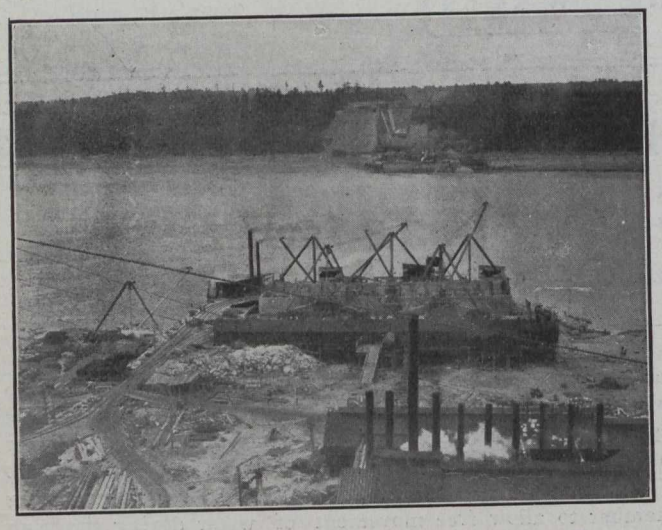
of the caisson which might tend to open up the joints and seams and consequently allow air to escape. On this account it was decided that the ordinary method of sinking, where all the load is carried on the cutting edge, would not allow the movements of the caisson to be sufficiently controlled during the actual sinking. The rather unusual method has therefore been employed of carrying the entire

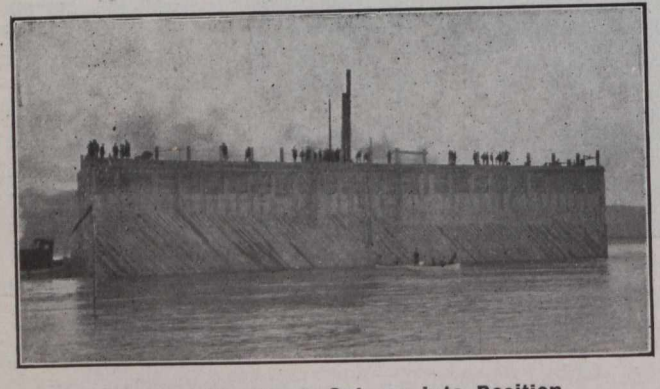


The Plant on the South Side, Showing Caisson During Sinking.

(The plant on the north shore across the river can be d stinguished). July 15th, 1912.

load on the bulkheads and the roof and no load at all on the cutting edge.

The caisson was supported on 40 sand jacks and about 25 posts 12 x 12 yellow pine and 54 sets of blocking. The jacks and posts bear directly against the roof while the blocking is piled under the bulkheads. When ready for a drop the blocking and posts are first removed by washing the sand from under them with a water jet. Then the whole caisson is lowered by operating each sand jack simultaneously. The sand jacks are of simple construction, consisting of a steel cylinder 29 inches in diameter closed in at the bottom. Near the bottom are two holes about 3 inches in diameter with a sliding cover. The plunger is a single piece of timber fitting easily into the cylinder. The cylinder is



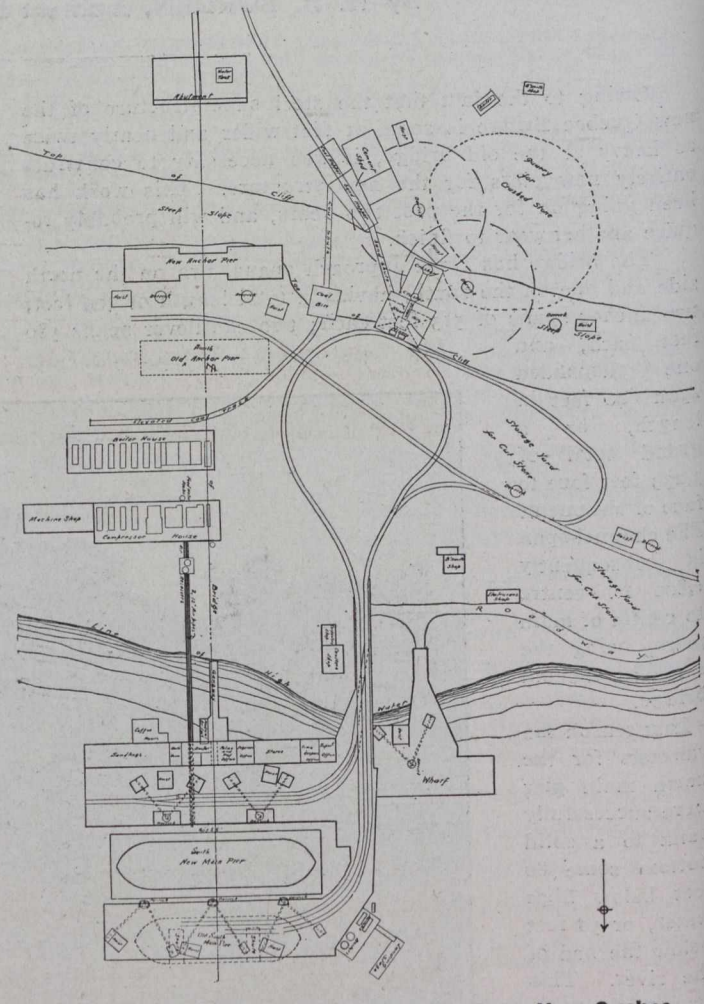
Floating the South Caisson into Position.

(Its huge proportion shows up in comparison with the men and boats). May 28th. 1911

filled two-thirds full of sand and the plunger inserted, the upper end being blocked against the roof.

The operation of lowering consists in opening the lower holes and placing a water jet therein, thus working the sand out. These jacks have been found to work admirably on this work, the result being that the caisson has been sunk absolutely level and in its proper location. Before each drop a trench was excavated under the cutting edge to a depth of two or three feet. This space was then filled with clay, which tended to prevent the escape of the air, and further acted as a lubricant during sinking. This scheme was followed throughout the entire sinking and seemed to materially facilitate the operation. The material encountered varied from small boulders and sand at the top to practically 95 per cent. sand towards the bottom. The sand is blown out through four-inch pipes by means of the compressed air. Ten of these pipes are in use and remove the fine material very rapidly. The larger material is removed through the material shafts in half-yard steel buckets. It has been necessary to do very little blasting.

Owing to the great depth of the caisson, special means have been employed to enable the men to enter and leave the working chamber with the least possible loss of time and labor. To this end an open shaft extends down to a horizontal steel lock placed over the roof of the working cham-



Contractors' Plant on South Side of River, New Quebec Bridge

ber. This lock is large enough to hold the entire shift. Communication with this lock and the outside air is made by means of a spiral stairway. There is an air valve at the foot of this shaft and also at the top of another shaft in the bottom of the lock leading down to the working chamber. As an extra safeguard, there are four other 30-inch ladder shafts. The excavated material is hoisted out through three material shafts.

At the beginning of the work about 300 "sand hogs" were used in three eight-hour shifts of 100 men each. As the caisson was sunk and the pressure increased the length of the shift decreased. At 50 feet below average high water or a pressure of about 22 lbs. per square inch, a change in working hours was made to four shifts of six hours each. At 65-foot depth or 32 lbs. pressure six shifts of four hours