

ANNUAL REPORT OF THE ENGINEERING AND PUBLIC WORKS DEPARTMENT

1937



YEARLY REPORT OF
CITY ENGINEER
FREDERICTON, N. B.

1937

I N D E X

YEARLY REPORT OF CITY ENGINEER

FREDERICTON, N.B.

Year 1937

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January 18, 1938.

TO HIS WORSHIP THE MAYOR AND ALDERMEN
OF THE CITY OF FREDERICTON:-

Gentlemen:

I submit herewith this report which is a statement of the work done in the different City Departments under the direct supervision of the City Engineer, and covers the period of time from the first of December 1936 to the first of December 1937.

This report is written with the purpose of reporting to the Council on the costs of the various Departments for the year. It is also written with the idea of having on file an accurate record of the different activities and costs under these departments.

All figures and statements derived from them appearing in this report have been carefully compiled and I believe are correct and fit to be used in working out costs for future expenditures.

The various City activities which come under the supervision of the City Engineer are:-

Roads and Streets, construction and maintenance.
Public Works, construction and maintenance.

Water System, operation, construction and maintenance.
Domestic Sewerage System, operation, construction and maintenance.

Surface Sewers, operation, construction and maintenance.
Street Lights, operation, construction and maintenance.

Shade Trees, planting, pruning, removal, etc.

Other construction or maintenance activities such as repairs to City Hall or other City buildings, or any other work which the Council may from time to time put in the hands of the City Engineer.

Following in the body of this report is a detailed statement of work done, comparative expenditures and unit costs under these different departments. The detailed report of any particular Department can readily be found by referring to the Index found on preceding page.

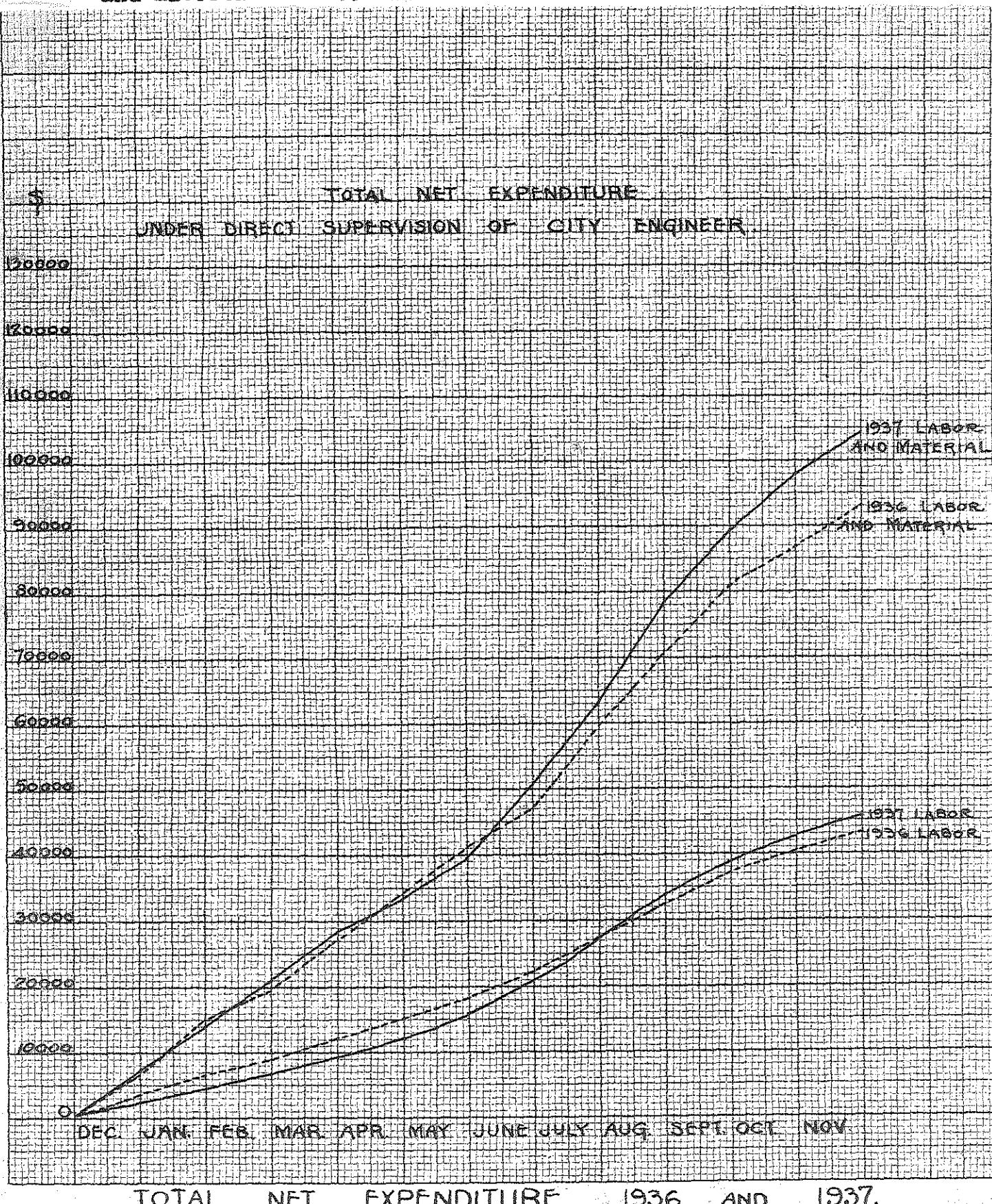
Respectfully submitted,

City Engineer.

TOTAL YEARLY EXPENDITURE

The total yearly net expenditure under the direct supervision of the City Engineer this year amounted to \$104,736.40. This expenditure will be taken up in detail under the different headings in this report.

A graphic comparison for both expenditure for labour and material for 1936 and 1937 is shown on the following chart.



ROADS AND STREETS EXPENDITURES 1937

ROADS AND STREETS

The City of Fredericton Roads and Streets system must be divided into two districts, viz. the Urban district and the Outlying or Rural district. The Urban district is roughly bounded as follows: by the river from Forest Hill Road Crossing to the western City line and on the rear by the line of Albert and Dundonald Street.

The Outlying or Rural district would be the district within the City limits outside of the above mentioned boundaries.

Altogether in Fredericton we have some $44\frac{1}{2}$ miles of roads and streets and about 32 miles of sidewalk. This sidewalk, of course, all lies within the Urban district.

The roads and streets are divided between the two districts as follows:

Miles of Roads and Streets

	<u>Urban</u>	<u>Outlying</u>	<u>Total</u>
Paved	9.49	3.46	12.95
Gravel	<u>8.19</u>	<u>23.21</u>	<u>31.40</u>
Total.....	17.68	26.67	44.35

Gross Expenditure.....	\$34,931.68
Credits.....	12,641.95
Net Expenditure.....	22,289.73
1937 Appropriation.....	20,000.00
Debit Balance.....	2,289.73

The above credits are made up as follows:

Received from other City Departments for work done and materials sold by Roads and Streets Department..... \$9389.45

Received from Provincial Government for work done and material sold by Roads and Streets Department..... 249.90

Work done for or materials sold to private parties by Roads and Streets Department..... 3002.60

Total..... \$12641.95

In the above amount of \$9389.45 shown as having been received from other City Departments appeared the following items:

154 cu. yds. crushed stone @ \$1.90 sold to the Permanent Road Department for curbing.

4054 cu. yds. crushed stone @ \$1.90, sold to Permanent Road Department for paving.

232 cu. yds. crushed stone @ \$1.90 sold to Cement Walks.

702 cu. yds. river gravel @ .50¢, sold to Permanent Road Paving Saint John Road.

In the amount of \$3002.60 shown as receipts from private parties appeared the following items:

12.9 short tons of junk sold to M. Rappaport for \$133.55.

1329 cu. yds. crushed stone sold to the Richardson Construction Company @ \$1.90.

The Gross Expenditure of \$18,060.48 is divided as follows:

Labour.....	\$18,060.48
Material charges and Workmen's Compensation Board.....	<u>16,871.20</u> \$34,931.68

The Labour Charge of \$18,060.48 is divided as follows:

<u>Snowploughing sidewalks:-</u>	\$ 54.43
<u>Snow Central:-</u> Shovelling and hauling snow, ploughing or scraping roads, cleaning gutters of ice and snow and any other means of snow control.....	1263.06
<u>Streets:-</u> General work on maintenance of streets and sidewalks and any other items such as building culverts, curbs and gutters or pavements which are not mentioned under some particular heading.....	3162.53
<u>Surface Sewers:-</u> Cleaning, flushing and repairing surface sewers and building new surface sewers within street limits.....	911.68
<u>Sanding Walks:-</u> Hauling, drying and storing sand in winter storage piles and spreading same on slippery walks	621.94
<u>Yard:-</u> Men working at blacksmith shop and repair work in City Yard, taking summer equipment and storing winter equipment, etc.....	<u>1377.97</u>
Forward...	7391.61

Brot Forward.....	\$7391.61
<u>Gravel:-</u> Tallying.....	41.62
<u>Street Sprinkling:-</u> Water carts	772.93
<u>Stone Crushing:-</u> Repairs to crusher and crushing stone.....	1926.04
<u>Saint John Road:-</u> (Not capital account). All work done on River Road from Alexandra Street to Eastern City line other than work done by power maintainer...	81.73
<u>Doak and Wilsey Road:-</u> All work done on these roads other than work done by power maintainer.....	417.07
<u>New Maryland Road:-</u> From C. P. R. crossing to southern City line. All work done on this road other than that done by power maintainer.....	157.35
<u>Outlying Roads:-</u> Hanwell Road, Cross Roads lying between Brick Hill and College Hill Road, Brick Hill Road, Poor House Hill road, College Hill Road and Forest Hill Road. All work done on these roads other than work done by power maintainer.....	651.36
<u>Street Cleaning:-</u> All cleaning and removal of dirt from streets.....	3522.89
<u>Tarvia Repairs:-</u> Patching and repairing asphalt and tar pavements and sidewalks and applying seal coat of light tar or asphalt to pavement.....	931.35
<u>City Road Patrol:-</u>	780.16
<u>Quarry:-</u> Quarrying and hauling trap rock from City Quarry and from LeBaron Grasse quarry to City Yard...	1277.23
<u>Richardson Construction Company:-</u>	<u>109.14</u>
Total.....	\$18060.48

The above items are made up entirely of labour costs and give a good idea of the amount and kind of work done by the Roads and Streets Department for this year.

Following is a table comparing labour expenditures in these items from 1932 to 1937.

TABLE COMPARING YEARLY COSTS IN ROADS AND STREETS
LABOUR ITEMS

<u>Item</u>	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>	<u>1936</u>	<u>1937</u>
Snowploughing side-walks	234.13	121.71	329.78	225.05	247.00	54.43
Snow Control	1548.55	918.95	4999.27	3973.77	3195.55	1263.06
Streets	617.40	1292.66	940.39	2908.55	1526.75	3162.53
Surface Sewers	450.20	351.75	241.33	238.05	1198.75	911.68
Sanding Walks	203.02	242.07	73.20	108.53	154.10	621.94
Yard	995.31	844.42	1134.39	1073.73	1202.68	1377.97
Gravel				55.91	58.99	41.62
Street Sprinkling	693.45	758.18	813.20	817.63	815.10	772.93
Stone Crushing	713.71		65.66	3550.57	2990.43	1926.04
St. John Road	2812.73	259.45	240.25	497.56	425.21	81.73
Dock & Wilsey Road	2390.52	218.69	99.90	296.30	239.45	417.07
New Maryland Road	6941.61	1935.44	69.87	168.84	98.21	157.35
Outlying Roads	1317.08	518.26	172.12	142.15	594.51	651.36
Street Cleaning	2256.16	1937.02	2409.02	3095.83	2662.17	3522.89
Tarvia Repairs	453.66	346.33	782.82	488.61	738.07	931.35
City Road Patrol	750.61	723.09	715.92	632.88	602.45	780.16
Quarry	1892.10		209.85	6990.20	1737.85	1277.23
Relief					869.78	
Richardson Cons. Co.						109.14
	24,270.24	10,607.98	13,332.51	25,264.14	18,357.85	18,060.48
	24,270.24					887.85

These labour items above may be better understood by the following explanations:

Snow Control:-

Snowploughing roads and streets.....	\$ 95.27
Shovelling and hauling snow and picking ice and ruts in streets.....	423.38
Scarifying walks.....	5.82
Draining Streets.....	114.70
Opening and thawing catch basins.....	140.75
Snow fences.....	365.48
Culverts, opening and thawing.....	52.00
General Expenses.....	65.66
Total.....	\$ 1263.06

This snow control item for 1937 was considerably less than that for 1936 when our labour for snow control amounted to \$3195.55. The difference was due to the different type of winter and not to any lowering of service.

