

ANNUAL REPORT OF THE ENGINEERING AND PUBLIC WORKS DEPARTMENT

1953



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TO HIS WORSHIP THE MAYOR AND ALDERMEN
OF THE CITY OF FREDERICTON.

Madam and 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, 1952 to the first of December, 1953.

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. During the year, along with our regular maintenance work, the City crews and contractors constructed the following new works:-

New Pavement and Recap (City crews and Diamond Construction Company.....	11.50 miles
Gravel Road Construction (City crews and Forbes and Sloat	12.15 miles
Concrete Curb and Gutter	7.00 miles
Concrete Sidewalk	1.09 miles
Diversion of Back Drain	1.10 miles
8" to 60" Surface Sewer82 miles
8" to 10" Domestic Sewer (City crews and Forbes and Sloat	1.42 miles
6" Water Main	1.10 miles
1 $\frac{1}{4}$ " Water Main29 miles

Contractors under contract with the City this year constructed the following works:-

Forbes and Sloat -	Continuation of 1952 Contract rebuilding St. John Road from Ketchum Bridge on Waterloo Row to lower entrance to Experimental Station, a distance of 2.18 miles. This firm also did the sub- grading and fine grading on the Maryland Road from Albert Street to the City line, a distance of 3.55 miles.
Diamond Construction Company -	Laying of Asphalt paving on the St. John Road from Ketchum Bridge to Experimental Station, lower entrance, 2.2 miles; Maryland Road, from Albert Street to City line, 3.55 miles and 2.34 miles of City Streets at various locations. In addition to above 2.28 miles of City streets were recapped with 2" asphalt. The excavation and grading of City Streets in preparation for

paving and the repairs to shoulders
of recapped streets were done by
City crews.

Forbes and Sloat - Construction of 1346 lineal feet of
10" Terra Cotta pipe for Domestic
Sewer on Smythe Street from the
Reliever Sewer on Victoria Street
to Tamarack Terrace.

International Water - Exploration and test drilling for
Supply Co. ground water supply.

The location of the above listed work is shown on a
map following Page #3.

Our regular expenditures appear for 1953 as follows:-

	<u>Appropriation</u>	<u>Net Expenditure</u>	<u>Debit</u>	<u>Credit</u>
Street Lights	27,000.00	25,487.47		1,512.53
Public Works	15,000.00	14,908.80		91.20
Roads & Streets	191,000.00	184,748.22		6,251.78
Sanitation	51,000.00	34,756.85		16,243.15
	<u>Revenue</u>	<u>Net Expenditure</u>		<u>Credit</u>
Water Pumping Station)		29,534.74		
Water Ordinary)	95,727.42	42,728.58		14,351.80
Sewerage Domestic)		9,112.30		

The City of Fredericton occupied 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 preliminary report on the 1951 Census shows the City's population as 16,018.

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,

W.L. Barrett

City Engineer.

TOTAL YEARLY EXPENDITURE

The expenditures shown in this report cover the period of time from December 1st, 1952 to December 1st, 1953.

The Total Yearly Net Expenditure under the direct supervision of the City Engineer this year amounted to \$70⁴,010.26. This expenditure will be taken up in detail under the different headings in this report. The Total Gross Expenditure for this period amounted to \$9⁴3,036.63.

A graphic comparison of expenditure for Labour and Material for the year 1953 and the year 1952 is shown on the following charts.

The location of new construction completed this year is shown on two maps inserted after page three of this report.

ROADS AND STREETS

This year we had an appropriation for Roads and Streets of \$191,000.00. We under-expended this appropriation by \$6,251.78.

We have, in Fredericton altogether, 55.30 miles of Roads and Streets. 10.50 miles being located on the north side of the Saint John River and 44.80 miles on the south side. In addition we have 37.64 miles of Sidewalk; 6.51 miles on the north side of the Saint John River and 31.13 miles on the south side.

Our paved and unpaved streets are divided between the Rural and Urban Districts, (inside and outside tax rate) as follows:-

Roads and Streets

	<u>Urban</u>	<u>Rural</u>	<u>Total</u>
Paved	25.65	6.54	32.19
Unpaved	<u>11.90</u>	<u>11.21</u>	<u>23.11</u>
Total..	37.55	17.75	55.30

Roads and Streets Expenditures 1953:-

Gross Expenditure	\$ 220,110.40
Credits	<u>35,362.18</u>
Net Expenditure	\$ 184,748.22
1953 Appropriation	<u>191,000.00</u>
CREDIT	\$ 6,251.78

The above Credits of \$35,362.18 are made up as follows:-

Caldwell Construction Co. (Rental on Michigan Shovel)....	\$ 24.50
Edward Moran (Use of Grader)	7.00
Victoria Public Hospital (Asphalt in Ambulance Entrance)	76.66
Imperial Oil Co. (Thawing Valves on Tank Car).....	6.08
John H. Stephens (Concrete Walk)	24.00
Irving Oil Co. (Thawing Wash Stand)	10.18
Canadian National Railway (Thawing Culvert and Rental of Compressor)	32.14
Dr. A. W. G. Good (Concrete)	52.00
E. N. Hellwell (Thawing Cellar Drain)	9.62
Hornsnell Machine & Iron Works (Repairs to Shovel).....	172.78
Works Foreman St. Anne's Pt. Barracks (Patching).....	3.00
Bemrose & Kilburn (Hire T-6K Shovel)	28.00
George St. Baptist Church (Repair Walk).....	15.00
Fredericton Tire Service (6 Bags Calcium Chloride)....	16.50
Mr. A. C. McCulloch (Concrete Walk)	18.00
Fredericton School Board (Concrete walk rear of Gym)...	201.14
South Devon Fuel Co. (Replacing 4 Guard Posts).....	12.00
Journal Voucher (Wood, 79 loads @ 10.00 per load).....	790.00
Journal Voucher (Coal, Labour and trucking - 2 Tons)...	41.02
Journal Voucher (Recreation, Street Brooms).....	3.38
Journal Voucher (Holiday Account)	1,293.40
Journal Voucher (Airport)	18.92
Journal Voucher (Machinery, including use of Bulldozers, Power Shovels, Trucks, etc.).....	30,545.10
Journal Voucher (Gas and Oil used by other Depts.).....	<u>1,961.76</u>
	\$ 35,362.18

The Gross Expenditure is divided as follows:-

Labour being the total of Roads and Streets, Pay-Rolls,
which include the cost of hired trucks or any
other machinery hired by the hour \$ 66,594.65
Material Charges, which includes workmen's
compensation and unemployment insurance and
all material charges including purchase and
repairs of City owned equipment 153,515.75

I have divided the Labour Charges of \$66,594.65 into
the following items. These items 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> :- 37.64 miles	\$ 301.68
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. 55.3 miles	11,557.12
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 headings.....	15,325.70
4.	<u>Surface Sewers</u> :- Cleaning, flushing and repairing surface sewers and building new surface sewers within streets limits	1,613.93
5.	<u>Sanding Walks</u> :- Storing sand in winter storage piles and spreading same on slippery walks and streets	3,747.46
6.	<u>Yard</u> :- Men working in blacksmith shop and repair work in City Yard; taking out summer equipment and storing winter equipment	3,971.01
7.	<u>Gravel</u> :- Application of gravel for maintenance on City Roads and Streets	758.63
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	109.99
9.	<u>Doak and Wilsey Roads</u> :- All work done on these roads other than work done by power maintainer	459.80
10.	<u>Maryland Road</u> :- Montgomery Street to southern City line. All work done on this road other than that done by power maintainer or by special contract	-----
11.	<u>Killarney Road</u> :-	-----
12.	<u>Outlying Roads</u> :- Hanwell Road, Cross Roads lying between Brick Hill and College Hill and Forest Hill Road and the Golf Link Road. All work done on these roads other than work done by power maintainer	2,422.36
13.	<u>Street Cleaning</u> :- All cleaning and removal of dirt, leaves, etc. from streets	<u>15,440.11</u>
	Forward	\$ 55,707.79

	Brought Forward	\$ 55,707.79
14.	<u>Tarvia Repairs</u> :- Patching and repairing asphalt or tar pavement and applying seal coat of light tar or asphalt to pavements	2,626.40
15.	<u>City Road Patrol</u> :-	954.66
16.	<u>City Forest</u> :-.....	<u>7,305.80</u>
	TOTAL	\$ 66,594.65

Following is a table comparing Labour Expenditure in these items from 1950 to 1953:-

TABLE COMPARING YEARLY COSTS IN ROADS AND STREETS LABOUR ITEMS

ITEM	1950	1951	1952	1953
1. Snowploughing sidewalks	319.59	347.32	849.71	301.63
2. Snow Control	11,348.98	9,357.68	23,077.47	11,557.12
3. Streets	6,182.19	10,280.99	11,612.92	15,325.70
4. Surface Sewers	3,426.24	2,826.10	2,075.21	1,613.93
5. Sanding Walks	2,067.79	2,030.36	3,656.30	3,747.46
6. Yard	1,973.93	3,674.26	2,825.92	3,971.01
7. Gravel	5,246.41	3,937.62	1,297.59	758.63
8. St. John River Road	92.27	455.93	590.27	109.99
9. Doak & Wilsey Roads	216.15	1,912.01	321.27	459.80
10. New Maryland Road	162.44	34.72	----	----
11. Killarney Road	----	58.36	----	----
12. Outlying Roads	925.21	792.31	142.80	2,422.36
13. Street Cleaning	13,431.84	16,356.33	19,831.53	15,440.11
14. Tarvia Repairs	2,835.38	3,990.16	2,691.59	2,626.40
15. City Road Patrol	804.04	1,295.83	762.22	954.66
16. City Forest	<u>3,122.05</u>	<u>4,854.43</u>	<u>4,213.90</u>	<u>7,305.80</u>
TOTAL	52,154.51	62,204.41	74,948.70	66,594.65

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

Item 1.

37.64 miles of sidewalk were kept ploughed this year. To the Labour cost of \$301.68 must be added an estimated material cost of \$1000.00, giving a total cost of \$1301.68 or a unit cost for ploughing and, per mile of sidewalk of \$34.58.

Item 2.

Snow Control	1950	1951	1952	1953
Snowploughing Roads and Streets	1,279.89	972.48	3,817.66	1,539.66
Shovelling and Hauling Snow	8,098.56	6,037.60	15,793.04	4,913.72
Catch Basins	632.83	415.04	1,995.12	1,425.51
Snow Fences	483.81	954.17	709.86	572.38
Keeping drains on hills open	801.29	968.01	761.79	2,991.25
Thawing Culverts	<u>52.60</u>	<u>10.38</u>	----	<u>114.60</u>
	\$ 11,348.98	9,457.68	23,077.47	11,557.12

55.3 miles of Roads and Streets were ploughed and maintained during the winter months under this cost item. To the labour cost of \$11,557.12 must be added the material and machinery cost of \$23,483.52, giving a total cost of \$35,040.64 or a unit cost per mile of road maintained under winter conditions, of \$633.64.

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 1st, 1952 to May 1st, 1953. It is 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 26, 1953.

Department of Public Works,
Province of New Brunswick.

In Account With
The City of Fredericton

City of Fredericton - Snow Control Account
November 1, 1952 to May 1, 1953

City Pay Rolls charged to Snow Control, Nov. 1, 1952 to May 1, 1953	\$ 15,501.49
Workmen's Compensation	465.04
Pension Fund paid by City	775.07
City Trucks:	
Ford 1951 - 3 Ton Dump, License #C-16931.....	
Chev. 1951 - 3 Ton Dump, License #C-16933.....	
International 1948 - 2 Ton Dump, License #C-16927	
Total Hours, City Trucks, 1633 Hrs. @ \$1.70.....	2,776.10
City Jeeps - Sidewalk Plows:-	
License #C-16926	
License #C-16928	
Total Hours, City Jeeps - 406 Hrs. @ \$1.00.....	406.00
City Road Patrols:-	
Adams #410	
Austin Western #99-H	
Total Hours, City Road Patrols - 485 Hrs. @ \$5.00	2,425.00
City Bulldozers:	
International T.D.-6, 1948	
International T.D.-6, 1949	
Total Hours, City Bulldozers - 271 Hrs. @ \$3.00...	813.00
City Thawing Machine:-	
Total Hours, City Thawing Machine - 464 Hrs. @	
\$1.80	835.20
City Shovel:-	
Michigan C-16	
Total Hours, City Shovel - 134 Hrs. @ \$7.00.....	938.00
Forward	24,934.90

Brought Forward \$ 24,934.90

City Snow Blower:-

Sicard Junior:

Total Hours in use - 50 Hours	
188 Gallons Gas @ \$0.277	52.08
10 Quarts of Oil @ \$0.3015.....	3.02
Insurance - 1 Year.....	130.39
Storage	80.00
Repairs	1,595.73
Depreciation (10% of Depreciated Value, \$8,462.64).....	846.26

NOTE: Wages of operators of City Machines do
not appear as they are included in Pay
Rolls charged to Snow Control.

Tractors & Equipment Grader:-

Rental charges (Caterpillar Road Patrol).....	2,496.00
Repairs	1,405.86

Sand:-

From Bemrose & Kilburn - 3400 Tons @ \$0.75.....	2,550.00
--	----------

Calcium Chloride:-

40 Tons @ \$51.45	\$ 2,058.00
4% Tax	<u>82.32</u>
	2,140.32

Rock Salt:-

100 Bags @ \$1.02	\$ 102.00
4% Tax	<u>4.08</u>
	<u>106.08</u>

TOTAL\$ 36,340.64

Certified Correct,

W. L. Barrett

City Engineer.

