

CONSULTING ENGINEER'S REPORT.

NEW YORK, December 12th, 1903

MR. FREDERIC NICHOLS, Vice-President and General Manager,
Electrical Development Company of Ontario, Toronto, Ont.

Dear Sir, In accordance with your request I beg to submit the following report of progress on the construction of your power plant at Niagara Falls.

At the time this work was commenced it was recognized by all those conversant with the plans that the greatest difficulties the company would have to encounter would be in the installation of the coffer dam and the commencement of the work on the main tail race tunnels. It was considered by many that it would be impossible to carry out the work as outlined on the original plans. I am glad to say that both of these serious problems have been solved in a very satisfactory manner and without serious expense or delay.

It was assumed in the original estimates that the depth of the water would be about 8 feet as a maximum on the line of the coffer dam, and in view of the fact that this dam was to be located in the midst of the rapids of the Niagara River it was expected that it would be a difficult operation to build a structure that would withstand the excessively rapid current. As the work on the coffer dam proceeded and it became possible to a certain depth of the river, it was found that there was 26 feet of water, but even with this extraordinary depth and the rapid current, the work on the dam has proceeded continuously and at a rapid rate when the difficulties of construction are considered.

The most serious part of this work is now complete and there remains only a short spur to connect with the shore in shallow and still water. The dam as constructed is thoroughly stable and secure, as one cannot feel a tremor in any portion of the work and it is evident that the dam is well designed for the purpose intended.

A long section of this dam was constructed over a portion of the river bed covered with very large boulders, on which it was necessary to place the coffer dam, fitted to the boulders as well as was possible under the conditions. Naturally a coffer dam built on such a substratum would show great leakage, and it will require considerable work and time to stop the flow of water under the dam. An inspection of the work at the present time shows that very little water is leaking under the dam, even between these boulders, and there is no reason why the greater portion of these leaks should not be stopped. At the present time the amount of water coming through under the dam is not sufficient to seriously interfere with the construction of the work, as it could be handled by flumes and canals if necessary. The larger portion of these leaks, however, will be stopped in the next few months, and before the fore bay construction is commenced.

Considering the rapid current flowing at the face of the dam and the great depth and rough bottom upon which it was constructed, the contractor for this dam and your resident engineer, Mr. Value, are entitled to a great deal of credit for the masterly way in which this work has been handled, as it can be safely stated that this coffer dam represents as great an undertaking in this line of work as has probably ever been designed or constructed.

The plan for the tail race tunnel requires a portal under the Falls. There have been various theories regarding the condition under the Falls, as there are, at times, noticeable explosions, apparently, due to compressed air, and it was confidently predicted by engineers,