

ANNUAL REPORT OF THE ENGINEERING AND PUBLIC WORKS DEPARTMENT

1950



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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, 1949 to the first of December, 1950.

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 an accurate record on file of the different activities and costs under these Departments.

This year along with our regular maintenance work the City crews constructed the following new works:

Pavement,88 Miles
Gravel Road Construction,	3. Miles
Concrete Curb and Gutter,	2.36 Miles
Concrete Sidewalk,07 Miles
8" to 24" Surface Sewer,63 Miles
5" to 12" Domestic Sewer,	3.45 Miles
6" Water Main,8 Miles

The location of the above listed work is shown on the map on the following page.

The City of Fredericton occupies a total of some 23.5 square miles. This mileage excludes the water area occupied by the Saint John River within the boundaries of the City.

The City's population is, I believe, at the present time about 18,000 persons.

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

Respectfully submitted,

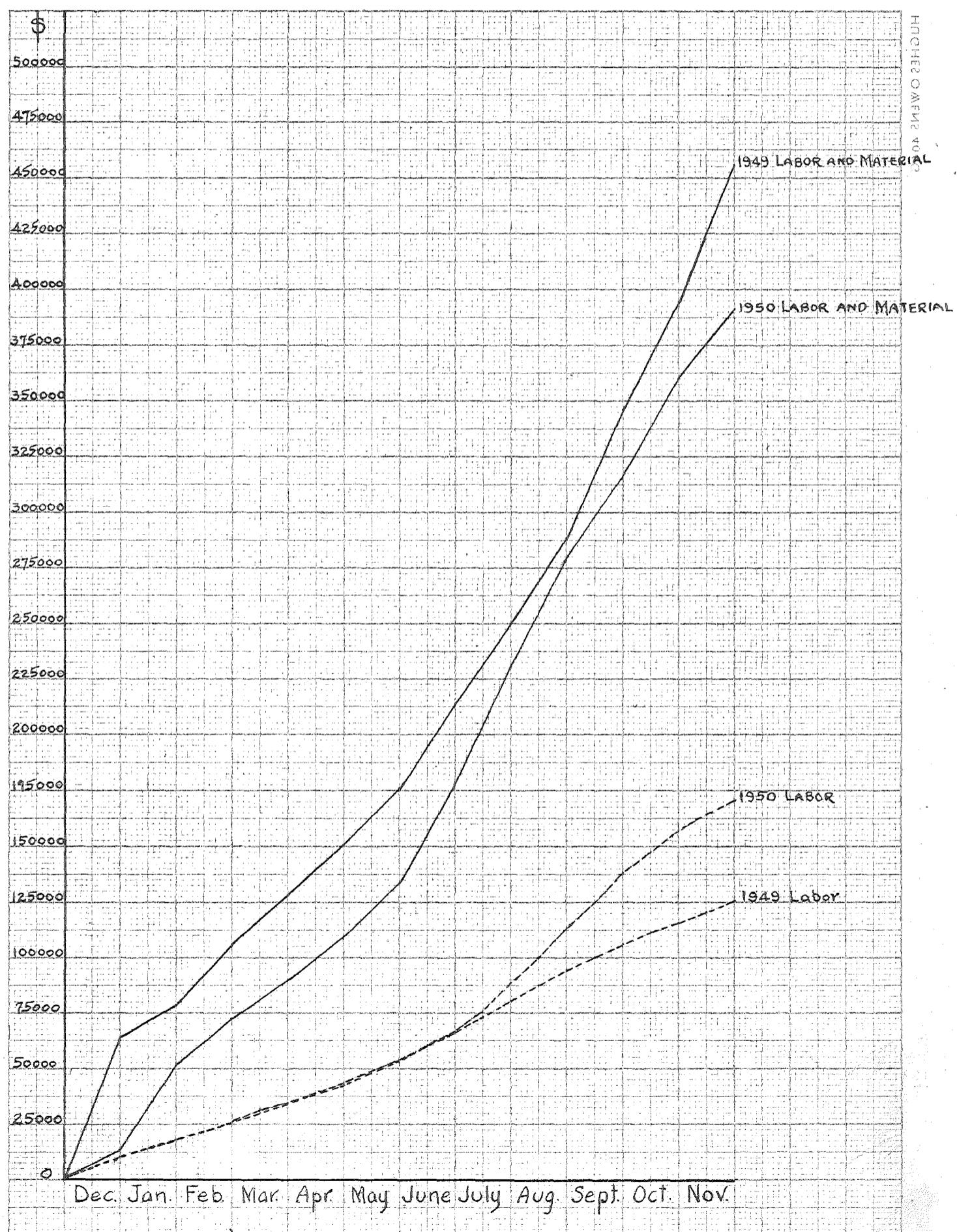
City Engineer.

TOTAL YEARLY EXPENDITURE.

The expenditures shown in this report cover the period of time from December 1st, 1949 to December 1st, 1950.

The Total Yearly Net Expenditure under the direct supervision of the City Engineer this year amounted to \$391,709.73. This expenditure will be taken up in detail under the different headings in this report. The total Gross Expenditure for this period amounted to \$574,995.69.

A graphic comparison of expenditure for labour and material for the year 1950 is shown on the following chart.



TOTAL NET EXPENDITURE 1949 AND 1950.

ROADS AND STREETS.

This year we had an appropriation for Roads and Streets of \$85,000.00. We over-expended this appropriation by \$15,181.60.

We have in Fredericton altogether some 56.87 miles or roads and streets.

Our paved and unpaved streets are divided between the Rural and Urban Districts as follows:-

<u>Roads and Streets.</u>		<u>Urban.</u>	<u>Outlying.</u>	<u>Total.</u>
Paved	20.52	3.46	23.98
Gravel	9.68	23.21	32.89
Total	30.20		26.67	56.87

Roads and Streets Expenditures 1950:

Gross Expenditures	\$110,169.90
Credits	9,988.30
Net Expenditures	100,181.60
1950 Appropriation	85,000.00
Deficit	\$ 15,181.60

The above Credits are made up as follows:

Scott Concrete Works (Sale of Stone Crusher)	\$ 475.00
Miles Service Station (5 Bags Calcium Chloride)	18.50
Gerald Grant (2 Loads Scrap 5,080 lbs. 2.54 tons (@ \$13.00 per ton))	33.02
Imperial Oil (Credit Note Sale of Drums)	71.00
Colwell Construction Co. (Hire of Shovel 15 hrs. (@ \$7.00 per hr.))	105.00
J. L. Simms & Son, Ltd. (Installation of Drain)	180.25
Journal Voucher (8 Empty Drums used for Float)	40.00
Journal Voucher (Labour)	276.90
Journal Voucher (Car Expenses)	500.00
Journal Voucher (Machinery Rental)	6,966.60
Journal Voucher (Workmen's Compensation)	512.03
Journal Voucher (Wood) 81 loads @ \$10 per load	810.00
Total	\$ 9,988.30

The Gross Expenditure is divided as follows:-

Labour	\$ 52,154.51
Material charges and Workmen's Compensation	59,015.39

I have divided the Labour Charges of \$52,154.51 into the following items. Although these items are made up entirely of labour costs, they give a good idea of the amount and kind of work done by the Roads and Streets Department during the year.

Item 1. <u>Snowploughing sidewalks:-</u>	\$ 319.59
2. <u>Snow Control:-</u> Shovelling and hauling snow, ploughing or scraping roads, cleaning gutters, thawing catch basins, of ice and snow and any other means of snow control.....	11,348.98
3. <u>Streets:-</u> General work of maintenance of streets and sidewalks and any other items as building culverts, curbs and gutters or pavements which are not mentioned under some particular heading	6,182.19
4. <u>Surface Sewers:-</u> Cleaning, flushing and repairing surface sewers and building new surface sewers within street limits	3,426.24
5. <u>Sanding Walks:-</u> Storing sand in winter storage piles and spreading same on slippery walks	2,067.79
6. <u>YARD:-</u> Men working in blacksmith shop and repair work in City Yard, taking summer equipment out and storing winter equipment	1,973.93
7. <u>Gravel:-</u> Used for maintenance on City Roads and Streets	5,246.41
8. <u>St. John Road:-</u> All work done on the River Road from Alexandra Street to eastern city line other than work done by power maintainer and pavement maintenance	92.27
9. <u>Doak and Wilsey Roads:-</u> All work done on these roads other than work done by power maintainer	216.15
10. <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, or by special contract..	162.44
11. <u>Kilarney Road</u>	-----
12. <u>Outlying Roads:-</u> Hanwell Road, Cross Road lying between Brick Hill and College Hill and Forest Hill Road. All work done on these roads other than work done by power maintainer	925.21
13. <u>Street Cleaning:-</u> All cleaning and removal of dirt, leaves, etc. from streets	13,431.84
14. <u>Tarvia Repairs:-</u> Patching and repairing asphalt or tar pavement and sidewalks and applying seal coat of light tar or asphalt to pavements	2,835.38
15. <u>City Road Patrol</u>	804.04
16. <u>City Forest</u>	<u>3,122.05</u>
Total	\$52,154.51

Following is a table comparing Labour Expenditure in these items from 1947 to 1950.

TABLE COMPARING YEARLY COSTS IN ROADS AND STREETS
LABOUR ITEMS.

Item		1947	1948	1949.	1950
1.	Snowploughing sidewalks	\$ 255.51	187.35	197.26	319.59
2.	Snow Control	7,832.44	11,281.23	7,130.54	11,348.98
3.	Streets	7,158.80	6,527.10	5,945.38	6,182.19
4.	Surface Sewers	595.70	480.23	1,627.19	3,426.24
5.	Sanding Walks	1,997.76	1,398.85	2,403.32	2,067.79
6.	Yard	1,006.19	1,605.38	1,734.12	1,973.93
7.	Gravel	3,677.75	3,105.20	2,594.78	5,246.41
8.	St. John River Rd.	398.10	3,853.72	72.65	92.27
9.	Doak & Wilsey Roads	965.68	2,863.32	83.61	216.15
10.	New Maryland Road	-----	121.48	182.01	162.44
11.	Killarney Road	175.84	33.63	-----	-----
12.	Outlying Roads	1,021.68	581.20	90.42	925.21
13.	Street Cleaning	12,072.44	13,948.03	11,757.46	13,431.84
14.	Tarvia Repair	1,101.86	2,006.41	1,508.48	2,835.38
15.	City Road Patrol	655.19	836.33	670.56	804.04
16.	City Forest	2,493.05	2,212.27	3,719.00	3,122.05
Total		\$42,445.99	51,042.03	39,716.78	52,154.51

Some of these above items for labour may be better understood by the following explanations:

Item 2.

<u>Snow Control:-</u>	<u>1948</u>	<u>1949.</u>	<u>1950.</u>
Snowploughing roads and streets	786.24	707.68	1,279.89
Shovelling and hauling snow	8,857.88	3,738.13	8,098.56
Catch Basins	406.78	663.11	632.83
Snow Fences	443.51	670.99	483.81
Keeping Drains on hills open	447.57	1,162.01	801.29
Thawing Culverts	47.98	164.76	52.60
General Expenses	289.27	23.86	-----
	\$11,281.23	7,150.54	11,348.98

It is interesting to note the account submitted to the Provincial Government for Snow Control. This account does not exactly coincide with this report as to dates, being expenditures made from November 9th, 1949 to May 10th, 1950. It is, however, a very exact account of Snow Control costs during the above period and I am incorporating it in this report for record purposes.

Fredericton, N.B. May 31st, 1950.

Department of Public Works,
Province of New Brunswick,

In account with the
CITY OF FREDERICTON

City of Fredericton - SNOW CONTROL ACCOUNT
November 9, 1949 to May 10, 1950.