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

Dec. 1, 1948 to Nov. 30, 1949.....	64"
Dec. 1, 1949 to Nov. 30, 1950	12 $\frac{1}{2}$ "
Dec. 1, 1950 to Nov. 30, 1951	93"
Dec. 1, 1951 to Nov. 30, 1952	14 $\frac{1}{2}$ "
Dec. 1, 1952 to Nov. 30, 1953	53 $\frac{1}{2}$ "

Snow Fences:

In our Snow Fencing this year we used 8,000 feet of lath-made snow fence.

Item 3

Streets:-

Repairs to Streets (Repairs to Curbs, Side-walks, Bridges, widening streets, Culverts, Rip-rapping, etc.).....	\$ 3,032.94
Painting Traffic Lines and Street Signs.....	2,108.52
Repairs to Machinery	1,126.30
Weather Account (Holidays).....	8,737.29
Unloading & Spreading Calcium Chloride.....	<u>320.65</u>
TOTAL	\$15,325.70

Included in the above item are, Labour costs in repairs to streets, 1387 lineal feet of Cement Sidewalk and 1687 lineal feet of Curb and Gutter were relaid.

This year we purchased 160 tons of Calcium Chloride and 100 bags of Malagash Salt.

The above Weather Account of \$8,737.29 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.

Item 5

Sanding Walks:-

We have 2,781 cubic yards of sand at City Yard for winter of 1954.

Item 7

Gravel:-

This year under Roads and Streets, 708 cubic yards of gravel from Lewis Hughes, 323 $\frac{1}{4}$.13 cubic yards from Forbes and Sloat and 2947.85 cubic yards from Bemrose and Kilburn, making a total of 6889.98 cubic yards purchased during the year for maintenance and repair of gravelled roads.

The following Streets were gravelled:-

Dunn's Crossing Road; Extension of Saunders Street, from O'Dell Avenue to Rookwood Avenue; Campbell Street, from Queen St. to Westmorland Street and from Carleton Street to Regent Street; Forest Hill; Hanwell Road; portion of the Doak and Wilsey Roads; St. Mary's Street; Highland Avenue; Smythe Street, from Donald Street to Montgomery Street and the shoulders of the Pavement on Union Street and Gibson Street.

Item 8

St. John Road:-

The Labour expenditure of \$109.99 was made up in cutting bushes on the side of the road, putting in posts and repairing culverts.

Item 9

Doak and Wilsey Roads:-

Approximately one mile of the Doak Road was rebuilt this year.

Item 12

Outlying Roads:-

The Labour expenditure of \$2422.36 is made up of maintenance expenditures incurred in repairs on Forest Hill, Smythe Street Hill, Montgomery Street, Higgins Cross Road, Golf Link Road, Dunn's Crossing Road and Hanwell Road.

This year, Hanwell Road was rebuilt from the Canadian National Railway to the City line, a distance of 4480 lineal feet. Higgins Cross Road was ditched from Regent Street to Smythe Street, a distance of 3200 lineal feet and the fill hauled to Woodfield Court.

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 \$15,440.11 shows a decrease of \$4,391.42 over last year, due mainly to the purchase of one Motorized Elgin Street Sweeper, which went into operation June 1st, 1953.

Item 14

Tarvia Repairs:-

Under this heading, \$1,987.11 was expended in Labour in Patching streets and \$639.29 to sealing 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 or asphalt and local pit run gravel which was dried out by gravel heaters. The holes in the pavements after having the 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. We also used in street patching this year, some 255.5 tons of premixed asphalt pavement which was hauled by city trucks from the plant of the Diamond Construction Company, situated below Oromocto.

This year, 5.62 miles of City Streets were sealed by the Diamond Construction Company, with a surface treatment of R.C.-3. The following materials were used:-

Diamond Construction Co.-Supplying and applying.	
19,016 Gals. R.C.-3 @ 25¢ per gallon.....	\$ 4,754.00
Diamond Construction Co.-Hauling and spreading	
940.855 tons sand @ \$1.20 per ton.....	1,129.03
Diamond Construction Co. - 15½ Hrs. - 10 Ton, 3	
Wheel Roller @ \$3.50 per hour.....	54.25
Bemrose & Kilburn - 696.9 cu. yds. sand @ 50¢	
per cubic yard	<u>348.45</u>
TOTAL	\$ 6,285.73

The following streets were sealed:-

<u>Location</u>	<u>Lineal Feet</u>
University Avenue - Waterloo Row to Canadian National Railway	2,810
Queen Street - St. John . to York Street.....	2,000
Queen Street - Northumberland St. to Smythe St....	720
King Street - York Street to Brunswick Street.....	2,380
Brunswick Street - Subway to R.C.M.P. Driveway....	6,580
Needham Street - Regent Street to York Street.....	1,260
Saunders Street - Westmorland St. to Smythe St....	1,320
Aberdeen Street - York Street to Smythe Street....	1,950
St. John Street - Queen St. to McLeod Avenue	2,900
Regent Street - Queen St. to Canadian National Ry.	2,760
York Street - Campbell Street to Queen Street.....	250
Northumberland St. - Queen St. to Aberdeen St.....	2,220
Smythe Street - Queen Street to West of Aberdeen..	2,190
Carleton Street - Campbell St. to Queen Street....	330
TOTAL.....	29,670 Lineal Feet

The unit price per mile, sealing would be approximately \$1120.00.

Waterloo Row, from Ketchum Bridge to Church Street, a distance of 4,780 feet, was resurfaced with a 2" layer of pre-mixed asphalt with a pre-mixed asphalt seal coat. This work was done by the Diamond Construction Co. from their plant set up below Oromocto.

The following tonnage was required:-

1900 tons base in place @ \$6.00.....	\$ 11,400.
450 tons seal in place @ \$8.00.....	<u>3,600.</u>
TOTAL	

This work on Waterloo Row was 4,780 feet long with an average width of 29 feet, giving a square yardage of 15,400 and a unit cost per square yard of \$0.97 and a unit price per mile of about \$16,600.00.

Item 15

City Road Patrol:-

The total repair charges on our Road Patrol for the last three years were:-

	<u>1951</u>	<u>1952</u>	<u>1953</u>
Adams #412 Grader.....\$ 2,361.05	4,056.27	1,247.59	
Austin Western Grader.....\$ 2,738.93	4,598.68	2,358.22	

Item 16

City Forest:-

Included in our regular Roads and Streets costs is a labour expenditure for City Forest of \$7,305.80.

This labour item is subdivided as follows:-

Cutting Wood	\$ 3,548.70
Sawing Wood (Machine)	892.99
Haying	45.69
Splitting Wood	1,245.84
Caretakers Wages and Miscellaneous Expenses.	<u>1,572.58</u>
TOTAL	\$ 7,305.80

Besides this labour cost, the City Forest shows an expenditure for material of \$1,773.09, making a total cost for the year of \$9,078.89.

The Roads and Trails in the City Forest proper were kept clear from fallen trees and bushes.

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

225 cords wood cut and split @ \$18.00...\$ 4,050.00
7 Tons Hay @ \$19.00 per ton..... <u>133.00</u>
TOTAL\$ 4,183.00

Improvements to City Yard included the installation of a toilet at a cost of \$180.19. Doors and supporting structures of the buildings were repaired and replaced where necessary.

The following equipment was purchased this year and charged to Roads and Streets:-

1 D-6 Bulldozer (Tractors and Equipment)....\$ 14,705.60
1 Airpic Compressor (Riley Sales Ltd.)..... 3,281.20
1 Elgin Street Sweeper (Mussens Ltd.)..... 12,841.92
1 Champion Grader (Auto Machinery)..... 16,033.16
1 Jeep, complete with plow (Capital Garage).. 2,805.74
1 Ford - 2 Ton (Price \$2,910.00 less allowance on International 1948 - \$310.00)..... 2,600.00
1 G.M.C. Truck with steel body (Price \$3970.93, less allowance on 1941 Truck of \$200.00)..... <u>3,770.93</u>
TOTAL\$ 56,038.55

CAPITAL ACCOUNT PAVING

The Net Expenditure under this heading amounts to \$112,509.89.

Included in above are:-

(1) Capital Account Curb and Gutter	\$ 40,308.06
(2) Capital Account Paving.....	<u>72,201.83</u>
	TOTAL\$112,509.89

For the above net expenditure of \$40,308.06, concrete curbs and gutters were laid at the following locations:-

	<u>Concrete Curb and Gutter</u>	<u>Lineal Feet</u>
1.	Victoria St. - York St. to Smythe St. (West side)	1,898
2.	Victoria St. - York St. to Smythe St. (East Side)	1,270
3.	York Street - Hartt Boot & Shoe Co. to Victoria Street (West side)	162
4.	Regent St. - Albert St. to Montgomery Street (Both sides).....	6,062
5.	Green Road, at the corner of Green Road and Maryland Hill	192
6.	Henry Street - Union St. to Devon Avenue (Both sides)	1,400
7.	Waterloo Row - Acacia Drive to Farraline Home (East side)	4,303
8.	Chestnut Street - Albert Street to Crocket Street (Both sides)	1,896
9.	Crocket Street - Chestnut St. to Reid Street (Both sides)	462
10.	Beckwith Street - Hanson St. to Kitchen Street (Both sides)	600
11.	Kitchen St. - Beckwith St. to Green Road (Both sides)	2,255
12.	King Street - Church St. to Queen Street (West side)	414
13.	Windsor Street - Albert St. to Green Road (Both sides)	2,824
14.	Devon Avenue - Henry St. to Gibson St. (Both sides)	633
15.	Albert Street - Windsor St. to U.N.B. property line (Both sides)	343
16.	Gill St. - C.P.R. tracks to Dobie St. (Both sides)	344
17.	Dobie Street - Carney St. to Medley Street (Both sides).....	947
18.	Medley Street - Dobie St. to MacLaren Avenue (Both sides)	2,065
19.	Carney Street - Dobie St. to MacLaren Avenue (Both sides)	1,700
20.	MacLaren Avenue - Carney St. to Medley Street (Both sides).....	1,753
21.	Athlone Street - Carney St. to Medley Street (Both sides)	1,529
22.	Coombes St. - Carney St. to Medley Street (Both sides)	1,611
23.	Clark Street - Union St. to C.P.R. tracks (West side)	399
24.	Secretary Lane - Queen Street running west (East side)	66
25.	Parkhurst Drive near Hanwell Road (East side)....	<u>179</u>
	TOTAL	35,307

All the listed Curbs and Gutters laid were built by City Crews.

All the concrete poured was purchased ready mixed on the job from the firm of Bemrose and Kilburn at a contract price of \$14.50 per cubic yard. A cubic yard of Cement for Curb and Gutter poured 23.2 lineal feet of Curb.

The unit cost of one lineal foot of Curb and Gutter found by dividing the total length laid which equals 35,307 lineal feet into the total cost of \$40,308.06, is \$1.14 a lineal foot.

With the net expenditures of \$72,201.83 the following streets were paved:-

<u>Streets Paved</u>	<u>Lin. Ft.</u>	<u>Sq. Yrds.</u>
Dundonald St. - York St. to Northumberland St.	1330	3990
Westmorland St. - Victoria St. to Dundonald St.	365	1095
Northumberland St. - Victoria St. to Dundonald Street	365	1095
Victoria St. - York St. to Smythe St.	1970	5910
Chestnut St. - Albert St. to Crocket St.	920	2760
Crocket St. - Chestnut St. to Reid Street	250	694
Approach to Forest Hill	50	200
Kitchen St. - Beckwith St. to Green Road	1120	3360
Beckwith St. - Hanson St. to Kitchen St.	270	810
Henry Street - Devon Ave. to Union St.	770	2310
Devon Avenue - Henry St. to Gibson St.	340	944
Parkhurst Drive - Haviland St. running west	900	2700
Woodbine Court	250	611
Londale Court	250	611
Fairlawn Court	250	611
Windsor St. - Albert St. to Green Rd.	1370	3957
Albert St. - Windsor St. to U.N.B. Property	154	462
Indian Reserve Road	1100	2200
Union St. - Gibson St. to Subway	1450	3222
TOTAL	13,474	37,542

Above pavement was laid to a thickness of 4". The Street Grading and preparatory work other than the actual supplying and laying in place of the pre-mixed pavement, was done by regular City Crews at a cost of 8¢ per square yard. The pre-mixed pavement was supplied and laid by the Diamond Construction Company from their plant located below Oromocto. The Company charged the City for this pavement in place, \$6.00 per ton for base and \$8.00 per ton for Seal. Altogether some 37,542 square yards (2.55 miles) of City Streets were laid at a unit price of \$1.113 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 this 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 pre-mixed pavement, would be this year approximately \$22,500.00

The quantities used in this pavement were:-

Base Mix - 1 Ton spread 5.15 square yards
Seal - 1 Ton spread 40.12 square yards

Also included in above expenditure for Paving was the Recapping of the following City Streets, with a 2" layer of pre-mixed asphalt base and with a pre-mixed asphalt Seal:-

<u>Location</u>	<u>Lin. Ft.</u>	<u>Square Yds.</u>
Bridge St. - Highway Bridge to Union St.	550	2077
Gibson St. - Bridge St. to Union St.	5500	13,444
Union Street - Bridge St. to Gibson St.	3885	8,633
Barker St. - Gibson St. to Bridge at Nashwaak	2150	5,000
TOTAL	12,085	29,154
	Lin. Ft.	Sq. Yrds.

This above recap of City Streets was also done by the Diamond Construction Co. The material being hauled from their plant below Oromocto.

The unit price per square yard for the above recap was 76.8¢ for pavement approximately 20 feet wide.

