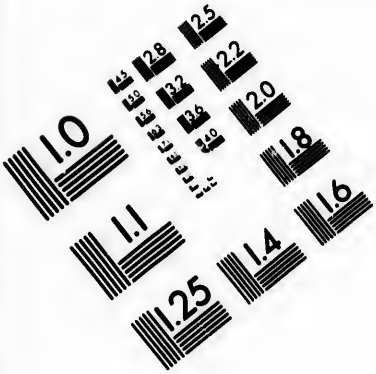

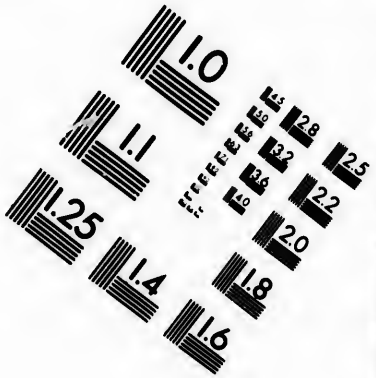

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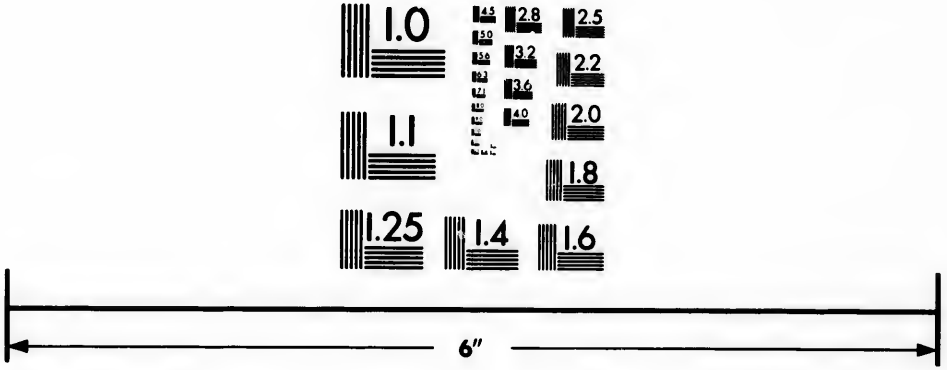

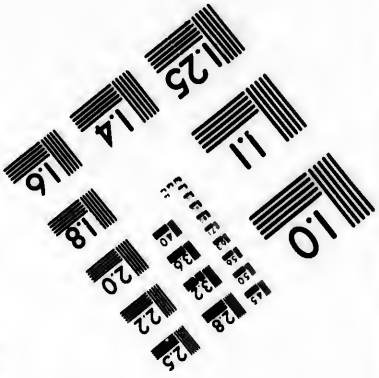

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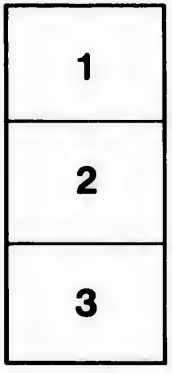
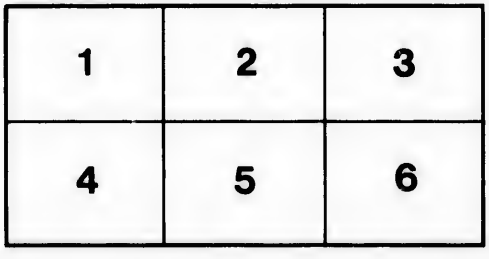