City Pay-rolls charged to Snow Control November 9, 1949 to May 10, 1950	\$12,955.06
Workmen's Compensation	388.65

Pension Fund paid by City	\$.	647.75
City Trucks		
Chev. 1945 - $2\frac{1}{2}$ ton License #C-1184		
Chev. 1945 -3 ton License #C-1183		
International 1941 $2\frac{1}{2}$ ton License #C-1187		
Total Hours City Trucks - 1797 hours @ \$1.40		2,515.80
City Road Patrols		
Caterpillar Diesel #10		
Adams Diesel #412		
Total Hours City Road Patrols 983 hours @ \$3.25		3,194.75
City Shovel - 36 hours @ \$4.00		144.00
City Jeeps		
License #1212		
License #1213		
Total Hours City Jeeps 432 hours @ \$1.00		432.00
City Team 328 hours @ \$.50		164.00
Thawing Machine 187 hours @ \$1.40		261.80
Sicard Snowblower		
Note: Wages of operator do not appear as they are included in payroll charged to snow control.		
Actual use 205 hours.		
734 gals. gas @ \$.279		204.79
26 qts. oil @ \$.50		13.00
Insurance (1 year)		182.15
Storage		144.00
Repairs		29.60
Depreciation 10% of Depreciated Value		1,160.86
McFarlane Construction Co.		
Grader 83 hours @ \$5.50		456.00
Bulldozer 18 hours @ \$7.50		135.00
Tractor Storage 21 nights @ \$.50		10.50
Diamond Construction Co.		
Grader #11 6 hours @ \$5.00		30.00
Grader #12 8 hours @ \$7.00		56.00
Tractors and Equipment Bulldozer $16\frac{1}{2}$ hours @ \$6.00		99.00
Hired Teams 42 hours @ \$1.00		42.00
700 Cubic Y ards of sand @ \$1.00		700.00
		<u>\$23,966.71</u>

Snow Fall in Fredericton for the last four years was as follows:

1946-47.....	76"
1947-48	83"
1948-49	64"
1949-50	$124\frac{1}{2}"$

Snow Fences:

In our Snow Fencing this year we used 10,400 feet of lathmade snow fence.

Item 3. Streets:

Repairs to Plant	\$ 409.58
Painting traffic lines and street signs	1,285.49
Repairs to Streets (Repairs to curb etc.)	131.17
Weather Account (Holidays)	3,188.70
Repairs to Bridges and Culverts	708.66
Unloading and Spreading Calcium Chloride	218.22
Surveying	<u>240.37</u>
Total	\$6,182.19

This year we purchased 130 tons of Calcium Chloride against a purchase of 140 tons last year.

The above Weather Account of \$3,188.70 is made up chiefly of wages paid to workmen when they were on their holidays.

Item 4. Surface Sewers.

All the Surface Sewers in the City were flushed and all Catch Basins were cleaned and repaired during the summer. One new Surface Sewer extension was made this year under this heading, 152 of 12" Terra Cotta Pipe from the northerly side of Waterloo Row through Timms' Property to the City Back Drain. A considerable portion of the above amount was expended in cleaning and flushing the main Surface Sewers on the Maryland Heights Project.

Item 7. Gravel:

This year we hauled from our city gravel pit at Barker's Point 8,842 cubic yards of gravel.

Item 8. St. John Road:-

The labour expenditure of \$92.27 was made in cutting and burning bushes on the side of the road.

Item 12. Outlying Roads:-

The labour expenditure of \$925.21 is made up of maintenance expenditures incurred in repairs on the Brick Kiln Road, York Street Hill, Hanwell Road, Cross Roads, Forest Hill and College Hill.

The actual maintenance by road patrol on these outlying roads does not appear in this item as it was charged under item headed "City Road Patrol."

Item 13. Street Cleaning:-

The labour cost of \$13,431.84 shows an increase of \$1,674.38 over last year. This is mostly accounted for by no snow in November of this year which prolonged our street cleaning activities.

Item 14. Tarvia Repairs:-

Under this heading \$2,835.38 was expended in labour in patching streets.

In most of this pavement patching we mixed the patching material used in a concrete mixer at the City yard, using a cut back tar of asphalt and local pit run gravel which was dried out by rough gravel heaters. The holes in pavements after having edges painted were raked full of patching material and were left to be rolled into place by traffic. To make a permanent patch by this method the holes must be treated more than once to get the patch to conform in elevation with the surrounding pavement. No seal coating was done this year.

The patching material in place, produced by the above method, costs \$15.50 per ton, \$10.25 being a labour charge and \$5.25 being the cost of binder and aggregate plus cost of gas, fuel and machinery repair charges.

Item 15. City Road Patrol.

The Total Repair costs on our Road Patrol this year and last year were:

	<u>1950</u>	<u>1949.</u>
Caterpillar #10 Grader	\$ 694.92	751.01
Adams #412 Grader.....	5,488.66	589.62

Item 18. City Forest.

Included in our regular Roads and Streets Costs is a labour expenditure for City Forest of \$3,122.05.

This labour item is sub-divided as follows:-

Hauling wood to City Yard	\$ 74.61
Cutting fuel wood in woods	717.41
Haying	89.98
Caretaker's wages and miscellaneous expenses....	2,240.05
Total	<u>\$ 3,122.05</u>

Besides this labour cost, the City Forest shows an expenditure for material of \$264.17 making a total cost for the year of \$3,386.22.

The roads and trails in the City Forest proper were kept clear from fallen trees and brush.

The following merchantable material was cropped from the City Forest this year:-

60 cords wood cut this year @ \$12.00.....	\$ 720.00
7 tons hay in City Barn @ \$17.00	<u>119.00</u>
Total.....	<u>\$ 839.00</u>

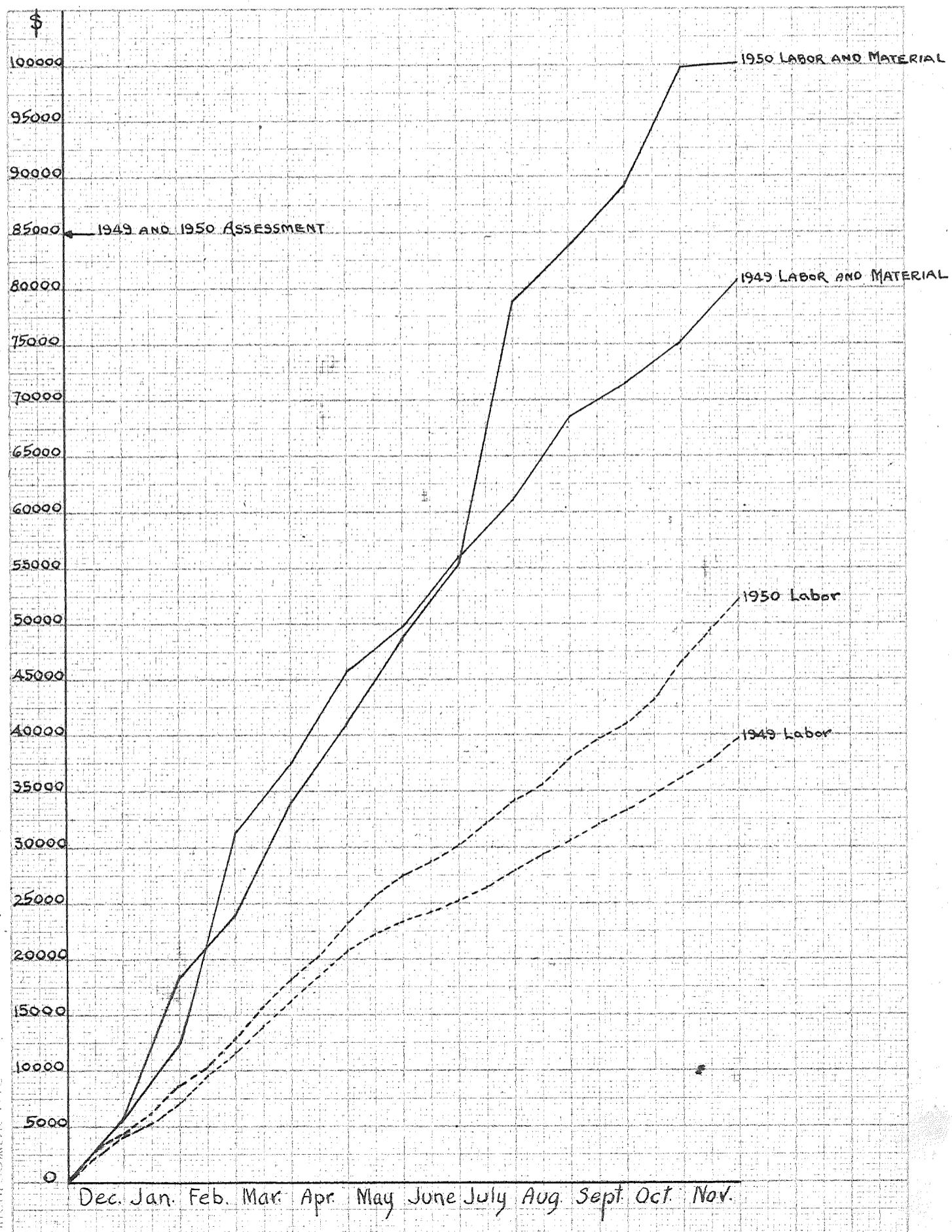
TABLE SHOWING COMPARATIVE COSTS OF ROADS AND STREETS.

Years 1933 to 1950.

Year.	Expenditure for Labour	Gross Expen- diture Labour and Material	Credits.	Net Costs Labour and Material	Appropriation.
1933	10,607.99	19,161.38	333.28	18,829.10	19,000.00
1934	13,332.51	23,665.94	2,311.50	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	22,289.75	20,000.00
1938	15,601.78	24,373.85	781.88	23,491.95	22,000.00
1939	16,681.88	32,509.93	1,762.67	30,747.26	28,000.00
1940	17,959.36	33,058.59	2,190.50	30,868.09	28,000.00
1941	22,816.69	40,283.46	3,050.12	37,233.34	28,000.00
1942	22,545.62	39,215.84	3,416.91	35,798.93	30,000.00
1943	22,879.44	36,970.80	6,597.85	30,372.95	30,000.00
1944	25,299.20	47,285.36	4,318.50	42,968.86	30,000.00
1945	30,232.12	56,049.45	5,306.15	50,743.30	33,000.00
1946	35,227.79	67,961.39	18,649.68	49,311.71	40,000.00
1947	42,445.99	69,318.46	1,979.65	67,338.81	50,000.00
1948	51,042.03	120,591.35	54,449.50	86,141.85	60,000.00
1949	39,716.78	85,638.38	4,890.13	80,748.25	85,000.00
1950	52,154.51	110,169.90	9,988.30	100,181.60	85,000.00

In looking at this year's deficit in Roads and Streets it must be remembered that labour received an increase of 15% after the estimates for the year were made out and also that the cost of purchasing a \$16,000.00 Road Patrol was not included in this estimate. However, machinery for Roads and Streets is usually charged to this account when purchased.

Besides rises in labour and material costs, an increase in Roads and Streets expenditures must be expected due to the growth of the City.



ROADS AND STREETS COSTS 1949 AND 1950.

CAPITAL ACCOUNT PAVING.

The Gross Expenditure under this heading amounts to \$42,988.07,

Included in the above are:-

(1) Capital Account Curb and Gutter	\$ 12,634.57
(2) Capital Account Paving	<u>30,353.50</u>
Total	\$ 42,988.07

For the above expenditure of \$12,634.57 concrete curbs and gutters were laid at the below listed locations:

<u>Concrete Curb and Gutters.</u>	<u>Lin. Ft.</u>
(1) Albert St., Regent to York St.(Both Sides)	2,451
(2) Reid St., Albert to Green Road (Both Sides)	2,464
(3) Hanson St., Albert to Green Road (Both Sides)	2,784
(4) Green Road, Graham Ave. to Kitchen St.(Both Sides)...	1,041
(5) Elmcroft (Both Sides)	1,067
(6) Waterloo Row, Lansdowne to Imperial Service Station (One Side).....	1,557
(7) Avondale Court (Both Sides)	<u>1,110</u>
Total	12,474

All the above listed Curbs and Gutters laid were built by City Crews. In the costs are included the labour cost of installing some 460 Lin. Ft. of 8" Terra Cotta surface in Avondale Court.

All the concrete poured was purchased ready mixed on the job from the firm of Bemrose and Kilburn at a contract price of 55¢ per Lineal Foot of completed curb and gutter. The cost per Lineal Foot of all curb and gutter constructed this year, found by dividing the total footage into the total overall cost for the year, is \$1.01.

Street Pavement.

For the above expenditure of \$30,353.50 the following streets were paved:-

<u>Streets Paved.</u>	<u>Lin. Ft.</u>	<u>Sq. Yds.</u>
Albert St., Regent St. to York St.	1,360	4,242
Reid St., Albert St. to Green Road	1,165	3,878
Hanson St., Albert St. to Green Road	1,372	4,352
Churchill Row, St. John to Church St.	615	1,712
Churchill Row, Church St. towards C.N.R. Tracks..	175	486
Total	4,687	14,670

Re the above Listed Pavement:

The street grading and all preparatory work other than the actual supplying and laying in place of the 4-inches of premixed

pavement was done by the regular City Crews at a cost of 10¢ a square yard. The premixed pavement was supplied and laid by the Diamond Construction Company from their plant located at Lincoln Air Port. The Company charged the City for this pavement in place \$8.15 a ton for base and \$9.53 a ton for seal. Altogether some 14,670 square yards (some .88 miles of City Street) were laid at a unit price of \$2.07 per square yard for completed premixed pavement 4" thick in place. This unit price includes all grading and preparatory work but does not include concrete curb and gutter in the price, nor is the concrete gutter included in the yardage.