CAPITAL ACCOUNT - SEWER DOMESTIC

Gross Expenditure	\$ 24,280.36
Credits	\$ 4,753.40
Net Expenditure	\$ 19,526.96

The above Credits are made up as follows:-

Work done on Domestic Sewers for private parties and a Journal Voucher correcting a debit of \$825.14,	
which should have been made to Domestic Sewer.....	\$ 996.16
Sale of Brick to Forbes and Sloat	11.88
Journal Vouchers (Material paid for by Capital Account Sewer and used by other City Departments).....	<u>3,745.36</u>
TOTAL	\$4,753.40

The above expenditure covers all new domestic sewer construction in the City. For this expenditure sewers were laid at the following locations:-

<u>Location</u>	<u>10" T.C.</u>	<u>8" T.C.</u>
Elmcroft Place		129'
MacLaren Avenue		189'
Northumberland St. - Dundonald St. towards Connaught Street.....		134'
Dobie Street - Neill St. to School St.....		425'
Westmorland St. - Victoria St. to Connaught Street.....	790'	
Mitchell St. - Starting East of Green Road to beyond Green Road...		255'
Tamarack Terrace		377'
Rookwood Ave. from Reliever Sewer to Road to Army Garage.....		555'
Friel St. - Union St. running East.....		580'
Woodfield Court		1070'
Connaught St. - Westmorland St. to Albert St. 517'		
Albert St. - Connaught St. running towards York Street.....		1109'
TOTAL	1307'	4823'

In addition to the above pipe laid by City Crews, Forbes and Sloat laid 13⁴6 lineal feet of 10" Sewer on Smythe Street under contract. The total amount of pipe laid under this expenditure was 7476 lineal feet or 1.⁴2 miles.

Included in the above expenditure was the payment of easements on properties along the route of the Reliever Sewer laid in 1952. The payment of these easements amounted to \$374.00 and were as follows:-

Tractors & Equipment (517 Lineal Feet @ 50¢ per Ft.).....	\$ 258.50
Hartt Boot & Shoe Co. (201 Lineal Feet @ 50¢ per foot).....	100.50
John Palmer Co. (30 Lineal Feet @ 50¢ per foot)	<u>15.00</u>
TOTAL	\$ 374.00

We had in stock, November 30, 1952, 1100 lineal feet of 8" Terra Cotta Pipe @ .757¢ per foot - \$ 832.70.

The unit cost per foot of the above pipe in place was \$2.60. The labour charge being 54¢ per foot and the material charge \$2.06 per foot.

We have in stock, November 30, 1953, the following 8" and 10" pipe:-

616 Lineal Feet of 8" Terra Cotta Pipe @ .757¢ per ft.	\$ 466.31
187 ¹ / ₂ Lineal Feet of 10" Terra Cotta Pipe @ ,987¢ "	<u>185.06</u>
TOTAL	\$ 651.37

CAPITAL ACCOUNT - WATER

Gross Expenditure	\$ 29,183.24
Credits	406.05
Net Expenditure	<u>\$ 28,777.19</u>

The above Credits are made up as follows:-

Work done on Water System for private parties , mostly house connections	\$ 338.15
Journal Voucher (Pipe)	<u>67.90</u>
TOTAL	<u>\$ 406.05</u>

Installations were made at the following locations:-

<u>Location</u>	<u>Lineal Feet</u>
	<u>6"</u> <u>1$\frac{1}{4}$"</u>
Rookwood Ave. - Parkhurst Drive to West Entrance to Woodfield Court.....	580 380
Rookwood Ave. - C.N.R. track to road to Army Garage	233
Northumberland St. - Dundonald St. towards Connaught Street.....	150
Windsor St. - Green Road running East.....	800
Dobie St. - Neill St. to School Street.....	400
Westmorland St. - Dundonald St. to Connaught St..	380
Mitchell St. - Green Road West.....	204
Tamarack Terrace	399
Connaught St. - Westmorland St. to Albert St.....	517
Albert Street - York St. to Connaught St.....	1109
Woodfield Court	981
Friel St. - Union Street running East.....	<u>630</u>
	<u>5230</u> <u>1533</u>

In addition to above pipe, 595 feet was used in repairs to the Water System, hydrant branches installed on new mains, Gate Boxes and Sprinkler System installed at Eastern Bakeries, King Street. The total amount of 6" Cast Iron Water Pipe used was 5825 lineal feet.

The unit cost per foot for 6" Cast Iron Pipe was arrived at as follows:-

Expenditure (Net Expenditure 1953 plus value of stock on hand, November 30, 1952).....	\$ 37,641.56
Minus stock on Hand, November 30, 1953.....	<u>10,696.11</u>
Actual Expenditure involved in laying pipe lines 1953.....	\$ 26,945.45

Value of stock on Hand, November 30, 1952.....	\$ 8,864.37
<u>Plus</u> Value of Stock & Labour, Nov. 30, 1953... Value of Stock & Labour for 1953.....	<u>28,777.19</u>
<u>Minus</u> Value of stock on hand, Nov. 30, 1953... Value of Stock & Labour used in 1953.....	<u>\$ 37,641.56</u>
	<u>10,696.11</u>

\$ 26,945.45

From the above \$26,945.45 is deducted the cost and labour of 1 $\frac{1}{4}$ " Galvanized Pipe which amounted to \$1521.50, making a total cost for laying 6" Cast Iron Water Pipe of \$25,423.95.

The unit cost for laying 6" Cast Iron Water Pipe was approximately \$5.00 per foot, labour charge being 58¢ per foot and the material charge 44.42.

The unit cost for laying 1½" Galvanized Pipe was as follows:-

Labour Charge.....	\$ 889.14
Material Charge (1533 ft. @ \$44.25 per 100 feet).....	<u>632.36</u>
TOTAL	\$ 1521.50

Total length of Pipe laid was 1533 lineal feet, making a unit cost of approximately \$1.00 per foot.

This year we purchased from Tractors and Equipment, 1 Littleford Burner unit with hose attachment for \$119.60.

CAPITAL ACCOUNT SURFACE SEWER

Gross Expenditure	\$ 15,615.80
Credits	<u>952.08</u>
Net Expenditure	\$ 14,663.72

The above Credits are made up as follows:-

Provincial Government (Dept. of Public Works) 1 Catch Basin and Frame)	\$ 44.10
Journal Voucher (Material)	<u>907.98</u>
TOTAL	\$ 952.08

Under this heading Surface Sewers were laid at the following locations:-

Location	Lineal Feet			
	24" Concrete	12" Concrete	10" Concrete	8" Terra Cotta
Hawthorne Terrace.....				92
Albert St. School Grounds..	400		225	
York St., near Green Road..	144			
York St. - Victoria to old course of Back Drain.....		130		30
Windsor Street.....	906		90	
Westmorland St. - Dundonald St. to Connaught St.....	333			
Westmorland St. - in old course of Back Drain.....	66			
Connaught St. - Westmorland toward Northumberland St. 289		30		
St. Marys St. - C.P.R. track to Jaffrey St.....		308		
Friel St. replacing old culvert.....	120			
Waterloo Row.....		198	39	
Clark Street			78	
Regent St. near Montgomery.				78
Sewell Street				25
Gibson St. - MacLaren Ave. to East				198
TOTALS.....	808'	2116'	432'	423'

Total amount of Pipe laid was 3,779 lineal feet.

We have in stock, November 30, 1953, the following pipe:-

152 Lineal Feet of 15" Concrete @ \$1.19 per foot.....	\$ 180.88
579 Lineal Feet of 10" Concrete @ \$0.672 per foot.....	389.09
1638 Lineal Feet of 12" Concrete @ \$0.862 per foot.....	<u>1411.96</u>

TOTAL\$ 1981.93

The unit cost of laying the above pipe was calculated as follows:-

Net Expenditure 1953, (Labour & Material).....	\$ 14,663.72
<u>Plus</u> Value of stock on hand, Nov. 30, 1952 and used).....	<u>247.00</u>
Total Expenditure	\$ 14,910.72
<u>Less</u> Stock on Hand, Nov. 30/53.	<u>1,981.93</u>
Value of Stock & Labour used 1953..	\$ 12,928.79

Total number of lineal feet laid = 3,779

Therefore, the unit cost per foot for laying the above lineal feet of Surface Sewer in place was \$3.41. The labour charge for laying the above pipe was \$3,683.66, thus making a unit price for digging, laying and backfilling of 98 cents per foot. This price is higher than estimated because included in the above expenditure of \$14,663.72, was the constructing of new Catch Basins and old locations changed on the following streets:-

Henry Street	Devon Avenue
Waterloo Row	Chestnut Street
Crocket Street	Beckwith Street
Kitchen Street	Medley Street
Carney Street	Dobie Street
Clark Street	

The cost of laying 24" surface sewer on Westmorland Street, Dundonald to Connaught Street and on Connaught Street, from Westmorland Street towards Northumberland Street, was kept separate and a unit cost per foot of \$5.24 was calculated as follows:-

Labour Charge -	\$ 538.73
Machinery Charge -	697.30
Material Charge -	<u>2025.46</u>
TOTAL	\$3261.49

The total number of lineal feet laid = 622

The labour and machinery charge for digging, laying and backfilling was \$2.00 per lineal foot.

CAPITAL ACCOUNT INTAKE

Expenditure \$ 12,282.18

The above expenditure is made up as follows:-

Canadian Pacific Railway Company	\$ 7.35
Canadian Pacific Express Company63
Canadian National Railway Company	8.60
Gleaner Limited	16.66
Forbes and Sloat	22.50
Hornsnell Machine & Iron Works	34.16
City Pay Roll (unloading pipe).....	50.81
City Machinery (unloading pipe)	80.80
Armco Drainage Co. Ltd.....	6,848.75
Jas. F. MacLaren Associates	<u>5,211.92</u>

TOTAL \$ 12,282.18

Under the heading "Jas. F. MacLaren Associates", were paid \$5,211.92 for redesigning the Pumping Station and 513 feet of 24" Armco Steel Spiral welded pipe was purchased for \$6,848.75 and stored at the City Yard. If the wells prove a success, this pipe can be used as casing according to officials of the International Water Supply Co., otherwise the pipe will be used where originally intended, as a pipe line from the proposed new intake pier to the proposed raw water well.

CAPITAL ACCOUNT GRAVEL ROADS

Expenditure \$ 27,015.25

Under this heading, the following streets were constructed, gravelled, partially constructed or partially gravelled:-

<u>Location</u>	<u>Lineal Feet</u>
Rookwood Avenue	900
Albert Street, York St. to Connaught Street.....	1300
Connaught St. - York St. to Albert Street	1120
Montgomery Street	3980
York St. - Dundonald St. to Montgomery Street.....	3300
Smythe St. - Montgomery St. to Second Cross Road.....	1720
Westmorland St. - Dundonald St. to Connaught St.....	370
Windsor Street - Albert Street to Green Road	1370
Tamarack Terrace	400
Dundonald St. - Northumberland St. to Smythe St.....	300
Proposed Street, opposite T. Webb's on York St.....	125
Hughes Street - Union St. to MacLaren Avenue	1400
Friel Street	600
Woodfield Court	1010
Dobie Street - Carney St. to Medley Street.....	510
Medley Street	1250
Athlone Street	670
McCoombs Street	840
MacLaren Avenue - Carney St. to Medley Street.....	1200
Carney Street	<u>980</u>
TOTAL	23,345 lin. feet

Included in the above, the fill to construct Woodfield Court was obtained from Ditching the Second Cross Road.

A total of 4.41 miles of new construction or excavating, grading and graveling was completed this year at approximately \$6100.00 per mile.

The Labour Charge included in the above expenditure was \$10,314.56.

CAPITAL ACCOUNT BACK DRAIN

Expenditure \$ 18,958.50

For years considerable trouble and inconvenience has been caused by a Drain, known as the "City Back Drain" which flows from above Montgomery Street, east of Regent Street, across to York Street; thence to approximately the corner of Westmorland and Dundonald Streets, across Dundonald Street; thence east to York Street across York Street along the Right-of-Way of the Canadian Pacific Railway to the Extension of St. John Street; thence along the Right-of-Way of the Canadian National Railway, across University Avenue; thence easterly across Waterloo Row to the St. John River. It was proposed this spring to change the course of this Drain, beginning at the concrete culvert on York Street and to construct a ditch from this point to Phyllis Creek, thus diverting the flow to Phyllis Creek in the west end of the City.

This operation was commenced May 25, 1953 and finished July 16, 1953. It consisted of digging 5842 lineal feet of trench. Reinforced Concrete Pipe 5' inside diameter was used to cross the various roads involved, namely York Street, Smythe Street, City Forest and Hanwell Road, and also from Hanwell Road across the properties owned by Ralph W. Wilson, James R. Waddell and B. A. Oil Co. In all, 568' of 60" Reinforced Concrete Pipe was used.

Rip-rapping along sections of this diversion drain remains to be completed to prevent erosion, most of which is taking place between Smythe Street and York Street in areas where a sandy clay soil was excavated.

The average price per foot for constructing the above ditch was \$3.24 per foot, with a bottom 10 feet wide and an average height of 6 feet; this price includes cost of concrete pipe and laying and back filling of same and rip-rapping headwalk.

CAPITAL ACCOUNT - SAINT JOHN & MARYLAND ROADS

The Saint John Road, from Ketchum Bridge to the Experimental Station and the Maryland Road from Albert Street to the City Limits were completed in 1953. The Provincial Government contributed, \$65,000 towards the cost of these two roads for the year 1953.

Gross Expenditure -	\$ 212,962.60
Credit	<u>96,067.74</u>
Net Expenditure	\$ 116,894.86

The above Credits are made up as follows:-

* Provincial Government (Dept. of Public Works).....	\$ 95,195.74
Dominion Government (Experimental Station).....	<u>872.00</u>
	\$ 96,067.74

The Provincial Government entered an agreement with the City of Fredericton to pay one-half of the cost of the Saint John and Maryland Roads, or a fixed sum estimated for each year, whichever be the lesser, excluding engineering, legal, land and removal of building costs.

In 1952 the sum contributed was \$50,000. This amount was \$1801.80 less than one-half actual cost, excluding engineering, legal, land and removal of building costs.

