

THE NECESSITY OF ENGINEERING SUPERVISION IN THE CONSTRUCTION AND MAINTENANCE OF EARTH ROADS*

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THE absolute necessity for engineer supervision in the construction of so-called "permanent" highways and large bridges is quite apparent to the average layman, but an erroneous idea is prevalent in Canada and particularly in Western Canada, to the effect that no special training or experience is required in order to supervise the construction of earth roads. This idea is one of the greatest obstacles in the way of securing better transportation facilities in the prairie provinces, and in the following brief treatise the writer shall endeavor to present a few of the many arguments in support of the

necessary energy and ambition can do the work which should be done by a trained scientist. This belief is the direct result of rapid immigration to a country whose resources are abundant and where the absence of competition has enabled men lacking in scientific education to succeed in spite of crude and wasteful methods. This stage in the development of the prairie provinces is now passing; specialists in the various trades and professions are coming into prominence, and the public are beginning to realize that in road building, as in other construction work, the skill of the specialist is required. This awakening is largely due to the fact that although considerable sums are annually expended on road improvements, the ratepayers of the various municipalities find that the roads leading to their market centres are still in unsatisfactory condition.

The economic necessity of properly supervising the expenditure of funds for road construction, is well emphasized in a paper written by Adolph Edwards, who has had fifteen years' experience on road improvement work in the State of Florida. Mr. Edwards states that of the \$300,000,000 spent on road improvement work in the United States during the year 1916, one-third was wasted. He adds that "this condition is the fault of the taxpayers primarily; they have not called for business-like administration and they have not received it."

"The pressing road problem of the country to-day is not so much to provide money for our highways and byways as it is to awaken the average taxpayer to a knowledge of the business side of the work for which he is contributing so liberally; that he may enlist the help of the ablest business men and the services of competent engineers in carrying it on. There is no question as to the correctness of this statement; the expenditure of road funds and the direction of road work by men of special training for the work is very often the exception, rather than the rule. Many a

country has spent enough money to have good roads, but have poor roads because that money has not been judiciously expended. It is not a question of dishonesty in most cases, but of incompetency."

The startling statement made by Mr. Edwards regarding the waste of public funds on road improvement work in the United States, as a result of the lack of business-like administration and engineering supervision, is confirmed by Mr. Paul D. Sargent, who held the position of assistant director, U.S. Office of Public Roads, at the time when he made a statement to the Third International Road Congress held in London, England, in 1913, to the effect that during the period 1904 to 1913, practically \$1,000,000,000 of local revenue was expended through the agency of 2,900 county officials and 19,000 township officials, with little, if any, permanent improvements resulting. We are safe in assuming that municipal officials in Canada are no better fitted to supervise road construction work than are the local municipal officials of the republic to the south of us, and any person familiar with road construction problems, travelling through our provinces can see instances on every hand where considerable funds have been expended without obtaining tangible results.

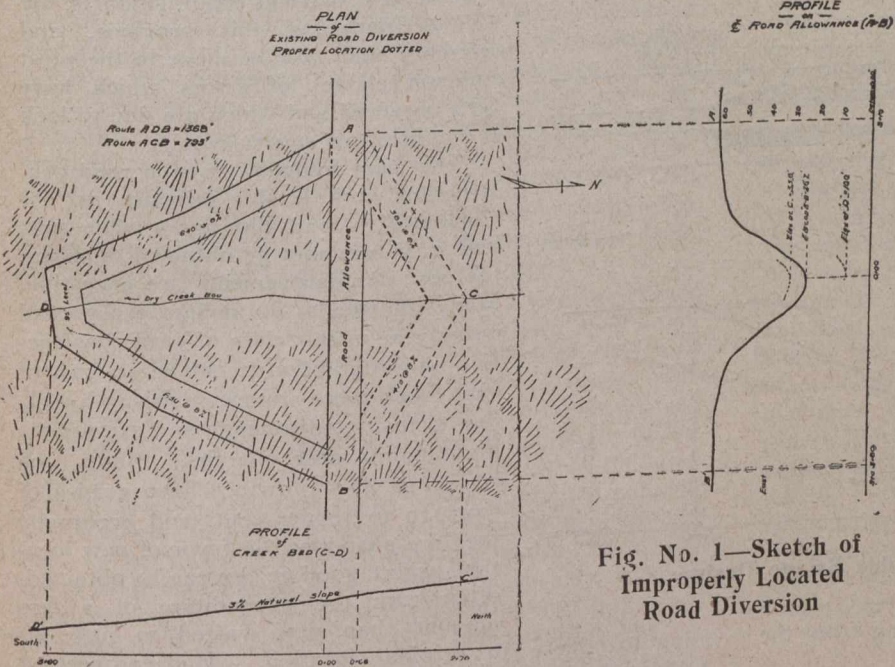


Fig. No. 1—Sketch of Improperly Located Road Diversion

contention that the construction of earth roads requires the supervision of competent engineers:—

The term "construction" as used in the heading of this article, refers not only to the grading of a road, but also to the location of required diversions, and to the installation or erection of the culverts and small bridges necessary to provide proper drainage facilities; and in view of the fact that Saskatchewan has not a single mile of "permanent" highway constructed in its rural area, this article applies generally to all road construction work in the province.

General Principles and Expert Opinions

Road building is divided into two parts, the theoretical and the practical, the one pertaining to the engineer, the other to the foreman or contractor. The engineer's duty is to design the road, having regard to cross-sections, gradients, alignment and drainage, whereas the duty of the foreman or contractor involves the direction of labor in an efficient manner.

We are still largely dominated in Canada by the belief that any ordinary capable man, possessing the

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