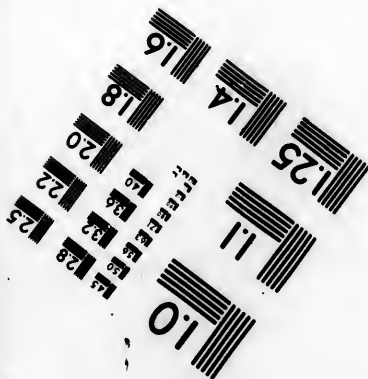
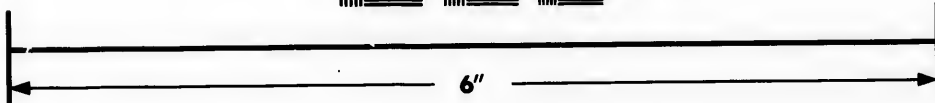
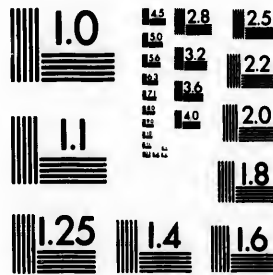


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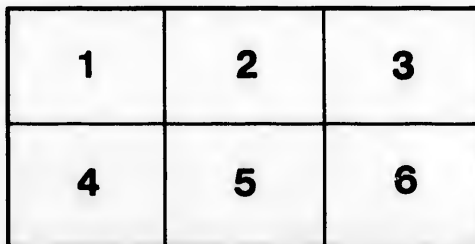
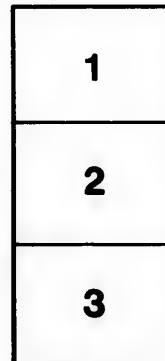
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T O R O N T O & L A K E H U R O N

R A I L - R O A D .

Toronto:

Printed at the Albion Office, S. E. corner Market Building.

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*To the Honorable J. ELMSLEY, and his
associates, Committee to procure Sur-
veys and Estimates of the proposed Rail
Road from Toronto to Lake Huron.*

GENTLEMEN :

I have the honor respectfully to present the following as the results of the reconnoissances and preliminary Surveys for the proposed Rail Road from Toronto City to Lake Huron, together with the Maps, Profiles, and estimated costs.

The line of survey commences at a point in the City of Toronto near the River Don, about half a mile from the Harbour, to allow an opportunity to diverge from that point, to the most advantageous ground for terminating the road,—another line was run from the West side of the City, passing near the Garrison, these lines intersected about five miles from the Harbour, and were connected in the City by a line through Front Street along the Shore of the Harbour. The City can be approached by either line as shall be determined upon by the facility of procuring lands for a Depot. Either of the lines that shall be adopted before a final location can be much improved.

From the intersection of the two lines, the main line continues through the Town of York to the Town of Etobicoke, on to the Humber River, crossing Black Creek and several small ravines—the Black Creek Valley is contemplated to be crossed by a viaduct of 600 feet in length, and 30 feet in height.

The Humber River will be crossed by a viaduct of three spans of 160 feet each, and 30 feet above the water, and the flats on the West side of the River for a distance of 300 feet by a system of timber fram-

ing. From the Humber River the line passes through the Gore of Toronto, a portion of the town of Vaughan to the commencement of the Oak Ridges in the Town of Albion.

The line through the Oak Ridges passes the summit (attaining an elevation of 705 feet above Lake Ontario) which divides the waters flowing South into Lake Ontario from those flowing North into Lake Huron. In passing through the Oak Ridges there will be some spurs of hills to be excavated, and the streams crossed and turned in several places to avoid making culverts, this portion of the route can be much improved on a final location.

From the 11th Concession in the Town of Tecumseth two lines were Surveyed one on each side of the Nottawasaga River. The line on the East side passes through the Townships of Assa, Vespre, and Floss, and terminates near the mouth of the Nottawasaga. From the point of deflection of the survey, and to the Portage Hill in the Town of Vespra, the grading will be light except the crossing of the streams emptying into the Nottawasaga and the Ravine washed through the table land. These gulfs and streams may be crossed by wooden viaducts, the excavation from the Portage Hill will be required for filling across the Beaver Meadow.

Immediately from the Portage Hill the line crosses the lands flooded by the Beaver Dams; through these flats will be required an embankment. The earth to be taken from Portage Hill; these flats although covered with water, and presenting to the eye rather a formidable appearance, have beyond the necessity of hauling the earth some distance to form the embankments nothing difficult in them, the bottom being hard, and the water except in the streams, but a few inches in depth.

The remainder of the East line has no further difficulties to encounter until within $1\frac{1}{2}$ miles of Lake Huron, here there is a chain of Sand Hills which make from the Blue Hills and continue West to the high lands in the town of Sing. The River Nottawassaga breaks through this side in the town of Sunnidale forming steep banks 150 feet high immediately preceding which are the rapids, any approach to the Lake East of the Blue Ridge will have to pass through this ridge or over higher ground more remote from the Lake, the points crossed by our lines were the most favorable found in the vicinity of the Nottawassaga Bay, and are not formidable, that on the East side of the river will require a cut of an average depth of 20 feet for a distance of 13 hundred feet.

