

municipality for itself. The intention is to give some information that will enable those having the construction and supervision of roads in charge to undertake and carry out the work on a uniform plan, and in such a manner that money and labor will be expended to the best advantage.

GRADES,

The grade of the road is a very important element in its construction and should be decided upon before the other works are commenced. In determining the grade, the necessary fall to carry off the water in the side ditches must be considered. There should be a fall in the ditch of at least 3 inches in 100 feet, and necessarily the road should be on the same grade; aside from this point, the road should be as level as possible. In order to show the advantages of having a road as nearly level as possible, the following table made from experiments by noted Engineers shows the difference of draught on different grades. Call the load which a horse can draw on a level 100.

Then on a grade of 1 in 100 a horse can pull.....	90
" " 1 " 50 " "	81
" " 1 " 40 " "	72
" " 1 " 30 " "	64
" " 1 " 20 " "	54
" " 1 " 10 " "	40
" " 1 " 10 " "	25

From this table it will be seen that a horse pulling a maximum load on a level can pull only four-fifths as much on a grade of 1 in 50; three-fourths as much in a grade of 1 in 40, and one-fourth as much on a grade of 1 in 10. In determining the grades of roads keep well in mind the following: 1. Never make a road ascend one foot more than is absolutely necessary. 2. Economy in maintenance depends on easy grades. 3. Hilly roads are full of danger, expensive to maintain, and destructive to horses.

If roads were classified as follows: First. Leading roads, that is roads leading to or connecting cities, towns, villages or principal shipping points. Second. The principal roads contributory to the above. Third. What are called back roads, not much travelled. Then the grade of the first should not exceed 5 feet in 100 feet, the grade of the second should not exceed 7 in 100 and the grade of the third should not exceed 10 in 100.

Any grades steeper than the above should be used only for light driving. Although the above grades should not be exceeded, still it is evident that no fixed gradient can be adopted in all situations; the question of the cost of construction is an item that must be considered. In this Province the road allowances were mostly laid out without considering the practicability or impracticability of constructing roads upon them. Most of those road allowances have been opened and are travelled upon, and it is

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