

Improvement of the Saint Lawrence.

is a bold shore, with high and uneven banks, we have made our estimates for wharfing, which is to consist of round timber three to four feet high, to be secured with brush ties, and the whole to be filled up with stone, clay and gravel.

This is the plan generally adopted in relation to the towing paths throughout.

Estimate for this distance, £964 2 9

At Mille Roche it is proposed to raise the upper level one foot by a dam, to construct a lock 7 feet lift, near Tait's store house, and to extend a pier and embankment from the head of the lock to Mr. Robinson's mill, 24 chains, where we join the pier already formed for the convenience of the mill. See enlarged plan of this point.

The estimated cost at this place is £1565 10 1½
£2529 12 10½

From Millroche to near Moulinette, a distance of 1 mile and 28 chains, to form a towing path, &c. will cost £109 16 6 At Moulinette the plan recommended is much the same as that at Mille-roche, we propose to cut across a piece of low ground for a short distance, and thence by a succession of embankments and rough wall and pier work to join the pier now erected, above Mr. Dickson's mill; here as at the former place we dam the river one foot. Total cost at this place, £1600 15 10. From Moulinette to Brownel's bay, very little is required, except levelling the bank & clearing away the trees that grow along the shore, and making one small cut 9 chains in length, 4 feet in depth, to avoid a shoal.

Whole cost for this distance, £145 13 9

This brings us to the foot of the Long Sault, to avoid which, it is necessary to make an entire cut. Two routes suggest themselves, the one formerly explored by Messrs. Clowes and Rykert, which passes up a ravine from Brownell's bay, through a piece of difficult cutting, for a distance of 1½ miles to Hoople's creek, thence down that stream to Dr. Archibald's point, where it enters the Saint Lawrence, the objections to this route are, that the line runs about 1½ miles through deep and unfavorable cutting, and the canal when finished, will be liable to injuries from earth washing into it from the adjoining land which is high and contains many springs.

The estimated cost of this route is £26243 13 4

The other route designated on the map as "Route No. 2," commencing at the same point in Brownell's bay, runs up the same ravine until it ascends the locks, where the deep cutting on No. 1 commences, there it turns off in the direction of the river, until it reaches the bank near the head of the Long Sault; thence along the margin of the river to the new Storehouse; thence a towing path along the river to Dr. Archibald's point.

This route will cost £17308 15 0 being £8935 18 4 less than No. 1, and as it will be less liable to contingencies when completed, we think it decidedly the best route.

From Archibald's point to point Avoyon, and thence to Rapid Plat, we make only one entire cut for a distance of 30 chains, at Pine tree point, the average depth 4 feet, this is necessary in order to avoid a difficult sand shoal.

For the remainder of the distance the expense consists in forming a towing path, deepening shoals, and in erecting bridges. Expense for this distance, (16 miles 34 chains,) £4825 9. At Rapid Plat we recommend a broad and substantial towing path along the waters edge; the current near the shore is not very strong, being checked by counter currents or eddies, average rate 5 miles per hour.

The resistance to be overcome in a current of 5 miles per hour, when compared with a canal or river of 60 feet surface, is as 3½ to 7, hence the objection to towing against a current in a canal of limited dimensions does not apply with the same force where there is a broad expanse of water as along the St. Lawrence. This fact is exemplified on the Welland canal, in which there is a succession of broad reservoirs. Mr. Clowes proposes making an entire canal around this rapid, the cost of which he estimates at £28,178, An expense in my opinion, the difficulties do not warrant. The proposed plan will answer every purpose, and only cost £1259 10 8.

The ordinary expense of a towing path, deepening shoals, and erecting bridges for the convenience of towing is incurred from the head of this rapid to Shaver's Island, a distance of 8½ miles, which we estimate at £3116 7 6.