The line on the West side of the River passes through the towns of Essa and Sunnidale, and terminates at the town laid out by government in the peninsula between Nottawassaga river and the lake, there is nothing of importance in this line until reaching the said ridge before spoken of, $1\frac{1}{2}$ miles from the Lake, at this point will be required an excavation averaging 35 feet in depth for a distance of 900 feet through light dry sand. From the summit in the town of Albion to Lake Huron the line passes through an entirely new country, and in some parts almost unexplored, and consequently these experimental lines are not considered to be over the most favourable ground, but in some cases the reverse, as much of the line may be materially improved, on a final location, particularly in point of grade, the lateness of the season when the Surveys were completed compelled us to abandon the field when our Surveys and examinations had given us proper data to improve the line upon. The most material points that offer improvements upon are the lines passing from Toronto City to their intersection in the Town of York, these should

have been carried more south westerly. Since improvement may also be made after crossing the Huron River and through the Oak Ridges by increasing the radius of curvature, and the points of crossing the streams. Over the Portage Hill, the line should be carried more to the west along the face of the Hill to gain the level of the swamp at an easier rate of inclination and less excavation, the line in the Town of Sunnidale should have been carried more easterly to avoid the summit of land near the centre of the Town.

The following statement of the linear arrangements of the road shows the length of the several straight lines and curves with the length of Radii of the curves.

Table of the linear arrangements of the East line from Toronto to Lake Huron.

TOWN OF YORK.

- 9 Miles, 1820 feet of straight lines.
- 1 Mile, 1720 feet of curves with Radii of 4000 feet and over.
- 3100 feet of curves with Radii from 2000 to 4000 feet.
- 4920 feet of curves with Radii under 2000 feet.

TOWN OF ETOBICOKE.

- 2 Miles, 4260 feet of straight lines.
- 3800 feet of curves with Radii of 4000 feet and over.
- 1000 feet of curves with Radii under 2000 feet.

TOWN OF VAUGHAN.

- 3 Miles. 1700 feet of straight lines.

GORE OF TORONTO.

2 Miles, 4900 feet of straight lines.

TOWN OF ALBION.

- 9 Miles 3460 feet of straight lines.
600 feet of curves with Radii of 4000 feet
and over.
- 2 Miles 1390 feet of curves with Radii from 2000
to 4000 feet.
- 1 Mile 1420 feet of curves with Radii under 2000
feet.

TOWN OF TECUMSETH

- 7 Miles, 4780 feet of straight lines.
4000 feet of curves with Radii of 4000 feet
and over.
- 2 Miles, 1320 feet of curves with Radii from 2000
to 4000 feet.
- 3 Miles, 1560 feet of curves with Radii under 2000
feet.

TOWN OF ESSA.

- 10 Miles, 2470 feet of straight lines.
3250 feet of curves with Radii of 4000
feet and over.
- 1 Mile, 720 feet of curves with Radii from 2000 to
4000 feet.
2400 feet of curves with Radii under 2000
feet.

TOWN OF VESPRA.

- 8 Miles, 1080 feet of straight lines.
1 Mile, 1220 feet of curves with Radii of 4000 feet
and over.

1100 feet of curves with Radii from 2000
to 4000 feet.

TOWN OF FLOS.

0 Miles, 1640 feet of straight lines.
2 Miles, 2240 feet of curves with Radii of 4000
feet and over.



Table of the Linear arrangements of the West
Line from Toronto to Lake Huron.

TOWN OF YORK.

9 Miles, 740 feet of straight lines.
1 Mile, 1720 feet of curves with radii of 4000 feet
and over.
1 Mile, 2120 feet of curves with Radii from 2000
to 4000 feet.
4920 feet of curves, with radii under 2000 feet.

TOWN OF ETOBICOKE

2 Miles, 4260 feet of straight lines.
3800 feet of curves over 4000 feet Radii.
1000 feet of curves from 2000 to 4000 feet
Radii.

TOWN OF VAUGHAN.

3 Miles, 1700 feet of straight lines.

GORE OF TORONTO.

2 Miles, 4900 feet of straight lines.

TOWN OF ALBION.

3 Miles, 3460 feet of straight lines.
600 feet curves over 4000 feet Radii.

2 Miles, 1390 feet of curves from 2000 to 4000 feet Radii.

1 Mile, 1420 feet of curves under 2000 feet Radii.

TOWN OF TECUMSETH.

7 Miles, 4780 feet of straight lines.

4000 feet of curves over 4000 feet Radii.

2 Miles, 320 feet of curves from 2000 to 4000 feet Radii.

3 Miles, 1560 feet of curves under 2000 ft. radii.

TOWN OF ESSA.

11 Miles, 4900 feet of straight lines.

3000 feet of curves with Radii over 4000 feet.

TOWN OF SUNNIDALE.

11 Miles, 4660 feet of straight lines.

2 Miles, 2620 feet of curves with Radii over 4000 feet.

2000 feet of curves with Radii under 2000 feet.

2 Miles of straight line not surveyed to unite the West line with the East at the mouth of Nottawasaga River.

RECAPITULATION, EAST LINE.

60 Miles, 4990 feet of straight lines.

6 Miles, 3450 feet of curves with Radii of 4000 feet and over.

6 Miles, 2350 feet of curves with Radii from 2000 to 4000 feet.

6 Miles, 0:740 feet of curves with radii under 2000 feet.

RECAPITULATION WEST LINE.