This year shows a new item, "Snow Fencing" amounting to \$365.48 which was the labour cost of putting up snow fences. These snow fences were made of small evergreen trees from six to ten feet high. The cost shown here includes placing of about 1.6 miles of such fences in December 1936, the removal of the same in the spring of 1937 and the replacing of about 1.6 miles of the same type of snow fence this fall. As the labour cost is practically the total cost in this work, I would judge that the cost for the placing and removal of such snow fences has been about \$135.00 per mile.

Streets:

Summary of labour costs:-

Spreading gravel on streets.....	\$452.70
Painting posts near pumping station.....	4.20
Painting lines on streets.....	319.10
Cutting grass on streets.....	111.20
Graham Lane.....	919.92
Queen Street between Carleton and Regent.....	561.39
Spreading calcium chloride.....	36.69
Alexandria Street.....	11.60
Painting Poles.....	93.40
Repairs on streets.....	268.40
Canadian National Railway subway.....	62.10
Green Road.....	158.85
General Expenses.....	<u>162.98</u>
Total.....	\$3162.53

The painting lines on streets above referred to was a labour cost incurred in painting traffic lines on Queen Street, Woodstock Road and Saint John Road and in repainting stop signs.

Graham Lane:-

This \$919.92 labour cost was entirely spent on Graham Lane from Albert Street to Green Road. This so-called lane was never formerly constructed by the City and as it mostly lies on a steep hill, was in very bad repair after the spring's freshet. This lane is about 1400 feet long. The roadway was built to a distance of about 22 feet and a rock paved ditch built on both sides. This lane cannot be widened beyond the present dimensions as we are now out almost against the building line of the houses located on it. This labour cost includes the quarrying and hauling of rock used in the paved ditch construction. Practically a total cost of the work is shown as labour cost.

Queen Street between Carleton and Regent Streets, with a labour expenditure of \$561.39.

This work consisted of the widening of

Queen Street from Regent Street towards Carleton Street on the north side. Here the curb was set back som $4\frac{1}{2}$ feet for a distance of 553 feet along the street line, that is from the corner of Regent Street to the Post Office. The contour of the street was not changed and although the curb was moved back the gutter was left in the same location as before and extended on a slope up to the new curb. This construction materially helped the parking and traffic problem on that portion of Queen Street. Included in this labour cost was the rebuilding of 354 feet of stone fence along the north street line at the edge of the Canadian Legion grounds. The Federal Government, Department of National Defence, which has control of these grounds, donated \$300.00 toward the expense of rebuilding this stone fence. The total cost for this street widening, including curb and gutter and repairs to surface sewerage was \$1200.00.

C. N. R. Subway:- \$62.10

This was for labour supplied to the Richardson Construction Company when they were building the C. N.R. subway. This labour cost was billed to the Richardson Construction Company and has been paid by them to the City and is shown in the Credits for Roads and Streets.

Green Road:-

Labour expenditure of \$158.85. This road was ditched during the late fall but was not put in as good shape as it should be and I believe must be properly built next summer.

Surface Sewers:-

The surface sewer on Northumberland Street was extended from the catch basin just south of the Valley Railway track where it had previously ended, south along Northumberland St. for a distance of 649 feet. The first 373 feet of this extension was made of 12" terra cotta pipe and the last 276 feet made of 10" terra cotta pipe. The sewer was laid to a .3% grade. Four catch basins were built on the corner of Northumberland and Victoria Streets, and two catch basins built one on each side of Northumberland Street at the end of the sewer which was about 70 feet north of Victoria Street.

I believe this sewer extension will permit run off of the ground water which at this location has always laid very near the ground surface most of the summer. The sewer was also necessary to drain the ground surface as this particular area is slightly lower than all the surrounding land and has never had any surface drainage.

Stone Crusher:-

This year the stone crusher ran from July 21st almost steadily until September 2nd, during this time totaling 56 running days of 8 hours each. On September 2nd we had finished crushing all our uncrushed stone and had used up practically all our crushed stone. In November we ran five days recrushing a surplus pile of some 300 tons of 3 inch stone into smaller grades to be used next spring in street patching. Our costs this year ran about the same as those of last year, that is about 38¢ a ton for labour and material.

Quarry:-

From December 28, 1936 to March 23, 1937 we quarried at Grasse's quarry and hauled in to the City Yard with the City Federal truck 2244 tons of trap rock. We used this operation to keep the truck and regular city men busy when we had no other work at hand. This rock cost us f.o.b. City Yard for both labour and material \$1.01 a ton.

From June 23rd to September 1st LeBaron Grasse supplied the City f.o.b. City Yard 1745 tons of trap rock for which we paid him \$1.00 per ton. These two operations together with some 3600 tons which we had on hand in the yard at the first of the year gave us a total for 1937 of rock on hand amounting to 7589 tons. This rock has all been used up during 1937 except some 300 tons of crushed stone now on hand.

Doak and Wilsey Roads:-

This season some \$417.07 was spent in labour on the Doak and Wilsey Roads; \$94.85 on the Doak Road and \$322.22 on the Wilsey Road. This labour does not take in the actual road patrol done by our power maintainer.

Outlying Roads:-

The labour expenditure of \$651.36 was spent as follows:-

College Hill.....	\$35.61
Cross Roads.....	23.64
Hanwell Road.....	153.10
Flanagan Road.....	<u>439.01</u> \$651.36

This year the Hanwell Road within the City limits was turnpiked and gravelled.

The Flanagan Road for a distance of 1450 feet east from the Maryland Road was during the early spring reconstructed.

This road had been nothing but a very rocky trail and impassible for car traffic. This portion of the road was reconstructed by hand but not gravelled. We worked out here at this time principally to give labour to men who were very much in need of assistance and also because the Federal and Provincial Governments were anxious to have this section of the road made passable as they were building a forest fire experimental station at this point.

Tarvia Repairs:-

Patching Streets.....	\$484.46
Patching Woodstock Road.....	42.55
Patching asphalt sidewalks.....	7.71
Patching St. John Road.....	233.90
Seal coating streets.....	104.65
Unloading colas.....	9.65
General Expenses.....	<u>48.43</u>
Total.....	\$931.35

This spring the St. John Road after a heavy late fall and early spring traffic showed a considerable amount of deterioration. This traffic was exceptionally heavy last year at a time when the base of the road was soft as the McNamara Construction Company had a rock quarry situated on Forest Hill and were hauling heavy loads of rock over this pavement during an open fall when the road was freezing and thawing and the base was in no condition to hold up heavy traffic. We patched this road in the first part of June for the following costs:-

1800 gals. Colas @ 12¢.....	\$216.00
26 cu.yds. crushed stone @ \$1.90.....	49.40
Labour.....	233.90
Overhead.....	<u>49.93</u> \$549.23

The following table shows the bituminous material used in 1937. This table includes material used in permanent road account as well as in our ordinary Roads and Streets account.

	<u>Heavy Tar or Asphalt</u> <u>(Tarvia X)</u>	<u>Light Tar or Asphalt</u>	<u>Road Oil Cut Back</u>	<u>Asphal- tum</u> <u>(Colas)</u>
Gallons in stock spring of 1937	44	0	0	0
Gallons purchased 1937	41917	0	4199	8525
Available for season 1937	41961	0	4199	8525
Stock on hand fall of 1937	0	0	0	0
Used in Season of 1937	41961	0	4199	8525

Gravel:-

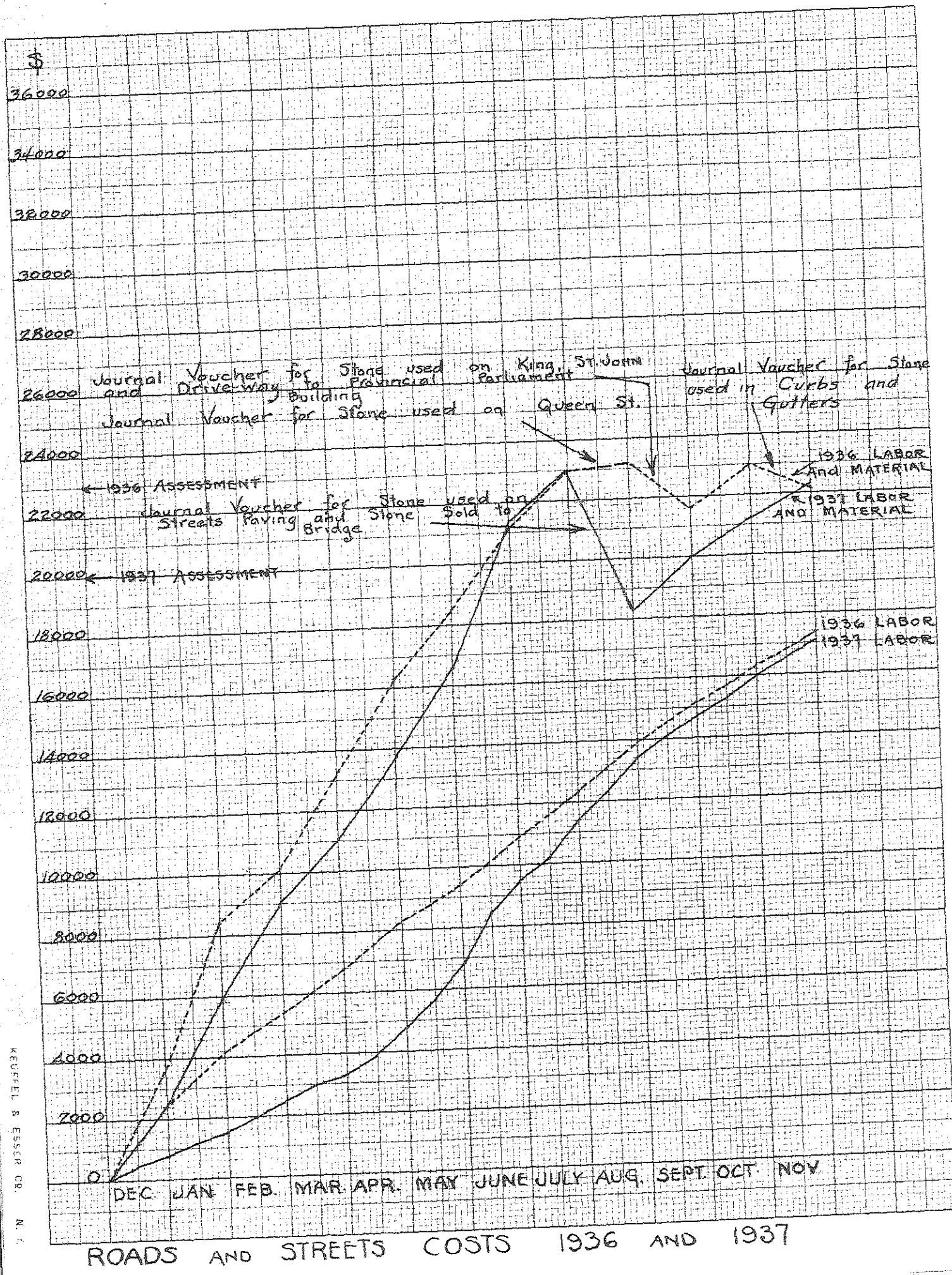
This year we purchased 3500 cu. yds. of river gravel from contractors Carten and Bonnar at a price of 45¢ per cu. yd. f.o.b. the City wharf. The contractors started their operations on the 14th of January and had their contract completed the 24th of February.

