PROPOSED SPECIFICATIONS FOR HIGHWAY BRIDGES

PROPOSED RECOMMENDATIONS OF COMMITTEE OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS—ARE COMPREHENSIVE IN CHARACTER.

[In *The Canadian Engineer* for April 6th and 13th, 1916, articles appeared by E. H. Darling, A.M.Can.Soc.C.E., entitled "Impact Formulas for Highway Bridge Design." The first article of the series dealt with the history of two railway bridge impact formulas, showing their unsuitability for highway bridge design. The second article discussed the Dominion government and Ontario government impact formulas and made some suggestions as to their simplification. In view of the proposed specifications for highway bridges, a draft of which follows, and which were presented and discussed before a meeting of the Mechanical Section of the Canadian Society of Civil Engineers, held in Montreal, November 30th, Mr. Darling's articles will be of interest to all who are interested in the design of this particular type of bridge.—EDITOR.]

THE draft report of the committee appointed by the Society was read by Mr. P. B. Motley, chairman. The discussion which followed was participated in by Messrs. W. C. Thomson, Walter J. Francis (who was in the chair), H. B. Stuart, C. N. Monsarrat, P. L. Pratley, G. H. Duggan, F. P. Shearwood and Prof. Brown.

The proposed specifications are intended to apply to steel highway bridges carrying ordinary highway traffic with or without electric street cars. They will not, however, cover bridges which carry electric railways only, as these will be designed under the specification for steel railway bridges.

In the case of combination bridges, carrying both railway and highway traffic, the responsible engineers on each individual project will be expected to issue particular specifications governing the questions of loading and unit stresses. Further, insomuch that modern practice has adopted riveted structures for all ordinary highway work, the specifications will not cover pin bridges, so that in the instance of long and important structures, where eye-bars and pin connections might possibly be used to advantage, special clauses covering this class of work will need to be drawn up by the responsible engineer.

The range of service to be accommodated under the general head of highway traffic is, necessarily, extremely wide, but the following are the principal considerations which will enter fundamentally into the design of those structures covered by this specification.

Firstly.—The amount of money available for the construction and its effect on the question of the permanency or semi-permanency of the bridge and upon the question of providing for probable future increase in traffic.

Secondly.—The location of the bridge and the character of the roads in its neighborhood with the probability of their being subject to improvement.

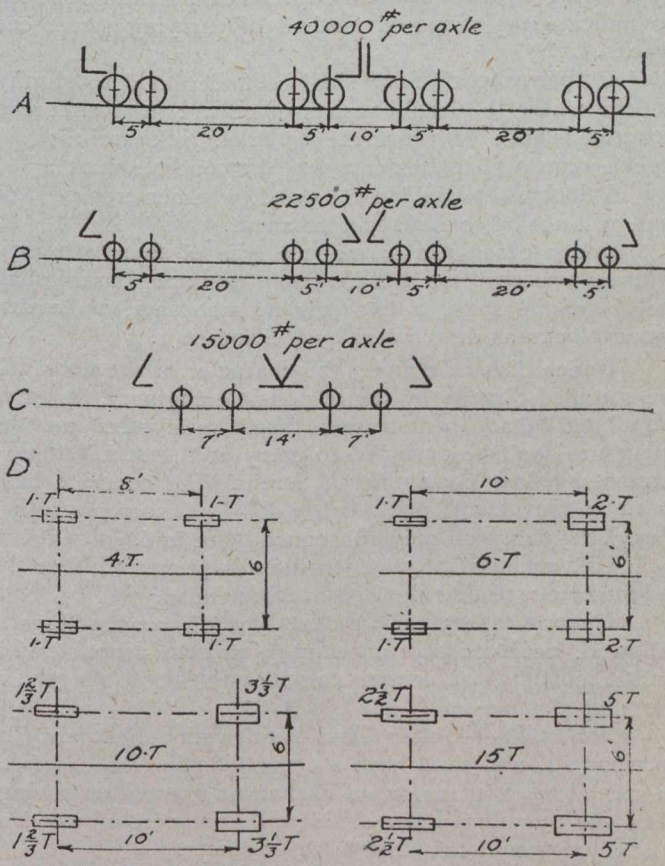
Thirdly.—The situation with respect to traffic as affecting the character of the flooring and the nature and magnitude of the superimposed loads.

With a view to meeting the whole range of conditions the specification classifies bridges according to the requirements of service and permanency under the following heads:—

Class 1 is intended to provide for first-class permanent structures situated on main arteries of traffic in large towns and cities where heavy concentrated loads, due to transportation of machinery and building material frequently occur. Bridges as designed under this class, will be equal in respect to permanency, rigidity, thickness of metal, and all details, to those built under the best railway practice.

Class 2 is intended to provide for city bridges in residential districts, where general traffic regulations limit both the loads carried on the highway and the speed of street car traffic. Bridges designed under this class will be equal to those designed under Class 1 in respect of general stiffness and constructional details.

Class 3 is intended to provide for highway bridges in towns where heavy manufacturing is not conducted and for bridges on main country highways. The need of providing for actual or possible street car traffic and the issuing of specifications regarding the street car loads are matters which will be left to the responsible engineer.



Diagrams of Wheel Loads Applying to Steel Highway Bridges.

Class 4 is intended to govern roadway bridges serving farming communities and situated on unpaved roads where it is unlikely that the character of the loading will change during the normal life of the structure.

Class 5 is intended to provide for bridges in remote or mountainous districts difficult of access, where lightness and first cost are prime considerations in determining the character of the proposed bridge.

The purpose of the classification is not to rigidly group every bridge under a specific head, but to guide the responsible engineer or purchasing authority in the