- 61 Miles, 3000 feet of straight lines including 2 miles to join East line at the Bay.
- 5 Miles, 5180 feet of curves with Radii of 4000 feet and over.
- 5 Miles, 4830 feet of curves with Radii from 2000 to 4000 feet.
- 5 Miles, 4710 feet of curves with Radii under 2000 feet.

You will perceive by reference to the table of Grades that the greatest inclinations are 40 feet to the mile & for short distances making a total of 4 9-11ths miles, these as well as all of the others may be reduced by a more expensive system of Grading, which in my opinion would be injudicious, as the cost of grading through a new country will be disproportionately greater than the increased cost of transportation over heavy grades.

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TABLE OF GRADES—EAST LINE.

No. of Grade.	Length of Grades in Miles & Feet.	Rate per Mile in Feet and parts.	Ascending, Descending, or Level.	Ascent or Descent in grade in Feet and parts	Above Lake Ontario.
1	0 4000	...	Level.	...	13
2	2 2140	40	Ascending.	97:00	110
3	2 4520	17:83	Ascending.	51:00	161
4	0 4600	...	Level.	...	161
5	1 0720	10:60	Ascending.	12:00	173
6	0 3900	9:48	Descending.	7:00	166
7	2 1240	7:60	Ascending.	17:00	183
8	0 4400	30	Ascending.	25:00	208
9	1 0620	1:79	Ascending.	2:00	280
10	2 5040	32:49	Ascending.	96:00	306
11	1 0220	19:20	Ascending.	20:00	326
12	1 3820	26:91	Ascending.	46:00	372
13	1 2120	16:41	Ascending.	23:00	395
14	1 0720	25:52	Ascending.	29:00	424
15	2 0640	21:68	Ascending.	46:00	470
16	1 3820	33:07	Ascending.	57:00	527
17	2 3540	33:44	Ascending.	88:00	615
18	1 3220	3:22	Descending.	5:00	610
19	3 4860	8:41	Ascending.	33:00	643
20	1 5020	31:78	Ascending.	62:00	705
21	1 0020	15	Descending.	15:00	690
22	2 1640	34:32	Descending.	78:00	612
23	0 2100	21:00	Level.	...	612
24	2 3140	31:60	Descending.	82:00	530
25	0 2000	...	Level.	...	530
26	3 1160	12:04	Descending.	39:00	491
27	0 4500	...	Level.	...	491
28	0 4800	5:50	Descending.	5:00	486
29	2 1840	2:55	Descending.	6:00	480
30	2 0940	2:75	Descending.	6:00	474

TABLE OF GRADES— EAST LINE *con'tinued.*

No. of Grade.	Length of Grade in Miles & Feet.	Rate per Mile in Feet and parts.	Ascending, Descending, or Level.	Ascent or Descent in grade in Feet and parts.	Above Lake Ontario.
31	0 4500	15:25	Ascending.	13:00	487
32	0 5000	8:45	Descending.	8:00	479
33	0 4500	4:68	Ascending.	4:00	483
34	1 4220	2:22	Descending.	4:00	479
35	0 5000	14:78	Descending.	14:00	465
36	1 1120	23:92	Ascending.	29:00	491
37	0 5100	8:28	Ascending.	8:00	502
38	0 4500	22:29	Descending.	19:00	483
39	3 0660	10:12	Descending.	32:00	451
40	0 5000	10:56	Ascending.	10:00	461
41	1 1620	8:41	Descending.	11:00	450
42	0 4200	26:40	Ascending.	21:00	471
43	0 4000	14:52	Descending.	11:00	460
44	1 5220	40:00	Descending.	79:00	381
45	0 4000	22:40	Descending.	17:00	364
46	1 1220	21:93	Ascending.	27:00	391
47	1 4220	13:90	Descending.	25:00	366
48	1 4020	10:00	Ascending.	18:00	384
49	2 3040	...	Level.	...	384
50	2 2040	8:93	Descending.	22:00	362
51	1 2020	16:80	Ascending.	24:00	386
52	1 0359	29:04	Descending.	31:00	355

Surface of Water in Lake Huron..... 340

TABLE OF GRADES—WEST LINE.

No. of Grade.	Length of Grade in Miles & Feet.	Rate per Mile in Feet. and parts	Ascending, Descending, Level.	Ascent or Descent in grade in Foot and parts.	Above Lake Ontario.
1	0 4600	5:74	Ascending.	5:00	18
2	0 4700	20:35	Ascending.	18:00	36
3	1 2920	46:50	Ascending.	72:00	108
4	1 1820	36:44	Ascending.	49:00	157
5	0 0300	26:43	Ascending.	4:00	161
6	0 4600	...	Level	...	161
7	1 0720	10:60	Ascending.	12:00	173
8	0 3900	9:48	Descending.	7:00	166
9	2 1240	7:60	Ascending.	17:00	183
10	0 4400	33:00	Ascending.	25:00	203
11	1 0620	1:79	Ascending.	2:00	210
12	2 5040	32:49	Ascending.	96:00	306
13	1 0220	19:20	Ascending.	20:00	326
14	1 3820	26:91	Ascending.	46:00	372
15	1 2120	16:41	Ascending.	23:00	395
16	1 6720	25:52	Ascending.	29:00	424
17	2 0640	21:68	Ascending.	46:00	470
18	1 3820	33:07	Ascending.	57:00	527
19	2 3540	33:44	Ascending.	88:00	615
20	1 3220	3:22	Descending.	5:00	610
21	3 4860	8:41	Ascending.	33:00	643
22	1 5020	31:78	Ascending.	62:00	705
23	1 6020	15:09	Descending.	15:00	690
24	2 1640	34:32	Ascending.	78:00	612
25	0 2100	...	Level.	..	612
26	2 3140	31:60	Descending.	82:00	530
27	0 2000	...	Level.	...	530
28	3 1160	12:04	Descending.	39:00	491
29	0 4500	...	Level.	...	491
30	0 4800	5:50	Descending.	5:00	486

