

The Canadian Engineer

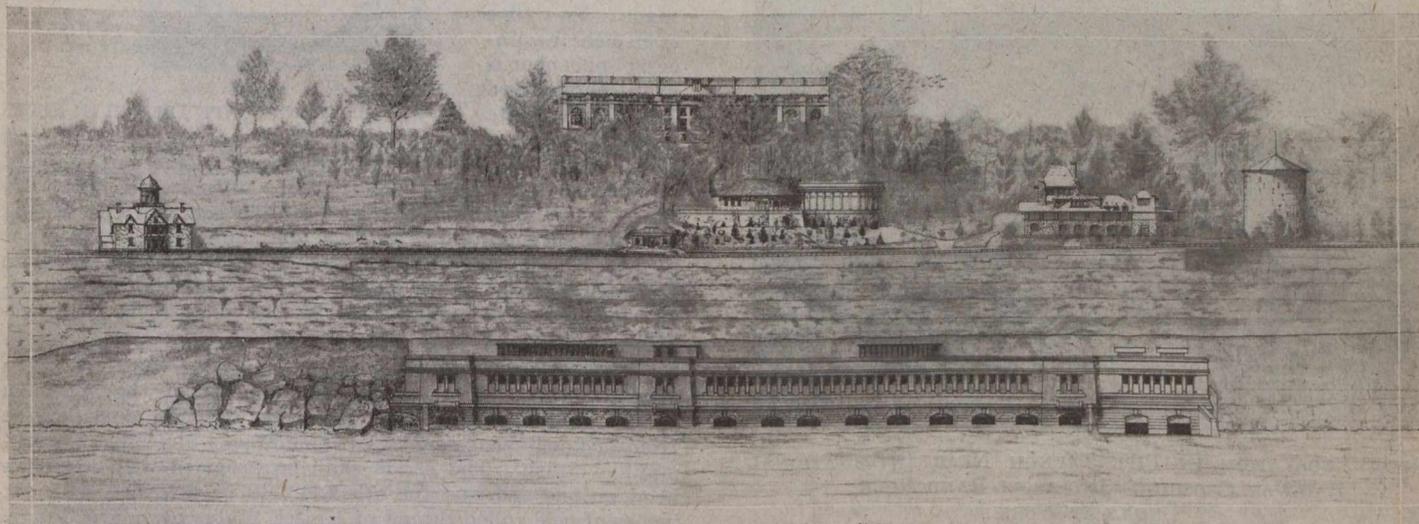
A weekly paper for civil engineers and contractors

Extension to the Ontario Power Co.'s Plant

Construction of 1.3 Miles of 13.5 Ft. Diameter Wood Stave Pipe for 50,000 H.P. Capacity, and of One of the Largest Differential Surge Tanks Ever Built—Power House Designed to Withstand Water Pressure to Crane Rail

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ELEVATION SHOWING POWER HOUSE AT FOOT OF CLIFF—EXTENSION AT THE RIGHT—ON BANK, FROM LEFT TO RIGHT, TABLE ROCK HOUSE, NO. 1 AND NO. 2 SURGE TANKS, REFECTIONARY, AND NEW SURGE TANK AT EXTREME RIGHT—ABOVE, DISTRIBUTING STATION

IN 1918 the shortage of power for essential war industries became critical, so an extension to the hydro-electric plant of the Ontario Power Company at Niagara Falls, Ont., was undertaken as an emergency measure.

The two other plants located at Niagara Falls on the Canadian side having reached their limit of capacity, the sole means of increasing the power supply, pending the completion of the Chippewa-Queenston development, was by the extension to the Ontario Power Company plant. This work was commenced in March, 1918, and when completed will furnish an additional 40,000 to 50,000 horse power, the first 20,000 h.p. of which will be ready by the latter end of this month, and the remainder a few weeks later. The whole 50,000 h.p. will therefore have been made available in less than twelve months, constituting a very creditable war construction record.

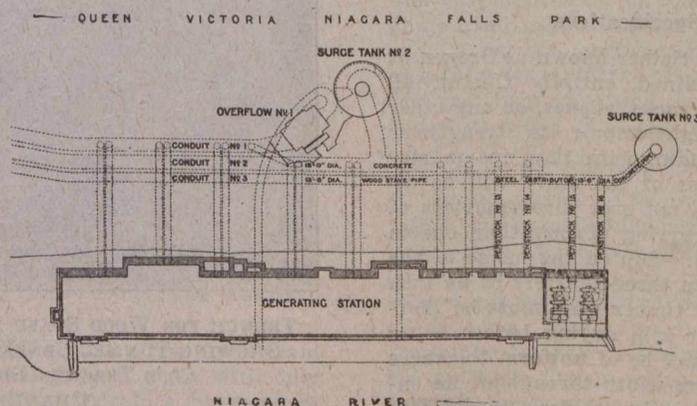
The construction, which is being handled by the Engineering and Construction Departments of the Hydro-Electric Power Commission, involved the excavation of 133,000 yards of earth and 14,000 yards of rock to permit the placing and erection of a 13.5-foot diameter wood stave pipe, 6,700 feet long; the fabrication and erection of a 13.5-foot diameter

steel distributor 179.5 feet long, and of a steel differential surge tank, 60 feet in diameter, and 94 feet high; the installation of four valves, two penstocks each 10.5 feet in diameter, and two new 20,000 h.p. turbines with direct connected generators, together with the necessary excavation for the building of the additional power house to house these units.

The installation is unique in several particulars. The wood stave pipe is one of the largest ever built; the differential surge tank has the greatest diameter, and the barrel of the same is the highest, of any similar tank not equipped with an auxiliary spillway, while the design of the power house was governed by extraordinary conditions which necessitated protection against a 40-foot rise of tailwater level.

The present plant of the Ontario Power Company, as now controlled and operated by the Hydro-Electric Power Commission, consists of an installation of fourteen turbines, seven with a rated capacity of 11,800 h.p., five rated at 15,000 h.p., and

two at 16,000 h.p., making a total of 189,600 b.h.p. These are direct connected to generators with a total rating of 149,012 k.v.a. Water is supplied through two 18-foot diameter conduits, each approximately 6,600 feet long, having



PLAN SHOWING GENERAL LAYOUT