

ANNUAL REPORT OF THE ENGINEERING AND PUBLIC WORKS DEPARTMENT

1955



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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, 1954 to the first of December 1955.

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 work:-

New Pavement (City crews and Chas. Charters) ..	4.66 miles
Recap (Diamond Construction Company)	3.09 miles
Seal (Diamond Construction Company)	4.62 miles
Gravel Roads (Maintenance)	11.83 miles
New Road Construction and Gravelling	1.67 miles
Concrete Curb and Gutter	4.08 miles
Concrete Sidewalk	1.07 miles
8" to 60" Surface Sewer	1.63 miles
8" Domestic Sewer	1.03 miles
8" - 6" - 1 ¹ / ₄ " Water Pipe	1.21 miles

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

Charles Charters:- Laying of Asphalt Pavement on various City streets. This work was sub-contracted to the Diamond Construction Company who layed 4.66 miles of asphalt pavement in the City. The excavation and grading for above pavement was done by City crews.

Diamond Construction

Company:- 3.09 miles of City streets were recapped and in addition 4.62 miles of city streets were sealed with a mixture of bituminous material and sand.

M. F. Schurman Co. Ltd.:- Construction of a 60' x 80' Equipment Garage at new city yard situated on Dundonald Street just east of York Street at the rear of City Municipal Home.

Robert Irvine:-

Construction of a reinforced concrete well house at Wilmot Park. The building was designed by Douglas T. Baird.

International Water Supply Co.: - Supplying and installing a 60 cycle, 3 phase 220-440 Volt, 30 H.P. 1200 R.P.M. type C.F.U. Layne Turbine Pump.

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

Our regular expenditures appear for 1955 as follows:-

	<u>Appropriation</u>	<u>Net Expenditure</u>	<u>Debit</u>	<u>Credit</u>
Street Lights	27,000	28,542.77	1,542.77	
Public Works	16,500	12,089.66		4,410.34
Roads and Streets	155,700	193,315.44	37,615.44	
Sanitation	45,000	44,009.36		990.64
Wilmot Park	2,500	2,603.03	103.03	
TOTAL	\$246,700	280,560.26	39,261.24	5,400.00

	<u>Revenue</u>	<u>Net Expenditure</u>	<u>Credit</u>
Water Pumping Station)		47,076.12	
Water Ordinary)	141,109.54	31,709.19	45,692.40
Sewerage Domestic)		7,731.83	
Salaries		8,900.00	

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

The 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 be readily found by referring to the index on the preceding page.

Respectfully submitted,

City Engineer.

TOTAL YEARLY EXPENDITURE

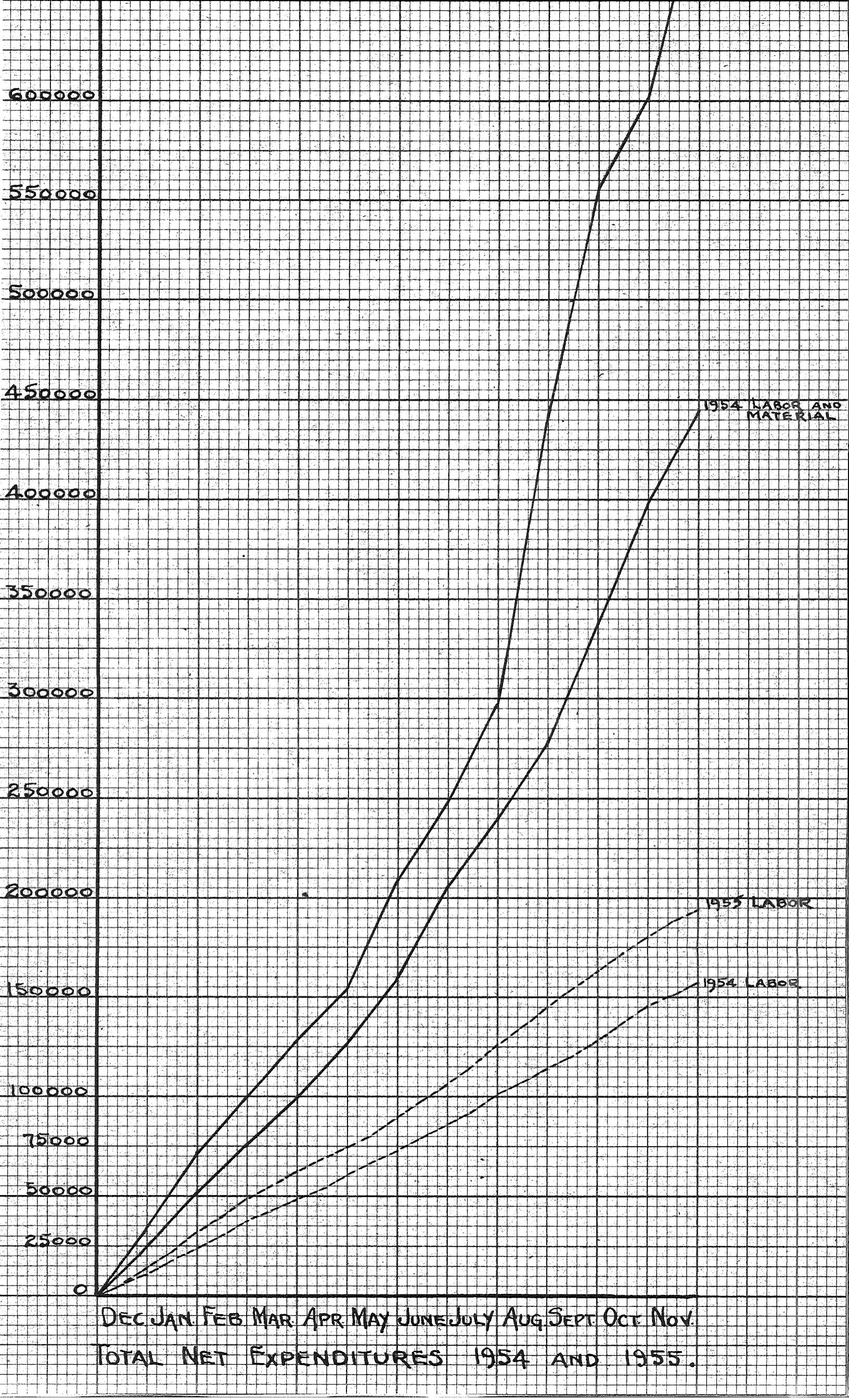
The expenditures shown in this report cover the period of time from December 1, 1954 to December 1, 1955.

The Total Yearly Net Expenditure under the direct supervision of the City Engineer this year amounted to \$704,792.42. This expenditure will be taken up in detail under the different headings in this report. The Total Gross Expenditure for this period amounted to \$811,561.51.

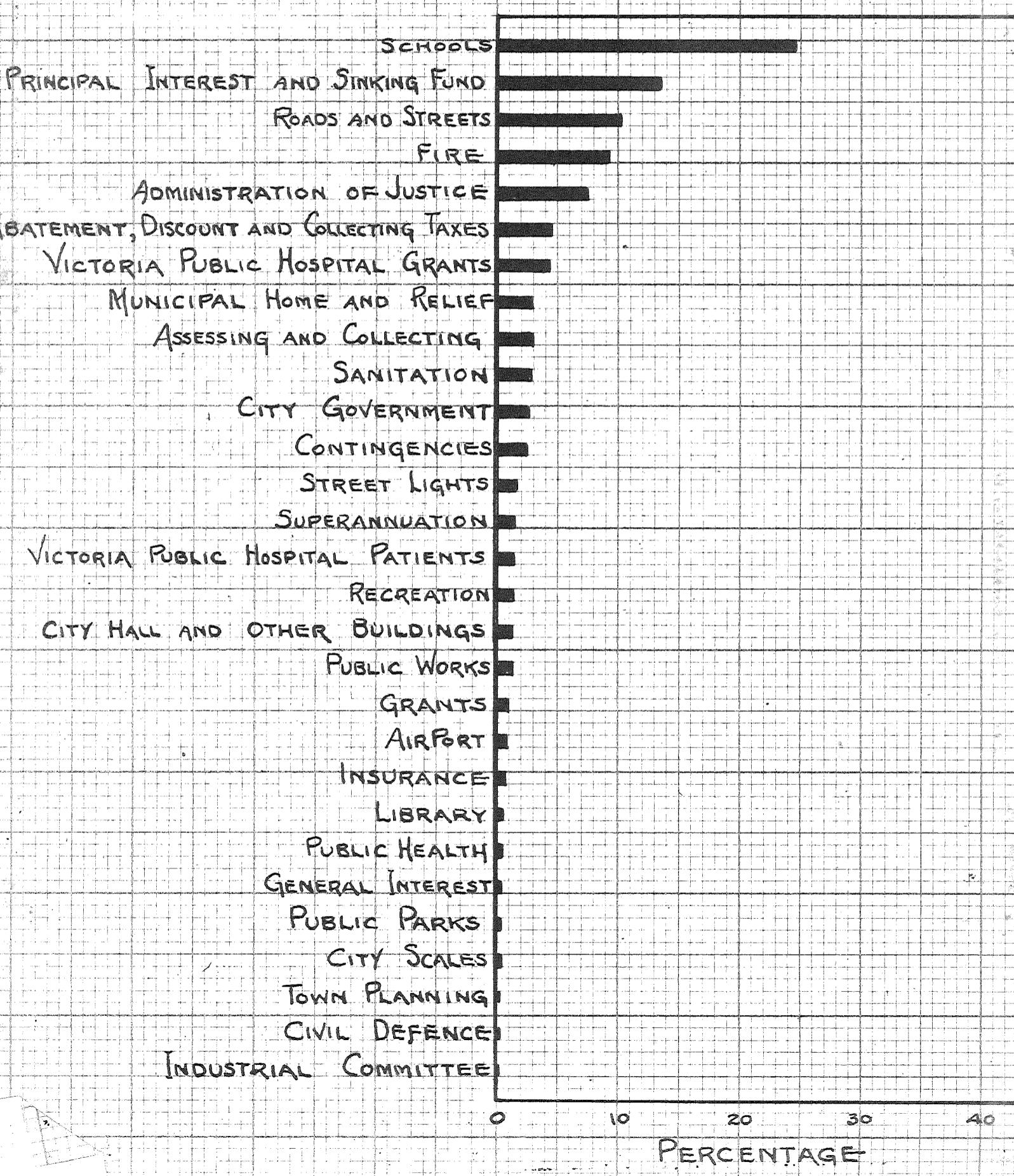
A graphic comparison of expenditure for Labour and Material for the year 1955 and the year 1954 is shown on the following charts.

The location of new construction completed this year is shown on two maps inserted after this page (page 3) of this report.

Following the maps is a graph showing the distribution of the City of Fredericton Dollar.



DISTRIBUTION OF THE 1955 CITY DOLLAR



ROADS AND STREETS

In 1955 the appropriation for Roads and Streets was \$155,700.00.

There is in Fredericton altogether, 56.85 miles of Roads and Streets; 11.21 miles being located on the north side of the Saint John River and 45.64 miles on the south side. In addition there is 38.17 miles of sidewalk; 6.51 miles on the north side of the Saint John River and 31.66 miles on the south side.

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

<u>Roads and Streets</u>			
	<u>Urban</u>	<u>Rural</u>	<u>Total</u>
Paved	30.17	6.54	36.71
Unpaved	<u>8.93</u>	<u>11.21</u>	<u>20.14</u>
TOTAL	39.10	17.75	56.85

Roads and Streets Expenditure 1955

Gross Expenditure	\$ 222,218.98
Credits	<u>28,903.54</u>
Net Expenditure	\$ 193,315.44
1955 Appropriation	<u>155,700.00</u>
DEBIT	\$ 37,615.44

The above Credits of \$28,903.54 are made up as follows:-

C.S. Barnes (1 Bag Salt @ \$1.08 per bag).....	\$ 1.08
F'ton. Tire Service (88 bags Calcium Chloride).....	255.20
U. N. B. (2 ton Rock Salt)	41.90
F'ton. Post Office (Plowing driveway and yard)	8.00
F'ton. Exhibition Ltd. (Rental on Bulldozer)	20.00
Caldwell Const. Co. (Rental on Bulldozer)	8.00
Board of School Trustees (Rental on Blower and Bulldozer)	52.00
Leo Hayes (Plowing driveway & rental on Shovel and Truck)	12.25
New Zealand Insurance Co.	71.67
D.W. Johnson (Constructing Cement Walk in front of Polio Clinic)	19.20
Marvel Porter (Sale of Cedar)	4.58
J.L. Simms (Use of Compressor at Voyer's Service Station, Carleton Ward)	37.55
Weyman Construction Co. (Rental on Shovel)	161.00
Bemrose & Kilburn (4 bags Calcium Chloride)	11.60
Kitchen Bros. (Repairing Apron in front of driveway, McLeod Street).....	88.00
Journal Voucher (Holiday Account)	<u>1,644.68</u>
Forward	\$ 2,436.71

	Carried Forward	\$ 2,436.71
Journal Voucher (Material sold to Municipal Airport)	650.54	
Journal Voucher (Labour & Material, Phyllis Creek)	1,812.79	
Journal Voucher (Municipal Home)	9.00	
Journal Voucher (Labour charged in error)	55.38	
Journal Voucher (Capital Acct. Drilled Wells)	391.00	
Journal Voucher (Administration of Justice)	7.91	
Journal Voucher (J. T. Clark Memorial Library Building)	13.68	
Journal Voucher (Machinery, including use of bulldozers, power shovels, trucks, etc.)	21,004.15	
Journal Voucher (Gas & Oil used by other depts.)..	<u>2,522.38</u>	
	TOTAL	<u>\$ 28,903.54</u>

The Gross Expenditure is divided as follows:-

Labour--being the total of Roads and Streets Pay Rolls, which includes the cost of hired trucks or any other machinery hired by the hour\$ 85,566.80

Material Charges -- which includes workmen's compensation, unemployment insurance and all material charges including purchase and repairs of City owned equipment\$136,652.18

I have divided the Labour Charges of \$85,566.80 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. Snowploughing Sidewalks:- 37.64 miles.. \$ 1,656.29
2. Snow Control:- Blowing, shovelling and hauling snow, plowing or scraping roads, cleaning gutters, thawing catch basins of ice and snow and any other means of snow control, 55.30 miles 33,709.50
3. Streets:- General work of maintenance of streets and sidewalks and any other items such as building culverts, curbs and gutters or pavements which are not mentioned under some particular heading 16,816.70
4. Surface Sewers:- Cleaning, Flushing and repairing surface sewers and building new surface sewers within street limits 1,852.13
5. Sanding Walks:- Storing sand in winter storage piles and spreading same on slippery streets and walks 4,327.59
6. Yard:- Men working in Blacksmith Shop and repair work in City Yard 3,653.97

Forward\$ 62,016.18

	Carried Forward	\$ 62,016.18
7.	<u>Gravel</u> :- Application of gravel for maintenance on City Roads and Streets ..	1,993.82
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	569.06
9.	<u>Doak and Wilsey Roads</u> :- All work done on these roads other than work done by power maintainer	738.67
10.	<u>New Maryland Road</u> :- Montgomery Street to southern City Line . All work done on this road other than work done by power maintainer or by special contract.	231.15
11.	<u>Killarney Road</u> :-	-----
12.	<u>Outlying Roads</u> :- Hanwell Road, Cross Roads lying between Smythe St. Ext. and College Hill and Forest Hill Road and Golf Link Road. All work done on these roads other than work done by power maintainer	461.63
13.	<u>Street Cleaning</u> :- All cleaning and removal of dirt, leaves, etc. from streets	13,186.69
14.	<u>Tarvia Repairs</u> :- Patching and repairing Asphalt or Tar Pavement and applying seal coat of light tar or asphalt to pavements	5,513.19
15.	<u>City Road Patrol</u> :-	856.41
	TOTAL	\$ 85,566.80

Following is a table comparing Labour Expenditure in these items from 1952 to 1955:-

TABLE COMPARING YEARLY COSTS IN ROADS AND STREETS LABOUR ITEMS

<u>ITEM</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
1. Snowploughing sidewalks	849.71	301.63	818.18	1,656.29
2. Snow Control	23,077.47	11,557.12	16,940.16	33,709.50
3. Streets	11,612.92	15,325.70	22,192.68	16,816.70
4. Surface Sewers	2,075.21	1,613.93	4,052.17	1,852.13
5. Sanding Walks	3,656.30	3,747.46	2,798.64	4,327.59
6. Yard	3,825.92	3,971.01	4,200.19	3,653.97
7. Gravel	1,297.59	758.63	2,259.22	1,993.82
8. St. John River Road	590.27	109.99	2,872.41	569.06
9. Doak & Wilsey Roads	321.27	459.80	88.89	738.67
10. New Maryland Road	----	----	121.03	231.15
11. Killarney Road	----	----	----	----
12. Outlying Roads	142.80	2,422.36	2,378.91	461.63
13. Street Cleaning	19,831.53	15,440.11	11,773.86	13,186.69
14. Tarvia Repairs	2,691.59	2,626.40	1,839.42	5,513.19
15. City Road Patrol	762.22	954.66	1,276.49	856.41
16. Preparation & Paving	----	----	416.33	----
17. City Forest	<u>4,213.90</u>	<u>7,305.80</u>	<u>2,481.11</u>	-----
TOTAL	\$ 74,948.70	66,594.60	76,509.69	85,566.80

City Forest in 1955 was taken out of Roads and Streets Account and put in Public Works Account as O'Dell Park.

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

Item #1 37.64 miles of sidewalk were kept plowed this year. To the labour cost of \$1,656.29 must be added an approximate cost of \$1,452.70 (Gas, Oil, Repairs and depreciation) giving a total cost of \$3,108.99 or a unit cost for plowing of sidewalk of \$82.59 per mile for 1955.