Using these above prices the cost for an average mile of City Streets with concrete curb and gutter and with 4" thickness of a premixed pavement and being 30 feet wide from curb to curb would be \$43,454.00.

The quantities used in this pavement were:

Primer42 Gal. per sq. yard
Base Mix..... one ton spread $5\frac{1}{2}$ sq. yds.
Seal..... one ton spread $48\frac{1}{2}$ sq. yds.

CAPITAL ACCOUNT SEWER DOMESTIC.

Gross Expenditure	\$ 45,612.77
Credits	<u>4,748.30</u>
Net Cost	\$ 40,864.47

This above Capital Account Sewer has been kept in two separate accounts:

A - Capital Account Sewer Carleton Ward.
B - Capital Account Sewer South Side of River.

A - Capital Account Sewer Domestic Carleton Ward.

Gross Expenditure	\$ 45,030.99
Credits	<u>4,748.30</u>
Net Cost	\$ 40,282.69

The Credits are made up as follows:-

Work done on domestic sewer system for private parties mostly house connections	\$ 3,187.44
Town of Woodstock (Sale of Pipe)	17.76
Diamond Construction Co. (Sale of Pipe and manholes)	133.10
Dominion Experimental Station (Sale of Pipe)	95.04
Journal Vouchers (Pipe)	<u>1,318.96</u>
Toal	\$ 4,748.30

This account covers the sewer construction in Carleton Ward which amounts to 10,455 feet and is divided as follows:

970 feet of 12" Terra Cotta Pipe
400 feet of 10" Terra Cotta Pipe
8,846 feet of 8" Terra Cotta Pipe
239 feet of 8" Concrete Pipe.

The average labour cost per foot for excavating, laying and backfilling was \$1.50 and the overall (labour and material) was \$3.85 per Lineal Foot.

In the above construction some pavement had to be ripped up and replaced and on some of the streets a considerable amount of rock was encountered which required blasting.

The percentages of Rock Ditch, sewer laid under pavement, and sewer laid where neither rock nor pavement was encountered on the above job was as follows:

Lin. Ft. of Sewer laid in Rock Ditch	25.3%
Lin. Ft. of Sewer laid under pavement.....	33.9%
Lin. Ft. of Sewer laid no Rock nor Pavement.....	40.8%

Note:- No rock in ditch was encountered under pavement.

Also laid under this heading was 5,767 feet of 5" Sewer to individual property owners. This amount of pipe was not figured in the labour cost or overall cost of pipe per foot as it was subtracted from the gross cost by the above credit of \$3,187.44.

The locations where sewer was laid this year are shown on the map on Page 2.

B-Capital Account Sewer Domestic on South Side of Saint John River.

Total Expenditure\$ 581.78

Under the above heading the following sewers were laid:

Parkhurst Drive 8"	Terra Cotta	266 Feet
Londale Court 8"	Terra Cotta	204 Feet
		<u>470</u> Feet.

The Overall Cost per foot for above sewers was \$1.24.

CAPITAL ACCOUNT WATER.

Gross Expenditure	\$ 20,493.61
Credits	2,293.30
Net Expenditure	<u>18,200.31</u>

The above Credits were made up as follows:

Town of Woodstock (Sale of Pipe).....	\$ 1,342.98
N. B. Electric Power Commission (Sale of Pipe).....	912.12
Costs installing water service over private property....	<u>38.20</u>
Total	<u>\$ 2,293.20</u>

Installations were made at the following locations:-

	<u>Lin. Ft. of 6"</u>	<u>1$\frac{1}{4}$"</u>
Parkhurst Drive	304	
Londale Court		220
Miles Street		187
Ryan Sub-Division	76	160
Clark Street	728	
Highland Avenue	1,055	
MacLaren Avenue	750	
Total	<u>2,913</u>	<u>567</u>

The overall cost of laying the above 6" and 1 $\frac{1}{4}$ " pipe amounted to \$5.23 per foot.

Of the total 2,913 feet of 6" Cast Iron Water Pipe, 1,805 feet was laid on Highland Avenue and MacLaren Avenue through practically solid rock. In order to get the cost per foot of laying the 6" Cast Iron Pipe through rock the following computations were made for laying pipe on Highland Avenue:-

Total length of 6" Cast Iron Water Pipe 1,055'	@ \$ 1.59 per foot ..	\$1,677.45
5-6" Gates	@ 39.00 each	195.00
1-6" McAvity Hydrant	@ 145.00	145.00
2-6" Cast Iron Tees	@ 33.75 each.....	67.50
Oakum, 25 lbs.	@ .29 per lb.....	7.25
Lead, 70 Joints 11 lbs. per Joint, 770 lbs.	@ .32 per lb.....	246.40
Dynamite, 43 cases	@ 17.14 per case...	737.02
Dynamite Caps, 43 boxes	@ 6.11 per box....	262.73
Brick, 5,000 bricks	@ 22.00 per 1000....	110.00
Manholes, 5	@ 41.00 each.....	205.00
Cement	10.00
Rock Dust, 30 loads, 5 $\frac{1}{2}$ ton per load	@ .50 per ton ...	82.50
Labour	<u>3,989.70</u>
	Total	\$7,735.55

Total cost per Lineal Foot laying 6" Water Main through solid rock on MacLaren Avenue\$ 7.33.

CAPITAL ACCOUNT WATER AND SEWER FOREST HILL.

This installation was let out by contract to Ashfield Bros. the City supplying material and the contractor doing the work and supplying everything but actual pipe, pipe line material and material for Catch Basins and Manholes. The contract for the Construction of a 35,000 Imperial Gallon Concrete Reservoir was awarded to Colter King.

In 1949 the following work was done under this heading:

6" C.I. Water Pipe laid in place	7,842 Lin. Ft.
8" Domestic Sewer laid in place	4,758 Lin. Ft.
5" Domestic Sewer House Connections	1,040 Lin. Ft.
5/8" Copper Water Connections	1,380 Lin. Ft.
1 - 35,000 Imperial Gallon Concrete Reservoir.	

This installation was completed in 1950 and the following amount of work was done:

6" C. I. Water Pipe laid in place.....	1,127 Lin. Ft.
8" Domestic Sewer laid in place	1,031 Lin. Ft.
5" Domestic Sewer House Connections	479 Lin. Ft.
5/8" Copper Water Connections	474 Lin. Ft.

This year the following expenditures were made:-

Cross Expenditure,..1950	\$ 17,040.85
Credit, 1950.....	<u>3,835.55</u>
Net Expenditure, 1950	\$ 13,205.30

The Credit of \$3,835.55 is work done for private parties mostly house connections.

Total Installation Water and Sewer Forest Hill includes the following:-

6" C. I. Water Pipe laid in place.....	8,969 Lin. Ft.
8" Domestic Sewer laid in place	5,789 Lin. Ft.
5" Domestic Sewer House Connections	1,519 Lin. Ft.
5/8" Copper Water Connections	1,854 Lin. Ft.
1 - 35,000 Imperial Gallon Concrete Reservoir	

Total Gross Expenditure	\$ 77,052.07
Total Crédits	<u>4,318.72</u>
Total Net Expenditure	\$ 72,733.35

We are now supplying 31 residences and 1 barn with water from this construction. All 31 residences are also supplied with sewerage.

CAPITAL ACCOUNT SURFACE SEWER.

The expenditure under this heading amounted to \$3,809.51.

Surface Sewers were laid at the following locations:

12" T.C. Sewer from St. John River to Woodstock Road located 450 ft. west of O'dell Avenue	480 ft.
12" T.C. Sewer from O'dell Avenue west along north side of Woodstock Road	917 ft.
10" T.C. Sewer Londale Court	64 ft.
8" Concrete Sewer Londale Court	98 ft.
12" T.C. Sewer on Brookmont Court to back of lots, then west along back of lots to rear of Ashland Court; also east from Brookmont Court along back of lots 200 ft.	1,090 ft.
12" T.C. Sewer on Parkhurst Drive	395 ft.
	<u>3,044 ft.</u>

The above total cost of \$3,809.51 cannot be used to work out a unit cost per foot as it does not include most of the costs of material which was bought and paid for last year. However, by taking this year's labour cost and prices for material used, the following unit price is arrived at:-

2,882 ft. of 12" T.C. Pipe @ \$1.06 per foot	\$ 3,054.92
64 ft. of 10" T.C. Pipe @ .81 per foot	51.84
98 ft. of 8" Concrete Pipe @ .4325 per foot.....	42.38
14 Catch Basin Covers and Frames @ 36.19 each	506.66
1 Manhole (Cover and Frame) @ 41.00	41.00
18,000 Bricks @ 22.00 per thousand	396.00
50 lbs. Oakum @ .29 per lb.	14.50
110 bags Cement @ 1.15 per bag	126.50
15 Y ards Sand @ .90 per yard	13.50
Labour	2,474.90
Extras (Tools, Gas, Oil, etc.).....	250.00
Workmen's Compensation	<u>47.07</u>
	\$ 7,019.27

Cost per Lineal Foot of Surface Sewer in place ..\$ 2.33.

CAPITAL ACCOUNT CULVERT DUNDONALD STREET.

Total Cost \$3,795.00.

A concrete box Culvert 4' high, 10' wide and 86' long was constructed under contract by the Colwell Construction Company. This Culvert carries the back drain under Dundonald Street just east of Westmorland Street. The contract price was \$3,490.00.

The City spent \$305.00 on this job in relaying the sewer line under the culvert location and in hauling rock to replace faulty foundation removed by the Construction Company at the culvert location. The fill hauled in on Dundonald Street to bring the street up to grade over the culvert was not paid for under this heading but was charged to grading operations carried on for pavement construction.

CAPITAL ACCOUNT MARYLAND ROAD.

This year the City entered into an agreement with the Provincial Government to reconstruct and pave the Maryland Road from Albert St. south to the City line, a distance of 3.55 miles.

The agreement was that the work was to be done if possible by the City Crews with their own or hired equipment. It was thought that the City could do the grading, gravelling etc. and prepare the road for pavement this year and that in 1951 the pavement could be laid. This pavement it was understood would have to be given as a contract to some Company paving near the Fredericton area.

The agreement was that the City and Provincial Government would each pay one-half the costs of the work.

The City started this grading work and by fall had completed 2.97 miles of grading and had applied about four inches of gravel over this completed grade.

This piece of road grading turned out to be more difficult than it first appeared. All cuts showed either solid rock or large boulders with very little other material.

Most of the gravel had to be hauled from a pit ten miles distant from the job.

The width in cuts, from ditch to ditch, was made 36' and width at top of fills was held to a minimum of 40 ft. The culverts were built with local cedar.

The City hired and used continuously on this job two 3/4 yard shovels, one small bulldozer, and one large compressor. They also hired for about three weeks two large bulldozers. One small bulldozer owned by the City and a City jeep were used continuously on the job. A 3/8 yard City shovel and two City road patrols were used from time to time on this work.

<u>Costs</u>	\$
Gross Expenditure	52 182.26
Credits	<u>R 6 h 10.37</u>
<u>Net Cost to City</u>	<u>\$ 25,971.89</u>

The above credits are made up of amounts paid by the Provincial Government as per their agreement with the City.

PUBLIC WORKS.

Gross Expenditure	\$ 8,109.12
Credits	32.00
Net Expenditure	<u>\$ 8,077.12</u>
1950 Appropriation	8,000.00
Deficit	<u>\$ 77.12</u>

The above Credit of \$32.00 is hire of Bulldozer from McPherson & Myles for work done at Dominion Stores site, King Street.

The Net Expenditure is made up of a labour charge of \$5,447.70 and a material charge of \$2,629.42. The labour charge is divided as follows:-

Back Drain	\$ 193.45
Trees	440.59
Old Burial Ground	1,750.30
Unforeseen Account	<u>3,063.36</u>
	\$ 5,447.70

TREES:

The labour cost of \$440.59 was for cutting and pruning shade trees. We also supplied labour to the Entomological Department of the Federal Government who did some experimental spraying on some of our City elm trees which had shown damage due to the elm avis.

OLD BURIAL GROUND.

The labour expenditure of \$1,750.30 was used in the Old Burial Ground in the centre of the City. The work this year was in charge of a committee of the Chamber of Commerce. This Committee was headed by Alderman Cedric Cooper.