**TABLE SHOWING COMPARATIVE COSTS OF
ROADS AND STREETS, YEARS
1927 to 1937.**

Year	Expenditure for Labour	Gross Expenditure Labour and Materials	Credit	Net Costs Labour and Material	Appropriation
1927	15,692.00			25,245.00	26,000.00
1928	17,122.45			26,058.70	26,000.00
1929	14,490.47			26,682.98	31,000.00
1930	16,533.53			34,556.33	32,500.00
1931	26,024.54	50,849.60	15,511.97	35,337.63	31,000.00
1932	25,430.96	39,101.62	4,822.19	34,279.43	25,000.00
1933	10,607.99	19,161.38	333.28	18,829.10	19,000.00
1934	13,332.51	23,665.94	2,311.58	21,354.36	20,000.00
1935	25,264.14	46,588.85	21,502.31	25,086.54	23,000.00
1936	18,357.05	33,238.01	11,059.77	22,178.24	23,000.00
1937	18,060.48	34,931.68	12,641.95	22,289.73	20,000.00

The following plate shows graphic comparison of Roads and Streets costs for years 1936 and 1937.

NO 334 - 2 TN, 10 X 10 TO THE HALF INCH.



PERMANENT ROAD ACCOUNT.

Gross Expenditure.....	\$27,448.94
Credits.....	50.18
Net Expenditure.....	<u>\$27,398.76</u>

The credits as shown of \$50.18 were for two small concrete jobs done on private property for private citizens and have been paid for by these citizens and credited to this account.

This permanent road account must be divided into two items, the St. John Road account for \$2628.14 and city pavement amounting to \$24,770.62.

St. John Road Account:-

This St. John Road account is for the work done by the City on the construction of 1.54 miles of highway from the Experimental Farm to the city limits at Lincoln. The City agreed to reconstruct this portion of road and get it ready for pavement and the Government agreed to lay the pavement. The Provincial Government were to pay one-half the City's cost and the City were to pay one-half of the Provincial Government's costs, provided however that the maximum amount to be paid by the City for their half of the Provincial Government's cost was not to exceed \$9957.85.

The City made this piece of road ready for pavement as agreed upon and sent in the following account to the Provincial Government:

Devon Lumber Company	
1630½ cu. yds. of gravel @ 90¢.....	\$1512.15
City of Fredericton	
from storage pile 702 cu. yds.	
gravel @ 50¢.....	351.00
Total City Payrolls.....	<u>726.45</u>
Total.....	\$2589.60

The Government paid to the City one-half of this amount as per agreement. It may be seen that the accounts as sent in to the Government are \$38.47 less than the total amount of my costs as shown on my books for this work. This \$38.47 is made up by a supervision charge which showed on my accounts but which could not be billed to the Provincial Government.

The Provincial Government completed their agreement by laying pavement on this job. The work was done by the McNamara Construction Co. under the supervision of the Government engineers.

The pavement consisted of a 3 inch wearing course of premixed gravel aggregate black base, with a very light coat of finer premixed seal material. The Provincial Government have not as yet submitted their account for this pavement to the City.

City Pavement:-

Under this capital account \$24,770.62 was spent by the City in paving the following streets in the City proper:

Carleton Street, Charlotte to George.
George Street, Regent to York.
George Street, Northumberland to Smythe.
Charlotte Street, Smythe to Odell Ave.
Smythe Street, Charlotte to Saunders St.
Saunders Street, Smythe to York Street.

Curbs and gutters only, were laid on Church Street from Charlotte to Union Street.

The above listed pavement totals 5613 lineal feet or about 1.06 miles and it consists of 17763 sq. yds. of actual pavement. Besides the actual pavement 4770 lineal feet of curb and gutter were constructed on the job and some 465 feet of 10 inch surface sewer. This surface sewer was laid on Charlotte Street between Smythe and Odell Ave. New curbs were constructed on George Street between Northumberland and Smythe Street; on Charlotte Street between Smythe Street and Odell Ave; on Smythe Street between Charlotte and Saunders Street; on Saunders Street between Northumberland and Westmorland Street; and on Church Street between Charlotte and Union Street although no pavement was laid on this latter block.

This pavement consisted of a 3 inch crushed stone wearing course penetrated with tarvia X. The pavement was constructed as follows: Concrete curbs and gutters were first built on sections which were not already curbed. The road was excavated to the proper grade to coincide with the curbs and gutters and the sub-base built. This sub-base averaged about 5 inches of crushed trap rock bound with sand and rolled to a solid uniform contour. Where possible the old McAdam road was used for sub-base but on the whole the new rock necessary averaged about 5 inches thickness. After the base had been prepared for consolidation it was primed by an application of cut back asphalt at the rate of .27 gallons per square yard. This prime coat was applied in front of the wearing coat so that it would have penetrated the base and dried before the 3 inch stone wearing course was laid down.

At one time during the season we had difficulty in obtaining this cut back asphalt as a primer and the blocks on Charlotte Street and Smythe Street were built without having the base primed.

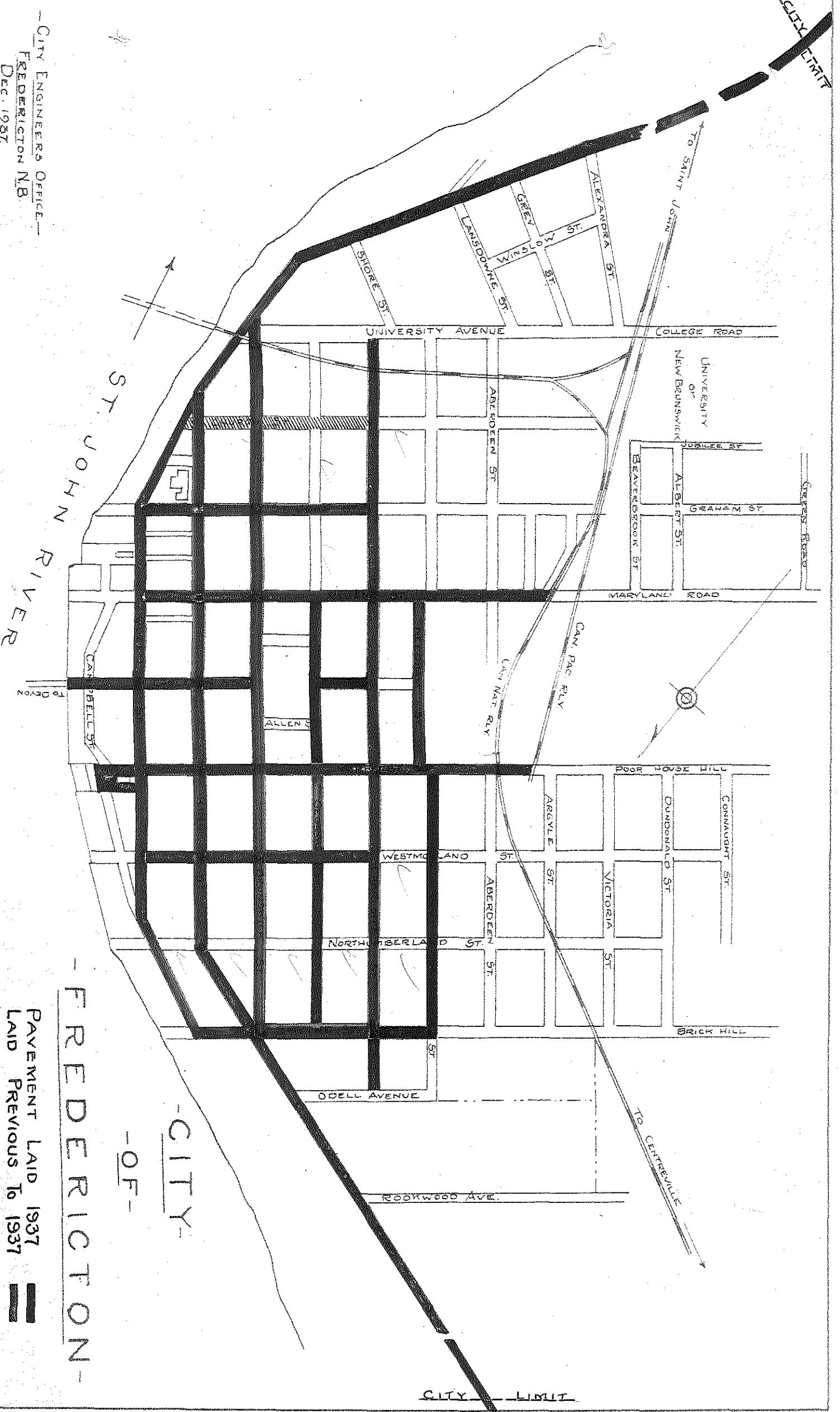
The block on Saunders Street between Westmorland and York Street when excavated seemed to have an excellent sub-base of natural sand and gravel. In this block we laid no other sub-base but after rolling and priming the sand and gravel sub-base we followed with a 4 inch wearing course of coarse base stone which we filled with tarvia X and sealed the same as our finer stone wearing courses.

All the rest of the wearing course on this pavement consisted of a 3 inch wearing course of stone ranging from 1 to $2\frac{1}{2}$ inches. This wearing course after having been rolled was penetrated with 1.86 gallons of tarvia X, then chipped, rolled and sealed by .5 gallons of tarvia X thus making the average amount of tarvia X used in the 3 inch wearing course to be 2.36 gallons per square yard.

Taking into consideration all costs in this paving that is the cost of constructing curb and gutter which had to be constructed for almost one-half the total distance of the pavement, the construction of the 465 feet of 10 inch surface sewer on Charlotte Street, the construction and repairs of most of the catch basins and cross drains on these streets and all other construction cost in any way pertaining to this job, the unit price was \$1.40 per square yard of finished bituminous pavement. This pavement was measured from the edge of the concrete gutter and the unit price is worked out by taking the square yardage of bituminous pavement only although, as I said above, all other costs are added in.

The total cost of this city pavement amounting to \$24770.62 shows a cost of 23% for labour and 77% for material and other expenses.

Following is a map of the City showing the streets paved this year marked in red, and those paved previously marked in blue.



- CITY ENGINEERS OFFICE
 FREDERICTON N.B.
 Dec. 1937

CEMENT SIDEWALKS.