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Above Lake
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TABLE OF GRADES—WEST LINE *continued.*

No. of Grade.	Length of Grade in Miles & Feet	Rate per Mile in Feet and parts.	Ascending, Descending, or Level.	Ascent or Descent in grade in Feet and parts.	Above Lake Ontario.
31	1 0440	2:50	Descending.	3:00	483
32	1 3120	...	Level.	...	483
33	0 4100	8:96	Ascending.	7:00	490
34	0 5100	8:28	Descending.	8:00	482
35	1 2620	...	Level.	...	482
36	1 5020	1:02	Ascending.	2:00	484
37	1 3840	1:17	Descending.	2:00	482
38	2 1140	...	Level.	...	482
39	1 4120	10:67	Descending.	19:00	463
40	1 0920	...	Level.	...	463
41	2 4720	30:35	Descending.	88:00	375
42	1 0620	5:36	Descending.	6:00	369
43	1 1720	3:10	Ascending.	4:00	373
44	0 4500	18:77	Ascending.	16:00	389
45	1 1320	4:71	Descending.	5:00	384
46	2 4940	23:84	Ascending.	70:00	454
47	0 3000	...	Level.	...	454
48	0 4000	13:20	Ascending.	10:00	464
49	1 0720	20:24	Descending.	23:00	441
50	0 3000	15:84	Descending.	9:00	432
51	1 4920	5:22	Descending.	10:00	422
52	1 1620	26:01	Descending.	34:00	388
53	0 5000	9:50	Descending.	9:00	379
54	0 2000	5:55	Descending.	2:00	377
55	1 0720	24:70	Descending.	26:00	351
56	0 8000	8:80	Descending.	5:00	346

Surface of Water in Lake Huron.....349

The curves throughout with the exception of those in the oak ridges, may have radii from five to ten thousand feet, some of those in the ridges will necessarily have radii as long as two thousand feet.

The total distance from Toronto to the termination of the survey, near the mouth of the Nottawasaga River is eighty-one one fourth miles, by the east line. The west line, as surveyed, terminates at the town on the Peninsula, in case this line should be adopted, it should be continued to or near the mouth of the Nottawasaga, by crossing the same below the rapids, and immediately after passing the said ridge and terminating at the site of the proposed town, as shewn on the maps. The objections to terminating the road at the town on the Peninsula, are the delays necessarily occasioned by having to navigate the river four miles with contrary winds, and at times against a very strong current, and the want of room to accommodate so large a population as will centre at, what may safely be anticipated to be, the great city of the North.

The first and most important object in the successful operation of this road will be its termination at a good and convenient harbour on Lake Huron. That the Nottawasaga River offers these facilities there is no doubt; the river opposite the proposed termination of the road for a distance of from three to four miles, is from five to six hundred feet in width, and ten or twelve feet in depth, the Bar at the mouth of the River is of moving sand, and the least depth of water we found was seven feet, this Bar can be removed at a reasonable expense by constructing piers to confine the discharge of the River and carry it into deep water, and to prevent the waves from washing the sand in the shoal water near the beach across the channel. This mode of improvement has been so fully tested in the Harbour on Lake Erie by the United States Government as to have become a settled point.

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Above Lake
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The Harbour on Lake Erie at Conneant, Ashtabula, Grand River, and Cleveland, had been previous to this improvement entirely dammed across with the moving sand and it was not an unusual occurrence in the early navigation of that Lake, for the storms to drive the small craft into some of the above Rivers, and place an embargo on them in the shape of a sand bar with not a foot of water, where the day previous there had been a depth of seven or eight feet, the next storm from the opposite direction would probably remove the obstructions. Since the improvements there has been found no difficulty in securing a depth of water to the hard bottom, and in some cases to the solid rock. I have made no estimate of the necessary improvements at the mouth of the river, supposing it to be exclusively a Government work and that they would make the necessary improvements on a commensurate scale and on such a plan as the importance of the location required, and the superior skill of their proper officers should suggest as soon as the wants and improvements of the country required them.

The advantage to be derived to the Road from the productions of so fertile a country as that bordering on Lake Simcoe, with the facility of Navigation to collect its produce to any one point made it a matter of some moment to ascertain whether and where a connexion could be made between that Lake and the Rail Road, and the obstructions, two points present themselves, that may be connected with great facility one from a point in the Town of Tecumseth by the valley of the Holland River, the other by a line south of the Barrie and Sunnidale Road to the Town of Barrie, in Kempenfeldt Bay, the first route will make about 18 miles of Branch Road and 45 miles of Main Road, making a total of sixty-three miles to Toronto City, the second route would have a branch of about 10 miles, and 62 miles of the main road, making a total distance of about 72 miles to Toronto. The

local advantages which either route possesses can only be known by a survey and estimate, but either route is practicable at a moderate expense and when constructed will add much to the business of the road.