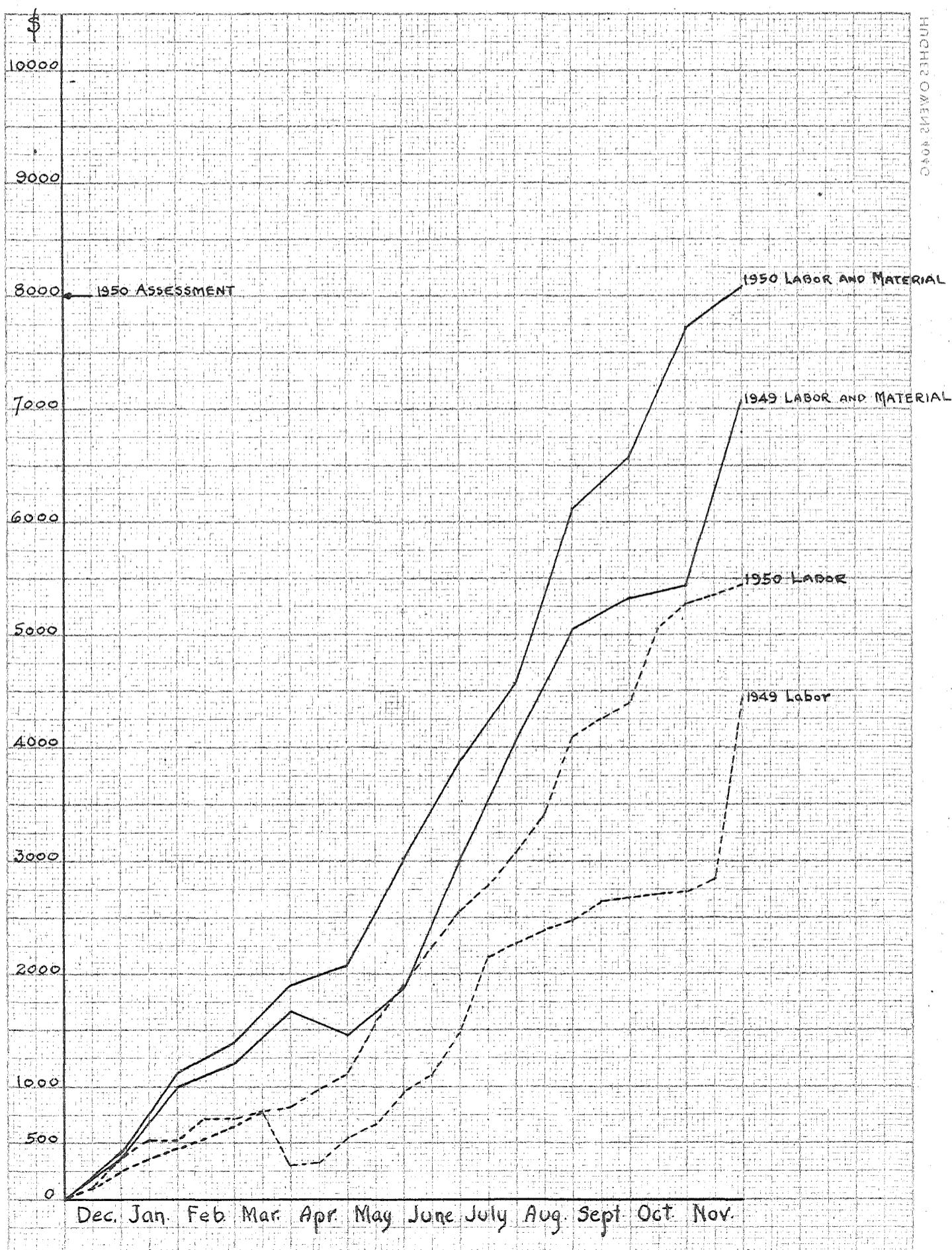
UNFORESEEN ACCOUNT.

The labour charged to this item was expended as follows:

Benches, repairing and painting	\$ 31.96
Cutting bushes along river bank from Pumping Station to Lincoln Crossing	1,318.06
Greens, cutting, raking etc.	1,324.55
Community Christmas Tree	30.10
John Palmer Co. (Digging trench)	15.29
Fredericton Air Port (Building Drag)	11.40
Thawing New Brunswick Telephone Co. manholes	15.10
Myles & McPherson (Rental Bulldozer)	5.20
Victoria Mills (Bulldozing fire on river bank)	46.59
Spraying swamps (Mosquitoes)	9.84
Robert Burns Monument	62.83
Erecting Steel Fence monument Carleton Ward	54.12
Fredericton Exhibition Co. Ltd.....	125.72
Children's Home, Putting on Storm Windows etc.	<u>12.60</u>
Total	\$ 3,063.36

TABLE SHOWING COMPARATIVE YEARLY COSTS OF
PUBLIC WORKS, Years 1933-1950.

Year.	Expenditure for Labour	Gross Expen- diture Labour and material.	Credits.	Net Costs Labour and Material	Appropriation.
1933	3,849.39	5,394.06	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	4,160.07	3,000.00
1937	3,673.48	4,283.52	123.45	4,208.80	5,000.00
1938	5,125.07	8,631.67	664.00	7,967.67	4,000.00
1939	3,957.07	4,606.53	255.10	4,361.43	4,000.00
1940	4,610.71	6,826.22	1,204.89	5,621.33	4,000.00
1941	4,751.76	7,204.65	204.95	6,999.70	4,000.00
1942	6,089.55	8,180.32	455.85	7,724.47	4,000.00
1943	5,063.23	5,890.39	280.43	5,609.96	6,500.00
1944	5,546.15	8,852.68	1,424.37	7,428.31	6,500.00
1945	8,307.69	11,843.69	644.61	11,199.08	6,500.00
1946	10,787.53	17,404.09	34.78	17,369.31	7,000.00
1947	12,088.29	20,307.34	384.70	19,922.64	13,000.00
1948	6,206.85	9,249.97	7.90	9,242.07	5,000.00
1949	4,430.77	7,917.90	849.11	7,068.79	8,000.00
1950	5,447.70	8,109.12	32.00	8,077.12	8,000.00



PUBLIC WORKS COSTS 1949 AND 1950.

RECREATION.

Expenditure \$ 2,268.59.

The above charge of \$2,268.59 is divided as follows:-

	<u>City Labour.</u>	<u>Material</u>	<u>Total.</u>
<u>Playgrounds:</u>			
Queen's Square, Wilmot Park, Carleton Ward, Victoria Mills, Maryland Heights, Queen St. and Hughes St.	\$ 861.90	439.54	1,301.44
Bathing Beaches	117.50	13.68	131.18
Rinks	872.00 792.00	43.97	835.97
Total	\$1771.40	497.19	2,268.59

The above costs do not include all playground and recreation expenditures but only those which appear on the payrolls or costs of material ordered through my office; for instance, the salary of Recreational Director, Mr. Vey, and other supervisors hired during the summer months is not in the above cost, nor do the costs of most of the equipment used on the playgrounds appear here.

CITY HALL.

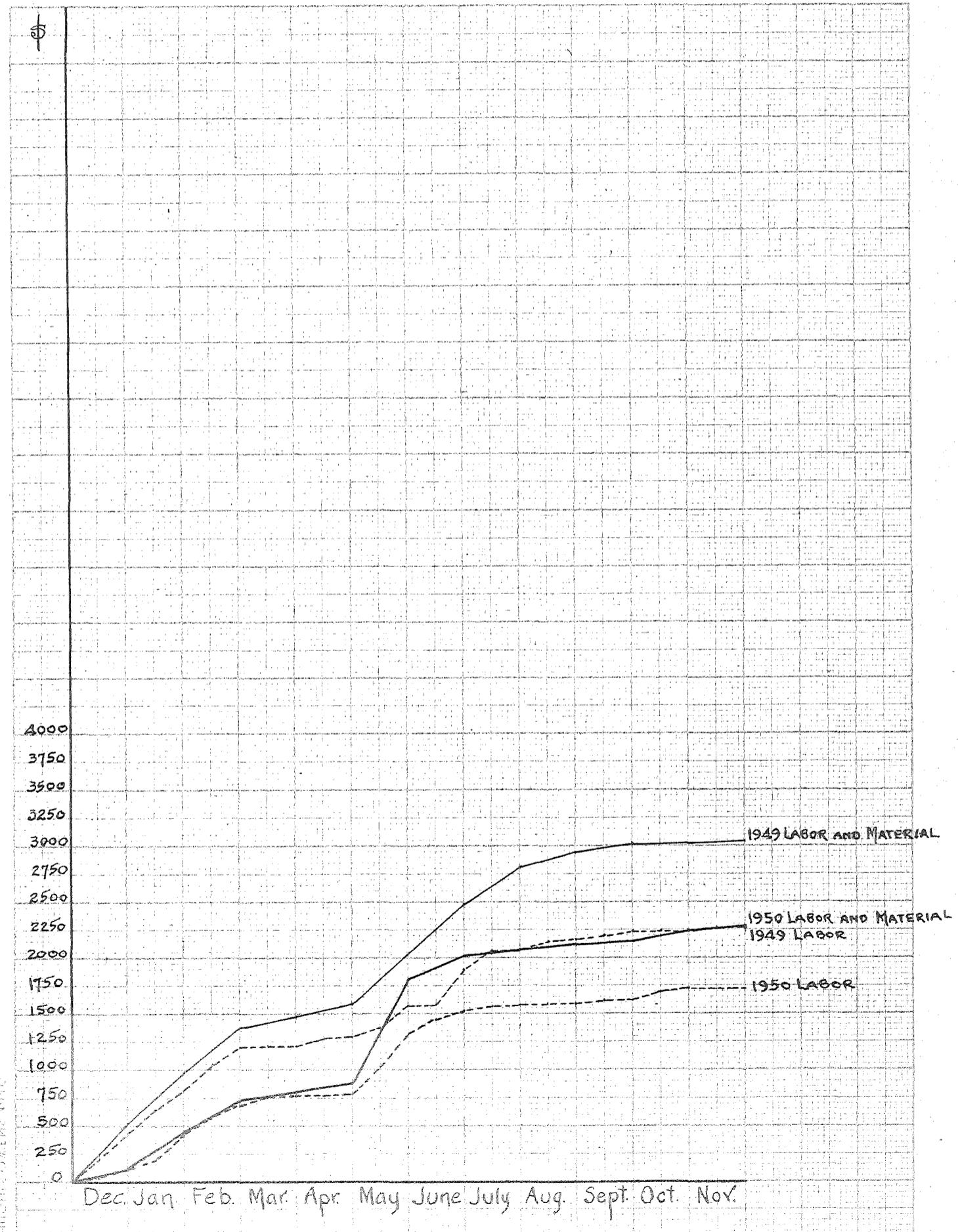
Expenditure \$11,100.02.

The above expenditure is made up as follows:-

Wages paid for labour at City Hall including winding and repairs to clock, cost of night fireman and extra janitor service	\$ 2,669.20
Water used at City Hall	100.00
Coal, 224.94 tons burned at City Hall	2,242.05
Repairs and Improvements to City Hall	5,125.24
Light Bill for City Offices	876.20
Supplies, etc.	<u>87.35</u>
Total	\$ 11,100.02

On December 4th, 1949 a fire occurred in the boiler room, causing considerable damage to the offices of the City Engineer. These damages were repaired and the City Hall Committee decided at the same time to make the following improvements:

- (1) To make more space for marketing facilities the coal bin room was made smaller. The old wall was torn down and a new one built.
- (2) Public Toilets and Washbasins were installed for both the men and women.
- (3) A new 10" Domestic Sewer main was laid from Phoenix Square to take care of the additional sewage.



RECREATION COSTS 1949 AND 1950.

The cost of repairing the City Engineer's Offices was as follows:

A. J. Gunter	\$ 432.27
Horsenell's	4.81
E. M. Young, Ltd.....	27.15
James S. Neill & Sons, Ltd. ..	9.61
J. L. Simms.....	1.422.75
Gunter's Flooring	<u>19.90</u>
Total	\$1,916.49

A cabinet was added to the Engineering Department's Office from J. C. Risteen Company at a price of \$343.44.

The improvement costs to basement exclusive of 10" Sewer main from main to building were as follows:-

E. M. Young, Ltd.	\$ 17.90
James S. Neill & Sons, Ltd. ..	17.11
Richards Electric	57.11
E. Hagerman	919.91
J. L. Simms	<u>1,563.06</u>
Total	\$2,575.09

MUNICIPAL HOME.

