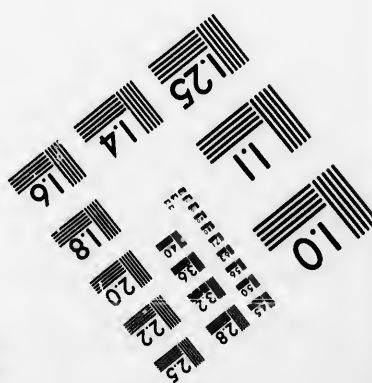
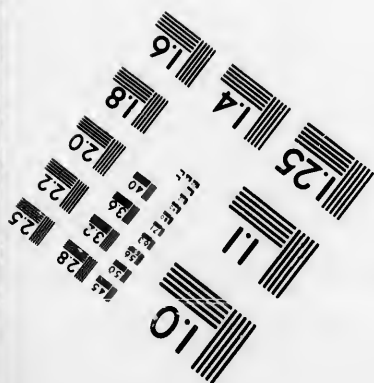
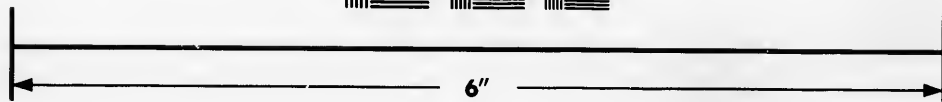
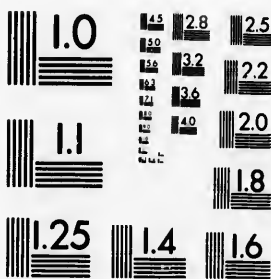


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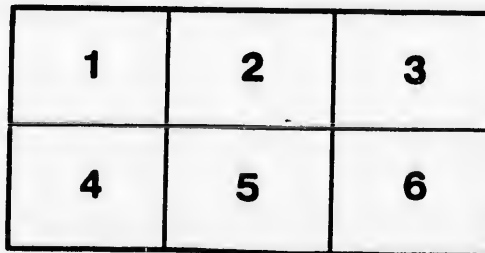
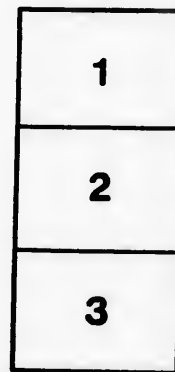
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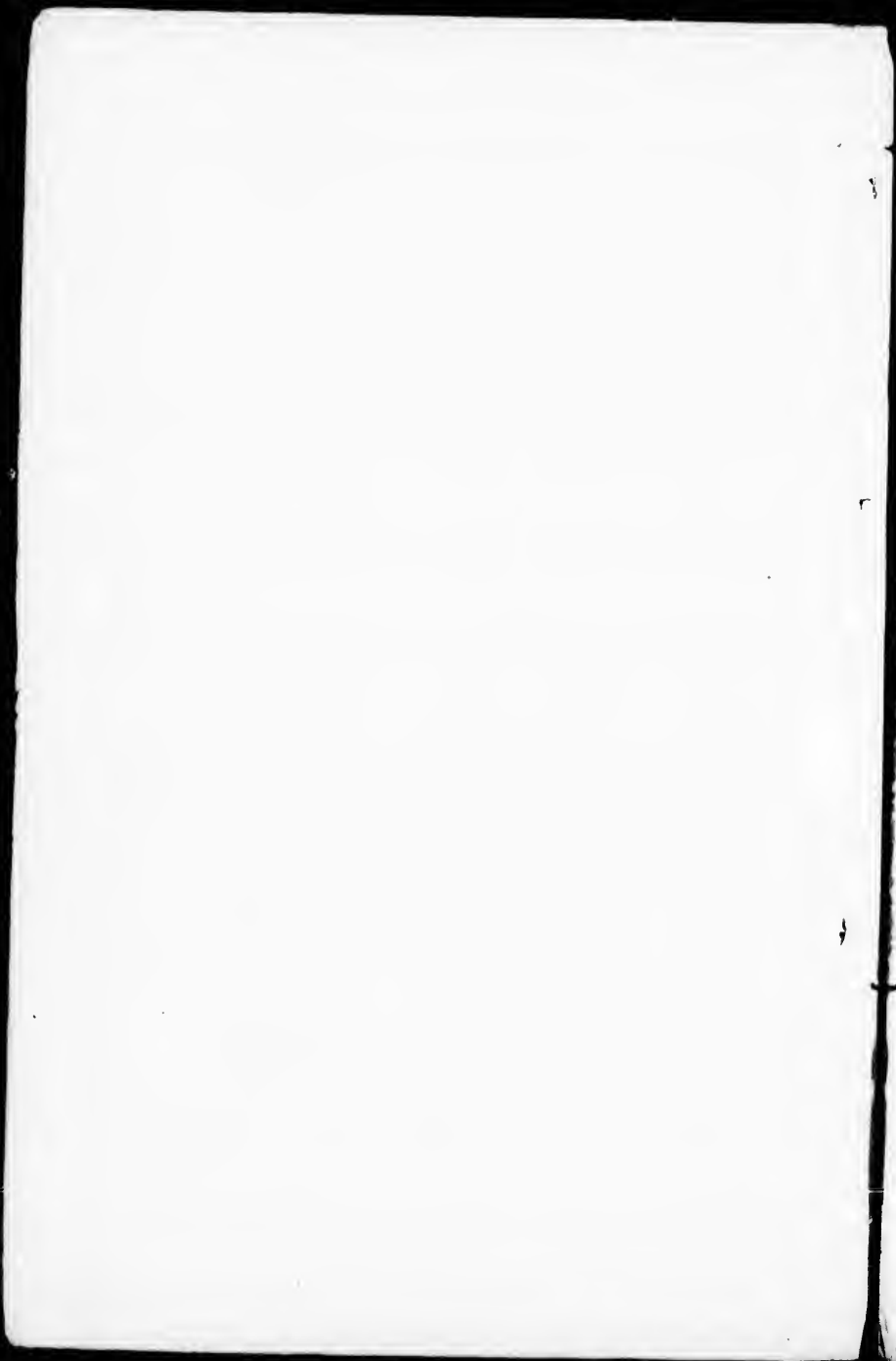
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A MINUTE STATEMENT

RELATIVE TO THE WORKS

OF THE

CHAMBLY CANAL,

EXHIBITING THE ENGINEER'S REPORT, ON WHICH THE CONTRACT WAS
FOUNDED, THE CONTRACT ITSELF—WITH A STATEMENT OF THE
EXTRA WORK PERFORMED BY THE CONTRACTORS, THE
DIFFICULTIES UNDER WHICH THEY LABOURED,
AND THE CAUSES OF SUCH DIFFICULTIES.

THE WHOLE SUPPORTED

BY THE AFFIDAVITS OF MANY OF THE OVERSEERS EMPLOYED ON
THE CANAL; BY THE REPORTS OF THE COMMISSIONERS
TO THE LEGISLATURE; AND CERTIFICATES OF
THE ENGINEER WITH HIS LETTERS
AND INSTRUCTIONS, AND VA-
RIOUS OTHER DOCU-
MENTS RELATIVE
TO THAT WORK

FORMING

A COMPLETE EXPOSEE OF THE MANNER IN WHICH THE WORK ON THE CANAL
WAS CONDUCTED, AND THE CAUSES OF THE NON-COMPLETION OF
THE WORK FOR THE AMOUNT ORIGINALLY CONTRACTED
FOR, &c. &c. &c.

MONTREAL:

PRINTED BY LOUIS PERRAULT.

1836

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**COPY OF THE ENGINEERS' REPORT ON THE
ROUTE CHOSEN FOR THE CHAMBLY CANAL.**

To the Honorable Commissioners of the Chambly Canal.

GENTLEMEN :

"Having explored the ground over which the line of canal from St. Johns to Chambly basin should pass, and having surveyed and levelled the same, we have the honor to make the following report.

"As the water for the canal must be taken from the river at St. Johns, works of some extent are required at that place, to secure a certain and abundant supply.

"It is proposed to effect this by conveying a dyke or embankment of stone from a point opposite Marchand's wharf (250 feet from the shore) on a shoal to the fifth pier of St. Johns' Bridge, continuing from the west shore, and thence to the guard lock in a direct line. The work to be carried for the first 1200 feet (as far as the bridge) to a height of two feet above low water mark, and to rise from thence to the guard-lock to a height of one foot above high water mark, a distance of 1160 feet.

"This work will be both cheap and durable : in high water it will be covered with water in such of its parts as are most exposed to ice and drifts, and at all seasons will give an abundant supply of water to the canal.

"Within this work wherever the water is less than six feet deep, it should be excavated to this depth, and

the earth so removed laid against the dyke to render it firm and water tight.

"The guard-lock is located in the present bed of the river; it has a slight lift of $\frac{50}{100}$ feet to give some pressure to the water in pressing the wicket gate."

SECTION NO. 1.

"Extends to 2600 feet below the guard lock. It is located entirely in the river bed, and is to be protected by a stone wall, on its outer bank slope from the action of the river. By referring to the estimate it will be seen that a large quantity of excavation is set down to this section, and this is to be removed from the river bed, which can however be effected with comparative ease, after the sections below are finished, when the river water may be drained off or dammed out and the canal excavated.

SECTION NO. 2

"Is located under the river bank. The canal will be laid entirely in the river bed so as to have the inside edge of the canal correspond as near as may be to the present line of surface of water. This section extends to the mouth of Wood Creek, and not much earth is necessary to be taken from the inside of the canal bank to give six feet water and the section only needs protection for a few of the first hundred feet.

SECTION NO. 3

"For the most part is under a bank from 12 to 14 feet high. The tow path is located about 60 feet from shore, in from one to eight feet deep water, but no protection is needed against the river.

SECTIONS 4 AND 5

Are very like section No. 3. Section 4 for a short

distance is located in excavation, but both sections are mostly embankment in the river. Both sections need protection against the river.

SECTION NO. 6

"After leaving the river and having a part of the canal in rather deep cutting for a short distance passes across some low level land opposite St. Thérèse Island where the canal can be constructed at a very slight expense.

SECTION NO. 7

Follows along on the same flat for most of its length except a few hundred feet of river embankment.

SECTION NO. 8

Is cut for a short distance in deep cutting, this soon falls to a flat a few feet above the river, and this flat is followed to the mouth of the Iroquois, across this a bank is to be thrown nearly thirteen feet high, which will make the present creek channel the canal, and very little expense will be necessary to prepare this part of the line for navigation. All that is required is to cut down timber and make a tow-path."

SECTIONS 9 AND 10

"Are in the valley of the Iroquois, or in a depression joining it, and running to the river near the lower end of the Island of St. Thérèse. They are located where there is seldom more than four feet excavation. On section 9 a culvert is required to carry off the water of the Iroquois creek, and from it a deep channel must be dug to the river."

SECTION NO. 11

"Follows in the ravine that section 10 is located in, and is very direct. It ends on the river side near the

road, and a bridge will be required on it for the road as there will be at section 9. If for any cause the line is thought better near the river, it can be constructed cheaper along it, but we are inclined to prefer the line as now located which passes a considerable way back from the river."

SECTIONS 12 AND 13

"These set are generally located a short distance from the river. On section 12, which is near the river for a few hundred feet, a bridge will be required for Carpenter's ferry. The sections are nearly all in light excavation. The road requires to be made new the length of these sections."

SECTIONS 14 AND 15

"Contain some of the heaviest work on the line, they are situated opposite Bunkers Hill. The embankment along this part of the work must be well protected against the river. In shallow water a wall can be laid; in deep water a dyke must be made like the one described at St. John's, wide enough on the top to receive a protection wall extending from the surface of water to above high water mark. The lower end of section 15 has some deep cutting, over this a road bridge can be made with ease. After leaving the river at section 15 the line passes over some very hard ground, and where light excavation, or a low tow-path Bank are necessary to form a canal."

SECTIONS 16, 17 AND 18

"Are some distance from the river, and on very favourable ground."

SECTION NO 19.

"Is for the most part embankment, and some of the bank will require to be raised rather high. The line was located in this way, that we might be enabled to found lock No. 1 on rock."

SECTION NO. 20.

"Has the first lock located on the upper end of it, is eight feet lift, and with the other locks is 100 feet long in chamber, and 20 feet wide. Lock No. 2 is of ten feet lift on rock also, and is located near the lower end of this section. The excavation and embankment are both light, and this section may be considered a cheap one."

SECTION NO. 21

"Has on it Lock No. 3, 10 feet lift. This section is a light one, consisting mostly of embankment."

SECTION NO. 22

"Is 3,500 feet long, ending in the channel in Chambly basin. It has on it lock No. 4 on rock foundation. Lock No. 5 with an inverted arch bottom; Locks Nos. 6, 7 and 8 combined. The lowermost of these locks must have its miter sill on a level with six feet below low water mark, its bottom must be well secured and an inverted arch must be turned under the chamber.

"The next lock will have its foundation level with the lower lock. A mass of rubble work the width of the foundation must then be carried as high as the upper miter sill at the lowest lock, the bottom can then be flagged over or capped over and the walls then carried up.

"The highest lock of all must be like the one below. It has its foundation carried as low as the bottom of the lowest lock, and to be brought up to the lock bottom with rough mason work, above this cut stone must be raised.

"We have been obliged from the nature of the soil to adopt the plan for combined Locks as given above. In gravel soil we should be willing to see upper lock walls founded on piles instead of masonry; but in such ground as that at the basin, it will not be safe to use them from the bank commencing about one hundred feet up stream. From the foot of the combined locks we propose to

run out a stone pier the same as that at St. Johns, carried within one foot of high water mark and extending into the basin, where the lowest water is six feet deep. Below this pier the channel must be excavated to the foot of said lock."

We are gentlemen your
very obedient servants.

HANDON & HOPKINS.

Chambly, 22d October, 1830.

The foregoing report submitted by the engineers was adopted by the commissioners, with the following alterations.

Instead of constructing on the entire line of canal, one guard and eight ten feet lift locks, as the report shows, one guard and nine other locks having less lifts were substituted, and instead of running the canal through the Iroquois creek as at first contemplated, the line was to be located through the channel of the river between the Island of St. Thérèse, and the main land by throwing a dyke across the west channel of the river at the upper end of the Island of St. Thérèse and another at the lower, and thus convert the intermediate portion of the river into a part of the canal. By this arrangement the work set forth in the foregoing report, from near the end of section 6 to the beginning of section No. 11 is avoided, but the remainder of the report was considered perfect, and with the alterations mentioned was furnished to such persons as wished to tender for the undertaking, for their guidance, as exhibiting a *full perfect and true* statement of the work required to be done, and under this impression, and believing the said report to be in every particular correct, Messrs. S. & S. R. Andres with others proposed for the job, and entered into an agreement with the commissioners on the 5th day of September, 1831, before P. E. Leclere, Notary, to complete the canal under the following

CONTRACT.

4800

In which the commissioners of the canal are the first party, and the contractors the second, as the preamble simply shows, and afterwards states, that

“ These presents witness that for the price and consideration herein after mentioned, the said parties of the second part do for themselves and their respective heirs &c., covenant promise and agree with and to the parties of the first part and their successors, that they the parties of the second part, their heirs, &c., shall and will at their own proper costs and charges, make, excavate, construct, open and complete a canal with nine cut stone lift locks, and one guard lock navigable for boats, barges, vessels and rafts, from a place at or near the town or port of St. Johns, at a point or place at any distance not exceeding between twelve and thirteen hundred feet above the bridge at St. Johns, towards Lake Champlain to extend through the Barony of Longueuil and western part of the Seigniory of Chambly, a space not exceeding eleven and a half miles in length from the guard lock, down the river Sorel or Richelieu, to be measured on the line originally located by Wm. R. Hopkins, Esq., to a certain other point or place near to Bunker's Hotel, at the Basin of Chambly, so as to connect the waters of the river Sorel or Richelieu at the places aforesaid in conformity to an act of Parliament passed, &c., and shall and will make and construct the said canal, in the most substantial and workmanlike manner and within such time as is hereinafter expressed and limited, and conformably to the places and specifications hereinafter mentioned, and at their like expense shall and will do, perform execute and construct, or cause to be done, performed, executed and constructed in a good substantial & workmanlike manner, and agreeable to the directions and approbation of Wm. R. Hopkins, Engineer, or other the engineer or engineers to be from time to time appointed by the said commissioners as aforesaid or their successors, all such necessary lift locks, guardlocks, dams, culverts, waste weirs, aqueducts, bridges,

sluices, excavations, levelings, spreadings, works, matters and things in and about making constructing and completing the said canal, as shall be by the said engineer deemed or considered necessary or proper in relation thereto, according to the specifications hereinafter expressed, and shall and will at his and their own proper costs and like charges, find and provide all and all manner of gravel, stones, lime, cement, nails, lead, iron, brass, timber, wood and all other materials and things of every kind and description whatsoever, and all scaffolding, tackles, tools, utensils, labour, and workmanship whatsoever, necessary and sufficient, and that can shall or may be required to be used and done, in and about constructing and completing the said canal, and shall and will complete and finish the said canal, and have the same filled with water, and ready and adapted for navigation by boats and vessels on or before the first day of September, which will be in the year 1834, and in all things agreeable to the specifications or description and particulars hereinafter expressed, that is to say :

In all parts of the canal where the cutting is less than eight feet, the earth on the surface (vegetable, mould and muck) shall be removed to the outer slope of the banks, and all grass, leaves and timber carried without the bank entirely. A ditch one foot deep and six feet wide shall be made under the centre of each bank when the excavation is less than six feet.

The canal shall be made thirty-six feet wide at the bottom, and have six feet water, have slopes at the rate of one foot perpendicular to, two feet horizontal, making the canal sixty feet wide at the top water line.

The tow-path shall be ten feet wide on top, the birm path to be six feet, both banks on their in-edges to be eight feet three inches above bottom, and to be seven feet nine inches above at the backside of the birm and tow path, where a ditch is to be cut in excavation varying in depth from one to two feet with proper slopes.

“ All extra earth taken out of the Canal or the works connected with it, shall be so laid as to do as little injury as possible to the lands adjoining, and must

be laid highest next the Canal, this extra bank (spoil bank) must be ditched, and sluices must be made to let off the water that gathers on the top of the banks, at least four in every mile on each side where the Canal is not formed by embankment.

“Culverts five in number if required, shall be of stone, and covered with a coat of gravel of two feet thick, well wet and rammed down. The embankments shall have the same slope with the Canal on the inside, and on the outside, the slope shall be one foot and a half horizontal to one foot perpendicular.

“The earth taken from outside the body of the Canal to form the embankments must come from such points, as the Engineer shall direct, and the land from which the earth has been taken shall be left in a good shape after the embankment has been removed.

“A waste weir shall be made to have one hundred feet breast, and two sluices each five feet by six. It shall be formed of timber mainly, and well puddled according to the plans to be given by the Engineer.

“There shall be three road bridges and nine farm bridges, the bridge abutments shall be made of rubble masonry, the superstructure of wood according to the plan of the Engineer; bridge embankments to have a gradual slope and be easy of ascent.

“Wherever the Canal bank shall be laid in the River, it must be secured by a protection wall, either perpendicular, or sloped, as may be directed by the Engineer, in most places slope wall will be put up except in such parts of the embankment, as shall not have been mentioned in the original estimate of Mr. Hopkins, made in October or November 1830. It is however agreed by the parties to these presents that the embankments to be constructed at the head of the Island of St. Therese shall be protected by a substantial slope wall on the upper side, or as the Engineer may direct.

“Below water, where a wall cannot be laid, a foundation of stone must be prepared which on top will be a little wider than the wall it is to support, and slope on

each side to the bottom of the river, at the rate of one foot perpendicular to one horizontal.

"The size of the stone to be used will depend on the velocity of the current, none however shall be admitted of less than twenty-five pounds weight.

"Wherever embankments are to be made care is to be taken, that they are so sloped, and laid from the bottom, that the coarse and fine materials may be uniformly distributed throughout the bank.


"All places in the Canal below bottom shall be filled up to bottom with good earth, except in those places in which the water on the outside of the banks is usually level with the Canal bottom.

"The wing-dam, and works, at the head of the Canal shall be an embankment of stone lined with gravel, running as marked on the map, from the Guard Lock to near Pierce's Wharf, it must be made of heavy stone, and the earth on the inside of it must be removed to thirty-six feet wide at bottom with the usual slopes to six and one-half feet below low water mark.

"At Chambly below the lowermost Lock, an embankment must be made into the basin as far as the point at which six-feet water can be had at all times, and the proper Canal width excavated to that distance, and to the depth of six feet below low water.

"And it is hereby farther agreed, covenanted, and promised, by and between the said parties to these presents, that they the said parties of the second part, their heirs, &c., shall and will at his and their own proper expences in all things, make and construct the said Locks for the said Canal conformably to the specifications herunto annexed, signed by the said parties, and to form part of the present contract and agreement.

"And the said parties of the second part do hereby declare and agree, that they and each of them jointly & severally (solidairement) and their respective heirs, &c., shall be accountable for the full performance of this contract, and by the signing hereof admit, that the plans, specifications, descriptions, and particulars before referred to are sufficient to their intended purpose, and

that without any additional and extra work, other than the works set forth thereby, or necessarily inferred to be done from the general nature and tendency of the plans and descriptions as aforesaid, and that the whole of the said works shall be done to the entire satisfaction of the said Engineer or Engineers, and in all respects according to the intent and meaning of the specifications aforesaid, upon every sentence whereof a fair and liberal construction shall be made. 

“ And the said parties to these presents do hereby further covenant, promise, and agree to and with each other, that the said works shall at all times during their progress, be open and accessible to the said Commissioners and their successors, and shall be carefully examined and inspected, and to prevent all disputes and misunderstandings it is agreed that the said William R. Hopkins, Engineer, or such other Engineer as shall from time to time be appointed by the said Commissioners or their successors, shall be inspector of the said works; and the said contractors farther covenant, promise and agree to and with the said Commissioners, that if in the opinion of the said Engineer, they the said parties of the second part, should refuse or unreasonably neglect to prosecute the work, or execute or perform any part of the said works in an unworkmanlike manner or otherwise violate any of the stipulations of this contract, the said Engineer, and some one of the following persons, that is to say, Benjamin Wright, Canvass White, John B. Jerviss, and Moncure Robinson, Esqrs., to be chosen by the said parties of the second part, concurring in opinion with the Engineer of the Commissioners shall jointly have power to determine this contract, and to declare and render the same void and of no effect, and that such determination shall exonerate the said Commissioners and their successors from every obligation imposed upon them by this contract, and that they may immediately after such determination, and after a certificate thereof under the hands of such Engineer, and of the other person to be selected in manner aforesaid, shall have been deposited or placed in the office of the said Commissioners proceed

to dispose of the whole, or any part of the work, in the same manner as if these presents had not been made. And if the said parties of the second part shall refuse, or neglect to appoint, one of the above named Engineers, on twenty days' notice having been given them by the Commissioners, that the Engineer of the Commissioners shall of himself be competent to declare this contract void, and on his certificate being deposited in the office of the Commissioners, they may proceed as above stated to relet the same, as if this contract had never been executed. And that to obviate disputes as well as interruption and hindrance to the regular peaceable progress of the different parts of the works, and to prevent unnecessary injury to the rights and property of the neighbours in the vicinity of the Canal, the Engineer shall have the right to dismiss from the service of the said parties of the second part, every quarrelsome and disorderly person and such as shall be addicted to habits of intemperance, or who shall wantonly commit any unnecessary trespass either upon the person, lands, or property of any inhabitant, or other person living, travelling, or working upon, or near the works of the said Canal; and farther, that if at any time any overseer, mechanic, or workman employed on the said works, shall be found unfaithful, or believed to be so by the Engineer of the said Commissioners or of their successors, then and in that case the said Engineer shall have power to direct that any such person be forthwith dismissed and no longer employed by the said parties of the second part, on any part of the work.

“ And the said parties of the second part farther covenant and agree to and with the said Commissioners, that if any bad or imperfect materials are brought upon the ground, or put in the work, and shall be disapproved by the Engineer, they shall be forthwith removed to such distance from the work as shall be directed, and if not attended to immediately by the said parties of the second part, the said materials shall be removed at their expence by the directions of the Engineer.

“ And the said parties of the second part farther promise and agree, that they will from time to time during

the progress of the work, conform to such directions and departures from the present plans and specifications, and variations from the line originally located by William R. Hopkins as near as it can be ascertained, and of any part of the works as the Engineer may direct, and if the same be to the disadvantage of the said parties of the second part, a reasonable allowance shall be made, and the amount of such allowance be determined by the said Engineer. *Q2*

“ And the said parties of the second part do farther covenant, promise, and agree to and with the said Commissioners, and their successors, that they the said parties of the second part shall from time to time during the progress of the works, when required so to do by the Engineer, change the places of working. *Q2*

“ It is however agreed between the said parties, that the Engineer shall locate the said Canal through the channel between the island of St. Therese, and the main land, from a point near the head, to a point above a small run coming in near Carpenter's Tavern.

“ And the said parties to these presents do farther agree, covenant, and promise to and with each other, that if any omissions or errors shall be found to exist in the plans and specifications now made, or hereafter to be made and exhibited by the Engineer, by reason whereof, and of the not supplying and correcting the same, the said Canal might be incomplete, that the said parties of the second part, shall not take advantage of any such errors and omissions, but that notwithstanding such errors and omissions the said parties of the second part, shall at their proper costs and expence, make, execute, construct, and completely finish the work of every description whatsoever, which may be necessary in and about the said Canal, whether the said work shall be comprised in the said plans and specifications, or not, according to the true intent, spirit and meaning of these presents, and of the Act of Parliament aforesaid.”

Here follows the amount to be paid for the completion of the work, and the manner of payment, which

was to be monthly according to the estimates of the Engineer, and afterwards the following clause :—

“ That it is hereby further mutually agreed, that in case of absence or inability to act, of the said Engineer-in-Chief, then and in that case the assistant engineer having charge of the work embraced in this contract, shall have and he is hereby invested with all the powers hereinbefore given to the said Chief Engineer in the premises ; and that the submission herein contained, shall be considered, deemed, and taken as an essential part of this contract, and shall not be revocable by any or either of the parties thereto, and further that the decision of the said Engineer or Assistant Engineer shall be final and conclusive in any dispute which may arise between any of the said parties, touching the quality of the materials, location of the line, and the manner in which the work may be performed ; and it is further agreed by and between the parties to these presents : that the Engineer of the said Commissioners shall afford every reasonable facility to the said parties of the second part, during the progress of the work.”