With a gross expenditure of \$7208.16. As there were no actual credits appearing on my books for this account this \$7208.16 is also the net expenditure. On this sidewalk construction labour charges ran to 37% of entire cost. For this amount of money five foot sidewalks were laid at the following locations:

Westmorland -- King to Brunswick St. (West side).
Westmorland -- Brunswick to George St. (West side).
Westmorland -- Charlotte to Saunders St. (West side).
Westmorland -- Saunders to Aberdeen St. (West side).
Aberdeen -- Westmorland to Northumberland St. (South side).
Aberdeen -- Westmorland to Northumberland St. (North side).
Westmorland -- Aberdeen to Argyle St. (East Side).
Westmorland -- Argyle to Victoria St. (West side).
Westmorland -- Victoria to Dundonald St. (West side).
York -- Victoria to Argyle St. (West side).
York -- Victoria to Dundonald St. (West side).
Carleton -- George to Charlotte St. (East side).
Carleton -- Charlotte to Needham St. (East side).
Aberdeen -- Regent to St. John Street (South side).
St. John St. -- Charlotte to Union St. (West side).
Regent -- Aberdeen to Scully St. (East side).
Regent -- C.P.R. to Beaverbrook St. (East side).
Regent -- Brunswick to George St. (East side).
King -- Regent to St. John St. (South side).
King -- St. John to Church St. (South side).
Shore -- University Ave. to Waterloo Row (South side).
Winslow -- Lansdowne to Grey St. (East side).
Winslow -- Grey to Alexandra St.
York -- Dundonald Street (West side).
Alexandra -- Waterloo Row to University Ave. (East side).

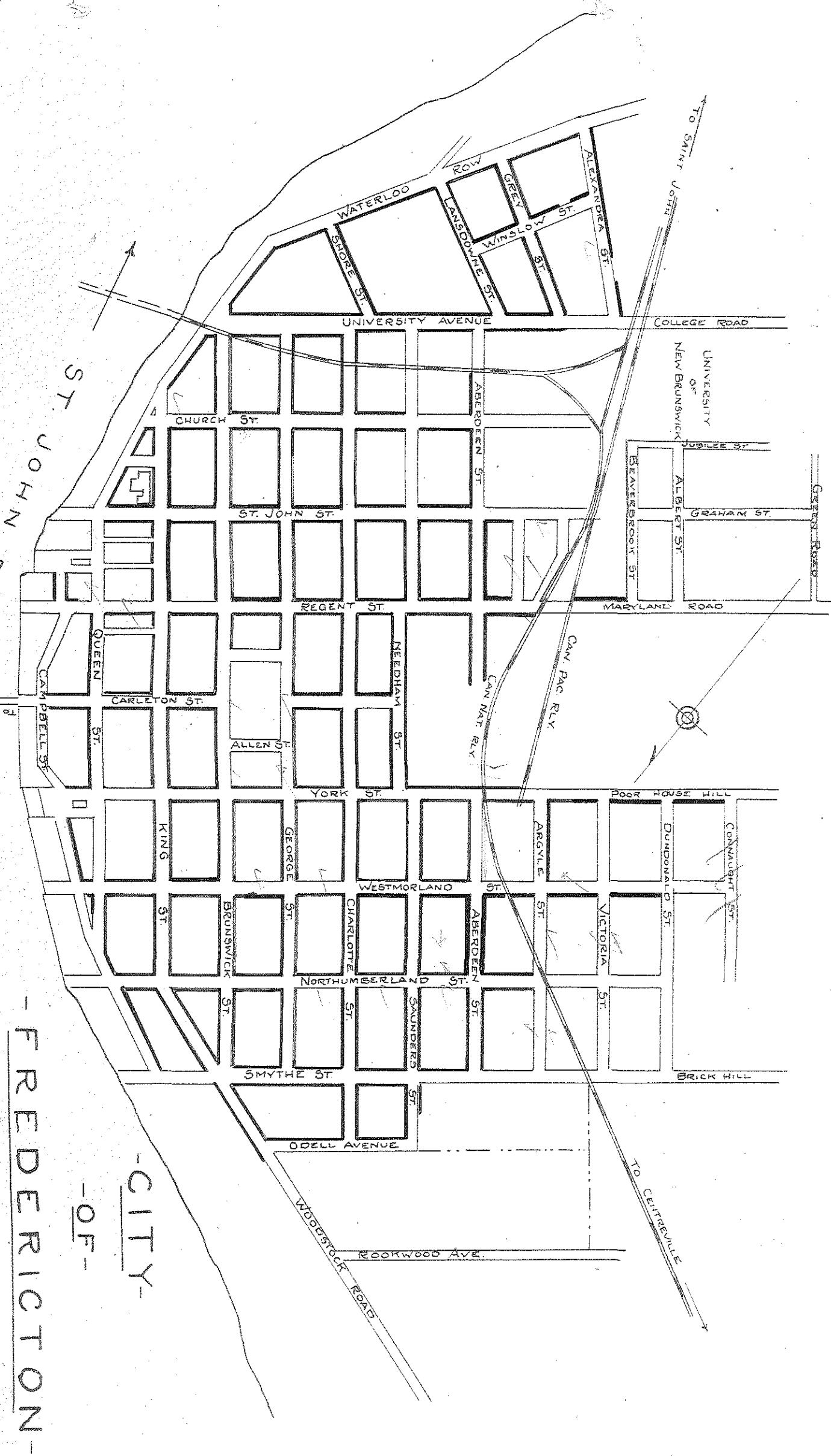
Altogether this sidewalk construction amounted to 10409 feet of 5 foot walk or almost 2 miles. Besides this above mentioned footage some 227 square yards of driveways, sidewalks and steps were put in for private persons. The cost of these extras is included in our above mentioned gross expenditure. Plans have been made up and are on file in the City offices showing all this sidewalk construction and bills have been made up and sent out to the property owners to whom part of this construction must be charged.

Following is a map showing the sidewalks laid this year in red and those laid in previous years in blue.

CITY ENGINEERS OFFICE
FREDERICTON NB
Dec. 1937

ST JOHN RIVER

CONCRETE WALKS LAID 1937 —
WALKS LAID PREVIOUS TO 1937 —



PUBLIC WORKS.

Gross Expenditure.....	\$4283.52
Credits.....	<u>123.45</u>
Net Expenditure.....	\$4160.07
1937 Appropriation.....	<u>5000.00</u>
Credit Balance.....	<u>839.93</u>

The credits of \$123.45 are made up of work done for private parties by the Public Works Department.

Gross Expenditure of \$4283.52 is made up as follows:

Labour.....	\$3673.48
Material costs.....	<u>610.04</u> \$4283.52

The above labour item is divided as follows:

Dump.....	\$1011.04
Back Drain.....	91.05
Trees.....	846.05
Unforeseen Account....	<u>1123.83</u>
Wood Lot.....	<u>601.51</u> \$3673.48

The labour cost charged to dump is for the wages of a dump tender who is employed the year round at our City Dump located on the Fraser Companies property at the junction of the St. John and Wilsey Roads. This item also includes the wages of a night caretaker whom the Fraser Company insisted be employed during the summer season, as without this night caretaker in attendance they were unable to get proper rates on their insurance.

This year the dump has become infested with a species of cock roaches known as Yankee Settlers. We have tried in vain to get rid of this attack of vermin. If they are not killed out by the cold weather this winter it will be necessary to make some expenditure next spring to kill them.

Back Drain:-

No work was done on this drain this year except our seasonal cleaning and removal of weeds.

Trees:-

The trees on all the streets of the City were gone over this summer with the view of pruning and removal of dead wood. Seven trees which were badly decayed or dead were cut down. No new trees were planted this year.

An exceptionally large amount of dead wood was found on the elm trees in that area of the City which had been heavily infested by a parasite known as elm avis which defoliated practically all the elm trees in the section of the City east of Church Street.

The City Council has authorized the purchase of a shade tree sprayer to be used in combating this pest next spring.

Wood Lot:-

During the months of December 1936 and January and February 1937 wood cutting operation was carried on on a piece of the College land situated along the New Maryland Road. We had at this time a number of men on direct relief and the City decided that the better policy would be to have these men work out, at the rate of 25¢ an hour, all direct relief received from the City.

During the months of December, January and February it was difficult to keep all these men employed at regular city labour so the college authorities staked off a section of wood lots and permitted us to clean up the under-bush and certain trees which the Forestry Department did not believe to be of value to the grounds. This work was done under the supervision of Professor Gibson, Dean of Forestry at the University.

Although the work was all carried on by recipients of relief to whom no cash was paid there was a bill of some \$601.51 incurred on this labour because of foremen and the City truck and team which had to be employed on this work. The City were permitted to take any wood salvaged from these cuttings and in this way acquired 487 cords of wood. This wood was hauled in and stored in the City Yard and the Municipal Home grounds. It was cut up and piled by relief labour and is still being used to supply wood to the city poor.

At the first of December 1937 we had on hand about 150 cords of this wood. Although the Municipal Home Department received this wood, the actual expenses of \$601.51 put on this operation by our paid city employees has been charged to Public Works account.

Unforeseen Account:-

Labour cost is divided as follows:

Christmas tree.....	9.50
Work done for Y.M.C.A.....	13.88
Bushing out river roads.....	17.40
Decorations and fire works for coronation.....	30.00
Queen Square playground.....	31.03
City greens.....	623.58
	Fwd. 725.39

Brot Forward.....	725.39
Cutting grass for Stuart Neill.....	13.60
Cutting grass on College Field.....	60.80
Cutting grass for Canadian Legion.....	38.40
Spraying for mosquitos.....	8.37
Work at Fredericton race track.....	51.29
Work at Fredericton Golf Club.....	67.20
Work at Fredericton Exhibition Grounds.....	36.60
Making survey re Dunn's Crossing.....	47.20
Cutting bushes on flats.....	14.20
General Expenses.....	<u>60.78</u>
Total.....	\$1123.83

In the above written list under Unforeseen Account the following items were, in other years, done by the Local Improvement Society:

Playground Queen Square.
 Labour on Greens
 Cutting grass for Stuart Neill
 Cutting grass for College Field
 Cutting grass for Canadian Legion

In all this amounted to \$767.41 labour cost. However, to get the total labour cost of what was formerly known as Local Improvement work we must add \$424.10 which is the amount paid out in labour by the Local Improvement Society for work done in the Old Burial Ground. This makes a total of \$1191.51 for labour of which however the City has paid through their payrolls only \$767.41. The other \$424.10 was paid by the Local Improvement Society from funds which they derived from other sources than that of the Municipality of the City of Fredericton.

Besides this \$424.10 spent by the Local Improvement Society on labour I would think there were other amounts spent by this society which would have brought their yearly expenditure to over \$500.00. The society this year obligated themselves to take over all the maintenance of the Old Burial Ground.