Gross Expenditure	\$1,944.84
Credit	85.00
Net Expenditure	<u>\$1,859.84</u>

The Credit of \$85.00 is made up as follows :-

(1) Journal Voucher for Labour should have been charged to Public Works	\$ 72.00
(2) Journal Voucher for Wood (1 load from Municipal Home to City Barn - Roads and Streets)	<u>13.00</u>
Total	\$ 85.00

Gross Expenditure is made up as follows:

City Water supplied to Municipal Home	\$.. 25.00
Labour - Sawing, splitting and delivering wood to needy families in the City along with some minor repairs to Municipal Home Building	1,109.84
Cost of 81 loads wood supplied to needy families from City Forest - 81 loads @ \$10.00 per load	<u>810.00</u>
Total	\$1,944.84

The above costs are, of course, only part of the Municipal Home expenditure for the year but they are the only expenditures made under the supervision of the City Engineer and are, therefore, shown in this report.

SANITATION.

Expenditure	\$ 6,509.44
1950 Appropriation	<u>6,000.00</u>
Deficit	\$ 509.44

The expenditure on Sanitation has been kept under two headings, namely City Dump and Incinerator.

CITY DUMP has in the summer season two dump tenders as material is deposited there from early morning until darkness. During the winter months when the daylight period is shorter one dump tender only is kept on. Besides the dump tenders the City Bulldozer works on the dump from time to time shaping up the dump for the dump tenders. This expenditure on dump for labour only (when the bulldozer works there only the operator's time is charged to dump) this year amounted to \$2,043.80.

CITY INCINERATOR.

Material charges	\$ 580.00
Labour	3,878.50
Total Expenditure.....	\$ 4,458.50

The material charge is made up of repairs to incinerator and light and power bills.

The labour charge is wages of incinerator attendants, along with some extra City labour used in bulldozing incinerator dump, shifting track, etc. We are operating the incinerator with two attendants who work a nine hour day, starting at 7:30 a.m. and finishing at 5:30 p.m.

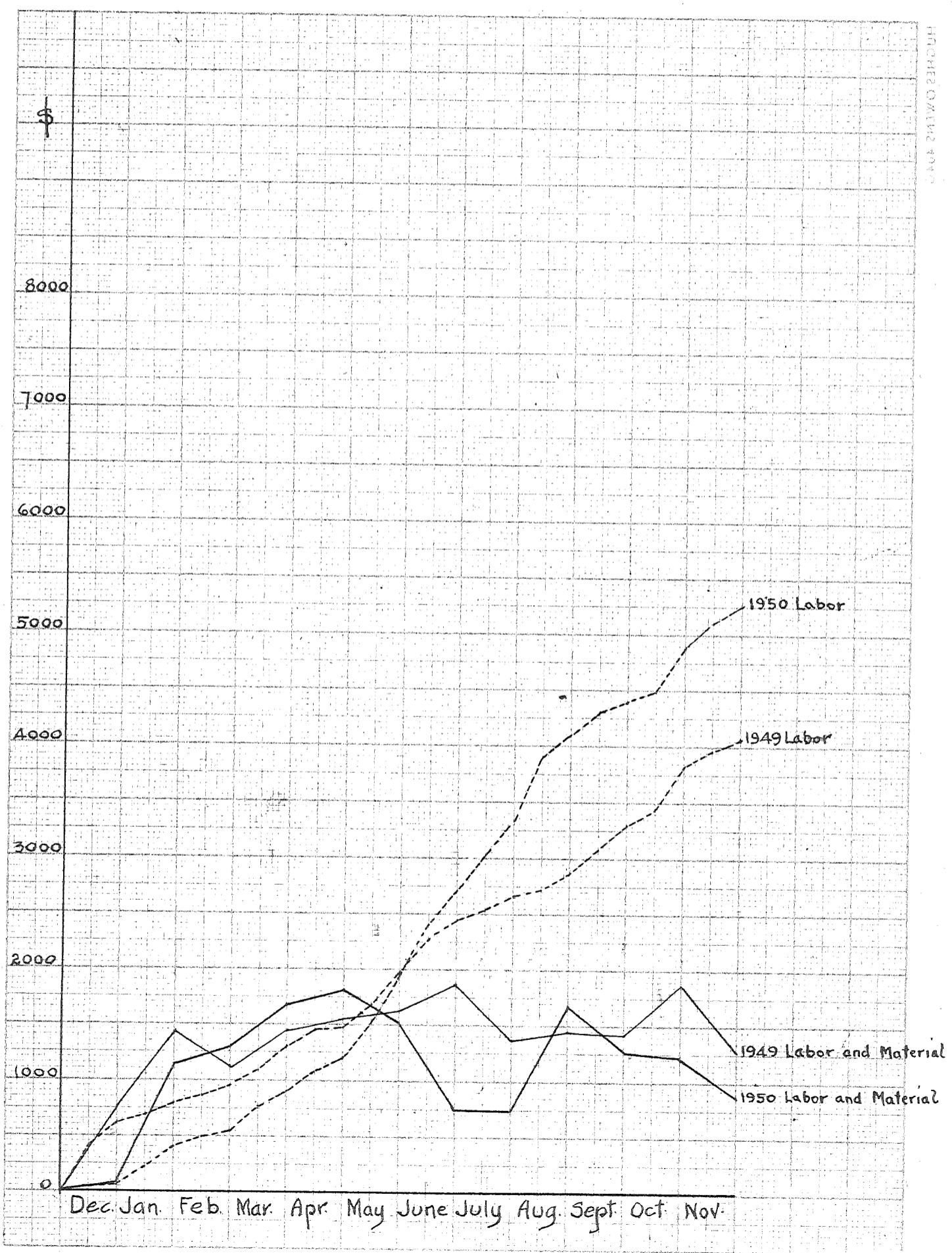
SEWERAGE DOMESTIC.

Gross Expenditure	\$ 6,852.92
Credits	<u>5,982.86</u>
Net Expenditure	\$ 870.06

The above Credit is work (mostly house connections) performed for private parties.

New Customers connected with City Sewerage System this year - 94.

No Domestic Sewerage extensions were made this year under this heading. All extensions were charged to Capital Account and appear under the Capital Account headings.



SEWERAGE DOMESTIC COSTS 1949 AND 1950.

STREET LIGHTS.

The City Street Lighting System at the present time consists of:

1. A series lighting system which lights most of the City on the south side of the St. John River.
2. A multiple lighting system.
3. A multiple lighting system in C. N. R. Subway.
4. A series lighting system in Carleton Ward.

SYSTEM No.1, the series lighting system, consists of some 23.40 miles of line and 412 lamps. This system is divided into five circuits, two of which are controlled each by a 25 K.W. Constant Current Transformer, the other three of which are each controlled by a 15 K.W. Constant Current Transformer. Four of these transformers, along with the main switchboard, are housed in a transformer room in the old street lighting building on Carleton Street. The fifth transformer is on a pole on McLeod Street and controls the new circuit for Maryland Heights.

The five circuits are made up as follows:-

<u>Lower Front Circuit:</u>	<u>Transformer Size.</u>
25-600 C.P. Lamps @ .350 K.W. demand.... 8.750	
19-250 C.P. Lamps @ .160 K.W. demand ... 3.040	
	11.790 K.W. 15 K.V.A.

Lower Rear Circuit:

133-250 C.P. Lamps @ .160 K.W. demand.. 21.280 K.W.	25 K.V.A.
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Upper Front Circuit:

13-600 C.P. Lamps @ .350 K.W. demand .. 4.55	
40-250 C.P. Lamps @ .160 K.W. demand .. 6.40	
	10.95 K.W. 15 K.V.A.

Upper Rear Circuit:

12-600 C.P. Lamps @ .350 K.W. demand .. 4.20	
89-250 C.P. Lamps @ .160 K.W. demand .. 14.24	
	18.44 K.W. 25 K.W.A.

Maryland Heights:

80-250 C.P. Lamps @ .160 K.W. demand .. 12.80	
1-600 C.P. Lamp @ .350 K.W. demand .. .35	
	13.15 K.W. 15 K.W.A.

SYSTEM No.2, the multiple lighting system consists of 85 units, 14 on Waterloo Row, 71 on King Street, Queen Street and Cross Streets including part of Campbell Street. Each unit consists of a 500 W. 115 Volt lamp set in a novaulex luminar fixture and hung on a bracket attached to the pole, these units being controlled by a control switch which is energized by our series lighting system. This system was installed and is owned, maintained and energized by the Maritime Electric Co., the City paying the Company \$60.00 per year for each unit.

SYSTEM No.3, consists of six multiple lights, each of 150 W. strength located in the C.N.R. Subway. This system is also controlled by a control switch which is energized by the series street lighting system.

SYSTEM No.4, is a series lighting system which had formerly been installed in the former Town of Devon and consists of 8.59 miles of line and 151 lamps. This system is composed of two circuits which are controlled by two 15 K.W. Constant Current transformers located on a pole platform on Pine Street.

The two circuits are made up as follows:-

<u>Carleton Ward (down):</u>	<u>Transformer Size.</u>
86-250 C.P. Lamps @ .160 K.W. demand ... 13.76 K.W.	15.
<u>Carleton Ward (up):</u>	

65-250 C.P. Lamps @ .160 K.W. demand .. 10.40 K.W. 15

The power for Systems 1, 3 and 4 is purchased from the Maritime Electric Co. at a contract price as agreed upon in a contract between the Maritime Electric Co. and the City made in 1927. This contract also covers the maintenance cost of \$20.00 a year per mile of pole line which is paid by the City to the Company.

All material such as wire, poles, pole fixtures, lamps, lamp fixtures, transformers, etc. is paid for by the City but installed by the Company under their contract price for maintenance. Any new installation which requires an enlargement of circuits must be paid for by the City, both labour and material.

Included in new installations were the following:-

- (1) Purchase of ornamental cedar poles.
- (2) Material and labour charges for extending Street Light System on Smythe Street and Maryland Hill.
- (3) Purchase and installation of 4 Bronze Floodlights at Cenotaph.
- (4) Material and Labour charges for extending Street Light System on Gibson, Hughes, School Streets and Devon Avenue.

- (5) Purchase and installation of new panel board Carleton Street Station.
- (6) Changing Street Light Circuits to conform with new Street Light System on Waterloo Row.
- (7) Extension of Light System in Sunshine Gardens.
- (8) Hauling, piling and painting poles.
- (9) Changing over down town street circuit and wiring new system.
- (10) Purchase and installation of lightning arrestors on Street Light System.
- (11) Removing Street Lights on King Street.
- (12) Installing street light cable on Carleton Street from Carleton Street Station to Brunswick Street.
- (13) Changing over up town Circuit.
- (14) Purchase of right angle brackets and braces, reflectors, heads and sockets.
- (15) Purchase of wire.

The Street Lighting costs for the year 1950 were as follows:

Gross Expenditure	\$ 25,732.23
Credits	<u>431.90</u>
Net Expenditure	25,300.30
1950 Appropriation.....	20,000.00
Debit Balance	\$ 5,300.00

The above Credits are made up as follows:

One-15 K. W. Constant Current Transformer sold to Town of Marysville	\$ 250.00
Sold to Maritime Electric Co.:	
200 Lin. Ft. #6 Flamelot 5000 Volt Wire ..	40.00
215 Lin. Ft. of 2 wire #6 Aerial cable ...	<u>141.90</u>
Total	\$ 431.90

The Expenditure is made up as follows:

120-600 C. P. Lamps	\$ 169.89
648-250 C. P. Lamps	457.43
21-150 C.P. Lamps	6.38
2-100 C. P. Lamps41
Current on Subway Lighting and Series Lighting from Nov. 29, 1949 to November 30th, 1950.....	11,233.69

Charges on Multiple Fixtures installed on City Streets at the contract price of \$60.00 per light per year.....	\$ 2,641.83
Maintenance, labour as per contract price	634.95
Material purchased for new installations and maintenance of lamp fixtures (Including only such articles as lamp standards, lamp brackets, heads, sockets, shades, time switches etc.)	1,318.04
Material and labour used in major repairs	9,038.60
Miscellaneous charges.....	206.90
Telephone in Transformer Room	<u>24.11</u>
Total	\$ 25,732.23

There are now 85 multiple fixtures on City Streets.

The total per capita charge for Street Lighting for 1950
population of 18,000 persons ... $\frac{25,300}{18,000} = \1.41 .

TABLE SHOWING CURRENT CHARGES FOR 1950

ON SERIES STREET LIGHTING.

