

man of the Bradford sewage works, until he was appointed superintendent of waterworks and inspector of plumbing department, under the corporation of the manufacturing town of Dewsbury, receiving high class testimonials for the ability displayed in raising the waterworks department to efficiency. In 1882 he came to Canada and put in a system of waterworks for the C. P. Ry. Co. at Montreal. During the past eleven years he has been in business in Toronto.

#### TORONTO HARBOR AND THE PROPOSED ISLAND RAILWAY.

In a discussion last month on the subject of the proposed Toronto Island Railway, this journal cautioned those interested in the future commercial and shipping interests of Toronto against plunging into an ill-considered scheme of bridging the western gap of the harbor at a time and in a way which would work a most serious damage to Toronto as a shipping centre. At the request of the publishers, A. B. Ross, C.E., who has had an extensive experience in railway and bridge work, made an independent estimate of the cost of bridging the gap, and Mr. Ross' report is as follows:

TORONTO, Feb. 22nd, 1897.

DEAR SIR,—In compliance with your request for an estimate of cost of the proposed Island Railway, I herewith submit approximate estimate on four different schemes. Two of these estimates are based on the same conditions as proposed by the City Engineer, and the other two on similar conditions, excepting that they provide for an overhead crossing of all railway tracks near the proposed site of the swing bridge at the Queen's Wharf.

Scheme number one is for a double track street railway, commencing at the corner of King and Bathurst streets, thence down Bathurst street, crossing the railway tracks at its foot by a steel bridge with a ten-foot roadway, and a seven-foot sidewalk on each side of the tracks, thence following down the present public road to the entrance of the Queen's Wharf property, and crossing the railway tracks at that point at grade, thence by a timber trestle approach to a swing bridge across the western channel, and thence around the island to Ward's, as proposed by the City Engineer. This scheme is for a double track street railway only; the trestle approaches to the swing bridge and embankments on the island being only 22 feet wide on top. The estimate for the swing bridge, which is 354 feet in length, provides for a ten-foot roadway and a seven-foot sidewalk on each side of the car tracks, this provision being advisable in case it should be desired at some future time to widen the embankment for a driveway. The estimate for the swing bridge also includes the cost of a crib protection and rest pier, this pier being necessary for the proper protection of the bridge when open, as well as of vessels passing through. For the right of way across the Queen's Wharf property I have allowed \$100,000. This is a capitalization of \$5,000 (the rent paid by the C. P. Railway to the Harbor Commissioners) at 5 per cent.

This may seem excessive, but it must be taken into consideration that a swing bridge at the point proposed, virtually ruins the south face of the Queen's Wharf for dockage purposes, as it will be necessary to keep the channel between the rest pier and the wharf clear for the safe passage of vessels.

#### ESTIMATE OF COST OF SCHEME NO. 1.

Permanent pavement on track allowance .....	\$ 9,200 00
Bridge across track foot of Bathurst St .....	20,000 00
Timber trestle approach, 22 feet wide, Queen's Wharf .....	2,800 00
Swing bridge, including rest pier and turning machinery .....	75,000 00
Embankment on island 22 feet wide .....	16,000 00
Sheet piling and rip-rap protection .....	12,000 00
Right of way and damages across Queen's Wharf .....	100,000 00
Engineering and contingencies .....	15,000 00
<b>Total .....</b>	<b>\$250,000 00</b>

#### SCHEME NO. 2.

The route for this scheme is the same as that of No. 1, but the bridge approaches are 50 feet in width, and the embankment on the island 80 feet. The embankment on the island provides for a 20-foot roadway on each side of the car tracks, and paved with macadam on a cedar log foundation. It also provides for a 12-foot plank sidewalk on each side, concrete foundations for the car rails, and the space between the rails being sodded.

#### ESTIMATE OF COST, SCHEME NO. 2.

Permanent pavement on track allowance.....	\$ 9,200 00
Bridge over tracks, foot of Bathurst St .....	20,000 00
Timber trestle approach on Queen's wharf.....	5,200 00
Swing bridge, including rest pier .....	75,000 00
Embankment 80 ft. wide, paving, side-tracks, etc	158,500 00
Sheet piling protection.....	12,000 00
Right of way and damages.....	100,000 00
Engineering and contingencies .....	30,000 00
<b>Total .....</b>	<b>\$409,900 00</b>
Say \$410,000.	

#### SCHEME NO. 3.

Provides for street car tracks only, as in scheme No. 1, but includes an overhead timber trestle from the swing bridge to the end of the Canadian Pacific Railway freight shed, and embankment to the foot of Bathurst Street. By adopting this arrangement it will leave the present public road from the foot of Bathurst St. to the entrance of Queen's wharf, free for wagon traffic to and from the freight sheds and docks, and will give easy grades with good alignment for the street railway. Part of the present public road is quite narrow, and a double car line would leave very little room for wagon traffic.

#### ESTIMATE OF COST, SCHEME NO. 3.

Permanent pavement on track allowance .....	\$ 6,000 00
Bridge over tracks foot of Bathurst street.....	20,000 00
Embankment 22 feet wide .....	1,500 00
Overhead timber trestle .....	8,000 00
Swing bridge, including rest pier.....	75,000 00
Embankment on island 22 feet wide.....	16,000 00
Sheet piling protection .....	12,000 00
Right of way and damages.....	125,000 00
Engineering and contingencies .....	14,000 00
<b>Total .....</b>	<b>\$277,500 00</b>
Say. \$278,000.	

#### SCHEME NO. 4.

No. 4 is for the same route as Scheme No. 3, but provides for 50-foot overhead timber trestle from the end of the bridge to the end of the Canadian Pacific freight shed and then embankment to the foot of Bathurst street, and an 80-foot embankment on the island part.

#### ESTIMATE OF SCHEME NO. 4.

Permanent pavement on track allowance .....	\$ 6,000 00
Bridge over tracks foot of Bathurst street .....	20,000 00
Embankment and paving .....	3,700 00
Overhead timber and trestle 50 feet wide.....	13,000 00
Swing bridge, including rest pier .....	75,000 00
Embankment on island, pavement, etc.....	158,500 00
Sheet piling protection.....	12,000 00
Right of way and damages.....	150,000 00
Engineering and contingencies .....	30,000 00
<b>Total .....</b>	<b>\$468,200 00</b>
Say, \$468,000.	