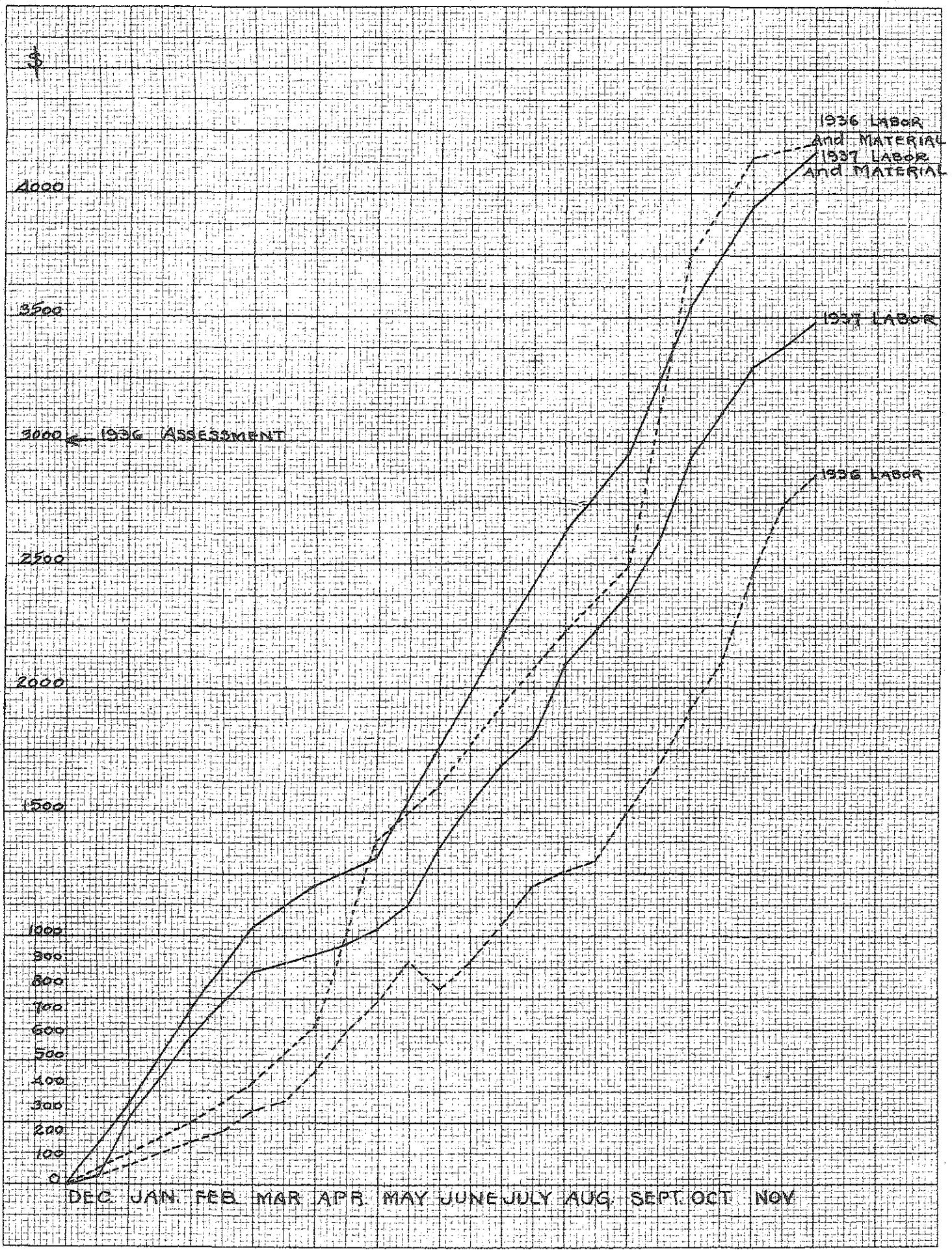
TABLE SHOWING COMPARATIVE YEARLY COSTS
OF PUBLIC WORKS.

Year	Expenditure for labour	Gross Expenditure Labour and Materials	Credits	Net Costs Labour and Materials	Appro- priations
1927	1,204.90			2,520.00	4,000.00
1928	2,470.39			3,156.87	3,000.00
1929	1,685.59	2,606.00		2,626.00	5,000.00
1930	2,729.82	3,379.09	237.90	3,159.19	5,000.00
1931	1,574.17	1,982.91	61.95	1,920.96	2,500.00
1932	3,797.65	4,992.98	322.35	4,670.63	2,500.00
1933	3,948.39	5,294.06	474.89	4,919.17	4,500.00
1934	3,734.85	4,929.00	1,302.36	3,626.64	4,000.00
1935	2,906.24	4,425.84	2,776.96	1,648.88	3,000.00
1936	2,867.38	4,211.33	2.73	4,208.60	3,000.00
1937	3,673.48	4,283.52	123.45	4,160.07	5,000.00

The following plate shows graphically a comparison
of 1936 and 1937 Public Works costs.

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-5000 ← 1937 ASSESSMENT



PUBLIC WORKS COSTS 1936 AND 1937.

STREET LIGHTS.

The street light system consists of some 17.93 miles of pole line and 381 lamps. Thirty-six of these lamps are only lighted during exhibition time. This system is divided into four circuits. Two circuits are each controlled by a constant current transformer of 15 K.W. capacity. The other two circuits are each controlled by a constant current transformer of 25 K.W. capacity. These transformers along with the main switch board are housed in a transformer room in the old street light building on Carleton Street.

The circuits are made up as follows:-

Lower Front Circuit:-

16 - 600 C.P. lamps at .372 K.W. demand.....	5.95 K.W.
48 - 250 C.P. lamps at .155 K.W. demand.....	7.44 K.W.
9 - 100 C.P. lamps at .0716 K.W. demand.....	<u>.644</u> K.W. 14.034 K.W.

Lower Rear Circuit:-

86 - 250 C.P. lamps at .155 K.W. demand.....	13.33 K.W.
31 - 100 C.P. lamps at .0716 K.W. demand.....	<u>2.219</u> K.W. 15.549 K.W.

Upper Front Circuit:-

1 - 600 C.P. lamp at .372 K.W. demand.....	.372 K.W.
76 - 250 C.P. lamps at .155 K.W. demand.....	<u>11.76</u> K.W. 12.152 K.W.

Upper Rear Circuit:

114 - 250 C.P. lamps at .155 K.W. demand.....	17.67 K.W. <u>17.67</u> K.W.
	Total K.W. Demand..... 59.405 K.W.

In the upper rear circuit are included 8 - 250 C.P. lamps in the Exhibition Building proper and 39 - 250 C.P. lamps used in lighting the Exhibition and trotting park grounds. Of these 47 lamps only 11 are kept continually in the circuit. The other 36 lamps are only lighted when the exhibition is being held.

These lights are turned on in the evening and off in the morning by two time clock switches, each time clock controlling two circuits. The time at which lights go on and off is governed by a schedule which is supplied by the City to the Maritime Electric who set the time clocks accordingly.

The power for street lighting purposes is purchased from the Maritime Electric at a contract price as agreed upon.

in the contract between the Maritime Electric and the City made in 1927.

Besides providing for the price of power this contract states that all maintenance of street light circuits, installation of new lamps, etc., shall be done by the Maritime Electric Company at a contract price of \$20.00 a mile of pole line. All material such as wire, poles, pole fixtures, lamps, lamp fixtures, transformers, etc., is paid for by the City but installed by the Maritime Electric under their contract price for maintenance.

Any new installations which require an enlargement of circuits must be paid for by the City both labour and material.

The following new installations were made in 1937:

Fredericton Post Office.....	2 standards
Corner Queen and York Street.....	1- 600 C.P.
Queen and Carleton Street.....	1- 600 "
Queen near Subway.....	1- 250 "
Brunswick St. near Subway.....	1- 250 "
University Ave. near Subway.....	1- 250 "
Wilmot Alley.....	1- 250 "
George Street railway crossing.....	1- 250 "
George Street between Regent and St. John Street...	1- 250 "
Victoria St. between York and Smythe.....	2- 250 "
Winslow St. between Alexandra and Grey St.....	1- 250 "
Alexandra St. between Winslow and University Ave...	2- 250 "
St. John Street near McLeod Ave.....	1- 250 "
Jubilee Street.....	2- 250 "
Beaverbrook Street.....	2- 250 "
Forest Hill Road.....	4- 250 "
Grey St. between Winslow and University Ave.....	1- 250 "

These new installations have increased our demand on the street light circuits by about 4 K.W. of demand in the lamps themselves. In the two standard installation at the Post Office the old standards and globes which have been in place for some time were used. These would not permit of large enough wire to hook them directly on our street light system so they were rewired in multiple and connected with the electric system of the Post Office. They are now operated by a switch installed in the Post Office. The Post Office authorities turn them on and off as they see fit and pay for the current used.

It will be seen by consulting the table shown on the following page that our consumption of K.W.H's. for street lighting has been increasing each year over the last five years while our demand in K.W's seems to have remained constant except for an increase of about 9 K.W. in 1937. This is not exactly true however as our demand has been increasing along with the increase in our consumption of energy. The fact is that the meters owned by the Maritime Electric Company and used to measure our demand had been more or less out of order and the

Company has been billing us on an agreed upon demand of 45 K.W. during 1934 - 36. New demand meters were installed by the Company during 1937 and our demand when accurately measured showed the increase which had been accumulating over the last three years.

In the spring of 1937 two R.V. 60 cycle 25 K.W. transformers were purchased to replace two 15 K.W. transformers on two of our street lighting circuits. These transformers cost us \$657.00 each f.o.b. Fredericton. The cost of installation for material and labour which was done by the Maritime Electric Company was \$214.40 making the total cost for material and labour for this change of transformer capacity to be \$1528.40. This cost not only purchased and installed the two new 25 K.W. transformers, but at the time of installation the switch board in the transformer room was changed to a better location and the wiring in the room much improved.

Temporary adjustments to our street lighting circuits were made at small costs to distribute the load on the circuits more evenly and take advantage of our increased transformer capacity. We now have on hand the two old 15 K.W. transformers which were replaced by the new 25's.

All street light poles, 98 in number, belonging to the City were painted red and white.

Street lighting costs for the year 1937 are divided as follows:

Gross Expenditure.....	\$9688.62
Credits.....	Nil
Net Expenditure.....	9688.62
1937 appropriation.....	<u>7500.00</u>
Dr. Balance.....	2188.62

This gross expenditure is made up as follows:

Current from November 27, 1936 to November 27, 1937, 213552 K.W.H.....	\$ 5767.18
Maintenance, labour as per contract with Maritime Electric..	330.96

Lamps for Replacement:-

12 - 600 C.P. lamps @ \$1.90.....	22.80	
360 - 250 C.P. lamps @ \$1.41.....	507.60	
60 - 100 C.P. lamps @ .68¢.....	<u>40.80</u>	571.20
Material purchased for new installations and maintenance of lamp fixtures (including only such articles as lamp standards, lamp brackets, heads, sockets, shades, etc.).....	288.46	
Material and extra labour used in line maintenance..	1002.17	
New Transformer installation.....	1528.40	
Miscellaneous charges.....	<u>200.25</u>	

Total..\$ 9688.62

The following is a list of facts re street lighting:

	<u>1933</u>	<u>1934</u>	<u>1935</u>	<u>1936</u>	<u>1937</u>
Average monthly demand in K.W.	45.6	45.0	45.0	45.0	54.25
Total K.W.H. consumed by street lights.....	180780	188640	202940	207240	213552
Number of nights streets lighted.....	367	365	366	365	364
Total hours light burnt.....	3893	3864	4010	3979	3971
Total cost for year for demand and energy..	4912.89	5053.79	5341.24	5430.39	5767.18
Average cost for year for demand and energy per K.W.H.,	2.72¢	2.67¢	2.63¢	2.62¢	2.70¢
Average cost per burning hour for energy alone.....	\$.94	\$.98	\$1.00	\$1.05	\$1.08
Average cost per burning hour for demand and energy.....	\$1.26	\$1.31	\$1.33	\$1.36	\$1.45
Total cost per year for street lighting, all charges included	6425.87	6065.28	6632.33	6957.72	9688.62

The total per capita charge for street lighting for
1937, (assuming population of 11000 persons) equals 9688.62 = 88¢
11000