The general character of the country through which the line passes is favourable to the construction of a good and cheap road, the most expensive points will be in crossing Black Creek, the Humber River and the several branches of the Nottawassaga River, these obstructions are less for the extent of country passed over, than the average of Rail Road routes, a large portion of the work will be through a country difficult of access and attended with an increased expense on that account, still the heaviest and most important places on the line are at points accessible by short communications now opened to parts of the country settled and yielding a surplus of produce.

The cost of the road will materially depend upon the plan of superstructure and the mode of crossing the Gulfs and streams. The abundance of Timber of the best quality throughout the whole line and contiguous thereto the scarcity and consequently the increased expense of good stone within a reasonable distance, and the want of road to transport them from the quarries in the Towns of Albion and Mono and near Lake Huron, under these circumstances I would recommend the adoption of Timber viaducts in place of stone culverts of a large class, these may be replaced with timber until such time as it becomes too costly to be used with economy for that purpose when you will have the facility of the road to transport the materials for more permanent works, the small culverts where Brick can be made or procured, may have brick arches and stone wing walls. Stone enough may be had for that purpose by splitting the granite boulders scattered through the country.

The plans A. B. D. No. 1, D. No. 2, D. No. 3 are proposed as substitutes for culverts. The plans A. and B. for viaducts over the gulfs and narrow valleys, the plans for the viaducts over the Humber River, the plans E. represent the superstructure of some of the best roads in the State of New York, and where timber is rather scarce it is considered the cheapest and best timber road that can be built.

The plan F. is for a T. rail of 80 tons to the mile, on a timber foundation, the scarcity of Stone must prevent their being used for a foundation, and as the whole of the foundation timbers would be covered by the earth, this may be considered as a permanent road, the present high price of Iron makes this road too expensive for general adoption, but if Iron should be reduced to the price that it was in 1833 I should recommend this rail for your road.

The plan G. is calculated for a cheap road to be made from the timber cut from the line of the road way, and bedded into the graded surface of the road, the sills to be of trees of a moderate size, flattening them on two sides and connecting them together by ties eight feet apart, let in flush with the top surface and wedged against a dove tail shoulder. on the tops of the sill will be spiked a wooden rail of three by three inches to receive the rail plate to weigh twenty two tons per mile, on top of the sill timber under the rail timber may be cut a groove to be filled with salt in a measure to resist the rapid decay of the timber in this most exposed situation.

A Road constructed after this manner having the sills well bedded and settled into the grading of the road would make a good temporary road ; but the exposed situation of the sill timbers to decay and the difficulty of replacing them is a serious objection to its adoption and I would only recommend it in situations where timber is plenty and Saw Mills scarce and difficult of access.

The parts of the superstructure of Roads, constructed after the plan E that are subject to decay first are the rails; and next the ties, either of these are replaced with the greatest facility, without deranging the foundation, (sill timbers) which is of the utmost importance in keeping the road even and true, and preventing the wear and breaking of the engines and cars by a continuous surging and straining occasioned by the uneven surface of the Road.

The plans for a depot at Nottawassaga were made with a view to keep the freighting cars with their incidental incumbrances distinct from the passengers, and yet in such a position as to connect the whole in as compact and convenient a form as possible. The termination of the road at the Nottawassaga will require the ground now lying waste for building purposes, with that view I have laid out a Town Plot at the terminations of the line on the East side of the River see Plan "I" - the principal depot at Toronto was not estimated in detail, the several proposed termination of the line offer different arrangements for the depot, and no satisfactory plan could be made until the grounds are selected, and their size and location determined upon, the amount allowed for this purpose in the estimates is considered sufficient. The following estimate for grading, is for a width to allow the laying of a second track being 24 wide in embankments, with side slopes of one and a half to one, and 36 feet wide on the bottom with ditches 6 feet wide, the importance of the route it is believed will unquestionably require the second track to be laid as soon as possible after the road shall have been opened, and the advantages of the route known by experience to the commercial and emigrating community. The viaducts with the exception of that over the Humber River, and that over Nottawassaga in the Town of Sunnidale, are estimated for a single track being

of a perishable nature, and not liable to settle ; the additional width for the second track can be attached to these if wanted before that of the first track commences decaying, the whole can then be made of the requisite width.

The Bridges over the Humber and Nottawassaga are contemplated to be permanent for that purpose, to secure the framing it is proposed to completely case them from the weather -- they are proposed to be built wide enough for two tracks.

The East and West routes from the City are estimated separately, as also the lines from the diverging point in the town of Tecumseth the proposed line crossing from the West to the East side of the Nottawassaga near Lake Huron, was not examined with instruments but being along the river, and in full view, we had a good opportunity to judge of its level by comparing it with the level of the River, and the estimate is considered ample to continue the line to the termination as represented on the maps.

