrete base, and surface of asphalt blocks, vitrified bricks, or sheet asphalt, the difference is not so great. For rough estimates, preliminary excavation costs from 30 to 40 cents a cubic yard, or from 10 to 15 cents a square yard of pavement. Rolling the earth sub-soil costs, say 2 cents a square yard. Concrete foundation costs from \$5.00 to \$5.50 per cubic yard, or 60 cents a square yard for a 4-inch base, and 90 cents for a 6-inch base. The cost of 4-inch tile drain is 5 or 6 cents per lineal foot, and concrete curb and gutter costs from 25 to 40 cents a lineal foot.

In addition to the excavation, concrete base and other preliminary work, a surface of asphalt blocks costs about \$1.50 per square yard with 20 cents a square yard additional for laying. A vitrified brick surface costs about 95c, with 20c additional for laying. A sheet asphalt surface costs from 80c to 90 cents a square yard in place.

Recent prices of pavements complete, exclusive of curb, have been as follows:

Vitrified brick on 4-inch base.....	\$2.12 per sq. yd.
“ “ 6 “	2.50 “ “
“ “ broken stone.....	1.80 “ “
Asphalt block.....	\$2.25 to 2.50 “ “
Sheet asphalt, heavy.....	1.99 to 2.10 “ “
“ “ light.....	1.36 to 1.66 “ “
Tar macadam.....	2.00 “ “
Bituminous macadam.....	2.25 “ “

While the foregoing prices of complete pavements are an index in a general way, yet for effective comparison a special estimate of any proposed work must be made, and the further cost of maintenance considered.

BROKEN STONE ROADS

Broken stone is being very largely used throughout the Province for road metal. This applies more especially to districts where suitable stone for crushing is plentiful, and where gravel is scarce or of a poor quality.

Broken stone costs more than gravel to the extent of the cost of crushing. But under heavy traffic it is much more durable than gravel, and in a term of years will very often be found a cheap road metal. The counties of Lanark and Wentworth use it largely on the county roads; and Simcoe, Wellington and Hastings use it to some extent. Among the townships using it are: Ameliasburg, Belmont, Bertie, Brighton, Burleigh, Camden East, Cornwall, Cumberland, Derby, Drummond, Hawkesbury East, Hawkesbury West, Luther East, Montague, Oxford West, Pickering, Richmond, Smith, Saltfleet, St. Vincent, Winchester, Yonge and Escott Rear.

Among the most practical points to observe in the construction of broken stone roads are:

(1) That the roadbed is properly prepared to receive the broken stone by grading and draining.

(2) If the road has an old and solid roadbed, it should be preserved by cutting off the shoulders of sod at the sides, throwing this material outward—never drawing it to the centre.