TABLE SHOWING CURRENT CHARGES FOR 1937

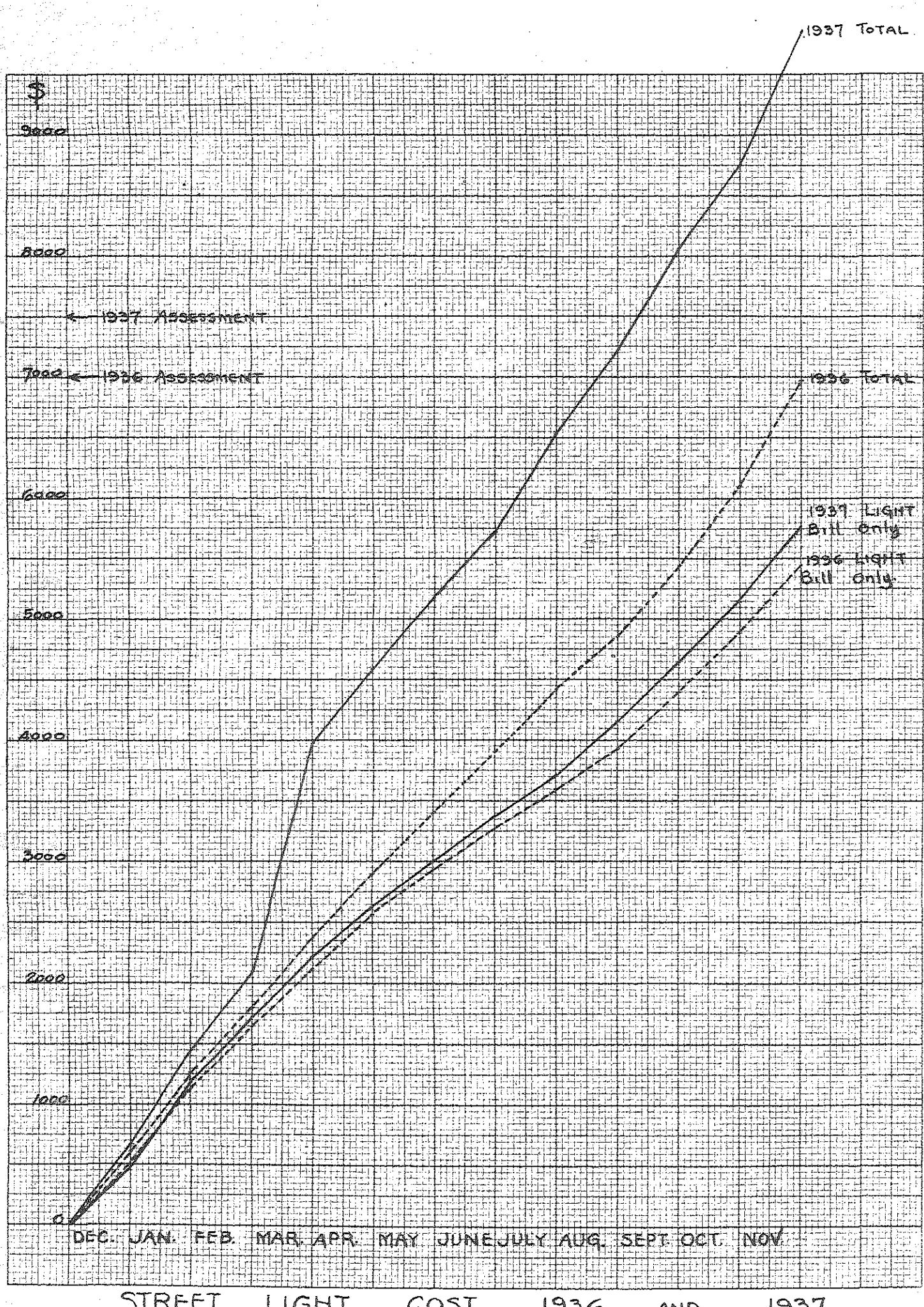
Date of Bill	K.W.H.	Demand in K.W.	Average No. of burning hours per night	Bill per month	Days per Bill	Burning hours in each bill
Nov. 27/36 to Dec. 31/37	20220	45	14½	511.36	34	501.50
Dec. 31/37 to Jan. 27/37	26570	56	14½	661.51	27	391.50
Jan. 27/37 to Feb. 26/37	21650	54	13	556.72	30	390.00
Feb. 26/37 to Mar. 27/37	17900	55	11½	484.41	29	326.25
Mar. 27/37 to Apr. 30/37	15540	52	9½	429.97	34	323.00
Apr. 30/37 to May 28/37	12770	52	8½	375.20	28	238.00
May 28/37 to June 25/37	11770	54	7½	358.99	28	203.00
June 25/37 to July 30/37	10700	53	7½	335.88	35	262.50
July 30/37 to Aug. 28/37	16282	54	8½	449.73	28	245.00
Aug. 28/37 to Sept. 27/37	17650	60	10½	488.48	30	315.00
Sept. 27/37 to Oct. 29/37	20300	56	12	533.88	32	384.00
Oct. 29/37 to Nov. 27/37	22200	60	13½	581.05	29	391.50
	213552			5767.18	364	3971.25

TABLE SHOWING COMPARATIVE YEARLY COSTS
IN STREET LIGHTING

Year	Total Yearly Cost	Yearly Appropriation
1927	\$ 8,088.41	\$ 8,000.00
1928	7,323.41	7,000.00
1929	7,434.72	7,000.00
1930	7,115.40	7,000.00
1931	6,672.23	10,000.00
1932	6,532.51	6,000.00
1933	6,425.87	6,000.00
1934	6,065.28	6,000.00
1935	6,632.33	6,000.00
1936	6,957.72	7,000.00
1937	9,688.62	7,500.00

A graphic comparison of 1936 and 1937 street light expenditure and power cost is shown on the following plate:-

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BATHING BEACH

This year as usual we maintained a bathing beach at the end of Smythe Street near the water works under the care and supervision of Mr. Charles Williams. The beach was opened under his supervision from June 5th 1937 to September 9th, 1937 at a total cost to the City of \$286.10, made up of \$283.10 labour and \$3.00 material charges.

MUNICIPAL HOME

Under this heading appears on my books \$804.15 as a labour item. This is the cost of hauling and delivering 455 loads of wood from the City wood yard to different persons in the City of Fredericton. I received orders for all these deliveries from Mr. Armstrong, the Poor Commissioner, and the cost above shown is the cost for delivery only and does not include any charge for the wood itself. This shows an average delivery charge of \$1.76 per load. These loads, I believe, would average about one and one-quarter cords.

The rather high delivery charge may be accounted for by the irregularity with which delivery had to be made and also by the fact that about one-quarter of this wood was delivered from our wood cutting operations on Maryland Hill.

SEWERAGE DOMESTIC.

Gross Expenditure.....	\$3605.71
Credits.....	1361.11
Net Expenditure.....	\$2244.60

This credit of \$1361.11 is made up of work done on domestic sewers for private citizens and has been billed to those persons.

The gross expenditure is made up as follows:

Labour.....	\$1753.76
Material charges.....	1851.95

\$3605.71

A domestic sewerage extension was made this year on Northumberland Street where the sewer was extended 133 feet to Victoria Street and thence up Victoria Street a distance of 303 feet. This extension was made with 8 inch terra cotta pipe.

New customers connected to the City's sewerage system this year.....	35
Old services which had to be dug up and replaced on account of roots in the sewer.....	4

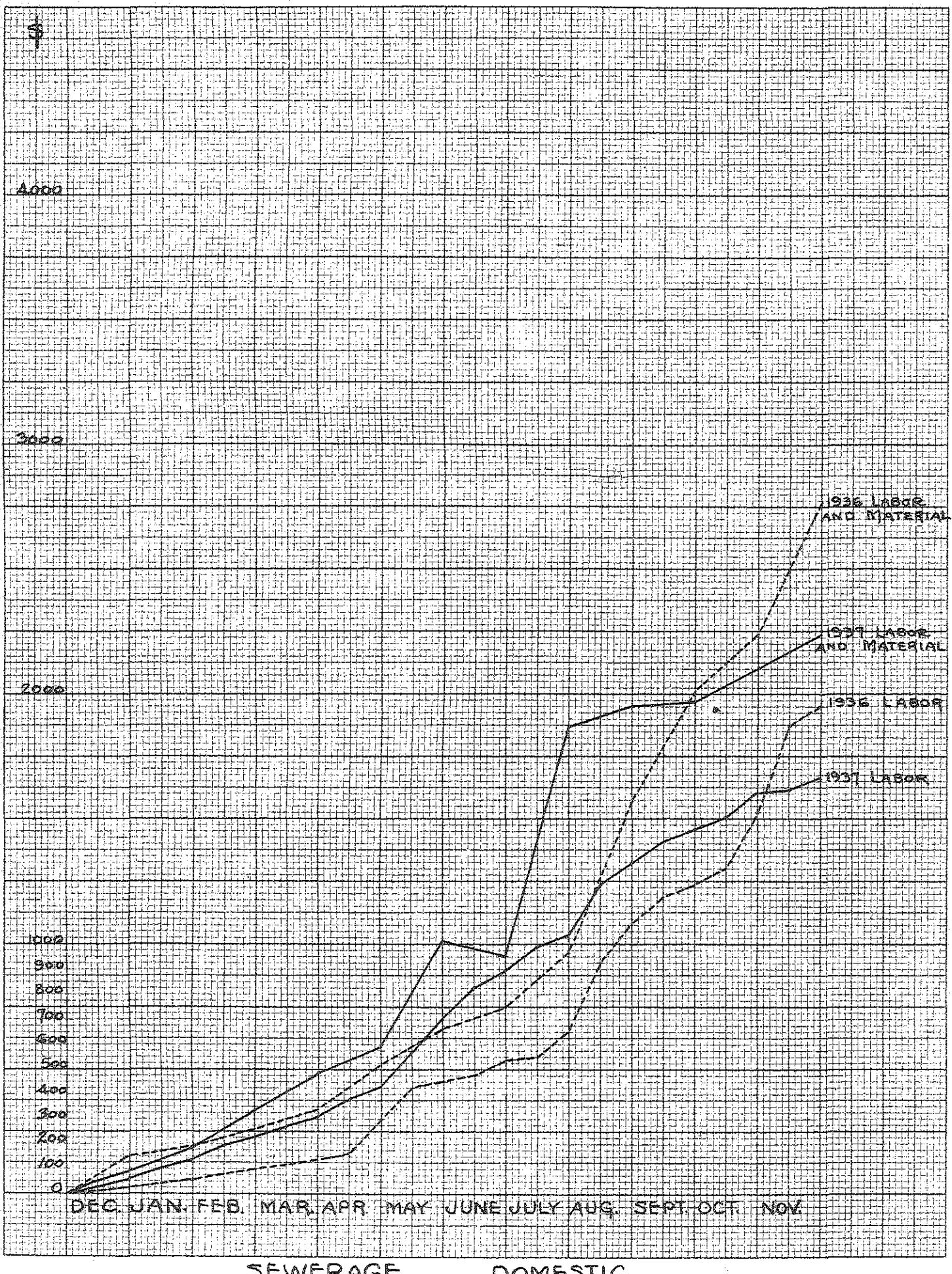
The entire domestic sewerage system was flushed out twice during the year, once from April 27 to May 14 at a labour cost of \$129.75 and once from October 13th to 24th at a labour cost of \$115.20.

Surface sewerage was charged \$65.00 by Water Pumping Station for the water used in these two flushes.

We had our usual trouble on Argyle Street between Westmorland and Northumberland Street with the surface sewer at this location freezing. We did considerable thawing at this point between February 2nd and March 25th.

A graphic comparison of domestic sewerage costs for 1936 and 1937 is shown on the following plate:-

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WATER.

The expenditure in this department is divided into two headings, viz., Water Ordinary and Water Pumping Station.

WATER ORDINARY.

This account takes in all expenditures for water outside the pumping station and pumping station grounds. The expenditure under this heading is made up as follows:-

Gross Expenditure.....	\$7657.67
Credits.....	<u>256.46</u>
Net Expenditure.....	\$7401.21

The credits are made up of work done for and material sold to private parties when installing a water service over grounds other than city property or when the material is to be used on parts of systems which do not belong to the City.

The gross expenditure is made up as follows:

City Payrolls for hydrants	\$ 552.25
City Payrolls for meters.....	1197.31
Payrolls for distribution system.....	<u>1969.30</u>
Total Payrolls.....	3718.86
Material and other charges.....	<u>3938.81</u>
Gross Expenditure.....	\$7657.67

We have in the City 148 hydrants. Our above costs show us an average yearly cost per hydrant for labour only, of \$3.73. These hydrants consist of five 8" hydrants, thirty-nine 6" hydrants and one hundred and four 4" hydrants.