Item #2

<u>Snow Control</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
Snowploughing Roads and Streets	3,817.66	1,539.66	2,559.95	5,655.80
Blowing, Shovelling and hauling snow	15,793.04	4,913.72	11,286.63	25,679.55
Catch Basins	1,995.12	1,425.51	1,078.51	1,189.07
Snow Fences	709.86	572.38	654.39	849.96
Keeping Drains on the Hills open	761.79	2,991.25	1,143.42	259.32
Thawing Culverts	----	114.60	217.26	75.80
TOTAL	\$ 23,077.47	11,557.12	16,940.16	33,709.50

55.3 miles of Roads and Streets were plowed and maintained during the winter months.

The unit cost per mile of plowing and maintaining City Roads and Streets was approximately \$1,261.00 and was calculated as follows:-

Labour (Snow Control)	\$ 33,709.50
(Sanding Roads)	2,163.79
Workmen's Compensation	1,076.20
Pension Fund paid by the City	1,793.66
City Trucks (3,177½ hrs. @ \$1.70 per Hr.)\$ 5,401.75 (853 hrs. @ \$1.00 per Hr.) 853.00..	6,254.75
City Road Patrols - 1,789 hrs. @ \$5.00 per hour	8,945.00
City Bulldozers (1,267 hrs. @ \$3.00 per hr. \$3,801.00 (459½ hrs. @ \$6.00 per hr. 2,757.00	6,558.00
City Thawing Machines, 232 hrs. @ \$1.80 per hr.....	417.60
City Shovels, 186 hrs. @ \$6.00 per hour	1,116.00
City Snow Blower	4,633.12
Rental on Snow Blower - Provincial Gov't., 7 hrs. @ \$16.00 per hour	112.00
Sand	538.00
Rock Salt	2,424.00
TOTAL	\$ 69,741.62

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 the expenditures made from November 1, 1954 to May 1, 1955. 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 6, 1955.

Department of Public Works
Province of New Brunswick.

In Account With
THE CITY of FREDERICTON

City of Fredericton - Snow Control Account
Nov. 1, 1954 to May 1, 1955

City Payrolls Charged to Snow Control

Nov. 1, 1954 to May 1, 1955	\$ 39,157.78
Workmen's Compensation	901.38
Pension & Holiday Fund Paid by City	3,004.61

City Trucks:

1953 Ford 3 ton Dump 898 hrs. @ \$1.70	1,526.60
1953 G.M.C. 3 ton " 720½ " @ \$1.70	1,224.85
1951 Chev. 3 ton " 725½ " @ \$1.70	1,233.35
1951 Ford 3 ton " 749 " @ \$1.70	1,273.30
1952 Ford ½ ton T.U. 853 " @ \$1.00	853.00

City Jeeps - Sidewalk Plowing:

Jeep #1 339 Hrs. @ \$1.50	508.50
Jeep #2 251½ " @ \$1.50	377.25
Jeep #3 352 " @ \$1.50	528.00

City Road Patrols:

Adams #412 415 Hrs. @ \$5.00	2,075.00
Austin Western #99.H 773 Hrs. @ \$5.00	3,865.00
Champion .. 647 Hrs. @ \$5.00	3,235.00

City Bulldozers:

T.D.6 - 1948 364 Hrs. @ \$3.00	1,092.00
T.D.6 - 1949 373 Hrs. @ \$3.00	1,119.00
D.2 - 1953 538 Hrs. @ \$3.00	1,614.00
D.6 - 1953 459½ Hrs. @ \$6.00	2,757.00

City Thawing Machine 232 Hrs. @ \$1.80

417.60

City Shovel:

C-16 ½ Yrd. 176 Hrs. @ \$6.00	1,056.00
-------------------------------------	----------

City Snow Blower - Sicard Junior:

Total Hours in use - 500½

2217.5 Gals. Gas @ \$.295	654.16
228 Qts. Oil @ .31	70.68
Insurance	136.53
Repairs	3,086.28
Depreciation - 10% Depreciation Value (\$6,854.74)	685.47

NOTE - Wages of operators of City Machines do not appear as they are included in Payrolls charged to Snow Control.

Sand:

Bemrose and Kilburn - 1076 yds. @ \$1.00	1,076.00
--	----------

Rock Salt:

80 tons @ \$19.00	1,520.00
40 tons @ \$22.60	904.00

Dept. of Public Works

Province of New Brunswick:

Rental of Snow Blower - Asset #1163 7 Hrs. @ \$16.00	112.00
---	--------

TOTAL \$ 76,064.34

Certified Correct,
City Engineer.

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

Dec. 1, 1950 to Nov. 30, 1951	93 "
Dec. 1, 1951 to Nov. 30, 1952	143 $\frac{1}{2}$ "
Dec. 1, 1952 to Nov. 30, 1953	53 $\frac{1}{2}$ "
Dec. 1, 1953 to Nov. 30, 1954	117-3/10"
Dec. 1, 1954 to Nov. 30, 1955	136-9/10"

Snow Fences: Eleven thousand feet of lath and wire snow fencing was erected to control drifting snow.

ITEM #3

Streets:-

Repairs to Streets (Repairs to Curbs, Driveways, sidewalks, bridges, widening streets, culverts, riprapping, sodding, etc.)	\$ 1,062.66
Painting Traffic Lines and Street Signs	2,763.99
Repairs to Machinery	3,224.76
Weather Account (Holidays)	9,512.62
Unloading & Spreading Calcium Chloride	<u>252.67</u>
TOTAL	<u>\$ 16,816.70</u>

Included in the above items Repairs to Streets, Queen Street on the East Side was widened from the upper driveway of the Fredericton Post Office Building to the upper line of the Canadian Legion property. In addition the northeast corner of the intersection of Queen and Carleton Streets was widened under this account, also Regent Street sidewalk on the east side from Queen Street to King Street was recapped.

A portion of the properties of Mr. R. L. Prime and Central Mortgage and Housing Corporation facing on Regent Street was riprapped along with a section on the west side of Gibson Street, north of MacLaren Avenue.

In 1955, 150 tons of Calcium Chloride and 140 tons of Malagash Salt were purchased for dust control and de-icing.

ITEM #4

Surface Sewers:-

The Surface Sewers in the City were flushed where necessary and all Catch Basins were cleaned and repaired during the year and repairs were made to any breaks that occurred or extensions needed to the sewer outlets.

A 10" Concrete Sewer was laid in Acacia Court, a distance of 125 feet, extending the outfall, that had been covered by fill during reclamation of the old gully.

ITEM #5

Sanding Walks:-

We used 2566 cu. yds. of Sand during the winter of 1954-1955. Cost of labour for sanding sidewalks during the winter was \$4,327.59.

ITEM #6

Gravel:-

12,835.79 cubic yards of Gravel was used in the maintenance and repairs to Gravel Roads.

The Gravel was purchased from the following:-

	Pit Run Gravel Cubic Yards	Crushed Gravel Cubic Yards
Forbes and Sloat	82.00	7,119.83
Lewis Hughes	300.00	
Bemrose and Kilburn	3,491.00	
S. S. Baird & Sons	<u>1,500.00</u>	<u>342.96</u>
TOTAL	5,373.00	7,462.79

An application of crushed gravel, approximately 3" thick, was applied to the below listed streets and roads.

The following streets were gravelled under the above heading:-

<u>Location</u>	<u>Lineal Feet</u>
Green Road, Windsor St. to York Street	2,640
Smythe Street, C.N.R. to Second Cross Road	5,695
York Street, Green Road to Montgomery Street	1,570
Montgomery Street - College Hill Rd. to Smythe St.	5,511
Second Cross Rd. - Regent St. to Smythe Street	3,234
Saunders St. - O'Dell Avenue to Rookwood Avenue.....	990
Rookwood Ave. - Parkhurst Drive to C.N.R.	1,452
Hanwell Road - Woodstock Road to Parkhurst Drive	528
Golf Club Road	800
Wilsey and Doak Roads (Spring trouble spots)	1,400
Albert Street - York Street to Connaught Street	1,250
Connaught St. - York Street to Albert Street	1,120
Westmorland St. - Dundonald St. to Connaught St.....	350
Forest Hill	4,528
Mitchell Street Extension	190
Acacia Court	640
Aberdeen Street - Church St. to C.N.R.....	300
Church Street - Aberdeen St. to Jas.S.Neill Warehouse..	600
Hayes St. (Parking lot, north side of Union St.)	150
Wilsey Road, No. 2 Highway, St. John Rd. to Doak Sta...	5,280
Tamarack Terrace	<u>410</u>
TOTAL	38,638

ITEM #8

St. John Road:-

The old corrugated iron and wooden culverts on the St. John Road from the Dominion Experimental Station main entrance to the City of Fredericton easterly line were replaced with 18" reinforced concrete culvert pipe at a cost of \$1,759.31.

This amount was made up as follows:-

Labour	\$ 569.06
Machinery	334.01
Material (Pipe, Gravel, Stone). <u></u>	<u>856.24</u>
TOTAL	\$1,759.31

ITEM #9

Doak and Wilsey Roads:-

This year approximately 2,000 feet of the Wilsey Road was rebuilt. This work was done on the road commencing midway of the Joshua Saunders property and extending to the roadway to S.S. Baird's Gravel Pit. The road was raised and ditched and cedar culverts were put in where necessary. This section of the road had in recent years been low and considerable trouble has been encountered by traffic especially in the spring and after rains. This construction amounted to \$1,856.77 and was made up as follows:-

Labour	\$ 738.67
Machinery	1,043.10
Material (Gravel)	<u>75.00</u>
TOTAL	\$ 1,856.77

ITEM #10

New Maryland Road:-

The labour charge of \$231.15 was made up of cleaning the refuse (paper, garbage, etc.) repairing the shoulders of the road and cutting bushes.

ITEM #12

Outlying Roads:-

The labour charge of \$461.63 was expended on the Golf Club Road. This year this road was rebuilt from the Canadian National Railway to the City of Fredericton line, a distance of 800 feet. The total cost of this construction was \$1,652.58 and was made up as follows:-

Labour	\$ 461.63
Machinery	438.30
Material (Gravel, Concrete Pipe)	<u>752.65</u>
TOTAL	\$ 1,652.58

ITEM #13

Street Cleaning:-

The labour expenditure charged to this account amounted to \$13,186.69. To this labour charge, to get the overall cost for cleaning streets, must be added a material charge of \$12,421.82, thus making a total cost for cleaning streets of \$25,608.51.

*Water Capacity 170 Gallons U.S. Galons
Elgin Street Sweeper
(1828.80 Gallons)*

The material charge of \$12,421.82 is made up as follows:-

Repairs (Elgin Street Sweeper)	\$ 2,494.28
Materials (Gutter Broom, Wire and Elco Hickory Fibre, etc.)	1,550.15
Gas (1828.80 Gals. @ 30¢ per Gal.)	548.64
Oil (89 Qts. @ 31¢ per quart)	27.59
Water (363,600 Gallons)	136.05
Insurance (Elgin Sweeper)	98.61
Depreciation (Elgin Sweeper)	2,568.38
Sicard Flusher (Depreciation)	2,000.00
Water (1,260,000 Gallons)	400.00
Gas (1311.25 Gals. @ 30¢ per Gallon)	393.38
Oil (123 Quarts @ 31¢ per quart)	38.13
Hand Brooms	145.70
Insurance (Flusher)	20.91
City Machinery (Trucks)	<u>2,000.00</u>

TOTAL \$ 12,421.82

*Depreciation
10% for 10 years
for original purchase*

The Elgin Street Sweeper worked 1212 hours during 1955. The actual cost for cleaning streets with this machine was \$9,723.70 and was computed as follows:-

Repairs (Elgin Street Sweeper)	\$ 2,494.28
Materials (Gutter Broom Wire, and Elco Hickory Fibre, etc.)	1,550.15
Gas (1,828.80 Gals. @ 30¢ per Gal.)	548.64
Oil (89 Qts. @ 31¢ per quart)	27.59
Water (363,600 Gallons)	136.05
Insurance	98.61
Depreciation	2,568.38
Labour (Operator & Helper making Brushes)	<u>2,300.00</u>

TOTAL \$ 9,723.70

The operating dates for the above machine were from April 13th to November 16th.

This year the City of Fredericton purchased a Sicard Master Flusher with a capacity of 2250 Imperial Gallons, the cost of this machine to be included in the budget for 1956.

The operating dates for the above machine were from August 15th to November 8, 1955.

The flusher worked 481 hours. The actual cost for cleaning streets with this machine was \$3,747.34 and was computed as follows:-

Labour (Operator and Helper)	\$ 894.92
Gas (1311.25 Gals. @ 30¢ per Gal.)	393.38
Oil (123 Qts. @ 31¢ per quart)	38.13
Water (1,260,000 Gals.)	400.00
Insurance	20.91
Depreciation	<u>2,000.00</u>

TOTAL \$ 3,747.34

ITEM #14

Tarvia Repairs:-

The labour expenditure charged to this account amounted to \$5,513.19. This amount was made up as follows:-

Patching \$ 4,484.26
Seal 1,028.93

TOTAL \$ 5,513.19

Patching:-

In most of this pavement patching the patching material was mixed in a concrete mixer at the City Yard using a cut back tar or asphalt and local crushed gravel which was dried out by an AD - 7 Px Tarco Aggregate dryer purchased this year at a cost of \$890.95. The holes in the pavements, after having the edges painted, were raked full of patching material and rolled by one M-157 Trail-O-Roller purchased this year at a cost of \$3,522.81. Also used in patching in 1955 was 418.125 tons of Base Pre-mixed Asphalt and 156.625 tons of Seal which was hauled by City trucks from the plant of the Diamond Construction Co., situated below Oromocto. The Diamond Construction Co. charged the City \$8.00 per ton for Seal and \$6.00 per ton for Base when hauled by City trucks. The above purchased asphalt is of much better quality than City mixed asphalt, due to higher temperature and better control of mix.

Seal:-

This year 4.62 miles of City Streets were sealed by the Diamond Construction Company at a cost of \$8,116.28, made up as follows:-

1089 tons sand @ \$1.90 per ton \$ 2,069.10
21,144 Gals. RC₃ @ 28.6¢ per Gal. ... 6,047.18
TOTAL \$ 8,116.28

The following streets were sealed:-

<u>Location</u>	<u>Lineal Feet</u>
Queen St. - Secretary Lane to Smythe Street	4,480
King St. - Church St. to Westmorland Street	3,400
Brunswick St. - Church St. to Subway	790
Charlotte St. - University Ave. to O'Dell Avenue	5,200
Church St. - Churchill Row to Queen Street	1,700
Regent St. - George St. to Campbell Street	1,400
Carleton St. - Brunswick St. to Highway Bridge	1,220
York St. - Brunswick St. to Campbell Street	1,200
Phoenix Square	300
Westmorland St. - Brunswick St. to Campbell Street	1,020
Smythe St. - Queen St. to King Street	400
University Avenue - George Street to Subway	350
Carleton St. - George St. to Charlotte Street	300
Aberdeen Street - Westmorland St. to York Street	630
Regent Street - C.P.R. to Albert Street	700
Brunswick St. - Carleton St. to Westmorland St.	<u>1,320</u>
TOTAL	24,410

The preparatory work and cleaning up of excess sand for the above was done by City Workmen at a labour cost of \$1,028.93, thus the total cost for the above sealing was \$9,145.21 making approximately \$2000 per mile for sealing.

In addition under the heading Tarvia Repairs, various streets in the business section were excavated between the curb and sidewalk and replaced with pavement, thus reducing the dust nuisance.

ITEM #15

City Road Patrol:-

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

<u>Date Purchased</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
1945 Adams #412 Grader	1,247.59	3,146.06	1,385.88
1950 Austin Western #99H	2,358.22	1,685.16	2,164.77
1953 Champion		1,355.68	2,465.78
1955 Allis Chalmers (AD-40)			

In November, the City of Fredericton purchased one only, Allis-Chalmers model AD-40 Motor Grader, serial #1437 with Mussen standard equipment and one only 378 Snow Wing with power hydraulic control system at a cost of \$22,647.64, less trade in allowance on 1945 Adams 412 Grader, \$6,100, making the cost of the above machine \$16,547.64.

The following were purchased by the City this year and charged to Roads and Streets:-

1-M157 Trail-O-Roller	\$ 3,522.81
1-AD-7 Px Tarco Aggregate Dryer	890.95
1-Allis Chalmers model AD-40 Motor Grader Serial #1437 with Mussen Standard Equipment Engine, Serial #45.51080 and one only model 378 Snow Wing with power hydraulic control system (\$22,647.64 less trade in allowance on 1945 Adams 412 Grader \$6,100)	16,547.64
1-MB Model 3-10 Marker, power propelled Double Line	891.02
1-1955 Chevrolet truck, 18,000 lbs. G.V.W. with Cam and Roller type hoist Serial No. 51643622227 Motor No. 2564 (\$4,352.46, less trade in allowance on 1951 Ford 2 ton - \$900.00)	3,452.46
1 - Scotchman Chemical Salt Spreader	669.50
2-Jeeps CJ-5-½ Cab 6' Snow Dozer (\$3,075 each, less trade in on 2 Jeeps - \$500.00 each)	5,150.00
TOTAL	\$ 31,124.38

In addition the City this year purchased 1-Sicard Flusher Model FL2G251, Serial 102-WT, Capacity 2250 Imperial Gallons at a cost of \$19,435.00, this price to be included in the 1956 budget.

