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PROGRESS IN CONNECTION WITH THE CONSTRUCTION OF THE QUEBEC BRIDGE.

Very satisfactory progress has been made in connection with the construction of the huge Quebec bridge, situated some seven miles above the city of Quebec.

The contract for the substructure was let in January, 1910, and the contract for the superstructure in April, 1911. The work on both contracts has gone ahead as rapidly as possible since these dates, and at the present time there are material evidences to prove that before very long the River St. Lawrence will be successfully spanned by the largest bridge in the world.

Owing to the increase in weight and width of the superstructure, the piers of the old bridge had to be removed and new ones constructed in their place. All the more difficult work in connection with the substructure is now practically completed. The caissons for the north and south main piers have been sunk to the required depth, that for the north pier about 50 feet and that of the south about 85 feet below the bed of the river. All the rest of the work in connection with the substructure is above high-water mark or protected from the water, and presents no serious problems. The masonry involved in this contract includes alterations to the existing abutments and the entirely new construction of one intermediate pier, two anchor piers, and two main piers. The total yardage in these various pieces of masonry amounts approximately to 105,000 cubic yards. The timber used in the caissons is mostly 12-inch by 12-inch long leaf southern pine, and some 18,000,000 feet B.M. were used in the construction. The piers on the north side of the river are well advanced, and will be ready to accommodate the steelwork early in the coming season.

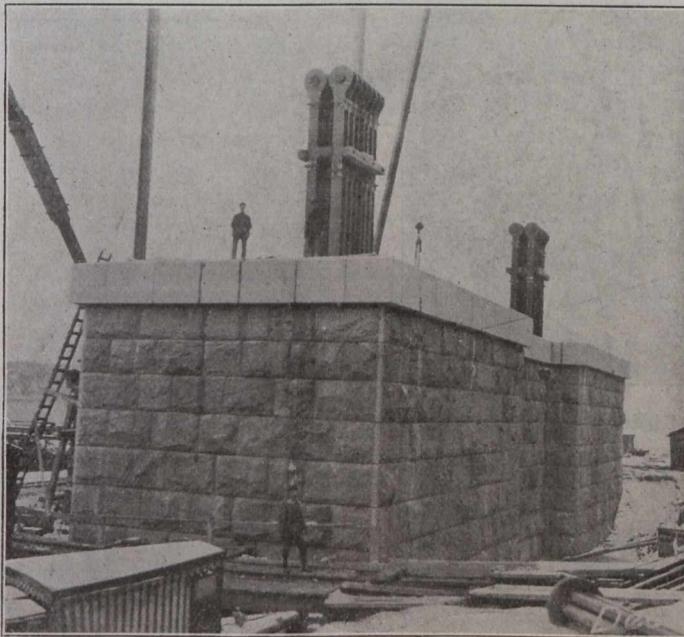
Since the awarding of the contract for the superstructure, the contractors, the St. Lawrence Bridge Company, of Montreal, have had a staff of between thirty and forty men engaged in their offices working on the detailed plans of the design. The design, details and problems in connection with this bridge are to a large extent without precedent, and as a result much time has been spent in investigation and studies that would not have been necessary with a smaller structure.

Plan after plan has been made, studied and revised, no detail of construction or calculation being too insignificant to court the minutest investigation. The contractors work in conjunction with the designers and calculators of the board of engineers, and no detail was passed unless thoroughly approved by both. Entirely independent sets of calculations were made by the board of engineers, each calculation being checked and re-checked independently so that there could be

no possibility of error creeping in. Therefore, each simple calculation was subjected to two independent investigations by the contractors and two independent investigations by the board before it was finally approved. The suspended span was first designed and shop drawings completed from which the actual dead loads were computed before starting on the cantilever arm, which is in turn being completed before the drawings of the anchor arm are made. It can therefore be seen that there can be no chance of over-run in dead weight in the completed structure, as was the case in the old bridge.

The enormous proportions of this bridge cannot be properly appreciated until actually viewed in place. Some idea, however, may be gained from the following facts:—

The completed bridge will probably exceed 50,000 tons of steel, equivalent to 1,700 carloads of 30 tons each, or over 500 train loads of 30 cars each. While this is an enormous quantity of steel to go into any one structure, yet there would be no difficulty in handling it were it manufactured in the ordinary commercial sizes used in bridges and structures to which we are accustomed. The great difficulty of the mechanical side of this enterprise arises from the fact that nearly all the members of the bridge are of such enormous proportions that the ordinary shops or equipment are entirely inadequate to manufacture or handle them. Shops with columns and girders of unusual strength are required to carry the heavy cranes which handle the enormous members. Almost every piece of machinery used must be of the largest capacity, and in the majority of cases are specially designed for this job.



View Showing North Anchor Pier with Eyebars Extending Above.

This pier will be extended 100 ft. higher than is shown here. Some idea of the enormous size of the stones can be gained by comparing with men in the picture. Dec. 2nd, 1912.