Of all our water services in the City 535 are charged under flat rate and 1080 are on meter giving us altogether 1615 services.

The labour cost this year per meter for installing, reading, repairing, testing, etc. is \$1.10.

Fifty-one meters were found stopped this year and had to be repaired.

All meters are read four times a year but bills are only sent out twice a year. The intermediate reading on which no bills are sent out is taken to check up on any abnormal consumption whereby water is being wasted and a large bill run up on a customer. We have about 25 customers whose meters are read once a month although they also are billed only twice a year. These are customers who ordinarily have large consumptions and where a stopped meter or a meter turned over without being noticed would mean considerable loss of revenue to the City.

Meters in service 1936.....	1049
Services metered for first time in 1937.	<u>37</u>
Total.....	1086
Meters taken off service in 1937.....	<u>6</u>
Services on meter Nov. 1937.....	1080

Meters in Store Room January 1, 1938

5/8 meters repaired and satisfactory for service.....	3
5/8 meters that can be repaired and made satisfactory for service.....	0
New 5/8 meters.....	4
3/8 meters fit for service.....	0
1 inch meters fit for service.....	0
1 inch meters that can be repaired and made fit for service.....	1
1½ inch meters fit for service.....	0

The City purchased this year 45 new 5/8 inch trident meters. The serial numbers of these meters run as follows:

211976 to 211977
5076030 to 5076054
5210180 to 5210194

We purchased no new water meters last year.

Distribution System:-

New water services put in this year.....	24
Old water services re-laid this year.....	21
Frozen services which had to be thawed.....	4

We had in this City on the 30th of November 1937 sixteen hundred and fifteen water services of which 1080 are on meter and 535 are on flat rate.

The Fredericton distribution system consists of 16.51 miles of water main made up of the following sizes:

10" main.....	1.53 miles
8" main.....	3.82 miles
6" main.....	8.84 miles
4" main.....	1.99 miles
3" main.....	<u>.33</u> miles 16.51 miles

The water mains were flushed on April 27th and 28th. It is generally necessary to do this in the early spring. During the summer and fall the watering carts and our sewerage flushing keeps the distribution system in very good condition except for a dead end on Woodstock Road and one on Saint John Road. These dead ends are flushed when we get complaints from nearby customers.

Because of the construction of the subway at the end of the bridge at the junction of University Ave. and Waterloo Row it was necessary to lower the water main beneath this subway construction for a distance of 225 feet. This main had formerly been 6 inch but we relaid in 8 inch thus bringing the size of water main beneath the subway to equalize that running west on Waterloo Row. From there down Waterloo Row in an easterly direction the main is 6 inch. The cost of this construction was entirely borne by the city and amounted to \$139.05 in labour charges and \$670.34 in material charges, making a total of \$809.39.

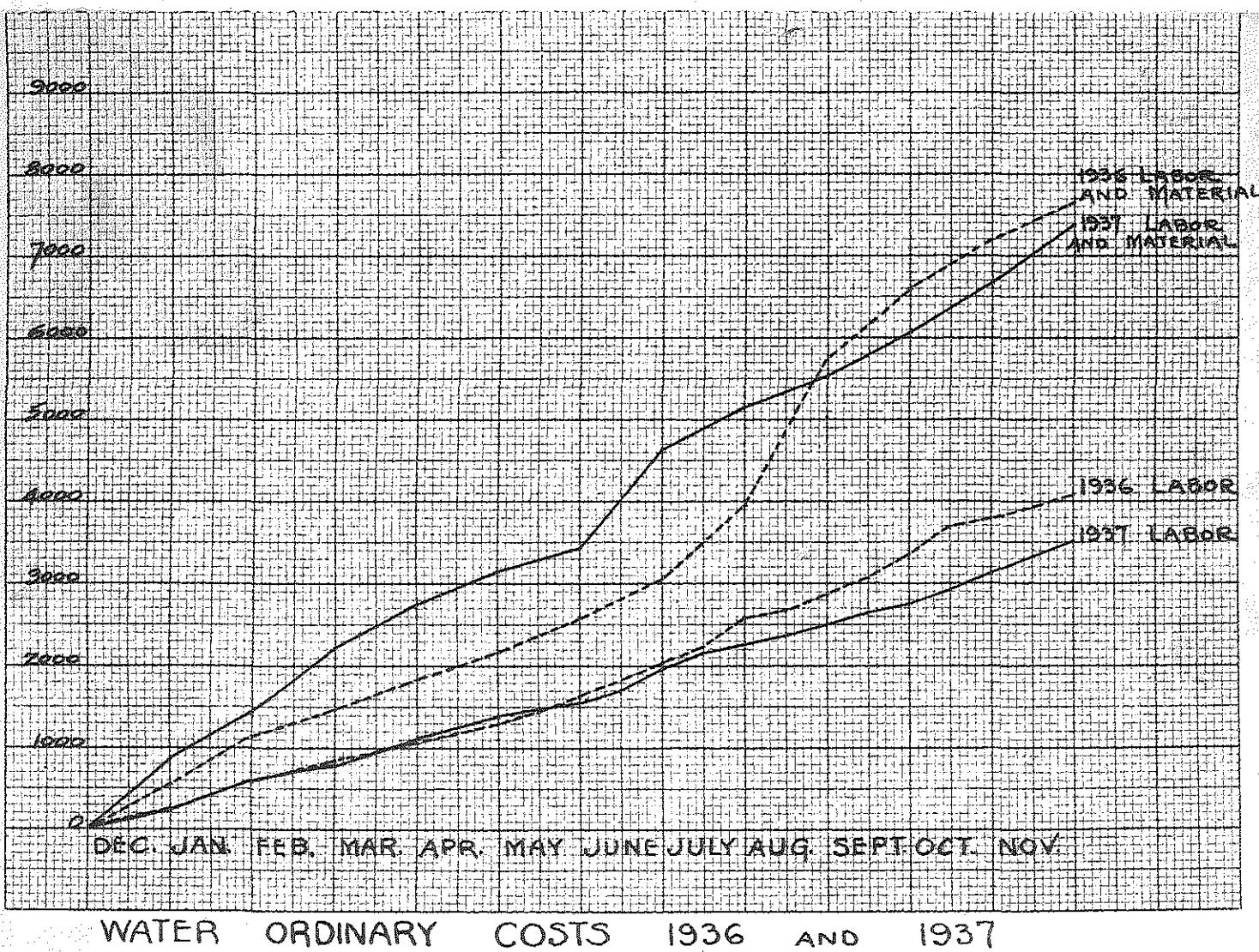
Note:- We did not find it necessary to lower our domestic sewer at this point but did have to shorten up two of our domestic sewerage manholes.

-tw-

TABLE SHOWING COMPARATIVE YEARLY COSTS
WATER ORDINARY.

Year	Labour	Material	Gross Expenditure	Credits	Net Expenditure
1929	3,236.77	2,203.13	5,439.90		5,439.90
1930	3,647.97	2,313.18	5,961.15		5,961.15
1931	3,836.33	4,376.87	8,213.20		7,933.55
1932	2,666.30	1,854.06	4,520.36		4,397.89
1933	2,333.25	1,604.17	3,937.42		3,907.15
1934	3,247.51	4,112.34	7,359.85		6,468.62
1935	5,372.83	5,897.23	11,270.06		10,871.64
1936	4,303.14	3,725.91	8,029.05		7,636.70
1937	3,718.86	3,938.81	7,657.67		7,401.21

A graphic comparison of expenditure on water ordinary for years 1936 and 1937 is shown on the following plate:



WATER ORDINARY COSTS 1936 AND 1937

WATER PUMPING STATION.

The water pumping station under the Plant Superintendent and Chief Engineer, John Malloy, has been kept in a very satisfactory condition.

During the year our low lift and service motor driven pumps were each readjusted as to rings and brushed after each month of service.

The coagulating basin was emptied and washed four times during the year.

Valves of the operating table for the filters were overhauled and repacked.

Both boilers were inspected by the boiler inspector and reported O.K. These boilers have been thoroughly cleaned. The fire box linings were removed and renewed and had new arches installed over the fire hold doors. The feed and blow-off connections were renewed in the east boiler.

A break occurred in the four inch air line from the air blower to the filters. This old line was taken out and renewed by installing a new section with leaded joints.

The air blower room was painted.

The sewerage system below the floor of the Allis Chalmers engine room was cleaned out and partially renewed. This sewerage system is now in as good condition as it is possible to get it with the grade at which it was first installed. This grade is very small but cannot now be altered on account of other permanent installations.

The fender pier in front of the intake pier in the river was partially rebuilt by constructing a new front of 8 inch spruce squared timbers backed up by stone concrete masonry and with the corners covered by heavy steel flashing. A concrete top consisting of about 8 inches of concrete reinforced by old road machine blades was laid on the top of the front half of the pier. The intake pier was cleaned out and the line from the pier to the low lift pump well flushed out. The top of the intake pier had to be partially renewed.

The low lift pump well was cleaned out. The steam syphon used in pumping out this well to clean it had to be renewed this year. It required about 25 feet of 3 inch pipe to do this job.

The pumping station grounds were as usual kept in good condition by the pumping station operators.

The chemical treatment of the water which consists of lime treatment and alum treatment to aid the filter operations was this year carried on as usual under the supervision of Dr.

H. H. Hagerman, City analysist. This service is performed of course by the regular water works operators under the direct supervision of John Malloy, Chief Engineer and Plant Superintendent.

Following is Dr. Hagerman's report for the year 1937.

FREDERICTON WATER SUPPLY - YEAR 1937

Total Count of Bacteria per c.c., Agar, two days.

Date of Samples	Raw Water	Effluent	Tap Water	Per Cent Removal
1937				
December 30/36	2000	1	5	99.9
January 13	600	2	2	99.7
" 25	300	0	2	100.0
February 11	650	0	-	100.0
" 15	2300	2	1	99.9
" 22	1000	2	4	99.8
March 15	1400	2	4	99.8
" 22	3000	1	3	99.9
April 11	6500	5	3	99.9
" 15	2500	5	3	99.8
" 21	12000	1	1	100.0
May 12	800	0	1	100.0
" 31	500	1	1	99.8
June 8	600	1	1	99.8
" 23	360	0	1	100.0
July 9	130	2	2	99.3
" 27	110	2	2	98.2
August 14	170	3	2	98.3
" 28	800	1	1	99.9
September 17	210	1	0	99.5
" 28	460	4	4	99.1
October 18	300	1	1	99.3
" 26	5000	10	15	99.8
" 31	2000	5	15	99.8
November 14	3000	1	2	99.9
" 24	1000	2	2	99.8
December 17	3200	0	1	100.0
" 28	260	1	1	99.6
Averages	51150	53	70	
	1827	1.89	3.3	

Average per cent Removal equals 99.896 or practically 99.9 p.c.

For Comparison:

1933	<u>2525</u>	<u>3.7</u>	<u>4.7</u>	<u>99.85</u>
1935	<u>2197</u>	<u>2.4</u>	<u>3.2</u>	<u>99.9</u>
1936	<u>2213</u>	<u>2.67</u>	<u>3.3</u>	<u>99.9</u>

The treatment of the water has been carried on during the year as usual, using hypo continuously and also alum during a large portion of the year. 1937 has been in many ways a difficult one from the water purification standpoint. Especially has this been so during the last three or four months in which time we have had to cope with at least four minor freshets. As I have pointed out so many times before, certain conditions arise particularly in the fall freshets, when it is impossible to obtain entirely satisfactory results. The water has been rendered safe enough from the standpoint of bacteria but the appearance and clearness has not always been as good as we could wish. In my opinion we shall always meet these difficulties with the present equipment.

