

ROADS AND PAVEMENTS

COST OF RURAL ROAD BUILDING IN PEEL COUNTY, ONTARIO.

C. R. Wheelock,* Orangeville, Ont., County Engineer.

The following tabulated statement is similar to the one sent to the Minister of Public Works for Ontario when the county was making its claim for their proportion of the Government grant.

The following is a summary of work done:

Miles of road graded	19 $\frac{3}{4}$
Miles of road metalled	15 $\frac{1}{2}$
Number of tile culverts	89
Number of other culverts under 10 feet span	2
Number of bridges 10 feet span and over ..	10

During the season county and township graders were used on the work 113 days and the steam rollers 164 days. The rock crusher and rotary screen were not used this season, the crushed stone being purchased from the quarry companies—suitable stone for crushing could not be procured in sufficient quantities convenient to the roads being built. The cost of operating the graders was \$14.50 per day, and the cost of operating the rollers was from \$3.90 to \$4.25 per day. To the latter must be added the cost of sprinkling—about \$4 per day—making the total for rolling and sprinkling about \$8 per day.

The wages paid during the season were as follows:

Ordinary laborers	\$1.50 to \$2.00 per day.
Foremen	2.00 to 2.50 per day.
Roller engineers	2.50 per day.
Teams	3.50 to 4.00 per day.

The following is a summary of the expenditures:

Roads (including culverts) ..	\$34,377.30
Bridges	6,313.75
New machinery	63.50
Engineering	691.45

Total

\$41,446.00

The following twelve sections of road refer to work done on different classes of work throughout the county, but the general statement applies.

Road No. 1.—Hurontario Street.

The work done on this road was as follows:

In the Township of Toronto: From the Lake Shore Road to Dundas Street, a distance of 2 $\frac{1}{2}$ miles, was graded. The soil along this portion of the road is a fine drift sand which would not stand rolling. As an experiment a short piece, running southerly from Dundas Street about forty rods, was first well graded, then crowned with a layer of stiff clay about four or five inches in depth and upon this was spread a layer of gravel about eight inches deep. If it is found that this piece of road will stand the traffic satisfactorily, it is our intention to build the remainder of the 2 $\frac{1}{2}$ miles in the same way. Ten tile culverts were used along the road, and at a springy place 20 rods of 4-inch tile under-drain was put in. Cost of work:

Grading	\$200.95
Clay	60.00

* In a report to the warden and council of the county of Peel, Mr. Wheelock, the county engineer, gave the following information:

Gravel	86.70
Tile culverts	100.30
Tile under-drain	29.10
Labor	188.20

Total

\$665.25

The three miles of stone road which was built last year from lot No. 8 to the northerly boundary of the township was repaired by filling in all ruts and low spots with crushed stone and rolling thoroughly with the steam roller. Our experience has been that the new roads require some repairs of this description the first spring after being built. They should then give good satisfaction as the metal is well consolidated and thickened along the wheel tracks. In addition to the repairs the stone road was extended twenty rods southerly, being graded and metalled similar to the part built last year. Two small cement concrete bridges of similar design were built, on opposite lot No. 6 and the other opposite lot No. 8. These bridges are 10-feet span over all, the tops are flat, reinforced with seven 5-inch I-beams. The railing is 2-inch gas pipe with globe fittings, which makes a strong railing with a good substantial appearance at a reasonable cost. The cost of the railing painted and complete was sixty-four cents per foot. Similar railing has been used on several of the bridges built for the County this year. The width of the roadway over these bridges is 18 feet, and I would strongly recommend that a width not less than this be used for small structures on leading roads.

Cost of work:

Stone (including freight) ..	\$166.93
Rolling	57.50
Labor, teaming, etc.	197.90
Tile	12.30

Total

\$434.63

Cost of bridges:

Concrete work	\$305.00
Metal	42.04
Railing	37.14
Approaches, etc.	92.91

Total

\$477.09

In Chinguacousy Township: Sixty rods of road were graded and metalled with Hagersville crushed stone opposite lot No. 3, at a cost of \$266.65. The three-quarters of a mile of road built opposite lots Nos. 9 and 10 last year was repaired by filling and levelling the ruts and hollows with gravel, at a cost of \$57.50. Six and one-half miles, from Side Road No. 10 to lot No. 27, were graded, and the five miles from Side Road No. 10 to Side Road No. 22 were metalled with crushed stone. Hagersville stone was used from Side Road No. 10 to Side Road No. 17, and stone from the Credit Forks and Shaw on the remainder. The average length of the haul in teaming the stone was one mile and a quarter. The grading was well done, knolls cut down and hollows filled, and the metal well sprinkled and rolled with a steam roller. Forty-seven tile culverts were put in and one reinforced cement concrete arch 10-feet span over all. The arch is a good, solid structure with a flood-proofing pavement between the abutments under the stream and reinforced with $\frac{1}{2}$ -inch steel longitudinal and cross rods; the longitudinal rods pass over the arch-ring through the abutments and pavements, thus tying the whole structure together. Cost of work from Side Road No. 10 to Side Road No. 17: