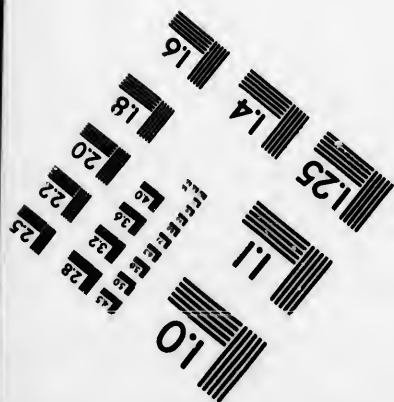
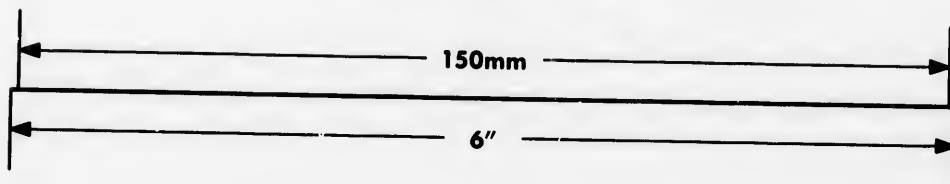
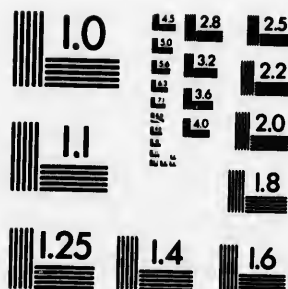
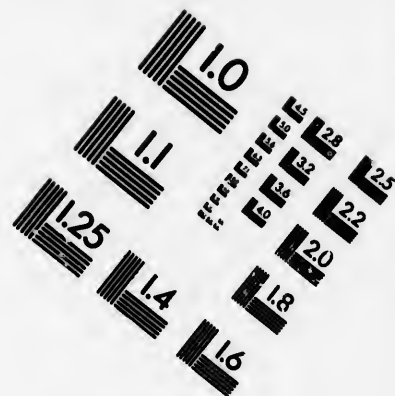
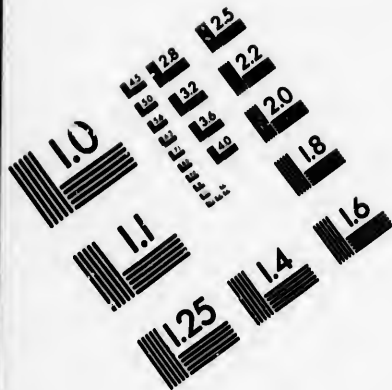


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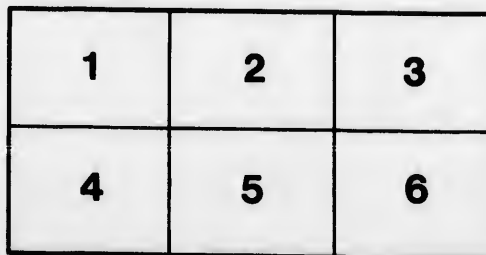
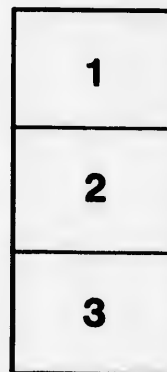
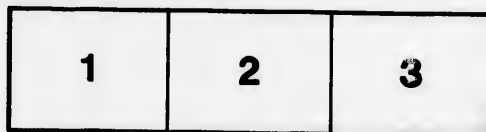
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ONTARIO DEPARTMENT OF AGRICULTURE.

ROAD BULLETIN

No. 1.

By A. W. CAMPBELL, C. E.,

Provincial Instructor in Road-making.

TORONTO, May 15, 1896.

DRAINAGE.

Perfect drainage, first, of the foundation of the road-bed; secondly, of the road surface, are the points in road-making on which too much stress cannot be laid.

The first is accomplished by underdrainage, tile drains being laid at a depth of three or more feet below the surface on each side of the roadbed at the foot of the grade and parallel to it. Care should be taken to fit and settle the tile in the trench so that, when refilling with earth, they will not be displaced. As a rule two and a half inch to four inch tile will be sufficient. The joints should be close and the grade a true line. Loose joints and an uneven grade allow silt to pass into the tile and remain there, destroying the drain.

Surface drainage is accomplished by open drains on each side of the grade, having sufficient capacity to drain, not only the road-bed, but the land adjoining. With open drains and with tile drains make and maintain a free outlet to the nearest watercourse. A drain without an outlet is useless. In constructing a good road a dry foundation is the matter of first importance.

CROWNING THE ROAD.

The graded portion of the road should be wide enough to accommodate the travel upon it, and not greater, the slope being uniform, not heaped in the centre. The crown should be well above the over-flow of storm water, and should have a grade sufficient to shed water readily to the open ditches on either side. Do not round it up so as to make the grade steep and dangerous, under the mistaken impression that better drainage will thereby be secured. Nor should it be so low as to allow water to stand upon it in depressions. Under ordinary circumstances one inch or one inch and a half to the foot is a proper grade; that is, a roadbed twenty-six feet wide should be from thirteen to twenty inches higher at the centre than at the side.

QUALITY OF GRAVEL.

The gravel should preferably be sharp, clean and of uniform size. Pit gravel usually contains too much earthy matter, and where the latter is in excess, the gravel, as a road-making material, is useless. Lake gravel is apt to be rounded, water-worn and lacking in the necessary earthy matter to make a solid and compact surface, but is generally a better road metal than pit gravel. A coating of pit gravel with a surfacing of creek gravel is a good combination. All large stones should be removed as they will work to the surface, and will then roll loosely or form rough protuberances.

PLACING THE GRAVEL.

The gravel should be spread evenly over the surface of the sub-grade to a depth of six or eight inches, and to the required width, then rolled with a heavy roller. Rolling should be performed in showery weather, as it is impossible to consolidate dry earth or gravel. The heavier the roller the better will be the results, but if a heavy roller cannot be obtained, a light roller is much better than none. The roller should be passed over the surface until the gravel or earth is so compact as not to be displaced and rutted by the wheels of a wagon passing over it with an ordinary load. The surface must be maintained smooth and hard, to shed water and resist wear. Every municipality should have a roller, but whether one can be obtained or not the gravel should not be left in a heap just as it falls from the wagon. Spread it evenly.

REPAIRS.

Gravel roads already constructed will need repair. By the use of road machinery scrape the surface and cut off the corners, which will have formed at the foot of the grade by the washing down of dusty material from the crown of the road. Loosen the surface, particularly that part of the travelled portion and where the road is rutted, with picks, or, if possible, with road machinery, then apply a coating of gravel and roll thoroughly. It is of more importance, however, to see that the drains are not obstructed in their course and that their outlets are free and open.

The office of the Provincial Instructor in Road-making will be found on the ground floor of the Parliament Buildings, Toronto (at main entrance), where Mr. Campbell will be pleased to see at any time any one interested in road improvement. Those wishing to communicate with him on any matter connected with this subject will please address him as follows :

A. W. CAMPBELL, C.E.,
Provincial Instructor in Road-making,
Parliament Buildings, Toronto, Ont.