Fredericton, N.B., Dec. 31 1937

(sgd). H.H. Hagerman.

Water Pumping Station Cost, 1937.

Gross Expenditure.....	\$19678.21
Credits.....	<u>3708.99</u>
Net Expenditure.....	\$15969.22

The credits of \$3708.99 are made up in the following manner:

12.4 tons of coal charged to the pumping station, sold to other city departments.....	\$ 59.49
Water used by Roads and Streets Department to sprinkle streets and flush sewers.....	250.00
Water charged to sewerage domestic for flushing domestic sewers.....	65.00
Water used in City Hall building.....	50.00
Water used in old street light bldg. Carleton St.	25.00
Water used in City yard.....	10.00
Water used in City Alms House.....	25.00
Water used in City parks.....	50.00
To yearly rental on 150 hydrants @ \$20.00....	3000.00
Junk sold to M. Rappaport.....	165.50
Chloride of lime sold to P. Gerow.....	<u>9.00</u>
Total... \$3708.99	

The gross expenditure is divided as follows:

City Payrolls for salaries of engineer at Pumping Station.....	\$5582.18
Work done by other City employees in and around Pumping Station.....	1354.08
Total City Payrolls.....	6936.26
Material and Workmen's Compensation charges..	12741.95
Gross Expenditure.....	\$19678.21

The material cost of \$12741.95 is itemized as follows:

Item # 1	Light and power supplied by Maritime Electric Co. -- 321,767 K.W.H.....	\$7303.99
Item # 2	Transformer charges.....	151.92
Item # 3	Lime, 8100 lbs., Price \$2.95-\$3.09 f.o.b. Fredericton.....	201.71
Item # 4	Alum, 168,000 lbs. = 84 tons, Price \$1.26 - \$1.43 per 100# f.o.b. Fredericton (all costs included).....	2250.08
Item # 5	Coal, 166.3 tons (12.375 tons of preceeding amount sold to other city departments...)	765.51
Item # 6	Fuel Oil.....	133.24
Item # 7	Engine Oil (237½ gallons) Renown.....	32.83
Item # 8	Motor Oil, 42 gallons.....	33.78
Item # 9	Gasoline, 128 gallons.....	-----
Item #10	Maintenance and repairs of the buildings and machinery.....	744.67
Item #11	New installations.....	84.48
Item #12	Supplies, packing, rags, etc.....	25.81
Item #13	Stationery, forms, charts, etc.....	-----
Item #14	Workmen's Compensation Board (this cost all carried by Water Ordinary this year).....	-----
Item #15	Dr. Hagerman's salary.....	900.00
Item #16	Hoisting chemicals.....	86.00
Item #17	Miscellaneous, telephone, etc.....	21.93
		\$12741.95

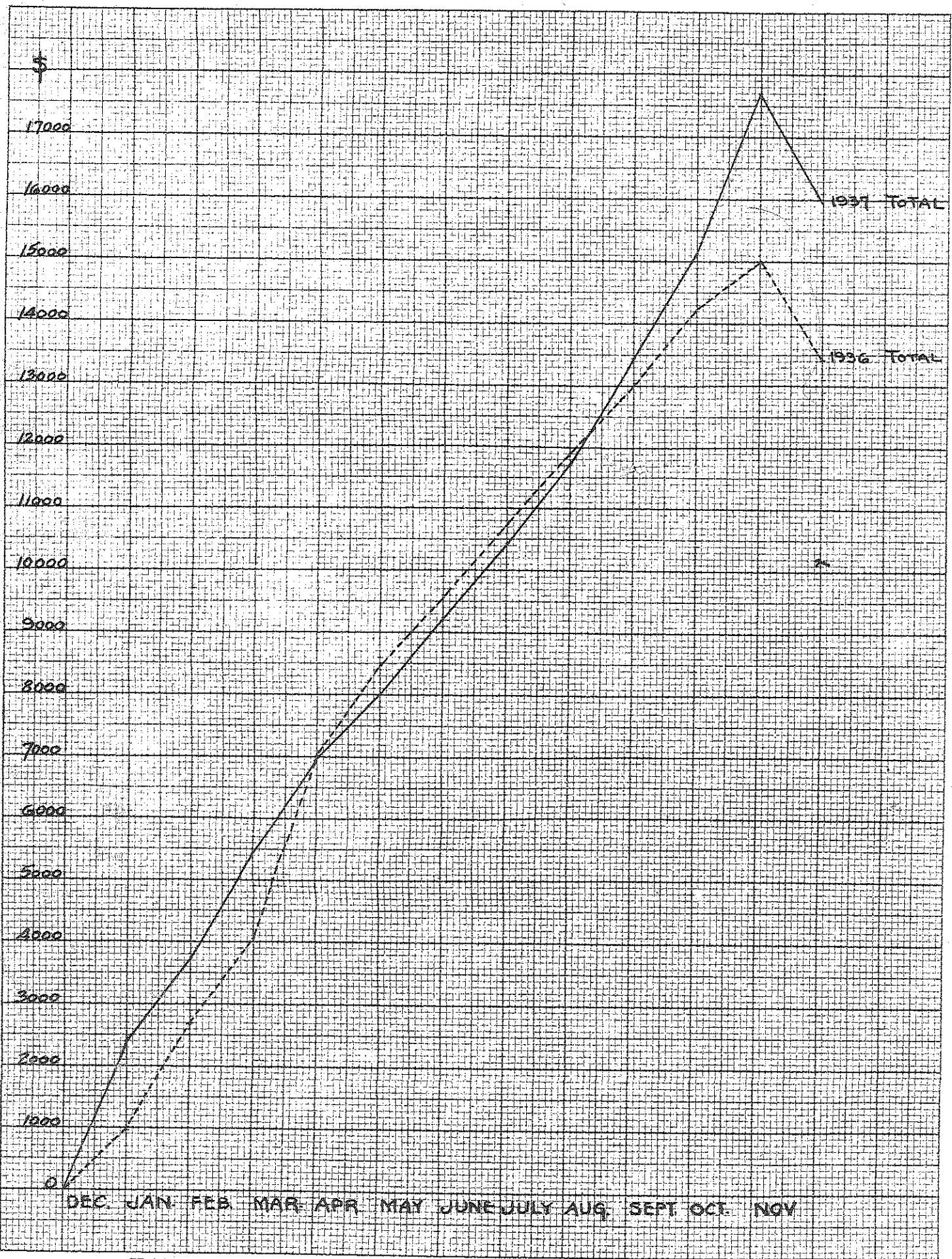
**COMPARISON OF WATER PUMPED AND COSTS
FOR LAST ELEVEN YEARS.**

Year	I.G. Water Pumped	Yearly Gross Expenditure at Pumping Station	Pumping Station Costs per 1000 gal.	Total Yearly Water Costs (Net Expen- diture of Water Ordin- ary and Gross Expenditure of Water Pump Station)	Total Yearly Cost per 1000 gal.
1927	198,168,000	18,040.65	9.10 cents	24,636.62	13.0 cent
1928	192,890,000	18,245.05	9.46 "	26,122.73	13.5 "
1929	195,590,000	17,722.44	9.00 "	32,142.34	16.4 "
1930	204,405,000	16,791.22	8.21 "	22,752.37	11.1 "
1931	187,164,000	16,425.55	8.8 "	24,359.10	13.0 "
1932	171,032,000	16,915.58	9.9 "	21,313.47	12.5 "
1933	175,050,000	16,483.67	9.5 "	20,390.82	11.6 "
1934	202,720,000	15,999.50	7.9 "	22,468.12	11.1 "
1935	197,641,000	16,251.61	8.1 "	27,123.25	13.6 "
1936	193,450,000	17,189.21	8.8 "	24,825.91	12.8 "
1937	187,008,000	19,678.21	10.5 "	27,079.42	14.5 "

All these preceding costs shown under Water Pumping Station and Water Ordinary do not include the costs of billing and collecting water bills or any other overhead charges included in City Government costs nor do they include bond payments or sinking fund charges.

The following chart gives a graphic comparison of water pumping station costs for the year 1936 and 1937.

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WATER PUMPING STATION COSTS 1936 AND 1937.

Table Compiled from Daily Pumping Station Charts
year 1937, showing water pumped and material
and machinery used in pumping.

Total Hours in Month	Month	Gals. Water Pumped	Coal lbs.	K.W.H.	Hours Supplied By			Fuel and Lubricants			Low Lift Pumps Hours Run			Service Pumps Hours Run		
					Mari- time	Steam	Gas	Pts. Eng.	Pts. Steam	Gals. Oil	No.1 Motor	No.2 Motor	Steam	No.1 Motor	No.2 Motor	Steam
744	Dec.	16445000	36,500	29790	743 $\frac{1}{4}$	39	16	542 $\frac{1}{4}$	106 $\frac{1}{2}$	72	6	-	741 $\frac{1}{4}$	-	2 $\frac{1}{4}$	
744	1937	17210090	35,500	20862	672	676 $\frac{1}{2}$	67	34 $\frac{1}{2}$	34 $\frac{1}{2}$	72	14	531 $\frac{1}{2}$	503	14 $\frac{1}{2}$	2 $\frac{1}{4}$	
672	Feb.	15575000	37,300	25065	744	2422	744	39	39	720	554	520 $\frac{1}{4}$	520 $\frac{1}{4}$	1 $\frac{1}{2}$	2 $\frac{1}{4}$	
744	Mar.	16695000	35,750	2422	720	23973	720	37 $\frac{1}{2}$	37 $\frac{1}{2}$	720	23864	23864	23864	23864	2 $\frac{1}{4}$	
720	Apr.	13298000	30,800	23864	744	25154	720	37 $\frac{1}{2}$	37 $\frac{1}{2}$	720	25154	25154	25154	25154	40	
744	May	15840000	18,800	25154	744	27885	744	40	40	720	29901	29901	29901	29901	42 $\frac{1}{2}$	
720	June	14530000	8,200	27885	744	29901	744	42 $\frac{1}{2}$	42 $\frac{1}{2}$	720	29901	29901	29901	29901	42 $\frac{1}{2}$	
744	July	15180000	15,180	29901	744	42 $\frac{1}{2}$	42 $\frac{1}{2}$	42 $\frac{1}{2}$	42 $\frac{1}{2}$	720	35954	35954	35954	35954	4 $\frac{1}{2}$	
744	Aug.	17265000	22,000	35954	744	42 $\frac{1}{2}$	42 $\frac{1}{2}$	42 $\frac{1}{2}$	42 $\frac{1}{2}$	720	5984 $\frac{1}{4}$	5984 $\frac{1}{4}$	5984 $\frac{1}{4}$	5984 $\frac{1}{4}$	5 $\frac{1}{2}$	
720	Sept.	15920000	9,200	5984 $\frac{1}{4}$	744	42 $\frac{1}{2}$	42 $\frac{1}{2}$	42 $\frac{1}{2}$	42 $\frac{1}{2}$	720	504	504	504	504	5 $\frac{1}{2}$	
744	Oct.	15370000	18,600	504	744	46 $\frac{1}{2}$	46 $\frac{1}{2}$	46 $\frac{1}{2}$	46 $\frac{1}{2}$	720	744	744	744	744	5 $\frac{1}{2}$	
720	Nov.	13680000	26,200	46 $\frac{1}{2}$	720	55	5	540 $\frac{1}{4}$	578 $\frac{1}{4}$	2	3	719	719	719	719	
8760		187008000	277,550	321767	8675 $\frac{1}{2}$	67	3 $\frac{3}{4}$	572 $\frac{1}{2}$	72	60	6762 $\frac{1}{2}$	23 $\frac{3}{4}$	56	2362 $\frac{1}{4}$	64	3 $\frac{1}{4}$