Progress on Queenston-Chippawa Power Canal

Nearly Seven Million Cubic Yards of Excavation Completed—Forebay Ready to be Lined—Power House Excavation Nearing Tailwater Level—Plant and Methods to be Used for Concreting Walls and Floor of Canal—New Construction Equipment Purchased—Complete Development to Total Half Million Horse-Power

REVIEWING the progress made by the Hydro-Electric Power Commission of Ontario in the construction of the Queenston-Chippawa power canal, the outstanding items are as follows: The excavation for the forebay has been completed; approximately half of the total excavation necessary for the entire work has been completed; the power-house site has been cleared and excavation for the power-house foundations has been started; the construction railway from Queenston to the power-house site has been built and is in operation; and three of the concrete arch bridges spanning the canal have been constructed.

Since the publication (on August 28th, 1919), of the last article in *The Canadian Engineer* on the progress that was being made on this development, nearly two million dollars' worth of additional construction equipment has been purchased, all of which will soon be on the job, with the result that excavation during the coming twelve months will proceed at accelerated speed. Labor troubles, which now appear to be settled, interfered greatly with the work this year, strike after strike being called by the unions last spring, as a result of which the work was completely shut down for nearly two months this summer, much of the machinery being partly dismantled and housed in. Necessarily a certain amount of time was lost in perfecting the organization again when activities were resumed, and it is only within the last few weeks that the working force has recovered its normal efficiency. Nevertheless, it is confidently expected that power will be delivered from the Queenston plant before the end of 1921, in time to take care of the Toronto Street Railway load.

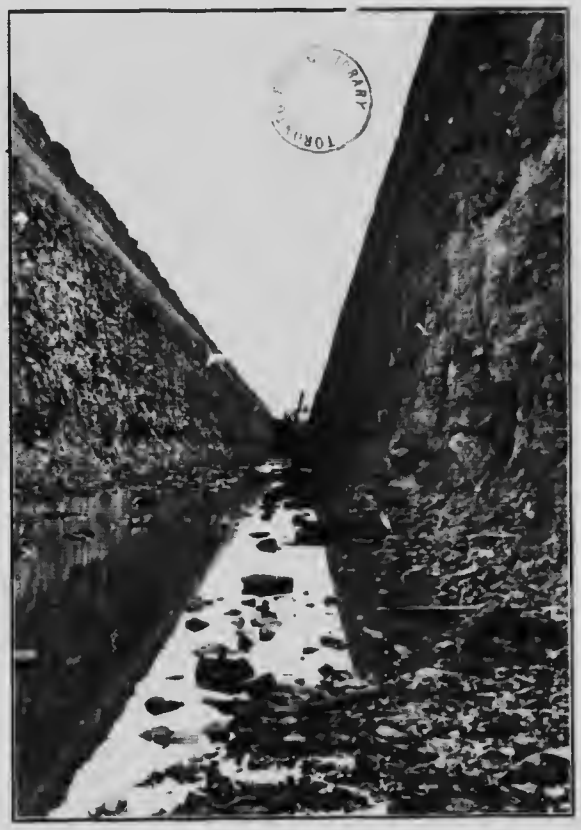

FIG. 1—TYPICAL ROCK CUT, QUEENSTON-CHIPPAWA CANAL

At present there are over 3,000 men on the payroll, of whom approximately 2,400 report for work daily. Work is carried on in two 10-hr. shifts, 6 days a week, for outside labor excepting pump-runners, and in three 8-hr. shifts, 6 days a week, for machine-shop and other inside labor, and for pump-running and other outside labor that is necessarily of a continuous nature.

At the intake, near Chippawa (see page 354 for plan of the canal), dredging is in progress [illegible] 1,200 lin. ft. of sheet piling is being driven at the rate of [illegible] ft. per day. The deepening and widening of the Welland River is still being carried on by means of the cableway excavator. About 750,000 cy. yds. of earth have been moved from the Welland River section of the canal, but another 1,250,000 cu. yd. must be excavated before the river channel will be satisfactory for a flow of 6,500 c.f.s., which will drive the first four [illegible]0-h.p. units in the Queenston power-house. Additional [illegible] in further enlarging the Welland River channel can be accomplished without difficulty after the first four units are in operation; but the canal from the control works at Montrose to the power house at Queenston must be excavated, lined and built complete to its full and final capacity before any water can be turned into the canal prism. The work of widening the Welland River has been done wholly on the north side of the river for its entire length of 4¼ mi. from the intake to Montrose. The river is now being dredged to a depth of 30 ft. below low-water level.

Two new bridges must be built across the Welland River on account of the increase in width of that stream. One will be a highway bridge and the other a railway bridge (Michigan Central R'y.) The substructure for the highway bridge is complete and awaiting the steel for the superstructure, which is being fabricated by the Hamilton Bridge Co. As the Welland is a navigable river, this bridge will be a bascule, of Strauss type, with 90-ft. clear span.

The M.C.R. bridge will be a swing span. Used steel was purchased for this superstructure, and the necessary alterations are now being made in the shops of the Hamilton Bridge Co. The substructure for this bridge is nearly finished, and as soon as the steel is received it will be erected so that the railway can abandon its present temporary diversion.

It can be noted from the profile of the canal (see page 534) that the original ground line along the canal route is below El. 565 for several hundred feet north of the Welland River. The mean level of the river is approximately 560. The canal will be excavated from the north up to the 565 contour line, and the control works will be built before the berm between the river and the 565 contour line is removed, which will be done by dredging from the river side of the berm. Construction of the control works has not yet been started, but they will probably consist of Stoney sluice gates,