

formance of previous contracts, public interest, &c., which the board is not qualified to judge of, and on which it cannot get information as readily as the department. My understanding of said clause was confirmed by the fact that the tenders for the masonry were not submitted to the board, nor was it asked to recommend to whom the contract should be given.

Referring to the first part of the recommendations of the board in their report of October 26, 1910, I beg to submit the following remarks, in regard to design V of the board:

(a) This plan has been accepted by all my colleagues. (Reports Nos. 11 and 15, and report of October 26, 1910.)

(b) Four of the best bridge companies of England, Canada and the United States and Germany have tendered on the board's design, and, in accordance with paragraph 8 of the preliminary specifications and paragraph 5 of the final specifications, are ready to absolutely guarantee, with a deposit of one and a half million dollars, the satisfactory erection and completion, as well as the materials, construction, design, calculations, plans, specifications and sufficiency of a bridge built in accordance with this design.

(c) Amongst the tenders submitted on the board's design No. V, one tender is \$950,000 and another is \$270,000 cheaper than design 'B' of the St. Lawrence Bridge Company, and the two tenders are respectively \$1,200,000 and \$520,000 cheaper than design 'C.'

(d) The English, American and German firms guarantee the completion of the bridge on design No. V of the board, one year earlier than the St. Lawrence Bridge Company on their own designs: A, 'B' and 'C.'

(e) The plan of erection I proposed for the suspended span, has been adopted by all the contractors and will eventually save one year in the completion of the bridge.

(f) The tenders received on the board's design and approved by the board are as follows:—

British Empire Bridge Company..	\$11,025,566.20
Pennsylvania Steel Company..	11,686,751.30
Maschinenfabrik Augsburg-Nürnberg..	13,230,050.10
St. Lawrence Bridge Company..	14,867,170.00

The first three tenders are well within the estimated cost sent to the department on June 3, 1910, and which, for reasons given, ranged between \$11,230,213 and \$13,409,983.

(g) Plans and calculations of the board's design are very complete and fulfil all the requirements of the order in council creating the board. The estimated cost sent you on June 3, 1910, has proved correct.

(h) The design of compression members and connections has been thoroughly tested and the tests have given the most satisfactory results, as shown in the report sent you on August 1, 1910.

(i) Board's plan No. V complies with all the requirements of the board and department. From an engineering standpoint any of the four tenders on this plan could, therefore, be accepted by the department, having been unanimously approved in the board's report of October 26, 1910.

(j) Design No. V of the board is stronger than designs 'A,' 'B' and 'C' of the St.

Mr. GRAHAM.

Lawrence Bridge Company, as will be shown later on.

Coming now to the letter of my colleagues dated November 3, 1910, I inclose a copy (Appendix 'A') having the paragraphs numbered for reference.

Paragraph 1. I heartily agree with this part of the letter. The difficulties noted therein, and my desire to put all the facts before you are my only excuse for writing such a long letter.

Paragraph 2. I beg to submit a few remarks on the question of single or double intersection, as follows:—

During the early stages of the work a majority of the board, composed of my two colleagues, favoured double intersection; a minority, composed of the Chairman, favoured single intersection.

I did not rely on my knowledge alone, but consulted on this point many well known engineers.

Amongst others the following, for one reason or another, favoured single against double intersection:

Mr. C. G. Emil Larsson, of the American Bridge Company.

Mr. Fred. W. Cohen, of the Pennsylvania Steel Company.

Mr. Phelps Johnson, of the Dominion Bridge Company.

Mr. John Sterling Deans, of the Phoenix Bridge Company.

The former deputy minister was present at some of the meetings where the question was discussed. Letters written on that subject by some of these engineers were sent you June 17, 1909, and April 25, 1910.

After two members had been added to the board, my two colleagues and Mr. Paul L. Wolfel of the McClintic-Marshall Construction Company, favoured double intersection; Mr. Phelps Johnson and myself favoured single intersection.

After tenders had been called, allowing contractors to present their own designs, three designs for cantilevers were submitted by the contractors; one by the Germans which is single intersection, and two by the St. Lawrence Bridge Company which are also single intersection.

No design for a double intersection bridge was presented by any firm. I felt, therefore, that my convictions on this point have been fully justified.

Paragraph 3. As shown by the advertisements for tenders and by the preliminary and final specifications, to this paragraph should have been added the words:

'Provided that plans, details and materials be made in accordance with the specifications of this board.'

This, of course, would have stopped any further argument, but without them the sentence referred to is incomplete and does not give all the facts.

Paragraphs 4 and 5. The same remarks on paragraphs 2 and 3 apply to paragraphs 4 and 5.

Further, the system of main panelling adopted in designs 'A,' 'B' and 'C' is not original, as it was published for the first time, to my knowledge, in 1901 by a Russian engineer for a 135 feet span. I am