Following is the list of vehicles and machinery used and charged to Roads and Streets, showing a comparison of repair charges for 1954 and 1955:-

Name of Vehicle	Year Purchased	Repairs 1954	Repairs 1955
Chevrolet, 3 ton Dump Truck	1951	640.92	334.35
Chevrolet, 2½ Ton Dump Truck	1955	----	59.16
Ford - 3 ton Dump truck (1951 trade in June 10, 1955)	1951	508.70	163.16
Ford - 3 ton Dump Truck	1953	221.46	876.57
G.M.C. - 3 ton Dump Truck	1953	245.61	820.01
Dodge Panel	1946	175.51	450.18
Ford - ½ Ton Pick-Up	1952	397.04	803.83
Chevrolet (Coach)	1954	115.73	412.43
Caterpillar D-6 Bulldozer	1953	210.13	406.39
Caterpillar D-2 Bulldozer	1954	2.87	270.79
International T-D-6 Bulldozer	1948	1,786.07	1,430.98
International T-D-6 Bulldozer	1949	3,302.88	873.48
Elgin Street Sweeper	1953	766.61	2,494.28
Air-Pic Compressor	1953	----	259.76
Michigan T-6-K Shovel (3/8 Yard)	1947	1,401.07	2,201.31
Michigan C-16 Shovel (½ Yard)	1951	1,477.23	1,465.85
Model #157 Trail-O-Roller	1955	----	13.01
Sicard Jr. Snow Blower	1949	616.25	9,058.97
Sicard Flusher (2250 I.G. Capacity) Purchased 1955 to be paid for in 1956			
Willys Jeep #1	1955	----	110.00
Willys Jeep #2	1955	----	79.48
Willys Jeep #3	1953	257.38	346.37
Willys Jeep (Trade in Jan. 23, 1955) ..	1950	200.54	181.06
Willys Jeep (Trade in Jan. 23, 1955) ..	1949	655.20	409.53
Adams #412 Grader (Trade in Nov. 22/55)	1945	3,146.06	1,385.88
Austin Western Grader #99H	1950	1,685.16	2,164.77
Champion Grader	1953	1,355.68	2,465.78
Allis Chalmers Grader AD-40	1955	----	-----
TOTAL		\$19,168.10	29,537.38

CAPITAL ACCOUNT - PAVING

The Net Expenditure under this heading amounts to \$159,086.37.

Included in above are:-

(1) Capital Account Curb and Gutter	\$ 27,542.26
(2) Capital Account Paving	<u>131,544.11</u>
TOTAL	<u>\$ 159,086.37</u>

For the above expenditure of \$27,542.26, concrete curbs and gutters were laid at the following locations:-

<u>Location</u>	<u>Lineal Feet</u>
Acacia Court (both sides)	924
Woodstock Road (both sides)	7,679
MacLaren Avenue - Central Mortgage & Housing Corp. property line (west line) to Clark Street (both sides)	1,580
Clark Street, Canadian Pacific Railway to Union Street (East Side)	376
School Street- Phillips St. to MacLaren Avenue (East side)	72
Neill St. - Dobie St. to MacLaren Ave. (both sides). MacLaren Ave. - School St. to Carney St. (both sides)	1,681
Pine Street - C.P.R. to Dobie St. (both sides).....	353
Dobie St. - Pine St. to Carney St. (both sides)	510
Phillips Street (both sides)	723
Elizabeth Street (both sides)	795
MacLaren Ave. (in front of Carleton Ward Fire Station - both sides)	320
MacLaren Ave.-Carney St. to Medley Street (north side) replaced old curbing	325
St. Mary's St. - Water St. to Highland Avenue (both sides)	2,687
Jaffrey St. - C.P.R. to St. Mary's St. (both sides).	729
Water St. - St. Mary's St. to Bridge St. (both sides)	960
Waterloo Row - Elmcroft Place to Ketchum Bridge (East side)	<u>196</u>
TOTAL	<u>21,547</u>

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 21,547 lineal feet into the total cost of \$27,542.26 is \$1.28 per lineal foot.

With the net expenditure of \$131,544.11 various streets were paved.

Following is a list of streets paved:-

<u>Streets Paved</u>	<u>Lin. Ft.</u>	<u>Sq. Yrds.</u>
Green Road - York St. to Graham Avenue	2,083	6,249
Kensington Court	450	1,100
Acacia Court	628	1,535
Elmcroft Place	520	1,386
Woodstock Road (4' Strip each side O'Dell Ave. to Hanwell Road)	4,000	3,555
McKeen St. - Union St. to C.P.R.	335	781
Jaffrey St. - Union St. to C.P.R.	805	1,878
St. Mary's St. - (C.P.R. to Highland Avenue) ..	695	1,930
St. Mary's St. - (6' strip each side, Union St. to Water St.)	310	413
MacLaren Ave. from near Hughes St. to Carleton <u>WARD St.</u> Fire Station	3,681	11,043
Clark St. - MacLaren Ave. to Hillcrest Drive ..	540	1,620
Forbes St. - MacLaren Ave. to Hillcrest Drive..	750	2,250
School St. - Dobie St. to MacLaren Avenue	897	2,691
Carney St. - Dobie St. to MacLaren Avenue	990	2,970
Coombes Street	830	2,305
Athlone Street	660	1,833
Medley St. - Dobie St. to MacLaren Avenue	1,025	3,075
Dobie St. - Medley St. to School Street	1,186	3,558
Pine St. - C.P.R. to Dobie Street	210	513
Gill St. - C.P.R. to Dobie Street	195	530
McEvoy Street	1,050	2,625
Neill St. - Dobie St. to MacLaren Avenue	890	2,670
Clark St. - Union St. to C.P.R.	350	1,050
Elizabeth Street	390	1,083
Phillips Street	350	972
Golf Club Road	800	2,044
TOTAL	24,620	61,659

Above pavement was laid to a thickness of 3". 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. The contract for the above pavement was given to Mr. Charles Charters who sublet the contract to the Diamond Construction Company. The pre-mixed pavement was supplied and laid by the Diamond Construction Company from their plant located at Oromocto. The company charged the city for this pavement in place, \$6.95 per ton for $\frac{3}{4}$ " minus dense mixed material with the exception of Golf Club Road, the price being \$7.25 per ton.

Also included in the above expenditure for paving, was the recapping of the following city streets:-

<u>Location</u>	<u>Lin. Ft.</u>	<u>Pounds Per Sq. Yrd</u>
St. John Rd. from the Experimental Station main entrance to the City of Fredericton easterly line ($\frac{3}{4}$ " minus)	7,950	275
Woodstock Rd. - O'Dell Ave. to Hanwell Road ($\frac{1}{2}$ " Minus)	4,625	180
Campbell St., midway between Westmorland and York St. to Westmorland St. ($\frac{1}{2}$ " Minus)...	370	200
Water St., St. Mary's St. to Bridge St. ($\frac{3}{4}$ " Minus)	558	275
Forward	13,503	

<u>Location</u>		Pounds <u>Lin. Ft.</u>	<u>Per Sq. Yd.</u>
Brought Forward	13,503		
St. Mary's St., C.P.R. to Water Street, ($\frac{3}{4}$ " Minus)	742	275	
Union St., Bridge St. to St. Mary's St. ($\frac{3}{4}$ " Minus)	550	275	
Intersections, Queen & Carleton, Queen & King, Regent & King and Regent & Queen Streets. ($\frac{1}{2}$ " Minus)	800	180	
Brunswick St., Smythe St. to O'Dell Avenue ($\frac{1}{2}$ " Minus)	500	180	
King St., Smythe St. to Brunswick St. ($\frac{1}{2}$ " Minus)	250	180	
TOTAL	16,345		

In addition to the Paving and Recapping Asphalt pre-mixed pavement was used at the following locations:-

Asphalt sidewalk on Water St., Between Hayes St. and Bridge Street (south side).
 Asphalt sidewalk on Union St., between Hayes St. and Bridge Street (south side)
 Asphalt sidewalk on Union St., between St. Mary's St. and Jaffrey Street (south side)
 Asphalt sidewalk on St. Mary's St., south of Union St. (west side).
 Asphalt pre-mixed pavement between Curb and Sidewalk on Bridge Street (both sides)
 Asphalt pavement between curb and sidewalk, St. Mary's Street (East side).
 Bridge St. was widened 12 feet from Water Street to Union Street by removal of curb on east side and paving from old curb line to the sidewalk and sloping to old curb line.

The above asphalt sidewalks replaced broken and cracked concrete sidewalks in the areas noted, which were dangerous to pedestrians.

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

CAPITAL ACCOUNT - SEWER DOMESTIC

Gross Expenditure and Stocked Material	\$ 14,048.58
Credits	<u>2,892.23</u>
Net Expenditure	\$ 11,156.35

The above credits are made up as follows:-

Work done on Domestic Sewers for private parties	\$ 386.75
Journal Voucher (Materials paid for by Capital Account Sewer and used by other City Depts.)	<u>2,505.48</u>

TOTAL	\$ 2,892.23
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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>8" T.C. Pipe</u>
Edinburgh Street	1,056'
Hawthorne Terrace (connecting line to Shamrock Terrace)	178'
Dundonald St., Northumberland to Smythe Street	600'
Elmwood Court	600'
Hughes Street	378'
Hanwell Road, Woodstock Road to Parkhurst Drive.....	495'
Inglewood Drive	600'
MacLaren Ave., extended sewer to Hughes Street.....	170'
Smythe St., Shamrock Terrace west	446'
St. Mary's St., extended sewer above Highland Ave....	<u>83'</u>
TOTAL	<u>4,606'</u>

In addition 600 lineal feet of 8" T. C. Sewer was laid in Shamrock Terrace by Ashfield Bros. and paid for by the subdivider Mr. Charles McLenahan.

An actual cost of installed 8" T. C. Pipe at the above locations was kept, giving a unit price per foot of \$2.34 for labour and material.

<u>Location</u>	<u>Labour & Machinery</u>	<u>Material</u>	<u>Total</u>
Edinburgh Street	\$ 1,469.46	1,272.92	2,742.38
Hawthorne Terrace	269.71	206.69	476.40
Dundonald Street	428.16	750.47	1,178.63
Elmwood Court	443.20	752.91	1,196.11
Hughes Street	396.40	468.81	865.21
Hanwell Road	384.44	548.39	932.83
Inglewood Drive.....	398.58	784.32	1,182.90
MacLaren Avenue	123.39	214.76	338.15
Smythe Street	901.85	566.52	1,468.37
St. Mary's Street	<u>320.47</u>	<u>83.65</u>	<u>404.12</u>
TOTAL	<u>\$ 5,135.66</u>	<u>5,649.44</u>	<u>10,785.10</u>

Total Lineal Feet - 4,606

Material in stock, November 30, 1955:-

400 lineal feet of 8" T. C. Pipe @ 75¢ per foot	-	\$ 300.00
9 manholes (covers and frames) @ \$42.65 each	-	<u>383.85</u>
TOTAL		<u>\$ 683.85</u>

CAPITAL ACCOUNT - SURFACE SEWER

Gross Expenditure and stocked	
Material	\$ 33,312.80
Credits	<u>5,195.05</u>
Net Expenditure	<u>\$ 28,117.75</u>

The above credits are made up as follows:-

Charles McLenahan (Sale of Pipe and Catch Basin)	\$ 109.50
McKim-Giddens Ltd. (Sale of brick for manhole)	19.93
Journal Voucher (Material paid for by Capital Account Surface Sewer and used by other City Departments)	<u>5,065.62</u>
TOTAL	<u>\$ 5,195.05</u>

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

<u>Location</u>	30" <u>Con.</u>	24" <u>Con.</u>	18" <u>Con.</u>	15" <u>Con.</u>	12" <u>Con.</u>	10" <u>Con.</u>	8" <u>Con.</u>	8" T.C.	Total
Edinburgh St.					1023			90	1113
McEvoy Street						300			300
Dundonald St.					518	50			568
Elmwood Crt.					630	26			656
Inglewood Dr.	1028	1050	154		40	28			2300
Rookwood Ave.					903	90	20		1013
Smythe St.					515	192		237	944
TOTAL ...	1028	1050	154	515	3306	494	20	327	6894

An itemized account was kept of installing Surface Sewers at the above locations and expenditures were made as follows:-

<u>COSTS</u>			
<u>Location</u>	<u>Labour & Machinery</u>	<u>Material</u>	<u>Total</u>
Edinburgh Street	\$ 1,769.58	1,630.94	3,400.52
McEvoy Street	298.66	298.13	596.79
Dundonald Street	487.30	841.29	1,328.59
Elmwood Court	487.84	909.46	1,397.30
Inglewood Drive	5,200.63	9,544.81	14,745.44
Rookwood Avenue	970.73	1,563.32	2,534.05
Smythe Street	<u>1,095.96</u>	<u>1,193.22</u>	<u>2,289.18</u>
TOTAL	<u>\$ 10,310.70</u>	<u>15,981.17</u>	<u>26,291.87</u>

In addition 76 lineal feet of 12" Concrete Pipe was laid by Ashfield Bros. in Shamrock Terrace and paid for by the subdivider, Mr. Charles McLenahan.

The following is the total cost for laying the various sizes of pipe in place:-

10" Concrete Pipe	-	\$2.00 per lineal foot
12" Concrete Pipe	-	\$2.12 - \$3.06 per lineal foot
15" Concrete Pipe	-	\$2.42 per lineal foot
24" Concrete Pipe	-	\$5.25 per lineal foot
30" Concrete Pipe	-	\$6.41 per lineal foot

We have in stock, November 30, 1955 the following:-

7½ feet of 6" Concrete Pipe @ 32¢ per foot	\$ 2.30
177 feet of 8" Concrete Pipe @ 52¢ per foot	92.04
146 feet of 12" Concrete Pipe @ 80¢ per foot	116.80
724 feet of 18" Concrete Pipe @ 1.99 per foot	1,440.76
348 feet of 15" Concrete Pipe @ 1.19 per foot	414.12
8 feet of 36" Concrete Pipe @ \$7.83 per foot	62.64
2 Catch Basins (Covers and Frames) @ \$43.99 each	87.98
10,000 Bricks @ \$41.96 per thousand	<u>419.60</u>
TOTAL	<u>\$ 2,636.24</u>

CAPITAL ACCOUNT WATER

Gross Expenditure and Stocked Material	\$ 34,217.36
Credits	274.34
Net Expenditure	<u>\$ 33,943.02</u>

The above credits are made up as follows:-

Henry Rogers (Sale of 1 Solid Sleeve, Cast Iron)	\$ 10.00
Journal Voucher (To material used in installing Sprinkler System at City Hall, including 1 - 6" Gate, 1 - 6" Sleeve, 6" C. I. Pipe, Lead and Oakum)	<u>264.34</u>
TOTAL	<u>\$ 274.34</u>

Installations were made at the following locations:-

<u>Location</u>	<u>8" C.I.</u>	<u>6" C.I.</u>	<u>Total</u>
Edinburgh Street		1118	1118
Dundonald Street		612	612
Elmwood Court		614	614
Hughes Street		591	591
Hanwell Road		678	678
Inglewood Drive	565	54	619
MacLaren Avenue & Bridge St. and across to St. Marys St.....	1223	67	1290
Rookwood Avenue	—	<u>344</u>	<u>344</u>
TOTAL	<u>1788</u>	<u>4078</u>	<u>5866</u>

CAPITAL ACCOUNT DRILLED WELLS

Gross Expenditure	\$ 24,274.95
Credit	<u>1,391.90</u>
Net Expenditure	<u>\$ 22,883.05</u>

The above credit of \$1,391.90 was a refund by Federal Sales Tax.

The new ground water supply for the south side of the St. John River was put into operation on July 30, 1955 and has been supplying the water requirements for the south side since the above date.

This ground water supply was the result of a test drilling program, initiated in 1953 to determine whether a ground water supply could be developed for the City of Fredericton.

Seven test holes were made in several locations in the City. These locations were chosen by International Water Supply who did the test drilling.

The result of these test holes showed that ground water was available at all locations with a very wide range of quality characteristics, ranging from very hard water, of 350 P.P.M. to fairly soft water of 80 P.P.M., also ranging from 0.7 P.P.M. of iron to 0.1 P.P.M. of iron.

From the chemical tests made of the water obtained from the test locations, International Water Supply entered into a contract with the City of Fredericton to develop a gravel wall well in Wilmot Park, guaranteed to produce a maximum of 900 I.G.P.M. and a minimum of 700 I.G.P.M.

The water from this well has a pH of 6.0 and is pumped through a 1^{1/4}" cement lined pipe through aeration cones to the clear water basin at the water works.

The aeration cones were installed to correct the pH from the acid side of the neutral point (below 7.0 P.P.M.) to the alkalinity side (above 7.0 P.P.M.). This correction of pH is necessary for the prevention of corrosion in the mains and services.

From results of tests made it was found that the pH was raised from 6.0 P.P.M. to 6.6 P.P.M. by aeration, which meant that the water was still on the acid side.

To correct this condition, lime was added to raise the pH to 7.0 P.P.M.

Chlorine is still being added to the suction side of the general service pump but the quantity has been reduced from approximately 60 lbs. per day with the river water supply, to 1.5 to 2.0 lbs. per day with the ground water supply.

Mr. E. W. Hagerman, City Analyst, and myself agree that chlorination is still necessary due to the possibility of latent bacteria coming off the mains and becoming active.

Chlorination could be done away with entirely, if all the mains in the City were cleaned and sterilized, the cost of which would be in the vicinity of \$25,000.

All the work on the development of the well, the installation of the pipe line and the construction of the pump house and aeration cones has been completed. The only portion of this construction incomplete is the installation of remote control cable between the waterworks and the well site, this work being delayed due to short supply of conductor cable.

The construction of the Pump House at Wilmot Park was let by contract to Mr. R. M. Irving. This building is of reinforced concrete construction and the contract price for the building was \$5,150.00.

The cost of the ground water supply to date, including ground water exploration, the development of the well, the installation of the pipe line and the construction of the pump house and aeration cones is listed below.