Date of Bill.	K.W.H.	Demand in K.W.	Average No. of Burning Hours per Night.	Bill per Month.
Nov.30/49 to Dec.28/49	41,076	104.0	14 $\frac{1}{2}$	\$ 1,045.41
Dec.28/49 to Jan.26/50	44,538	101.3	14 $\frac{1}{2}$	1,109.15
Jan.26/50 to Feb.28/50	42,507	103.0	13	1,072.79
Feb.28/50 to Mar.28/50	32,143	100.6	11 $\frac{1}{4}$	860.22
Mar. 28/50 to Apr.26/50	31,858	112.0	9 $\frac{1}{2}$	878.26
Apr.26/50 to May 30/50	28,214	110.0	8 $\frac{1}{2}$	801.44
May 30/50 to June 30/50	27,195	107.5	7 $\frac{3}{4}$	776.30
June 30/50 to July 28/50	25,865	110.0	7 $\frac{1}{2}$	756.61
July 28/50 to Aug. 28/50	34,265	112.0	8 $\frac{5}{8}$	927.17
Aug. 28/50 to Sept.20/50	36,542	110.3	10 $\frac{1}{2}$	969.25
Sept.20/50 to Oct. 30/50	37,840	112.3	12	996.66
Oct. 30/50 to Nov.27/50	41,557	97.0	13 $\frac{1}{2}$	<u>1,040.43</u>
			Total ...	\$ 11,233.69

TABLE SHOWING COMPARATIVE YEARLY
COST IN STREET LIGHTING.

Year	Total Yearly Cost	Yearly Appropriation.
1933	\$ 6,425.87	\$6,000.00
1934	6,165.28	6,000.00
1935	6,632.33	6,000.00
1936	6,957.72	7,000.00
1937	9,688.52	7,000.00
1938	8,314.06	9,000.00
1939	8,645.97	7,500.00
1940	8,172.25	7,500.00
1941	9,888.78	8,500.00
1942	9,803.27	10,000.00
1943	11,033.89	10,000.00
1944	10,675.80	10,000.00
1945	10,682.22	10,000.00
1946	11,611.45	12,000.00
1947	12,520.94	15,000.00
1948	15,269.12	15,000.00
1949	15,720.93	16,000.00
1950	25,300.30	20,000.00

CEMENT WALKS.

Gross Expenditure \$ 637.44.

Under this heading a 4' concrete sidewalk was laid on the west side of Waterloo Row, from Alexandra Street towards Ketchum Bridge, a distance of 390 feet. The grading and laying of forms was done by City workmen while the cement was obtained from Bemrose & Kilburn at 60¢ per Lineal Foot.

The costs on this piece of work are not normal as considerable fill and sodding had to be done in front of the Cameron property to get road width on which to lay the sidewalk.

WATER.

We have now two separate and distinct water systems in the City of Fredericton.

1. The system which supplies the City of Fredericton lying on the South side of the Saint John River and taking its water from the Saint John River.
2. The system which derives its water from two drilled wells and is situated on the North side of the Saint John River and serves that urban part of the City of Fredericton known as Carleton Ward. A description of this system may be found in my Yearly Report for 1946.

SYSTEM No. 1, on the South side of the Saint John River, has been discussed from time to time in my reports and I will not go into it at the present time except to say that it is a direct pumping system and working about to its capacity. This year the City Council have authorized an expenditure of some \$600,000 to be made over a period of years to enlarge and improve this system to the requirements of the City.

In authorizing this \$600,000 expenditure, the City acted on advice of James F. MacLaren Associates, a Toronto firm of Consulting Engineers. This firm was engaged by the City to study and make a report on the Fredericton Water Works System. This report was received and adopted by the City and the necessary expenditure authorized.

The water costs which follow in this report include the water costs of both the systems or the total Fredericton water costs. The water costs are divided into two headings, namely, Water Ordinary and Water Pumping Station.

WATER ORDINARY.

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

Gross Expenditure	\$ 31,601.94
Credits	6,390.05
Net Expenditure	\$ 25,211.89

The Credits are made up as follows:-

Work done for and material sold to private parties when installing a water service over ground other than City property, or when the material is to be used on parts of systems which do not belong to the City	\$1,493.56
Journal Voucher (Salary paid H. R. Hanson and charged to Water Ordinary).....	1,356.65
Journal Voucher (Salary paid to I.J. McCoombes and charged to Water Ordinary)..	1,967.01
Journal Voucher (Salary paid to C.W. McLenahan and charged to Water Ordinary)..	<u>1,572.83</u>
Total ..	\$6,390.05

The Gross Expenditure is made up as follows:

City Payroll for hydrants	\$ 1,447.30
City Payroll for meters	2,518.66
City Payroll for Water Ordinary	<u>7,770.08</u>
Total Payrolls	11,735.94
Material and other charges	19,866.00
Gross Expenditure	\$ 21,601.94

No water extensions were laid under this heading but they appear under Capital Account Water. However, \$2,700.14 was spent in the purchase of a reservoir site and in surveying and locating rock on site to get information for the design of a reservoir.

The purchase price of the reservoir site was \$2,295.

HYDRANTS:-

We have in the City 282 hydrants - 188 in the City proper, 6 on University of New Brunswick property, 7 in Military Areas and 81 in Carleton Ward. The credit for rental of these hydrants appears under credits of Water Pumping Station.

METERS:-

Of all our water services in the City 1,301 are charged under flat rate and 1,734 on meter, giving us altogether 3,035 services.

The labour cost this year per meter for installation, reading, repairing etc. is \$1.45.

All meters are read twice a year and bills are sent out twice a year. We have 99 customers whose meters are read once a month although they also are billed only twice a year. These are such customers who ordinarily have large consumptions and where a stopped meter or metre turned over without being noticed would mean considerable loss of revenue to the City. All meters on military buildings are included in the group of monthly read meters.

Meters in store room January 1st, 1951:-

5/8" meters repaired and fit for service.....	19
New 5/8" meters	64
3/4" meters fit for service	3
1-in. meters that can be repaired	0
New 1-in. meters with 1 $\frac{1}{4}$ " connections	0
New 1-in. meters	0
Compound meters fit for service	0
Compound meters not fit but which can be repaired	0
1 $\frac{1}{2}$ "Crest meters	0
$\frac{1}{2}$ " meters that can be repaired and made fit for service	0
1 $\frac{1}{2}$ " meters	1
2" meters	2
1 $\frac{1}{4}$ " meters	4

DISTRIBUTION SYSTEM:

New Services installed this year.....	80
Old Services relaid this year	55
Frozen Services which had to be thawed.....	22
Services discontinued	4

We had in the City on the 30th day of November, 1950, 3,035 Water Services.

32.51

The Fredericton Distribution System consists of 28.7 miles of water main made up of the following sizes:-

10 inch main	1.56 miles
8 inch main	6.62 miles
6 inch main	19.83 miles
4 inch main	4.23 miles
3 inch main27 miles

This does not include the water mains installed by the Department of National Defence at Military Training Centre No. 70, Military Depot No. 7 or the Military Hospital.

TABLE SHOWING COMPARATIVE YEARLY COSTS

WATER ORDINARY.

Year	Labour.	Material.	Gross Expenditure	Credits.	Net Expenditure
1934	3,247.51	4,112.34	7,359.85	891.23	6,468.62
1935	5,372.83	5,897.23	11,270.06	398.42	10,871.64
1936	4,303.14	3,725.91	8,029.05	392.35	7,626.70
1937	3,718.86	3,938.81	7,657.67	265.46	7,401.21
1938	4,797.47	2,254.68	7,052.15	153.11	6,899.04
1939	4,201.24	3,248.61	7,449.85	570.44	6,879.41
1940	4,231.75	2,708.22	6,939.97	808.48	6,131.49
1941	2,908.37	2,446.27	6,354.64	495.08	4,895.56
1942	3,407.91	1,989.02	5,396.93	411.44	4,895.49
1943	5,559.39	14,607.96	20,230.35	5,020.06	15,210.29
1944	7,713.27	5,772.85	13,486.12	3,501.14	9,984.98
1945	8,011.12	5,577.55	13,588.67	574.57	13,014.10
1946	9,873.28	14,044.55	23,917.83	6,351.37	17,566.46
1947	11,822.81	11,733.64	23,556.45	3,106.51	20,449.94
1948	12,827.95	17,666.25	30,490.20	8,117.82	22,378.38
1949	11,823.19	21,578.91	33,402.10	3,095.86	30,306.24
1950	11,735.94	19,866.00	31,601.94	6,390.05	25,211.89

WATER PUMPING STATION.

Water Pumping Station Costs 1950:-

Gross Expenditure	\$ 44,548.09
Credits	5,480.00
Net Expenditure	\$ 39,068.09

This Credit of \$5,480.00 is made up as follows:

To yearly rental on 264 hydrants for 1950	\$ 5,280.00
Water used in City Hall Building	100.00
Water used in Old Street Lighting	
Building on Carleton Street	25.00
Water used in City Almshouse	25.00
Water used in City Parks	50.00
Total	\$ 5,480.00

The Gross Expenditure is divided as follows:

City payroll for salaries of engineers at Pumping Station	\$ 8,467.04
Work done by other city employees in and around Pumping Station	1,505.36
Total City Payrolls	9,972.40
Material and Workmen's Compensation Charge	34,575.69
Total	\$ 44,548.09

The Material Cost of \$34,575.69 is itemized as follows-

Item #1	Light and power supplied by the Maritime Electric Co. (479,629 K.W. hrs.)	\$11,229.62
Item #2	Transformer charges	151.92
Item #3	Lime, 22,350 lbs.	2,227.68
Item #4	Alum, 159,035 lbs. (78 tons).....	2,979.71
Item #5	Coal, 207.125 tons ,.....	1,944.02
Item #6	Fuel Oil, 500 gals.	91.50
Item #7	Engine Oil, 90 gals.	61.89
Item #8	Motor Oil, 45 gals.	59.90
Item #9	Gasoline, 265 gals.	72.14
Item #10	Maintenance and repair of the building and machinery	1,445.45
Item #11	New Installations	12,925.55
Item #12	Supplies, packing, rags, etc.	262.58
Item #13	Stationery, forms, charts, etc.	34.24
Item #14	Workmen's Compensation Board
Item #15	Mr. E. W. Hagerman's Salary	933.34
Item #16	Miscellaneous, telephone, etc.	156.15
	Total	\$34,575.69

COMPARISON OF WATER PUMPED AND COSTS

FOR SOUTH SIDE OF RIVER

FOR LAST SIXTEEN YEARS.

Year	I.G. Water Pumped	Pumping Station.	Yearly Gross Expen- diture at Using Gross Expenditure	Pumping Station cost per 1000 gals.	diture Water Ordinary and Gross Expen- diture Water	Total Yearly Water Costs (Net Expen- diture Water)	Total Yearly cost per 1000 gallons.
						Yearly Gross Expen- diture at Using Gross Expenditure	
1935	197,641,000	\$16,251.61	8.1 cents	\$27,123.25	12.6 cents		
1936	193,450,000	17,189.21	8.8 cents	24,825.91	12.6 cents		
1937	187,008,000	19,678.21	10.5 cents	27,079.42	14.5 cents		
1938	181,558,000	19,239.49	10.6 cents	26,138.53	14.4 cents		
1939	199,662,000	18,144.43	9.1 cents	25,023.84	12.5 cents		
1940	203,975,000	22,503.55	11.3 cents	28,634.84	14.0 cents		
1941	222,255,000	19,474.56	8.8 cents	24,370.12	11.0 cents		
1942	257,205,000	23,400.09	9.1 cents	28,385.58	11.0 cents		
1943	280,115,000	26,338.50	9.4 cents	41,548.79	14.0 cents		
1944	295,945,000	22,926.61	7.7 cents	32,911.59	11.1 cents		
1945	321,355,000	24,990.14	7.7 cents	38,004.24	11.8 cents		
1946	338,979,000	25,640.43	7.5 cents	43,206.89	12.7 cents		
1947	319,243,000	37,123.42	11.6 cents				
1948	322,339,000	31,050.97	9.6 cents				
1949	345,320,000	30,513.39	9.8 cents				
1950	372,412,000	44,548.09	11.9 cents				

The column in the preceding comparison showing I.G. pumped does not include water used from wells in Carleton Ward.

By taking our average daily consumption of Carleton Ward as 121,000 G.P.D. arrived at from a number of test runs, I estimate the yearly water pumpage from our wells there to be for 1950 some 45,000,000 I.G.

The total amount of water pumped during 1950 for the whole City is, therefore, 417,412,000 I.G.

Our total net water expenditure for the City for 1950 = \$61,579.84.

Therefore our net cost to pump and deliver to the Customer 1000 I.G. of water in 1950 is $\frac{64,279.98}{417,412}$ = 15.4 cents.