From the tenor of many of the clauses in the foregoing contract, but especially from the extensive, nay, unlimited powers with which the Engineer is invested ; it may naturally be a matter of surprise that the contractors would have entered into such an agreement, which they never would have done on any other than a perfect understanding, and firm belief that mutual good feeling would exist, that the Engineer would conduct the works as is usual and customary ; and further, that he would, as the contract provides, give them every necessary assistance, and expose them to no needless expences. The contractors firmly believing that such would be the case, and the contract providing further, “ *That all extra or additional work, more than that set forth in the report, should be paid for,*” and that “ *a fair and liberal construction should be put on every clause of the Contract,*” had no good reason to apprehend that any misunderstanding would arise, consequently entered into the agreement, and commenced operations on the

Canal in the Autumn of 1831. In the prosecution of the work, they have been subjected to many inconveniences and heavy losses, some arising from unforeseen causes, over which they could have no controul, such as the cholera of 1832, the return of that disease in 1834, and the unprecedented heavy rains of 1833; others from the Engineer having augmented the work in a very great degree, and made many and very extensive alterations. In addition to these the report on which the contract was founded, proved in many essential points very different from what the contractors anticipated, as will appear from a particular examination of the original report which follows the accounts or demands due for extra work and which from the evidence and documents accompanying the accounts, will upon investigation, it is believed, be found correct.

Copy of account of Extra Work furnished to the Legislature of Lower Canada in 1836.

A statement of Extra Work on the Chambly Canal, by S. & S. R. Andres, Contractors, to the first October, 1835.

1st. From the Honble. Robt Jones' Bridge, to the Guard Lock, the Bank at present contains	25561 C. yds.				
per contract it would only have contained	9373				
increase	16,188	a	19	1416	8 3
2d Section No. 1 at present contains	42,003 C. yds.				
per contract it would only have contained	15,979				
increase	26,024	"		2277	2 0
1620 perches protection stone wall		a	11 3	911	5 0
3d Section No. 2 at present contains	41,271 C. yds.				
per contract it would only have contained	18,620				
increase	22,651	a	19	1981	19 3
1475 perches protection stone wall		a	11 3	829	13 9
4th Section No. 3 at present contains	27,851 C. yds.				
per agreement it would have contained	13,880				
increase	13,971	a	19	1222	9 3
Carried forward,				8638	17 6
	3				

	Brought forward,		8638	17	6
5th	1936 perches pro. stone wall	11 3	1089	0	0
	Section No. 4 at present contains	30,229 C yds.			
	per contract it would have contained	16,720			
	increase	13,509	a 1 9	1182	0 9
6th	1898 perches protection stone wall	11 3	1067	12	6
	Section No. 5 at present contains	37,955 C yds.			
	per agreement it would have contained	17,100			
	increase	20,855	a 1 9	1824	16 3
7th	1511 perches protection stone wall	11 3	849	18	9
	Section No. 6 at present contains	22,649 C yds.			
	per agreement it would have contained	17,226			
	increase	5423	a 1 9	474	10 3
	1282 perches protection stone wall	11 3	721	2	6
8th	Paddle Gates, and putting same in		75	0	0
9	Extra Cost of iron bridge at Demerses		500	0	0
10	Excavation on section No. 4 Lower Division		5	3	6
11	Cost of waste weirs		300	0	0
12	Large stone culvert on section No. 10		37	10	0
13	Extra cost of putting up 4 farm bridges		257	3	6
14	Quarrying and cutting hard stone for locks		201	2	11
15	37 yds excavation in upper trench of lock No. 1	a 2 5	4	18	8
16	112 feet timber for same	' 3d.	1	8	0
17	500 feet of planks for same	' 9s p. h.	2	5	0
18	250 feet of boards for same	' 5s "	12	6	
19	Spikes and nails used for same		1	7	6
20	Puddling upper sheet pile of same		1	5	0
21	Carpenters' labor on same		1	5	0
22	36 yds excavation in lower trench of same		4	16	0
23	500 feet of timber for extra width of same		18	10	0
24	79 feet of check cut in same	at a 5s	19	15	0
25	Coping on check of same		1	10	0
26	Backing coping with masonry		1	15	0
27	5 barrels cement for laying coping	at 17 6	4	7	6
28	Putting down timbers in extra length		5	0	0
29	Pumping water during operations		9	15	0
30	12 days of an overseer, with board	at 12s 6d	7	0	0
31	220 perches stone work	15s	165	0	0
32	Tree nailing in lock No. 1		5	0	0
33	860 yds. embankment on section No. 10 L. D.	1s	43	0	0
34	Digging puddle trench on section 9		5	0	0
35	Raising birm bank on section 8		5	0	0
36	94 yards excavation in puddle trench of section No. 7	at 2 8	12	10	8
	Carried forward,		17,544	19	3

	Brought forward,	17,544	19	3
37	150 days laborers working in mud and water, including overseers on sections Nos. 6 & 7		at 3-9	28 2 6
38	Roads and bridges on sections 3 & 4	493	18	6
39	Culvert across the road on sec. No. 4	40	0	0
40	Roads on sections Nos. 1 & 2	65	10	0
41	Mr. Henshaw's road	90	0	0
42	Culvert No. 1	37	10	0
43	Building bridges and bushing road at Mayotts	7	10	0
44	Dyke near culvert No. 1 to form the road	12	10	0
45	Roads, bridges, &c. in Upper Division	528	0	0
46	Cutting wings of lock No. 4		7	9
47	Excavating and levelling for ditto	17	8	9
48	17 Paddle gates wt. 1751 lbs.	c 27s 6d p cwt.	22	9 11
49	Putting same into gates		3	17 6
50	204 lbs. bolts and nuts for stone weights to balance gates		5	2 0
51	136 lbs. bolts and straps for ditto to bridges		3	8 0
52	20 paddle gate spring to guard and lock No. 1 at 7s 6d		7	10 0
53	12 days carpenter making models		4	14 9
54	Making models for castings for iron bridge		3	4 3
55	Stone sluice laid in section 5 U. D.		2	15 0
56	332 feet cut stone in locks 2, 3, 4	at 5d	6	18 4
57	48 days laborers, assisting engineer	2s 6d	6	0 0
58	½ day blacksmith at St. Thèrese			3 9
59	½ do. carpenter at ditto			11 3
60	260½ yds. excavation in guard lock	1s 3d	16	5 10
61	138 feet 8 inches cut stone work on same	5s	34	13 4
62	326 feet excavation in same		1	10 0
63	126 feet stone work in same	2s	12	12 0
64	3907 feet of ashler	6d	97	13 6
65	32 pieces cut stone to balance lock gates	20s	32	0 0
66	35 feet stones to balance bridges		5	7 6
67	Alterations on bank at Wood-creek		25	10 0
68	Excavation on ditto		55	0 0
69	Alterations on bank between Quarry and Upper Dyke		90	0 0
70	Extra earth put into bank at Mr. Marchand's in consequence of deep water		325	0 0
71	Dressing face of bank above the guard lock		18	0 0
72	216 perches pro. stone wall above Mr. Marchand's, stones being at hand		81	0 0
73	85 days labourers making roads and drains		12	9 0
74	6 days of overseers at roads and drains		1	10 0
75	16 do. of under do. at do.	3s 6d	2	16 0
76	40½ do of labourers on section No. 4	3s	6	1 6
77	61½ do. of do. taking off bank for waste weirs	'	7	12 6
78	4 days of an overseer on same	5s	1	0 0

Carried forward, 19,758 12 8

	Brought forward,	19,758	12	8
79	3 do. of a carpenter selecting timber	6s 3d	18	9
80	1020 yds. embankment on section No. 1		63	15 0
81	Extra excavation on ditto		76	10 0
82	Making slope on birm bank and extra width of Canal bottom on section No. 2		200	0 0
83	Making bank opposite Mr. Waywood's house		175	0 0
84	Bank above Mr. Marchand's		75	0 0
85	Excavating below canal bottom		50	0 0
86	500 days labourers pumping water	2s 6d	62	10 0
87	240 yds embankment on section 11	5d	5	0 0
88	300 yds. excavation on same		6	5 0
89	300 yds. filling in lock pit equal to 240 yds. embankment	5d	5	0 0
90	500 feet of timber for extra width of lock No. 1		6	5 0
91	555 yds. excavation in slate being in the additional width of same	2s 8d	74	0 0

Total amountas furnished to the Legislature in 1836 £ 20,558 16 5

[For particulars of the foregoing account see index at the end of the work.]

☞ In consequence of the many alterations made by the Engineer, and particularly the small amount of the monthly estimates of the work done on the Canal and which never covered the expenditure, as also from the manner in which the estimates were made out and which it was impossible for the Contractors to comprehend, they became suspicious that the Engineer was not accounting for what extra work he was compelling them to perform, and consequently furnished him with an account of what they considered extras that had been done up to October the 1st, 1833. The following is a copy.

Contractors' Bill of Extras up to 1st October, 1833.

	MACRAE LOCK.	£	s.	d.
Upper Puddle trench, 37 C. yds.		20	5	0 0
112 feet Timber, extra,		6	25	1 11 3
500 feet of Plank, do.		9	2	5 0
250 feet of Boards,		2	50	0 12 6
Spikes and Nails,		5	50	1 7 6
Puddling upper sheet pile,		5	1	5 0
Carpenter's labor on same,		5	1	5 0
2 lower puddle Trenches, 36 ft. each,		20	5	0 0
Timber for extra width, 500 ft.		27	50	6 17 6
Excavating extra width, of Lock, 213s.		55	13	15 0
342 yards Excavating,		68	40	17 2 0
550 yards to fill extra digging,		66	60	16 13 0
Cutting extra check in Lock, 79 ft.		79	19	15 0
Extra coping in check,		6	1	10 0
		<hr/>		
Carried forward,		93	18	9

	Brought forward,	93	18	9
8	Extra backing masonry in coping,	7	1	15 0
9	5 barrels Cement for laying coping,	15	3	2 6
0	Putting down timber extra length,	20	5	0 0
0	Extra pumping water,	39	9	15 0
0	12 days Superintending,	28	7	0 0
0	Extra Tree nailing,	20	5	0 0
0	220 perches extra Work on lock,	660	165	0 0
0	Extra embankment on Beebys' lot, 860 yds. at 12 c	103 25	25	16 3
0	Sec. 9.—Digging puddle trench on birm,	20	5	0 0
0	“ 8.—Extra taking off and putting on earth on birm,	20	5	0 0
0	“ 7.—Extra puddle trench,	50	12	10 0
0	“ 6 and 7.—Extra ditch, culvert and field, 150 days,	112 50	28	2 6
0	“ 3 and 4.—Roads and Bridges,	2000	500	0 0
0	Extra culvert across road Sec. 4,	160	40	0 0
0	Sections No. 2 and 1, Roads,	262	65	10 0
0	Extra for Henshaw's road,	360	90	0 0
5	Extra on culvert No. 1,	150	37	10 0
—	Building Bridges and bushing road,	30	7	10 0
he	Extra on small dyke,	50	12	10 0
	Extra on upper division,	2112	528	0 0
			£1648	0 0

It will be observed that the charges made in the foregoing Bill of Extras, still forms a part of the charges made in the foregoing account of extra work amount £20,558 16 5, although at the time it was furnished the Engineer returned the following as his account up to the same date, 1st October, 1833.


Engineer's Bill of Extra, up to 1st October, 1833.

UPPER PUDDLE TRENCH, ACCORDING TO SPECIFICATION.

	\$	£	s.	d.
3 pieces of timber extra, 112 ft. a 5c.	6	1	10	0
300 feet of plank, a \$14,	4 20	1	1	0
No boards to be allowed, Spikes and nails necessary, No allowance for puddling upper pile nor for carpenter work,				
Lower puddle trench, 70 C. yds. a 25c.	17 50	4	5	0
Extra excavation of lock, 382 “ “	95 50	23	17	6
Extra puddling, 98 yds. a 30c.	29 40	7	7	0
Extra bailing, 20 days, a 60c.	12	3	0	0
Extra check 50 ft. a \$1,	50	12	10	0
Extra coping, extra backing is included in the above, 980 feet coping altered, a 5c.	49	12	5	0
For extra timber and work,	36	9	0	0
		74	15	6

Carried forward,

	Brought forward,	74	15	6
Superintending allowed above,				
No extra levelling put in:				
Extra work in back 150 perches,	300	75	0	0
Extra embt. in Beeby's basin, 253 yds.	30 30	7	11	6
Digging extra puddle trench, No. 9 cannot be allowed, or section 8 cannot be allowed,				
Extra ditching saves sluices on sections 6 and 7, which are required by contract, but allow it	45	11	5	0
Extra length of wooden culvert,	140	45	0	0
Extra for Henshaw's road allowed for in estimate of two bridges saved,				
Extra culvert across round,	90	22	10	0
Bushing road, business of the Contractors, but allow it	256	64	0	0
Extra on small dyke,	80	20	0	0
		<hr/>		
	Total, £320	2	0	

 The foregoing was the Engineer's account of extra work, furnished in opposition to the preceding one from the contractors, and it will plainly be perceived what a vast difference is between the two statements, as also the manner in which the latter is made out. For instance, alleging "such things are not extra, but allow them"—whilst others called by the Engineer himself as *extra*, he states "cannot be allowed," &c. It will also appear strange, that the most particular items in the contractor's statement, are not taken the slightest notice of by the Engineer, thus the contractor's bill is reduced to less than one-fifth. This great disparity in the accounts caused the contractors to fear and indeed believe, they were not likely to be dealt with according to the understanding when they entered into the contract, and feelings of a very unpleasant nature began to exist between them and the Engineer, which increased and was the primary cause of separation betwixt the contractors—three of whom resigned in the latter end of December 1833, leaving the other two, S. & S. R. Andre to finish the Canal. This latter party continued the job separately from the others, (for all were equally bound) only with the direct understanding, that the Engineer would make them every reasonable allowance for all extra work, which he pro-

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mised in the most unreserved terms to do *liberally*, and began with such acts, as led the contractors to believe him sincere; having added to the estimate for October, 1833, a sum of 792*l.* 15*s.* for extra work done to the banks above the island of St. Therese; he however, soon afterwards relapsed into his former method of estimating the work, and his after estimates were even more deficient in amount than his former. To elucidate this, it will be necessary to follow his several monthly estimates from this date; which will be done as briefly as possible, and first it may be remarked that in

Estimate to February 1834, 792*l.* 15*s.* is allowed for extra excavation in upper division, 11*l.* 5*s.* for extra ditches, and 50*l.* for extra lock pits.

Estimate to 1st March, remains the same.

Ditto to 1st April, same.

Ditto to 1st May, same.

Estimate to 1st June, same, except that the 50*l.* formerly allowed as extra lock pits is in this estimate increased to 125*l.*

Estimate to 1st July, is same as last. with these exceptions that the 125*l.* allowed in the last estimate for extra lock pits, is in this one *reduced to 50*l.* and 75*l.** is allowed for extra work in lifting and laying wall in Section No. 6, Upper Division.

Estimate to 1st August, same as last, only extras on lock pits is again raised to 75*l.*

Estimate to 1st September.—Extra ditches, 11*l.* 5*s.*—Extra for locks, 150*l.*, same as in July estimate for laying wall, and 1315*l.* 5*s.* for other extra work—not particularized.

Estimate to 1st October, same as last.

Estimate to 1st November.—In this estimate the extra work is divided amongst the different sections, it therefore cannot be known whether or not 11*l.* 5*s.* allowed for ditches has been included in this; but the extras on locks allowed last estimate, 150*l.* is in this one reduced to 100*l.*, and 225*l.* is allowed as extra for three lifting bridges.

Nothing particular occurs in the estimates as regards extra work, from this estimate ; farther than the amount gradually increases till the estimate for September 1835, when the extra work stands thus—For a wooden Culvert, 75*l.*—for three lifting Bridges, 225*l.*—for wood work of Iron Bridge, 200*l.*—for waste Weirs, 50*l.*—for rounding coping of Locks, 70*l.*, and for Extra Excavation and Embankment on the different Sections of the Canal, 7228*l.*—making in all a sum total of 7848*l.* From the circumstance of the value of the work often decreasing, and which the Contractors could not comprehend—nor what amount was absolutely allowed them for extra work as it appeared in the estimates and unable to obtain farther explanation from the Engineer, they addressed to the Commissioners of the Canal, about the beginning of September 1835, a letter of which the following is a copy:—

GENTLEMEN—We beg your Honorable Board will be pleased to direct your Engineer, to furnish us with a detailed account of all the work he with yourselves may consider as extra (saying nothing of the enlargement of the Locks) from the commencement of the work, till the present time. What proportion of them are already done?—and what remains to be finished?—what prices he has allowed?—and what will be considered as extras, in the work yet to be completed?—How much for stone, stonework, excavation, embankment, work at St. Johns, &c.—All the different parts specifically put down separate from the estimates.

As the extra work is now in the estimates, we do not clearly enough understand, nor what prices he has affixed.

We are, Gentlemen, your very obedient humble Servants,
S. & S. R. ANDRES.

To the Commissioners of }
the Chambly Canal. }

☞ In compliance with the foregoing request, the Contractors received the following:—

EXTRA WORK ALLOWED FOR.

Extra allowance on a wooden Culvert,	\$300
Extra cost of three lifting Bridges,	900
Extras on waste Weirs, (small ones)	132
Extras to add to Section No. 1	5530
2 and 3	9775
4	4509
5	1800
6	1524
1 lower do.	730
2	760
3	730
4	320
6	64

Carried Forward.

\$27,074

Brought Forward.		\$27,074
	7	100
	8	100
	10	30
Extra Lock Pits,		400
Arranging Coping		200
Iron extra for Bridges		800
Chambly, September 10th, 1835,		
(Signed)		4)28,704
WILLIAM R. HOPKINS,		
ENGINEER.		£7,176

When the foregoing document was handed to the Contractors by the Engineer, they complained "that it afforded them no more information than what they had previously received"—"nor was the amount so much as was even contained in the estimates, and which they alleged was far below the amount to which they were entitled as their just due." "Go then," said the Engineer, "and make out your own bill and show it me." This the Contractors immediately set about, and had proceeded a certain length, when they again called with the Engineer, to know what he considered extra, with regard to the banks, protection walls, &c., on the upper division of the Canal; he desired them "to call at his house when he would let them know," adding "he could then apply to his books." The Contractors accordingly called and received from the Engineer a statement of which the following is a copy:—

Wharf,	\$6211,
Extra No. 1.—Basin.	1854,
{ 14,732 C. yds. emb.	
64 perch pron.	
No. 2.—7,509 C. yds. emb.	
1,725 perch protection.	
No. 3.—8,792 C. yds. emb.	
3,488 perch prot.	
No. 4.—10,495 C. yds. emb. extra	
2,160 perch prot.	
No. 5.—6,610 C. yds. emb.	
676 perch prot.	
Extra wall removed, &c. &c.,	\$290
No. 6.—4,146 C. yds. emb.	
485 perch prot.	
Section No. 1.—Lower division,	
Roads wooden culvert, &c. &c.,	\$724
No. 2.—Roads,	760
No. 3.—Believe	350
No. 4.—Ditto,	604
No. 6.—Ditches,	34
Protection per perch	\$1,50

Embankment per C. yd. 12½ cts.
44,254

14,732
7,509
8,792
6,610
10,495

52,284

It will be observed the foregoing statement refers almost solely to the upper division of the work, as was requested. It was given to the Contractors purposely to assist them in making out the account requested by the Engineer, and by no means containing all he considered extra; which will be evident on examining his other statements of extra work. Many of the most important items in the others being left out in this. No amounts are carried out, but the quantities are stated distinctly, and the prices allowed marked on the corner. Calculating from this data, the amount would be £7572 15 10, to which, if were added the different items left out of this, but to be found in the other statements, the amount would be very considerable. With the aid of this document, and what memoranda the Contractors were possessed of themselves, the account as desired by the Engineer was made out and handed to him by the Contractors. This account was precisely the same as the one heretofore inserted, amounting to £20,558 16 5, differing only in having the entire embankment in the upper division, as also the protection wall, joined together and which were divided into the different sections, as in the foregoing accounts, at his (the Engineer's) recommendation, but the total was precisely the same. This account was most particularly and minutely examined and corrected by the Engineer, and is now in the hands of the Contractors; with the corrections in his handwriting. When he had thus examined and scrutinized the account thus presented, he furnished the Contractors with a certificate, of which the following is a copy.

“The Contractors having, during the time the Chambly Canal has been under their charge, exerted themselves to carry on the work in the best possible manner; and having constructed the Canal so far to my entire satisfaction, I for one should be gratified by seeing them placed beyond the pressure of debt, and in a situation to carry on the contract and complete it to the advantage of all parties, which I presume they can do by the appropriation of twenty thousand pounds currency to pay them for extra work.”

(Signed,)

W. R. HOPKINS,
Engineer.

Engineer's Office, }
Chambly Canal, }
Oct. 29th, 1835. }

To the foregoing certificate from the Engineer the Contractors also received the following letters.

NEW YORK, 21st Oct. 1835.

GENTLEMEN,

Your favor of this day, I have well considered, and have no hesitation in answering your questions.—1st. "Whether it has been customary to allow liberally for extra service on contracts for Public Works, where the terms of the contract were for the specific work hard upon the Contractor?"

In all Contracts with the States, and also in Contracts for Chartered Companies, it has been the invariable practice, to allow very liberally for extra work, where the Engineer saw that the contract was a very hard one for the party executing it.

The principle is a plain one that no man ought to be ruined in executing any great public work, *if he has managed well and done his duty*, and as the specific terms of the contract cannot be altered, the only way to save him from ruin, is to allow all which can be done for extra work, as a course that is both equitable and just.

The second question, "of whether the charges you have made as extra are reasonable?"

I cannot answer for this in detail, because I never examined them on the ground. I have visited the Canal in November, 1833, and looked over the work with the Engineer, and I can say freely that in my opinion, that work with nine locks and a guard lock, and all the other appendages, could not be executed upon the plan of such large locks, for less than thirty to thirty-five thousand dollars per mile, and even should it reach forty thousand, it would not be surprising to me. It is a large Canal and large locks, and some parts of the excavation below the surface of the river must be very expensive.

I do not know that I can be more explicit; if I can say anything more to the point which you require please write me.

I am, Gentlemen,

Very respectfully,

Your obedient servant,

BENJAMIN WRIGHT,

Civil Engineer.

S. & S. R. ANDRES, Esquires.

GENTLEMEN,

I cheerfully comply with your request to give my opinion of the Bill of Extras, submitted to me and amounting to about £20,000.

In the first place I must observe, that many of the charges occurred previous to my engagement on the Canal, but the two grand items, namely, the extra embankment and the protection wall, were in a great measure done under my superintendance, whilst acting as assistant Engineer, and I have no hesitation in saying, that I consider the prices fair. The exact quantity of work I of course do not know, but judging from such data as I have, I should think it as near an approximation as could well be made.

The short period I served on the works, prevents my being more explicit, but I repeat, that to the best of my knowledge, the Bill is in all respects fair and reasonable.

Yours very respectfully,

WILLIAM R. CASEY, *Engineer*,
Champlain and St. Lawrence Rail-Road.

Messrs. S. & S. R. ANDRES.

The Contractors aware of the justice of their demands for extra work, and supported as those must appear to be from the foregoing letters, as well as from the certificate of the Engineer applied to the Legislature for payment, about the opening of last Session, and had the satisfaction to know that their claims were referred to a committee of the House of Assembly; but before it was possible for that tribunal to bring the business to a close, the Engineer (Mr. Hopkins) addressed to the committee the following letter:

To the Committee of Internal Improvement.

GENTLEMEN,

I have the honor herewith to send you, for your information a statement of the actual increase of work on the Chambly Canal above the original estimate.

This statement can easily enough be shown to be correct, for the work has been examined both by John B. Jervis and Timothy Jervis, Engineers, chosen by the Contractors themselves, and my measurements and calculations were found to be correct, as will be seen by the reports of these gentlemen now in possession of the Commissioners of the Chambly Canal.

If the Committee have any doubt on this subject, the work can be in all important points so far measured, as to show if any great error has been committed, this Mr. T. Jervis did.

When this subject was brought before you, I understood that the utmost that was asked by the Messrs. Andres' was £20,000, of this sum £6,000 was to be paid back to the Commissioners, (money borrowed), and I always understood this was to be asked as a favor, not as a right.

The following is a statement of the increase of work:—

23,700 c. y. of ex.	£ 722 0 0
8,800 c. y. of rock	2,200 0 0
20,300 c. y. in lock pit	913 0 0
7,024 c. y. muck	211 0 0
6,833 c. y. of ex. under water	427 0 0
Other extras	1,394 0 0
	<hr/>
	£ 5,867 0 0
Deduct overplus on walls, &c.	519 0 0
	<hr/>
	£ 5,348 0 0

The 23,700 c. y. is not put down at the highest price, as it was not of the most expensive kind.

The 8,800 yards of rock (the main entry) was found in a point where it was not expected, it was of great advantage to the contractors, as it gave them stone for backing the locks and for wall.

The work under water (6,833 c. y.) is perhaps half done.

I have purposely avoided saying anything about the iron bridge, as the cost of it can be ascertained from the master blacksmith.

I am, Gentlemen,

Truly, your most obdt. servant,

(Signed)

WM. R. HOPKINS,

Civil Engineer.

Quebec, 22d Feby., 1836.

