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THE CONSTRUCTION OF THE SOUTH MAIN PIER OF THE QUEBEC BRIDGE.

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Owing to the fact that the steel superstructure of the new Quebec Bridge is some 21 feet wider and nearly twice as heavy as the old bridge, it was necessary to construct entirely new piers for the new structure. This work has been going on for the past two years, and will probably require another year to finish.

The bridge has three approach spans, two on the north side and one on the south, having a total length of 409 feet, two anchor spans of 515 feet each; two cantilever spans 580 feet each, and one suspended span 640 feet in length, or a grand total of 3,239 feet face to face of abutment. The channel span is consequently 1,800 ft. centre to centre of main piers, being the same as the old bridge.

Last season the caissons for the north main pier were successfully sunk to a solid bottom some 80 feet below high water, or 50 feet below the bed of the river. This season the contractor has concentrated his efforts upon the sinking of the mammoth caisson for the south

main pier. The caissons for the north main pier were in two sections each 60 ft. x 85 ft. with a 10-foot span between, this space being filled with concrete after the sinking was effected. On the south side one single caisson is being employed 180 ft. x 55 ft., which, taking into consideration the great depth it must go, is by far the largest caisson ever employed on a work of this kind. The caisson is being carried down to solid rock 85 feet below the level of the river bed and 100 feet below extreme high water.

The caisson was floated into position last season and grounded on a prepared bed which is exposed at low

water. It remained here all winter, guard piers of rip-rap being placed along its sides to protect it from the ice. The rip-rap was mostly broken concrete taken from the old pier in course of demolition situated just outside the caisson. Weep holes were provided in the roof over the working chamber to allow free movement of water during the high tides, and thus guard against any floating of the caisson when once properly grounded. As the water rose several feet each tide above this roof it was feared that if snow

were allowed to accumulate ice would form and tend to strain the structure. To guard against this contingency, the caisson was entirely housed over, and as a further precaution steam pipes were led around the walls just above the roof of the working chamber, steam being supplied by a boiler on top of the caisson. It was found, however, that the steam heating was not necessary as the interior kept sufficiently warm to prevent ice from forming.

Owing to a very late spring,

actual sinking operations were not started until June 15th. Since that date the work has progressed steadily, and at the time of writing the caisson has reached bed rock, some 85 feet below the bed of the river. The material, being mostly sand, has been exceptionally easy to penetrate, the rate of progress having averaged nearly 9 inches per day for the entire time. Some weeks, however, the rate has averaged as high as 15 inches per day.

Owing to the unusual size of the caisson, extraordinary precautions were considered necessary to provide against any unequal settlement or any twisting or other movement



The Plant on the Side of the South Cliff.

(There can be seen the quarry to the right, with crushers and stone chutes leading to the concrete mixers, also the sand and coal hoppers and chutes leading to the lower level. At the left is the south abutment).
June 15th, 1912.