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

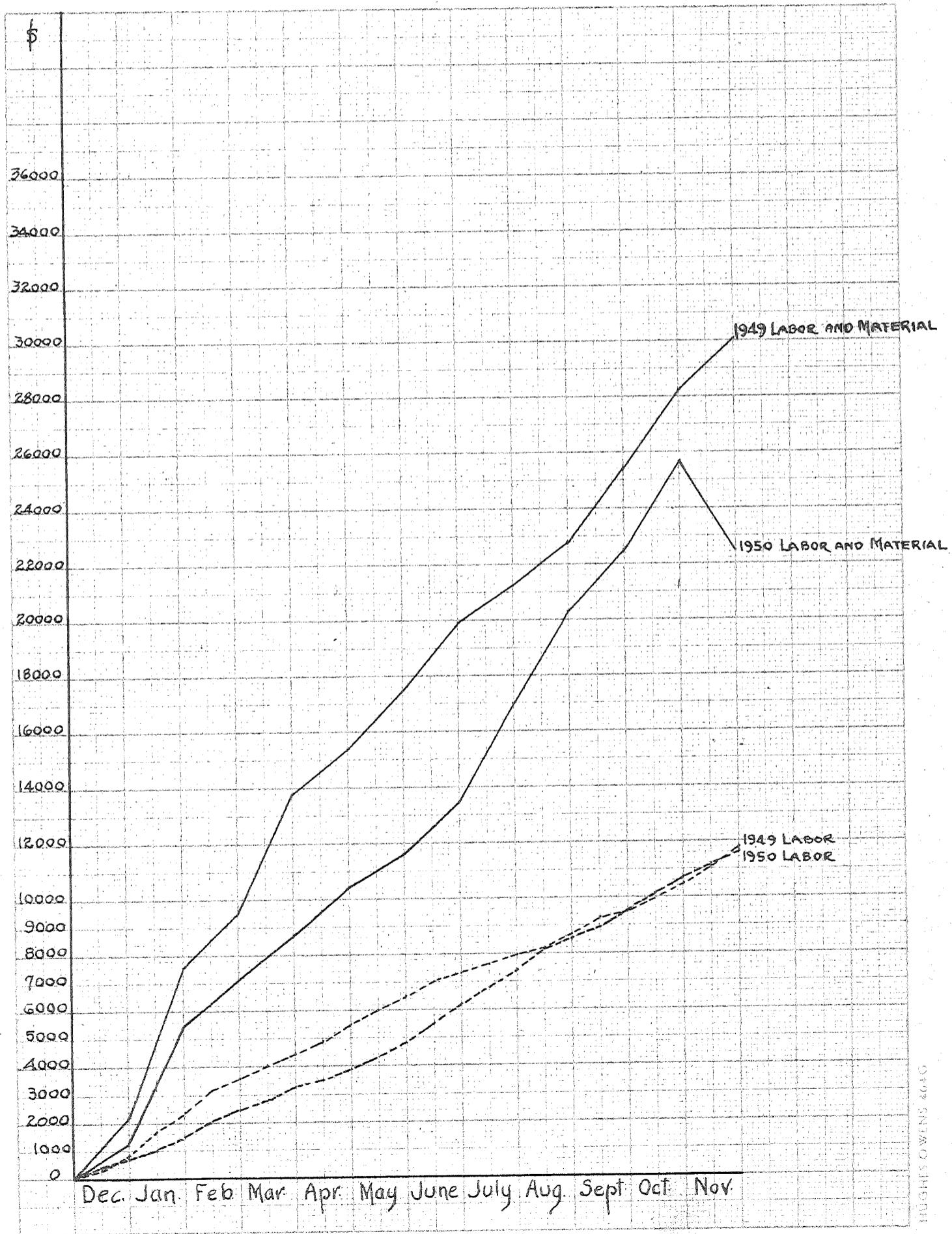
The Water Pumping Station was as usual under the supervision of the plant superintendent and Chief Engineer, Mr. John Malloy and Mr. Fred Nason.

Accompanying this report is the report of Mr. E. W. Hagerman on the Fredericton Water Supply from January 1st, 1950 to December 31st, 1950.

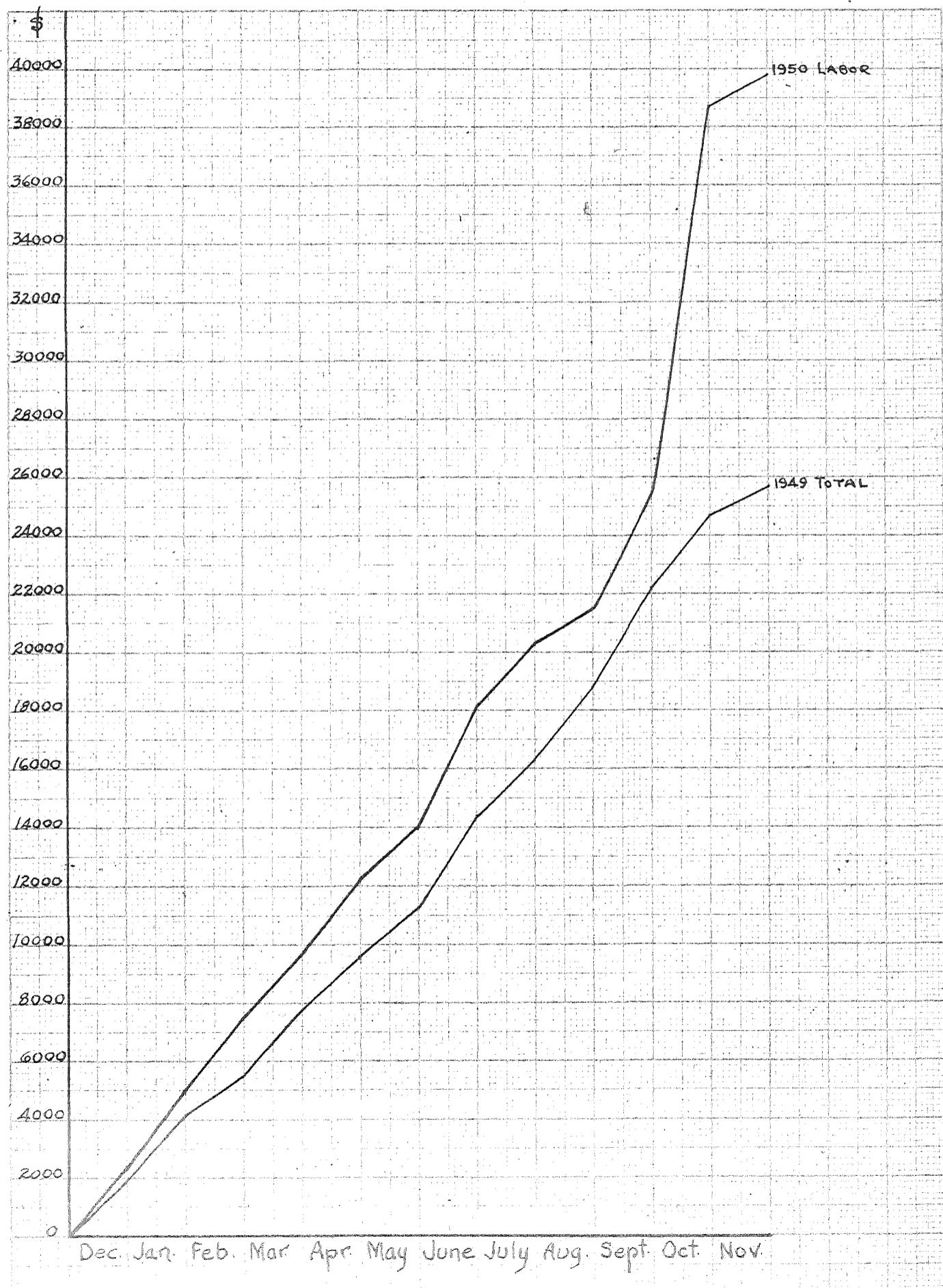
I would like to draw the attention of any readers of this report to the sixth paragraph of Mr. Hagerman's report. In this paragraph Mr. Hagerman explains changes in characteristics of the Saint John River which have and are taking place.

X Respectfully submitted.

City Engineer.



WATER ORDINARY COSTS 1949 AND 1950 .



WATER PUMPING STATION COSTS 1949 AND 1950.

FREDERICTON WATER SUPPLY.

Year 1950.....Jan. 1st to Dec. 31st.

The quality of the water supplied to the City mains for 1950 was generally fair.

The number of positive tests, indicating the presence of the undesirable Coli-Aegogenes group, was low, well within the required limit for safety.

The Physical characteristics of the water were not always all that could be desired but this condition will be corrected when the new settling basin is built. This improvement is in the program as recommended by Gore and Storrie in their report of December, 1949.

Prior to the winter of 1947-48 it was possible to discontinue the use of alum, during the winter months, while the River was low and sealed with ice. In December, 1947 the alum was cut off as in former years but due to the formation of objectionable tastes, formed from the combination of the chlorine with substances in the water, it was found necessary to resume its use.

It is most probable that 1947 marks the last time that the people of Fredericton will ever have water from the St. John without the alum treatment.

X The characteristics of the St. John River are changing due to the increased use of it as a sewer. Dams on it and its branches cause large ponds of water where conditions are favourable to the growth of algae and slime. The Fraser pulp and paper mills at Edmundston and Madawaska are pouring in large quantities of stinking mill waste. The growing towns, along its watersheds, add everything, including starch factory waste, to the brew. Tributaries from the west are the worst offenders, draining the towns of Maine. The Aroostook drains Presque Isle and Caribou. The Presquile drains Mars Hill. Especially evil is the Meduxnekeag, sewer from Houlton. Men building a bridge across this stream, not far from the Maine Border, say that the stench from it is nauseating. The St. John is on its way to join the rest of the Dead Rivers flowing into the North Atlantic.

The deterioration of the raw water made it increasingly difficult to be sure of producing a supply of safe water at all times with our antiquated Chloride of Lime equipment, so a pair of Chlorinators were installed.

The Chlorinators using Chlorine gas as a sterilizing medium were put in operation on September 24th. An improvement in the taste of the water was noticed almost immediately. Probably the reason for the taste improvement lies in the fact that we are now able to control the amount of Chlorine with a greater degree of precision than was possible under the old system. Even better results may be expected as regards taste when new pumps and settling basin with constant pumping rate controls are added to the system.

The raw water from the St. John has a pH of approximately 7 which is neutral, or non-corrosive. The addition of alum lowers the pH to 6 which is on the acid side of neutral and makes a water of corrosive nature.

Fredericton Water Supply...1950 (Continued).

The Chloride of Lime as used as the source of Chlorine before September 24th added some lime to the water as well as Chlorine. This lime raised the pH from 6 to about 6.5. While not up to neutral, water at 6.5 is not as corrosive as water at 6. After the adoption of the Chlorinators the treated water is back to pH 6. The lime from the Chloride of lime is missing.

It will be necessary to install a proper Dry Lime Feeder which will give us a positive control over the amount of lime added and enable us to adjust the pH of the finished water to neutral. This should result in a better water than we have ever had in so far as the corrosive element is concerned.

Our system of adding alum is as antiquated as our Chlorine system was previous to the installation of the Chlorinators. The old alum solution tanks are 44 years old and the equipment that goes with them is worn out. The stirring device for mixing the 500 gallons of alum solution was never satisfactory and needs supplementary hand stirring which is no good because men will not stir solutions thoroughly unless some one stands and watches them. Most mixes are made at night when there is no supervision. The result is a solution of alum of varying strength which results in a varying dose to the water. If the dose is less than the minimum required the alum does not form the proper jelly like floc about the dirt particles which can be settled out or trapped in the sand of the filter beds. When floc does not form the raw alum goes through the sand into the treated water. It probably flocks later in the pipes.

A Dry Feed machine similar to the one mentioned for Lime will handle alum as well and one should be installed as soon as it is possible to do so and at the same time be in accordance with the plans of Gore and Storrie.

While renovations are being made at the Plant it would be advisable to add a third Dry Feed machine (they are identical machines) for a spare. It could be used occasionally to add activated charcoal to the water at times when objectionable tastes develop.

Following are the particulars of the bacteriological tests made for the year.

The Standards by which the water quality is measured are taken from the United States Health Reprint No. 2440. Copies of this reprint may be obtained from Superintendent of Documents, Washington, D.C. A brief of the standards as applicable to Fredericton conditions is given below.

- (1). A Sample consists of 5 portions.
- (2). Each portion contains 10 cc. of water.
- (3). The Confirmed test shall be used to show the presence of the Coli-Aerogenes group (b. coli). The confirmatory media 2% Brilliant Green Bile shall be used in the confirmatory test.

Fredericton Water Supply 1950 (Continued).

APPLICATION OF TEST.

- (1). Of all the 10 cc. portions examined per month not more than 10% shall show Positive.
- (2). When less than 20 samples per month are examined one standard sample per month may have 3 Positive portions out of the 5 Portions making up the Sample.
- (3). The procedure given, using a standard sample composed of 5 portions, provides for an estimation of the Most Probable Number (written M.P.N.) of coliform bacteria per 100 cc., present in the sample as set forth in the following table.