After reading the foregoing letters and documents, it may be asked, could a more surprising production than the foregoing be sent at the eleventh hour to the Committee investigating the business? thereby leaving the contractors no opportunity to refute the statements therein made, and which would have been an easy matter indeed, had time been afforded. Let the account of extra work therein made out be carefully examined, with the Engineer's former statements of extra work, and do they hold the most distant semblance to each other? Not the slightest!!! In this document, for the first time since the commencement of the canal, has Mr. Hopkins given information that £2,200 had been expended in raising rock which was extra, and the admission is excellent, for he states "*it was found in a point where it was not expected,*" and on the same grounds all the rock raised on the line is EXTRA, because not one word is said in the original report about any, except what was to serve for lock bottoms. By this last account however, the Engineer states the entire extras to amount to £5,348. Now by adding £2,200 for rock (it not being contained in any of his former accounts) to the amount of the statement furnished to the contractors of £7,572 15 10d. it would appear that 9,772l. 15 10d. would be the true amount, and if to this sum be added those extras, not found in either of these statements, but in his others, as likewise in the monthly estimates, no less a sum will appear as extras than upwards of 12,000l., and all this on the ENGINEER'S OWN SHOWING; yet he states to the Committee investigating the case, that 5,348l. is the entire amount; and even adds, "that this statement can easily be shown to be correct, as the Messrs. Jarvis measured the work." Pray how could either of the Mr. Jarvis prove the "measurements and calculations correct," when neither of these gentlemen have seen it since 1833? That they are both talented Engineers there is no doubt, yet it must be impossible for them or any other individuals to certify as to the correctness of a work they had not seen for three years, and which was in a rapid state of progress; indeed when the Messrs. Jarvis were on the work they never measured it, but merely took Mr. Hopkins' statement, and on such made their report, as will be seen by reference to that report itself, inserted hereafter.

Mr. Hopkins further asserts that "He considered the Messrs. Andres "only wanted 20,000l., 6,000 of which was to be paid back to the "Commissioners, and considered, this sum was only demanded as a favor, not as a right."

Mr. Hopkins is perfectly correct in the first part of the foregoing statement; in the latter part, namely, that 20,000*l.* was demanded as a "*favor*," not as a "*right*," is decidedly erroneous, and Mr. Hopkins never could conceive it in that light. For he well knew the demand was made as a "*right*." Had it been otherwise, would not the contractors naturally have accepted the amounts offered by Mr. Hopkins? But no, they refused them on the express grounds, that the sum he wished to give them did not pay for the extra work, and when that objection was urged on the Engineer, did he not desire them to make out their own accounts? which he examined, and afterwards granted the certificate "**TO PAY THEM FOR EXTRA WORK.**" Had he considered the demand in any other light, why did he not state so in the document itself, and not attempt to mislead the Legislature on the matter? The fact is, Mr. Hopkins never conceived the demand in any other way, than to pay the contractors for extra labour they had performed, and which he had examined and approved of; till subsequent circumstances made him desirous of placing his views in that light. Had the contractors wanted to obtain such a favor, they never would have applied to Mr. Hopkins on the subject, for what assistance could he have lent them? None whatever, and of which the contractors were well aware at the time. Had the demand been made as a *favor*, it would naturally have been to the Commissioners or to the Legislature the application would have been made, but as it was demanded as a *right*, of course Mr. Hopkins was the proper person to grant the certificate.

"Mr. Hopkins has purposely avoided saying anything about the Iron Bridge, as the cost of it can be ascertained from the Master Blacksmith."

That the Engineer should be anxious not to have that part of the work closely investigated, is not to be wondered at, but the contractors cannot permit it to be passed over without explaining the circumstances connected with it minutely, and particularly. In the first instance then, it may be proper to mention, that it was the intention of the Engineer to erect a Wooden Bridge, where the iron one is now put up, and this in his original estimate of the Canal he valued at 75*l.* [See a copy of his original estimate, page 34]. The stone abutments to receive the wooden superstructure were put up, at a considerable expense, when the Engineer proposed to the Commissioners to erect an iron one in its stead, as being much more durable, and would only cost from 30 to 50*l.* more, [not exceeding the latter amount], on this representation permission was given to erect an iron one, and the alteration was commenced by pulling down in part the abutments then erected, to substitute stronger ones in their stead, which alone cost 235*l.* 16 11*d.* [Calculating nothing for the stone work that had been done to receive the wooden bridge]. Cast metal at a cost of 113*l.* 18 3*d.* had to be procured, and by the time the bridge was completed it cost no less a sum than 628*l.* 12*s.* [see particulars page 31], instead of 125*l.*, the sum at first stated by the Engineer, and which clearly explains the reasons Mr. H. passed this part slightly over.

What could have induced the Engineer to address such a letter to the Committee of the House of Assembly, the Contractors cannot pretend to say, except it was in consequence of a misunderstanding that arose be-

tween them shortly before the letter was written, in consequence of a difference of opinion with regard to the amount required to finish the Canal. Let the cause however be what it may, Mr. Hopkins has, it is hoped, failed in the object he had in view, to explain away the certificate he had given. With equal justice he might say, that that part of the same certificate where he states "that the contractors had so far exerted themselves to carry on the work *in the best possible manner*, and had constructed the Canal so far *to his entire satisfaction*," was never intended by him to convey the meaning it expresses, and means quite the contrary, as to state he considered the amount sought for by the contractors only in the light of a *favor*, not as a *right*, since it has been shown that the certificate was granted in no unguarded moment, but after days, nay, weeks spent in maturely and considerably examining every account, document, and memorandum, that could throw light on the subject. Having thus as briefly as possible noticed Mr. Hopkins' letter to the Committee of the Assembly, the contractors beg to explain particularly the

Cost of the Iron Bridge.

Mason work done by Jas. Poitras.

	Length.		Breadth		Thicks.		Content	
	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	
North wing,	20	3	3	0	4	0	243	0
	3	0	3	0	3	0	27	0
West wing,	20	3	2	3	4	0	182	3
Loss in cutting, &c.							23	0
							475	3
							a 4s £ 95 1 0	

Rubble stone work.

North wing	27	0	13	0	5	0	1755	0
West wing	same						1755	0
Back part	21	6	1	9	3	0	112	10
Slope on side	3	0	2	3	2	0	135	0
							3757	10
	or							
	150 perches 7 ft. 10 ins. a 16s 120 4 9							
	475 bushels, or 77 bs. 3 bus. mortar, a 3s 11 12 6							

Excavation.

	278	0	15	0	15	6	6432	0	or	
							238 $\frac{3}{4}$	C. yards,	a 9d	8 18 8
Balance stones,									4 10 0	
Hanging the Bridge,									5 10 0	
2 cwt. bar lead,									3 14 8	
									a 37s $\frac{1}{4}$	
									Carried forward,	£249 11 7

Brought forward, £249 11 7
Iron Work and Castings.

9828 lbs. Wrought Work,	a 6d.	£245 14 0	
Boring Posts of Bridge,		2 10 0	
2 casts Iron Crabs,		25 0 0	
4 Posts 25 cwt. a 25s. per cwt.		56 5 0	
6 Cylinders 7 cwt. "		8 15 0	
Chains,		11 0 0	
Freight from Montreal,		1 0 0	
			350 4 0

Carpenters Work.

John White, making Models,		£6 5 0	
" making 2 Wheels,		1 10 0	
" 3½ days Work, a 5s8		0 18 5	
T. Woolcot, 20¾ " a 10s		10 7 6	
Nails and Spikes for Scaffolding,		0 5 6	
85 lbs Lead a 37s4 per cwt.		1 5 0	
			20 11 5
6½ days Work of a double team, a 10s.			3 5 0
Timber for flooring scaffolding, &c.			5 0 0

Total cost of Bridge, £628 12 0

Cost of Paddle Gates and fitting in.

	<i>cwt. q. lb.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>
Bought from Amos Stow, 47 Paddle Gates, wt. 47 1 16 a 25s.		59	4	10
Bought from Ward & Co. 70 Paddle Gates, 46 Boxes and 182 half Boxes,	wt. 73 0 9 a 25s.	91	7	4
Freight of same from Montreal,		1	17	2
Paid John White for making Models,		1	5	0
Turning, dressing and filing 73 Gates, a 2s6		9	2	6
Carting ditto from Chambly to St. Johns,		0	17	6
Strapping 5 Paddle Gates with iron, a 5s.		1	5	0
44 days of Carpenters putting in first set of Paddle Gates in 5 Locks, a 10s.		22	0	0
31 days of Carpenters refitting Paddle Gates, after they had broken, a 7s6		11	12	6
35 days of Labourers assisting, a 2s6		4	7	6
Paid Moses Brown for putting in Paddle Gates into Guard Lock,		1	0	0
Total cost of Paddle Gates exclusive of loss sustained } by detention,		£203	19	4

Carried forward,

Paddle Gates, brought forward,	£203 19 4
CR.	
44 Gates, 44 Boxes and 176 half Boxes would only have been required for 5 Locks had they stood, wt. 50cwt. 0qr. 2lb. a 25s.	£62 10 6
44 days Carpenters putting in, a 10s.	22 0 0
Making Models,	0 6 3
Freight from Montreal,	1 5 0
	<hr/>
	86 1 9

Less in consequence of Gates breaking, £117 17 7

The following documents, relate to, and prove in part the two foregoing accounts, viz., the Iron Bridge and Paddle Gates.

No. 1.

St. Johns, 11th August, 1834.

Messrs. S. & S. R. ANDRES,
Gentlemen,

I have examined and accepted 13 paddle gates, 10 gate boxes, 6 pivots for gates and 8 boxes delivered by Mr. Stow.
(Signed,) Wm. R. HOPKINS,
Engineer.

No. 2.

I hereby certify that in the year of eighteen hundred and thirty four I entered into an agreement with Messrs. S. & S. R. Andres to furnish them with the paddle gates for the Chambly canal, according to a certain model furnished by them, and when I had cast some of them they were accepted by the Engineer, Mr. Hopkins, who afterwards ordered me to alter the model, which I did according to his directions, and cast gates to the amount of forty-seven hundred and forty-four pounds, all of which were made of as good materials as the first received by said engineer, for which said Andres agreed to pay me five dollars per hundred pounds, and that the whole of the gates so furnished were received by said engineer.

(Signed) AMOS STOW.

Sworn before me this first day of July, one thousand eight hundred and thirty-six.

(Signed) SOLOMON BINGHAM, J. P.

No. 3.

DR.	Iron Bridge on Chambly Canal,	
9827 pounds of cast and wrought iron, a 6d		£245 14 0
To boring posts of bridge		2 10 0
To two cast and wrought iron crabs,		25 0 0

£273 4 0

The chains four posts and six cylinders I do not take into this bill as I had not the bills of them.

I do certify this is correct to the best of my knowledge.

(Signed)

B. DRAPER.

The expense of repairing paddle gates is £63 since the month of May, 1836.

(Signed)

B. DRAPER.

Sworn before me one of His Majesty's Justices

of the Peace, this 19th day of July, 1836.

(Signed)

D. DAVID, J. P.

No. 4. Chambly, 12th July, 1836.

Making models for castings for iron bridge over the Chambly Canal,		£	s.	d.
		6	5	0
1½ days assisting to floor same,	at 5s. 8d.		8	11
Making 2 wheels for same,	15	1	10	0
½ day framing abutments for same,	5 8		2	10
Making models for paddle gates,		1	5	0
1 day flooring top of butment and putting on a piece of timber, in consequence of the bridge to be wood at first but now being of iron is consequently of no use			5	8
Making models for castings for lock gates,			10	0
			10	8 ½

I certify that I done the above work as also much more work by order of the engineer of the Chambly Canal, and that the above prices are, in my opinion, fair and reasonable. I also dressed many paddle gates for the locks, which I consider worth two shillings and six pence each, but having kept no account at the time cannot state the number.

(Signed)

JOHN M. WHITE.

Sworn before me, one of His Majesty's Justices of the

Peace, this 14th day of July, 1836.

(Signed)

D. DAVID, J. P.

The other items contained in the two accounts to which the foregoing affidavits allude, can be proved by Jas. Poitras, T. Woolcot and the other tradesmen who done the work, also by the individuals from whom the materials were purchased, such as Ward & Co., Workman & Irwin, &c., &c.

Engineers original estimate of the cost of the Chambly Canal.

	SECTION NO. 1	s.	£	s.	d.
4873 perch of wall in river	at 10		2486	10	0
1612 do. protection wall,	"		806	0	0
134 do. for piers of bridges,	"		67	0	0
Wood work for ditto			25	0	0
1995 perches in Guard lock	25		2368	15	0
4033 c yds. ex. in Basin	1 6		302	9	6
			6055	14	6
	Carried forward		6055	14	6

		£	s.	d.
Brought forward.		6055	14	6
2364 do. in lock pit		177	6	0
30,242 do. ex.	1	1890	2	6
460 do. muck	1	23	0	0
		8146	3	0
SECTION NO. 2.				
1272 yards excavation	1	0	63	12
19,000 do. embankment	7	²⁰ / ₁₀₀	570	0
720 do. protection	10		360	0
480 do. muck			24	0
			1017	12
SECTION NO. 3.				
35,860 yards embankment	7	²⁰ / ₁₀₀	1075	16
1,500 do- muck	1	0	75	0
			1150	16
SECTION NO. 4.				
31,915 yards embankment	a	7 ¹⁰ / ₁₀₀	957	9
983 do. raising road			29	11
New bridge			5	0
2808 perches protection wall	10		1404	0
460 yards muck	1		23	0
			2419	0
SECTION NO. 5.				
7,200 yards excavation		6	180	0
15,999 do. embankment	7	²⁰ / ₁₀₀	479	19
292 do muck	1		14	12
1,300 perches protection wall	10		650	0
			1,224	11
SECTION NO. 6.				
15,920 yards excavation		6	398	0
6,456 do. embankment	7	²⁰ / ₁₀₀	193	13
250 do. muck	1		12	10
1,007 do. birm bank	7	²⁰ / ₁₀₀	30	4
77 perches in culvert	20		77	0
150 yards in culvert			11	5
1,296 perches protection	10		648	0
			1370	12
SECTION NO. 7.				
9,144 yards excavation		6	228	12
8,180 do. embankment	7	²⁰ / ₁₀₀	245	8
300 do. muck	1		15	0
5*	Carried forward		489	0

		£	s.	d.
	Brought forward	489	0	0
Bridge		75	0	0
		<hr/>		
		564	0	0
	SECTION NO. 8.	<hr/>		
30,520 yards excavation	6	513	0	0
600 do. muck	1	30	0	0
4029 do. excavation	7 ²⁰ / ₁₀₀	120	18	4
Gravelling and clearing creek		37	10	0
900 yards tow-path		22	10	0
		<hr/>		
		723	18	4
	SECTION NO. 9	<hr/>		
900 yards tow path	6	22	10	0
14,647 do. excavation	6	366	3	6
Gravelling		2	10	0
		<hr/>		
		391	3	6
	SECTION NO. 10	<hr/>		
Gravelling		12	10	0
Drain		250	0	0
1,595 yards muck	at 1	97	19	0
21,294 do. excavation	6	523	7	0
970 yards tow-path	1 6	72	15	0
Culvert 155 perches		155	1	0
1026 yards culvert pit	1 6	76	19	0
		<hr/>		
		1197	11	0
	SECTION NO. 11.	<hr/>		
Gravelling		30	0	0
16,255 yards excavation	6	413	0	0
888 do. muck	1	44	8	0
Bridge and embankment		100	0	0
		<hr/>		
		587	0	0
	SECTION NO. 12.	<hr/>		
15,444 yards excavation	6	386	2	0
Altering road		75	0	0
844 yards muck	I	42	5	0
		<hr/>		
		503	7	0
	SECTION NO. 13.	<hr/>		
16,522 yards excavation	6	413	2	6
750 yards muck	1	37	10	0
		<hr/>		
		450	12	6

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s. d.

		SECTION NO. 14.			
6283 yards excavation		6	157	1	6
400 do. muck		1	20	0	0
27608 do. embankment		7	828	4	9
1166 perches protection			583	0	0
				1582	6 6
		SECTION NO. 15.			
6,222 yards protection wall			3111	0	0
555 do. wall			277	10	0
45,480 do. embankment		8	4004	8	0
15,148 do. excavation		7	454	8	9
Bridge			75	0	0
				5522	6 9
		SECTION NO. 16.			
14,966 yards excavation		6	373	12	0
60 perches culvert		20	60	0	0
25 do. do.		10	12	10	0
Moving house			25	0	0
				471	8 0
		SECTION NO. 17.			
17,657 yards embankment		7	529	14	2
1518 do. excavation			37	19	0
400 do. muck		1	20	0	0
1 culvert			15	0	0
2548 yards birm bank		7	76	8	9
				679	1 11
		SECTION NO. 18.			
18032 yards tow-path		7	549	1	2
14769 do. Birm			443	1	4
60 perches culvert		15	45	0	0
4101 yards excavation		6	102	11	6
				1139	13 6
		SECTION NO. 19.			
26981 yards embankment		7	809	8	7
500 do. muck		1	25	0	0
				834	8 7
		SECTION NO. 20.			
20370 yards embankment		7	611	2	0
1600 do. in lock pit		1	80	0	0
		Carried forward		691	2 0

		£	s.	d.
Brought forward		691	2	0
1600 perches in 8 feet lift lock	25s	2000	0	0
1867 do. in 10 feet do.		2333	15	0

5024 17 0

SECTION NO. 21.				
2177 yards excavation		6	54	8 10
2100 do. rock		5	525	0 0
25200 do. embankment		7	756	0 0
1867 perches in 10 feet lift lock	25	100	2333	15 0

3369 3 10

SECTION NO. 22.				
5000 yards embankment		7	156	0 0
1867 perches 10 feet lift lock	25	100	2333	15 0
12450 yards excavation		6	311	5 0
Lock No. 5, 2592 perches		25	3240	0 0
4546 perches in 3 combined locks		..	5682	10 0
6559 do. rubble work		7	2458	0 0
1150 do. pier		5	237	10 0
20,600 yards excavation in lock pit		1	1030	0 0
Road bridge			125	0 0

15624 0 0

RECAPITULATE.

Sec. No. 1	£8146	3	0	Section No. 12	503	7	0
" " 2	1017	12	0	" " 13	450	12	6
" " 3	1150	16	0	" " 14	1588	6	3
" " 4	2419	0	9	" " 15	5522	6	9
" " 5	1324	11	4	" " 16	471	8	0
" " 6	1374	12	9	" " 17	679	1	11
" " 7	564	11	4	" " 18	1139	13	0
" " 8	723	18	4	" " 19	834	8	7
" " 9	391	3	6	" " 20	5024	17	0
" " 10	1197	11	4	" " 21	3669	3	10
" " 11	587	8	0	" " 22	15624	2	6

£54400 4 0

12 R. bridges		300	0	0
1 waste weir		112	0	0
Contingencies and engineer		5481	16	0

£60300 0 0

Many errors occur in the calculations of the foregoing estimate, but as it was not submitted to the contractors for their guidance in making out their proposals, it will be unnecessary for them to recapitulate them.

Account of Extra Work not included in the account already furnished and before inserted amounting to £20558 16 5

		at	£	s.	d.
One quarry contains	1156 yards		361	5	0
A Second do. do.	1304 do.	6 3	407	10	0
And a third do. do.	10278 do.		3211	17	6
			<hr/>		
Deduct 1543 toises used for protection wall, piers, &c., &c.		12 6	964	7	6
			<hr/>		
Expense of rock Rounding inside edge of coping of all the locks			3016	5	0
			<hr/>		
			75	0	0
			<hr/>		
9 days Carpenter, making alterations on guard lock			3091	5	0
Increasing lock bottom		2 16 3			
		25 0 0			
			<hr/>		
			27	16	3
Carpenter's work at wharf		74 9 3			
13500 feet of timber at 4 cents		135 0 0			
Earth work		50 0 0			
Incidental expenses		7 10 0			
			<hr/>		
			266	19	3
			<hr/>		
			£3386	0	6

At the time the Contractors made out their account of extra work, upon which the Engineer granted his certificate for £20,000 so careful and guarded were they of charging anything with which they had the most distant idea the Engineer could find fault, that they omitted altogether the first charge in the foregoing account, although they always believed themselves entitled to payment for raising rock, *none being mentioned in the original report*. Yet as no notice is taken of such being extra either in the Engineer's monthly estimates, or in any statement furnished by him, the Contractors conceived he did not consider it extra, and therefore did not charge it. Had the Engineer furnished a regular detailed account of the extra work as requested by the Contractors, it could then have been known what part of the work Mr. Hopkins considered extra; but this he declined doing, and the Contractors had not such a document to guide them, as they were entitled to. Mr. Hopkins, however, in his letter to the Committee of the House of Assembly acknowledges the *Rock is extra*, and the Contractors therefore now charge it.

The second item in the foregoing account, viz.:—For rounding the coping of the Locks, was at the time the last account was made up—unfinished, but is acknowledged by the Engineer as extra in his second statement of extra work, before inserted—where he terms it “arranging coping.”

The third charge in said account was in consequence of alterations made at the Guard Lock by the orders of the Engineer, (5) and is no doubt extra work.

The last charge in the aforesaid account is for work done to the wharf at St. John's, and that such was considered by the Commissioners, as extra, may be seen by reference to the second clause in their report to the Legislature, dated the 14th September 1834, page 02 as likewise by reference to the Engineer's statement of extra work given to the Contractors, and before inserted at page 25—where the wharf is valued \$6211.

The reason no charge was made for the wharf in the first account of extra work was in consequence of a small part only of the labor being finished, and as the timber was then in the hands of the Contractors, they thought it better to leave out any charge till the whole was completed, when the entire cost could then be correctly ascertained. Since that time however, the Engineer has taken possession of the timber, and consequently the charge as before recited is made, the amount of the labor is substantiated by Moses Brown's statement, No. 5—the cost of the timber by Mr. Wheeler's account—and the other charges can be attested to by the several men, under whose charge the work was performed.

No. 5.

5153 feet timber hewn on three sides and framed for wharf at St. John's, work- manship only at \$3 1-2 per 100 feet,	\$180 35
4080 feet Ties,	81 60
1795 feet Blocks,	35 90

\$297 18

I certify that the above work was performed by myself and others under my charge, and having taken an account of the same as the work progressed, to the best of my knowledge and belief it is true and correct. Previous to entering on the above work, I applied to Mr. Hopkins the Engineer of the Chambly Canal for instructions respecting how to hew and frame the timber for the wharf. When he referred me to his specification in the hands of the Contractors, on seeing which my own opinion was, that it would not be necessary that the timber should be hewn down to the smallest dimensions of the logs, as they were to be planked over; and hewing them in such a manner I considered as a great waste. I therefore proceeded as my judgment dictated; however I was ordered by Mr. Hopkins to hew them down to the very least dimensions, which I afterwards did, and altered what I had previously done agreeable to the said instructions—further when I left St. John's the above timber had not been used for the purposes intended, which with about three hundred feet hewn but unframed and about six hundred feet in a rough state, I left as far as I can now judge, two-thirds of the entire securely piled on Horace Wheeler's premises, and the remainder secured in the water by booms. The timber so prepared by me for the wharf was squared when it came into my hands, and it was for the purpose of bringing them to a close joint the logs were afterwards hewn over.

In May 1834 I was employed by the Contractors of the Chambly Canal and sent by them to lay the timbers and floor the Guard Lock on that work, when I received instructions from Mr. Hopkins the Chief Engineer, how far to extend the floor beyond the miter sill; I performed the work accordingly, after which Mr. Seymour the Assistant Engineer called and said "it was not floored to a sufficient length"—and ordered the planking for twelve feet in length to be taken up, the timbers extended five feet farther, and then replanked to that length which I did accordingly, and had the one side finished when the Chief Engi-

The Contractors having thus recited the report upon which their proposals were founded—the contract into which they entered—their demands for extra work—and in what manner those demands are substantiated, propose in the next place as briefly as possible to examine how far the said original report was correct, and in order the better to do so, they will take it up section by section and compare the work absolutely performed, with what is stated in the original report to be required in the first instance. The said original report first sets forth that,

“As the water for the Canal must be taken from the River at St. Johns, works of some extent are required at that place, to secure a certain and abundant supply.

“It is proposed to effect this by conveying a dyke or embankment of stone, from a point opposite Marchaud's wharf, (250 feet from the shore) on a shoal to the fifth pier of St. Johns bridge, continuing from the west shore and thence to the guard Lock in a direct line. The work to be carried for the first 1200 feet (as far as the bridge) to height of two

feet again called and asked—“for what reason I had made the alteration?”—I replied by Mr. Seymour's orders, when he said—“there was no manner of use in it”—and ordered me to finish the other side as he had at first directed, which I did, consequently leaving one side five feet longer than the other. These alterations, I believe, was a loss to the Contractors in work alone, of twenty-five dollars, over and above the loss sustained by the detention of the masons and labourers, but to what amount I cannot say.

I farther declare that previous to my commencing the flooring of the said Lock, I received orders from the Chief Engineer, to fill up betwixt the timbers with clay, which I accordingly did, and commenced planking in presence of the Assistant Engineer, who pointed out the place at which I was to commence. Continued myself and five men planking all that day, next morning the Chief Engineer again visited us when he said “we must again lift up the planks we had laid, and spread soft clay underneath”—accordingly we did so, which occupied the same number of men as before, half a day each, thus causing a loss to the Contractors of nine days at a dollar and twenty-five cents a day; which loss certainly would have been prevented, had proper instructions been at first given.

I am farther aware a mistake took place in excavating for the wings of said Lock, as on the upper end the excavation ran into the banks, I believe twenty feet, whilst at the lower end only ten, and which afterwards was changed to twenty at the lower end, and only ten at the upper. In consequence of this mistake of cutting so far into the tow-path at the upper end, the most serious consequences were likely to result, and had not I with many others used the utmost exertions, I believe the water from the river would have forced through the banks and inundated the entire lock pit.

Whilst engaged working on the Canal under the superintendance of Mr. Boardwell as master carpenter—was put to frame gates for the locks—had previously dressed a quantity of timber for that purpose, but which was found to be too short, consequently remained unused.

In testimony of the above I hereunto subscribe my name, this 24th day of May, Eighteen Hundred and Thirty-six.

Sworn before me at Dorchester, the day and year before written.

(Signed)
P. P. DEMARAY, J.P.