<u>Year</u>	<u>Expenditure</u>
1953	\$ 7,500.00
1954	42,271.16
1955	<u>22,883.05</u>
TOTAL	\$ 72,654.21

CAPITAL ACCOUNT - GRAVEL ROADS

Expenditure\$ 33,606.57

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

<u>Location</u>	<u>Lineal Feet</u>
Hughes St., Union St. to MacLaren Avenue	2,000
Gibson St. (West side of Gibson St. along the shoulders of the road from MacLaren Ave. north).	350
Sewell Street (from Coombes Ext. toward C.P.R. track)	200
Killarney Road (Highland Ave. to City Line)	2,000
Coombes St. Ext. (Sewell St. to Gibson St.)	300
MacLaren Ave. (Hughes St. to Bridge St.)	380
Bridge St. (C.P.R. track to MacLaren Avenue)	600
Road across Indian Reserve (Bridge St. to St. Mary's)	638
Edinburgh Street	1,006
Inglewood Drive	620
Elmwood Court	630
Dundonald St. (Northumberland St. to Smythe St.) ...	630
Beaverbrook St. (Windsor St. to University Ave.) ...	890
Road in front of Cemetery, parallel to MacLaren Ave. & connecting Medley St. to McEvoy St.	1,090
Carney St. (MacLaren Ave. to Cemetery Road)	190
Phyllis Creek (Shoulders of Road)	<u>600</u>
TOTAL	<u>12,124</u>

A breakdown of cost for the new streets constructed is as follows:-

<u>Location</u>	<u>Labour & Machinery</u>	<u>Material</u>	<u>Total</u>
Bridge St., MacLaren Ave. & road across to Indian Reserve	\$ 2,081.54	7,977.23	10,058.77
Beaverbrook St., Windsor to University Avenue	1,314.44	3,711.16	5,025.60
Road in front of Cemetery (Carleton Ward)	1,161.46	1,028.07	2,189.53
Dundonald Street	310.84	3,153.39	3,464.23
Edinburgh Street	2,835.67	1,232.36	4,068.03
Elmwood Court	437.22	2,301.51	2,738.73
Inglewood Drive	<u>1,254.41</u>	<u>1,893.55</u>	<u>3,147.96</u>
TOTAL	<u>\$ 9,395.58</u>	<u>21,297.27</u>	<u>30,692.85</u>

In addition and included under the above heading, Capital Account Gravel Roads, the Woodstock Road (No. 2 Highway) at Phyllis Creek was widened and the culvert on the north side was extended 20 feet and on the south side 15 feet, at an expenditure of \$3,235.19.

CAPITAL ACCOUNT - BACK DRAIN

Expenditure\$ 5,378.76

The above expenditure includes the following:-

- (1) Back Drain
- (2) Back Drain diversion constructed 1953

Back Drain:-

The open ditch Back Drain was piped this year with 24" concrete pipe from Northumberland Street to Westmorland Street, a distance of 606 feet. The open ditch from the Canadian Pacific Railway culvert, below Regent Street to Westmorland Street and from Northumberland Street to Smythe Street was cleaned out and lowered where necessary.

Back Drain Diversion:-

During 1953 the course of the City Back Drain, from the concrete culvert on York Street, was changed and a ditch was constructed from the culvert to Phyllis Creek, thus diverting the flow of the water to Phyllis Creek in the west end of the City.

This year the drain was riprapped where necessary and a headwall built. A cedar trough was built from the headwall and extending towards the Canadian National Railway Culvert. In addition two drains were dug and piped into the drain between York Street and Smythe Street.

CAPITAL ACCOUNT - STREET LIGHTS

Expenditure \$ 2,903.94

The above expenditure was to material received from Northern Electric Company and charged to Street Lights.

Following is a list of material:-

10-824T - 12 - 1 Street Light Standards
20-T91004 Straight Bracket complete with T 32 Pole Plate for inside wiring
20-319R Series Fixtures for interior wiring
600 feet - 2" Standard Fibre conduit 5 ft. length
25-2" Standard Fibre Elbows 90° - 18" Radius
10-2" Standard Fibre Couplings

The above material was used for the new installation of street lights on Queen Street, from Court House Square to Carleton Street and newly opened streets.

CAPITAL ACCOUNT - NEW CITY YARD

Expenditure \$ 37,128.77

This year the City Yard was moved to a new location, situated on the south side of Dundonald Street and at the rear of the Municipal Home Building.

The ground was levelled, ditches were dug where necessary and the following buildings were constructed:-

- (1) Equipment Garage and Auxillary Building
- (2) Storage Shed
- (3) Building placed over the Gas and Diesel Pumps

(1) - Equipment Garage and Auxillary Building:-

This building was of Trafford Tile and Steel construction, with an asbestos lumber finish on the inside and a twenty year bonded roof. The dimensions of this building are 60' x 80'. Attached to the Garage is an Auxillary Building 40' x 12" of concrete block construction.

The above buildings were let by contract to M. F. Schurman Co. at a price of \$22,000.00, plus \$825.00 in extras, making the total price paid \$22,825.00.

The total cost of the completed buildings was \$33,498.66 and was computed as follows:-

City Labour (Installing floor drains, surface sewers, domestic sewer, water service).....	\$ 264.86
City Material (5" - 8" T. C. Sewer Pipe, Manhole, $\frac{3}{4}$ Copper Pipe, Etc.)	1,084.69
Province of N. B. (Prints of the Building)	35.00
L. E. Shaw (6" - 12" Concrete Sewer Pipe)	68.61
Hornsnell's (Making of floor drains)	169.95
Dominion Steel Co.	5,278.75
Canadian Pacific Railway	1.94
J. S. Neill (Electrical Material)	773.17
E. J. Moran (Water tank, basin, etc.)	299.55
W. J. Bearisto (Heating)	1,225.70
Richard Wilcox (Doors)	996.00
Harry G. Moore (Wiring)	475.44
M. F. Schurman Co.	<u>22,825.00</u>
TOTAL	<u>\$33,498.66</u>

(2) & (3)

A storage shed 20' x 40' was constructed by City workmen having a sloping roof 15' on the front and 10' on the rear. In addition a building 8' x 10', housing the pump on the Rifle Range Road in Carleton Ward was moved by trailer to the City Yard and placed over the Gas and Diesel Pumps; the roof and siding of this building being renewed.

LOCAL IMPROVEMENT

A Local Improvement By-Law was passed by the Fredericton City Council in 1955, by which the subdivider shares in the cost of services within the bounds of the subdivider's development.

Services were installed at the following locations under Local Improvement:-

<u>Location</u>	<u>Service</u>	<u>Cost</u>	<u>Subdivider's Share at By-Law Rates</u>	<u>Cost To City Of Fredericton</u>
Edinburgh Street	Water	3,740.38	2,192.88	1,547.50
	Domestic Sewer	2,742.38	2,689.38	53.00
	Surface Sewer	3,400.52	3,188.75	211.77
	Gravelled St.	<u>4,068.03</u>	<u>3,336.55</u>	<u>731.48</u>
	TOTAL COST	\$13,951.31	11,407.56	2,543.75
O'Dell Sub-division	Water	5,009.93	2,750.31	2,259.62
	Domestic Sewer	2,379.01	3,373.02	-----
	Surface Sewer	17,003.24	7,481.93	9,521.31
	Gravelled St.	<u>5,886.69</u>	<u>3,158.55</u>	<u>2,728.14</u>
	TOTAL COST	\$30,278.87	16,763.81	14,509.07
Shamrock Terrace	Water	$\frac{1}{2}$ cost of water paid to subdivider who installed		1,141.00
	Domestic Sewer	Surface Sewer all other services at own expense		
	Gravelled St.			
	TOTAL COST - LOCAL IMPROVEMENT	\$44,230.18	28,171.37	18,193.82

PUBLIC WORKS

Gross Expenditure	\$ 13,312.06
Credits	<u>1,222.40</u>
Net Expenditure	\$ 12,089.66
1955 Appropriation	<u>16,500.00</u>
CREDIT	\$ 4,410.34

The credits of \$1,222.40 were made up as follows:-

Federal Dept. of Public Works (Cleaning Wharf)	\$ 53.93
Maritime Engineers Ltd. (Rental & Sale of Transit) ..	250.00
Jas. S. Neill & Sons	16.69
Bemrose & Kilburn (Cutting concrete at Curling Rink).	22.32
McColl Frontenac Oil Co. (Planting tree - corner of King & St. John Street)	29.17
Journal Voucher (to plans for Municipal Home)	9.60
Journal Voucher (Work performed should have been charged to Capital Account - Back Drain)	<u>840.69</u>
TOTAL	\$ 1,222.40

The labour charge under the Public Works expenditure was incurred for the following:-

Lady Beaverbrook Rink	\$ 32.20
O'Dell Park	2,473.70
Trees	1,420.69
Survey	243.84
Back Drain	113.36
Old Burial Ground	1,114.09
Unforseen Account	<u>3,245.62</u>
 TOTAL	<u>\$ 8,643.50</u>

Lady Beaverbrook Rink:-

The labour charge of \$32.20 was the amount spent in cutting trees and limbs on University Avenue at the Lady Beaverbrook Rink site.

O'Dell Park:-

Gross Expenditure	\$ 3,427.49
Credit	<u>21.00</u>
Net Expenditure	<u>\$ 3,406.49</u>

The above credit of \$21.00 is for three loads of wood sold to the Municipal Home.

The above expenditure of \$3,427.49 is made up as follows:-

N. B. Telephone Co.	\$ 38.50
Horsnell's Machine and Iron Works Ltd.	31.27
Workmen's Compensation	124.40
Burtt's Harness Shop	2.99
W. A. Calhoun	5.00
J. Gibson & Sons	48.25
J. S. Neill & Sons Ltd.	21.36
Forbes and Sloat (Gravel)	391.20
Journal Voucher (Labour)	2,473.70
Journal Voucher (Material and Machinery)	<u>290.82</u>
 TOTAL	<u>\$ 3,427.49</u>

A gravelled road was constructed this year along the north side of the Back Drain from Smythe Street to the O'Dell Park Road at a cost of \$488.78.

Under this heading \$2,473.70 was spent in wages. The total expenditure for labour and material was \$3,406.49.

Trees:-

The labour cost of \$1,420.69 under this item was for cutting, pruning, spraying and the planting of new trees.

The city purchased this year, from the Forest Nursery at Charlottetown, the following trees and these were planted by city workmen:-

10 Norway Maples - Large @ \$2.50	\$ 25.00
10 Crimson King Maples @ \$3.00	30.00
10 Acer Rubrum @ \$3.00	30.00
2 Pyramidal European Hornbeam @ \$2.25	4.50
10 Golden Weeping Willows @ \$1.25	12.50
10 Dutch Linden @ \$2.25	22.50
10 Pin Oaks @ \$2.50	25.00
10 Little Leaf Lindens @ \$2.00	<u>20.00</u>
 TOTAL	<u>\$ 169.50</u>

The above trees were planted at the following locations:-

Along the river front from Lord Beaverbrook Hotel to Alexandra Street.

Albert Street, near Albert Street School, Sunshine Gardens and at various locations on Charlotte and Churchill Row, Devon School Grounds, School Street, Dobie Street and Neill Street.

Considerable interest is being shown in the City shade trees by our citizens. During 1952 a committee of citizens under the chairmanship of a City Alderman was formed to act in an advisory manner. The chairman of this committee this year was Alderman H. G. Hughson. This committee is made up mostly of foresters and others who have a professional knowledge of tree culture. Approximately 25 trees were cut and removed this year which on inspection were found to be in a dangerous condition.

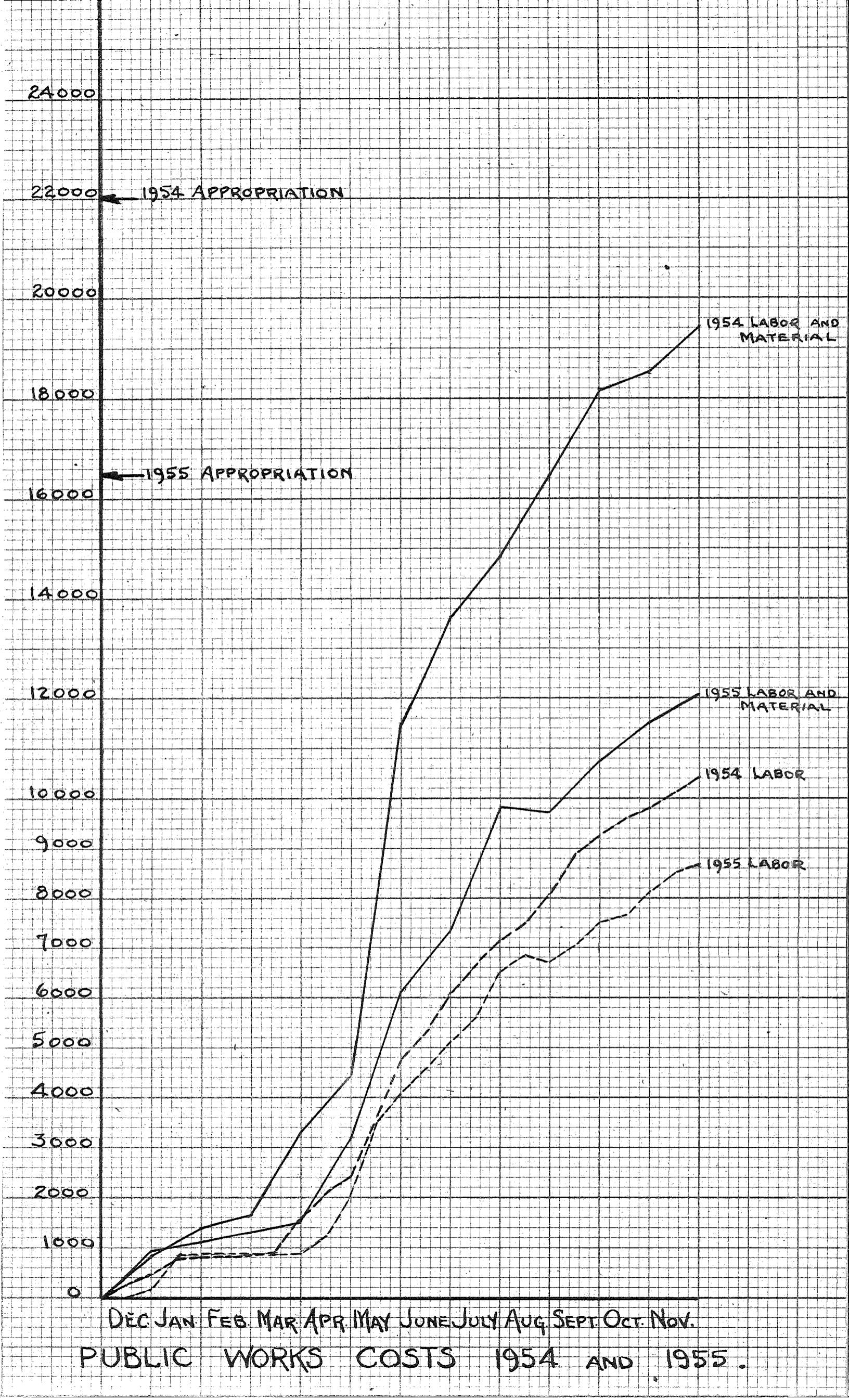
Surveying:-

The labour cost of \$243.84 under this heading was for wages for a helper with the Engineers during the course of their work during 1955.

The following locations were surveyed:-

1. MacLaren Avenue, Hughes Street to Bridge Street
2. Bridge Street, MacLaren Avenue to C.P.R.
3. Edinburgh Street
4. Inglewood Drive
5. Elmwood Court
6. Dundonald Street, Northumberland Street to Smythe Street
7. Road parallel to MacLaren Avenue across Indian Reserve from MacLaren Avenue to St. Mary's Street.
8. Road in front of cemetery, Carleton Ward, parallel to MacLaren Avenue from Carney Street to McEvoy Street.
9. Phyllis Creek
10. Back drain from C.P.R. culvert east of York Street to Smythe Street.

In addition, under this heading, traffic counters obtained from the Provincial Highway Department, were placed at various locations in the City and on the Fredericton Highway Bridge before one way traffic went into operation in June. The results of these findings are on a map on file in the City Engineer's Office.



Back Drain:-

The labour charge under this heading amounted to \$113.36, which was for cutting ice away from the culverts on York and Dundonald Streets during the winter and for general maintenance to the Back Drain.

Old Burial Ground:-

The labour expenditure of \$1,114.09 was used in maintaining the old burial ground in the center of the City.

Unforseen Account:-

Greens (Cutting, Raking, Seeding, Fill)	\$ 1,846.50
Benches (Repair, painting, etc.)	53.42
Preparing for civic election	97.38
Retroactive pay increase - Casual Labour (April 1 to December 31, 1954)	560.85
Christmas Tree	62.53
Salary (Miss Moore attending Council Meetings)	60.00
Parking Lot	37.37
Carleton Ward School Grounds (Preparation for sodding between curbs and sidewalk)	225.16
Cutting Bushes and cleaning river front	201.52
Spraying for Mosquitoes	15.64
Cleaning Regent St. Wharf (Invoiced Department Public Works)	18.20
Cleaning and painting statue of Robert Burns	51.73
Fredericton Exhibition Co. Ltd.....	5.60
Bemrose & Kilburn (Curling Rink) - (Invoiced Firm)	9.72
TOTAL	\$ 3,245.62

RECREATION

Net Expenditure \$ 1,656.05

The above expenditure does not include all playground expenditures, but only those which appear on department pay-rolls, or costs of materials ordered through this office. The salaries of the Recreation Director and Playground 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	463.85	493.31	957.16
Bathing Beaches	59.75	17.26	77.01
Rinks (Outside)	460.34	161.54	621.88
TOTAL	\$ 983.94	672.11	1,656.05

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

The Gas and Oil used by the director's truck is also included in the above expenditure under Materials for Playgrounds.

CITY HALL

Net Expenditure \$ 8,377.51

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 \$8,377.51 is divided as follows:-

Labour at City Hall, including winding and repairs to clock, night fireman and extra janitor	\$ 4,190.30
Water Bill for City Hall	100.00
Repairs	77.75
Light Bill for City Offices	1,319.80
Supplies, etc.	15.36
Coal (177.36 tons)	1,986.15
Labour, Machinery and Material for City Watermain to City Hall building for installing 6"	
Sprinkler System	<u>688.15</u>
TOTAL	<u>\$ 8,377.51</u>

The fountain in front of the City Hall was painted as usual in 1955.

6" Sprinkler connection was installed this year for City Hall.

