



Cap Rouge Viaduct. 2.9 Miles West of Quebec St. Lawrence River Bridge.
Length, 3,335 ft. Height, 172 ft. Tons steel, 4,228.

final grading estimates had been returned, or were being prepared.

During the winter of 1914 the only portions of the line being operated were as follows: From Moncton to near the Quebec bridge, by the Intercolonial Railway; from Cochrane east to Harricaniaw, and west to Hearst, by one of the firms of grading contractors, under contract to the Commission; from Superior Junction to Winnipeg, by the Grand Trunk Pacific Railway Company.

Parliamentary enactment has given the Minister of Railways and Canals the power to operate a part, or the whole, of the line, if necessary, and also to acquire the Grand Trunk Pacific branch from Fort William to Superior Junction.

Owing to the recent refusal of the Grand Trunk Pacific Company to take over the line for operation, the Minister has exercised his rights and has placed the operation under the management of the Canadian Government Railways, so that all the points between Moncton and Winnipeg are now accessible to the travelling public.

Many articles have been written on the ease of the gradients, the lightness of the curvature, and the splendid roadbed, but with all these favorable elements the chain would not be of much value if the connecting links were weak.

As the bridges are undoubtedly these links a few facts concerning them may be of interest to the readers of *The Canadian Engineer*, and will tend to show that the whole chain is fully as strong as it was originally intended to be.

While an article of considerable length might be written, giving the history of any one particular bridge built on the Transcontinental, the writer proposes in the present article to give only a general summary of the information regarding the construction of the bridges and viaducts.

The sub-structure of all steel bridges is of concrete, designed in all cases to be fully adequate for every requirement. Where the foundation for piers and abutments was not of solid rock, or other equally suitable material, piles were driven to the limit of penetration, and the concrete sub-structure laid on the foundation thus prepared. Reinforcement was used in all cases where it was considered necessary, and in cases where its use gave efficient as well as economical design. Very frequently streams of considerable size were temporarily diverted while some difficult construction was in progress. Sheet-piling of

the Wakefield type was principally used for cofferdams, and proved very satisfactory.

All bridges have been constructed to conform with the "Department of Railways and Canals General Specifications for Steel Superstructures of Bridges and Viaducts" —(1905 and 1908), and the live load in all cases being considered in the designs as "Class Heavy" (as per Diagram "B" of the Specifications) and consisting of two consolidated locomotives of 180 tons each, coupled, connected with and followed by a train having a uniform load of 4,750 lbs. per lineal foot.



Red River Bridge, Winnipeg. Mile 1,804 from Moncton.
(Strauss Bascule Lift Span of 129 ft. 6 in.)