In 1953 the sum contributed by the Provincial Government was \$65,000. This sum being \$17,010.47 less than one-half actual cost, excluding engineering, legal, land and removal of building costs.

The net expenditure by the City of Fredericton for the Saint John and Maryland Roads for the period December 1, 1952 to November 30, 1953, is \$133,905.33.

The Gross Expenditure of \$212,962.60 included the following:-

City Pay Roll	\$ 1,178.23
City Machinery (Rental)	1,105.75
British American Oil Co. (Primer)	3,282.18
Canadian National Railway	602.22
Material used from City Stock (Including Pipe, Cement, Bricks, etc.)	1,145.11
Bemrose and Kilburn (Gravel)	432.50
Imperial Oil Co. (Primer)	2,859.20
Diamond Construction Co. (Paving)	92,920.58
Maritime Electric Co. (Shifting Poles)	1,056.02
Dept. of Public Works (Surveying, Rental on Panel truck, work done on account of highway improvement, moving poles on Route #2, Forest Hill, Stakes, etc. 1953)	3,149.47
Provincial Secretary-Treasurer (Surveying and use of Panel Truck 1952)	7,082.71
Forbes & Sloat	89,903.73
Blizzard Property	8,000.00
All Charters (Removal of Building)	150.00
Shaws (Brick)	<u>94.90</u>
TOTAL	\$212,962.60

Under this heading the Diamond Construction Co. paved the Saint John Road from Ketchum Bridge to the lower or eastern entrance to the Experimental Station, a distance of 2.2 miles and the Maryland Road, from Albert Street to the City Limits, a distance of 3.55 miles. The pavement was laid to a thickness of 4" and material hauled by Diamond Construction Company from its plant located below Oromocto.

The cost per mile of the actual laying of the pavement was calculated as follows:- Total Amount paid to Diamond Construction Company was \$92,920.58 and the distance, 5.75 miles; thus making the unit cost per mile of \$16,200 with an average width of 23 feet.

* The credit of \$95,195.74 shown on the preceding page has been reduced at time of writing by \$17,010.47, which the Provincial Government had been billed for and which Premier Hugh John Flemming in a letter to the Mayor, indicated the Provincial Government would not pay.

CAPITAL ACCOUNT STREET LIGHTS

Net Expenditure\$ 1,951.17

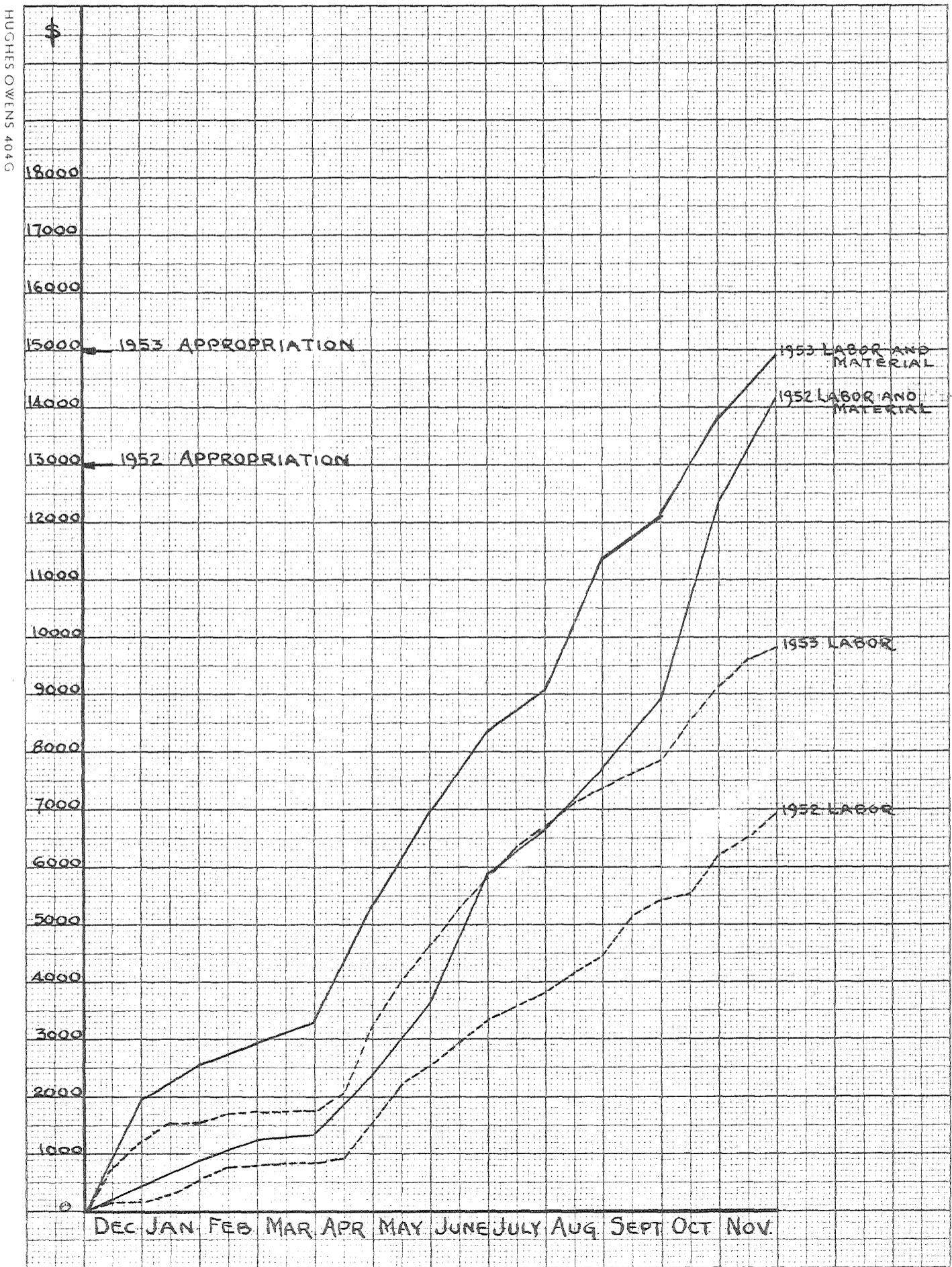
The above expenditure is made up as follows:-

Labour, trucking and material used in the extension of 5 series, 250 Lamps on MacLaren Avenue.....	\$ 358.34
Labour, trucking and material used in installing two series Street Lights on Maryland Hill	39.43
Labour, trucking, extending series Street Lights on Mitchell Street	26.10
Labour and trucking extending series Street Lights on Prince Street	51.05
Labour and Trucking, extending series Street Lights on Acacia Court	197.19
Labour and trucking, extending series Street Lights on Lansdowne Court	149.28
Labour and trucking, extending series Street Lights on Woodstock Road	5.42 (Near property of Everett Trites)
Labour and trucking and material used in extending Street Lights on Bridge St. for Highway Bridge.....	159.98
Material and Labour, installing one, 600 series Street Light on George Street - near High School and removing 1 series Light to an adjacent pole.....	15.78
Labour and material extending series Street Lights on Hillcrest Drive	288.67
Labour and trucking extending series lighting fixtures at corner of Mitchell St. and Green Road	5.71
Labour, trucking and material used in extending series lighting on Hanwell Road	236.35
Canadian Line and Material Limited	332.20
Province of New Brunswick (4% of \$332.20).....	13.29
Canadian General Electric Co. (Fixtures)	<u>72.38</u>
TOTAL	\$1,951.17

PUBLIC WORKS

Gross Expenditure	\$ 15,849.41
Credits	<u>940.61</u>
Net Expenditure	\$ 14,908.80
1953 Appropriation	<u>15,000.00</u>
CREDIT	\$ 91.20

The Credits of \$940.61 were made up as follows:-



PUBLIC WORKS COSTS 1952 AND 1953.

Federal Department, Public Works (Cleaning Wharf).....\$	64.58
Fredericton Board of School Trustees (Grading Grounds, Albert Street School)	823.95
C. Toner (Labour, moving safe to City Hall for Assessing Department)	<u>52.08</u>
TOTAL	\$ 940.61

The Labour Charge under the Public Works expenditure was incurred for the following:-

Surface Sewer	\$ 38.26
Back Drain	10.91
Trees	3,583.98
Old Burial Ground.....	1,766.88
Unforseen Account.....	4,188.54
Surveying	<u>212.96</u>
TOTAL	\$ 9,801.53

Surface Sewer:-

The Labour charge of \$38.26 was amount spent on repairing a surface sewer on the St. John Road on private property. This sewer was found to be broken down.

Back Drain:-

The Labour charge of \$10.91 was incurred due to a flooding condition that occurred due to ice plugging the Victoria Street culvert.

Trees:-

The Labour cost of \$3,583.98 under this item was for cutting and pruning city trees. The City purchased this year, from the Forest Nursery at Charlottetown, the following trees and these were planted by the Chamber of Commerce:-

20 Schewedleri Maples 6-7' @ \$1.50.....\$	30.00
5 Rock Maples Saccharum 4-5' @ \$1.50.	7.50
20 Horsechestnuts 5-6' @ \$1.25.....	25.00
20 Cutleaf Maples, Sacchurinum Weiri, 5-6' @ \$1.00	20.00
10 Mountain Ash @ 50¢	5.00
10 Tilia Pallida, Emperors Linden, 5-6' @ \$1.60	<u>16.00</u>
TOTAL	\$ 103.50

Considerable interest is being shown in the City shade trees by our citizens. During 1952 a committee of citizens, under the Chairmanship of Alderman Brawn was formed to act in an advisory manner. This committee was made up mostly of foresters and others who have a professional knowledge of tree culture. Approximately 103 trees were marked for removal by this committee. We cut and removed some 90 trees this year, some being marked and others being what I thought to be in a dangerous condition. At the time of writing this report, the City tree crew is still removing the marked trees.

Old Burial Ground:-

The Labour expenditure of \$1,766.88 was used in maintaining the old burial ground in the center of the City.

Unforseen Account:-

This labour item is divided as follows:-

Preparing for Civic Election	\$ 107.36
Greens (Cutting, Raking, Seeding, Fill)	2,437.31
Christmas Tree.....	55.39
Cutting Bushes along River Bank	109.80
Benches, (Repairs, Painting, etc.).....	98.62
Albert Street School	823.95
Spraying for mosquitoes	9.65
Coronation	259.45
Cleaning Wharf (Regent Street)	43.58
Moving Safe (City Assessors Office).....	45.28
City Fireworks	50.94
Miscellaneous	<u>147.21</u>
TOTAL	\$ 4,188.54

Surveying:-

Under this heading \$212.96 was expended in labour on surveying new streets.

RECREATION

Net Expenditure \$ 6,535.99

The above expenditure does not include all playground expenditures, but only those which appear on my pay-rolls or costs of materials ordered through my office. The salaries of the Recreation Director and Playgrounud Supervisors hired for the summer months is not in the above costs, nor does the cost of most of the equipment on the playgrounds appear here.

The above costs are divided as follows:-

	<u>Labour & Machinery</u>	<u>Material</u>	<u>Total</u>
Playgrounds	1,425.72	4,242.82	5,668.54
Bathing Beaches.....	93.52	23.50	117.02
Rinks (Outside).....	<u>723.36</u>	<u>27.07</u>	<u>750.43</u>
TOTALS	2,242.60	4,293.39	6,535.99

At Wilmot Park a new concrete bottom was constructed for the fountain. The work was done by City workmen and the cement used was obtained ready-mixed from Bemrose and Kilburn.

The Bathing Beaches were not opened for childrens' swimming this year. The expense shown was for repairing and launching floats.

This year the tennis courts at Queen Square were recapped with an Asphalt Pavement at a cost of \$1,788.00.

The gas and oil used by Mr. Vey's truck is also included in the above expenditure.

CITY HALL

Net Expenditure \$ 7,119.92

The above cost is only the expenditure for City Hall made through the City Engineer's Department and is not the total expenditures made on City Hall.

The expenditure of \$7,119.92 is divided as follows:-

Labour at City Hall, including winding and repairs to Clock, Night Fireman and Extra Janitor Services	\$ 3,504.36
Water Bill for City Hall	100.00
Repairs	278.98
Light Bill for City Offices	1,096.50
Supplies, etc.....	129.72
Coal (180.3 Tons)	<u>2,010.36</u>
TOTALS	\$ 7,119.92

MUNICIPAL HOME

Net Expenditure..... \$ 1,230.11

This expenditure is of course, only part of the Municipal Home costs, but is the only expenditure which was made through the office of the City Engineer and is therefore shown on this report:

The above expenditure is divided as follows:-

Water Bill	\$ 50.00
79 Loads of wood, delivered on orders of the Poor Commissioner to needy families of the City.....	790.00
Cost of Delivering 79 loads of wood to needy families	364.86
Minor repairs to Municipal Home.....	<u>25.25</u>
TOTAL	\$1230.11

SANITATION

Expenditure..... \$ 12,752.93

This expenditure is only part of the total Sanitation expenditure. It is only the expenditure which was made through the office of the City Engineer and is therefore shown on this report.

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

The City Dump has one dump tender. One of the City Bulldozers works on the dump from time to time helping the dump tender keep the dump in order. The total expenditure on the Dump this year was \$3,019.16.

The City Incinerator is tended by two men who work a daily shift of nine hours, starting at 7:30 a.m. and finishing at 5:30 p.m. Besides these two attendants, extra city labour was used in bulldozing incinerator dump, shifting tracks, etc. During December, 1952, repairs were made to the Incinerator. These repairs, amounting to \$2,563.61 are included in this years total expenditure for City Incinerator, which was \$8,915.32.

The contract for City Garbage Collection held by McMinniman's Transfer, expired this year and during the interim while a new contract was being drawn up, the Garbage was collected by City Crews at an expenditure of \$818.45. The contract for the Garbage is now held by Mr. J. Coates.