MUNICIPAL HOME

Net Expenditure \$ 172.67

This expenditure is of course only part of the Municipal Home costs, but is the 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	\$ 100.00
3 loads of wood, delivered on order of the Social Welfare Worker to needy families of the City	21.00
Cost of delivering 3 loads of wood to needy families	13.91
Minor repairs to Municipal Home	28.76
To plowing out driveway - William Estey - 2 hrs. T. D. 6 Bulldozer @ \$4.50	<u>9.00</u>
TOTAL	<u>172.67</u>

SANITATION

Expenditure \$ 11,009.36

This expenditure is only part of the total Sanitation costs. 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 \$3,060.30.

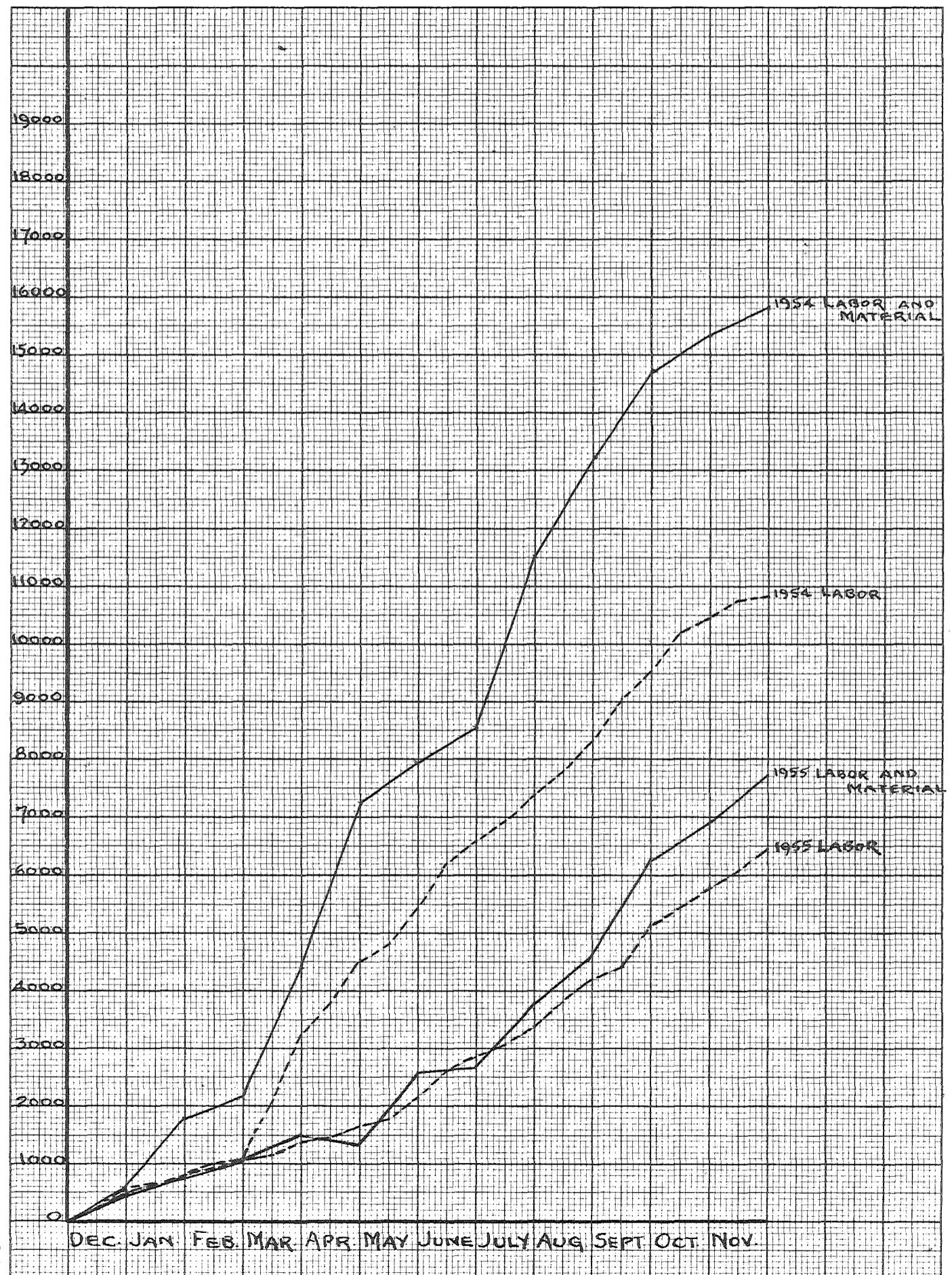
The City Incinerator is tended by two men who work a daily shift of nine hours, starting at 7:30 a.m. and finishing at 5:30 p.m. Besides these two attendants, extra city labour was used in bulldozing incinerator dump, shifting tracks, etc. The total expenditure for City Incinerator was \$7,949.06.

The contract for the Garbage is now held by Mr. J. Coates at a yearly cost of \$33,000.00.

SEWERAGE DOMESTIC

Gross Expenditure	\$ 14,355.70
Credits	6,623.87
Net Expenditure	<u>\$ 7,731.83</u>

The above credits are made up as follows:-



SEWERAGE DOMESTIC COSTS 1954 AND 1955.

Material and Labour supplied for house connections ..	\$ 6,160.71
Fredericton Tire Ltd. (Use of Pump)	100.00
Wilson's Cleaners (Use of Pump)	14.43
N. B. Telephone Co. (Raising 6 manholes)	60.00
Maritime Engineering Ltd. (Sale of 86 ft. of 5" T. C. Pipe)	43.00
Journal Voucher (25 lbs. of joint compound)	2.25
Journal Voucher (527 feet of 5" T. C. Pipe)	<u>243.48</u>
TOTAL	<u>\$ 6,623.87</u>

New customers connected to City Sewer System this year were 90.

No domestic sewer extensions were made this year under this heading but appear under "Capital Account Sewerage Domestic."

The Fredericton Domestic Sewer system consists of 38.78 miles (10.09 miles in Carleton Ward and 28.69 miles in the City proper) of sewer mains made up of the following sizes:-

24" T. C. Pipe54 miles
18" T. C. Pipe	1.29 miles
15" T. C. Pipe	1.63 miles
12" T. C. Pipe	6.12 miles
10" T. C. Pipe72 miles
8" T. C. Pipe	<u>28.48</u> miles
TOTAL	<u>38.78</u> miles

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 Saint 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 405 lamps. This system is divided into five circuits, one of which is controlled by a 25 K.W. Constant Current Transformer, the other four of which are 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 building on Carleton Street. The fifth transformer is on a pole on McLeod Avenue and controls the rear circuit for Maryland Heights.

The five circuits are made up as follows:-

<u>Lower Front Circuit</u>	<u>Transformer Size</u>
32-600 C.P. Lamps @ .350 K.W. demand	11.20
9 - 250 C.P. Lamps @ .160 K.W. demand	<u>1.44</u> <u>12.64</u> K.W.
	15 K.W.

Lower Rear Circuit

4-600 C.P. Lamps @ .350 K.W. demand	1.40
96-250 C.P. Lamps @ .160 K.W. demand	<u>15.36</u> <u>16.76</u> K.W.
	15 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	<u>5.76</u> <u>12.41</u> K.W.
	15 K.W.

Upper Rear Circuit

19-600 C.P. Lamps @ .350 K.W. demand	6.65
102-250 C.P. Lamps @ .160 K.W. demand	<u>16.32</u> <u>22.97</u> K.W.
	25 K.W.

Maryland Heights

4-600 C.P. Lamps @ .350 K.W. demand	1.40
84-250 C.P. Lamps @ .160 K.W. demand	<u>13.44</u> <u>14.84</u> K.W.
	15 K.W.

System No. 2

The multiple lighting system consists of 265 units made up of 179 units of 500 Watts and 86 units of 200 Watts.

The 179 Units of 500 Watts are located as follows:-

14 on Waterloo Row, 145 on King Street, Queen Street, Brunswick Street and Cross Streets, including part of Campbell Street and York Street, 9 on Woodstock Road, 5 on George Street and 6 on Regent Street.

The 86 Units of 200 Watts are located as follows:-

4 on Rockwood Avenue, 4 on University Avenue, 50 on Saint John Road to W. McFadgen's subdivision, 9 on Woodstock Road, 4 on Beaverbrook Street, 4 on Edinburgh Street, 3 on Smythe Street Extension, 3 on Second Cross Road, 4 on Connaught Street and 1 on Westmorland Street.

Each of the above units consists of either a 500 or 200 Watt 150 Volt Lamp set in a novalex lumina 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 500 Watt Unit and \$40.00 per year for each 200 Watt 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 Town of Devon and consists of 8.59 miles of line and 182 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.

<u>Carleton Ward (Down)</u>	<u>Transformer Size</u>
90-250 C.P. Lamps @ .160 K.W. demand	14.40
1-200 W. Lamp (East end of Union St.)	.20
	<u>14.60 K.W.</u>
	15 K.W.
<u>Carleton Ward (Up)</u>	
91-250 C.P. Lamps @ .160 K.W. demand	14.56 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 material such as wire, poles, pole fixtures, lamps, lamp fixtures, transformers, etc. are paid for by the City, installed by the Company under their contract price for maintenance. Any new installations which require an enlargement of circuits must be paid for by the City, both labour and material.

The Street Lighting costs for the year 1955 were as follows:-

Net Expenditure	\$ 28,542.77
1955 Appropriation	<u>27,000.00</u>
Debit Balance	\$ 1,542.77

The Street Lighting Expenditure of \$28,542.77 is made up as follows:-

84-600 C. P. Series Lamps	\$ 99.86
768-250 C. P. Series Lamps	548.45
1-200 C.P. Lamps49
13-150 C. P. Lamps	4.00
Current in subway and series lighting, Nov. 28, 1954 to Nov. 27, 1955	10,246.42
Charges on Multiple fixtures owned and operated by Maritime Electric Co. @ \$40.00 and \$60.00 per light per year	12,652.01
Maintenance and contract of pole line	639.84
Maintenance of lamp fixtures including only such articles as lamp standards, lamp brackets, heads, sockets, shades, cut outs, time switches, etc.)	279.89
Material and Labour used in major repairs and new installations	3,602.27
Cenotaph Light Bill and Lamp replacements	217.43
Miscellaneous	<u>252.11</u>
TOTAL	<u>\$28,542.77</u>

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

- 1-250 C. P. Lamp rear of Fredericton High School, Regent St.
- 2-250 replaced by 2-600 C. P. Lamps in Avondale Court
- 36-250 C. P. Lamps changed to Multiple Lighting on St. John Road
- 1-250 C. P. Lamp on Grey Street
- 1-250 C. P. Lamp on Winslow Street
- 1-250 C. P. Lamp on Shore Street
- 1-250 C. P. Lamp at J. S. Neill's warehouse Church Street
- 5-250 C. P. Lamps on Montgomery Street
- 1-250 C. P. Lamp on Dundonald Street (east of York Street)
- 1-250 C. P. Lamp at New City Yard
- 1-600 C. P. Lamp in Brookmount Court
- 3-250 C. P. Lamps in Shamrock Terrace
- 1-250 C. P. Lamp on Smythe St., entrance to Shamrock Terrace
- 2-250 C. P. Lamps on Dundonald St., Northumberland to Smythe

In an effort to improve the appearance on Queen Street from the Court House Square to Carleton Street, the wooden poles and overhead wiring for Street Lighting were removed and replaced by ten (10) steel standards with underground wiring.

The cost of the standards and conduit was charged to "Capital Account Street Lights", the price being \$2,903.94. The labour and material costs were included in "Street Light" expenditure which amounted to \$602.00. The labour was done by city workmen.

The average cost per light installed was \$350.19.

A future improvement could be made on Queen Street if standards were erected between York and Carleton Streets, but it would not be advisable to undertake this construction

until the trees are removed since the standards would have to be placed behind the sidewalk and the trees would hinder the illumination of the street.

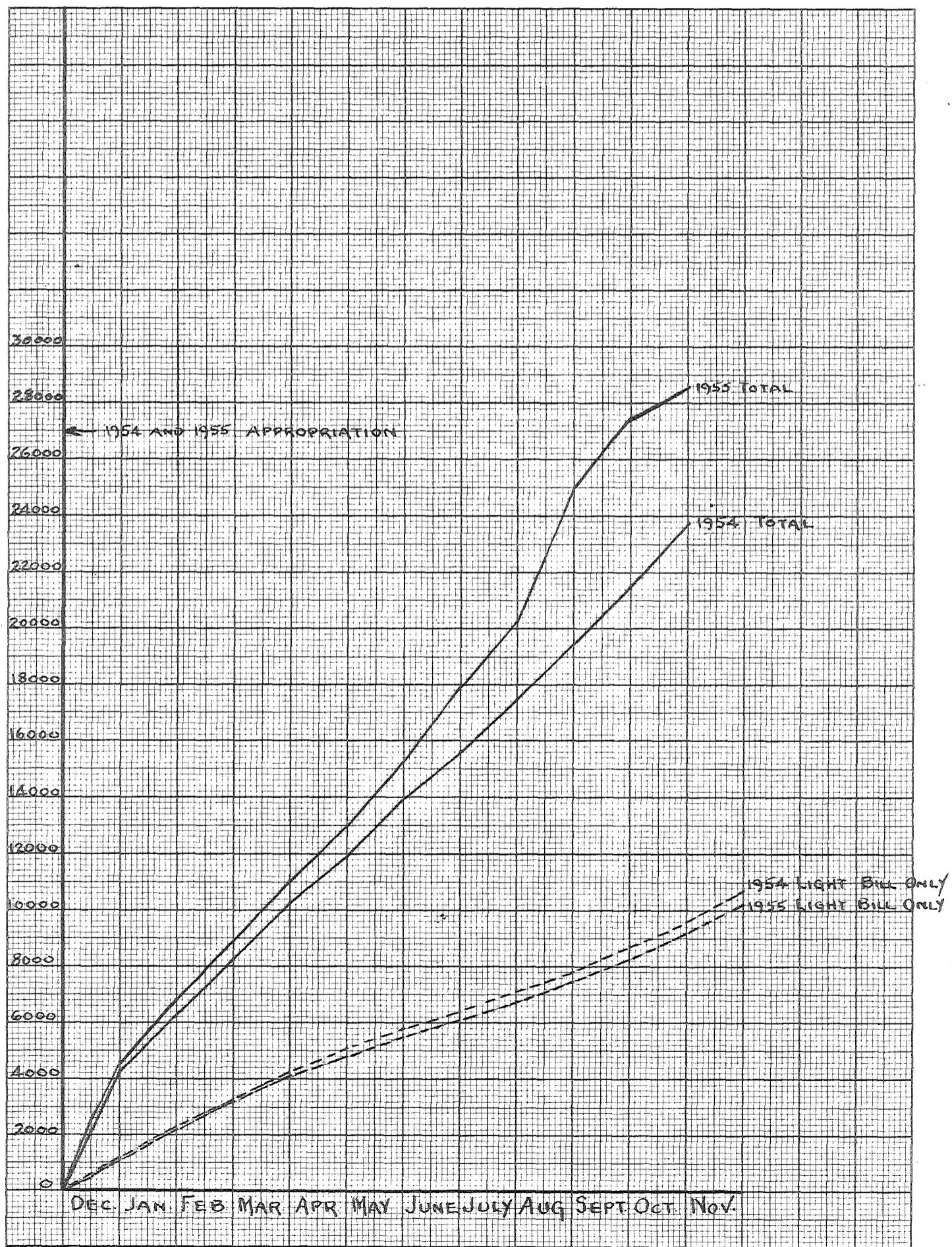
In 1955 the City Council authorized the sale of the Carleton Motors Building in which is housed the transformer bank and switch board for Series Street Lighting and this necessitated a new switch light plant on a site which was purchased through negotiations from Willett Fruit Company on Carleton Street, south of Needham Street. A building to house the transformer bank and street light switchboard, etc. is under construction at the present time.

Sale of the Garage is to become effective April 1, 1956. There may be some delay in moving from the present site in Carleton Motors due to the fact that cable required for the switch over to the new site is very scarce at the present time with guaranteed delivery not less than three (3) months, so it may be necessary to negotiate with Mr. W. W. O. Fenety, purchaser of the Carleton Motor Building, for an extension for the period of occupancy.

The total per capita charge for Street Lighting for 1955, population of 16,018 as per the 1951 census, is
28,542.77 - \$1.77
16,018

TABLE SHOWING COMPARATIVE YEARLY COST IN STREET LIGHTING

<u>Year</u>	<u>Total Yearly Cost</u>	<u>Yearly Appropriation</u>
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
1954	23,812.54	27,000.00
1955	28,542.77	27,000.00



STREET LIGHT COSTS 1954 AND 1955.

CONCRETE WALKS

Included under the above heading are:-

(1) Concrete Walks Ordinary	\$ 6,950.45
(2) Concrete Walks Special	<u>2,286.10</u>
TOTAL	<u>\$ 9,236.55</u>

(1) For the above expenditure of \$6,950.45, concrete sidewalks were laid at the following locations:-

<u>Location</u>	<u>Lineal Feet</u>
Gibson St., MacLaren Ave. to the south property line of Gerald Ashfield property (west side)	1,333.3'
Regent St., Albert St. to Green Road (East side)	1,425.3'
Regent St., Green Road to near Montgomery Street (west side)	<u>1,392.5'</u>
TOTAL	<u>4,151.1'</u>

The cost of the above sidewalk was paid for, one-half by the City and one-half by the property owner.

(2) For the above expenditure of \$2,286.10, concrete sidewalks were laid at the following locations:-

<u>Location</u>	<u>Lineal Feet</u>
MacLaren Ave., Clark St. to near Hughes St. (South side)	780'
MacLaren Ave., Clark St. to School St. (South side)	<u>733'</u>
TOTAL	<u>1,513'</u>

The cost of the above sidewalk was paid for by the City due to an agreement entered into with the Central Mortgage and Housing Corporation in 1946.

The cement for the above construction of sidewalks was obtained from Bemrose and Kilburn and from Blakney Concrete Products at a cost of \$14.50 per cubic yard.