(Signed)

MOSES BROWN,
Master Carpenter.

feet above low water mark, and to rise from thence to the guard lock to a height of one foot above high water mark, a distance of 1160 feet.

"This work will be both cheap and durable; in high water it will be covered with water in such of its parts as are most exposed to ice and drifts, and at all seasons will give an abundant supply of water to the Canal. Within this work wherever the water is less than six feet deep, it should be excavated to this depth, and the earth removed laid against the dyke to render it firm and water tight."

↳ Instead of the "point," (where the Engineer put down a stake,) from which the bank above described commences—being "250 feet from the shore"—it is 250 feet from the outer end of Marchand's wharf, that being upwards of 250 feet from the shore at low water; thus the contractors were forced 500 feet into the river, instead of 250.

From the stake so put down "to the fifth pier of St. John's bridge,"—is 1300 feet measured in a direct line by the Engineer; it is, however, much curved, and consequently must measure considerably more, although it is only stated in the report to be 1200 feet.

From the fifth pier of said bridge to the guard lock, the bank is serpentine and measures 1233 feet instead of 1160.

The height of that part of the banks betwixt the bridge and guard lock, in some places much exceeds "one foot above high water mark"—in other places they are somewhat less; but if the earth of which they are now composed, was regularly distributed, the banks would at all events exceed the stipulated height. The banks above the bridge, for nearly half the distance, instead of being "two feet above low water mark," have been much higher, and at present are above high water; whilst the remainder was raised to the stipulated height, if not more.—(1.)

The work as before set forth, commenced by excavating a little above the guard lock, so as to connect that part with the work previously done; but instead of proving "cheap," as was expected, was attended with vast expence and difficulties, inasmuch as earth had to be procured by digging into the bank of the river to enclose a small space at one time, out of which the water had to be pumped to get materials for the construction of the principal bank; and in this dilatory and expensive manner operations proceeded till a permanent bank was completed as far as the St. Johns Bridge. The expence was also greatly increased in consequence of an innumerable quantity of large stones found on the bed of the river which had to be blasted with gunpowder before it was possible to remove them, and the greater part of the excavation being in quick-sands, &c., made it next to impracticable either to cart, wheel, or shovel. The earth removed from the bank of the river to enclose the first space had to be replaced, and the materials used to enclose the numerous others, had to be removed after the excavation had been finished to the principal bank, thus causing double labor before the bank could be completed. To all these difficulties was added that of keeping the water out which oozed

(1.)

The several measurements here given, can be confirmed by Mr. Casey, Engineer, who at one time was Assistant Engineer on the Canal, and as the banks yet remain, can be again measured, which the Contractors lately did and found them as here stated.

through the then imperfect banks, that arising from numerous springs, as also from rains, and what flowed in from the adjacent streets and lands, from inundating the scene of labour, at which a considerable number of men had to be employed day and night, and in many instances their exertions proved ineffectual, and it was found frequently impossible to proceed with the excavation till all the men employed on that part of the work had been engaged for days together, in the single operation of removing the water. In such manner and under such unforeseen difficulties and expence was that part of the banks, betwixt the guard lock and the St. Johns bridge completed. A further expence was likewise incurred amounting to 18*l.* as charged in the 71st item of foregoing account of extra work, in consequence of the center and cutting stakes put down by the Engineer above the guard lock, not agreeing with that part of the banks previously made, whereby the bank had to be altered so as to bring the joining together of the two parts to correspond with each other.—(6.)

No. 6.

Memoranda kept by order of Messrs. S. & S. R. Andres, of Chambly, and St. Johns, May 27, 1834.—Ordered to wood creek with a squad of men to make the Canal from thence downwards; on arriving found two rows of center and cutting stakes; enquired of Mr. Andres which line of stakes I should make the Canal by, and was referred by him to Mr. Hopkins for his instructions. Mr. Hopkins pointed out the outside line of stakes for me to work by. Mr. Andres desired me to drive down both lines of center stakes and not allow them to be drawn out or removed, and to make a memorandum of the same.

June 9th.—Cutting stakes on the bank side at the curve removed by Mr. Casey, nearly six feet into the bank, which occasioned extra work—Mr. Andres ordered a memorandum to be kept of it.

June 24th.—Ordered to work down near Mr. Fritchett's tavern: there removed back part of the bank made the year before to bring it in a line with the inside top bank stakes then put down by the Engineer.—Ordered to make a memorandum of same.

In the month of October last, when making that part of the bank above the lock at St. Johns, had extra work to perform in consequence of the center and cutting stakes not agreeing with that part of the bank made in the spring.

In testimony of the above, I have hereunto signed my name after being duly sworn before me at Dorchester, this 23d December, 1834.

(Signed)

P. P. DEMARAY, J. P.

(Signed)

J. H. GASS.

AMOUNT OF EXTRA WORK.

Altering the bank three different times, made by Mr. Young at wood creek,	£25 10 0
Taking out extra earth and throwing it over the bank at wood creek, and making extra long slope,	55 0 0
Removing back that part of the bank agreeably to the Engineer's stakes, then put down below the quarry and near to the dyke,	50 0 0
Extra earth in consequence of making the bank in deep water going from wood creek towards Mr. G. Marchand's	325 0 0
Altering face of bank in joining the two banks above the Guard Lock,	18 0 0
	£513 10 0

Under still more unfavourable circumstances has the work above the bridge been constructed. This portion was commenced by throwing into the river rubble stones (which had to be procured from the United States) beginning both at the stake, placed by the Engineer opposite Marchand's wharf, and at the bridge, so as to meet in the centre. On the dyke thus formed for nearly half its length, a part of the soil excavated below the bridge was wheeled or carted to render it "water tight"—and which proved both difficult and costly, not only on account of the swift current and high winds carrying a great part away, but from the nature of the soil as before described, it was next to an impossibility to remove it, besides the soft state of the surface over which it had to be taken increased the difficulty; and it was only by constructing roads of timber, floats, brushwood, &c., it could in anywise be accomplished. From the extremity of this bank to the shore, a coffer dam was constructed, and from the space so inclosed the water was drawn off as far as possible and ditches dug to receive the remainder and drain the surface by pumping. The excavation would have proceeded now with tolerable ease, had the banks proved as was anticipated by the Engineer "WATER TIGHT," but such was their imperfection though made according to his orders, that the water made its way through many parts, and the works were in a continued flood; notwithstanding every exertion was used, both by keeping a large number of men constantly pumping and otherwise. The work thus circumstanced had often to be abandoned, and could only be resumed after immense expense had been incurred to clear it of such inundations as frequently took place. On this section of the work the soil was of the same nature as that below the bridge, and the same expensive means had to be resorted to to clear away the immense number of large stones found during the excavation. [1] During operations on this very critical part of the work, the advice of an Engineer must have been of great benefit; none, however, was in attendance for 14 days, nor any person qualified to give instructions; the consequence was, that the work in many places was excavated far below the stipulated depth, and thereby springs were opened which augmented the water in a very great degree, and rendered the operations much more expensive and troublesome than otherwise would have been the case had the work been properly attended to. Out of this section of the work the materials had to be carted to complete the remainder of the bank as far as the stake before mentioned, and proved still more costly than the last described operation of the same kind, owing to the entire materials having to be carted over floats, and that part of the land over which the carts had to pass was so soft, roads had to be constructed as before, of timber, brushwood, &c. &c. [1]

It has been already observed that the wharf to be constructed at St. Johns is extra, and this has been already substantiated by a reference heretofore made to a clause in the report of the Commissioners to the Le-

[1] The immense trouble in completing this section of the work as also that below the bridge, can be fully verified by the Honble. R. Jones, Mr. Maerea, and the several overseers, the latter can likewise prove the absence of the Engineer, sinking below Canal bottom, &c.

gislature. It may, however, be proper farther to mention, that in addition to the charge as made in the account of extra work the contractors were put to a great increased expense in consequence of this alteration, inasmuch as they were obliged to have a second coffer dam constructed running from the stake already mentioned to the shore, in order to clear out the water and enable the wharf to be begun on Canal bottom. A large quantity of timber was purchased for this work, and this was hewn down in a most unnecessary manner to the smallest dimensions of the sticks, which there could be no manner of use in doing as the wharf was to be planked on the outside. [See Moses Brown's statement page 40]. The timber so prepared for the wharf was confined within a Boom, which the Engineer has since removed, a great part has in consequence gone adrift and was lost; a part was used by the Engineer for other purposes, and the remainder at present lies exposed. Had the contractors contemplated at first having a wharf to build, they would of course have calculated accordingly, but nothing is said in the report concerning such a work, and which was begun by the orders of the Engineer. [7]

Under circumstances such as described has that portion of the Canal been so far completed, at an expense never contemplated by the contractors, nor indeed could it have been so by the Engineer, as he states in the report that it will be "CHEAP," whereas it has been EXTREMELY EXPENSIVE; but the cost might have been no doubt considerably lessened had the work been prosecuted with vigour during the extreme and almost unprecedented lowness of the water in 1834, and which the contractors were exceedingly anxious to get completed at that time; *they were however prevented by the Engineer, who under the contract had a right to change the men to whatever part of the works he chose, and at the time the contractors were pushing on the work above the Guard Lock with all possible speed, they received orders from the Engineer to withdraw 40 of the men, and which was a very great loss and interruption indeed.* [~] Some time afterwards this portion of the work was resumed under accu-

(No. 7.)

Messrs. S. & S. R. Andres.

Gentlemen :

Please to begin to frame the wharf and go on with it to be ready by the time the water is drawn out.

Also remove the fence on the farm below Patenodes, in a right line with that below, and take off the earth till the road is reduced to its proper width.

(Signed)

WM. R. HOPKINS,

Engineer.

St. Johns, Nov. 27th, 1834.

(No. 8.)

Messrs. S. & S. R. Andres, Contractors.

Gentlemen :

Please to remove 40 men from St. Johns to Chambly, to discontinue work above the Guard Lock, as soon as it is safe to do so, and set the men at raising the bank below the Guard Lock at section 2, 3 & 4.

Yours, &c.

W. R. HOPKINS,
Engineer, Chambly Canal.

St. Johns, Sept. 29, 1834.

mulated difficulties, and was not even then pushed on with haste as the Engineer asserted there was "NOTHING PRESSING," tho' it is evident it should have been finished with all convenient speed. [9] In this dilatory way was this portion of the work continued till April 1835, when it was altogether abandoned by order of the Engineer [10] to Mr. Stetson, one of the overseers. Such was the condition in which this extensive section of the work was left, that the coffer dams have since become very naturally injured by the ice, and the banks have washed away considerably, it will therefore require a much larger sum now to complete them, than would have been necessary at the time the work was retarded, or even when it was afterwards altogether abandoned.

"The Guard Lock is located in the present bed of the river—it has a slight lift of $\frac{50}{100}$ feet to give some pressure to the water in pressing the wicket gates."

The work as above described in the report, was commenced on the 17th February, 1834, by making an enclosure in the bed of the river, for the guard lock, according to stakes put down by the Engineer; but great difficulty was found in completing it, owing to the scarcity of earth, which had to be taken out of the bank of the river, to enclose at first a small space out of which the water was pumped, and by sinking in this space from 5 to 6 feet below Canal bottom, more earth was obtained and a space sufficiently large to contain the lock was finally enclosed, pumped clear of water, excavated to the given depth, and the earth so excavated was thrown into a bank in the direction in which it was proposed to con-

(No. 9.)

January 7th, 1835.

To the Contractors :

Please to prepare the piles for the combined locks; get the dam in just above Wood Creek; leave two planks off till water rises, and when the bank leaks much put them in. Be very careful to make all tight about the dam.

Get stone ready for protection wall on the Dyke at Chambly, say 1200 perch- es for the present.

If the weather moderates it may be well to get the upper coffer dam finished at St. Johns, but there is nothing pressing about this.

It may be well to get the posts and sills in for the waste wier; Capt. Kerr will give the level of the top of the sill.

As to walling the banks at St. Johns and below, I would lay as little as possible regularly, and that in shallow water. In deep water you had better not touch the work, except the foundation is now made. Lay a little of the work above the foundation, and throw stones loose on the above to high water, and you will preserve your bank.

WM. R. HOPKINS,
Chief Engineer.

(No. 10.)

Mr. Stetson :

It is the express orders of Mr. Hatt and Mr. Macrae that no more work be done above the bridge at this time. Do not excavate upon the road on section No. 2, but keep all your men there. Protect the bank as you go along with brush. I will try and be up to morrow, if not this evening.

Yours, &c.

WM. R. HOPKINS.

21st April, 1835.

struct the tow-path. When completely ready to lay the bottom of the lock, the Engineer altered the site about 73 feet farther down the river, and thus the previous work proved of no avail and was a total loss of 177. 15s. 10d. as charged in the 60th and 62d items of account of extra work and proved by the affidavit of Jacques Poitras—under whose charge the work was performed.—(11.) In consequence of this change a second cross bank had to be formed, and the one first made at the lower end taken away; when the second location was excavated, and the earth disposed of as in the previous instance. Immense difficulties however presented themselves, owing to the banks which formed the enclosure not having had time to subside and become solid, and being raised to an unnecessary height for the purposes intended (which was merely to keep out the water) was in eminent danger of falling into the excavation prepared for the lock, which was only prevented with the greatest exertions and difficulties by sheet piling, &c., at which many men were employed both day and night at a considerable cost. The timbers for the lock bottom were now laid down agreeably to the directions of the Engineer and

(No. 11.)

Extra work done on the Chambly Canal.

1834

May 14th	Excavation of Guard Lock at St. Johns, upper wing 12 feet long by 16 X 10	3840	
	Lower do. 10 feet X 10 X 16	3200	
		<hr/>	
		7040	
	feet or 260 3-4 yards		at 1s 3d £16 5 10
		f f f	
	May 28th 2 upper wings 2 X 2 X 4 }	326, feet }	1 10 0
		f. f. f. in.	
	Cut stone for 4 stop-gate checks, 16 feet high, 2 x 2, 138. 8, at 5s.		34 13 4
	Cut stone upper wing walls, covered by dry walls 9 f. X 3½ X 3		
	63 f. 126 f. a. 2s.		12 12 0
	Cut stone repaired at St. Johns and Chambly (from Barrier Quarry) in the months of March, April, and July, 1834, 3907 superficial feet, a. 6d.		97 13 6
	Stone weights to balance beams at Guard Lock and Chambly, four at each, 16 inches square, a. 20s.		8 0 0
	Four stone weights, 2d Lock, Chambly,		4 0 0
	One piece one cube foot,		12 6
	Thirty-one cubic feet of cut stone for balancing swing bridge, a. 3s. per foot, including the wastage of cutting the 2d time, they having been cut previously for the Lock.		4 13 0
			<hr/>
			£180 0 2

I Jacques Poitras, after being sworn, certify the present account correct according to the best of my knowledge.—Dorchester, this 23d December, 1834.

(Signed)

JAMES POITRAS.

Sworn before me at Dorchester, this 23d December, 1834.
(Signed)
P. P. DEMARAY, J.P.

partly floored with planks, when orders were given to take the same up again, in order that soft clay might be spread below them, which would have been done at first, had instructions to that effect been given; and thus a loss of nine days of a carpenter avoided. The Chief Engineer likewise pointed out the length to which the lock bottom was to be floored, but his assistant had it extended five feet farther, and which the Chief Engineer finally affirmed "*was of no manner of use*," thus much time was lost and an unnecessary outlay occasioned of not less than \$100. An error was likewise made in excavating for the wings of the lock, which were to run into the banks ten feet at the upper and twenty at the lower end; instead of which the Engineer caused twenty feet at the upper and only ten at the lower to be excavated, which he had afterwards to alter, and by which a loss of 20*l.* was sustained by the Contractors.—(In confirmation of these errors, see Moses Brown's affidavit, No. 5, page 40.)—Previous to beginning the masonry of the Guard Lock, a specification was furnished by the Engineer, detailing the height of the different courses of stone of which the lock was to be built; and a quantity sufficient to complete the same, was landed at St. Johns and hauled out on the common at much expence; but the Engineer having altered the courses, a great part was found of no use, and consequently were re-shipped to Chambly, whilst others had to be procured in their stead.—3,907 feet of stone was also cut and approved of by the Engineer, and the labor amounting to upwards of 100*l.* paid; but subsequently the Engineer found fault with the manner in which the same had been cut and ordered them to be re-cut, for which 97*l.* 13*s.* 6*d.* was again paid, and a total loss to that amount was the consequence.—(see Poitras' affidavit, No. 11, page 47.) this error forms the 64th item in account of extra work. In building the lock-wings 126 feet of cut stone has been covered up by the banks and a dry stone wall, when it is evident rubble stone work would have answered the purpose as well, and by which a saving would have been effected of 12*l.* 12*s.*, being the 63d item of aforesaid account; and is substantiated by Poitras' affidavit also.

An immense loss was likewise sustained by the Contractors in consequence of the puddle gates for the locks breaking, altho' approved of by the Engineer before put in—a detailed account of the expence is to be found in page 32, by which it appears a loss has been sustained of 117*l.* 17*s.* 7*d.* as is substantiated by the affidavits annexed to said account.—At the time however the Contractors made out their account of extra work, the exact loss could not be ascertained, and only 101*l.* 7*s.* 5*d.* is charged as contained in the 8th, 48th, and 49th items of said account. In addition to a great loss the Contractors were subjected to in consequence of detention in passing through boats, and many other expences it would now be impossible to particularize. It is to be observed that the Engineer altered the puddle gates not less than five or six different times, and each time was approved of by him,—they would not however answer the purpose, and finally had to be strapped with iron at a cost of about 63*l.*—in addition to the charges made by the Contractors.—(See Draper's affidavit, No. 3, page 33.)

Paddle gate springs to keep the paddle gates open and shut had also to

be put on the Lock gates at a cost of 17 10 0, being the 52d item in account of extra work. Springs were not contemplated by the engineer and therefore not taken into the first calculation, consequently are extra, and can be proved by Draper, the blacksmith who made them, or by any other individual acquainted with the works. No checks were to be cut in the sides of the Locks at first, which has however been done by order of the engineer at a cost of 134 13 4 as charged in 61th item of said account, and substantiated by Poitras, document No. 11, page 47, as likewise by engineer's first statement of extra work, page 21. The balance-beams having been ordered by the engineer too short, it was found necessary to supply the deficiency to attach a large cut stone to each, as also to the other balance beams afterwards put up, in all 32 pieces were required which is valued by Poitras at 20s. each in his statement, page 47, and forms the 65th charge in the aforesaid account of extra work, as likewise 15 2 0 for iron work to hang the same, being the 50th item in said account.

To the many and very expensive alterations, as before described, relating to the guard lock, may be added another very costly item, that of procuring earth to bank in the lock, a great part of which had to be carted off the surface of the road for a great distance, (12) and the remainder procured by digging under canal bottom at an immense expense & trouble. The earth at first removed to make the enclosure for the Lock, and of which double the quantity necessary was made use of, as has been already explained, was found to have been placed too far into the river, and consequently had to be shoveled back, at least so much as was above the surface of the water, the remainder was entirely lost; although in the first instance it was procured at great expense on account of the depth it was found necessary to sink owing to the confined situation from which it had to be taken. No charge is however made for this as well as several other weighty items of unnecessary expense to which the contractors were subjected, owing to the alterations of the engineer, and which should in justice be considered extra. Nor indeed is any charge made but such as produced a proportionate good on the work, and with which the engineer could find no fault.

Under such circumstances has the Guard Lock been completed. It may however be observed that the report states the Lock is to have ⁵⁰100 feet, or six inches head water outside, instead of which it has in the highest state of the river not less than seven feet, and in the lowest about 24 inches. This circumstance alone must have added considerably to the cost, and there is no doubt but under *proper management* the Guard Lock could have been finished in as sound and substantial a manner for much less cost.

To the Contractors.

No. 12

GENTLEMEN :

You will please take off from 2 to 3 feet of the surface of the road near the guard lock to embank the Lock.

(Signed)

M. R. HOPKINS,

Engineer of Chambly Canal.

St. Johns, June 11th, 1834.

"Section No. 1 extends to 2600 feet below the guard lock. It is located entirely in the bed of the river, and is to be protected by a stone wall on its outer bank slope from the action of the river. By referring to the estimate it will be seen that a large quantity of excavation is set down to this section, and this is to be removed from the river bed which can however be effected with comparative ease after the sections below are finished; when the river may be drained out and the canal excavated."

☞ Before entering into an examination of the work on the upper division of the canal, it may be advisable to save repetition, to state that by the contract the banks were to be raised to a height of 7 feet 9 inches on the outside, and 8 feet 3 inches on the inside, making an average of 8 feet. That instead of being raised to the height stipulated they have been increased to 15 feet high at and above the Guard Lock, gradually declining to 9 feet at the upper dyke or near the end of section No. 6. That from such increase arises the extra embankment as charged in the account of extra work and certified by the letter of Mr. Casey, inserted page 27.

It will be observed that in the original estimate to which attention is directed in the report, that the cost of the entire work from 2600 feet below the Guard Lock, to the upper extremity of the basin opposite Marchand's Wharf is calculated under the head of section No. 1. This portion of the canal is said to contain in total 37,099 cubic yards embankment and excavation; 4972 perches of stone in river, and 10612 perches protection wall: but from the increase in the side of the banks as already explained, it has been augmented to 79,311 yards embankment and excavation, and 3232 perches protection wall, making an increase of 42,212 yards excavation and embankment, and 1620 perches protection wall as near as can be ascertained and which forms the 1st and 2d items in account of extra work. The stone in the river cannot be ascertained to a certainty, being under water; but it is believed the quantity stated in the estimate falls far short of what is contained in the work.

In consequence of such a great increase in the size of the banks it became a most difficult and expensive matter to procure earth to complete them, and orders were given by the engineer to take it in part off the bank of the river; this was done, but the inhabitants complaining of the roads falling in, it had again to be filled up at a cost of 176 10 0 as charged in the 81st item of extra work, and can be substantiated by L. Conner under whose superintendance the work was done. The earth had therefore to be taken from below the canal bottom at an enormous cost to the contractors.

When operations commenced on this section of the canal, stakes to mark out the line of the bank were demanded from the engineer, but instead of acceding to this request, he gave directions to "run the bank from a point about 200 feet above the guard lock, in a right line with two trees on the opposite side of the river, a considerable way farther down," and which was accordingly done, till about 300 feet below the Guard Lock when it was discovered the embankment was too far into the river, and instructions were then given by the engineer to alter the course, but in bringing the inside of that part of the bank already formed to range with the latter 1020 yards of embankment were lost, amounting to 463 15 0

being the 80th item in aforesaid account, and can likewise be attested to by L. Conner who done the work. A part of it immediately behind the Guard Lock was however removed to back the lock, but the greater part still remains, and had stakes been provided in the first instance as was required, this unnecessary increase would not have taken place. For the same reasons, viz. the want of stakes, (13) many parts of the banks on this section besides that already stated, are considerably wider than ten feet at top, and though the banks were raised only to the height directed by the engineer, they were afterwards found too high and the earth carted off to the next section.

The engineer after having placed stakes along the bank of the river, afterwards altered them about 4 feet further into the road, which he stated "would give a sufficiency of earth to construct the bank." Notwithstanding it proved insufficient, and although the canal was excavated considerably below bottom, the banks at the lower end of this section had to be left unfinished, till earth from the next section was procured to complete it, and which had to be carted a great distance, though a part, as before stated, had afterwards to be taken back in consequence of the engineer having raised them too high. In addition to the cost thus unnecessarily heaped upon the contractors, they also lost much by the engineers refusing stakes and proper instructions, and which accumulated difficulties were

No. 13.

In June, 1834, I was appointed by Messrs. S. & S. R. Andres an overseer of a large squad of men on the Chamblay Canal, and went to work in the rapids below the bridge at St. Johns. Mr. Hopkins gave me my top stakes in the road and directed me to commence a dam running about 40 feet into the river, and when that was done he would give me the outside stakes for tow-path. In about a week he removed my top stakes about 4 feet into the road saying, "That it would give me a large surplus of earth which I could carry over the canal into the river." I often called on him for tow path stakes, but got none for a long time, when at last he sunk some buoys in the current, which were floated out of place and compelled me to depend upon my own judgement which often led me astray. I took the earth from the shore and run down my bank about 4 chains, run dam across below, pumped out the water, and took out the bottom to finish my bank. When I came to bottom I called on Mr. Hopkins for earth, and he directed me to go below bottom, which I did I think from one to two feet and yet my bank was unfinished. He then told me to leave my work there and run on down making my bank as the earth would permit, and some other time we could get earth from Mr. Vaughan's field and finish the banks. During my work below bottom I complained to Mr. Hatt that for want of earth I was compelled to carry my heavy earth from below bottom to the top of a high bank to an unwarrantable expense of the contractors. His reply was that he had always told Hopkins to give earth sufficient to complete the banks.

Many times during the season I was put to great inconvenience for want of proper instructions from the engineer.

(Signed)

A. MOORHOUSE.

Champlain, N. Y., May 26th, 1836.

Clinton County, N. Y., }
 Champlain, May 26th, 1836. }

Sworn to before me

(Signed)

RUFUS NORTON, Justice Peace.

only surmounted at a very heavy expense. (See A. Moorhouse's affidavit, No. 13, page 51) Owing also to this section of the work abounding in quick-sands it was found both difficult and costly to complete, which nevertheless was finished to the satisfaction of the engineer, who has however since caused the inside of the tow-path bank to be protected with stones, owing to the banks having avalaunched into the canal in consequence of being partly built of quick sands, as before stated, but of which not one word is said in the original report.

The engineer states that in the report "That the excavation can be effected on this section with comparative ease, after the sections below are finished when the river water may be drained off, or dammed out and the canal excavated."

That this could be done with "*comparative ease*" which statement leads to the supposition that it could be done for "*comparative little expense*," is a direct absurdity, for by no other means could "the river water be dammed off" than by erecting a coffer dam the entire length of the section which would have cost an enormous sum, consequently the entire work had to be done by cross damming, &c. as done above the Guard Lock; and though this was attended with great cost, still the expense was nothing in comparison to the plan proposed by Mr. Hopkins.

