

**Cost Per 100 Ft. of 12-ft. Roadway.**

			Present method.	Proposed method.
Preparation of base, say average of 6 in. excavation or fill, with necessary rolling and grading...	22.2 cu. yd. at \$0 75..	\$16 65	\$16 65	
Quarrying stone . . . .	23 " " " 0 50..	11 50		
Quarrying stone . . . .	15 " " " 0 50..		7 50	
Hauling field stone . 15	" " " 0 25..		3 75	
Crushing quarry stone 23	" " " 0 25..	5 75		
Crushing quarry stone 16	" " " 0 25..		4 00	
Hauling crushed stone 23	" " " 0 32..	7 36		
Hauling crushed stone 16	" " " 0 32..		5 12	
Placing and rolling .133.3 sq. yd. at	0 15..	20 00		
Placing and rolling .133.3 " " "	0 10..		13 33	
Comparative totals . . . . .		\$61 26	\$50 35	

These figures are not intended to fit any particular case, but are taken as an average from cost items on several roads. The first item will vary considerably, and will affect somewhat the total percentage save under the proposed method. The cost of hauling field stone may vary, also, but, if stone walls are convenient, and if the stones are of moderate size or easily broken, the figure used may be reduced. The quantities used are, 23 cu. yd. of stone for the present method and 30 cu. yd. for the proposed method, giving a thickness of finished macadam of 6 inches in the former case and 8 inches in the latter. In the proposed method it is estimated that 50 per cent. of the volume will be crushed stone.

Where there are no field stones, but a good quarry is at hand, the estimate would be changed, as follows:

			Present method.	Proposed method.
Preparation of base . . . . .		\$16 65	\$16 65	
Quarrying stone . . . 23 cu. yd. at \$0 50..		11 50		
Quarrying stone . . . 30 " " " 0 50..			15 00	
Crushing stone . . . . 23 " " " 0 25..		5 75		
Crushing stone . . . . 16 " " " 0 25..			4 00	
Hauling crushed stone 23	" " " 0 32..	7 36		
Hauling crushed stone 16	" " " 0 32..		5 12	
Hauling quarry stone 15	" " " 0 32..		4 80	
Placing and rolling .133.3 sq. yd. at	0 15..	20 00		
Placing and rolling .133.3 " " "	0 10..		13 33	
Comparative totals . . . . .		\$61 26	\$58 90	

Under such conditions as abundant field stone with no quarry suitable for top stone, so that top stone would be imported in any case, trap might be specified for the top, and the estimate would be about as follows:

			Present method.	Proposed method.
Preparation of base . . . . .		\$16 65	\$16 65	
Hauling field stone . . 16 cu. yd. at \$0 25..		4 00		
Hauling field stone . . 22 " " " 0 25..			5 50	
Crushing field stone. 16	" " " 0 25..	4 00		
Crushing field stone . 11 " " " 0 25..			2 75	
Hauling crushed stone 16	" " " 0 32..	5 12		
Hauling crushed stone 11	" " " 0 32..		2 52	
Trap, dumped in place 8	" " " 3 50..	28 00		
Screenings (limestone) 5	" " " 2 25..	12 25		
Placing and rolling .133.3 sq. yd. at	0 15..	20 00		
Placing and rolling .133.3 " " "	0 10..		13 33	
Comparative totals . . . . .		\$90 02	\$81 10	

Although these figures cannot be exactly determinate, owing to inability to apply them, as they are, to any particular road, the writer believes that, as an average, they are fair, and that they indicate a reduction in cost and the production of a superior roadway, in favor of the proposed method.

It may be said, in opposition to this method, that it is impossible to roll the loose stone of such depth into the spaces among the large stone of the base. This, however, the writer does not believe to be the case, as the sub-base is

being constructed by this method on many roads. Why not make the roadway itself a sub-base?

One often hears it said that macadam roads cost too much, both at first and in maintenance, yet contractors are slow to take them at appropriation figures. It is the duty of the engineer to furnish the best construction for the least money possible. The effort at improvement, however, has been directed toward making the present method more thorough and more expensive.

Macadam is being laid over comparatively good roads built before the days of rollers and stone crushers. In the finer product let engineers not forget entirely the methods and means of those who built before them, for they built well and at little cost. More stone and less expensive manipulation is a step in the right direction. Try it.

**REPORT ON STREETS AND SIDEWALKS.**

The council of the city of Moncton, N.B., appointed a special committee to report on permanent streets and sidewalks. The report is signed by City Engineer, J. Edington, and four members of the council, and although local in its application contains suggestions for city engineers in other districts.

Moncton is a city of about 10,000 people and contains within its limits about twenty-five miles of streets, roads and lanes.

The committee say in part:

In compiling this our report we have constantly kept before us not only the probable future requirements and demands of our municipality, but also a reasonable regard to any unnecessary advance towards increasing the taxes, and with that in view, have to the best of our knowledge and information formulated this policy of what we consider as economical, yet practical permanent work, at the same time being mindful not to increase the present assessment; in other words, that the best policy for permanent streets and sidewalks, adapted to Moncton, may be inaugurated on the most conservative, economical and adequate basis, not inconsistent with beneficial, substantial and lasting results.

Their recommendations are as follows:

1. For residential streets, with more or less heavy traffic.

(a) On account of the mileage of these sidewalks, the probable demand for the same within the next few years occasioned by the growth and expansion of the city, keeping in view the city's finances, we recommend for this division permanent sidewalks of asphalt and tar, with cinders or stone foundation from eight to twelve inches in depth, well underdrained, and to be from four to six feet wide, as the locality of each respective street may demand or require.

(b) If the residents along any street in the city of Moncton desire granolithic sidewalks they may have the same by contributing 50 per cent. towards the cost of material and construction, the other 50 per cent. to be provided by the city, said sidewalks to have the same width as described in sub-section a of section 1.

(c) That this class or division of residential streets be first properly crowned and graded, and then macadamized with a heavy covering of broken stone or slag.

(d) That curbing and gutters be constructed at the intersections of each street and same to be freestone or concrete, and to extend about twenty-five feet at each corner. Your committee recognizes the necessity of further curbing and gutters when the finances of the city allow.

2. For residential streets with light traffic we recommend as follows:

(a) That this division or class of permanent sidewalks be the same material and construction as set forth and described in sub-section a of section 1.

(b) That this division or class of permanent sidewalks be the same material and subject to the same financial conditions as sub-section b of section 1.

(c) That this class or division of residential streets be first properly crowned and graded, and then macadamized with a reasonable covering of broken stone or slag.