The total cost for both Concrete Walks Ordinary and Special was \$9,236.55 and the total lineal feet was 5,664.1. These figures give the overall cost per lineal foot of completed concrete sidewalk of \$1.63.

CITY SCALES

Expenditure	\$ 384.15
Credit	10.00
Net Expenditure	<u>\$ 274.15</u>

The above credit is the amount obtained from the sale of the Old Scales from Mr. W. J. Gorman.

The above expenditure of \$384.15 is made up as follows:-

Unemployment Insurance Commission	\$ 15.66
Maritime Electric Co. (Light Bill)	22.78
Imperial Oil Co. (Stove Oil)	22.34
Department Trade and Commerce	13.75
Paul Burden	3.09
Pat McGinn	12.61
Joseph A. Likely	27.84
C. J. Toner	5.00
Mr. Harry C. Moore.....	11.82
Fredericton Shoe Findings	2.16
J. S. Neill & Sons	13.43
Journal Voucher (City Labour)	<u>\$ 233.67</u>
TOTAL	<u>\$ 384.15</u>

The wages of the weigh scale operator do not appear in the above expenditure. The expenditure is not made through the office of the City Engineer and is therefore not shown in this report.

WILMOT PARK

Expenditure\$ 2,603.03

The above expenditure is made up as follows:-

Labour and trucking at Wilmot Park	\$ 2,035.40
Material used on lawns and flower beds	57.14
Supplies and repairs to lawn mowers, etc	44.25
Telephone	38.50
Water Bill	50.00
Miscellaneous (tools, etc.)	8.69
Repairs to Caretaker's Building (roof)	<u>\$ 369.05</u>
TOTAL	<u>\$ 2,603.03</u>

CHILDREN'S HOME

Expenditure \$ 144.91

The above expenditure is made up as follows:-

Federal Hardware	\$ 13.59
J. S. Neill & Sons	2.06
Lockhart's Woodworking Ltd.	27.54
Journal Voucher (Labour and trucking)	<u>101.72</u>
TOTAL	\$ 144.91

FIRE DEPARTMENT

Expenditure \$ 8,326.83

The above expenditure is made up as follows:-

Journal Voucher (1679.30 Gallons Gasoline)	\$ 496.81
Journal Voucher (306 hydrants @ \$2.00 per month)	7,344.00
Journal Voucher (To paving driveway - Fire Station, Carleton Ward)	208.50
Journal Voucher (Installing 2" Water Service at Fire Station, King Street)	177.52
Journal Voucher (Water used at Fire Station)	<u>100.00</u>
TOTAL	\$ 8,326.83

ADMINISTRATION OF JUSTICE

Expenditure \$ 1,758.51

The above expenditure is made up as follows:-

Journal Voucher (4,536.75 Gallons Gasoline)	\$ 1,342.40
Journal Voucher (to invoice #199 from Richards Electric Co., charged to Street Lights in error)	87.21
Journal Voucher (Labour)	<u>328.90</u>
TOTAL	<u>\$ 1,758.51</u>

This year a city By-Law was passed enforcing one-way traffic on some of the City Streets. The above labour charge of \$328.90 includes the painting of dividing lanes on these streets and the painting of new street signs in accordance with this By-Law.

AIRPORT

The expenditure under this heading was \$650.54 and was made up of Journal Vouchers for Bituminous Material (2,340 gallons RC3) for use in patching at the airport.

CLARK MEMORIAL BUILDING
LIBRARY

Under this heading the expenditure amounted to \$13.68 and was for Labour spent in cleaning grounds around the Library Building.

WATER

There are two separate and distinct water systems in the City of Fredericton.

1. The system which supplies the City of Fredericton lying on the south side of the Saint John River and taking its water from a drilled well, situated at Wilmot Park. This well water was turned on July 30th and is at present supplying the system. Up to July 30th the supply of water was taken from the Saint John River and treated by coagulation, filtration and chlorination. This, in future, will be used as a stand by.
2. The system which derives its water from two drilled wells and is situated on the north side of the Saint John River and serves that part of the City of Fredericton known as Carleton Ward.

The water costs which follow in this report include the water cost 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 expenditures in Carleton Ward. The expenditure under this heading is made up as follows:-

Gross Expenditure	\$ 44,405.72
Credits	12,696.53
Net Expenditure	<u>\$ 31,709.19</u>

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	\$ 3,779.16
Gunter Plumbing Service (I only, Stem extension for MacAvity Hydrant)	5.00
Arthur E. Cale (Tapping Water Main)	12.01
Hope Adjustment Bureau Ltd. (Repairs to hydrant)	117.48
Journal Voucher (Installing Water Service, Fire Station)	177.52
Journal Voucher (Material for fluoridation)	411.36
Journal Voucher (Yearly rental on 306 hydrants @ \$2.00 per hydrant per month)	7,344.00
Journal Voucher (Water used in City Hall Building) ...	100.00
Journal Voucher (Water used at Municipal Home)	100.00
Journal Voucher (Water used at Wilmot Park, Caretaker's House)	50.00
Journal Voucher (Water used at Queen Square, Carleton Ward Playgrounds and Wilmot Park Pool).	500.00
Journal Voucher (Water used by Fire Department)	<u>100.00</u>

TOTAL \$ 12,696.53

The Gross Expenditure is made up as follows:-

City Pay Roll for Hydrants	\$ 1,720.23
City Pay Roll for Meters	3,766.70
City Pay Roll for Water Ordinary	<u>7,554.28</u>

TOTAL PAY ROLLS \$ 13,041.21

Material and other charges 31,364.51

GROSS EXPENDITURE \$ 44,405.72

No water extensions were laid under this heading but they appear under Capital Account Water.

There are, at present, 47 Sprinkler Systems in the City. The city charge for water supplied for sprinkler systems is \$25.00 per year.

Hydrants:-

There are in the City, 312 hydrants; 207 in the City proper, 9 on University property, 7 in Military Area and 89 in Carleton Ward. The credit for rental of these hydrants appears under credits of Water Ordinary. As there were six added this year, late in the fall, the rental charge on these six was not changed. They were installed at the following locations.

*Macrae
Southill
Smythe*

Dundonald St., between Northumberland St. and Smythe St.
Edinburgh Street
Hanwell Road, between Woodstock Road and Parkhurst Drive
Elmwood Court
Shamrock Terrace
Inglewood Drive

All hydrants in the City were inspected and repairs were made where necessary and winterized.

Meters:-

Of all the water services in the City, 1,116 are charged under flat rate and 2,331 on meter rate, making a total of 3,447 services.

The labour cost this year per meter for installing, reading, repairing, etc. is \$1.61.

All meters are read twice a year and bills are sent out twice a year. The meters of 137 customers are read once a month although they are billed twice a year. Those are such customers who ordinarily have large consumptions and where a stopped meter or meter digits 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.

and fed for service ————— 90
————— 140

ined ————— 0

ined ————— 1

————— 0

————— 3

and fed for service ————— 3
————— 5

————— 6

————— 6

Meters in store room, December 1, 1955 are:-

5/8" meters repaired and fit for service	28
New 5/8" meters	123
5/8" meters to be repaired	16
3/4" meters fit for service	1
New 3/4" meters	6
1" New Meters	5
1 1/4" meter repaired and fit for service	1
1 1/4" meters, new	2
1 1/2" meters, new	3
2" meters, new	1

Distribution Systems:-

New services installed this year	81
Old services relaid this year	25
Old services repaired this year	4
Frozen services that had to be thawed:- Cranes Ltd., 620 King St.	
D. Jones, 255 St. Mary's Street	
York Structural Steel (MacKay House)	
St. Mary's Street	
Services discontinued	7

The Fredericton distribution system consists of 38.44 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	7.23	miles
6 inch main	23.11	miles
4 inch main	4.28	miles
3 inch main27	miles

This does not include the water main installed by the National Defence at Military Training Center No. 70 (Exhibition Grounds), Military Depot #7, (Woodstock Road), Military Hospital (Wilmot Park) and Army Garage situated west of Bookwood Avenue.

The Supply System consists of .36 miles of 14" cast iron pipe extending from the Well site at Wilmot Park to Pumping Station and .10 miles of 15" steel pipe extending from the Intake Pier in St. John River to the Pumping Station.

Also included in the above expenditure was the purchase of the following meters from the Neptune Meters Ltd.:-

250-5/8 x 3" Trident C.I.B. cold water meters, straight reading, imperial gallons complete with couplings included.

6 - $\frac{3}{4}$ " Trident C.I.B. cold water meters, straight reading, imperial gallons, complete with couplings included.

- 6 - 1" Trident C.I.B. cold water meters, straight reading, imperial gallons, complete with couplings included.
- 3 - 1" x 1 $\frac{1}{4}$ " Trident C.I.B. cold water meters, straight reading, imperial gallons, complete.
- 1 - 1 $\frac{1}{2}$ " Trident Style 3, cold water meters, flanged, straight reading, imperial gallons, complete with companion flanges included.
- 3 - 2" Trident Style 3, cold water meters, flanged, straight reading, imperial gallons, complete with flanges included.
- 1 - 4" Trident Compound cold water meter, flanged, straight reading, imperial gallons, complete with companion flanges included.

In an effort to meter all services, a program of installing 200 meters per year was begun in 1954.

The number of meters installed in 1955 was 217.

Following are the vehicles used and charged to Water Ordinary showing a comparison of repair charges for 1954 and 1955.

<u>Make of Vehicle</u>	<u>Year Purchased</u>	<u>Repair Charges</u>	
		<u>1954</u>	<u>1955</u>
Chevrolet 1 Ton	1953	\$ 68.96	129.50
Dodge $\frac{1}{2}$ Ton	1950	249.78	549.17

In 1955 a very dry summer caused considerable concern over the water supply for Carleton Ward.

On several occasions the deep well pumps at the Killarney Road Reservoir and the Rifle Range Reservoir were over-pumping the aquifer and had to set back in the amount of water pumped, so that the pumps were not pumping at a faster rate than the rate at which the wells were being recharged.

In view of the above and the fact that some consideration had to be given to a water main extension above the present reservoir, on Smythe Street, to relieve the load on the College Hill Reservoir and also supply water to a level higher than that served at present by the College Hill Reservoir (Green Road is the limit), the Public Works Committee recommended to the Fredericton City Council that the Consulting Firm of Jas. F. McLaren Associates be engaged to make a survey and report on the Fredericton Water System on both sides of the Saint John River.

The report of the consulting firm is included in this report for record purposes and necessary action by the Fredericton City Council.

CITY OF FREDERICTON

REPORT

ON

WATER SUPPLY SYSTEM

At a regular Fredericton City Council meeting, held on September 27, 1955 it was decided to employ our firm to make a survey of the City's future water requirements, and that our report should be submitted to the Council early in 1956.

At a subsequent meeting of the City Council, our firm was instructed to make a study of the electrical system at the main pumping station, and submit our recommendations with regard to rewiring and making operation of this station automatic. Our report, dealing with the main pumping station, will be submitted at a later date.

The water supply problem facing Fredericton at the present time can be dealt with under two separate headings as follows:-

- (1) Increasing present sources of supply to meet future requirements of Fredericton on both the north and south sides of the river.
- (2) Expansion of the present distribution system on the south side of the river to supply water to the higher areas that cannot be served by gravity from the Smythe Street Reservoir.

Water Supply System

on

The South Side of the River

At the present time, that portion of Fredericton south of the Saint John River is deriving its water supply from one gravel wall well located in Wilmot Park. Until this well was brought into operation, filtered water from the Saint John River was the source of supply. The filtration plant is now the standby source of supply for this area and is held in readiness to serve in case of an emergency.

Wilmot Park Well

The above mentioned gravel wall well located in Wilmot Park, near the intersection of Rookwood Avenue and Woodstock Road, is rated at 900 Imperial Gallons[¶] per minute with a static level of 29.5 feet and a pumping level of 35 feet below ground level. The outer casing is 26 inches in diameter and the inner casing is 16 inches in diameter. Complete details of the well, pump, motor and test pumping are shown in an Appendix to this report.

This gravel wall well is presently operating at the rate of 650 Imperial Gallons per minute and is discharging through a 1½-inch cement lined cast iron pipe and through two

aerators into the 382,000 gallon clear well at the main pumping station. The pH of the water coming from this well is in the vicinity of 6.0. The aerators correct the pH to approximately 6.6. Lime, at the rate of about 125 lbs. per 24 hours, is being added to the water in the clear well, in order to further correct the pH to 7.0 at the pumping station.

Approximately 1.5 lbs. of chlorine for a 24-hour period is being injected into the clear water well by means of a manual chlorinator and a residual of 0.1 parts per million is being maintained at the pumping station.

Filtration Plant

The filtration plant which was constructed in 1906 ceased to be the main source of supply for that portion of Fredericton south of the Saint John River on July 30, 1955 when the Wilmot Park well was brought into operation. The filtration plant is held in readiness as a standby source of supply in case of power failure or other disruption of service from the Wilmot Park Well.

The existing filter plant, under the most favourable raw water conditions, has a net capacity of 1.65 m.g.d. and when the river is low, the existing low lift pumps have a combined capacity of approximately 1.25 m.g.d.

Reservoir Storage

- (a) Clear Water Reservoir: The clear water reservoir, located at the main pumping station, has a storage capacity of 382,000 gallons with Top Water Level at elevation 27.6. This reservoir can be fed direct from the Wilmot Park Well through the aerators or from the Saint John River through the low-lift pumps and the filtration plant.
- (b) Smythe Street Reservoir: This concrete storage reservoir, located on high ground on Smythe Street, has a capacity of 2,000,000 gallons, with Top Water level at Elevation 190. This reservoir is supplied with water from the main pumping station, and provides the means for supplying the city with water when operation of the pumping station is interrupted. It also provides a reserve supply for fire protection, and to meet any excessive demand that exceeds the output of the pumping station.
- (c) College Heights Reservoir: This is a concrete storage reservoir with 100,000 gallon capacity with overflow level at Elevation 230.0, located on high ground south of the University of New Brunswick. This reservoir is supplied from the distribution system by a Booster Pumping Station located at Albert and Windsor Streets. It serves the University of New Brunswick and the residential area above Elevation 75.0.

(d) Forest Hill Reservoir: This is a concrete storage reservoir with 35,000 gallon capacity with overflow level at elevation 313.0, located on high ground, approximately one mile south-east of the College Heights Reservoir, in an area known as Forest Hill. This reservoir is supplied from the 6-inch distribution line on Forest Hill Road by a booster pumping station.

Distribution System

The distribution system is in the form of a grid system with a minimum of dead ends. Supply is taken from the 18-inch diameter main, running from the main pumping station to the Smythe Street Reservoir, distributing through a grid of 8-inch diameter and 6-inch diameter mains with one 12-inch diameter and one 10-inch diameter cross-town feeder lines reinforcing the system.

Main Pumping Station

In 1925 a gasoline engine-driven pump was installed for standby and auxilliary high-lift service, this pump having a capacity of 2,000 gallons per minute at a delivery pressure of 90 lbs. per square inch.

The steam plant, boilers and pumps, installed in 1906, have been removed from the pumping station.

The high-lift pumps, sometimes referred to as the general service pumps, now draw water from the clear water reservoir and pump to the distribution system and to the 2,000,000 gallon reservoir on Smythe Street.

Originally, the service pumps were operated by synchronous motors. One of the pumps the synchronous motor was replaced by an induction motor in 1949. At 3:00 P.M. on December 7th, with 3.75 inches of vacuum, against 75 lbs. discharge pressure, this pump was delivering at the rate of approximately 1,000,000 gallons per day, as recorded by the Venturi Meter. This pump is presently being operated against a partially closed valve on the discharge line and will pump approximately 1.3 million gallons per day against a discharge pressure of 73 lbs. when the gate valve on the discharge is fully opened.

The pump, which is still operated by the synchronous motor, will deliver approximately 800,000 gallons in 24 hours and is not capable of raising water in the Smythe Street Reservoir to a depth of more than 4 feet (El.178). These service pumps will be considered in more detail in our report dealing with the wiring and automatic operation of the main pumping station.

Electric Power for Pumping

Electric power for pumping is obtained from two sources: one, the City's power distribution system and the other a Diesel Generator standby unit.

The standby electric power is furnished by a Diesel Generator unit installed in an extension to the main pumping station. This Diesel is a 3-cylinder, 150 b.h.p., 250 r.p.m., direct connected to a 125 K.V.A., 2,300-volt, 3-phase, 60-cycle alternator.

The electrical power supplied from the City's distribution system originates in the generating plants of the New Brunswick Electric Power Commission at Minto, Chatham, Saint John, Tobique and Musquash. The first three mentioned plants are steam generating and the last two are hydro-electric. These five plants are all tied together into a distribution grid and power reaches the New Brunswick Electric Power Commission substation near the north end of the Highway Bridge over two 66,000 volt lines, one from Minto and one from Tobique. From this substation power at 4,000 volts is supplied to the City on the south side of the river over one line carried across the Highway Bridge. The water works pumping station receives power from the City's grid at 2,300 volts.

Water System
on
North Side of River

The water supply system in Carleton Ward derives its source from two rock wells, each equipped with electric motor-driven, deep-well vertical turbine pumps, described as follows:-

Killarney Well

Located on the Killarney Road, approximately 600 feet beyond the north limits of the City in the Parish of Douglas. 6-inch drilled well, 190-feet deep into sandstone formation. Equipped with a deep-well pump with 10 H.P. electric motor. Pump installed in 1942. Tests in June, 1946 by the Fredericton Water Works Department showed a yield of 170 gallons per minute against a draw-down of 23 feet. Well and pump housed in concrete block pump house constructed in 1955. Fluoridation equipment was installed at this well in 1955.

Range Well

Located about 4,000 feet east of the Killarney Well and approximately 700 feet north of the North limits of the City in the Parish of St. Mary's. 6-inch drilled well, 325 feet deep, well pump operated with 20 H.P. electric motor. Pump installed in 1946. Tests in June, 1946 by the Fredericton Water Works Department showed a yield of 180 gallons per minute against a draw-down of 36 feet. Well and pump housed in concrete block pump house constructed in 1955. Fluoridation equipment was installed at this well in 1955.