SEWERAGE DOMESTIC

Gross Expenditure.....	\$ 20,530.60
Credits	<u>11,418.30</u>
Net Expenditure.....	\$ 9,112.30

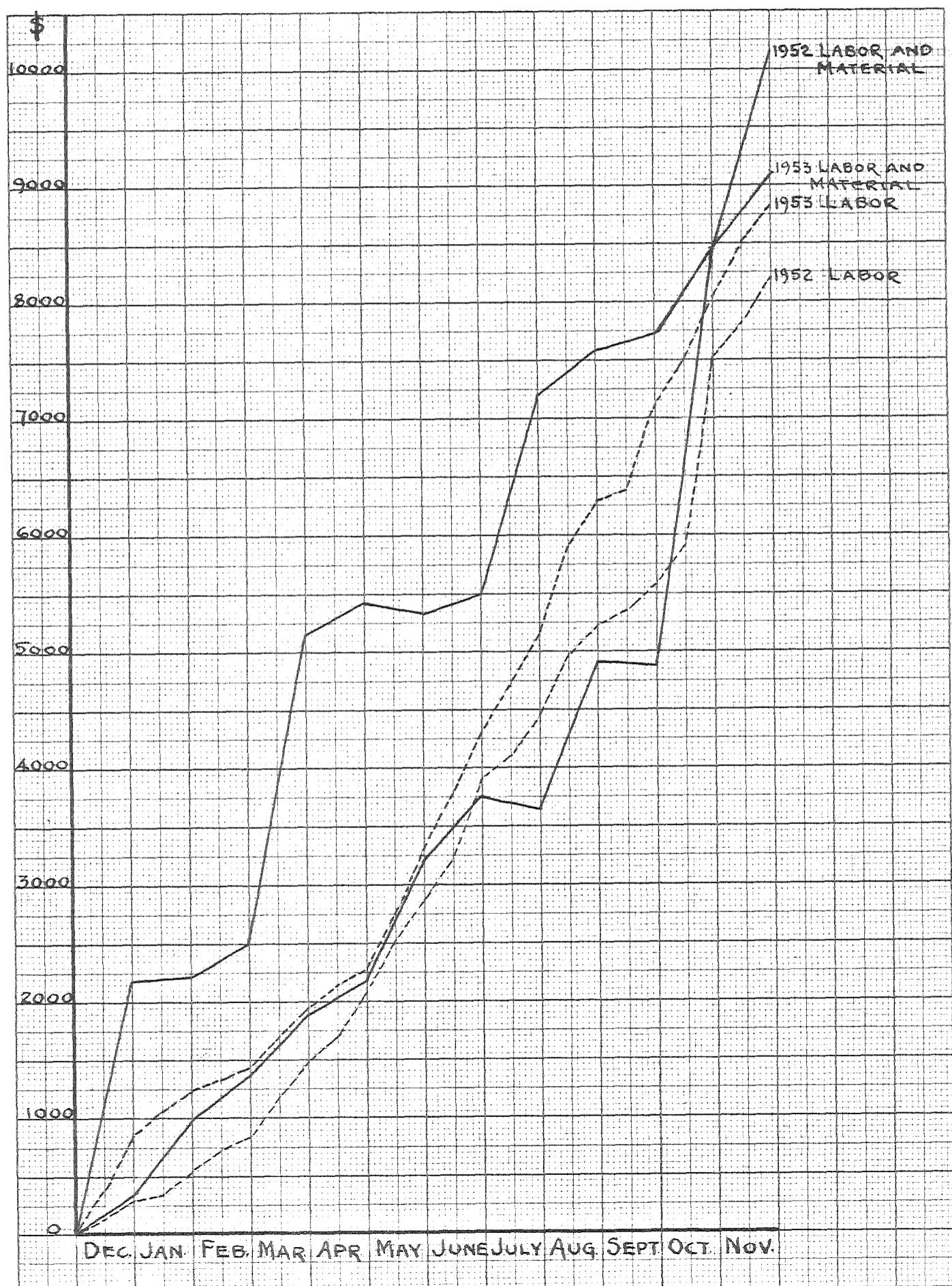
The above Credits are made up as follows:-

Material and Labour supplied for house connections.....	\$ 10,540.24
Journal Voucher (98' of 5" Terra Cotta Pipe @ 54¢ per foot)	52.92
Journal Voucher (Proportion of Labour and Material used on Sewer Services, Smythe Street, credited to Cap. Domestic Sewer should have been credited to Domestic Sewer).....	<u>825.14</u>
TOTAL	\$ 11,418.30

New customers connected to City Sewer
System this year..... 118

The Domestic Sewerage System on both sides of the Saint John River were flushed and cleaned this year.

No Domestic Sewer extensions were made this year under this heading but appear under Capital Account Sewerage Domestic.



SEWERAGE DOMESTIC COSTS 1952 AND 1953.

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 447 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 dwelling 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>
35-600 C.P. Lamps @ .350 K.W. demand.. 11.25	
10-250 C.P. Lamps @ .160 K.W. demand.. 1.60	
	12.85 K.W. 15 K.W.

Lower Rear Circuit:-

2-600 C.P. Lamps @ .350 K.W. demand... .70	
136-250 C.P. Lamps @ .160 K.W. demand. 21.76	
	22.46 K.W. 25 K.W.

Upper Front Circuit:-

19-600 C.P. Lamps @ .350 K.W. demand.. 6.65	
36-250 C.P. Lamps @ .160 K.W. demand.. 5.76	
	12.41 K.W. 15 K.W.

Upper Rear Circuit:-

12-600 C.P. Lamps @ .350 K.W. demand.. 4.20	
116-250 C.P. Lamps @ .160 K.W. demand. 18.56	
	22.76 K.W. 25 K.W.

Maryland Heights:-

4-600 C.P. Lamps @ .350 K.W. demand... 1.40	
77-250 C.P. Lamps @ .160 K.W. demand.. 12.32	
	13.72 K.W. 15 K.W.

System No. 2:-

The multiple lighting system consists of 160 units; 14 on Waterloo Row, 146 on King Street, Queen Street, Brunswick Street and Cross Streets, including part of Campbell Street, Bridge Street and York Street. Each unit consists of a 500 W.

115 volt lamp set in a novalex 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 and maintained by the Maritime Electric Co., the City paying the Company \$60.00 per year for each unit.

System No. 3:-

System No. 3 consists of six multiple lights, each of 150 Watt 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:-

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 162 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:-

Transformer Size

Carleton Ward (Down)

97-250 C.P. Lamps @ .160 K.W. demand...	15.52
1-200 W. Lamp (East end of Union St.)...	.20
	15.72 K.W. 15 K.W.

Carleton Ward (Up)

64-250 C.P. Lamps @ .160 K.W. demand... 10,24 K.W. 15 K.W.

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 per year per mile of pole line which is paid by the City to the Company.

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

The Street Lighting Costs for the year 1953 were as follows:-

Gross Expenditure.....	\$ 25,537.47
Credits	<u>49.76</u>
Net Expenditure	25,487.71
1953 Appropriation	<u>27,000.00</u>

CREDIT BALANCE.....\$ 1,512.29

The above Credit of \$49.76 is the cost of repairing light fixture at the Subway, broken by a truck owned by Bill Lynch Shows.

The Street Lighting expenditure of \$25,537.47 is made up as follows:-

96-600 - C.P. Series Lamps	\$ 123.11
1151-250 - C.F. Series Lamps	838.51
Current in Subway and Series Lighting, Nov. 27, 1952 - November 28th, 1953	11,676.61
Charges on Multiple Fixtures owned and operated by Maritime Electric Co. @ \$60.00 per light per year	9,351.33
Maintenance and contract of Pole Line	639.84
Maintenance of lamp fixtures (including only such articles as lamp standards, lamp brackets, heads, sockets, shades, time switches, etc) ..	471.74
Material and Labour used in major repairs and new installation	2,101.28
Cenotaph Light Bill and Lamp replacements.....	202.00
Miscellaneous	<u>133.05</u>
TOTAL	\$25,537.47

The following new lights were installed and paid for under Street Lighting Ordinary:-

Church Street - Between Churchill Row and Aberdeen Street
Churchill Row - Between Church Street and St. John Street
Charlotte Street - Between Church Street and St. John Street
Churchill Row - Between St. John St. and Regent Street
Needham Street - Between Regent Street and Carleton Street
Charlotte Street - Between Regent Street and Carleton Street
Charlotte Street - Between Carleton Street and York Street
Saunders Street - Between York Street and Westmorland Street
Aberdeen Street - Between York Street and Westmorland Street
Victoria Street - Between York Street and Westmorland Street
Westmorland Street - Between Charlotte and Saunders Streets
Westmorland Street - Between Saunders St. and Aberdeen Street
Westmorland Street - Between Aberdeen and Argyle Streets
Westmorland Street - Between Argyle and Victoria Streets
Westmorland Street - Between Victoria and Dundonald Streets
Charlotte Street - Between Westmorland St. and Northumberland St.
Saunders Street - Between Westmorland & Northumberland Streets
Aberdeen Street - Between Westmorland & Northumberland Streets
Victoria Street - Between Westmorland St. and Northumberland St.
Northumberland St. - Between Charlotte St. and Saunders Street
Northumberland St. - Between Saunders Street and Aberdeen Street
Northumberland St. - Between Aberdeen and Argyle Street
Northumberland St. - Between Argyle and Victoria Streets
Northumberland St. - Between Victoria and Dundonald Streets
George Street - Between Northumberland St. and Smythe Street
Charlotte Street - Between Northumberland St. and Smythe Street
Saunders Street - Between Northumberland St. and Smythe Street
Aberdeen Street - Between Northumberland St. and Smythe Street
Argyle Street - Between Northumberland St. and Smythe Street
Smythe Street - At Hawthorne Terrace.

13-250 C.P. Lamps were removed and replaced with 600 C.P. Lamps in our Series Circuit Lighting System this year.

The total per capital charge for Street Lighting for 1953 population of 16,018 as per the 1951 census, is

$$\frac{25,487}{16,018} = \$ 1.59.$$

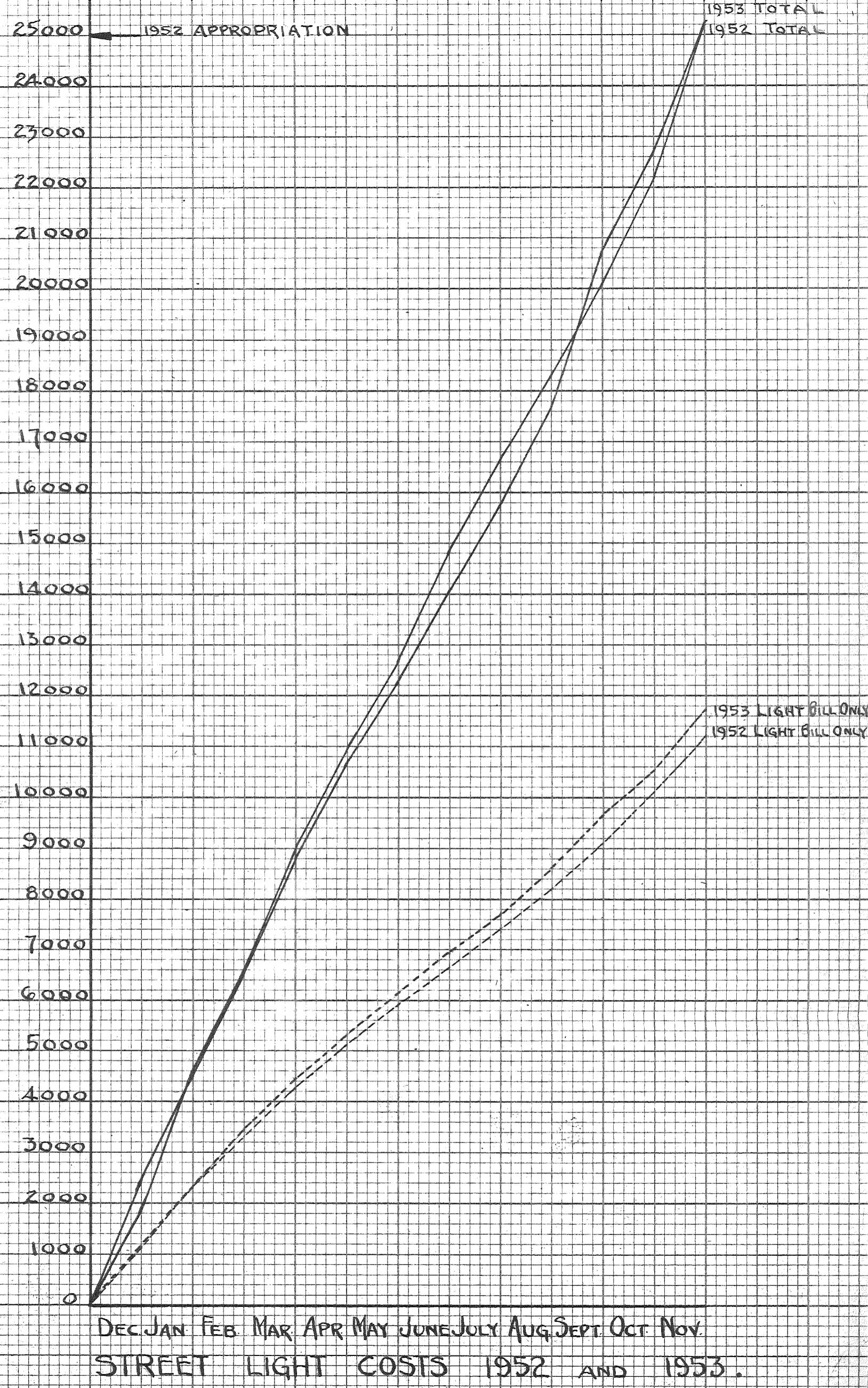


TABLE SHOWING COMPARATIVE YEARLY
COST IN STREET LIGHTING

<u>Year</u>	<u>Total Yearly Cost</u>	<u>Yearly Appropriation</u>
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	12,530.94	15,000.00
1948	15,269.12	15,000.00
1949	15,720.93	16,000.00
1950	25,300.30	20,000.00
1951	23,848.42	20,000.00
1952	25,211.39	25,000.00
1953	25,487.71	27,000.00

CONCRETE SIDEWALK

Expenditure.....\$ 7,550.14

Under the heading "Concrete Sidewalk" was laid at the following locations:-

<u>Location</u>	<u>Lineal Feet</u>
Brookmount Court - From Parkhurst Drive towards Woodstock Road (West Side)	105
Parkhurst Drive - Haviland Street running west (North side)	945
McEvoy Street (South Side)	905
Water Street - Hayes Street to St. Marys Street (North Side)	250
St. Marys St. - Water Street towards Union Street (East Side)	177
Smith Street (4' Sidewalk) East Side	377
Special - Green Road from Mitchell Street to Regent Account Street on the North side and from Regent Street to Central Mortgage & Housing Line on the South Side.....	<u>1531</u>
TOTAL	4290 Lineal Feet

The cement for the above construction was obtained ready mixed from Bemrose and Kilburn at a unit price of \$14.50 per cubic yard.