Number of Portions (total of 5)	Most Probable Number of Coliform Bacteria per 100 cc. of sample.
------------------------------------	---

Negative	Positive	When 5--10 cc. portions are examined
5	0	Less than 2.2
4	1	2.2
3	2	5.1
2	3	9.2
1	4	16.0
0	5	More than 16.0

Test for Coliform Group. Primary media Lactose Broth Confirmatory media 2% Brilliant Green Bile.

Positive result means Coliform Group Present.

Negative result means Coliform Group Absent.

Date of Sample	Origin of Sample	Test divides the 5-10 cc. portions as:-
		Positive Negative.

1950

Jan. 9	Pumping Sta.	0	5
" 15	127 Charlotte St.	0	5
" 18	Engineering Building UNB	0	5
" 23	Engineering Building UNB	0	5
" 30	Pumping Station	0	5

All samples Negative for January.

Feb. 5	Pumping Sta.	0	5
" 11	127 Charlotte St.	0	5
" 19	Engineering Building UNB	0	5
" 25	Pumping Sta.	0	5

All samples were Negative for February.

Fredericton Water Supply ...1950 (Continued).

Date of Sample	Origin of Sample	Test divides the 5-10cc.	Portions as:	
		Positive.	Negative.	
1950				
March 6	City Hall	0	5	
" 13	Engineering Building UNB	0	5	
" 19	Pumping Sta.	0	5	
" 26	Pumping Sta.	0	5	
All samples were Negative for March.				
April 2	127 Charlotte St.	0	5	
" 8	Pumping Sta.	0	5	
" 13	Engineering Building UNB	0	5	
" 20	127 Charlotte St.	0	5	
" 26	Pumping Sta.	1	4	
There was one positive portion for April or 4%.				
May 2	Pumping Sta.	0	5	
" 9	127 Charlotte St.	0	5	
" 14	Pumping Sta.	0	5	
" 24	Engineering Building UNB	0	5	
" 29	Pumping Sta.	0	5	
All samples were Negative for May.				
June 3	City Hall	0	5	
" 9	Pumping Sta.	1	4	
" 16	Pumping Sta.	0	5	
" 22	127 Charlotte St.	0	5	
" 29	Pumping Sta.	0	5	
There was one Positive portion for June or 4%.				
July 8	Pumping Sta.	0	5	
" 14	127 Charlotte St.	0	5	
" 23	Pumping Sta.	0	5	
" 28	Pumping Sta.	0	5	
All samples were Negative for July.				
August 2	127 Charlotte St.	0	5	
" 7	City Hall	0	5	
" 13	Pumping Station	0	5	
" 19	Pumping Station	0	5	
All samples were Negative for August.				
" 14	Well at Wilsey Road	1	4	Muddy
14	Spring at Victoria Mills	5	0	
16	Well at Wilsey Road	2	3	Muddy
16	Spring at Victoria Mills	5	0	
Sept. 4	Pumping Station	0	5	
" 9	127 Charlotte St.	0	5	
" 15	Pumping Station	1	4	
" 21	127 Charlotte St.	0	5	
" 23	Pumping Station.	0	5	
There was one Positive portion for September or 4%.				

Fredericton Water Supply 1950 (Continued).

Date of Sample	Origin of Sample	Test divides the 5-10 cc. Portions as:-	
		Positive	Negative
<u>1950</u>			
Oct. 1	Engineering Building UNB	0	5
" 10	Pumping Station	0	5
" 16	Pumping Station	0	5
" 23	127 Charlotte St.	0	5
There were no Positive portions for October.			
" 4	Wilsey Well	5	0
Nov. 2	127 Charlotte St.	0	5
" 6	Engineering Building UNB	0	5
" 11	127 Charlotte St.	0	5
" 18	Pumping Station	0	5
" 24	Pumping Station	0	5
All samples were Negative for November.			
Dec. 4	408 University Avenue	0	5
" 7	127 Charlotte St.	0	5
" 11	Pumping Station	0	5
" 16	Pumping Station	0	5
" 27	Pumping Station	0	5
All samples were Negative for December.			

The Most Probable Number of Coliforms per 100 cc. of samples average for the year would be less than 2.2.

The Average Residual Chlorine content of the water entering the City mains was 0.2 parts per million.

Sgd. E. W. Hagerman
December 31st, 1950.

TABLE SHOWING PRINCIPAL PURCHASES
OF MATERIAL
USED BY DEPARTMENTS HEREINBEFORE MENTIONED.

Material.	Amount Purchased 1950	Average Price F.O.B., Fredericton. (4% Provincial Sales Tax not included.)
4" Soil Pipe	1250 ft.	96.8¢-\$1.072 per ft.
4" Terra Cotta Pipe	52 ft.	38¢ per ft.
5" Terra Cotta Pipe	5600 ft.	39¢-46¢ per ft.
6" Terra Cotta Pipe	148 ft.	49¢ per ft.
8" Terra Cotta Pipe	12000 ft.	54½¢-60¢ per ft.
10" Terra Cotta Pipe	750 ft.	.8136¢ per ft. & freight
8" Concrete Pipe (3' long)	972 ft.	.4325¢ per ft.
10" Concrete Pipe (3' long)	330 ft.	.5490¢ per ft. & freight
12" Concrete Pipe (3' long)	324 ft.	.6570¢ per ft. & freight
Portland Cement	683 bags	95¢-\$1.40 per bag
Brick	120900 bricks	\$22.00-\$26.00 per thousand
Rock Dust	638.4 tons	50¢ per ton
Brushed Rock	39.35 tons	\$1.50 per ton (delivered)
Sand (Screened)	85 yds.	\$2.00 per yd. (delivered)
Gravel	5781 yds.	5¢ per yd.
	150 yds.	.90¢ per yd. (delivered)
Calcium Chloride	130 tons	\$42.82-\$43.22 per ton
Road Machine Blades 6'	42 blades	\$8.87-\$9.75 per blade
Road Machine Blades 7'	6 blades	\$10.27 per blade
Road Machine Blades Serrated 6'	8 blades	\$19.27 per blade
Lime (Chloride of Lime) (Liquid Chlorine)	18600 lbs. 3750 lbs.	\$6.48 per cwt. \$13.55 per hundred lbs.
Alum	158285 lbs.	\$1.80-\$1.98 per 100 lbs.
Coal	79.14 tons 87.075 tons (Springhill) 157.750 tons (Screened) 274.740 tons (Minto)	\$16.00-\$17.00 per ton \$10.30 per ton
Primer	272.6 gals	\$7.40 per ton & delivery
R.C. 2	1995.7 gals.	.38¢ per gal. Drums included
R.C. 3	2458.0 gals.	.31¢-40¢ per gal. Drums included
M.C. 2	649.5 gals.	.31¢ per gal. Drums included
5/8" Copper Tubing	5676 ft.	.386¢ per gal. Drums included
1" Copper Tubing	198 ft.	\$20.53-\$21.66 per 100 ft.
1½" Galv. Pipe	258'-1"	\$38.55 per 100 ft.
		\$32.94 per 100 ft.

Provincial Sales Tax
4% not Included

Material.	Amount Purchased 1950.	Average Price F.O.B. Fredericton.
8" Cast Iron Pipe	456 ft.	\$2.81 per ft. & freight
6" Cast Iron Pipe	3600 ft. (Delavand)	\$1.59 per ft.
	2004 ft.	\$2.04 per ft.
6" Sleeves	2	\$8.56 each
6"x6"x8" Tee B.E.S.	1	\$36.45 each
8"x6" Reducers	1	\$19.44 each
1/8 Bends 6"	2	\$11.63 each
6" Split Sleeves	2	\$26.40 each
4" Split Sleeves	3	\$18.10 each
McAvity Milwood Iron Bronze mounted Hubend Gate Valves	7	\$58.65-\$39.00 each
McAvity World Compression fire hydrant 6'bury 6" hub connection with 2 $\frac{1}{2}$ " hose nozzle	7	\$145.00 each.
Service Boxes 5'-6'	150	3.77 each
Lead	3397 lbs.	24¢-31¢ per lb.
Lumber	12941 ft.	\$55.00-\$75.00 per thousand
	98320 ft.	\$45.00-\$47.00 per thousand
Cedar Posts P/c/s.	30	\$12.50 each.
<u>Water Meters.</u>		
3" Trident Compound Meter (Cold Water)	1	\$303.26
2" Trident Style 3 Cold Water Meter	1	\$112.95
1 $\frac{1}{2}$ " Trident Crest Cold Water Meter	1	\$ 77.76
1 $\frac{1}{2}$ " Trident Style 3 Cold Water Meter	1	\$ 73.14
5/8x3/4 Trident C.I.B. Cold Water Meter	75	\$19.27-\$19.97 each.
Dynamite	181 cases - 9051#	\$28.00-\$33.00 per case (50# in case).
Blasting caps 6' 8' 10'	55 boxes 39 $\frac{1}{2}$ boxes 2 boxes	\$11.75 per hundred \$12.75 per hundred \$13.50 per hundred
Oakum	2100 lbs.	24¢-29¢ per lb.
Manholes (Covers and Frames) (Small Size)	30	\$28.37-\$28.70 each
Covers	34	\$10.20 each
Frames	30	\$18.17 each.
(Covers and Frames) Large Size	45	\$34.80-\$39.69 each
Catch Basins (Covers and Frames)	21	\$21.73 each
(Covers)	21	\$7.10-\$7.59 each
(Frames)	19	\$14.96 each
1-3x3x50' Creosoted Culvert Complete	1	\$601.05

Provincial Sales Tax 4%
Not included

Material.	Amount Purchased 1950.	Average Price F.O.B. Fredericton.
K 627 Hydraulic Hoist heavy duty with 14" Tipping Sills Internation K-5	1	\$ 587.60
(2) Type Masvm Chlorinators (Cap. 60# per 24 hrs. (inj. #99 with outlet (for 3/4" hose		7815.00
(1-Automatic Differential (Converter Serial LD-2044 (1-W & T Comparator		
1-1950 Dodge $\frac{1}{2}$ Ton Express Serial No. 900090936		1632.80
Fire Alarm Boxes	34	210.75 each
1-99 H. Austin Western Heavy Power Grader with heater, windshield wipers wt. 22600 lbs.		16198.00
1-Scarifier for 99 H Austin Western Grader	1	761.62
2-20"x60" Air Receivers 250# per sq. in. test	2	131.64 each.
1- Fairbanks Morse Westco Pumping Unit, $7\frac{1}{2}$ H.P. 3/60/220 Volt 1800 R.P.M.		465.82
1-Type RO-15 K.W. 2300 V. Primary 6.6 Amp. 60 Cycle Pole Type Constant Current Transformer Scr.#252794		730.00
1-Feeder Panel Sum 9562302		1699.92
1-Francis Hankin Self Propelling Sewer Nozzle		78.50
1-Power Mower		149.50
Rods for No. 5 Flexible Sewer Cleaning Set	15	4.70 per rod.
6 Cond. Plus 3 Pairs 16 B and S solid annealed tinned copper grs. heat resistant rubber insulation color coded braid R I L C Fire Alarm Cable to I.M.S.A. Specification	4500 feet	.783¢ per foot including lags and reels.
4 Cond. Plus 2 Pairs 16 B and S solid annealed tinned copper grs. heat resistant rubber insulation color coded braid R I L C Fire Alarm Cable to I.M.S.A. Specification	250 feet	.687¢ per foot including lags and reels.

Provincial 4% Sales
Tax not included.

Material.	Amount Purchased 1950.	Average Price F.O.B. Fredericton.
8 Cond. Plus 4 Pairs 16 B and S solid an- nealed tinned copper grs. heat resistant rubber insulation color coded, braid RILC Fire Alarm cable to I.M.S.C. Specifi- cations	1950 feet	\$ 1.07 per foot in- cluding lags and reels.
P.G.U. 1613 DeFroster fan	2	30.12 each
Scarifying teeth	34	1.97 each
Alemite Grease Gun	1	32.40
P.G.F. 9796 Wiper (motor)	1	22.73
Diesel Oil	7915 gals.	18.30/-19.10/- per gal.
Gasoline	8430	26.30/-27.90/- per gal.

FOREST HILL
6" C.I. WATER PIPE = 1127 LIN.FT.
8" DOMESTIC SEWER = 1031 LIN.FT.
5" DOMESTIC SEWER = 479 LIN.FT.
5/8" COPPER TUBING = 474 LIN.FT.

GRAVEL
CONSTRUCTION
3.0 MILES