"Section No. 2 is located under the river bank, the canal will be laid entirely in the river bed so as to have the in-edge of canal correspond as nearly as may be to the present line of surface of water. This section extends to the mouth of Wood Creek and not much earth is necessary to be taken from the inside of the canal bank to give 6 feet water, and the section only needs protection for a few of the first hundred feet."

This section of the canal contains 41271 yards embankment and excavation, and 2195 perches protection stone wall, but had it been finished agreeable to contract would only have contained 18,620 yards of the former, and 720 perches of the latter, (as the original estimate shows) presuming "protection would only be required for the first few hundred feet."

↪ The difference between those quantities therefore, forms the 3d item in the account of extras. The upper end of this section, like section No. 1, contains quick-sands and soft clay intermixed with stratum of hard pan, found most difficult and expensive to remove, and on which the original report is silent. In some parts of this section the bed of the river was much further below the surface of the water than predicted, and the engineer wishing to preserve the road caused the earth to be carted from each end of the section (but principally from the lower end) to form the tow path in the centre, and which cost £375 more than if it had been procured from the bank of the river generally, as was understood at the time the agreement was entered into, and it cannot be denied this was perfectly practicable, the engineer having since ordered the same to be done, so as to increase the height of the banks, which are still too low, but have only been calculated in the account of extra work to the height they were raised by the contractors. This charge is contained in the 82d and 83d items of aforesaid account, and cannot be disputed as being extra. In addition to the expenses thus incurred, the curve at Wood Creek after

having been partly constructed according to the directions of the engineer was considered by him to be too rapid in its turn, and he gave directions to alter it further into the river, by throwing the earth from the inside to the outside of the bank and which was done at an expense of £80 10s. 0 (See Gass' affidavit No. 6, page 43) and which is charged in the 67th and 68th items in account of extra work, besides causing many incidental expenses and great delay, which was greatly increased by the immense quantity of water which flowed into the canal at all times, but particularly in wet weather, from the creek, but which could not even at the time be accurately taken an account of.

"Section No. 3 for the most part is under a bank from 12 to 14 feet high. The tow path is located about 60 feet from the shore in from one to eight feet water in depth, but no protection is needed against the river."

☞ This section was commenced by removing the earth from the lower end of last section into the river at 60 feet from its bank, so as to form a tow path; but it was found by soundings made by the Contractors, that the tow path would thereby be placed close to the channel of the river, where the water was very deep: and the dread that a great part would consequently slide into the channel, caused the Contractors, not only to point out to Wm. Macrae, Esq., one of the Commissioners the probable loss that would occur, but likewise to make application to the Engineer, to allow the bank to be built nearer the shore, to which he would not accede. In place therefore of having the bank to form in water of "from one to eight feet in depth" (as the report states) it had to be constructed in water of from 6 to 18 feet, at an extra cost of £325 as charged in the 70th item of account of extra work, (see John Gass' affidavit, No. 6, page 43) and frequently avalanched as was feared for great length; in fact the impossibility of finishing the bank at any other than a ruinous expense, became so evident that the Contractors were compelled to appeal to the Commissioners on the subject. These gentlemen appeared much surprised that the Engineer had so acted, and on enquiring his reasons, he said, "he did not know the water was so deep"—this appearing still more strange, that he should be ignorant of so important a fact, caused him upon examination, to attempt to do away with the impression his first answer had evidently created, by stating "he had done so to save the cost of land, on which he otherwise must have encroached," however when he was informed by the Commissioners, that their wish was, and that their instructions had been given to him, to take in all cases a *sufficiency of land*, and not to subject the Contractors to so unwarrantable an expense, he added "that the work could be completed, by sinking wooden cribs loaded with stones to prevent the avalanches." (As this conversation took place at a general meeting of the Commissioners, any of these gentlemen can attest to the truth, as it is here related.) The plan of wooden cribs as proposed by the Engineer, was however conceived too expensive, and the idea was given up, and instead a great quantity of very large stones were procured at great expense, and thrown into the deep water; by means of which the avalanches were at length stopped, and the bank could then have been finished with comparative ease, had the Engineer permitted earth to be removed from the bank of the river, which he, not-

withstanding the Commissioners, order to the contrary, still refused, and caused a part to be carted from the surface of the road for a great distance, and the remainder to be taken from the birm bank by reducing it from the proportion of two feet horizontal to one foot perpendicular, to that of one horizontal to one perpendicular; thus leaving the bank so steep that it has since fallen into the canal in many places, owing in a great measure to its height which was upwards of 14 feet, a circumstance in itself quite sufficient to warrant its original slope. Besides the unwarranted and unnecessary expenses thus incurred the entire section had to be protected with stones, although the report states, "that no protection is needed against the river." Under such circumstances was this section finished, and it is much to be regretted, that the Engineer located the bank in the first instance as he did, as also that he would not comply with the desire of the Commissioners in allowing a sufficiency of earth to be taken from the bank of the river; for it is certain the work could have been completed in every respect to as good advantage at an expense exceedingly trifling to what it really cost. Calculating nothing however on these losses, farther than what has been already stated, this section contains at the lowest computation 27,851 yards embankment and excavation, and 1936 perches of protection stone wall, whereas had it been finished agreeable to the Engineer's report it would only have contained 13,880 yards embankment and excavation, and *no protection wall whatever*; thus an increase of 13,971 yards embankment and excavation, and 1936 perches protection wall has taken place. Calculating them only as they now are, and neither are completed, this forms the 4th item in aforesaid account of extra work. After about 300 feet in length containing 216 perches of the protection wall had been laid agreeable to the directions of Mr. Hopkins; he altered the stakes still further into the river, by which this quantity was covered over and lost, as also many perches that slid into the channel, and which is valued by the overseer under whose superintendance the work was performed, at £81, and which is contained in the 72d item of aforesaid account. (14) "Sections 4 and 5 are very like

No. 14.

I certify that on the Chamby Canal above G. Marchand's, at which place I was ordered to work, I found the foundation of the protection wall laid for a considerable distance in a depth of water from eight to ten feet, and three hundred feet in length and which had been built according to stakes, said to have been laid down by Assistant Engineer Casey. Mr. Hopkins afterwards laid down another line of stakes for me to work by, in consequence of which the wall has been covered up by the bank I was ordered to construct, and thereby totally lost, as well as a further expense incurred from large masses of earth sliding into the water, in forming the bank to the necessary slope and width. Protection wall covered by bank.

300 feet	9 feet	2 feet, 216 perches,	a 7s6	£81 0 0
16 days work making road and drain			3s6	2 16 0
71 do do			3s	10 13 0
Drain 12 do do			3s	1 16 0
				£96 5 0
			Carried forward,	

Section No. 3. Section 4 for a short distance is located in excavation, but both sections are mostly embanked in the river. Both sections need protection against the river."

The labor on both these sections was much more expensive than predicted, or stated in the above quotation from the original report; and was carried on under the most disadvantageous circumstances. The work was commenced in the Summer of 1833, and the banks completed as far as practicable; but the incessant rains in that year often inundated the works, and prevented them from progressing with that rapidity and ease which would have been so desirable. A creek also that empties itself into Section No. 4 greatly increased the difficulties and subjected the Contractors to a cost of £62 10 0 in pumping out the water, and which is charged in the 86th item of account, as it was an expense which might have been prevented by constructing a culvert, and which it was the Engineer's duty to do. The expense likewise was much increased in consequence of the earth on both sections, being for the most part quicksands and hard pan, which it was not only difficult and expensive to remove, but likewise to form a bank with; and in consequence of the Engineer's refusal to allow earth to be taken from the bank of the river, a great part had to be removed from the surface of the road at an extra expense of £75 as charged in the 84th item of account. Notwithstanding such was the waste of earth, that the lower part of Section No. 5 had to be left in an unfinished state, and having so remained for the following winter was almost completely washed away and which the men who performed the work can substantiate. No mention is made in the original report of a large quantity of rock found on Section No. 4, although a large quarry of immense hard rock had to be raised at an enormous expense and loss of time, greatly augmented by the inundations that frequently took place, and which had to be pumped out at a great cost. On both sections an immense number of large stones were found, that had also to be removed by blasting, and after the Canal had been excavated to the Engineer's satisfaction and a part of the protection wall built, the Canal was considered too narrow, and instead of widening it by removing the earth from the bank of the river, the Engineer caused the inside of

	Brought forward,	£	s	d
Overseer 6 do do	5s	1	10	0
Aug. 27th.—40 1-2 days extra work on the road section 4, a 3s		6	1	6
per day,				
Levelling Lock bottom.				
Section No. 4, taking off bank for waste weir.				
61 1-4 days	a 2s6 per day	7	12	6
4 days (overseer)	a 5s	1	0	0
		£	112	9 0

In testimony of the above I have hereto signed my name after being duly sworn.

(Signed)

D. KILDAY.

Sworn before me at Dorchester, this 23d December, 1834.

(Signed)

P. P. DEMARAY, J. P.

the tow-path bank to be thrown to the outside, whereby the protection was covered up and in a great measure lost, and which cost £90 as charged in the account of extra work, item 69, (see J. Gass' affidavit, No. 6, page 43,) as likewise (L. Connor's, No. 15, page 56.)

By reference to the contract it will be seen, that the Engineer had authority to direct the protection walls to be built either perpendicular, or on such a slope as he might deem best; on these sections he ordered them to be built in the proportion of one foot perpendicular to one horizontal, and such part as was done in 1833 was so executed. In 1834 the assistant Engineer continued them on the same proportion, and after a number of perches had been finished, the chief Engineer gave directions to build the remainder one foot perpendicular to one and a half horizontal—this work having been executed in the winter season, was found insufficient in the spring and had to be re-built together with that erected in the proportion first mentioned, a great part of which had fallen, owing to its not having sufficient slope. The consequence of these changes was a great loss of stones, besides the expense of labor, and the banks having by the wall failing been left unprotected were considerably washed away and had to be put in their former condition at much cost and loss of time (15).

To procure earth sufficient to finish the banks on these sections, the Canal had to be excavated considerably below bottom at a cost of £50, (as charged in the 85th item of aforesaid account) but were finally raised to such a height and protected as the Engineer considered necessary; but from the height of the water in the following spring, both were discovered to be too low, the former therefore had to be raised after having been much washed away and protected with brushwood but neither are yet so high as will be necessary.

From what is stated in the Engineer's original report respecting sections 4 and 5, it was anticipated these sections would have been both easily and cheaply executed; but from the unlooked for rock and stones found in them—the nature of the ground—the unprecedented heavy

No. 15.

In the month of may last being in company with Messrs. Hopkins and Andres, on the tow-path between Mr. Marchands and the lower dyke, I asked Mr. Hopkins what was to be done with the protection wall which was then built; it being then one foot horizontal to one perpendicular. Mr. Hopkins replied the wall must be re-built of the demensions of one foot and a half horizontal to one foot perpendicular and I will give him a new estimate for it. The wall was accordingly altered to the required proportion. I likewise declare that I have frequently asked for stakes to mark the line of wall, from the Engineer, and got but two and could I have obtained the number necessary to mark the boundaries I could have proceeded into the work quicker and more to my satisfaction and that the want of a proper demarcation has been detrimental to the Contractors.

In testimony of the above I have made my mark after being duly sworn.

his
LAUGHLIN ✕ CONNOR.
mark,

Sworn before me at Dorchester this 23d December, 1834.

P. P. DEMARAY, J. P.

rains—and the many alterations made, and losses sustained, as already described; they were executed with the utmost difficulty & at a heavy cost. In the embankment and excavation alone, as far as can be estimated, 34,364 yards of the former, and 3,409 perches of the latter, (being the 5th and 6th items in account of extra work) have been done more than would have been necessary had the original report and contract been adhered to. In order also to convey the water from the road leading to Montreal, a ditch was cut by order of the Engineer and afterwards found insufficient for the purpose intended—in consequence, a stone sluice had to be made across the road opposite to Fritchett's Tavern, at a cost of £2 15s. as per 55th charge in aforesaid account of extra work, and which it cannot be denied is extra, as there would have been no necessity for it had the ditch dug in the first instance been of proper dimensions.

“Section No. 6, after leaving the river and having a part of the Canal in rather deep cutting for a short distance, passes across some low level land opposite St. Therese island, when the Canal can be constructed for a very slight expense.”

The section as above described ran a little farther down than the upper dyke, but owing to the route having been changed into the St. Therese channel it ends at the dyke. Had the banks been built according to contract they would have contained 17,226 yds. embankment and excavation, and 1296 perches protection wall, but owing to the enlargement of the banks, it contains about 22,649 yards embankment and excavation, & 2578 perches protection wall, the difference therefore forms the 7th item in account of extra work. The Canal from the upper end of this section to the dyke, after having been excavated according to stakes set down by the Engineer, and part of the protection wall built, proved to be too narrow and was ordered by the Engineer to be widened by throwing earth over the tow-path as in the case of last section, by which a great proportion of the wall then built was covered up and lost, (as can be attested to by L. Connor the overseer who did the work.)

Some parts of this section were pretty deep cutting, and the Engineer having laid out the line farther into the bank than was requisite to produce a sufficiency of earth for the construction of the tow-path, the surplus earth which was a large quantity had to be used in the formation of the dyke, whilst a sufficiency could have been procured from the island at a much cheaper rate, and with a great deal less cost, where the most part was brought from.

This section ends the upper division of the Canal, and has been so far completed, with the many additions to the work contracted for as already stated; besides the great difficulties, loss of time, and increased expense arising from the circumstances as already related. The several alterations and additions made to the original work by the Engineer, the contractors were bound to comply with, as will appear by the contract, but for which *they were to be paid a fair and reasonable price*. To such increased work was added the expense of making new roads and bridges along the greater part of the upper division, in consequence of the old ones having been damaged by taking off the surface of the roads, with which to build the banks, instead of allowing earth to be taken from the

banks of the river for that purpose, and which was done *by the Engineer's own admission to the Commissioners to save expense of land.* That the roads were extra will be seen by reference to the 13th clause in the commissioner's report to the Legislature inserted in page _____ and for which the Contractors only charge 52*8*l., being the 44th item in the account, although they consider they have lost considerably more, as that sum was barely sufficient to put the roads and bridges in the same repair in which they were found, and allows nothing for the inconveniences to which the Contractors were subjected in not being permitted to take earth from the most convenient places—and which certainly was the understanding when the contract was entered into.

Sections Nos. 7, 8, 9, and 10, were not executed owing to the alteration in the route as already stated, but it may be observed, that one coffer dam had to be surk at a great expense immediately above the upper dyke and another below the lower, to prevent the water flowing into the Canal before the excavation had been completed, and which afterwards were removed.

“Section No. 11, follows the ravine that section 10 is located in, and is very direct; it ends on the river side near the road and a bridge will be required on it for the road as there will be at section 9.—If for any cause the line is thought better near the river, it can be constructed cheaper along it, but we are inclined to prefer the line as located which passes a considerable way back from the river.”

The section as before described, is No. 1 in the lower division, and is constructed from the lower dyke along the side of the river. In consequence of altering the line of Canal into the river Richelieu the culvert that was to be constructed on section 9 is built on this section. It was to have been a single culvert, instead of which it has been made a double one; in order to increase its size & strength, and as the public road passes close to the Canal and over the culvert so constructed, it was considered necessary by the Engineer to increase its length also, so as to pass underneath the road for its entire width, a distance of from 24 to 30 feet; when it is evident a bridge could have been built to answer every purpose as well at much less expense. The extra work on this culvert is acknowledged by the Engineer in his account of extra work inserted page 21, but a fair price is not allowed, it having cost 37*l.* 10*s.* as charged in the 42d item of account of extra work. The road on each side of this culvert had to be raised for a considerable length, to effect which a dyke had to be formed on each side and which cost 20*l.* as charged in the 43d and 44th items of account of extra work. This section had likewise to be excavated from 2 to 3 feet below Canal bottom in order to procure earth to finish the tow-path, the Engineer refusing to let it be removed from the bank of the river.

It will be observed that in the Engineer's report, no mention is made of a bridge to be erected for Carpenter's ferry, till under the head of section 12, tho' it is calculated in this section in his original estimate and said to cost with the embankment 100*l.* This portion of the work was done at a time when the Contractors were otherwise very busily engaged, and the Engineers took the sole management of it. The abutments were con-

constructed of extreme hard stones hammered to close joints and laid without cement—a manner of building most expensive. When both abutments had been raised to a sufficient height to receive the bridge which was to be a wooden one—that on the west side of the Canal from 12 to 14 feet, the other somewhat lower, and the embankment nearly completed; the west abutment or wall fell into the Canal and caused a great deal of damage and much inconvenience and delay. At the time this accident happened, about 300*l.* had been expended on the Bridge, which it is believed when finished will cost upwards of 500*l.*, although 100*l.* is only stated in the first instance to be the cost, which increased expenditure over the original estimate, which it is evident could not have occurred through any means of the contractors, when it is taken into consideration, as has before been observed, that this particular portion of the work was carried on under the Engineer's direct and untroubled management.*

“Sections 12 and 13.—These set are generally located in short distances from the river on section 12, which is near the river, for a few hundred feet, a bridge will be required for Carpenter's ferry. These sections are mostly all in light excavation. The road requires to be made new the length of these sections.”

↳ The excavation on these sections was for the most part hard slate, with a quarry of hard rock, which had to be blasted out at a very great expense with gunpowder;—neither the slate or the rock are mentioned in the original report in which the excavation is termed “light,” instead of which it was extremely weighty, and much more expensive than there was the slightest reason to expect. New roads and bridges had to be made along these sections, as also in former section, and section No. 4—and not being included in the contract, of course are extra and charged in account, items 38, 40, and 41, amount to 649*l.* 8*s.* 6*d.* That these roads and bridges are extra will appear by the Engineer's statement of extra work, page 21, wherein he acknowledges them as extra, but allows nothing in consequence of two bridges he alleges were saved to the contractors; and farther they are acknowledged as extra by the Commissioners themselves in their report to the Legislature, page clause 13. On these sections also a culvert, which cost 6*l.* 1*s.* 6*d.* as per 76th charge in aforesaid account, was made across the road, and a ditch dug to conduct the water from the foot of Bunker's-hill into the Canal, agreeable to the directions of the Engineer; (16) but was found in consequence of the heavy and incessant rains of 1833, too small, and orders were given to lift it up and construct another of larger dimensions, which cost 40*l.* as charged in 29th item of said account. The work on sections 12 and 13 was most difficult and costly to finish, owing to the nature of the soil

* James Poitras, master mason—T. Woolcot, master carpenter can attest to the monies expended on this bridge—and Oliver Carpenter as to its having fallen, and the inconveniences thereby produced.

(No. 16.)

June 3d.

CONTRACTOR.—Please to get the ditches opened above culvert No. 3, to bring

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being slate, hard rock, and quick-sands, together with many springs found, more particularly in section 13, and the adjoining lands to the Canal being high, immense quantities of water flowed in from the neighbourhood and inundated the work, and the water as in many previous instances had to be pumped out at a great expense and loss of time; and the excavation in many places had to be sunk below Canal bottom to get a sufficiency of earth to finish the banks. A large ditch had likewise to be dug for the entire length of section 13,—a waste weir had to be constructed, and a coffer-dam put in—none of which were contemplated at first—nor are they alluded to in the original report.

“Sections 14 and 15 contains some of the heaviest work on the line. They are situated opposite Bunker’s Hill. The embankment along this part of the work must be well protected against the river, in shallow water a wall can be laid; in deep water a dyke must be laid like the one described at St. Johns, wide enough at the top to receive a protection wall extending from the surface of the water to above high water mark. The lower end of section 15, has some deep cutting. Over this a road bridge can be made with ease. After leaving the river at section 15 the line passes over some very hard ground, and where light excavation and tow path bank are necessary to form a canal.”

The work contained on sections 14 and 15 was most difficult and expensive in excavation. The cutting being in many places very deep and the greater part of section 15 being very hard slate and rock. The quarry upon section 15 is the one, the contractors presume, alluded to by Mr. Hopkins in his letter to the committee of the House of Assembly as it is the most extensive on the line. Nothing is however mentioned in the original report concerning rock on these sections, from which it must be evident the engineer was not aware of the nature of the ground through which the canal had to be excavated, otherwise he certainly would not have overlooked so very expensive a part of the work.

In order, as the engineer stated, “not to encroach on Mr. Johnston’s garden,” near Bunker’s hill, (though it has since been altered by order of the commissioners) the line of canal was run much further out into the river than otherwise would have been necessary, and instead of the engineers permitting earth to be taken from the bank of the river to make the tow path, it was ordered to be brought from the lower end of section 15, being a great distance and by which a ruinous loss to the contractors was suffered, greatly increased by the tow path so constructed, being in deep water, where the current being very swift, carried away a great part of the bank before it could be protected. For the same cause, viz., the bank being put far into the river, the protection wall was increased, and had

back water into it, as staked out by Mr. Seymour.

Please to open the ditch on section No. 4, near Demerse’s, on the back of the spoil bank.

Please to prepare for building bridges on the new road along sections Nos. 2, 3, and 4.—Yours, &c..

WILLIAM R. HOPKINS,
Engineer.

Engineer’s Office, 3d June, 1833.

to be built considerably stronger than would have been necessary had it been situated nearer the shore. In fact this portion of the work was completed at an enormous expense, about 500 feet of the protection wall being 6 feet thick, built perpendicular, of dry masonry, and finished in the most expensive manner.

It is stated in the report that "*a road bridge can be made with ease,*" and in the engineers' original estimate it is valued at £75. Instead of putting up this bridge, which was to have been wood, an iron one is erected at a cost of £628 12 0, as has been already shown; deducting from this amount £75, a balance of £553 12 0 would remain as extra, but at the time the contractors account of extra work was made out the amount could not be accurately ascertained, and only £500 is charged. (See 9th item in account.) In addition to this loss, the delay that necessarily attended the aforesaid change, subjected the contractors to the most serious inconveniences and obliged them to construct a floating bridge over the canal to accommodate the public, at a very considerable cost; and which would not have been required had the wooden bridge as originally intended been put up.

No mention is made in the report of waste weirs on these sections, nor are any accounted for in the original estimate. Two, notwithstanding, have been made, at great expense and under the most disadvantageous circumstances, inasmuch as the engineer pointed out the place where one was to be erected, and when partly excavated in slate and gravel at a cost of £5 3 6, as charged in account of extra work, item 10th, he ordered it to be abandoned and built at another place, where the canal is 214 feet distant from the river, and where a large quantity of stones had first to be removed from the surface of the ground, and afterwards the culvert excavated through an immense hard rock for its entire length, and which incurred an expense never predicted, of at least £300 as contained in the 11th item of aforesaid accounts of extra work.

Such were the circumstances under which these sections of the work were completed and fully establishes what the report states "*that they contain some of the heaviest work on the line.*" Although not one half of the sum they absolutely cost is contained in the engineers' original estimate.

"Section 16, 17 and 18 are some distance from the river, and on very favourable ground."

The excavation for the entire length of the above sections, was made through very hard gravelly ground, abounding in hard-pan and other earth, both difficult and expensive to remove. There are two culverts on this part of the line, and both after having been completed to the *entire satisfaction of the engineer*, and agreeable to his orders had to be taken up in the following spring, in consequence of the water making its way through the gravel, and puddled with clay, which cost a considerable amount more than would have been necessary to finish them so in the first instance. Deep ditches were likewise cut on each side of the canal to convey the water to the culverts and from thence to the river. (See Mr. Hopkin's letter No. 16, page 59.) This part of the work occupied 150 days of labourers &

overseers at a cost of £28 2s. 6, being the 37th charge in account of extra work. A puddle trench was likewise cut by order of the engineer, but as the excavation was more than six feet in depth, was unnecessary, besides the contract only provides "that puddle trenches are to be cut where the excavation is less than six feet." This error cost £12 10 8, as charged in the 36th item of said account.

✎ This part of the work contains 3 farm bridges, commenced by order of the engineer, (17) also one on section No. 3. and another on section 10, together with a floating bridge on section 9, another on section 4, and a third on section 1, in all 5 farm and 3 floating bridges. The latter were only temporary, had several times to be repaired, and were finally lost, and cost in all about \$169, as near as can be computed.

The farm bridge on Section No. 10 was first built on the plan and under the directions of the engineer at a cost of £184 2s. 8d. The second on section 8 was built under the superintendance of Mr. Nichols, master carpenter, and only cost £124 7s. 11d., including masonry (which was the same in both bridges,) although it was as strong, likely to be more durable, and much more convenient to open and close than the former, and in fact in every respect superior, at £59 14 9 less cost. (18) Not-

No. 17.

1st April, 1835.

Messrs. Andres :

Please to get a bridge ready for the point first above the first lock and when it is prepared and ready remove the present one.

Yours, &c.

WM. R. HOPKINS.

No. 18,

Cost of a Farm Bridge built over the Chambly Canal according to plans and direction furnished by Wm. R. Hopkins, the engineer.

TIMBER.

	length. feet.	breadth. inches	thickness. inches	contents. feet
3 string pieces	48	8	12	96
3 do. do.	27	12	12	71
3 braces	30	12	8	60
3 do.	10	8	12	20
4 ends	8	12	12	32
Pivot beam	8	16	16	14
String beam	8	8	16	7
4 pieces for frame work of pivot,	8	12	12	32
4 do. do.	4	12	15	20
2 do. do.	6	6	12	6
2 hand rails	75	4	6	25
2 do. do.	75	3	4	12½
2 posts	4	4	6	10½
12 sleepers for plat- form	10	12	12	120

Cubic feet

526½ at 6d.