*Estimates of the Easterly Line surveyed
for the proposed Toronto and Lake Huron
Rail Road.*

TWELVE MILES IN THE TOWN OF	£.	S.	D.
YORK.			
Grubbing & cleaning	£ 450 0 0		
Fencing 9 miles at 4s per rod	1,152 0 0		
189,693 cubic yards of excavation at 7d. per yard	5,529 15 11		

	£	s.	d.
199:143 do. do. of embankment at 6d. 4978 11 6			
600 lineal feet of viaduct over Black Creek at 15s. per foot 450 0 0			
13 small brick culverts, at £20 per culvert 250 0 0	13820	7	5
THREE AND THREE FOURTH MILES IN THE TOWN OF WOBICOCKE.			
Grubbing & clearing 150 0 0			
69:648 yards of excavation at 6d. per yard 1,741 4 0			
79:321 yards of embankment at 8d. per yard 2,644 0 6			
500 lineal feet of viaduct over the Humber River as per plan at £6 3,000 0 0			
Two small brick culverts at £20 each 40 0 0	7575	4	8
THREE AND ONE THIRD MILES IN THE TOWN OF VAUGHAN.			
Grubbing & clearing 300 0 0			
35:500 yards of excavation at 7d. per yard 1,753 8 4			
31:010 embankment at 6d. per yard 775 5 0			
2 small bridges as per plan D No. 1, at £4 1s. 3d. per bridge 8 2 0	2118	15	10

THREE MILES IN TORONTO GORE.		£.	s.	d.
Grubbing & clearing	250 0 0			
32:326 cubic yards of excavation at 7d. per yard,	942 16 10			
30:000 cubic yards of embankment at 6d per yard,	750 0 0			
2 bridges 12 feet span, as per plan D. No. 1, at £4 1s. 3d.	8 2 6	1950	19	4
THIRTEEN AND ONE HALF MILES IN THE TOWN OF ALBION.				
Grubbing & clearing	600 0 0			
271:152 yards of excavation at 7d. per yard	7,908 12 0			
271:986 yards of embankment, at 6d.	6,799 13 0			
3 56 feet bridges over the Humber as per plan B at £29 3s. 3d.	87 99			
12 12 feet do. as per plan D No. 1, at £4 1s. 3d.	48 15 0			
6 36 feet do. as per plan B No. 3, at £19 6s. 6d.	115 19 0	15560	8	9
FOURTEEN AND ONE FIFTH MILES IN THE TOWN OF TECUMSETH.				
Grubbing & clearing	700 0 0			
116:630 cubic y'ds.				

		£	s	d.
of excavation at 8d.	3,887	13	4	
166:441 do. do. em- bankment at 7d.	3,473	19	0	
300 feet bridge over branch of Notta- wassaga, 15s. per foot	225	0	0	
1 bridge 36 feet long per plan D No. 3 at £19 6s. 6d. per bridge	19	6	6	
4 do. 24 feet long per plan D No. 2, at £11 15s. per do.	47	0	0	
7 do. 12 feet long per plan D No. 1, at £4 1s. 3d.	28	8	9	
TWELVE AND THREE FOURTH MILES IN THE TOWN OF ESSA.				
Grubbing & clear- ing	600	0	0	
183:585 yards of ex- cavation, at 8d. per yard	6,119	10	0	
277:523 yards of embankment, at 8d. per yard	9,250	18	8	
1,200 feet of bridge over 30 feet high as per plan A. at £1 per foot.	1,200	0	0	
300 feet bridging over 20 feet high at 15s. per foot	225	0	0	
1 Bridge 56 feet as per plan B.	29	3	3	
13 Bridges 25 feet as per plan D No. 2	152	15	0	
	17577	6	11	

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	£	s.	d.
NINE AND ONE FOURTH MILES IN			
THE TOWN OF VERGA.			
Grubbing & clearing	400	0	0
166:805 y'ds. of excavation at 8d. per yard.	5,560	3	4
125:739 y'ds of embankment at 9d.	4,715	4	3
8 bridges 100 feet long over 20 feet high, at 15s. per foot	600	0	0
4 do. 36 feet long per plan B at £29 3s. 3d. per bridge	116	13	0
18 do. 12 feet long per plan D No. 1, at £4 1s. 3d.	73	2	6
	11465	3	
EIGHT AND ONE FIFTH MILES IN			
THE TOWN OF FLOS.			
Grubbing & clearing	300	0	0
125:819 cubic yards of excavation at 8d. per yard.	4,193	19	4
67:610 cubic y'ds. of embankment at 8d. per yard	2,253	13	4
2 bridges 38 feet long at £19 6s. 6d. as per plan D No 3	38	13	0
bridge 24 feet long £11 15s. 0d as per plan D No. 2	11	15	0
9 bridges 12 feet long £4 1s. 3d.			

as per plan D No. 1	36 11 2	£. 6834	s. 11	d. 11
RECAPITULATION OF THE EAST LINE.				
12 miles in the Town of York	£12,820 7 5			
3½ miles in the Town of Etobi- coke	7,575 4 8			
3½ miles in the Town of Vau- ghan	2,118 15 10			
3 miles in Toronto Gore	1,950 19 4			
13½ miles in the Town of Albion	15,560 8 9			
141-5 miles in the Town of Tecum- seth	8,345 7 7			
12¾ miles in the Town of Essa	17,577 6 11			
9¼ miles in the Town of Vespra	11,465 3 1			
8 1-5 miles in the Town of Flos	6,834 11 11	84248	5	6
Depot at Nottawasaga, buildings, fixtures, &c.....		5000	0	0
Do. at Toronto, including build- ings, fixtures, land, &c		12500	0	0
Nine Water and Wood Stations. at £125.....		1125	0	0
Six Engines £1,750.		10500	0	0
20 first class Carriages at £250		5000	0	0
20 second do. do. at £100		2000	0	0
Forty-eight Cars at £50.....		2000	0	0
Engineering and superintending		15000	0	0
Add ten per cent for contingen- cies.....		137,373	5	6
		13,737	6	6
		151,110	12	0