The total cost of the above 4290 lineal feet of completed walk was \$7,550.14. These figures give the overall cost per lineal foot of completed sidewalk as \$1.76.

CITY SCALES

Expenditure \$ 1,467.19

The above expenditure is made up as follows:-

Wages and extra help at City Scales	\$ 1,435.23
Repairs	11.18
Light Bill	17.36
Supplies	<u>3.42</u>
TOTAL	\$ 1,467.19

WILMOT PARK

Expenditure \$ 2,107.31

The above expenditure is made up as follows:-

Labour and trucking at Wilmot Park.....	\$ 1,787.83
Materials used on lawns and flower beds.....	39.36
Supplies and Repairs to Lawn Mowers, etc.....	129.64
Repairs to Park House	73.84
Telephone	41.64
Water Bill	<u>35.00</u>
TOTAL	\$ 2,107.31

Included in the above expenditure under item supplies, was the purchase of 1 Power Driven Gasoline Lawn Mower from S. Locke and Sons Ltd., at a price of \$91.58.

CHILDRENS HOME

Expenditure \$ 254.63

The above expenditure is made up as follows:-

Jas. S. Neill & Sons	\$ 6.76
Horsnell's Machine & Iron Works	2.63
S. Locke & Co.....	2.39
J. C. Risteen Co.....	27.58
Federal Hardware Store	51.97
Labour (City workmen)	<u>163.30</u>
TOTAL	\$ 254.63

FIRE DEPARTMENT

Gross Expenditure.....	\$ 6,650.08
Credits	<u>2,125.00</u>
Net Expenditure	\$ 4,425.08

The above Credits of \$2,125.00 is a Journal Voucher for hose purchased from the Fire Department for Domestic Sewer.

The Gross Expenditure is made up as follows:-

Journal Voucher (1736.3 Gallons Gasoline)	\$ 490.08
Journal Voucher (303 Hydrants @ \$20.00 per hydrant)....	6,060.00
Journal Voucher (Water used at Fire Station)	<u>100.00</u>
TOTAL	\$6,650.08

ADMINISTRATION OF JUSTICE

Expenditure \$ 1,244.73

The above expenditure is made up as follows:-

Hall's Book Store	\$ 1.25
S. Locke and Co.....	17.51
Federal Hardware Ltd	56.85
Journal Voucher (Labour and machinery)....	278.99
Journal Voucher (3114.7 Gallons Gasoline).....	<u>890.13</u>
TOTAL	\$1244.73

WATER

We have 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 St. John River and taking its water from the St. John River.

2. The system which derives its water from two drilled wells and is situated on the North side of the St. John River and serves that part of the City of Fredericton known as Carleton Ward. A description of the system may be found in the Yearly Report of 1946.

The water costs which follow in this report include the water costs of both systems or the Total 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 other than Capital 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	\$ 45,483.84
Credits	<u>2,755.26</u>
Net Expenditure	\$ 42,728.58

The Credits are made up as follows:-

Work done for and materials 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 the systems which do not belong to the City.....	\$ 2,684.31
R.C.M.P. (Repairing Hydrant, Charlotte and Church Streets).....	<u>70.95</u>
TOTAL	\$ 2,755.26

The Gross Expenditure is made up as follows:-

City Pay Roll for Hydrants	\$ 3,232.45
City Pay Roll for Meters	<u>3,197.24</u>
City Pay Roll for Water Ordinary	<u>8,967.05</u>
TOTAL PAY ROLLS.....	\$ 15,396.74
Material and other charges	<u>30,087.10</u>
GROSS EXPENDITURE.....	\$ 45,483.84

No water extensions were laid under this heading but they appear under Capital Account Water. Under this heading, a 4" Water Main was installed at the Sussex Ginger Ale building on Clark Street and a sprinkler system was laid by City workmen at the Eastern Bakeries building, King Street. The above installations were paid for by the owners, and are included in the above credit of \$2,684.31. No City charge is made for water supplied for sprinkler systems.

Hydrants:-

We have in the City, 303 Hydrants; 198 in the City proper, 9 on University property, 7 in Military Areas and 89 in Carleton Ward. The credit for rental of these hydrants appears under Credits of Water Pumping Station. All hydrants in the City were painted during the summer, inspected and repairs were made where necessary.

Meters:-

Of all our water services in the City, 1241 are charged under Flat Rate and 2039 on Meter, giving us altogether 3280 services.

The labour cost this year per meter, for installing, reading, repairing, etc. is \$1.60.

All Meters are read twice a year and bills are sent out twice a year. We have 110 customers whose meters are read once a month although they also are billed only twice a year. Those are such 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. All meters on Military buildings are included in the group of monthly meter readings.

Meters in store room, December 1st, 1953:-

5/8" Meter repaired and fit for service	15
New 5/8" meters	54
3/4" Meters fit for service.....	4
1" Meters fit for service.....	2
1 1/4" Meters fit for service.....	1
2" Meters.....	1
1 1/2" Meters fit for service.....	0

Distribution System:-

New services installed this year.....	100
Old Services relayed this year.....	26
Frozen services that had to be thawed (220 Victoria Street).....	1
Services discontinued.....	4

We have in the City on November 30, 1953, 3,280 Water Services.

The Fredericton Distribution System consists of 37.10 miles of water main made up of the following sizes:-

18 inch main	0.98 miles
12 inch main	1.01 miles
10 inch main	1.56 miles
8 inch main	6.89 miles
6 inch main	22.16 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 (Exhibition Grounds), Military Depot No. 7 (Woodstock

Road) or the Military Hospital (Wilmot Park).

The City this year purchased a 1953, 1 Ton Truck, the cost of which less allowance of \$400.00 on 1948 Fargo 1 Ton Truck, was \$1,771.80.

Included in this item, Water Ordinary was the expenditure of \$7,500.00 to the International Water Supply Co. for exploring, drilling and testing for ground water supply. I am including the report of the consulting Engineers, Jas. F. MacLaren Associates for record purposes. This report was presented to the City Council on November 24, 1953.

Mr. W. R. Godfrey representing James F. MacLaren Associates, presented the following report re City of Fredericton proposal for well water supply:-

Your Worship and Councillors:-

In May of this year, the City of Fredericton received a proposal from the International Water Supply Limited for conducting a ground water survey to determine if the water requirements of the City of Fredericton could be adequately supplied from ground water sources. The proposed drilling was to be carried out to the level area of the City lying between The C. P. R. tracks and the Saint John River. The Council accepted the proposal and drilling proceeded throughout the summer in the designated area until the well drillers had completed 7 test holes. The location of these test holes is shown on the accompanying plan No. 22-D-1838.

James F. MacLaren Associates were appointed to inspect and report on the water investigation project as carried out by the well drillers. Based on the information obtained in the test drilling program, the International Water Supply Limited have now submitted a proposal for development of a permanent well at the location of No. 6 test well, near the corner of Rookwood Avenue and Woodstock Road. Two copies of this proposal are submitted herewith and one copy has been passed to the City Engineer.

The above mentioned test drilling survey shows that water bearing formations were encountered at all test holes, indicating the probability of an adequate quantity of ground water. However, the chemical analysis of samples of water taken from these test holes showed wide variation in the iron content and hardness. 25 samples of water from the various test holes were analyzed by 4 different testing agencies. The results of these analyses were inconsistent and have made the information gained through the test drilling program concerning the quality of the ground water inconclusive.

The proposal now submitted is in the form of an agreement between the International Water Supply Limited and the City of Fredericton in which the Company sets forth particulars of the well, the scope of the work, and the capacity guaranteed, as well as the cost and the terms of payment. Because of the uncertainty which exists concerning the chemical quality of the ground water encountered the proposal now put forth by the International Water Supply Limited provides for a larger diameter test well and high

rate pumping to get further information on chemical quality before continuing with completion of the permanent well. The proposal is accompanied by a covering letter written by Mr. T. L. McManamna, the general manager, under date of October 6, addressed to James F. MacLaren Associates. Exact particulars of the proposal and the specifications are set forth and appear to be in conformity with the accepted practice for such installations.

The company guarantees that the well will have a minimum capacity of 700 I.G.P.M., this capacity to be determined by an 8-hour test. If, within the period of one year, it is found that the yield from the well is less than the guaranteed capacity and remedial measures by the company fail to restore the yield, the company shall refund to the city, a sum calculated at \$42.00 a gallon to the extent of the deficiency. It will be noted that while the company guarantees the capacity it does not accept responsibility for the quality of the water. In this regard the contract provides for the construction of a test well for the lump sum price of \$5,120.00, this sum to be paid by the City to the contractor if the city is not satisfied with the quality of the water and does not wish to proceed further. If the city is satisfied with the quality of the water produced from this test well and desires to proceed with the permanent well, then the cost of same, inclusive of test well, will be:

Gravel-walled well with 26" diameter outer casing and 16" inner casing and screen, equipped with turbine pump to deliver water at 10 p.s.i., motor and across the line starter.....\$ 29,300.00

Reduced voltage starter if required.. 326.00

Additional cost of pump and motor to pump directly into the distribution system at 75 p.s.i..... 1,630.00

Additional items not included in the International Water Supply Limited proposal but which are essential parts of the installation and which will have to be provided by the City are: pump house, piping and connecting to distribution system, water meter to measure output of the well and electrical power supply line and wiring, estimated to cost..... 10,000.00

Analysis of a sample of water collected from No. 6 test hole is reported in the letter from Mr. Bourgeois to Mr. Barrett under date of September 17. The analysis indicates a total hardness of 58 p.p.m., alkalinity of 20 p.p.m., zero iron, chlorides 20 p.p.m., and pH 6.6. This indicates a water low hardness and alkalinity and zero iron content. Analysis of the water from No. 6 test hold made by Mr. Hagerman agrees fairly well with the analysis reported by Mr. Bourgeois except that Mr. Hagerman reported 0.4 p.p.m. of iron.

It appeared to us from the chemical analysis of the first test wells that water of suitable quality was

doubtful and this feeling was shared by the authorities in Fredericton and also, we believe, by the International Water Supply Company's representatives. However, the chemical analysis of samples obtained from test holes No. 6 and No. 7 indicate water of suitable quality; and the underground formation at these sites, as evidenced by the driller's log, appears favourable.

Notwithstanding the evidence to date, until a well is pumped for some days at or near the intended rate, one cannot be sure that the quality of the water will be within accepted standards. Accordingly, it is difficult to make definite recommendations as to whether or not the City should commit itself to an expenditure of \$5,120.00 for the test well pumping to more definitely determine the quality of the water. It is our opinion however, that in view of the necessity for assuring Council and the ratepayers that an extension of the water supply will cost the City no more than is absolutely necessary, we feel that a well should be developed in accordance with the proposal now submitted by International Water Supply Limited. Depending on the performance and the cost of this well and the quality of the water, the City can then determine whether it wishes to have additional wells developed.

If the housing program now proposed for Fredericton becomes a reality, the water requirements of the City will be doubled within the next few years. To keep pace with this rapid growth, it will be necessary to develop 3 wells similar to the one now under consideration and additional wells as future growth materializes. However, the possibility of meeting the future requirements of the City from ground water sources can only be established with confidence in our opinion by operating a full scale well such as is now proposed by International Water Supply Limited.