Carried forward

£13 13 1½

withstanding the saving that might have been thus effected, the engineer
as so tenacious of his own plans, and so adverse to receive advice, or

	£	s.	d.
Brought forward	13	13	1 $\frac{1}{2}$
48 rails of 2 inch plank 4 by 2 inches, 104 square feet, at \$3 per M		6	2 $\frac{1}{2}$
300 2 inch plank for flooring		1	16 0
100 3 do. do. for platform		0	10 0

IRON WORK.

	c.	q.	lb.				
Pivot and cap	1	1	12				
4 friction wheels,	2	3	4				
	<hr/>			c.	q.	lb.	
				4	0	16	a 25s
Collars	35 $\frac{1}{2}$	lbs.		at	7 $\frac{1}{2}$		5 3 7
Spikes	35 $\frac{1}{2}$	do.		5d			1 2 2
Bolts	22 $\frac{1}{2}$			8 $\frac{1}{2}$			0 14 9
Spike heads	74			"			7 14 4 $\frac{1}{2}$
do. do.	49			"			1 10 0
do. do.	12			5			1 2 1
do. do.	12			5			0 5 0
Bolts and straps	136			6			3 8 0
Circle and bolts	73			7 $\frac{1}{2}$			5 8 1 $\frac{1}{2}$
One fifth expenses of models and castings,							0 12 0
Carriage from Montreal							5 0

27 5 1

Platform.

4 days laborers excavating and leveling	3s. 6d.	0	14	0
9 perches of stone	5 0	2	0	0
Horse work, teaming		0	10	0
2 days of a mason	5 0	0	10	0
2 do. of laborer	3 6	0	7	0
31 feet cut stone for balance stones	3 0	4	13	0

8 14 0

Carpenters work.

250 days of a carpenter	6 3	78	2	0
2 do. do.	5 0	0	10	0
3 do. of a laborer	2 6	0	7	6
2 $\frac{1}{2}$ do. double teams	10 0	1	5	0

80 4 6

Total cost of bridge exclusive of mason work

131 18 11

Cost of a bridge built over the Chambly Canal, agreeable to the direc-
tions and under the superintendance of Elias Nichols

Master Carpenter

TIMBER.

	length.	breadth.	thickness.	contents.
	feet	inches.	inches	feet.
3 string pieces	48	8	12	96
3 do. do.	27	12	12	81
				Carried forward

to alter any part of the works otherwise than he might himself propose, even could improvement be made, and expense saved; that he caused the

				£ s. d.
Brought forward				
	length, feet.	breadth, inches	thickness, inches,	contents, feet.
2 bracts	5	12	12	16
4 tie beams	8	12	12	32
Pivot do.	8	16	16	14
12 sleepers for plat- form	12	12	12	132
2 ribbons or strings	75	4	6	25
2 balance beams	85	12	16	93
2 hand rails	50	4	6	17
4 posts	4	12	12	16
42 small do.	4	4	6	28
Cubic feet				550 a6d 13 15 0
Planks for flooring				2 16 0
				16 11 0
<i>Iron.</i>				
1 pivot box and cap	1	1	12	25 0
Bolts	0	5	24	7½
Iron rollers	39 lbs.			1 3
spikes	9 "			0 5
Friction bar	136 "			1
Bolts	79 "			2 8 7½
				14 6 0½
<i>Platform.</i>				
4 days labour excavating and levelling				3 6
8 perches of stone				5
Horse work, teaming				0 14 0
2 days of a mason				2 0 0
2 do. of a labourer				5 0
2 do. of a labourer				3 6
4½ feet cut stone, for balance stones				0 7 0
				3 0
				4 15 3
<i>Carpenter's work.</i>				
50 days of a carpenter				6 3
6½ do of a do.				15 12 6
4½ do. of double teams				6 3
				19 4 4½
				10 0
				2 5 0
				37 1 10½
Total cost of bridge, exclusive of mason work				72 4 2
50½ days of carpenter's working at the waste weir opposite Moses Banker's				at 5
Carpenter's work putting on paddle gates				13 8 9
3 days of a carpenter				8 14 0
				6 3
				0 18 9
Carried forward				border-top: 1px solid black;

remaining three to be constructed on the plan of the first, with some alterations of his own, and by which an unnecessary outlay was occasioned of £272 4 0, but as this loss could not be accurately ascertained at the time the contractors made out their account of extra work, only £257 3 6 is charged in the 13th item, together with £8 15 6, for stones and iron work to balance the bridges after they were put up, which is charged in the 51st and 66th items of said account. It may be further remarked that the piers supporting the farm bridges are in their present condition very defective, and are liable to be knocked down by the boats navigating the canal, and under this impression, Mr. J. B. Jervis, an Engineer of eminence from the United States, who was brought on the Chambly

	£	s.	d.
Carried forward			
Difference as before stated, in the cost of 4 farm bridges,	238	10	0
Alterations on the last erected three	33	5	0
	295	5	6

I, Elias Nichols, hereby declare the foregoing statement of the two bridges, is correct and true to the best of my knowledge and belief, and I consider the last mentioned bridge to be as substantial and in every manner as useful and convenient as the former, if not more so, and by erecting them according to the last mentioned, a saving might have been effected of fifty-nine pounds fourteen shillings and nine pence on each bridge, as charged in the fourth item of the foregoing account. The fifth item in said account is owing to the engineer having made alterations from the original after the timber had been framed according to his (the engineer's) directions. The second item in the above account, of eight pounds, fourteen shillings is for putting paddles into the Lock gates in consequence of those previously put in having broken, & the third item is in consequence of the engineer having ordered the carpenters to prepare a bill of timber for which he afterwards declared he had no use. The first charge in the aforesaid account is for work done at a waste weir opposite Moses Bunker's, for which there was likewise procured, by the said engineer's directions 24 bolts of iron to fasten the sill to the rock; but the engineer having directed all the rock to be removed they were not used. In addition I further declare, that when I with the men under my charge began to frame the lock gates for the Chambly Canal, I found a quantity of timber laid in for that purpose both too short and too small in the dimensions, but I cannot say by whose directions, or under what circumstances it was so prepared, having been procured before I came upon the work of the canal. In addition to the above, I further declare, that in my opinion the contractors lost very considerably through the engineer's unstable conduct with respect to giving directions how he wished the work on the canal done, as continual changes and alterations were made by his counter orders. At first he would probably give a plan how the work was to be done and afterwards give verbal orders to alter it. In many instances, several times before the work was completed, all of which must have been a very considerable loss to the contractors, and was the means of delaying the work much, all of which to the best of my knowledge and belief is true and correct, and I herewith subscribe my name.

(Signed) ELIAS NICHOLS, *Master Carpenter.*

Sworn before me one of His Majesty's Justices of the Peace this 15th day of July, 1836.

P. P. DEMARAY, *J. P.*

Canal by the commissioners to survey the works and report if it was progressing as it should, recommended that wooden piers should be placed opposite the stone piers to protect them, but his recommendation has not been acted on and this part of the work remains very much exposed to the damages dreaded, and which has in a slight degree already taken place in two or three instances, and where such has occurred the piers will require to be rebuilt.

On this section of the work likewise great complaints were made by the farmers occupying the land in the vicinity of the Canal, "that the farm bridges had been erected at places most inconvenient for them to cross," and in order to allay as far as possible, the discontent that prevailed, orders were given by the Engineer, to construct roads, &c., (19,) which he said " would be advisable to prevent the inhabitants travelling on the tow-path," and which was accordingly partially done, for almost the entire length of these sections, on both sides of the Canal, and which cost in the first instance 16l. 15s. being the 73d, 74th, and 75th charges in the account of extra work. These roads were afterwards repaired by order of the Commissioners themselves, who have since arranged with the inhabitants to keep them in repair for the future—but with these last the contractors have nothing to do.

Section 19 is for the most part embankment, and some of the bank will require to be raised rather high. The line was located in this way, that we might found lock No. 1, on rock."

As it is stated in the Engineer's report, this section is for the most part embankment, and the nature of the soil was rather favorable being clay and not difficult to work, but the line of location which it appears was chosen, "that lock No. 1 might be founded on rock," and thereby save the expense of a timber bottom, was far from being the most advantageous route, as the banks are placed exactly on the face of a declivity, and thereby subjected to break away; which was frequently the case, and had to be repaired at considerable cost and loss of time, besides inundating the lands in the vicinity of the Canal. Had the line of location however been altered to the low ground this would have been effectually prevented, and this section executed at much less expense. The line was however chosen, that Lock No. 1 might be founded on rock, which is absolutely the case, but instead of the rock serving as a bottom—and the expense of a wooden one saved as predicted it only increased the cost, as the Engineer directed the rock to be quarried out, and a wooden bottom put in, thus subjecting the Contractors to an immense expence in excavating the lock-pit in rock and slate to what would have been the cost in clay, besides having the banks to raise an increased height and subject to break away as already stated. In addition to the expense

(No. 19.)

Mr. STURDEVANT, Chambly, July 20th.
Sir,—Please move back the fences and make the roads on those farms where the land has been paid for.—Mr. Seymour will give you the stakes.

Your's &c.,

WILLIAM R. HOPKINS,
Engineer.

thus unnecessarily incurred, the Engineer, after having ordered the bank on this section to be raised to a given height, and when such had been accomplished, thought it too high and ordered it to be lowered by removing a part of the earth to be taken off and put on the tow-path side, and which was no sooner performed, than the brim bank had again to be raised to the same height as it was before it had been lowered, and which cost 5*l.* as charged in the account of extra work item 35th.

"Section No. 20 has the first lock located on the upper end of it—is eight feet lift, and with the other locks is 100 feet long in chamber, and 20 wide. Lock No. 2 is of 10 feet lift, and is located near the lower end of this section—on rock also. The excavation and embankment are both light, and this section may be considered a cheap one."

The section as before described in the original report contains the first and second locks. The excavation and embankment are stated to be "light," and the section "a cheap one;" the contrary is, however the case. In the first place, the banks are very high, indeed more so than those on the last section, although they are stated in the report to be "rather high;" and in the second place, the section is not *cheap*, but a VERY EXPENSIVE one—a considerable part of the excavation being made through a hard slate, very difficult and costly to raise, besides the engineer instead of permitting the earth to be procured as could have been done convenient to the embankment, caused it to be carted from the lower end of next section at a very weighty expense, and which was by no means necessary, (as the Engineer afterwards, desirous of strengthening the banks to prevent the water oozing through the slate and gravel of which they were composed removed the earth for that purpose from the identical spot from which in the first instance he would not permit it to be taken; further also, the engineer ordered a puddle trench to be cut on the brim bank of this section at a cost of £5, charged in the 34th item in account of extra work in consequence of it being, by his own admission, of no use, in which case certainly the contractors were subjected to that unnecessary cost. At the time the report was made, it was proposed to erect in the entire line of Canal, one guard and eight other locks, some of the latter to have 10 feet lift, but before the contract was entered into, this determination was abandoned, and the contractors agreed to erect one guard lock and nine other locks, the latter having 8 feet lift, of 100 feet long by 20 feet wide in the chamber; before, however, the work on the lock was commenced, the Engineer changed his mind with regard to their size and ordered them to be constructed 120 by 24 feet in the chamber. (19). The pit for lock No. 1 was therefore excavated to

[No. 19.]

Canal Commissioners Office, April 6th, 1833.

To Messrs. Shulter, Andres & Co, Contractors of the Chamby Canal.

GENTLEMEN—

I am now authorised by the Commissioners of the Canal to inform you that they wish the measures taken in future in regard to the locks to have reference to the alterations made from 20 to 24 feet in width, and from 100 to 120 feet in length of chamber.

WM. R. HOPKINS,
Chief Engineer.

admit a lock of that dimensions, a wooden bottom put down, and the masonry had progressed to some extent, when he again altered the size to that originally proposed, viz., 100 by 20 feet, (20), at which dimensions the lock was completed, and the several alterations as specified produced the charges made in the account of extra work from the 14th to the 32d items, as also those made in the 90th and 91st, amounting in all to £330 15 2. The second lock was commenced on the same dimensions, at which the first had been completed, the lock pit excavated, the bottom laid, and a number of courses of masonry built. When in this advanced state of completion, the size was again altered to 120 by 24 feet in the chamber, and an agreement entered into with the contractors to take down and rebuild the 1st, alter the second, and construct the remaining seven of such dimensions; the second was accordingly altered, but the first yet remains of the smaller size. ↪ It will appear by reference to the original report that both the 1st and 2d locks were to be *founded on rock*, consequently it was expected would not require wooden bottoms, and under this impression the contractors tendered, and finally agreed for the work. However, in the contract a clause is inserted leaving it discretionary with the Engineer to have wooden bottoms put in, should he conceive the rock insufficient! but for which the contractors evidently understood they were to be remunerated. That such was also the opinion of the Engineer is certain, as he declares in the report, last section was *located in its present course so that Lock No. 1 might be founded on rock*, which he consequently conceived would save the Commissioners the expense of a timber bottom, as the contractors have no good grounds to believe such a course was adopted for their benefit; no future act of the Engineer's exhibiting such a disposition. Without doubt in the present instance he was sacrificing the interest of the contractors to benefit the Commissioners, by locating the line of last section in an expensive way, much to the disadvantage of the former; for had he taken their interest into consideration, and conceived them liable to put in a wooden bottom without an extra charge, he certainly would have located the last section in the cheapest route, and not subjected them to the most expensive line, as also to excavate a lock pit in rock and slate; when they might with so much more ease, and with so much less cost, have taken the cheaper route, and had the lock pit to excavate in clay, which from the report there is every reason to suppose would have been the case. However, as such a clause (as before referred to) is contained in the contract, and nothing expressly said about timber bottom to be extra; the contractors have not made any charge. They conceive such a course, as that adopted by the Engineer intended to induce persons to tender

[No. 20.]

Chambly, 11th July, 1833.

To the Contractors of the Chambly Canal,

GENTLEMEN—

I am directed by the Commissioners to inform you that we shall have the locks constructed according to the original plan of 100 feet by 20 in chamber.

WM. R. HOPKINS,
Engineer.

for the work, by giving a semblance of EASE AND CHEAPNESS to the undertaking that it did not in reality possess. This course the contractors regret to say has been too successfully practised by the Engineer in many instances, which his report compared with the work really done, and the disadvantageous circumstances attending its execution, fully establishes.

"Section No. 21 has on it Lock No. 2, 10 feet lift, the section is light and mostly consisting of embankment."

This section ends close to the lower end of Lock No. 3. It is stated in the report to be "LIGHT AND MOSTLY CONSISTING OF EMBANKMENT," a great part notwithstanding is excavation which passed through a quarry of hard rock at the upper part, both expensive and difficult to blast out. The earth to form the embankment was hard to procure, owing to a quarry covered with slate rising near the surface, over which there was but a slight covering of earth. This difficulty had to be surmounted by taking in a much greater space than was necessary for the width of the Canal, so that a sufficiency of earth could be procured for the embankment, and increased the work 860 cubic yards, being the thirty-third charge in account of extra work. This section contains Lock No. 3, located in a hollow part of a hard stone quarry; and the excavation of the Lock pit was consequently difficult and expensive, partly owing to the springs of water arising out of the rock, and which had to be pumped out at much cost, and partly from the excavation being in hard slate rock that proved obstinate and very expensive to remove. Under these circumstances this section proved expensive, instead of "light" as is not only inferred but distinctly stated in the Engineer's report.

"Section 22 is 3,500 feet long, ending in the channel in Chamblly Basin, it has on it Lock No. 4 on rock foundation Lock No. 5, with an inverted arch bottom. Locks Nos. 6, 7 and 8 combined, the lowermost of these Locks must have its mitre sill on a level with six feet below low water mark, its bottom must be well secured, and an inverted arch must be turned under the chamber. The next Lock will have its foundation level with the lower Lock; a mass of rubble work the width of the foundation must then be carried as high as the upper mitre sill, at the lowest Lock the bottom can be flagged over or coped over and the walls carried up. The highest Lock of all must be like the one below, it has its foundation carried as low as the bottom of the lowest Lock, and to be brought up to the Lock bottom with rough mason work, above this cut stone will be raised."

"We have been obliged from the nature of the soil to adopt the plan for combined Locks, as given above. In gravel soil we should be willing to see upper Lock walls founded on piles instead of masonry; but in such ground as that at the basin it will not be safe to use them, from the bank commencing about one hundred feet up stream from the foot of the combined Locks, we propose to run out a stone pier the same as that at St. Johns; carried within one foot of high water-mark, and extending into the basin where the lowest water is six feet deep, below this pier the channel must be excavated to the foot of said Lock."

Section No. 22 contains about the half length of Section 10, and the entire of section 11 as exhibited on the map, and ends in the Chamblly

basin. It is to contain Locks Nos. 4, 5 and 6, together with the three combined Locks at the entrance to the Canal, but only Nos. 4 and 5 are yet finished, and the excavation is not completed. At the upper end of this section a quarry of hard rock was found, which after being removed to Canal bottom at great expense was used for backing for the Locks, and in addition a large quantity quarried for that purpose by directions of the Engineer, (21), these stones were found useful no doubt for backing to the Locks, and the Engineer considered them of such a quality as authorised him to order them to be also cut for facing, in consequence a large quantity was cut, for which much higher prices were paid (in consequence of their hardness) than for those brought from the United States; however, but a small portion was used, and the remainder remaining over winter it was discovered would not suit the intended object, having cracked by exposure to the air and frost, and consequently remain on hand of no use, only for backing; the cutting being therefore lost, forms the 14th item of the account for extra work, as it was a total loss to the contractors, occasioned by the Engineer's directions, and by no means by their own instrumentality, as when the expense of quarrying, the additional expense of cutting, the difficulty of forming the banks of the Canal round a large space opened in consequence of the quarry, and the expense considered to what it would have been if taken in a direct line, together with many other incidental expenses and incumbrances, there is no doubt the contractors could have procured stones as formerly, on much more advantageous terms than they could raise them from the quarry, even had they answered the purposes for which they were intended, and so convinced were they of this fact that they would not have opened the quarry to a greater extent than was necessary to form the Canal, had not the Engineer so directed.

On this section a stone culvert was to be built of four feet in diameter and finished in plain masonry—instead of which the Engineer has increased it to eight feet, and finished it in a very expensive manner with hammered stone and coping, the additional cost of which 7l. 10s. is charged in the 12th item of account of extra work. A farther expenditure was unnecessarily incurred of in consequence of having waste weirs to construct on this as also on some of the former sections—after the banks had been completed, whereas the proper time to build them would have been at the time the banks were in the act of being raised, whereby the earth would not have been required,—first to complete the banks, and afterwards to be cut away. Besides this loss, the

(No. 21)

Messrs. Andres, Contractors, &c.

Chambly, Sept. 12, 1834.

GENTLEMEN—

The work at the Locks will probably be stopped in the middle of October, and I greatly wish to have a large portion of work done before that period. You had better therefore put 30 men at the quarry just below the Boileau Lock at getting out face stone, and have 40 men to cut stone. Please to put 60 men on Lock pit No. 5, to complete that as soon as possible.

Yours, &c.

WM. R. HOPKINS.
Engineer.

Contractors were farther subjected to erect two waste weirs on the upper end of this section—one on the tow-path side—over which they had a bridge to build, and another on the brim bank side directly opposite the former. One of these waste weirs might certainly have been saved by increasing the size of the other, the former however being evidently extra, are charged in account, items 77th and 78th—as also 5l. charged in item 87th being for deepening and levelling a part of section 11 after it had been finished agreeable to the Engineer's orders—and to his entire satisfaction, which error arose as stated by himself, in consequence of an incorrectness in his level.—(22.)

It will be observed by reference to the report, that a stone foundation (and consequently bottom) was promised for Lock No. 4—and most probably from the hardness of the stone where it was first located, this would have been the case, but Mr. J. B. Jarvis (before alluded to) conceiving it would be situated so near Lock No. 3, as to retard the operation of locking through vessels, owing to the shortness of the level betwixt them; recommended it should be changed farther down than was first intended which was consequently done, and the same expenses and inconveniencies sustained as already explained, of Locks Nos. 1 and 2. Besides in cutting the Lock wings—according to stakes set down by the Engineer which in the first place were four feet

(No. 22.)

I the undersigned B. Gibson, certify that in the year 1832—being employed on the Chambly Canal, I was ordered by Mr. Hopkins the Engineer, to excavate lock-pit No. G, according to the stakes then laid down after excavating 300 yards of the same; I received orders from the Engineer to fill it up again and which was done at a considerable expense to the Contractors.

In the years 1831 and 1832, I was ordered to excavate the Canal in Section No. 11, lower division, which was done and approved of by the Engineer. I was, however, in 1833 directed by Mr. Hopkins to excavate the Canal about 12 inches deeper and re-level the bottom, the first being incorrect arising from a mistake of the Engineer's level.

When directed to build the protection wall near Louis Frechette's last winter, I was directed by the Assistant Engineer, Mr. Seymour, to build it to the proportion of one foot perpendicular to one horizontal. After a number of perches had been done, I was ordered to build it one foot and a half horizontal to one foot perpendicular, which was done and highly approved of by the Engineer, but I have since heard it has been rebuilt.

In building the aforesaid wall extra excavation and foundation was incurred by the stakes being placed about twelve feet too far within the line of Canal, and after proceeding a number of perches in this line the stakes were altered by the Engineer, and his assistant Mr. Seymour.

300 yards excavation of lock-pit,
240 yards of embankment.

Total, 540 yards at 5s.	£11 5 0
300 yards filling up lock-pit considered as 240 yards of embankment at 5s.	5 0 0

£16 5 0

Sworn before me this 24th }
December, 1834. }

D. DAVID, J. P. }

BENJAMIN GIBSON.

too short and cost together with sinking and re-levelling the bottom—in consequence of a mistake in his (the Engineer's level) 17l. 16s. 6d., as charged in the 46th and 47th items of said account of extra work, and comprises all the extra work, the contractors are aware of, in this Lock.

The 5th Lock was located considerably farther down on this section than the last—and was the most expensive to excavate—the lock-pit being sunk very deep through a vast quantity of slate stone—very difficult to raise, which was rendered still more costly in consequence of a great quantity of water arising from springs, which could only be kept out by incessant pumping, at which many men were engaged both by day and night. This is the last Lock finished, making in all one Guard Lock and five others.

In Locks Nos. 2, 3, and 4, 332 feet of cut stone was covered up by the embankment, under the same circumstances as in the Guard Lock—and together with carpenter's time making models for castings for Lock Gates, Iron Bridge, &c., and men's time employed otherwise in assisting Engineer, and with which the Contractors had nothing to do, amounts to 22l. 11s. 1d.—as charged in 53d, 54th, 56th, 57th, 58th, 59th, and 79th items of aforesaid account of extra work.

In 1832 the location of Lock No. 6 was staked out by the Engineer, and partly excavated but immediately filled up by his directions, which cost 11l. 5s., (see Benjamin Gibson's affidavit, No. 22, page 71,) charged in before mentioned account, items 88th and 89th, this lock pit has since been partly excavated at another place—but the work has proceeded no farther.

Under such circumstances have six of the Locks, including the Guard Lock been completed, at a cost and under circumstances ruinous to the extreme. Stone weights had likewise to be hung to each balance beam as in the case of the Guard Lock, also springs to keep the gates open and shut, and which cost 35l. 2s., as charged in 50th item—and part of the 52d and 65th.

It is however to be wished, the remaining Locks may be finished, and the Canal completed under more favourable circumstances, and without so many expensive alterations as have hitherto taken place. But from the statements already made with regard to the combined Locks, it may naturally be inferred that many and very costly alterations are yet contemplated, and which it may not be improper to notice. It will be observed, the Engineer states in his report that "*in gravel soil we should be willing to see upper Lock walls founded on piles instead of masonry, but in such ground as that at the basin it will not be safe to use them.*" In the report to the Commissioners made in July 1833, by Mr. J. B. Jarvis, an Engineer upon whose judgment every reliance may be placed, that extensive professional abilities and knowledge can warrant, occurs the following:—

"Mr. Hopkins (the Engineer of the Chambly Canal,) has made a plan for the general arrangement of the combined locks, but has not decided on a plan for securing the foundations. He informs me, the bed of the Chambly basin where the Locks are located is a soft clay, and there appears no doubt if the lower Lock walls will be in clay, the other two in the combination will have a clay foundation. My impression is, that this foundation will be best secured by driving piles of 10 to 14

inches in diameter, and of such length that a hammer of 1,000 pounds weight falling twenty-five feet, will not drive them at the finishing stroke more than two inches."

Such is the opinion of an Engineer of extensive practice, and made on the representation of Mr. Hopkins himself, as to the nature of the soil. Mr. Hopkins of course made his own report, under the same impression (with regard to the soil) when he stated in such ground, (soft clay) piles could not safely be used, he has since however changed his opinion in that respect, for he has caused the contractors to provide a larger quantity at much cost, (see Mr. Hopkin's letter, page 46,) but whether they will be used or not is a matter of doubt, as the soil where the combined Locks are located, instead of being *soft*, is *very hard* clay.

✶ The contractors having in the foregoing investigation contrasted the work really performed on the Chambly Canal with the original report—and pointed out the alterations that have taken place, as also the extra work that has been done—and upon which the demand of 20,558*l.* 16*s.* 5*d.* was made; they are satisfied it would be superfluous for them to make any farther comments. Still they may be permitted to state—that altho' no such statement as has been here laid before the public—accompanied their account to the Engineer. Yet, nevertheless it was verbally explained to that gentleman—and there can be no doubt be fully understood the nature of the demand, and was perfectly satisfied with the correctness of the account—as he particularly examined and corrected every item previous to granting the certificate formerly alluded to, for 20,000*l.* How he could therefore state "that he considered the sum demanded, was asked as a *favour* not as a *right*"—the contractors feel at a loss to explain, nor will they offer a single remark on the subject, but leave the reader to draw such conclusions from the facts stated—as circumstances warrant.

It may be farther remarked—that the contractors never were satisfied with the amount of the Engineer's monthly estimates, and still less with the unsatisfactory manner in which they were made out—and that such dissatisfaction may not appear to have been frivolous on the part of the contractors—they beg to call attention to the following affidavit—and afterwards to point out such errors and inconsistencies as are contained (in their opinion) in his monthly estimates—which the contractors do not with the object of bringing before the public any of the inconsistencies of the Engineer—but to exonerate themselves from the charge of having *without cause complained of the course adopted by Mr. Hopkins*—as appears to have been the Commissioner's opinions—expressed in the latter part of the 11th clause in their second report to the Legislature.—(inserted page 81.)