Georgian Bay Canal
Pamphlets

REPORT

OF

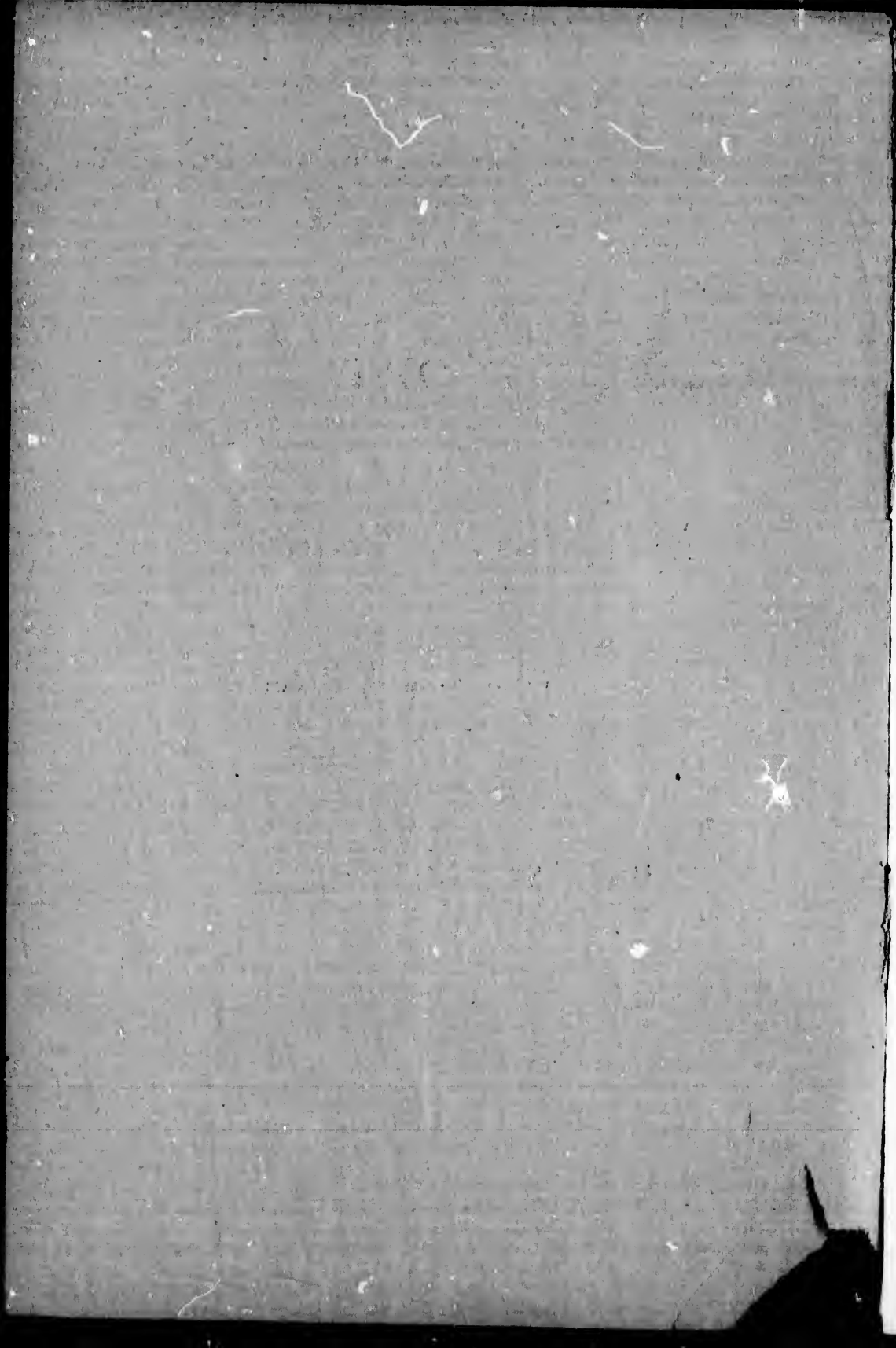
MARCUS SMITH,

M. INST. C. E.

REGARDING THE CHANNEL

OF THE

M. O. & G. B. CANAL.



REPORT

OF

MARCUS SMITH,

M. INST. C. E.

REGARDING THE CHANNEL

OF THE

M. O. & G. B. CANAL.

OTTAWA, DEC. 30th, 1898.

MONTREAL, OTTAWA AND GEORGIAN BAY CANAL

MCLEOD STEWART, ESQ.,

Dear Sir,—

Estimates have been made for the construction of this work on a scale of ten feet depth of water on the mitre sills of locks and twelve feet in canal, river and lake channels. But it is now required that the depth on mitre sills of locks shall be fourteen feet, and in canal, river and lake channels fifteen to sixteen feet, according as the bottom may be rock or earth.

The question has been raised whether there is a sufficient supply of water and depth in the channels of rivers and lakes to maintain these dimensions throughout the season of navigation ?

From my own knowledge and judgment I should answer in the affirmative, but for the information of yourself and others I submit the following :

The water supply comes from three different sources, so that the work of construction will naturally be arranged in three divisions.

I. From Lake Nipissing by way of French River to the Georgian Bay, the length is about forty-nine miles and the fall a little over sixty feet. This is made by a series of still-water

stretches, like narrow deep lakes, separated by narrow bands of rock, forming rapids or falls. The aggregate length of canal crossing these bands is less than one mile, so the extra cost of three feet depth of rock cutting for a fifteen feet channel will not be great.