Submitted in accordance with your request,

Respectfully yours,
JAMES F. MACLAREN ASSOCIATES

W. R. Godfrey,
Manager.

WATER PUMPING STATION

Water Pumping Station costs for 1953:-

Gross Expenditure.....	\$ 36,179.74
Credits.....	<u>6,645.00</u>
Net Expenditure.....	\$ 29,534.74

The Credit of \$6645.00 is made up as follows:-

Journal Voucher (Yearly rental on 303 hydrants).....	\$ 6,060.00
Journal Voucher (Water used in City Hall building)....	100.00
Journal Voucher (Water used at old street lighting building on Carleton Street).....	25.00
Journal Voucher (Water used in City Alms house).....	50.00
Journal Voucher (Water used at Wilmot Park).....	35.00
Journal Voucher (Water used at Queen's Square and Carleton Ward Playgrounds).....	275.00
Journal Voucher (Water used by Fire Department at King Street and MacLaren Avenue Stations)	<u>100.00</u>
TOTAL	\$ 6,645.00

The Gross Expenditure is divided as follows:-

City Pay Roll for salaries of Engineers at Pumping Station... \$13,354.72	
Work done by other City employees in and around Pumping Station..... <u>1,132.55</u>	
TOTAL CITY PAY ROLLS..... \$ 14,487.27	
Material and workmen's Compensation Charge..... <u>21,692.47</u>	
TOTAL	\$ 36,179.74

The Material Cost of \$21,692.47 is itemized as follows:-

Item #1 Light and Power supplied by the Maritime Electric Co. (525173 K.W. Hours)	\$ 12,286.79
2 Transformer charges.....	151.92
3. Liquid Chlorine (9450 lbs.)	1,439.83
4. Alum (81340 lbs.)	1,975.64
5. Coal (161.585 Tons)	1,801.63
6. Fuel Oil.....	----
7. Engine Oil	----
8. Motor Oil (45 Gallons D.B. Oil #43)	36.95
9. Gasoline	----
10. Maintenance and repair of buildings and machinery and Pier	1,509.13
11. New Installations	----
12. Supplies, Packing Rags, etc.....	142.74
13. Stationery, forms, charts, etc.....	82.27
14. Workmen's Compensation Board	351.71
15. E. W. Hagerman's salary	1,210.04
16. Lime (580 bags)	432.45
17. Miscellaneous, Telephone, Trucking, machinery, etc.....	<u>271.37</u>
TOTAL	\$21,692.47

COMPARISON OF WATER PUMPED AND COSTS

FOR SOUTH SIDE OF RIVER

FOR LAST EIGHTEEN YEARS

<u>Year</u>	<u>Imperial Gallons of Water Pumped</u>	<u>Yearly Gross Expenditure at Pumping Station</u>	<u>Pumping Station Cost per 1000 Gallons, Using Gross Expenditure</u>
1936	197,641,000	16,251.61	8.8 cents
1937	187,008,000	19,678.21	10.5 cents
1938	181,558,000	19,239.49	10.6 cents
1939	199,662,000	18,144.43	9.1 cents
1940	203,975,000	22,503.35	11.3 cents
1941	222,255,000	19,474.56	8.8 cents
1942	257,205,000	23,400.09	9.1 cents
1943	280,115,000	26,338.50	9.4 cents
1944	295,945,000	22,926.61	7.7 cents
1945	321,355,000	23,990.14	7.7 cents
1946	338,979,000	25,640.43	7.5 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
1951	367,130,000	35,058.57	9.5 cents
1952	339,330,000	40,476.10	11.9 cents
1953	351,310,000	36,179.74	10.3 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 180,000 G.P.D. arrived at from a number of test runs, I estimate the yearly water pumpage from our wells there to be for 1953, some 65,700,000 I.G.

The total amount of water pumped during 1953 for the whole City is therefore 417,010,000 Imperial Gallons.

Our total net water expenditure for the City for 1953 - \$72,263.32.

Therefore our net cost to pump and deliver to the Customer, 1,000 I.G. of water in 1953 is 72,263.32 = 17.3 cents.
417,010

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 charge included in the City Government Cost, nor do they include bond payment of Sinking Fund Charges.

The Water Pumping Station was, as usual, under the supervision of the Plant Superintendent and Chief Filter Plant Operator, Mr. Fred Nason.

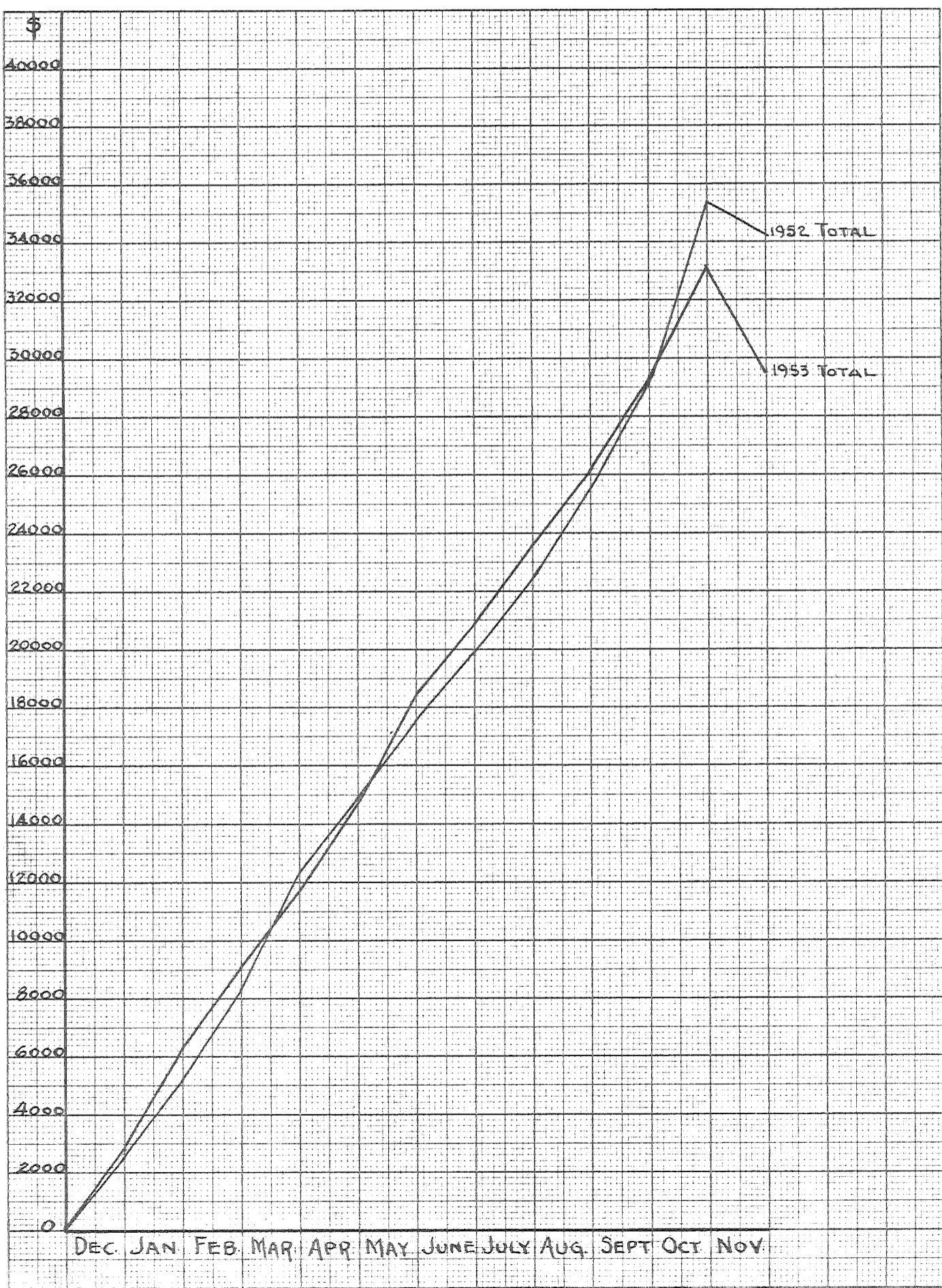
Accompanying this report is the report of Mr. E. W. Hagerman on the Fredericton Water Supply, from January 1, 1953 to December 31, 1953.

Respectfully submitted,

W.H. Baillie

City Engineer.

HUGHES OWENS 404C



WATER PUMPING STATION COSTS 1952 AND 1953 .

FREDERICTON WATER SUPPLY

There is little to be said about the good qualities of the Fredericton water supply for 1953, excepting that we have been able to keep the bacterial content within safe limits.

To accomplish this, it was necessary, at times, to pass objectionable tasting water into the mains. These tastes are due to complex compounds formed by the chlorine uniting with organic substances carried by the water. Consumers detecting these tastes always believe that too much chlorine is being added to the water. This is generally not the case. The following may explain.

Through the last part of October and up to November 7th, the water was receiving approximately 2.7 parts per million of chlorine and having little if any objectionable taste, then on or about November 8th, tastes and smells of a chlorinous nature became noticeable and grew worse, with the same amount of applied chlorine. This leaves little room for doubt that some change in the character of the water was the cause.

These objectionable tastes appear soon after the fall rains begin, and the rise in river level brings the water loaded with the leached out colour from the grasses and leaves. If the rains continue we get a dilution of this infusion and consequently there is little organic matter per gallon of water taken in for treatment. In this case only a small part of the added chlorine goes into combination with the organic because there is so little of the latter present. This leaves the large part of the original chlorine dose as Free Available Chlorine, which does not taste.

Take the other case where only a small rain occurs. The organic is leached out but not diluted with rain water so a strong infusion results. Each gallon going into the plant carries a large dose of organic matter. This takes into combination all of the chlorine (unless an excessively large initial dose was used) and forms Combined Available Chlorine. Most of these combinations have evil tastes and smells.

This latter case is parallel with conditions existing in the St. John River through November and part of December of this year. With pure water chlorine forms Hypochlorous Acid. In this state it is called Free Available Chlorine. It is tasteless (in quantities necessary to kill bacteria) and only very small quantities of it are necessary for this purpose. A concentration of 0.2 parts per million in contact for 10 minutes will give approximately 100% kill of bacteria. Free Available Chlorine does not persist long in the system but soon dissipates, probably into some inorganic combination which is tasteless and odorless.

When water contains organic compounds the chlorine unites with the ammonia, organic nitrogen and probably with other complex organic compounds. In this form it is called Combined Available Chlorine. These organic combinations of chlorine give up their chlorine for sterilizing purposes very slowly. They are the cause of the tastes which the consumer thinks is chlorine. Some combinations may be tasteless depending on the particular organic present. A much greater dose of this combined chlorine must be present to get the same kill of bacteria as is necessary with Free Available Chlorine. About 1 part per million for 1 hour of contact is the equivalent of 0.2 ppm Free Available Chlorine for 10 mins. As mentioned before, if the water is loaded with organic it is probable that

all the chlorine added will combine. In this case the bacteria kill must depend on the action of the Combined Chlorine alone. The best that can be done under these circumstances is to add to the water the necessary amount of chlorine which will produce the minimum amount of Combined Available Chlorine to give an effective kill of bacteria. Even this minimum amount may have objectionable tastes.

Under the proper conditions it is possible to add excessive doses of chlorine until all of the organic is in combination and Free Chlorine makes its appearance. It will break down the Combined Chlorine (the bad tastes) into simple substances which have no taste. It is not possible to practice this at our plant because we do not have the proper devices for measuring and controlling the flow of the water to be treated.

Another method used to remove chlorinous tastes is to install equipment to de-chlorinate the water after the chlorine has killed the bacteria and before it is put into the mains.

The installation of a proper mixing and sedimentation basins so that a large part (60 to 70 per cent) of the organic material may be removed by coagulation and sedimentation before applying the chlorine is the best solution.

One other change has occurred this year. After heavy rains large quantities of clay were added to the river by the new back drain. This drain adds its water to the Hermitage Creek which is so close to the Plant intake that effects of a heavy rain are noticed much sooner than heretofore.

Some clay in the raw water is a help to the filtration process in that it weights the flow thus causing more rapid settlement but on its first appearance the quantity was so great that the filters were unable to remove all of it. This resulted in some water of high turbidity passing into the system. Later floods from the ditch did not carry so much clay and it has proved a help rather than a detriment.

Following are copies of tests made on samples taken at various points in the City. The tests are to show the presence or not of the Coliform Group. If the test shows that this group is present the result is recorded as Positive, if absent it is Negative. The organisms of the Coliform Group are not in themselves harmful but as they are of fecal origin their presence is an indication that other harmful bacteria may be gaining entrance to the system. The test is made for the Coliform Group because they are much easier to identify than are the specific germs that cause disease.

Respectfully submitted,

Mr. E. W. Hagerman.

FREDERICTON WATER SUPPLY

Test for Coliform Group. Primary Media Lactose Broth.
Secondary Media 2% Brilliant Green Bile.
Sample - 5-10 cc. Portions.

Date of Test	Origin of Sample	The test divides the 10 cc. Portions comprising the Sample as follows into Pos. or Neg.	
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1953

January 2	U.N.B. Eng. Bldg.	0 Positive	5 Negative
January 8	Pumping Station	0 Positive	5 Negative
January 13	127 Charlotte Street	0 Positive	5 Negative
January 24	Pumping Station	0 Positive	5 Negative
February 5	Pumping Station	0 Positive	5 Negative
February 8	Pumping Station	0 Positive	5 Negative
February 11	Pumping Station	1 Positive	4 Negative
February 14	127 Charlotte Street	0 Positive	5 Negative
February 17	Pumping Station	0 Positive	5 Negative
February 25	Pumping Station	0 Positive	5 Negative

Samples taken on 5th and 8th showed gas in Lactose Broth in 48 hour period but both failed to confirm on Green Bile so they go on record as Negative.

March 3	Pumping Station	0 Positive	5 Negative
March 8	127 Charlotte Street	0 Positive	5 Negative
March 14	Pumping Station	0 Positive	5 Negative
March 20	U. N. B. Eng. Building	0 Positive	5 Negative
March 25	Pumping Station	0 Positive	5 Negative
March 29	Pumping Station	0 Positive	5 Negative

April 1	Pumping Station	0 Positive	5 Negative #
April 7	Clear Well while cleaning	0 Positive	5 Negative #
April 9	Pumping Station	0 Positive	5 Negative
April 15	Pumping Station	0 Positive	5 Negative
April 23	Pumping Station	0 Positive	5 Negative
April 27	Pumping Station	0 Positive	5 Negative

April 1st sample taken with ice running, water very difficult to flock. Chlorinous compounds giving bad tastes. Sample gave slight gas 24 hour but would not confirm on Green Bile.

April 7th sample taken while cleaning clear well, which has not been cleaned since installation 1905. Cleaning made possible by completion of New Reservoir which should have been built in 1905 if the plans of the late F. A. Barbour, design engineer for the system, had been fully carried out by City Council. This sample gave some gas in 24 hours but failed to confirm on B.G.B.

