winds, rain and labor troubles delayed us so much that it was not completed until about the middle of September.

Tower Design and Erection

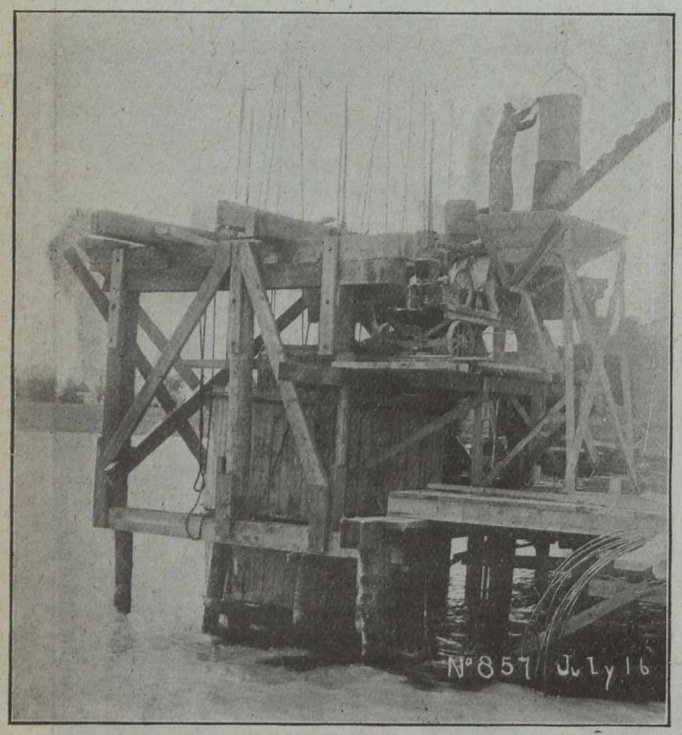
The towers were designed for the following loads:—

A vertical load of 530,000 lbs., made up of 350,000 lbs. due to the weight of the tower itself and 180,000 lbs. due to the vertical component of the tension in the cable.

A horizontal load of 42,000 lbs. at the top of the tower, parallel to the line, due to the horizontal component of the tension in the cable.

A horizontal load of 26,000 lbs. at the top of the tower, normal to the line, due to wind load on the line.

A wind load on the towers of 400 lbs. per foot height, or 140,000 lbs. total.



Concreting a 6 ft. Caisson Lift

The maximum compression on each of the front legs was estimated to be 575,000 lbs. and the maximum uplift on the rear legs 233,000 lbs. per leg.

The calculated deflection of the towers under maximum load is 4½". The wind and dead load stresses in the tower members do not exceed 20,000 lbs. per square inch.

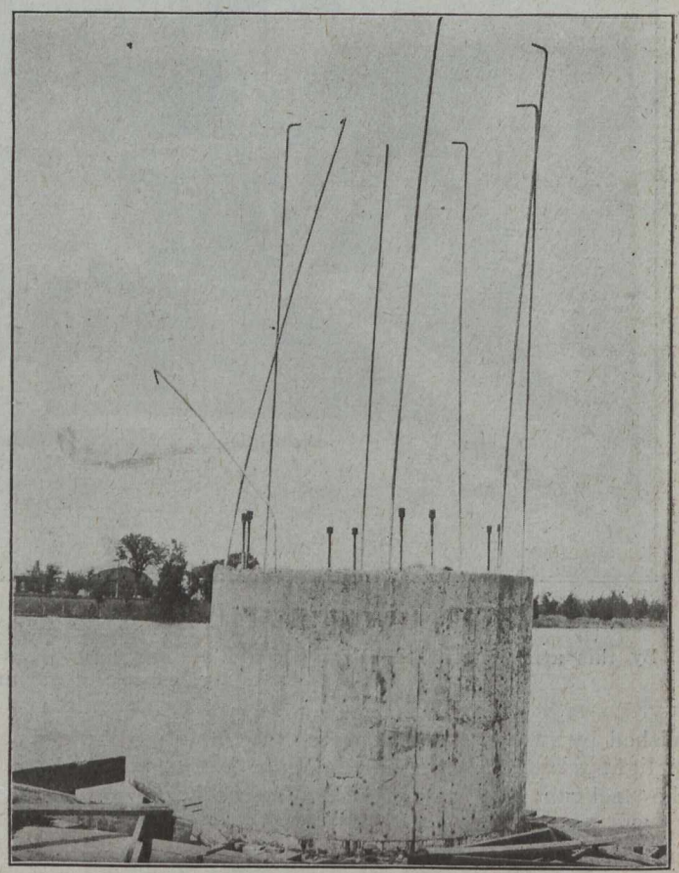
The bottom sections of the tower legs are composed of two 18" I-beams weighing 70 lbs per foot. These sections get lighter towards the top, the top sections being made up of two 12" channels weighing 20½ lbs. to the foot. The two members composing each leg are laced together with 2" by 2" angles.

Access to the top of the towers is obtained by means of Otis-Fensom automatic elevators, operated by electric hoists at the top and controlled by push buttons at top and bottom. The elevated baskets are composed of angle frames with plank floors 3 ft. wide by 4 ft. long. The elevator guides consist of four ⅝" diameter cables, one at each corner of the basket, suspended from the top and weighted at the bottom to provide a constant tension of 1,000 lbs. A steel ladder along one of the legs also provides access to the top and to the various levels at which insulators are strung. The ladder is enclosed from the 50 ft. level to the top with a wire cage and provided with trap doors and seats every 50 ft.

The towers are erected as follows:—

A timber erection tower 10 feet square was built up to a height of about 20 feet on piles which had been driven in the centre of the working platform. A steel derrick with a 60 ft. boom was hoisted to the centre of the erection tower by means of a jin-pole. The material for the towers was unloaded from the cars on the wharf at Three Rivers and transported to the site in barges. The bottom section with its cross-bracing and girts, was erected in place by means of the steel derrick. The erection tower was then raised another 50 feet, the derrick hoisted to the top as before and the next section of tower erected and so on to the top.

The erection tower was guyed to the legs of the steel tower as it went up. Rivetting gangs followed close on the heels of the erection gang. As soon as the north shore tower was completed work was begun on the south shore tower. The erection of the north shore tower was begun early in September. The winter set in rather early and working conditions were so adverse that, in spite of the fact that the Shawinigan Co. paid the men a substantial bonus, the south shore tower was not fully completed until after the first cable was erected in March.



First Section of a Caisson, Before Lowering
Showing Long Reinforcing Rods for Tying Into Next Lift, and Shorter Bars for Connection to Screws for Lowering the Lift.

Each of the towers is grounded by means of a copper plate 4 ft. square which is buried in the river bed and connected to one of the tower legs.

The design and erection of the towers was carried out under our direction by the Canadian Bridge Co.