Lake Nipissing has a surface area of over three hundred square miles, fed by watershed area of over three thousand square miles. Mr. T. C. Clarke, M. Inst. C.E., who made the surveys for the government in 1858 59, states in his report:

"The quantity of water, found by careful guaging, to be flowing in French River (from Lake Nipissing) at a low stage, was nine thousand five hundred (9,500) cubic feet per second, or eight hundred and twenty millions eight hundred thousand (820,800,000) cubic feet in twenty-four hours. Assuming the locks to be 250 x 50 x 12 feet and that fifty lockages are made each way in twenty-four hours it would require fifteen million feet of water, or less than one-fiftieth part of the supply."

2. From Lake Nipissing, by Trout and other connecting lakes and the Mattawan River to the Ottawa River--length forty-five miles. This crosses the dividing ridge which forms the watershed between the basin of the Ottawa and that of Lake Huron.

The distance from Lake Nipissing to the west end of Trout Lake is a little over four miles

and the latter is about twenty-three feet higher than Lake Nipissing, and is on the summit level. The small stream that flows into Trout Lake is not sufficient to supply the water necessary for navigation on a much smaller scale than is now required. It is therefore proposed to construct a dam at the outlet of Lake Nipissing (into French River) to maintain the height of that lake at its highest ordinary flood level, or as high as can be done without material damage to adjacent property, and to lower Trout and Turtle Lakes to the same level. The former is about eight and a half miles long and of great depth. At the foot of this is a narrow ridge of rocks which divides it from Turtle Lake, the fall to the latter is only about a foot and the water on the rapid about eighteen inches in depth. Turtle Lake is about three and a quarter miles in length, and from its outlet at the east end the descent to the Ottawa River by rapids and small lakes will be made chiefly by locks and dams.

There is ample depth of water in Trout and Turtle Lakes, so that when lowered to the adjusted level of Lake Nipissing there will be more than sufficient depth left for navigation on the scale required.

The excavation for the canal between Lakes Nipissing and Trout, and in deepening the river at the east end of Turtle Lake will be

heavy; the quantities can be calculated from the plans and profiles of the government survey. Thus the great body of water in Lake Nipissing will occupy the unique position of the summit level of the whole scheme, so that its waters can be directed westward to Lake Huron or eastward, commingling with those of the Ottawa to Montreal.

On this arrangement Mr. T. C. Clarke remarks: "The waters of Lake Nipissing are sufficient for any scale of navigation for all time to come."

3. The Ottawa River has at any stage a sufficient body of water for the scale of navigation now proposed. The total fall between the mouth of the Mattawa River and Lake Deschenes is fully three hundred feet, not uniform, but with stretches of still water, light currents and long rapids.

The banks of the river are generally high and mostly rocky. Taking advantage of this Mr. T. C. Clarke has arranged the works in a series of high dams and locks to overcome the rapids, so that there are only two places (in the Culbute channel) where rock cutting and dredging is necessary, except in short approaches to the locks. For the larger scale of navigation now required there will be more of that class of work, but the quantity will be moderate.

From the City of Ottawa to Grenville the latest information we have of the depth of water is from the report of Mr. (now) Sir Sandford Fleming, from soundings made under his direction in 1888. On the longitudinal section of the channel the least and greatest depth of water is given for each mile, reduced to a uniform datum, which conforms to the lowest level of the river, taken daily by the lock-master of the Rideau Canal during a period of seventeen years.

Mr. Fleming states: "There are only five points on the whole distance of sixty miles on which the depth of the channel on extreme low water is under ten feet * * * and these shallow parts are limited in length to a few hundred yards each, the whole making an aggregate length of a mile. * * * The material to be dredged is coarse red sand, and finer sand or silt in about equal proportions."

For the depth of water now required there will be, at extreme low water, according to Mr. Fleming's table of soundings, twelve points at which dredging will be required, varying from one to nine feet in depth in short lengths. These may probably be reduced by the necessary enlargement of the locks and canal between Grenville and Carillon for the larger scale of navigation, if the dams are raised a few feet.

From Carillon to Lachine no dredging is shown for a twelve feet depth of channel, but for a sixteen feet channel there may be some dredging. This can be ascertained from the charts and soundings of the Ottawa River in the Department of Public Works.

On the whole the extra cost of construction, though large, may be considered moderate in proportion to the great advantages afforded by the larger scale of navigation.

Yours very truly,

(Sgd.) MARCUS SMITH,
M. INST. C. E.