FREDERICTON WATER SUPPLY

Test for Coliform Group. Primary Media Lactose Broth.
Secondary Media 2% Brilliant Green Bile. A Sample is
comprised of five 10 cc. portions.

Date of Test	Origin of Sample	The test divides the 10 cc. Portions comprising the Sample as follows into Pos. or Neg.	
<u>1953</u>			
May 2	127 Charlotte Street	O Positive	5 Negative
May 11	U.N.B. Eng. Building	O Positive	5 Negative
May 16	City Hall	O Positive	5 Negative
May 23	Pumping Station	O Positive	5 Negative
May 29	U.N.B. Eng. Building	O Positive	5 Negative
June 6	Pumping Station	O Positive	5 Negative
June 12	Pumping Station	O Positive	5 Negative
June 18	Pumping Station	O Positive	5 Negative
June 23	127 Charlotte Street	O Positive	5 Negative
July 2	127 Charlotte Street	O Positive	5 Negative
July 9	Pumping Station	O Positive	5 Negative
July 15	Pumping Station	O Positive	5 Negative
July 24	U.N.B. Eng. Building	O Positive	5 Negative
July 29	127 Charlotte Street	O Positive	5 Negative
August 7	127 Charlotte Street	O Positive	5 Negative
August 15	U.N.B. Eng. Building	O Positive	5 Negative
August 21	Pumping Station	O Positive	5 Negative
August 25	Pumping Station	O Positive	5 Negative
August 29	123 Charlotte Street	1 Positive	4 Negative

The load on the Filter Plant is gradually increasing. At the first of September the daily pumpage was 1,100,000 gallons which is approximately 200,000 gallons increase over last year.

We have been able to keep the bacteria within safe limits but we are not able to produce a water whose physical characteristics are up to standard. To produce water enough to supply the demand it is necessary to run two low lift pumps and four filters for a large part of the twenty-four hours. This results in a high velocity through the system which does not allow time for proper flocculation, giving water with a blueish cast.

Until the plant is enlarged or wells are bored, water of an objectionable nature is certain at some time or another. The worst times will be in the fall freshet when we get high colour from decaying vegetation and during the ice run in the spring.

Fortunately the Chlorinators are of ample size to sterilize any amount of water that we can pump so there need be no fear of water born disease.

Fredericton, N. B.
Sept. 14th, 1953.

Mr. E. W. Hagerman.

(COPY OF REPORT TO THE BOARD OF HEALTH)

FREDERICTON WATER SUPPLY

Test for Coliform Group. Primary Media Lactose Broth. Secondary Media 2% Brilliant Green Bile. Sample is made up of 5--10 cc portions.

Date of Test	Origin of Sample	The test divides the 5-ten cc portions comprising the Sample into Positive and Negative as follows:-	
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1953

September 1	City Hall	0 Positive	5 Negative
September 6	U.N.B. Forestry	0 Positive	5 Negative
September 12	Walker Apts. (York St.)	0 Positive	5 Negative
September 18	127 Charlotte Street	0 Positive	5 Negative
September 25	U.N.B. Eng. Building	0 Positive	5 Negative
September 29	Pumping Station	0 Positive	5 Negative
October 1	Pumping Station	0 Positive	5 Negative
October 6	127 Charlotte Street	0 Positive	5 Negative
October 17	Pumping Station	0 Positive	5 Negative
October 26	U.N.B. Eng. Building	0 Positive	5 Negative
November 3	U.N.B. Eng. Building	0 Positive	5 Negative
November 9	Pumping Station	2 Positive	3 Negative
November 11	Pumping Station	2 Positive	3 Negative
November 13	Pumping Station	0 Positive	5 Negative
November 14	Pumping Station	0 Positive	5 Negative
November 16	Pumping Station	0 Positive	5 Negative
November 18	Pumping Station	0 Positive	5 Negative
November 19	Nixon's Barber Shop	0 Positive	5 Negative
November 23	Pumping Station	0 Positive	5 Negative
November 27	Pumping Station	0 Positive	5 Negative

There were several portions in the above samples that formed gas in the 24 to 48 hour period but failed to confirm on Brilliant Green Bile. They therefore class as Negative.

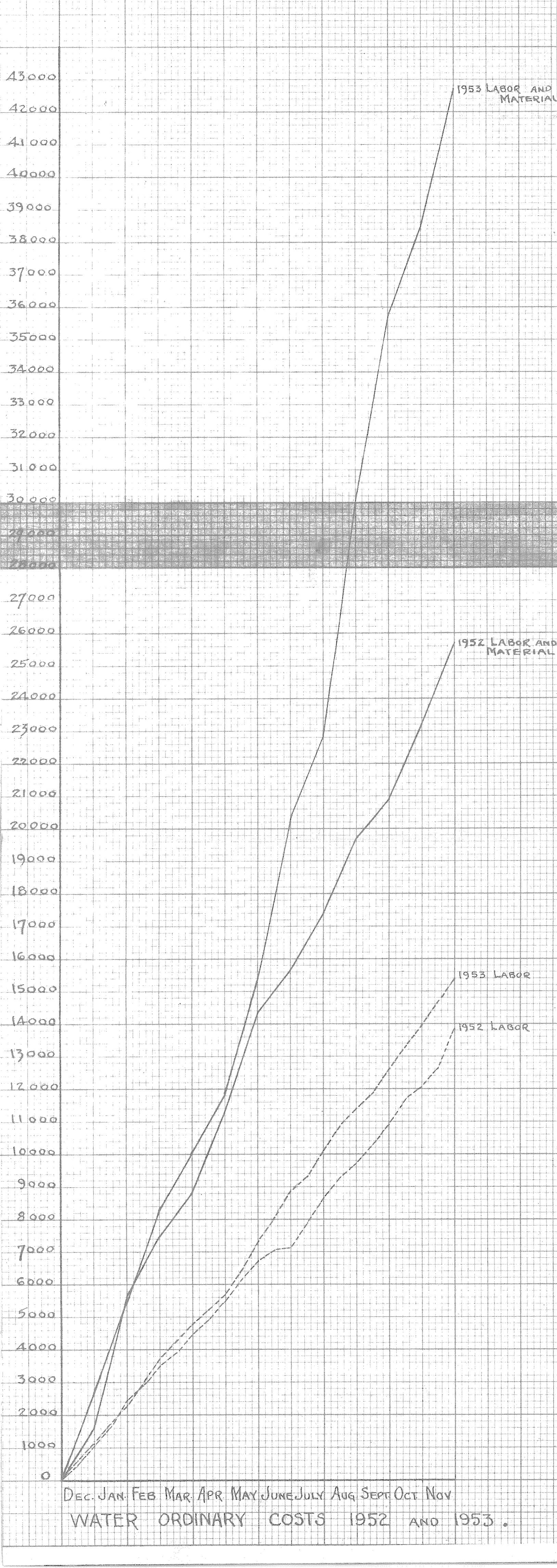
December 1	Pumping Station	0 Positive	5 Negative
December 5	Pumping Station	0 Positive	5 Negative
December 8	Pumping Station	0 Positive	5 Negative
December 13	127 Charlotte Street	0 Positive	5 Negative
December 17	Pumping Station	0 Positive	5 Negative
December 26	Pumping Station	0 Positive	5 Negative

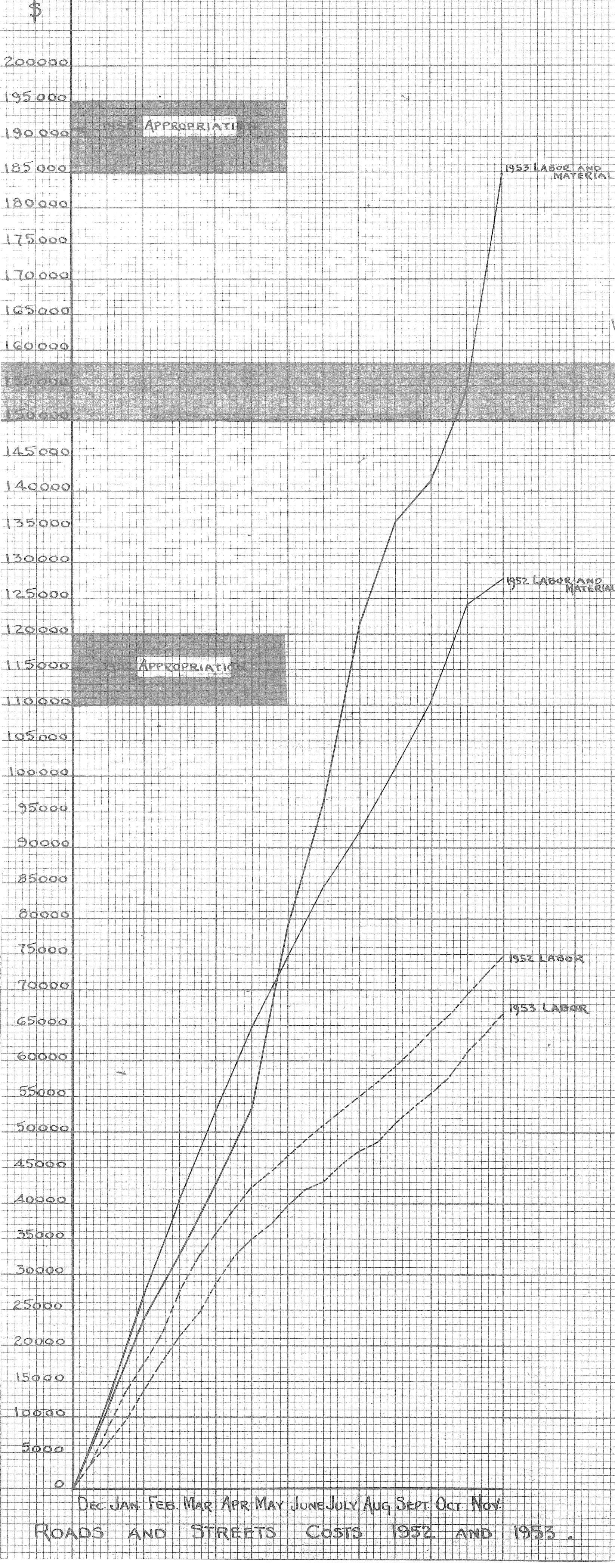
The large number of tests were made in November because gas was forming in the 24 to 48 hour period of incubation and the gassing portions had to be confirmed on Brilliant Green Bile to be sure that the gas formers were of no significance. Two samples, November 9th and 11th were positives. They got by the chlorine, probably protected by the mud that came from the new back drain on its first flush.

Fredericton, N. B.
January 30, 1954.

Mr. E. W. Hagerman.

(COPY OF REPORT TO BOARD OF HEALTH)





SAINTE

JOHN

RIVER



GRADING AND GRAVELLING
DUNN'S CROSSING ROAD
PORTIONS OF DOAK AND WILSEY ROADS

To EXPERIMENTAL STATION
EAST ENTRANCE

SAIN

JOHN

RIVE

DITCHING 2ND CROSS ROAD

To 2nd cross road

This is a detailed hand-drawn map of a residential area in Montgomery. The map shows a grid of streets with various names. In the upper left, there's a cluster of streets including ALBERT ST., GRAHAM AVE., HANSON ST., KITCHEN ST., BECKWITH ST., and MARYLAND ROAD. To the right of this is a row of streets: CROCKET ST., CHESTNUT ST., REID ST., ALBERT ST., PALMER ST., and MITCHELL ST. Further to the right, a curved street labeled BACK ST. runs parallel to ALBERT ST. Below these, a series of streets are labeled: CONNAUGHT ST., DUNDONALD ST., VICTORIA ST., ARGYLE, ABERDEEN, SAUNDERS ST., and NORTHUMBERLAND ST. In the center, a large block of streets is labeled CHURCHILL ROW, NEEDHAM ST., CHARLOTTE ST., and MORLAND ST. To the left of this central block, there's a cluster of streets: SCULLY ST., ABERDEEN ST., JOHN ST., GEORGE ST., REGENT ST., BRUNSWICK ST., ALLEN ST., KING ST., and YORK ST. At the bottom, a row of streets includes QUEEN ST., CAMPBELL ST., and CITY TAIL. On the far left, a street labeled WINDSOR ST. is shown. There are also some smaller, unlabeled streets and alleys throughout the map.

A hand-drawn map of a residential area in Woodstock, Ontario. The map shows several streets and landmarks:

- Streets:** NAT. RLYS., CAN. ST., ALEXANDER COLLEGE, ODELL AVE., ROOKWOOD AVE., WOODFIELD AVE., MANOR COURT ROAD, PARKHURST DRIVE, HAWTHORN TERRACE, HANWELL ROAD, CITY LINE, and NASHWAAKSIS.
- Landmarks:** HAWTHORN TERRACE, DRAIN, TAMARACK TERRACE, WADING POOL CONCRETE BOTTOM, WOODSTOCK, BROOKMOUNT COOPS, ASHLAND COURT, RIVERDALE COURT, PHYLIS COOP, and LONDALE COURT.
- River:** A winding river labeled "RIVER" is shown flowing through the southern part of the map.
- Other:** An arrow points towards "N RLYS." with the label "BAPTIST CHURCH" nearby. A small "R" is located near the bottom left corner.

CONSTRUCTION — 1953 .

PAVEMENT	8.30 MILES
CURB AND GUTTER	.68 "
CONCRETE SIDEWALK	.81 "
REPLACEMENT OF OLD CONCRETE SIDEWALK	.29 "
RETREAD 2 INCH	3.19 "
REPLACEMENT OF OLD CONCRETE CURBS	.32 "
GRADING AND GRAVELLING	12.15 "
SEAL	5.62 "

ALL PAVED ROADS GRAVELLED BEFORE PAVEMENT

PLAN OF THE
CITY OF FREDERICTON

CITY ENGINEERS OFFICE
DEC. 1948