SUMMARY.		£	s.	d.
81½ miles of super-structure, as per the plan E. at £979 4s 7d per mile,	79,562 7 5			
Grading depot, bridges, machinery, &c.	151,110 12 0	230,672	19	5
81½ miles of super-structure, as per the plan F. at £1,883 1 10 per mile,	153,061 3 11			
Grading depot, bridges, machinery, &c.	151,110 12 0	304,111	15	11
81½ miles of super-structure, as per the plans G. at £733 3s 7d per mile,	59,570 16 2			
Grading bridges, depot, machinery, &c.	151,110 12 0	210,681	8	2
Per mile as per plan E. \$11,356.20 cts.		2939	1	0
Per mile as per plan F. \$14,971.63 cts.		3742	18	2
Per mile as per plan G. \$10,372.00		2593	0	0

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*Estimate of the Westerly Line Surveyed
for the Proposed at Toronto and Lake
Huron Rail Road.*

B.

		£	s.	D.
	Grubbing and clearing,	450	0	
	Fencing 10 miles at £4 per rod,	1,280	0	0
	164,008 Cubic yds. of excavation at 9d per yard,	4,783	11	4
5	165,614 " of embankment at 6d	4,140	7	0
	11 Culverets brick at £25	275	0	0
		10,928	18	4
	THREE AND ONE FOURTH MILES IN THE TOWN OF ETOBICOKE.			
	Grading &c. as per detailed estimate of each line.....	7,575	4	8
11	THREE AND ONE THIRD MILES IN THE TOWN OF VAUGHAN.			
	Grading &c. as per detailed estimate of East line.....	2,118	15	10
	THREE MILES IN THE CORE OF TORONTO.			
	Grading &c. as per estimate of East line.....	1,950	19	4
2	THIRTEEN AND ONE HALF MILES IN THE TOWN OF ALBION.			
	Grading &c. as per detailed estimate of the East Line.. . .	15,560	8	9
0	FOURTEEN MILES IN THE TOWN OF TECUMSETH.			
2	Grubbing and clearing,	600	0	0
0	55,402 yds of excavation at 8d per yard.	1,846	14	8

210:213 " em- bankment 8d	7,907	2	0			
400 feet of bridge over branch of Nottawassaga Ri- ver, £1 per foot,	400	0	0			
2 bridges 38 feet long at £19 6s 6d per bridge,	38	13	0			
do 24 feet long at 14 15 0	47	0	0			
8 do 12 feet long at 4 1 3	32	10	0	9,971	19	8
TWELVE MILES IN THE TOWN OF ESSA.						
Grubbing and clear- ing,	500	0	0			
48:968 yds. of exca- vation at 8d per yard,	1,632	18	8			
259:687 " embank ment 8d	8,656	4	8			
400 feet of bridge over Nottawassa- ga at £1 pr. foot	400	0	0			
800 " over streams and ravines at 15s per foot,	600	0	0			
3 bridges 56 feet long £29 3 3 per bridge	87	9	9			
6 do 36 feet at 19 6 6	115	19	0			
6 do 12 feet at 4 1 3	24	7	0	12,015	19	7
SIXTEEN AND ONE FOURTH MILES IN THE TOWN OF SUNNIDALE.						
Grubbing and clear- ing,	700	0	0			

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243:972 yards ex- cavation, 8d per yard,	8,132	8	0
215:887 " embank ment 8d	7,196	4	8
300 feet of bridge at £15 per foot	225	0	0
120 " 10s "	60	0	0
4 bridges 24 feet long each £11 15	47	0	0
3 stretches 170 feet each over the Nottawassaga, si- milar to that over the Humber, £5 per foot,	2,550	9	0
30 miles of super- structure as per the plan G. at £733 3s 7d per mile,	58,634	6	8
Grading Bridges, de- pot. machinery, &c.	14,909	16	10
Cost per mile as per plan C. \$11,- 371,50,	2,842	17	6
Cost per mile as per plan F. \$14,- 98697,	3746	14	10
Cost per mile as per plan G. 1038- 740,	2596	17	0

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As to the general advantages and utility of the Road, the following remarks from the Montreal Courier may not be inapplicable to the project, although designed for a rival one; and I offer them as sound views on any communication that will diminish the time and expence of transportation to the far west:—

“In estimating the value of any Railway project, the first consideration is to calculate the probable amount of business which will be done on the proposed route, to ascertain that the traffic on it will be sufficient to secure a reasonable profit on the capital expended in its construction, and cover all expences for repairs; this once satisfactorily ascertained, the project loses its doubtful character; it then becomes rational and promises to become as certainly profitable to its projectors and beneficial to the community as anything in the womb of futurity can possibly be. On looking in this light at the projected Toronto and Lake Huron Rail Road, a superabundance of evidence presents itself to satisfy the most sceptical that the traffic between the great inland seas it would connect is now immense, and doubtless at no distant day will exceed all present calculation, and that were this Rail Road in operation it would command by its superiority in many respects to all other means of transport at present in existence between the proposed points a very large proportion of this traffic. In saying indeed that this undertaking proposes to open a direct communication between Lake Ontario and Lake Huron, its value can be at once appreciated by all who have watched the tide of commerce and population that is pouring to the *far West*, and daily increasing in force and velocity. The country bordering on and beyond Lakes Huron and Michigan which shall be though within the immediate range of the Rail Road, is famed for the fertility of its soil, and according to estimation, could support a population of from twenty to thirty millions of souls; the only convenient route at present to this region both for the