"I do hereby certify that I have been employed by the Messrs. Andres, contractors for the Chambly Canal in the year 1834, for the purpose of revising and transcribing the estimates of Mr. Hopkins, the Engineer of the Canal, since its first commencement up to the month of July 1834—and also in superintending the excavation of some of the Locks, and the making of a part of the tow-path; and that in each of these departments I have detected the most glaring errors—errors indeed unpardonable in an Engineer, and pregnant with the most ruinous consequences to the interest of the Contractors. In observing these errors, I could not suppress my indignation; consequently communicated the

results of my observation to Mr. Samuel Andres, one of the contractors, who immediately brought Mr. Hopkins forward in order, if possible, to explain the cause, being convinced of their existence, and after some meditation, he contented himself by remarking that they were of *little or no importance*—and that finally every thing would be right or words to that effect—and that Mr. Andres could not suffer by them; to which remarks I replied, that although he should finally receive the amount of his contract he should nevertheless suffer the loss of the interest of any sums of money which might become due, and which he would be prevented from receiving until the completion of the Canal, on which principle I believe the contractors must have sustained serious losses.

In the excavation of the Locks which I superintended, and in the making of the part of the tow-path alluded to, many losses were sustained by the contractors in consequence of the negligence or ignorance of the Engineer, and which I, in remarks in my journal charged to account, of the systematic errors of the Engineer, which errors Mr. Andres did not at that time wish to expose, and requested me to keep as secret as possible. Nor am I now induced to make this declaration by any other motive than the love of equity and in hopes of its being useful to the individuals who must have been long suffering by these and similar errors.

T. M. ANSBROW, L. M., first battalion
of Kamouraska Militia.

Montreal—Sworn before me, this }
18th day of August, 1836. }
DANIEL ARNOLDI, J. P. }

ERRORS AND INCONSISTENCIES TO BE FOUND IN THE MONTHLY ESTIMATES OF WORK DONE ON THE CHAMBLY CANAL.

Remarks on Engineer's Estimates.

No. 1.—To the 14th December, 1831.—1st line, 10s. too little in transferring dollars to pounds, and 10s. too much in the addition.

No. 2—1st March, 1832.

2d line—\$10 too much in calculation. In this estimate, 125*l.* for “opening and covering at quarry”—as also 100*l.* for “tools and implements,” both allowed in the last estimate, *are struck out*—the prices of the stones are raised—and the embankment on section No. 9, is reduced 7550 cubic yards.

No. 3—to 1st April, 1832.

In this estimate the manner of estimating the stones has been changed, and the prices allowed for embankment and excavation have in many instances been increased a little.

No. 4—to 1st June, 1832.

1st line, 80 cents. too little in calculation.

2d, do. 62 do. do.

Section No. 4—first line—\$1 too little in do.

.. No. 1—embankment reduced 2530 cubic yards.

.. No. 4—do. do. 5600 do.

No. 5—to 1st July, 1832.

Stones cut at St. Therese, reduced in price 5 cents per foot.

Section No. 9—embankment reduced 4104 cubic yards.

Blasting rock is increased in price from 50 to 100 cents. per yard.

No. 6—to 1st August, 1832.

Line 1st—4s. too little in calculation.

No. 7—to the 1st September, 1832.

5500 feet of stone reduced 4 cents. per foot.

7180 do. do. 2 do. do.

6000 do. of timber, a \$35—struck out altogether.

4000 do. do. reduced in price \$10 per 1000 feet, and the excavation and embankment on the different sections, are increased in price to 1 cent per yard.

No. 8—to 1st October, 1832.

Line 2d—Stones at St. Johns reduced in price 2 cents. per foot.

Do. 4th—do. at St. Therese do. do. 1 do. do.

600 feet do. at do. previously valued at 37l. 10s., struck out

Section No. 1, L. D.—is decreased in excavation 3144 cubic yards.

.. 8 .. do. in do. 890 do.

No. 9—to 1st November, 1832.

£7 10 0 too little is deducted for former payments.

4th line—too little, in calculation, 37 cents.

2000 feet of timber, formerly valued at 25l. is here thrown out—and 4000 feet is increased \$10 per 1000 feet—which was its original value per Estimate No. 6.

Section No. 3—200 perches rock at \$1 left out.

£12 10 0 for removing stones in rapids—struck out.

No. 10—to 1st December, 1832.

Section No. 4—1500 perches wall reduced 1s. 3d. per perch.

£7 9s. 11d. too little is deducted for former payments.

No. 11—to 1st January, 1833.

£12 10s. 0d., for removing stones in rapids, struck out in No. 9—is here again inserted.

Section No. 3—L. D.—200 perches rock left out in No. 9—is here again inserted.

No. 12—to 1st February, 1833.

Section No. 1, L. D.—40l. too little in transferring dollars to pounds.

.. 3, 10l. do. do.

No. 13—to 1st March, 1833.

50l. too much in the addition of page 1, of this estimate.

43l. 15s. for 36 balance beams in last estimate, is struck out in this one.

No. 14—to 1st April, 1833.

The balance beams struck out last estimate are again put into this one.

Section No. 3, L. D.—price of excavation raised 1 cent. per yard.

.. .. 8, \$3 too little in calculation of excavation.

No. 15—to 1st May, 1833.

Section No. 4—Reduced in quantity of excavation 2620 cubic yards, but raised in price 1 cent per yard.

Section No. 6—Excavation reduced 1347 cubic yards,—\$3 error on section 8 in last estimate, corrected in this one.

No. 16—to 1st June, 1833.

No errors.

No. 17—to 1st July, 1833.

Fifty-two cents. too little in calculation of hemlock timber.

Sixty cents too little in calculation of pine timber.
Culvert No. 2, lessened in value 5d.

No. 18—to 1st August, 1833.

Culvert No. 2 is again lessened in value 4s.

Do. . . 3 is lessened in do. 1s.

In the excavation of dyke, the value is reduced 1 cent per yard—making a decrease of 43l. 5s.

It will be seen by last estimate that the work done on sections Nos. 1, 2, and 3, amounts to \$11,110—whereas in the present estimate only \$7,690 is allowed, and the full value of those sections when finished is put at \$8,340, to which is added afterwards \$300 for rock.

As in sections 1, 2, and 3,—so in sections 5, 6, 7, 8, and 9—which are now joined together and said to be valued when finished, for \$11,312—whereas by last estimate \$13,324 was allowed, which sum is reduced in the present to \$11,462—to which is added \$300 for rock on section No. 9.

Section No. 10.—Both excavation and embankment are here reduced 1 cent per yard—and in the excavation too little is even then calculated by 1 dollar and 30 cents.

Section No. 11—has appeared in every estimate since No. 9, to contain 16,200 yards excavation, and 6,650 yards embankment, valued at 604l. 10s.—in the present estimate however, the entire work has been reduced to 10,000 yards excavation, valued at 275l.—making a deduction of 329l. 10s.

No. 19—to 1st September, 1833.

Thirty-eight feet hemlock timber struck out, and one cent per foot added in price.

Four cents per foot added to the pine timber.

Planks for Locks reduced in value 11l. 5s.

Stone Boats reduced in value 13l.

Culvert No. 1, reduced in value 2l. 10s.

Upper Division—The stone quarried in this division, is reduced 300 perches.

The excavation has been reduced 8,500 cubic yards.

Eighty cents too little in calculation of embankment.

£75, allowed in last estimate for rock on section No. 9—is here struck out.

In this estimate the drawback is reduced from 15 to 10 per cent.—and notwithstanding this alone, makes a difference of 1012l. 1s. 3d., the estimate only amounts to 1834l. 7s. 6d.

No. 20—to 1st October, 1833.

One pound too little is deducted out of this estimate on account of former payments. It is quite impossible to compare this estimate with the preceding one, as the different items are so amalgamated that not a vestige of similarity betwixt them remains.

No. 21—to 1st November, 1833.

In this estimate the value of the hemlock timber is increased one cent per foot more than in last.

Upper division—Stone on slope wall reduced 223 perches, formerly valued at 83l. 10s.

No. 22—to 1st December, 1833.

This estimate is made up in round numbers and no particulars given—it is therefore impossible to detect any errors in it.

No. 23—to 1st February, 1834.

No errors.

No. 24—to 1st March, 1834.

Ditches on section 10 formerly valued at 12*l.* 10*s.*, struck out of this estimate. 6*s.* 7*d.* too little deducted for former payments.

No. 25—to 1st April, 1834.

No errors.

No. 26—to 1st May, 1834.

£369 10*s.* allowed last estimate for preparing Lock bottoms, is reduced in this estimate to 300*l.*

Excavation in pit of Guard Lock, reduced in quantity 500 cubic yards, and increased in price 2 cents per yard—this alteration lessens the value 12*l.* 10*s.*

No. 27—to 1st June, 1834.

Building and getting backing for Lock No. 1, reduced 858*l.* 15*s.* 20,000 feet hemlock timber at 6 cents, is said to amount to 66*l.*, whereas it should be 300*l.*

From the manner in which the Engineer has calculated the work and materials for Locks, it is impossible to compare them item by item with last month's estimate—however taking the whole materials, such as timber, cement, mortar, &c., together; last month they amounted to 2,073*l.* 10*s.*, and this month only 1,900*l.*, a matter quite impossible!!! Many other errors are likewise contained in this estimate; as for mortar alone an increase of 520*l.* is shown, and the contractors never received lime approaching to that amount in any single month.—Boats for conveying stones are also increased 342*l.* 10*s.*, a sum altogether too large. £530 is allowed for stone boats, which sum was allowed for bridges in last estimate, but is here struck out.

Temporary bridges allowed last estimate 37*l.* 10*s.*, is struck out of this one.

First page added 430*l.* too little.

Second do. do. 569*l.* 10*s.*, too much.

From the multiplicity of extensive errors in this estimate—it would be difficult to say how the Engineer got it to leave such a balance as he desired—but certain it is the amount to be paid the Contractors—**WAS FIXED ON BEFORE THE ESTIMATE WAS MADE OUT,** and in fact fully establishes the estimate to be **GUESS WORK!!!**

No. 28—to 1st July, 1834.

Machinery about Locks reduced 50*l.*

Boats for conveying stones do. 280*l.*

In former estimates sections 5, 6, 7, 8, and 9 are set down when finished at \$11,812 in this—they are only stated to be \$11,662—deduction therefore 37*l.* 10*s.*

Section 10 is heretofore estimated 49*l.* more than in the present.

No. 29—to 1st August, 1834.

£210 allowed last estimate for excavation of Lock pits, is struck out of this one.

No. 30—to 1st September, 1834.

£50 allowed for embanking Lock No. 1, is here omitted.

£250, too little in changing dollars into pounds—first line.

£7 10s. too little in calculation of pine timber.

£19 is here allowed for ditch at culvert, No. 1.

No. 31—to 1st October, 1834.

67l. 10s. allowed in last estimate for excavation in basin, is included in section No. 1, upper division, this estimate.

Boats for conveying stones reduced 50l.

Machinery about Locks do, 50l.

No. 32—to 1st November, 1834.

\$300, too little, in calculation of lime on hands.

\$100, error in subtraction of same.

\$100, error in addition of the deductions on Locks.

10s. too little in reducing dollars into pounds in the item of earth work.

No. 33—to 1st December, 1833.

£270 mistake in subtracting what it will cost to finish the bridges, &c., from the full amount, this error is against the Contractors!

£858 11s. 9d. too much is deducted this month for former payments.

No. 34—to 1st January, 1835.

£400 for boats and machinery allowed in last estimate, struck out.

No. 35—to 16th February, 1835.

Ten shillings less allowed for bridges and culverts.

No. 36—to 1st. April, 1835.

Last estimate \$1600 was stated to be sufficient to finish section No. 1, upper division.—In this estimate the cost is laid at \$3,260.—Have the banks washed away \$1,660?—or has the Engineer increased the work by altering the plan—at this time very nearly completed?

No. 37—to 1st May, 1835.

Five shillings too little deducted for former payments.

\$200 added to cost of finishing—being for bushing the bank.

No. 38—to 1st June, 1835.

\$100 too much in addition of extra work.

No. 39—to 1st July, 1835.

No errors.

No. 40—to 1st August, 1835,

£100 too much deducted for former payments.

No. 41—to 1st September, 1835.

£3, too little in changing dollars into pounds in “required to finish” part of this estimate.

Work done on Locks reduced 354l. 5s.

\$160 more to finish section No. 1, upper division, than last estimate.

It may be necessary and proper to state, that the manner of making out the Estimates, was by valuing every month—the entire work done on the Canal, from which former payments were deducted, and the balance formed the months' expenditure. On this principle it was quite

impossible any diminution in the work done, could take place, unless errors had been previously committed—for instance—in every estimate from 1st October 1832, to 1st July, 1833, Mr. Hopkins allows that section No. 11, lower division, contains 16,200 yards excavation and 6650 yards embankment, but in the estimate of the 1st July 1833, the entire section is said to contain only 10,000 yards, and in that of the 1st October 1833, is again increased to 13,000 yards, *although no work had been done on that section during the intermediate time.* This section of the Canal was sublet to Benjamin Gibson, to whom the Contractors were bound to pay a certain price per yard—ACCORDING TO THE ESTIMATES OF THE ENGINEER; and the Engineer having estimated the work at 22,850 yards, and afterwards reduced it to 13,000—caused of course, A TOTAL LOSS TO THE CONTRACTORS OF 9,850 YARDS, amounting to about 275*l.* This is but one instance out of AN IMMENSE NUMBER—where the Engineer has reduced the embankment and excavation in the different sections of the Canal; besides numerous instances of his having valued work at a certain amount one month—and the next reduce the identical same work, to less than one-half—or perhaps LEAVE IT OUT OF THE ESTIMATE ALTOGETHER—of which the reader will find many instances in the foregoing remarks on the estimates. That the Engineer might mistake the true value of a piece of work—and afterwards see the necessity to reduce the price—might occur on a rare occasion, or under peculiar circumstances—but that such should be an almost daily occurrence, is certainly to be wondered at—and to strike out altogether, work that had been previously estimated is a DOWNRIGHT ABSURDITY; for what would induce any man to include in his estimate work, that never had been performed. That he might neglect work that had been done—IS NOT AT ALL UNLIKELY but it is an impossibility the former could occur by mistake. With regard to the reduction on the embankment and excavation, the contractors would beg to observe—that neither could decrease, and that both were made up—NOT BY GUESS, but by MEASUREMENT AND CALCULATION—at least so says Mr. Hopkins in his letter to the Committee of the House of Assembly, and further adds—“that his measurements and calculations were found both by John B. Jervis and Timothy Jervis—chosen by the Contractors themselves, to be correct.” Now it may be asked, how it was possible for the Messrs. Jervis to find such calculations as has been before cited to BE CORRECT?—they must have discovered them to be incorrect either in the first or last instances had they measured them, but this they did not do—and J. B. Jarvis even states in his report THAT MR. HOPKINS HAS FURNISHED CALCULATIONS FOR THE PRINCIPAL PART OF THE WORK, WHICH WITH THE OBSERVATIONS I HAVE BEEN ABLE TO MAKE, has led me to the opinion, &c.” Yes—THE CALCULATIONS THAT MR. HOPKINS FURNISHED, NOT THE MEASUREMENTS MR. JERVIS MADE, led to the opinion—that Mr. Hopkins was correct—and how could it be otherwise, for it is more likely the mistakes were made in taking the measurements, than in making up the calculations, and Mr. Jervis having only performed the latter part—never could detect the mistakes that had been committed in the former,

otherwise neither of the Messrs. Jervis would have stated that documents abounding in such *errors and inconsistencies were correct*, which testimony Mr. Hopkins appears by his letter to the Committee, desirous to turn to his own advantage, a course the contractors neither wish, nor can deprive him of taking—but at the same time, they think it but justice to add the circumstances under which the report was made—*although Mr. Hopkins has been judicious enough to observe silence on that part of the subject.* Mr. Hopkins is also in error by stating “the contractors brought both the Messrs. Jervis on the works”—for they only brought T. Jervis—the other was employed by the Commissioners; but this is a matter of no consequence!

In consequence of the errors as already stated—as also the numerous others that occurred as before particularized, many of them in even the simple operations of *addition and subtraction*, was it to be wondered at—that the Contractors should be apprehensive of mistakes in the most intricate parts of the work—and that being unable to obtain any satisfaction from the Engineer, they should complain to the Commissioners, as was the case shortly after the commencement of the work, as acknowledged by the Commissioners in the 10th clause of their second report to the Legislature; but the Commissioners add “that in their opinion the complaints of the Contractors are frivolous and unfounded,” and ground their belief on the *opinion of Mr. Jervis*, who be it remembered, *never used chain or instrument on the work*, but gave his opinion as he himself states—FROM THE CALCULATION FURNISHED BY MR. HOPKINS.

Should the contractors be considered too presumptuous in laying these facts before the public, they plead in mitigation of the offence, their anxious desire to place the entire matters relative to the Canal, *in as clear and perspicuous a manner as possible—to simply state facts* and accompany such facts, *with the evidence upon which they rest.*—Farther they would not have presumed to trespass; but when they considered the immense number of documents, and the manner in which these documents were interwoven with each other—the contractors considered it would be a great assistance to those persons who honored the work with a perusal—to accompany the several documents with such statements as would lead them immediately to the different facts. They have however to lay before them such extracts from the Commissioner’s several reports to the Legislature, as affect the Contractors—or to which they have any occasion to refer.

“*Extracts from the Reports of the Commissioners of the Chamby Canal to the Legislature.*”

FROM 2d REPORT.

Clause 1st. That the work has advanced during the past season as rapidly as could under all circumstances have been reasonably expected, notwithstanding the extraordinary embarrassments, and unlooked for difficulties that have been encountered.

2d Clause. That portion of the Canal line located between the Island of St. Thérèse and St. Johns, to which the efforts of the Contractors have been chiefly directed during the last summer, is generally below the level of the river Richelieu, & can only be excavated by the aid of temporary dams & embankments, erected for the purpose of keeping out the water to enable them to work, these were frequently rendered unavailing by the excessive & perpetual rains which in spite of every precaution that could be devised, continually inundated the work, and imposed the necessity of the almost incessant use of the pumps, greatly increasing the labour of throwing out the wet clay and quick-sand, of which the bottom is there composed. These difficulties were only partially surmounted, and that was effected by the greatest labour and perseverance on the part of the Contractors, indeed the obstacles that have presented themselves on this section of the canal are much more formidable than were anticipated, and must eventually lead to an increased expenditure, occasioned in a great measure by the unfavorable season.

6th Clause. Great additional labour and expense has been incurred in the execution of this part of the work, from the same unavoidable cause that has produced such injurious effects on the upper part of the line.

8th Clause. The protection wall and embankment in Section No. 4, was an arduous undertaking, but it has been completed, and that as well as the dams, culverts, and other works of a similar nature, were not at all injured by the admission of water into the Canal, which is a satisfactory test of the solidity of their construction.

11th Clause. The Contractors also express much dissatisfaction with respect to the conduct of our Engineer, who, they assert, has not estimated the work correctly, and that this is the cause of their present difficulties. In order to obtain relief they have stated their intention of employing another Engineer, for the purpose of verifying the measurement and calculations already made, but as these assertions have already been several times carefully examined and revised, the Commissioners infer that the complaints of the Contractors are frivolous and unfounded, and they are the more confirmed in this opinion, by the report of J. B. Jervis, Esq., an eminent civil Engineer, who was employed in the month of July, last, with the sanction of His Excellency, the Governor-in-Chief, to inspect and examine the state of the work, and to suggest such alterations and improvements in the plans as he might consider necessary. His views of the amount of the work performed at the time, corroborated the statements of Mr. Hopkins, the Engineer employed by the Commissioners.

13th Clause. The canal has in several places interfered with the public highways to a considerable extent making alterations absolutely necessary, and as the soil is unfavourable for roads, some expense has already been incurred in effecting these objects, and a further sum will still be required to complete them; these, with other items of expense not embraced in the agreement with the Contractors, must be paid for as extra work, but the exact amount cannot at present be ascertained.

14th Clause. Notwithstanding the numerous and unforeseen disasters, which have befallen us in the prosecution of this work, occasioned by disease during the past summer, and by the elements during this year,

which no human precaution could have foreseen or prevented, the Commissioners assert without fear of contradiction, that a greater quantity of work has never been performed in any part of America, for less money than has been expended on the Chambly Canal, and they still entertain hopes that the whole work may be completed for sixty thousand pounds, the lowest sum contemplated by the act.

FROM 3d REPORT.

Clause 1st. That the work has been prosecuted with great vigour during the past summer, and although it was retarded for some time by the prevailing epidemic, yet it has advanced with as much expedition, as from the limited funds placed at the disposal of the Commissioners could have been reasonably expected considering the obstacles that have been met with on the upper section of the canal, slides having frequently occurred causing thereby great increased labour and difficulties which have only been overcome by the perseverance and exertions of the Contractors and has been effected at a much heavier expense than was anticipated. Notwithstanding the unfinished state of the work, the navigation of nearly the whole line of the Canal has continued with little interruption during the past summer, all the heavy materials required in its construction having been transported upon it, and with adequate funds the Commissioners are sanguine in their belief that the whole undertaking will be completed in the course of next summer.

Clause 2d. In order to render the entrances to the Canal accessible and convenient at St. Johns and Chambly, it will be absolutely necessary to construct a wharf at both these points, the last of which it appears by the estimate of the Engineer will not exceed two thousand pounds. These items must be considered extras, as they are not embraced in the agreement with the Contractors.

Clause 3d. The guard-lock erected at St. Johns is a very substantial well executed piece of workmanship, and has been in use for more than three months. It has been found necessary to construct a very heavy and expensive embankment from that lock to the foot of the rapids, which is protected on the outside by a substantial slope wall. Laborers are now employed in strengthening and raising the banks to their proper height from the foot of the rapids as far as Col. Marchand's farm. The excavation of that part of the line has been very expensive owing to the nature of the soil, being in many places composed of quick-sand and rock. The bed of the river is also considerably lower than the bottom of the Canal which has greatly increased the difficulties.

Clause 4th. The embankment across the channel at St. Thérèse having stood firm two winters without sustaining any injury from the ice or spring floods, little doubt can now be entertained of the stability of their construction. From their place to the commencement of the 7th locks, nine in number the Canal is finished, with the exception of a little rock excavation, and the formation of a proper slope to the high bank on section No. 4.

Clause 5th. It is intended to take down the first or Macrae Lock and to rebuild it on the extended scale of one hundred and twenty feet in length, and twenty-four feet in breadth, this being the dimensions on which all the others have been constructed. Four of them are now completed, except the hanging of three pair of gates, another is also commenced and the remainder will be finished during next summer unless the work should be retarded by untoward events beyond the control of the Commissioners. A large quantity of materials has been provided by the Contractors which will enable them to commence their operations as early in the spring as weather will permit.

All the culverts are completed. Three of them are built of stone and one of wood. That which is located on the government ground near the Chambly Basin, is a work of considerable magnitude, and has been constructed with the greatest precaution. The bridges are also in a state of forwardness.

Clause 7th. The monthly estimates under which the contractors can legally obtain payment have hitherto been predicated upon the agreement made with them dated the 5th September, 1831, for the consideration of forty-six thousand two hundred and eighteen pounds currency, and that sum is found quite inadequate to cover the actual expenditure. It is now clearly proved that the work was taken far too low, and that it cannot be completed for that price; indeed, it must have stopped before now if indulgence had not been granted to the Contractors. When the Engineer, Mr. Hopkins, was first employed to make the necessary surveys, plans, &c., for the construction of this Canal it appeared from his estimate that the contemplated work would cost upwards of sixty-two thousand pounds currency without including the allowance for the extension of the locks subsequently adopted, and the unsuspected and increased demands claimed for lands, fences, damages and other extras connected with the undertaking and it is now distinctly proved that it cannot be completed for a less sum than that above stated.

Clause 8th. The appropriations actually made will not cover the expenses of the next year, and it is quite certain that a further appropriation of at least ten thousand pounds will be required to complete the work, there being only about ten thousand seven hundred and fifty pounds of the former unexpended, including that for two thousand four hundred pounds voted during the last session of the legislature, which was reserved for His Majesty's sanction. It now remains to be decided whether it will be more advantageous for the public to support the present Contractors to such an extent as will enable them to complete the work or that the Commissioners should take the management of it into their own hands. Upon this point they do not feel themselves authorised to decide and they respectfully pray that the legislature will convey to them their instructions thereon.

Clause 9th. The Commissioners however feel themselves called upon to state, that the individuals at present charged with the execution of the work undertook the management of it under the most unfavorable circumstances after it had been abandoned by their former associates, ever since that time they have uniformly manifested the greatest zeal, fidelity, and

energy in the prosecution of the undertaking & it is believed that no other individuals with the same limited means at their disposal, could have effected more than the present contractors have done.

Clause 10th. The plan adopted for making the Canal and its different structures will increase its aggregate cost beyond the sum for which a work less substantial might have been constructed but it is nevertheless in the opinion of the Commissioners the cheapest and most useful. Experience has satisfactorily shown that economy in the construction of a public work does not consist in the adoption of plans based on the idea of making low estimates. The expenses of repairing and re-building locks, culverts, bridges and waste weirs, generally exceed the first cost at least one hundred per cent, that plan, therefore, that will most effectually prevent the occurrence of these contingencies is no doubt the best.

A considerable sum of money has been expended in forming the road in such places as it was found necessary to alter it, and although the distance has been shortened, and in other respects it has been much improved yet the inspector of highways refuses to accept it under the pretext that it is not made in the shape prescribed by law, and that Legislative enactments may be required to obviate these and other frivolous and vexatious objections now raised.

FROM 4th REPORT.

Clause 5th. The period at which the undertaking should have been completed has now elapsed, and the inability of the Contractors to finish it at the stipulated cost is clearly demonstrated, owing partly to the low price at which the contract was originally taken, as well as the unfavorable seasons, disease and other untoward events, all of which have concurred to baffle their efforts in the progress of the work.

↪ *Clause 7th.* Although the Contractors have failed in completing their undertaking for the price agreed upon, yet it is believed that the money they have received has been faithfully expended, and that no other individuals would have effected more, with the same means than they have done, and it is but justice to add, that they have otherwise always manifested great zeal and perseverance in the prosecution of the work.