In order to pass Presque Isle, we leave the river at station No. 530, and make a canal 72 chains, place a lock of three feet lift, and erect a small dam at the foot of the island. The cost of which will be £1626 2 6. From the head of Presque Isle to Point Cardinal, the distance is two miles and 62 chains, and will require an expenditure of £648 1 0 At point Cardinal, £877 5 0

From Point Cardinal to the foot of Rapid au Galloup, the distance is one mile and 58 chains, estimated cost, £742 11 0 At this rapid we propose a lock of 4 feet 6 inches lift, to cut a canal between Mr. Armstrong's mill & the shore; thence to cross the bay formed at the mouth of Armstrong's creek, by a towing path bridge, and to cut across a small point at the head of the natural pier, deepen two or three shoals where we enter the river. The whole cost £1,287 3 0. From the head of the Galloupes to

Prescott, a distance of eight miles, the difficulty of making a towing path increases; the expense of dredging sand shoals, and in erecting bridges, swells the amount to £,5017 7 0.

RECAPITULATION.

	£	s.	d.
From Cornwall to Milleroche,	964	2	9
Milleroche,	1565	10	1½
Milleroche to Moulinette,	109	16	6
Moulinette,	1600	17	4
Moulinette to Brownell's bay;	145	13	9
Brownell's bay to Archibald's point,	17308	15	0
Archibald's point to Rapid plat,	4825	9	0
At Rapid Plat,	1259	10	8
Rapid plat to Presque Isle,	3116	7	6
At Presque Isle,	1626	2	6
Presque Isle to Point Cardinal,	648	1	0
Point Cardinal,	879	0	0
Point Cardinal to Galloppes,	742	11	0
Galloppes,	1287	3	0
Galloppes to Prescott,	5017	7	0
Add for contingencies 10 per cent.	4101	12	10
	£ 45167	0	0
	45197	19	11½

For the estimates in detail you are referred to the accompanying field notes, in memorandum books No. 1 and 2, in which the estimates are made for each six chain station.

(Signed) ALFRED BARRETT,

Engineer.

(Signed) GEORGE KEEFER, Junr.

Assistant Engineer.

In relation to the Steam boat canal, I have not been so particular in collecting materials for a minute estimate, my attention having been directed to the subject of improving the river for the navigation of Durham boats, and large barges, not having deemed it so important since the survey and estimate of Messrs. Clowes and Rykert, have for some time been before the public, their attention having been directed to an examination of the River, with a view to its improvement for Steam-boats, and having had sufficient time for a most particular examination, they have, no doubt, furnished a useful document for reference.

Had not the season been so far advanced, while making the examination, I should have suggested the propriety of examining the country adjacent to the river, for an entire cut from the head of the Long Sault, or Dr. Archibald's point, to Cornwall.

The country presents a favorable surface for a canal, and by taking advantage of a higher level, I am fully of opinion much of the difficulty and deep cutting which Mr. Clowes had to encounter from Milleroche to Cornwall, might be avoided, and the canal when constructed, be less liable to the expense of repairs &c.

In the present estimate it is proposed to confine the navigation to the river, from Cornwall to Brownell's bay.

It has been suggested that Steam-boats will find some difficulty, from the strong current at point Moline, Pine tree point Crab Island and at French's rift, this objection coming as it does from a highly respectable source, is worthy of particular consideration, still as the strong current at those points is very short and no where exceeding six miles per hour. I would recommend this route in preference to raising a dam 13 feet high, across the river at Millroche, and making an entire canal thence to Cornwall as proposed in the above mentioned survey.

The estimated cost from Cornwall to Brownells bay on the proposed plan is as follows. From Cornwall to French's rift and thence to Tait's Store house, there is deposited in the bed of the river a quantity of detached fragments of lime stone rock, to remove which will cost, L 3725 0 0 At Millroche will be required 1 lock of 9 feet lift 87520 feet of stone at 1s 4376 0 0 A dam to raise the water 5 feet above the present height, 3500 0 0 Pier, excavation, embankment, &c. 3425 0 0

The items of expense at Molinette are similar, (see enlarged plan of these places) one lock of 12 feet lift, will be required. A dam to raise the water five feet above its present level. The estimated cost L 12858 0 0 From Brownell's bay to avoid the long Salt rapids we leave the river to the left, passing up the valley that is connected with this bay, a distance of 1½ miles, thence through Hoopole's Creek, to Archibald's point. 1½ miles of the line, is through deep and unfavorable cutting average about 20 feet, here we propose contracting the bottom width to 26 feet which may be done by making 8 lie-by places, 1700 feet lockage will be required, and about 600000 cubic yards excavation, require grubbing &c. Whole cost, 62545 16 0 L 90429 16 0

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