

Common excavation, per cubic yard.....	24 cents
Loose rock, per cubic yard.....	55 cents
Crosswaying, per square .....	3.75
Concrete, per cubic yard.....	8.00
Dry masonry, per cubic yard.....	4.00
Rubble masonry, per cubic yard .....	8.00
Timber for erection, per M.....	35.00
Labor on erection, per M .....	11.50
Sheet piling, per M.....	39.00
Wrought iron, per pound .....	6 cents
Cast iron, per pound .....	5 cents
Piles driven, per lineal foot.....	47 cents
Solid rock, per cubic yard .....	1.50

The solid rock was all granite and usually free from seams.

Hauling material per ton mile, free haul to four miles .....	50 cents
Ballasting and trimming, per cubic yard..	30 cents
Train fill, per cubic yard.....	21 cents
Track laying per mile.....	325.00

far as we are able to learn no effort has been made to secure reliable data as to what this would amount to.

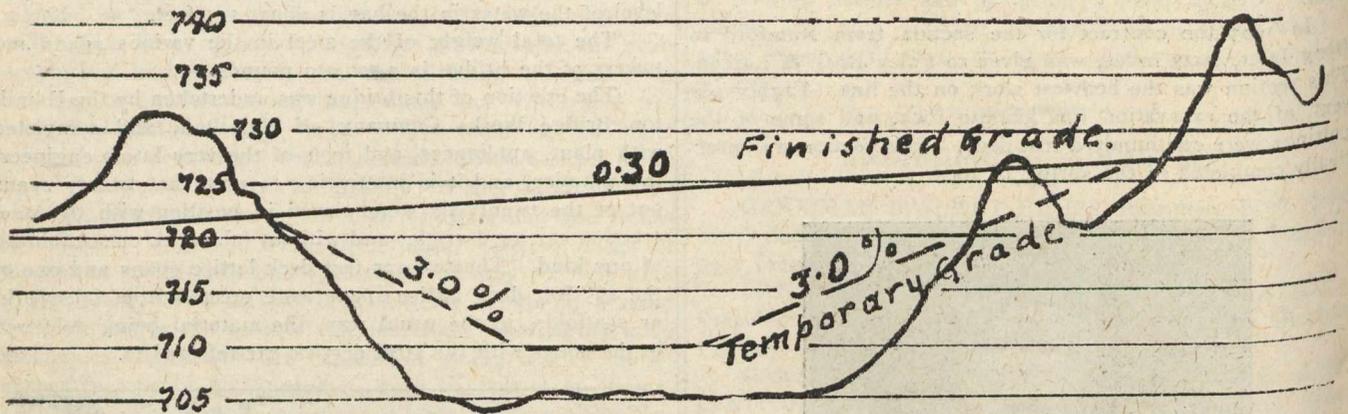
Aside from this unknown loss depressed grades must have saved the railway from \$2,500 to \$3,000 per mile through the rock country.

In connection with train haul two things are worth of note.

First, that the C.P.R. consolidated engine 2-6-4 and 2-6-0 class were able to haul up 3 and 3.5 grades ten Hart convertible cars holding 30 cubic yards of gravel; and second, that the same engines could haul the same load around 12 degree curves on 0.5 grades coming out of ballast pits.

Including grading, track stations and bridges the line about \$45,000 per mile.

In April, 1907, Mr. Leonard found his duties as Assistant General Manager required all his time, and Mr. J. G. Sullivan was appointed manager of construction. Mr. F. S. Darling, who was division engineer during location and construction has as assistants on the grading, Messrs. F. Padget, F. G. Mackie, E. T. Agate, and A. Fronhoefer and



Profile Showing Depressed Grades.

In these three last items the railway company were to supply cars, engines, locomotives and crews.

The engine house cost approximately \$3,000 per stall, while the concrete work and track for the 70-foot turntable cost \$3,500.

An interesting feature in connection with this work was the fluctuation in the labor market.

The main contracts were let with wages for laborers at from 13 to 15 cents per hour. The demand for railway laborers so increased that many sub-contractors had to pay 20 to 25 cents per hour to get men for the completion of their work. For the last few months the price of labor has dropped back to 14 and 15 cents per hour.

Foot-drilling cost 30 cents per foot by the piece and about 40 cents by day labor. One of the interesting features of construction was the use of depressed grades.

A profile of a short section of the road is here given. When the grade line was struck it was drawn so high that the cuts would not make the fills even after allowing for the expansion of the rock, which in most cases was between sixty and seventy per cent. Instead of borrowing rock which cost \$1.50 per cubic yard, a temporary grade was struck. Sometimes this grade was as steep as 3 per cent., often not so steep, the dump was kept narrow and a grade was made sufficiently safe for the skeleton track, then sand and gravel was brought in by the train load and the track raised to the established grade line.

One can only estimate the probable saving this method made.

With solid rock at \$1.50 per yard the loose rock in the dump, allowing for 66 per cent. expansion, stood the railway at 3.5 of \$1.50 = 90 cents per cubic yard.

The sand or gravel cost 20 cents per cubic yard plus the cost to the C.P.R. for hauling. The cost for hauling varied so much that an average is difficult to secure, but on a seven mile haul a fair price would be 25 cents per cubic yard. This gives a saving in favor of depressed grades of 45 cents per cubic yard. Against this saving there must be placed the loss of material that sifted away in the rock fills. As

E. L. Miles, and as assistants on tracks and buildings Messrs. A. J. Isbester and J. W. Porter.

A much larger proportion in number of buildings for a much smaller amount of estimated value is the record of five months in Toronto's building this year. The buildings erected for that period numbered 2,010 as compared with 2,437 in 1907, the value to \$3,957,840, as compared with \$7,574,665; the proportion being more buildings last year by 82 to 28, while the value of this year's was only 52 per cent. of last year's. This indicates the erection of a lower-priced class of houses.

The Cutler Hammer Company of Milwaukee have issued a pamphlet descriptive of their Wirt type dynamo brush. The construction of the brush is fully described and illustrated in the pamphlet in question, which states that in designing a dynamo two conditions must be met in order to insure satisfactory operation. One of these is that the brush must be elastic so that it will make good contact with the commutator under slight pressure, disregard of this condition resulting in undue heating and rapid deterioration of both brush and commutator, due to friction. The second requisite is that the brush must be so designed as to oppose a high resistance to the wasteful and destructive current that is generated when adjoining commutator bars are short circuited by the brush. The claim is made that the construction of the Wirt type dynamo brush is such that these two necessary conditions are fully met. Elasticity is secured by constructing the brush of laminated strips of metal, while the desirable feature of high resistance is obtained by combining with the copper laminations, strips of a high resistance metal through which the wasteful current referred to is compelled to pass in completing the circuit from one commutator bar to another. In addition to the purely descriptive matter and price list, the pamphlet contains useful information on the care of commutators and brushes, the importance of correct lap, etc.