The Contractors beg to direct the attention of the reader to the foregoing reports of the commissioners, from which it appears *the work has been conducted to the SATISFACTION* of these gentlemen, as also to the **ENTIRE SATISFACTION** of the Engineer, as stated in his certificate already inserted.

It may be asked that when such errors and inconsistencies as the Contractors have shewn to exist in the Engineer took place in the early part of the works, why complaints were not sooner made? That such was done will appear from the Commissioners second report, clause 11th. The Contractors were alone influenced in desisting to press such complaints more forcibly before the commissioners, by a belief that they would be redressed by the Engineer himself, who always led the Contractors to believe such would be done, and it was not until every prospec

vanished, they could bring themselves to lay the subject before any other than the individual *empowered under the contract* to arrange such demands and the engineer having at last done so, by his certificate for £20,000, the Contractors believed they would not be compelled to expose the matter farther; but to which they have been reluctantly forced by the Engineer's statement to the committee of the House of Assembly, attempting to explain away the certificate he had given. The Contractors having thus laid before the reader the amount of their claims for extra work, and explained *by documents* the manner such claims are substantiated, beg to lay before the reader Mr. J. B. Jervis report, to which Mr. Hopkins alludes in his letter to the committee, and to which the Commissioners have reference in the 10th clause of their second report to the Legislature.

Mr. J. B. Jervis Report to the Commissioners of the Chambly Canal.

GENTLEMEN:

Agreeable to previous arrangement I have examined the line of the Chambly Canal and inspected the works of the same in their present state of advancement.

There are a few points where I think some improvement of the line could have been made; but generally, the line is judiciously located, and at those points where I would have recommended some variations there is nothing of a character to effect the general convenience or usefulness of the contemplated navigation.

Locks Nos. 3, and 4 have a short pond between them, which it would be advisable to enlarge. The discharge of a lock full of water will raise this pond on the surface about one foot, and the drawing off a lock full would of course diffuse it the same. The fluctuation is greater than will be convenient for the navigation the pond or basin may be made extra width for two-thirds its length without serious expense. It is probable No. 3 will require to be carried back some 50 feet to bring its foundation uniformly on rock; and No. 4 may be carried forward 50 feet without much extra work, perhaps it would be better to extend it to 80 feet so as give room in the embankments to take the surplus materials from the basin; this must be decided by measurement and calculation. A rise and fall of four inches by the operations of filling and emptying the locks is as much as is usually allowed, and I should recommend it to be so enlarged as not to allow more than six inches which if the locks are made so as to admit a flush plank on the tops of the lock gates of 4 inches' will answer the purpose. The extra expense to enlarge this pond will be from \$100 to \$150, a small sum in my estimation, compared with the convenience of an ample pond. In the construction of the towing path along the Island of St. Thérèse, the height above the surface of the water should not exceed seven feet, and generally I think six feet will be the most suitable maximum height. I conversed with Mr. Hopkins, your engineer, in relation to back drains and sluices, that will be required on this towing path, and also generally on the Canal, to guard against injury from land floods. He appeared to have this work in contemplation; it has indeed

been commenced, and I do not think it necessary for me to say more on this point than to remark simply on the importance of having this part of the work well attended to. It is a small item, but if neglected or imperfectly done much inconvenience to the navigation and expense of repair may be produced by heavy showers of rain, throwing large deposits of mud into the bottom of the Canal. There does not appear that any provision has been made to protect that part of the embankment on section No. 1 & 2, which is exposed to the river. The wind will drive the water with too much force to be resisted by earth of so tender a character as that of which this bank is formed. If stone for a slope wall cannot be conveniently obtained, I should recommend a protection of facies of small brush well staked down. Materials for this are at hand if well done I believe will answer the purpose. "The place for locks in its general features, I approve, but consider some variations necessary. The most important is in the thickness of walls which I think too light. I would recommend the main walls to be so increased as to make an average thickness (exclusive of buttresses which I would leave as they are) of five and a half feet from bottom to top; not exceeding six feet at bottom and so arranged that the upper section of 4 feet in height shall have a level or slope on the back side of 2 inches to 1 foot rise and be four feet wide on the top. The object of the slope near the top is to allow the earth when it expands by freezing to rise up from the wall which will reduce its effect in a horizontal direction.

The additional thickness proposed will require 140 perches (of 25 feet) masonry. As no extra face work is required this may be estimated at \$2 per perch or £70 per lock. The platform at the head of the lock to secure against the passage of water to the foundation, should be put on a level with the foundation, or be a part of it extended up above the head of the walls, 6 or 7 feet and well lined with boards and joined well with wire sheeting. The earth embankment for three or four rods from the foot of the Locks will require a slope wall to protect the face against the current that will flow from the paddle gates when the locks are emptied. If this is not done the face of the banks will soon be cut away, and the earth deposited in the form of a bar at some 50 to a 100 feet below. This will require about 150 yards (cubic) of wall for each lock. I have recommended some variation in the iron work of the gates which I have fully explained to your Engineer. It will not enhance the cost. The plan of the paddle gates I think too large; they are thirty inches square; but I would reduce them to 25 inches square. The large size will be more difficult to manage under a heavy head and more liable to break.

The specifications for Locks are in general very good, and I would recommend particular attention to the masonry. Too much care and attention cannot be bestowed on this part of the work,—I am of the opinion all the stone in every course should be well bedded in mortar, and only the interior vertical joints depend on grout, and the grouting be finished on every course before any stones are laid on the next. In laying the heavy face stone, the mortar is often removed so as to leave some portion of the bed hollow; great care should be taken to guard against this which is a serious evil in building Locks. The face stone should be

imbedded in hydrolic cement, but the end joints need not have more than six inches from the face back laid in hydrolic cement. The pier walls of the bridge will require some strong protection from their exposure to be knocked down by vessels navigating the Canal. I would recommend a timber pier placed at each end, projecting in front (an inch perhaps) so as effectually to guard the pier, and to be 7 feet wide and 12 feet long on the bottom, and 5 feet on the top—and to rise 1 foot above the top water line. The outer ends of the pier to have a slope of one to one, and next the pier to be perpendicular so as to stand close against it. The pier to be filled with stone. They will each require about 250 cubic feet of timber. The plan of a draw, for the road bridges is similar in its general features to draw-bridge, in successful operation. There are a few points which I have advised Mr. Hopkins to alter, the swivel bridges for the accommodation of farmers will I think work very well; they are narrow in proportion to their length, and will require the foundation that support the pivots and rollers to be firmly made, and the balancing to be uniformly laid on so as to give the motion of the bridge as much steadiness as practicable,—otherwise it will be liable to be overturned into the Canal. Mr. Hopkins has made a plan for the general arrangement of the combined locks, but has not decided on the plan of securing the foundation. He informs me the bed of the Chambly basin where the Locks are located is a soft clay, and there appears no doubt if the lower Lock will be on clay the other two in the combination will also have a clay foundation. My impression is, that this foundation will be best secured by driving piles of 10 to 14 inches in diameter and of such length that a hammer of 1,000 pounds weight falling 25 feet, will not drive them at the finishing stroke more than one or two inches; the first rows will drive them much easier than the last. As I have a plan maturing for combined Locks, on the Chenango Canal, I will defer saying more on this point at present, and as soon as I have the plan settled I will communicate any hints that I may think useful in the case under consideration.

In my examination I have had in view the character of the work done and that to be done in order to form some general opinion on the question, whether the contract price will be adequate to cover the expense of the same. Mr. Hopkins has furnished calculations for the principal part of the work which with the observations I have been able to make has led me to the opinion that it is probable with prudent management, the work may be completed for the contract price; but I believe the contractors will not be able to make much profit—and if in the further prosecution of the work any serious contingent unforeseen difficulties are found, it may be impossible for them to complete their undertaking at the contract price. The interest of the work in regard to its cost would suffer if the present Contractors should abandon it. They have their arrangements made and can prosecute the work with better advantage than a new set. Should any circumstance lead them to abandon the work, I do not believe it could be re-let for the same price. Persons that might be induced to make new offers will be likely from the circumstance of abandonment to believe there are more difficulties than are apparent, and will therefore demand a larger price than they would do if the work had not been commenced. Should the work require to be re-let it will probably be the best

method to let the Locks in a separate contract, also the work (excepting the Guard Lock) above the head of the Island of St. Therese in one contract—the remainder may be let in part according to its situation and the circumstances that may occur. This arrangement will require much more attention in the superintendance.

If the present contractors are disposed to prosecute their contract in a faithful manner, I am of the opinion it will be for the interest of the work to extend to them all the facilities consistent with existing circumstances. To re-let could hardly fail to enhance the cost, I would suggest the propriety of reducing the discount on the estimates from 15 to 10 per cent., the condition of the work done is such that I should consider 10 per cent. deduction from the estimates is adequate security against any error that may occur in the estimate, and to cover the expense that may be incurred to remedy any imperfect work, I mention this from the impression that it may be advisable to extend to the contractors, all the facilities the condition of the work will warrant.

Respectfully submitted by your most obedient servant,
JOHN B. JERVIS,
Civil Engineer.

Chambly, 15th July, 1833.

The contractors beg to direct the particular attention of the reader to the foregoing reports, and if any doubts were entertained of the works of the canal having been most judiciously conducted; of the money entrusted to the contractors having been faithfully expended; of the increase of the works, and that such increase was extra; or if the difficulties under which the contractors laboured, from the numerous causes already explained. They hope such testimony as has been given by the commissioners in their reports, will fully do away with the doubts that may have existed, as also satisfy the reader of the correctness of the Engineer's statement "*that the contractors have exerted themselves to carry on the work in the best possible manner.*" The contractors further beg leave to observe, that none of the unforeseen causes which operated to their disadvantage, have been taken into account by the Engineer, in his certificate for £20,000, but only such as were under the contract *extra*, although the contractors suffered much by the former, and particularly the cholera, which has been corroborated by the commissioners in their reports, and to which testimony the contractors would beg to add the following certificates, viz:

I hereby certify that I was a member of the board of health for the parish of Chambly during the prevalence of the cholera in the summer of 1832, and that twelve hundred cases of cholera were reported to the board, one hundred and fifty of which proved fatal. That during five weeks of that period there were only five nights in which I was not called to visit the sick, and that a large proportion of my time was passed among the Irish laborers on the Canal. That to my knowledge there was a great panic among the said laborers, so great as to cause frequent changes among them, and to arrest the progress of the work on the canal which

must have proved of great injury to the contractors. And I further certify that during the summer of eighteen hundred and thirty-four the disease although it did not produce so much excitement, from having appeared before, was still more fatal than in 1832, and must by its serious effects on the canal have been a drawback upon the advancement of the enterprise. The rains with which we were visited too, in 1833 and 1835 were unusually severe and destructive, and I have no doubt operated to the serious impediment of the work.

P. M. MIGNAULT.
Priest.

Chambly, August 16th, 1836.

St. Johns, 6th August, 1836.

I certify that in the year 1832, being then assistant to the late Doctor Robert McG. Walmsley, I attended the labourers on the greater part of the canal, between Chambly and St. Johns, that in the course of that summer many persons were attacked with the cholera morbus, of which the twentieth part fell victims to that disease.

In 1834, Doctor Wilson and myself attended the labourers on the whole line of canal from the month of May to the month of December. The labourers on the principal part of the canal were to the number of four to five hundred, in consequence the sick were very numerous, amongst whom the cholera morbus made great ravages from the 13th of July to the month of November in said year; and I can farther state that the number of cholera patients were greater on the canal than in the country, and that all can attest and maintain as well as myself.

That disease in, 1834 as well as in 1832, caused great consternation amongst the labourers and must have retarded the works upon the canal particularly.

J. J. DAVIGNON. *M. D.*

Chambly, 20th July, 1836.

In the year 1834, when the cholera visited this province a second time, I was engaged attending in a medical capacity the labourers on the Chambly canal, particularly the northern division. On that part of the works where there are upwards of two hundred workmen, I had among them, or their wives and children, fifty-four cases, several fatal. The work was necessarily much impeded by the panic among the people.

WILL. WILSON,
Surgeon Chambly Canal.

I hereby certify that in the summer of 1832, the parish of Chambly and vicinity was severely visited by Asiatic Cholera; that the disease prevailed to an alarming extent among the labourers on the Chambly ca-

nal, and must have operated to a very considerable degree to the prejudice of the work, and cosequently to the embarrassment and loss of the contractors.

JOSEPH BRAITHWAITE,

Rector Chambly.

August 17th, 1836.

In order to enable the reader the more readily to find in the foregoing pages, any account, letter, or other document to which he may desire to refer, the following index to the work is inserted:—

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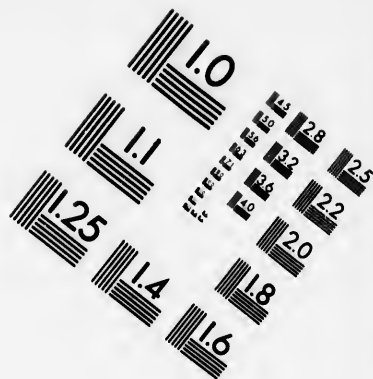
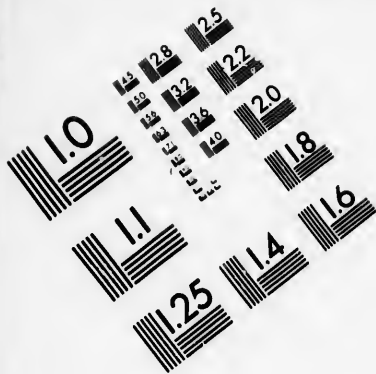
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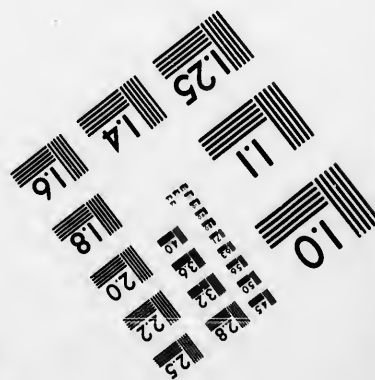
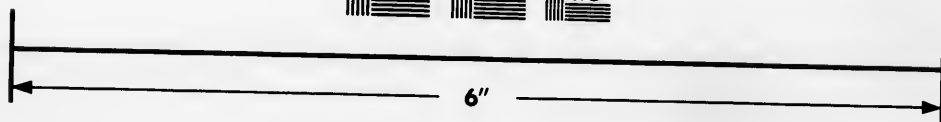
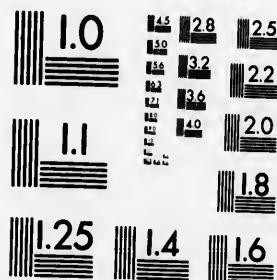
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In the foregoing pages, the Contractors have suppressed much matter, and many original documents which would have farther proved the injudicious manner in which the work was conducted, as likewise the large amounts the Contractors lost, and how unsparingly their exertions were sacrificed. Such statements and papers it was the intention of the Contractors to lay before the public, and their only object in withholding them, was a desire to make the work as brief as possible; still they are afraid it has reached so great a length, as to preclude many from perusing it. To obviate therefore this objection the Contractors would beg the indulgence of the public, whilst they sum the principal facts into as narrow bounds as possible; in order, that should the reader be unable to devote as much time as to attentively peruse the former, he may at least find a sufficiency to read the latter.

In the first place then it may be stated, that the Contractors claim £20,558 16s. 5d. as per account furnished to the Legislature of Lower Canada, in the year 1835, and to be found page 17.—Also the sum of £3,386 0s. 6d. as per account page 39; making a sum total of £23,944 16s. 11d. This amount the Contractors claim for *extra work* done on the Chambly Canal, over and above any amount it may require to complete the work, and which claim they make under the following circumstances.

That previous to the Contractors having entered into an agreement, for the completion of the Canal, a report was furnished by the Engineer, purporting to exhibit *the quantity of work required to be done, and the ease and difficulties to be encountered in the execution of the same, AND ON WHICH REPORT*, the Contractors founded their agreement. That neither the quantity, nor the description of the said work was *fairly stated in said report*, but that on the contrary, an immense increase of work had to be performed, a great proportion of which was not even hinted at, nor was one of the difficulties which had to be surmounted mentioned. These facts will be evident from a perusal of the report itself to be found page 3, and on investigation of the work done, as set forth from the 41st to the 73d pages.

That the agreement into which the Contractors entered, gave unlimited power to the Engineer, which he used much to the prejudice of the Contractors; although at the time the Contract was entered into, a perfect understanding existed, *that the works should be conducted as is usual and customary, and that the Contractors were to receive every assistance from the Engineer*, which latter the Contract specifies. That the Engineer never extended to the Contractors such assistance, but on the contrary found indignant when such was asked, will appear from the foregoing statements, as likewise from the answer which follows a request of the Contractors, in these words—

“ Chambly, November 28th, 1834.

“ SIR—Will you have the kindness to give us the particulars of the manner in which you wish us to balance the bridge?

"And also we want your plan of the draw-bridges, in order that we may proceed to work them.

"We also want the plan of the waste-weir, as it is to be made on the rock.

"Your ready compliance will oblige your obedient servants,

S. & S. R. ANDRES.

"To W. R. HOPKINS, Esq."

A N S W E R .

"Monday.

"Messrs. ANDRES,

"GENTLEMEN—As I am not very patient with people who ask for what they do not want, I request that you will not in future ask for instructions when full ones have been given to a person of your own selection, as with Poitras in the case of loading the bridge.

"The waste-weir I will give farther verbal orders about, when I see the rock clear.

"I am not ready with the draw-bridge plans.

"Yours,

"WM. R. HOPKINS,

"Engineer."

That although the Contract contained many clauses pressing hard on the Contractors, still some were of such a tendency as to shield them from ruin, the principal of which was one, providing that *all extra or additional work performed was to be paid for*, and under such, the Contractors claim the amount of the aforesaid accounts. That the work contained in such accounts *is extra*, will be manifest by referring to the Commissioner's reports, inserted page 80, wherein a part is acknowledged, and the remainder in the Engineer's different statements of extra work, to be found in the 21st, 24th, 25th, and 28th pages of this work.—Nor does the correctness of such accounts, rest on the foregoing proof alone, but is farther substantiated by the Engineer, in his certificate page 26, (and which the Contract empowers him to grant) as also by Mr. Casey, (see his letter page 27,) who had a perfect knowledge of the work done on the Canal, having been for a length of time Assistant Engineer.

That the Canal could not be completed *under existing circumstances*, for the amount agreed upon, will readily appear by Mr. Wright's letter, page 27, where he values the work, at from £105 to £120,000, and upon his judgment the greatest reliance may be placed, as he is not only an Engineer of splendid abilities, but a man of sterling worth and integrity. Mr. J. B. Jervis, another Engineer, who was brought on the Canal by the Commissioners, also entertained doubts if the Canal could be completed for the stipulated amount, but he does not speak positively on the matter, perhaps from the circumstance of *his not having measured the work*. He however states, "That he believes the Contractors will not be able to make much profit, and that if in the farther prosecution of the

work, any serious contingent unforeseen difficulties are found, it may be impossible for them to complete their undertaking at the Contract price." And further he recommends to the Commissioners, "to afford to the present Contractors all facilities consistent with existing circumstances," adding that "TO RE-LET COULD HARDLY FAIL TO ENHANCE THE COST." Mr. Jervis farther gives his opinion how the work should be conducted in case of abandonment by the Contractors, it is therefore not too much to suppose he considered such an event as probable, and in fact he was so far correct, three of the Contractors having resigned in the latter end of the year 1833. The remaining two (S. & S. R. Andres) did not however abandon the work, but on the contrary assiduously attended to it, till they not only involved themselves in utter ruin, but likewise many other persons who furnished materials and labour for the Canal.

For the Contractors to state, *that they have faithfully expended the monies intrusted to them—that they have carried on the work in the best possible manner—that they have performed as large a quantity of work for the same amount, as any other individuals could have done—that they have always manifested great zeal and perseverance in the prosecution of the work, or that they had conducted the operations to the entire satisfaction of the Engineer*, might appear egotism, if such had not been corroborated by the Commissioners in their reports page 80, as also by the Engineer in his certificate page 26, to which the reader is respectfully referred, and if he is satisfied on these points certainly, as Mr. Wright states in his letter page 27, "THEY OUGHT NOT TO BE RUINED IN EXECUTING ANY GREAT PUBLIC WORK."

The foregoing are the grounds on which the Contractors claim the amount due for extra work, and they are convinced that the justice of the country will not refuse them payment. On the sympathy of the public they have likewise many and very strong demands, not only on account of the many difficulties under which they have for five years struggled to carry on a great public improvement, but that such difficulties were not brought on by any mismanagement or misconduct of their own. Some arose from causes over which no human aid could have control; others from causes which might have been prevented. The contractors having thus divided their misfortunes into classes, beg to explain them to the reader.

In the first class the Cholera of 1832, and the return of that disease in 1834, was most injurious to the interests of the Contractors, having created great panic and consternation amongst the laborers employed on the Canal, many of whom fell a sacrifice to its ravages while numbers left the work. This consequently retarded operations, and raised the price of labour, besides the men who remained could not be persuaded to perform the same quantity of work. This is fully corroborated by the Commissioner's reports already quoted; also by the foregoing certificates to be found in the 88th, 89th and 90th pages.

A second cause that greatly impeded the exertions of the Contractors, and exposed them to much expense, was the heavy and almost incessant rains of 1833, in which year the waters fell in such abundance as fre-

quently to inundate the works, and caused the almost incessant use of the pumps, thereby greatly retarding operations and subjecting the Contractors to a great expense. The rains also of 1835 were unusually severe, and by which the Contractors lost very considerably.

The second class of misfortunes to which the Contractors were subjected, which might have been prevented, have already been so fully explained, in the former part of this work, as to require here only to be very briefly noticed.

The first was their being compelled frequently to change the men from one part of the work to another, by which a considerable time was lost and the work being left in an unfinished state, was of course more subject to injury, (besides the loss of materials sustained, and are now suffering, such as lime, sand, mortar, boards, planks and timber of all kinds partly framed for the Locks, the necessary tools for the same, with the other implements too numerous to mention, and beyond calculation.) This often caused the Contractors to expend large sums before the work could be put in the same state it was in at the time it was unnecessarily abandoned.

A second very serious loss was occasioned in consequence of the Canal not having been begun at St. Johns and finished downwards. This would have enabled the Contractors to transport all the weighty materials upon it, whereas they had to be taken down the rapids in boats, and when the water was low in the river, this was almost impracticable. In 1834 (an unusual dry season) the Contractors had many boats laden with stones greatly damaged, and which cost large sums to repair, and also much loss of time, and was altogether highly detrimental.

A third cause of loss to the Contractors, was their not being permitted to excavate the basin at St. Johns when the water in the river was low, particularly so in 1834. Had permission been given to finish the basin and wharf at that time, it could have been done for comparative little cost, but at that time the Engineer removed the men to Chambly and elsewhere and the Contractors were not permitted to resume the work till the autumn of that year, by which time the water had risen considerably, and the work was begun and continued all that winter and to the following spring under the greatest disadvantages and expense, at which time the men were altogether withdrawn by order of the Engineer, and the work left in an unfinished state, thereby very subject to injury, which has very materially taken place already.

A fourth circumstance by which the contractors were severely injured, arose from the numerous errors in the monthly estimates of the Engineer, page 74. Although the Contractors are not charged with a larger amount of money than they absolutely received, still such errors operated much against them, as they were deprived of receiving the amount of work done at the time it was due, and consequently were deficient in funds to pay the labourers and tradesmen at the stated periods their wages became due. To remedy this evil the Contractors were often obliged (at much loss of time) to borrow large sums (their own monies being entirely absorbed) for which they had to pay weighty interests, and notwithstanding

were frequently unable to pay the men in full. This was a serious injury not only to the men, but to the Contractors, and has been a general cause of their present misfortunes, as it is a well known fact that unless workmen receive their wages regularly no good can be expected from them, nor the same quantity of labour. By reference to the errors as detailed in the 74th page, it will be seen that in many estimates, the amount thus kept back from the Contractors was from 500 to £850, and which certainly might have been prevented by proper attention in the Engineer.

A fifth cause by which the Contractors suffered in an eminent degree, was their being obliged to cart the earth for great lengths to form the embankments, but particularly off the surface of the roads, when it might have been procured more conveniently had the Engineer permitted it. This is fully explained in the foregoing pages, also by many of the preceding affidavits, as well as by the following order from the Engineer.

St. Johns, 26th November, 1834.

“As you are short of earth I wish you to take the embankment from the road, making the surface of the road even and giving it a dip backwards to prevent the wash from the road injuring the Canal bank. You can begin at Mr. Marchand's, on section 4, and work upwards, taking care to make passages for the inhabitants from their houses to the road.”

“Yours, &c.

WM. R. HOPKINS,

Engineer.

“Messrs. S. & S. R. Andres.”

To all the expenses and unnecessary outlays, as already stated, could be added many others, which subjected the Contractors to the most grievous expenditures and loss of time; such as sinking below Canal bottom—having to raise in the course of the excavation much slate, hard-pan and quick-sands not mentioned in the original report—having to land stones for building the Locks, and afterwards having to re-ship them in consequence of the Engineer having altered the height of the courses, and the innumerable alterations made by the Engineer, all of which operated in no slight degree against the interest of the Contractors, but for which no charge is made in the foregoing accounts of extra work, as the Engineer did not consider them as extra, and the Contractors were unwilling to make any charge with which he could find fault, consequently confined their charges to what has either been acknowledged as extra by the Engineer or by the Commissioners themselves in their several reports. We have only one observation more to make. The facts on which our claims rest, were no secret between the Engineer and ourselves. The public along the Canal were aware of them; the Commissioners knew them; (yet they did not do as the Commissioners on the Cornwall Canal did, advance the price of the Contractors thirty per cent.) and the Contractors

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are induced to believe that this knowledge of theirs has had some influ-
ence, when they finally dismissed the said Engineer.

The Contractors having thus confined themselves simply to facts, and
supported by the many documents, affidavits, Commissioner's reports, &c.
as before recited, leave the reader to draw such conclusions as circum-
stances warrant, and the Contractors have no doubt to what result a can-
did investigation will bring them.



FINIS.