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thousands of emigrants from the Eastern States and those from Europe that are flocking to it, is by the Hudson and Erie Canal, Lake Erie, River Detroit, Lake St. Clair, &c. and the enormous revenue of the Canal, the crowded wharves of Buffalo, the number and capacity of the Steam Boats and other shipping on Lake Erie, all prove the vast amount of traffic between the Western States and Territories on the one side, and the Eastern States, Canada and Europe on the other. Now it cannot surely be doubted that the Toronto and Huron Rail Road, which, as we shall presently show, would be greatly superior in point of expedition, cheapness and safety to the existing route would engage a large share of business. We should deem it useless to dwell upon this point, did not the reasonableness of the undertaking entirely depend upon it, and hence the probability of its being executed with advantage to the capitalist and to the country."

The project receives farther support from the fact that two rival ones have been set on foot, their projection demonstrates the existence of a very general conviction that a Railway between Huron and Ontario would be profitable, and that it would prove no visionary scheme.

Regarding the Toronto and Lake Huron Railway, merely as a means of transit between these Lakes, we shall now proceed to point out some of its astonishing advantages over the route by Buffalo. To reach Green Bay from Lake Ontario by Buffalo, it is necessary to encounter the boisterous navigation of Lake Erie, the rapids of the River Detroit, the crooked channel and shallow waters of Lake St. Clair and the River of the same name, and traverse Lake Huron, thus passing over a distance of not less than 1,100 miles. Again the saving of time would be immense. Hours would suffice for what it now takes as many days to accomplish even by the aid of Steam Boats; but in the transport of merchandize, the difference would be still greater.

At present a sail vessel from Oswego consumes on an average from eighteen to twenty-four days to reach a point on the Upper Lakes as far in advance as Green Bay. At this dilatory rate is the bulk of merchandize and agricultural produce transported between those Lakes. With the contemplated Rail Road however in operation, and the substitution of Steam Boats for sailing vessels on Lake Ontario and Lake Huron, the same point would be reached in 52 hours, including an allowance of time for the transhipment of goods.

That the Toronto and Lake Huron Rail Road would attract from your neighbors a large share of carrying trade, at present almost entirely monopolized by the Hudson and Erie Canal cannot be doubted, not only in consequence of the serious inconveniences experienced on the present route at Buffalo Harbour—for instance the narrowness of the Lake combined with the heavy current near the mouth of the Harbour, constantly setting down the Niagara River frequently causes a detention of from one to three weeks to sailing vessels waiting for a fair wind. The navigation also of Lake Erie is frequently from four to five weeks later in being opened than on the other Lakes, so that merchants at Chicago on the West and South shores of Lake Michigan, Saginaw Bay, Green Bay, or in the North Western States or Territories could receive their goods by the projected Rail Road six or seven weeks earlier than at present, which circumstance would certainly induce them to give a preference to the new route. The advantage of this road may be still farther seen by regarding the vast effect of it, taken in connexion with other improvements now in progress, would have in changing the direction of the intercourse between several of the greatest commercial cities on the continent and the North Western States and Territories. From New York for instance to Green Bay, to any point on Lake Huron or Michigan, the route and the time occupied in traversing it would be as follows :—

From New York to Albany		
hours by Steam Boat.	130 miles	12
" Albany to Oswego via Utica		
hours by Rail Road.	170	" 12
" Oswego to Toronto		
hours by Steam Boat.	160	" 14
" Toronto to Nottawassaga		
hours Rail Road.	80	" 5
" Nottawassaga to Green Bay		
hours by Steam Boat	400	" 38

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The Rail Road between Boston and Albany will bring the former into the same route as New York, and should the Rail Road between Lake Champlain and Ogdensburg be constructed, it will be another feeder to the Toronto and Huron rail way. It is almost unnecessary to remark, that when the improvements of the St. Lawrence are completed, the trade to and from the route will be still more drawn in our direction, and in that of the rail way in question.

We have hitherto been regarding the proposed Toronto and Lake Huron rail way in the sole light of an expeditious mode of communication between Lakes Huron and Ontario, and as a convenience which the inhabitants on their borders, and emigrants from a distance would very gladly avail themselves of. But although, in this view alone, the project could not only be justified, but holds out a most profitable investment to capitalists, yet it is not the only one in which it ought to be examined, or in which alone it appears to good advantage. The Rail Road will pass through a rich district of country where merchandize and surplus produce would be transported along it, and thus increase its resources. To the landholders and farmers of the district within a short distance of the road, it would be of incalculable benefit.

Upon the whole whether we view the likelihood of this undertaking, when completed, intercepting a large portion of the transit trade between the Western and Eastern portions of this continent, or of its creating business for itself, in the fertile district, which is now making rapid strides in population and wealth, where it will be located,—the prospect is cheering, the conviction strengthening, THAT IF ANY RAIL ROAD EVER PAID THE STOCKHOLDERS THIS IN MY OPINION WILL.

R. HIGHAM,
CIVIL ENGINEER

*Office of the Toronto and
Lake Huron Rail Road Com-
pany, Utica, February 1st,
1837.*

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