

# The Canadian Engineer

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## HIGHWAY BRIDGE SPECIFICATIONS

The Canadian Society of Civil Engineers has just issued a general specification for steel highway bridges. Much valuable work has apparently been done upon this specification, and the members of the committee are to be congratulated upon the general thoroughness with which the specification has been prepared.

There are a few points, however, upon which the specification might be criticized if it is intended to have it generally adopted throughout Canada as uniform standard specification for all highway bridges. There are other valuable specifications for highway bridges now in use in Canada which differ somewhat from the society's new specification, and a thorough discussion and adjustment of these matters at the forthcoming annual meeting of the society would no doubt do much to facilitate the uniform adoption of the society's specification.

For instance, section 5 permits the use of 1/4-in. metal, provided that the bridge is not located near salt water or other deleterious elements. Bridges in inaccessible wooded country, particularly in altitudes subject to damp weather, and especially if more or less roughly constructed and poorly painted, would be safer if a greater thickness of metal were to be specified as the minimum, as it is sometimes impracticable to give close and constant attention to the maintenance of such bridges.

Section 6 specifies a clear width between roadway curbs of not less than 15 ft. With the increasing use of

8-ft. motor trucks, this width as a minimum would seem insufficient for bridges in cities and large towns where two trucks might try to enter the bridge at the same time. And the specification does not state the minimum width of roadways which carry street car tracks.

Section 31, in specifying the method of calculation for floorbeams, hangers and other truss members, does not provide for computation of stresses due to concentrated axle loads.

Section 40 specifies an increase of 50 per cent. in the smaller stress to be computed for members subject to reversal of stress or stresses of opposite kinds. An interesting calculation bearing upon this subject was given in the October 5th, 1916, issue of *The Canadian Engineer* by David A. Molitor, formerly designing engineer of the Toronto Harbor Commission.

Section 89 permits butting joints to be spliced for 50 per cent. of the axial stress in the members. Some other specifications insist upon such joints being fully spliced, and it would appear to be a question as to whether the latter is not the better practice.

Regarding movable bridges, the specification does not provide for protection of the operator by guards over all exposed gears; also no provision is made for the protection of gears situated beneath the bridge floor and exposed to debris falling from the roadway.

## OUR COAL PROBLEM

The coal situation on this continent has reached a point at which we may reasonably expect adequate action from the government with a view to future supplies. The coal resources of the United States, while greater than those of Canada, are sorely taxed to meet the demands. The Dominion will not be given preference over other countries in the matter of coal supplies. It will have to fall in line with the export regulations of the United States. An increasing number of commodities is being subjected to embargoes and those already in force are being stiffened. It is pointed out on another page of this issue, in the notable article by Mr. Arthur V. White, a student of this subject, that no country can be expected to send out of its confines that which is essential to the very existence of its own people. No matter what is the goodwill or desire for exchange of commodities, the United States may not be able to cope with the prevailing need. Canadians must be prepared to help themselves by the development of their own fuel resources in a way that they have never done before.

Since the latest editorial on this subject was published in *The Canadian Engineer*, just a week ago, the United States has found it necessary to declare a policy providing that no coal may be exported from that country during 1918 except for purposes contributing materially to the conduct of the war. As pointed out by Mr. White, there is no need to start again learning the A B C of this fuel problem. Officials of the government of Canada, such as those in the Geological Survey, Department of Mines, the Commission of Conservation and other organizations, have knowledge of existing conditions and of practical means by which much of the stress may be relieved. Mr. White says: "To carry out these measures of relief and to place Canada in a reasonably independent position with respect to fuel will take time; but there is no doubt that if matters are dealt with in a broad, statesmanlike manner, and the necessary encouragement of financial and other assistance is given to those who are competent to