

received the full force of the current on one side of the bow, and great precaution had to be taken to prevent them from being swept out of position; this was done by means of anchors placed on the inshore side, and from which the cables were brought to the capstans fixed at both bow and stern of the barges, and in this manner held in position till sunk.

It was not found necessary to scribe the bottoms of the caissons, as they invariably fitted close to the bed rock, which was remarkably level and dredged thoroughly clean.

At the early stages of the undertaking it took three days to place and sink a caisson, but, as the work progressed they were placed and sunk in a day.

On the caisson finally being settled and weighted in its position, the barges upon which it was transported were then removed. Divers were then sent down, and a canvas curtain, 6 feet wide, which had been previously nailed on the inside of the caisson 2 feet from the bottom, was unrolled, and upon this were piled bags of concrete to prevent any wash to the concrete afterwards to be deposited. Once commenced the concreting was carried on continuously day and night, until completed. A floating electric light plant furnished the light for the night work. A derrick scow was placed alongside the caisson, and as the concrete was mixed it was deposited in iron boxes with false bottoms holding from one to two cubic yards, and lowered slowly into the caisson, and the bottom tripped, thus preventing the separation of the materials which would ensue from allowing the concrete to fall unprotected through the water.

The composition of the concrete was: one part of English Portland cement, three different brands being used,—White's, Johnson's and Union,—one part of sand, and between three and four parts of broken stone of 2" cube.

A bed of concrete was thus obtained, varying in depth from 8' to 12' and all brought to the uniform height of 12' below water level, at which point the masonry in all cases was started from.

After allowing the concrete 48 hours for setting, the caisson was pumped out with an 8" horizontal centrifugal pump driven by a 30 horse power engine, both on a scow alongside and connected with the caisson by a rubber suction hose. The pumping of a caisson usually took from 20 to 40 minutes, and little or no trouble was experienced in keeping them dry, they being thoroughly caulked from top to bottom. When this was accomplished the masonry was commenced and carried on to completion.

The concrete was found in all cases to have so thoroughly set as to make it as difficult to dress it to receive the masonry as an ordinary footing course.

The caissons were ripped on the outside to the level of the top of the concrete.

The stone used for the piers and abutments is lime stone, and was taken from the quarries at Apple Hill and Caughnawaga, the last stone being laid on December the sixth, thus occupying the space of eight months and six days in the construction of the substructure.

The quantities were 8000 cubic yards of masonry, and 7000 cubic yards of concrete, in which were used 25,000 barrels of Portland cement.

In the winter of 1888, the contract for the construction and erection of the superstructure was awarded to the Dominion Bridge Company of Lachine, and preparations were at once commenced for the undertaking.

Specifications prepared by the railway company for the superstructure required that it be of the rivetted lattice type, and the general design finally adopted had a double system of triangular or inclined web members, inclined batter or end posts extending over one panel and girders of the swing span, and the longer fixed spans of varying depth, only the central upper chord panel of the fixed spans being horizontal, the chords sloping each way from the central panel to a junction with the batter posts, the depth of the girders at ends being made just sufficient to give the required clearance between track and portal bracing.

The use of inclined chords results in small economy of material, reduces wind surface, and gives good depth at centre of span with