

For further details on this subject, I beg to refer you to the Report made by Mr. Ross and myself on the 6th of June, 1853, to the Honorable the Board of Railway Commissioners, Quebec."

We have not at hand the report referred to, but in his report of 3rd November Mr. Ross goes over the reasons which influenced him in deciding on the dimensions of the abutments, and justifies the manner of their construction. He says of them :

"These it appears, are considered unnecessarily large, and more costly than the tubes, and it is suggested that they may be reduced by making openings in, or by shortening them. These abutments are not in reality what, upon paper, they appear to be, a solid mass of masonry: *they are hollow*—each having eight openings or cells, 48 feet in length, and 24 feet in width, separated by cross walls five feet in thickness. The flank wall on the down stream side rising nearly perpendicular, is seven feet in thickness, and that on the upper stream side is sloping from its foundation upwards to an angle of  $45^{\circ}$ : its thickness is twelve feet, and presents a smooth surface to facilitate the operations of the ice, on which account its form had thus been determined; and to ensure greater resistance to the pressure of the ice, the cells are filled up with earth, stone and gravel, so that one solid mass is thus obtained at a moderate cost. The subjoined plan and section of this work will better explain its form and proportions.

The idea of introducing any other description into the abutments than those described, is altogether inadmissible; passages through it where ice could accumulate, would ensure its inevitable destruction upon the first hydraulic pressure it had to encounter.

I have observed in this immediate neighborhood the effects of swift currents created by obstructions in the river on a recently formed causeway constructed of timber connecting a small island below the bridge with the shore, having openings about 12 feet in width at intervals of about 30 feet.

In the autumn of last year, these openings were partly covered by heavy timber and planking strongly secured by iron work, and the consequence has been, that during last winter, the first crush of the ice, in forcing its passage through, destroyed every timber, plank, and bolt, that opposed it—having got under, it was immediately blocked up, and the pressure of water still forcing its way, the jam became at length so tight, that it burst with an explosion.

It is stated that the length of the abutments is unnecessary and greatly in excess. Upon paper this may seem so, and a recollection of the idea conveyed to my own mind subsequent to the earlier considerations of this subject which led me to the conclusion of adopting their dimensions, prevents my attaching so much importance to such a view as I otherwise might do. You will recollect that the bridge is approached from the north shore by an embankment 1200 feet, and from the south shore 800 feet in length, the river being thereby narrowed to this extent; the waters thus far embayed, have now to find their way through the bridge, and the current, overcharged with ice, sweeping its way along the front of the embankment into the nearest passage, attains, ere reaching it, a velocity which nothing but the most substantial masonry could resist. This, it will be seen, bears on the question of the length to which such masonry should extend, and I am more than ever convinced that I have not exceeded the limits which prudence dictates—thus confirming my original view in reference to this particular and very important point. I