Reservoir Storage

Two open surface reservoirs described as follows:-

Killarney Reservoir

Located adjacent to the Killarney Well. Concrete open surface reservoir, circular in shape, 75 feet in diameter, with water depth varying from 10 to 7 feet. Capacity of 230,000 gallons with Top Water Level at overflow elevation 178.0. Reservoir normally supplied by the Killarney Well, but the Range Well output can be diverted to this reservoir, through a 6-inch line.

Range Reservoir

Located adjacent to the Range Well. Brick masonry structure with concrete facing. Open surface reservoir rectangular in shape, with water depth 7.9 feet at sides and slightly more at centre. Capacity of 193,000 gallons with Top Water Level at overflow Elevation 179.0. Reservoir normally supplied by the Range Well Pump but the Killarney Well output can be diverted to this reservoir through a 6-inch pipe line.

Distribution System

The distribution system, which is supplied by two 8-inch lines drawing from the Killarney and Range Reservoirs, consists of a network of 8-inch, 6-inch and 4-inch cast iron pipe. Static pressure over the area is satisfactory but circulation of flow is limited because the present street layout offers little opportunity for a distribution grid. The present system contains a number of dead ends.

Operating Conditions - 1955

Killarney Well

This pump is operated for 8 hours a day. On November 24, 1955 the static level was 88 feet below ground surface and the pumping level was below the bottom of the airline which was set at 112 feet. On this same date air bubbles were seen rising in the reservoir from the end of the pump discharge.

Killarney Reservoir

The water level in this reservoir is being maintained at about the half-full mark. This action being necessitated by the excess leakage through cracks in the concrete walls when the reservoir water level is at the overflow mark. On November 24, 1955 this reservoir showed signs of a brownish colored algae floating on the water surface and covering the floor of the reservoir. Leaves and other wind-blown debris were evident in the reservoir water.

Range Well

This well is operating 14 hours per day but the pumping rate is throttled by a partially closed gate valve on the discharge. During the past summer (1955), the pumping level was drawn down below the pump suction and some sand was being pumped into the reservoir. The water department throttled this pump down to approximately one-half capacity. On November 24, 1955, the static level was 172 feet below ground surface and the pumping level was below the airline setting of 200 feet.

Range Reservoir

The water level in this reservoir is being maintained at about the half-full mark because of the excess leakage through cracks in the reservoir walls when the reservoir is full of water. This reservoir had been cleaned recently and the water in it appeared clear.

Distribution System

Recently some cross connections have been made to the system but even so the City Engineer reports that when the Killarney Reservoir was isolated from the system, the water flowing by gravity from the Range Reservoir only reached to approximately the 160-foot contour in the 8-inch main on the Killarney Road. The City Engineer also reports that water will not flow by gravity through the 6-inch line which connects the two reservoirs, with the head available from the reservoirs, indicating a crest in the pipe line profile above the reservoir level. This 6-inch cross connection can only be utilized when one reservoir is isolated from the system - then both well pumps can pump to the other reservoir.

No chlorination or other treatment of the water is at present applied to the water system on the north side of the river.

Samples of water taken from the Killarney and Range Wells, collected and analyzed by Mr. Hagerman and listed in our 1949 report on Fredericton Water Works System show the following analyses:

Killarney Well

Color	Nil
Turbidity	Nil
Odor	Nil
Soap Hardness as CaCO ₃	107 p.p.m.
Alkalinity - (Methyl Orange)	79 p.p.m.
Chlorides	2 p.p.m.
pH	7.6 p.p.m.

Range Well

Color	Nil
Turbidity	Nil
Odor	Nil
Soap Hardness as CaCO ₃	75 p.p.m.
Alkalinity - (Methyl Orange)	89 p.p.m.
Chlorides	1.5 p.p.m.
pH	7.5 p.p.m.

These analyses indicate water of good quality, and are probably representative of that obtained from most wells in the area in the sandstone aquifer.

Recommendations for Future Supply

At the present time, the Range Well and the Killarney Well are barely capable of supplying the demands on the north side. When precipitation is below average, such as during

the latter part of 1955, these wells are drawn down to a point where the pump suction is not always submerged. We propose that one or more large diameter rock wells be drilled on the north side, in the hope of finding ground water of quality as good as the Range and Killarney Wells, and with output several times greater than the combined output of these wells.

The chemical quality, of ground water pumped from the sandstone formation on the north side of the river, is more acceptable for domestic use, than that found to date on the south side. We believe that in searching for further ground water supplies, Fredericton should explore the area north of the river before developing additional wells on the south side.

While one side of the river was being supplied with filtered river water, and the other with well water, there was justification for maintaining two separate water supply systems, one for each side of the river. Now that both sides of the river are being supplied from wells, the advantages of laying a pipe line across the bed of the Saint John River to connect the two separate supplies into one single water supply system should be considered. By so doing, all the storage, pumping facilities and source of supply on either side will be available to the other.

The final decision concerning the installation of a pipe to join both sides of the river is dependent to a large degree upon the amount of water that can be developed in Carleton Ward. If ground water in quantities greater than that required for Carleton Ward can be developed from the sandstone in that area, then this better quality water could be made available for consumption on the south side of the river by joining the two systems. If the drilling in Carleton Ward does not provide enough water for that area, which is highly improbable, then the pipe line will have to be laid across the river, joining the two systems, in order to supply water to the north side of the river. If the drilling program discovers water in quantities that are considered to be equal to the present and future requirements of the north side only, then the necessity of laying a pipe line to join up the two sides of the river is not so apparent.

Both the Killarney and Range Reservoirs are open surface type reservoirs, and, as such, constitute a possible source of contamination to the water supply of Carleton Ward. Also, at the present time, these reservoirs are in a poor state of repair, and proposals have already been received by the City Engineer for repairing and covering these structures. In view of the possibility that at some future time the two systems on each side of the river may be joined together, and in view of the cost of rehabilitating these two reservoirs, we propose that a new 1,000,000 gallon concrete reservoir be constructed on the high ground east of the Killarney Reservoir with Top Water Elevation at 190 - the same elevation as the present Smythe Street 2,000,000 gallon reservoir.

A programme of water main replacement should be gradually carried out on the north side of the river, to eliminate some of the 4-inch and 6-inch lines. These small diameter pipes were adequate for a small community but will have to be replaced by larger mains as expansion and consequent increased water consumption takes place in Carleton Ward.

When the well in Wilmot Park has been pumped for a period of a year or more, and the chemical analysis, temperature and drawdown has been recorded over this period, the information gained concerning this well will indicate whether or not a second gravel wall well should be developed in that general section of Fredericton.

As the city continues to develop and increase its consumption of water, additional wells can be developed on either side of the river, in whatever areas prove to be the best for developing ground water.

We recommend that the following steps be undertaken with regard to developing future water supply for the City of Fredericton.

- (1) That one or more well be drilled in Carleton Ward, where it is hoped to find water, in the sandstone formation, of a quality that can be pumped directly into the distribution system, and of a quantity several times greater than that already being obtained from the two wells on the north side of the river.

Estimated Cost \$ 25,000

- (2) Further consideration should be given to the installation of a pipe line across the Saint John River to join the two water supply systems after the results of the drilling in Carleton Ward are known. (When the proposed new bridge is erected across the Saint John River at Fredericton, provision should be made for that bridge to carry a water main)

- (3) That a one million gallon reservoir be built on the high ground east of the present Killarney reservoir with a Top Water Elevation of 190 feet, the same as the present Smythe Street Reservoir.

Estimated Cost \$ 75,000

- (4) If the information gained by pumping the present gravel wall well for a year or more warrants development of additional ground water supply in the area south of the river, that a gravel wall well be developed at test location #7. This well should be equipped for emergency operation by means of gasoline or Diesel standby power.

Estimated Cost \$ 55,000

Extension of the Water Distribution System
On The South Side of The River Above The
Present Smythe Street Reservoir

In the area south of the river, elevations run from 30 feet, near the river bank, to over 375 feet on the high ground south of the built-up section of the City. The present 2,000,000 gallon Smythe Street Reservoir, with its Top Water Level at Elevation 190, provides adequate pressure in all areas below the 110-foot level, and at the present time, this reservoir is supplying water, at reduced pressure, to some areas above the 110-foot contour.

In order to supply water to the remaining high ground, we propose that the distribution system should be extended to provide an intermediate, and a high pressure area, besides the present low pressure system.

<u>Pressure Area</u>	<u>Elevation Served</u>	<u>Reservoir T.W.L.</u>	<u>Pressure Range (In Feet)</u>
Low	0 - 110	190	190 - 80
Intermediate	110 - 275	350	240 - 75
High	275 - 375	455	180 - 80

The water distribution system supplying the intermediate pressure area will eventually require:-

- (1) A booster pumping station near the present Smythe Street Reservoir, or at some other point on Smythe Street between the reservoir and Green Road.
- (2) A 1,000,000 gallon concrete reservoir with T.W.L. Elevation 350, approximately 2,500 feet out Smythe Street from the present 2,000,000 gallon reservoir.
- (3) A 1½-inch watermain between these two reservoirs.

For the present it will be possible to supply water to the intermediate areas by erecting the above mentioned booster pumping station, installing pumping equipment to pump directly into the intermediate system, and deferring construction of the reservoir at Elevation 350 until the area is further built up. Meanwhile, the 100,000 gallon College Heights Reservoir should be kept in operation and supplied from the intermediate pressure system through an altitude valve placed in one of the 6-inch lines which lead to that reservoir.

The estimated cost of a Booster Pumping Station, together with pumping equipment to serve the intermediate pressure area is \$30,000.

At some future time when there is a demand for water in the area south of Montgomery Street, it will be necessary to

put a high pressure system into effect. This can be accomplished by means of a booster pumping station, located near the 1,000,000 gallon reservoir (El. 350), or at some lower elevation between this reservoir and Montgomery Street. Eventually, when the area south of Montgomery Street becomes developed, it will be necessary to erect an elevated storage reservoir with Top Water Level at Elevation 455.

* Where the word "Gallon" is used in this report, we refer to the Imperial Gallon.

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APPENDIX "A"

Wilmot Park Well

Location: West end of Park 300 feet from No. 2 Highway

Completion Date: September 2, 1955

Pump

No.	29285	Head	TF818	Diam.	Pipe 8" Cpld Setting BF to MB- 60'
Bowl Size	14"	Outlet Diam.	8"	"	Tubing 2½" Lgth. Bowl 3' 7"
Type	RKHC	Imp. Mat'l.	Bronze	"	Shaft 1½" Lgth. Suction 10'
No. Stages	2	Max. Col. Section	10'	"	Suction 10" Lgth. Air Line 50'

Motor

Make U.S.	R.P.M.	1170	Phase 3	Serial No. 102979
Type C.F.U.	Frame	405	Cycles 60	Upper Brg. 7320M
H.P. 30	Amps.	78 or 39	Volts 220/440	Lower Brg. 6215

Well

Depth from Base plate 147'3"
Ht. B.P. above orig. GL 6"
Static Level 29' 6"

Capacity 900 I.G.P.M.
Pressure Main Pump 10 lbs.
Pumping Level 35'

Test

Time	Meter or Orif. Reading	I.G.M.	Pump Press	Main Press	Air Line Rdg.	Pump Level	R.P.M. Volts Amps
12 Noon	Metered	1025	5 lbs		36'	36'	Static
1 P.M.		1025	5 "		36'	36'	on gauge
2 P.M.		1025	5 "		36'	36'	was 30'
3 P.M.		1025	5 "		36'	36'	Air Line
4 P.M.		1025	5 "		36'	36'	Gauge is
5 P.M.		1025	5 "		36'	36'	above Pump
6 P.M.		1025	5 "		36'	36'	Base
7 P.M.		1025	5 "		36'	36'	

WATER PUMPING STATION

Gross Expenditure	\$ 48,063.07
Credits	986.95
Net Expenditure	<u>\$ 47,076.12</u>

The above credit is made up of scrap iron and steel sold to York Structural Steel Company for \$986.95.

The above expenditure is divided as follows:-

City Pay-Roll for salaries of employees at Pumping Station	\$ 15,440.16
Work done by other City Employees in and around the Pumping Station	<u>1,486.63</u>
TOTAL CITY PAY ROLLS	\$ 16,926.79
Material and Workmen's Compensation Charge	<u>31,136.28</u>
TOTAL	<u>\$ 48,063.07</u>

The material cost of \$31,136.28 is itemized as follows:-

Item # 1	Light and Power supplied by the Maritime Electric Co. (514061 K.W. Hrs.) Pumping Station	\$ 12,085.51
# 2	Light and Power supplied by the Maritime Electric Co. at well in Wilmot Park	1,003.19
# 3	Steamheat supplied from Victoria Public Hospital	2,888.42
# 4	Transformer Charges	151.92
# 5	Liquid Chlorine (3000 lbs)	533.12
# 6	Alum (132,200 lbs.)	3,344.67
# 7	Coal (22.19 tons)	247.47
# 8	Diesel Fuel Oil (1200 Gallons)	241.20
# 9	Motor Oil (51 Gallons)	72.08
#10	Maintenance and repair of buildings, machinery and intake pier	1,016.20
#11	New Installations	6,049.93
#12	Supplies, Packing Rags, etc.	222.14
#13	Stationery, forms, charts, etc.	128.06
#14	Workmen's Compensation	533.14
#15	E. W. Hagerman's Salary	1,210.08
#16	Lime (624 Bags)	493.95
#17	Sodium Flouride (3000 lbs.)	405.00
#18	Miscellaneous; Telephone, Trucking, Machinery, etc.	<u>510.20</u>
	TOTAL	\$ 31,136.28

The Raw Water Well and the Coagulation Basin were both cleaned once this year, namely in the Spring.

The Steam Boilers in the Pumping Station, along with the Allis Chalmers Steam Engine this year were done away with. Steam heat was obtained from the Victoria Public Hospital, the work being done by Mr. E. J. Moran. A Sump Pump was installed in the room housing the Low Lift Pumps.

COMPARISON of WATER PUMPED AND COSTS
For South Side of River
for last nineteen years

Year	Imperial Gallons of Water Pumped	Yearly Gross Expenditure at Pumping Station	Pumping Station Cost per 1,000 Gallons using Gross Expend.
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
1954	388,540,000	40,403.81	10.4 cents
1955	376,591,000	48,063.07	12.7 cents

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

By taking the average daily consumption of Carleton Ward as 180,000 Gallons per day arrived at from a number of test runs, the estimated yearly water pumped from these wells for 1953 is 65,700,000 Imperial Gallons.

1955-

The total amount of water pumped during 1955 for the whole City is therefore 432,291,000 Imperial Gallons.

The total net water expenditure for the City for 1955 is \$78,785.31.

Therefore the net cost to pump and deliver to the customer 1,000 Imperial Gallons of Water in 1955 is $\frac{78,785.31}{432,291} = 18.2$ cents.

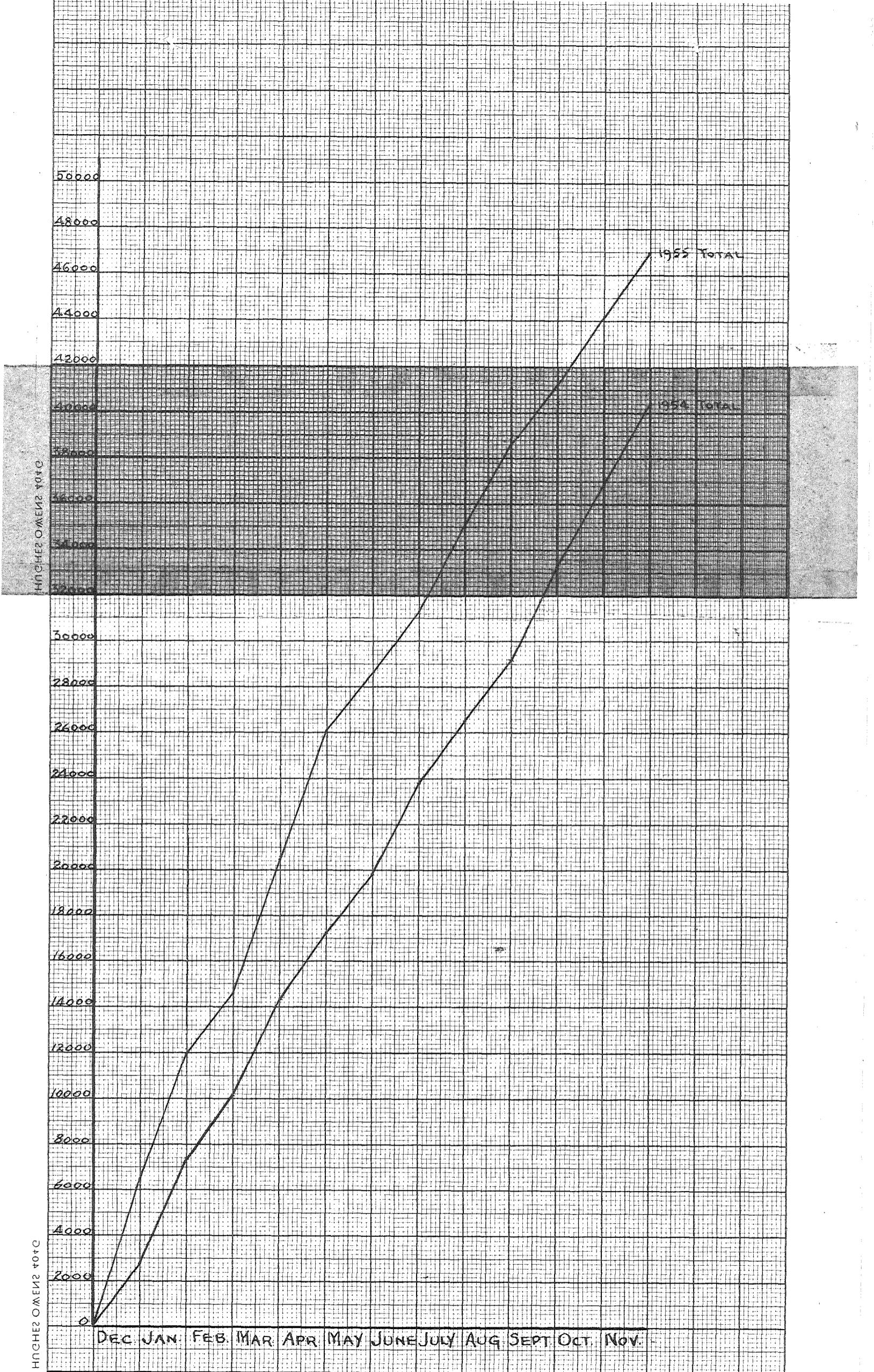
All the preceding costs shown under Water Pumping Station and Water Ordinary do not include the cost of billing and collecting water bills or any other overhead charge included in the City Government Cost, nor do they include bond payment or sinking fund charges.

