

Ottawa Junction Railway," with the United States railways on the south of the St. Lawrence. The bridge proper will be one mile in length.

As an hydraulic Engineer his name stands among the first in the Dominion, and he is consulting Engineer for many of its public works.

THE ROYAL ALBERT BRIDGE.

(See pages 100, 104 and 121.)

I.

We publish, to-day, views showing various parts of this contemplated bridge destined, when completed, to greatly excel in magnitude any similar structure which has yet been built.

The impetus which for several years past has been given to the construction of railways on the north of the St. Lawrence and Ottawa rivers; with a continuation through to the waters of Lake Huron, to tap the lake traffic of north-western States; a more immediate connection by rail of the great lumber districts of the St. Maurice and Ottawa rivers, including their numerous tributaries, with the leading markets in the United States; the geographical position of Montreal, almost on the air line; as well as other important considerations to be glanced at, demand a second bridge over the St. Lawrence at this city, in order to effect a union of those Eastern, Northern and Western roads with the great American system on the South, and secure an easy and cheap interchange of traffic.

The Victoria Bridge, while performing the most important function in this interchange of traffic, more strictly speaking accommodates but that of the St. Lawrence Valley with such through freight as it can get. It is a close corporation, in other words under the entire control of one railway company. It is not too much to say that, in a decade or two, its capacity will be tested to the utmost to accommodate the traffic of the Grand Trunk Railway alone. Even were its carrying capacity much greater, and in a position to be made use of by all railways on the same terms, the difficulty of access to it by the Quebec, Montreal, Ottawa, and Occidental Railway, coming in at the eastern end of the city would be almost insuperable.

It may be of interest to state that the point of crossing now determined on is nearly identical with the one pointed out many years ago for the Victoria Bridge, when it was proposed to pass the river by a span of then unheard of dimensions, from St. Helen's Island to a point east of the Market Place, and thence by arches north-ward to Côte à Barron.

The idea of that day is now being realized in the proposed Royal Albert Bridge, a fit mate for its Royal consort, a couple of miles farther up the river.

In combination with its railway traffic, it has also been thought desirable to accommodate that of ordinary character, such as city passenger cars with dummy engines, the various descriptions of vehicles, and also afford ample space for pedestrians.

As is well known, for about two months or more each year, this city is cut off entirely from the south shore, whence it derives its principal amount of market supplies, hay, &c.

During this period, prices go up and the additional money so paid would be no inconsiderable part of the amount required to meet the interest on the cost of the bridge. Ready access would be offered to the south shore night or day, the year round, at a very trifling cost, and at a most expeditious rate of speed, resulting in a few years in the growth of a large city, or "Southern Montreal."

The bridge will also give every required facility for reaching the St. Helen's Island Park., destined to be one of the most pleasant and beautiful of drives or resorts.

The great length of the bridge (about three miles) permits us to give views of but some of its most salient points.

Fig. 1. Represents general elevation.

Fig. 2. " " bird's eye view of that portion over the navigable channel.

Fig. 3. Represents elevation of 500 ft. span.

Fig. 4. " " " 300 " "

Fig. 5. " " end elevation of 500 ft. span.

Fig. 6. " " part end elevation and part section of 300 ft. span.

Fig. 7. Represents General Plan, showing connection with the railways on the North and South shores.

11.

In connection with these views, the following brief description of the structure is given.

Leaving the level of the ground on the line of Sherbrooke St., it is carried as a viaduct, east of and parallel with Colborne Avenue, at a level of ninety feet above the surface of the ground, in spans varying from 150 to 200 feet each. Striking the navigable channel of the River St. Lawrence near Molson's Brewery, it passes over to St. Helen's Island with six spans.

Owing to the angle made by the axis or the bridge with the current, the piers are placed on the skew, so as to be lengthwise in line with the current, and in this manner offer the *minimum* of obstruction; while doing this service, however, it lengthens considerably the superstructure, as for instance in the case of the large span of five hundred feet between the masonry, measured at right angles, the length of superstructure span is increased to five hundred and fifty feet; and so proportionately with the four remaining spans of 300 feet each.

The bottom of the superstructure will be carried level from Sherbrooke St., to the centre of St. Helen's Island there meeting the natural surface of the ground. This will give a clear headway of 130 feet above summer water level in the harbour, or say 120 feet above winter level. (The latter figure is the height of the Britannia Bridge above mean tide level, determined by the British Admiralty as a suitable elevation for navigation purposes).

Reaching St. Helen's Island, four spans of 240 feet each will carry the bridge to the height of land, where this first section of the structure will terminate.

From the south side of the Island the second section of the bridge will be carried over the unnavigable channel of the St. Lawrence, to the south shore by twenty-one spans of two hundred feet each, grading down with an inclination of one foot in one hundred feet. Reaching the south shore the bridge becomes again a viaduct of five additional spans of two hundred feet each, or until the superstructure has approached within such a distance of the natural surface of the ground, as to make embankment more economical; and thence proceeds with ordinary grading to a junction with the Montreal, Portland and Boston Railway, as also the Grand Trunk.

The total length of the bridge and viaduct will be fifteen thousand five hundred feet, or within a fraction of three miles; and the extreme distance covered from the point of departure from the Quebec, Montreal, Ottawa and Occidental Railway on the Mile End heights, to the junction with the line on the south side, will be five and a half miles.

A sufficient length on the natural surface of the ground on St. Helen's Island exists between the two bridges for siding purposes. Trains from opposite directions can thereby cross each other here, and so double the capacity of the bridge.

The piers to be placed in the two channels of the river will be designed on the general principle of those of the Victoria Bridge, for the purpose of allowing the ice to cut freely past.

Those in the navigable channel will be sunk in *caissons*, thereby obviating the use of cofferdams and other obstructions in the river, and rendering pumping unnecessary. In the south channel the water is very shallow, with a rock bottom, and very little expense will be incurred in putting in the foundations of the piers.

The abutments and piers on the land portion will be of simple design, the first probably partaking of the Egyptian style.

The iron superstructure from end to end will be composed of four independent longitudinal ribs, or open lattice girders, placed certain distances apart, and strongly connected laterally.

These ribs will be provided with the usual friction rollers on each alternate pier, to provide for expansion and contraction. Between the two inner girders, on the lower floor, will be a space of eighteen feet to accommodate two tracks for trains of city cars, to be drawn by dummy engines. Between the two inner girders and outside girders, on either side of the bridge, will be spaces of fourteen feet respectively, for ordinary cart and waggon traffic, passing in one direction on the western, and in the opposite direction on the eastern side of the bridge. Exterior to these two outside girders will be footwalks, firmly supported on brackets of iron, strongly attached to the side girders and floor beams; they will each possess a width of 8 feet and be provided with ornamental railing for the protection of pedestrians.

At a distance of fifteen feet above the lower floor will be placed a second one, strongly connected and braced with iron kelsons and gussets to the longitudinal girders; on the floor, between the two inner girders, will be placed a railway track with crossing arrangements for trains, as before stated, at St. Helen's Island. The spaces existing between the inner and outer girders will