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

Accompanying this report is the report of Mr. E. W. Hagerman, City Water Analyst, on the Fredericton Water Supply from January 1, 1955 to December 31, 1955.

Respectfully submitted,

City Engineer.



FREDERICTON WATER SUPPLY

1955

July 30th marked another point in the history of the City of Fredericton. On this day the source of the City's water supply was changed. From the year 1883 when the first pipe-lines were laid until the 30th day of July, 1955, the people of Fredericton have never been without St. John River Water in their homes. On this latter date the river water was turned off and water from a gravel packed well drilled in Wilmot Park was turned into the system. It is yet to be seen if the well can give as faithful service as did the River.

The quality of the filtered effluent from the St. John River supply was gradually becoming worse as the load continued to increase on the old Filter Plant, fifty years old this year. Especially, on hot days, with everybody running their lawn sprinklers, the demand crawling up to 1,300,000 and over, almost two and one-half times the intended capacity of the old plant; on such days everything was at the limit, even the factor of safety was gone.

On Friday the 8th day of July 1955, there is an entry in the analysts records, "The old plant has at last reached the point of "the last straw" alum has no time to flock and is all going through the sand as alum." From this time the use of alum was discontinued. The water was Chlorinated, lime added, for pH adjustment and put through the filters into the system, until the well water was ready for use, July 30th. River Water has not been admitted to the system since.

The filtration plant is kept in readiness for emergency use should the well pump fail. With the two million gallon reservoir in reserve it is not likely to be needed unless some major break should occur. In case of need the filter plant can be put into use in less than one-half hour.

The raw well water (Wilmot Park) is comparatively free from bacteria of all kinds. All tests have shown negative in so far as the Coliform group is concerned.

A small amount of chlorine is used to take care of possible contamination in the pipe system through breakage of the pipe or from possible cross connection. The amount is very small, not more than 3 pounds of Chlorine in ten million pounds of water and not less than 1 pound of Chlorine per ten million pounds of water. The residual Chlorine varied from 0.15 p.p.m. to 0.1 p.p.m. The demand is low as per:

Maximum applied is 0.3 ppm minus 0.15 residual = .15 Demand

Minimum applied is 0.1 ppm minus 0.1 residual = .00 Demand

The residual is all in the form of free available chlorine and as such should not give any taste. Compare this amount with doses that we were forced to use with the river water. It was necessary at times to add 50 pounds of chlorine to 10 million pounds of water or 5 parts per million. From this added dose we got varying residuals depending on the organic load carried by the water at the time. The residuals varied from .15 to .25 denoting a chlorine demand of about 4.75 ppm. Most of this chlorine entered into combination with the organic material in the water making the compounds that gave the water the chlorinous tastes. The well water is free of organic matter.

Water as it comes from the Well has a pH of 6.2. By passing it in a thin layer through the air we are able to reduce the Carbon Dioxide and thus raise the pH to 6.4, and sometimes to 6.5. Possibly on a windy day more air goes through the louvers of the aerator houses.

To cut down on corrosion, lime was added to raise the pH to 7. At this pH we received occasional complaints that the water had a medicinal taste. As the taste was not general throughout the system and was also of short duration it is more likely to be caused by scale sloughing off the old pipes than from the lime itself. Quoting from the Manual of Water Quality and Treatment: "Hale in Journal AWWA 1935 noted that upward adjustment of pH loosens rust in old pipes."

Modern practice seems to favour the addition of more lime than we have been using. Enough should be added to bring the water up to the saturation point or slightly over. The point of saturation is approximately at pH 7.7. It has been found that slightly over saturated water will precipitate a fine film of limestone on the pipe walls thus forming a protective layer. This might seal in the old scale and the evil tastes with it.

Bacteriological tests were occasionally made on the North side of the river. Water from the lower reservoir has always shown negative tests. Samples from the upper or Killarney reservoir have often given positive portions at times. This has been occurring over a period of ten years or so. Since there has never been an outbreak of water-borne disease it is probable that the Coliform bacteria gain entrance from the dust blown off the road. It is not likely that water-borne disease germs could gain entrance in this manner but it is not good practice to have this type of bacteria showing up in a water supply.

A proper cover should be built over both reservoirs or better still a new one of large size built. The old ones are badly worn with probable cracks in them.

A covered reservoir would stop the entrance of dust carried bacteria and also prevent the growth of algae. It would seldom need cleaning. The necessity of having men with shovels and brooms climbing in and out of it would be eliminated. Although some attempt is made to sterilize the floor with chloride of lime after a cleaning, it is

doubtful if the contact time is long enough for a complete kill of the bacteria introduced by the workmen. It is conceivable that the men, who clean sewers as well, could introduce undesirable bacteria from their feet, clothes, or from the implements with which they work.

Bacteriological tests were made on the south side of the river as in former years, for the Coliform Group. A few positives were found while the river water was in use. Since the well water has been turned into the system, no positives have been found.

Following is a list showing date and place of sampling. The sample is divided into 5 portions. Nothing will be noted if the portion is negative. A positive result will be marked 1 plus, two positive portions will be 2 plus, etc.

January 2	U.N.B. Engineering Bldg.	
January 9	127 Charlotte Street	
January 16	Pumping Station	
January 26	Pumping Station	
February 1	U.N.B. Engineering Building	
February 7	Pumping Station	
February 15	127 Charlotte Street	
February 19	U.N.B. Engineering Building	
February 24	Pumping Station	
March 5	Pumping Station	- 1 Plus
March 14	Pumping Station	
March 20	476 Regent Street	
March 30	U.N.B. Engineering Building	
April 4	U.N.B. Engineering Building	
April 9	Pumping Station	
April 14	Pumping Station	
April 19	Pumping Station	
April 26	127 Charlotte Street	
May 2	127 Charlotte Street	
May 8	Pumping Station	
May 15	Pumping Station	
May 23	U.N.B. Engineering Building	
May 31	Pumping Station	
June 6	U.N.B. Engineering Building	
June 13	127 Charlotte Street	
June 20	Pumping Station	
June 27	Pumping Station	
June 27	Wilsey Road Pump	
July 4	Pumping Station	
July 4	Jack Miles, North Devon	- 1 Plus
July 4	Jack Fenety, South Devon	- O. K.
July 7	North Devon Reservoir	- 2 Plus
July 19	Pumping Station	
July 26	Pumping Station	
N.B. Well in use from here.		
July 31	Pumping Station	

August 1	Pumping Station	
August 6	Pumping Station	
August 15	Alexandra Street	
August 15	Killarney Reservoir	- 5 plus
August 17	Seymour - Killarney Res.	3 plus
August 22	U.N.B. Engineering Bldg.	
August 23	Killarney Reservoir	- 3 plus

Started Chlorination of Killarney Reservoir and continued for several days.

August 26	Killarney Reservoir	- O. K.
August 29	127 Charlotte Street	
September 1	Killarney Reservoir	- O. K.
September 12	862 Brunswick Street	
September 17	U.N.B. Engineering Bldg.	
September 26	City Hall	
October 1	Pumping Station	
October 9	127 Charlotte Street	
October 15	U.N.B. Engineering Bldg.	
October 20	U.N.B. Engineering Bldg.	
October 28	Pumping Station	
November 5	E. Cunningham, Golf Club Road	
November 10	127 Charlotte Street	
November 16	U.N.B. Engineering Bldg.	
November 25	127 Charlotte Street	
November 30	Pumping Station	
December 5	127 Charlotte Street	
December 14	U.N.B. Engineering Bldg.	
December 19	Pumping Station	
December 31	Pumping Station	

Fredericton, N. B.
January 30, 1956.

Mr. E. W. Hagerman

<u>Material</u>	<u>Amount Purchased</u>	Avg. Price F.O.B. Fredericton, N. B. 3% S.S. & E. Tax <u>Included</u>
Aluminium Sulphate	132,200#	\$2.53 per 100#
Antifreeze	116 Gals.	\$2.37 - \$2.97 per gal.
<u>Asphalt</u>		
Base (City Truck)	427,00 T. $\frac{3}{4}$ " Mix	\$6.00 per T.
Seal (City Truck)	168.500 T.	\$8.00 per T.
Recap (Intersections)	1837.825 T. $\frac{1}{2}$ " Material	\$8.00 per T.
Golf Club Road	380.225 T. - $\frac{3}{4}$ " Minus Aggregate	\$7.25 per T.
Charles Charters	14231.225 T. - $\frac{3}{4}$ " Minus Aggregate	\$6.95 per T.
Bitumuls Hx.	2475 Gals.	.298¢ per gal.
R.C. ₃ (Sand Sealing)	21,144 Gals.	.286¢ per Gal.
Axes	17	\$3.04
Batteries	7	\$20.02 - \$80.86
Brick	131,000	\$42.99 per M.
Broom Fibre	4000#	17.51¢ per #
Broom Wire	1500#	56.50¢ per #
Bulbs Ordinary	288	.165¢ each
Bulbs (Street Light 2500 W)	768	.73¢ each
Bulbs (Street Light 6600 W.)	84	\$1.27 each
Calcium Chloride	115 T	\$52.99 per T.
Catch Basins (Complete)	60	\$43.99 each
Cedar	36371.5 M.	\$55 per M.
Cement	15,400 Bags	\$105.83 - \$106.44 per 100
Chains	9 sets	\$5.90 - \$52.22 per set
Chains Cross	235	.266¢ - \$1.01 each
Chlorine Liquid	4650#	\$13.88 - \$14.13 per 100#
Coal (Minto)	190.807 T.	\$11.15 - 11.25 per T.
Coak (Springhill)	27.255 T.	\$19. - \$19.50 per T.
Detonators	867	\$18.25 per 100
D.D.T.	4 cases	\$32.00 per case
Dipping Needles	2	\$29.35 each
Dipper Teeth	4	\$11.59 each

Dryer Tarco Aggregate AD 7/Px	1	\$890.95
Dynamite	319#	51¢ per #
Fibreene	16 rolls	\$10.45 - \$32.02 per roll
Fill (City Truck)	3375 cu. yds.	.075¢ per cu. yd.
Fill	680 cu. yds.	30¢ per cu. yd.
Fuel Diesel	11565 gals.	.2060¢ - .23¢ per gal.
Fluorine - 30-100" Bags		
Fluorine - (Hem-O-Feeder)	2	\$1450 each
Fluordizer	1	\$2920 each
Fluorine Machine Parts		\$351.
Gasoline (City Yard)	28582 gals.	.2960¢ per gal.
Gasoline (Service Stations)	264.8 gals.	.441¢ per gal.
Gasoline (Naptha)	33 gals.	.50¢ per gal.
Grader, Allis Chalmers, Snowing Model 378, less allowance - Adams \$6100.		\$16,547.64
Grader Blades	125	\$11.05 - \$20.49 each
Gravel (Crushed)	32,963.65 T.	\$1.00 - \$1.35 per T.
Gravel (Pit Run)	30,239.40 T.	.55¢ - .67¢ per T.
Grease	75#	\$22.81 per 100 #
Heater (Warm Comfort)	1	\$65.82
Heaters (Car-Truck)	2	\$12.36 - \$46.35 each
Jeep, CJ5, $\frac{1}{2}$ Cab. 6' Sno Dozer, less trade in \$500.	2	\$2575 each
Kerosene	1956 gals.	.2720¢ per gal.
Lead	6413#	20¢ - 24¢ per #
Level Repair	1	\$53.10
Lime (Pumping Station)	624 Bags	.80¢ per bag
Lumber	25,200 L.F.	\$75. - \$100 per M.
Manholes	92	\$42.65 each
Meters 5/8" x 3/4"	250	\$19.89 each
Meters 3/4"	6	\$32.42 each
Meters - 1"	6	\$47.14 each
Meters - 1" x $\frac{1}{4}$ "	3	\$51.17 each

Meters - 1½"	1	\$95.17 each
Meters - 2"	4	\$143.88 each
Meters - 4"	1	\$624.49 each
Oakum	1132#	.309¢ - .43¢ per #
Oats	15 bags	\$3.10 - \$3.25 per bag
Oilskins (Complete)	3 Suits	\$19.05 per suit
Oil - Britamalube	145 Gals.	.7446¢ per gal.
Oil - Dieselube Series 2#30	45 Gals.	\$1.68 per gal.
Oil - Dieselbube Series 10	45 Gals.	\$1.10 per gal.
Oil - Furnace	1000 gals.	19.50¢ per gal.
Oil Gear	325 Gals.	\$1.18 - \$1.60 per gal.
Oil Imperial Voltessa	45 gals.	\$2.48 per gal.
Oil Van Hymelt #2	150 Gals.	\$1.865 per gal.
Oil Marvelube	490 gals.	\$1.21 per gal.
Oil Mobiloil Artic	96 Gals.	\$1.42 per gal.
Oil Mobiloil A. F.	45 Gals.	\$1.27 per gal.
Oil Mobiloil Special	18 Gals.	\$1.83 per gal.
Oil R. P. M.	225 Gals.	\$1.12 per gal.
Paint	176 Gals.	\$3.90 - \$12.16 per gal.
Picks	39	\$2.10 each
Pavement Chisel	5	\$17.16 - \$24.88

Pipe

4" V. C.	83'	.41¢ per foot
5" V. C.	82960'	.44¢ per foot
6" V. C.	32½'	.59¢ per foot
8" V. C.	6800'	.74¢ per foot
6" Concrete	180'	.317¢ per foot
10" Concrete (Shaw)	834'	.615¢ - .7225¢ per foot
10" Concrete (Likely)	402'	.646¢ per foot
12" Concrete (Shaw)	1233'	.733¢ per foot
12" Concrete (Likely)	2624'	.776¢ per foot

15" Concrete (Shaw)	654'	\$1.18 per foot
15" Concrete (Likely)	400'	\$1.15 per foot
18" Concrete (Likely)	1200'	\$1.52 per foot
24" Concrete (Shaw)	600'	\$2.29 per foot
24" Concrete (Likely)	1200'	\$2.90 per foot
30" Concrete (Likely)	1140'	\$5.098 per foot
60" Concrete (Likely)	32'	\$21.99 per foot
5/8" Copper	11900'	.3065¢ per foot
3/4" Copper	2640'	.4137¢ per foot
1" Copper	660'	.5782¢ per foot
4" Soil	385'	\$1.10 per foot
6" C. I. Mechanical Joint	4631'	\$1.89 per foot
6" C. I. Lead Joint	250'	\$2.36 per foot

Tees

6" x 6" x 6"	6	\$35.21 each
14" x 14" x 8"	1	\$145.33 each

Increases

6" x 8"	6	\$29.95 each
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Bends

6" 1/16	8	\$23.95 each
6" 1/8	10	\$23.95 each
6" 1/4	6	\$29.10 each
8" 1/8	3	\$28.05 each
8" 1/4	6	\$44.19 each
14" 1/4	1	\$111.60 each

Reducer

14" x 8"	1	\$66.69 each
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Sleeves

4" Solid	6	\$11.16 each
6" Solid	8	\$13.54 each
6" Split	12	\$36.27 - \$44.73 each
10" Solid	3	\$25.90 each
10" Split	3	\$71.51 each
14" Solid	2	\$41.20 each

Gates

3"	1	\$24.72 each
4"	3	\$34.80 each
6"	28	\$59.38 each
8"	12	\$104.09 each
Hydrants	9	\$180.25 each
Hydrant (Pumper Connection)	3	\$213.73 each
Hydrant Extensions	12	\$5.15 each
Pipe Cutter (14" x 24")	1	\$326.61
Plywood	62 sheets	\$6.59 - \$7.50 per sheet
Regulator Pole Type R.2 & Hangers		\$986.43
Rock Crushed	16.405 T	\$3. per T.
Rock Dust	111.445 T	\$1. per T.
Roller Little Ford Model 151	1	\$3522.81
Rubber Boots	11 pair	\$10.25 - \$12.50 per p
Sand	2709 cu. yds.	\$1. - \$2.85 per cu. yd
Shovels	219	\$2.31 - \$3.37 each
Salt (Rock) #5 Highway	60 T	\$19 per T.
Salt Sifto	220 T	\$19 per T.
Scotchman Chemical Salt Spreader	1	\$669.50
Schotchlite	3 rolls	\$171.38 - \$178.06 per roll
Service Boxes	175	\$5.61 each
Series Sockets	50	\$2.37 each
Sewer Rods	102'	\$81.60 complete
Sewertite	5200#	\$10.497 per 100#
Seed	420#	.1655¢ - 20¢ per #
Street Light Standards Complete	10	\$233.15
Street Stripper Model 310 Doublelined		\$891.02
Sno Fence	3000 Lin. Ft.	.17¢ per lineal ft.
Stakes Surveying	90 Bundles	\$2.27 - \$4.53 per bundle

Sump Pump	1	\$53.97
Stone	120 Perch	\$1.25 per perch
Tires	39	\$11.40 - \$176.23 per Tire
Trees	72	\$1.25 - \$3.00 each
Tractor Shoe Sets	2	\$201.99 per set
Truck (1955 Chevrolet 18000# less allowance \$900.		\$3452.46
Varsol	43 Gals.	.41¢ per gal.
Wheel Barrow Rubbertired	1	\$30.75

