ANNUAL REPORT
OF THE ENGINEERING AND PUBLIC WORKS DEPARTMENT

1941

I N D E X

YEARLY REPORT OF CITY ENGINEER

FREDERICTON, N. B.

YEAR 1941

December 30, 1941.

TO HIS WORSHIP THE MAYOR AND ALDERMEN

OF THE CITY OF FREDERICTON

Gentlemen:

I submit herewith this report which is a statement of the work done in the different City Departments under the direct supervision of the City Engineer, and covers the period of time from the first of December 1940 to the first of December 1941.

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

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

Roads and Streets, construction and maintenance.
Public Works, construction and maintenance.
Water System, operation, construction and maintenance.
Domestic Sewerage System, operation, construction and maintenance.
Surface Sewers, operation, construction and maintenance.
Street Lights, operation, construction and maintenance.
Shade Trees, planting, pruning, removal, etc.
Other construction or maintenance activities such as repairs to the City Hall or other City buildings, or any other work which the Council may from time to time put in the hands of the City Engineer.

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

Respectfully submitted,

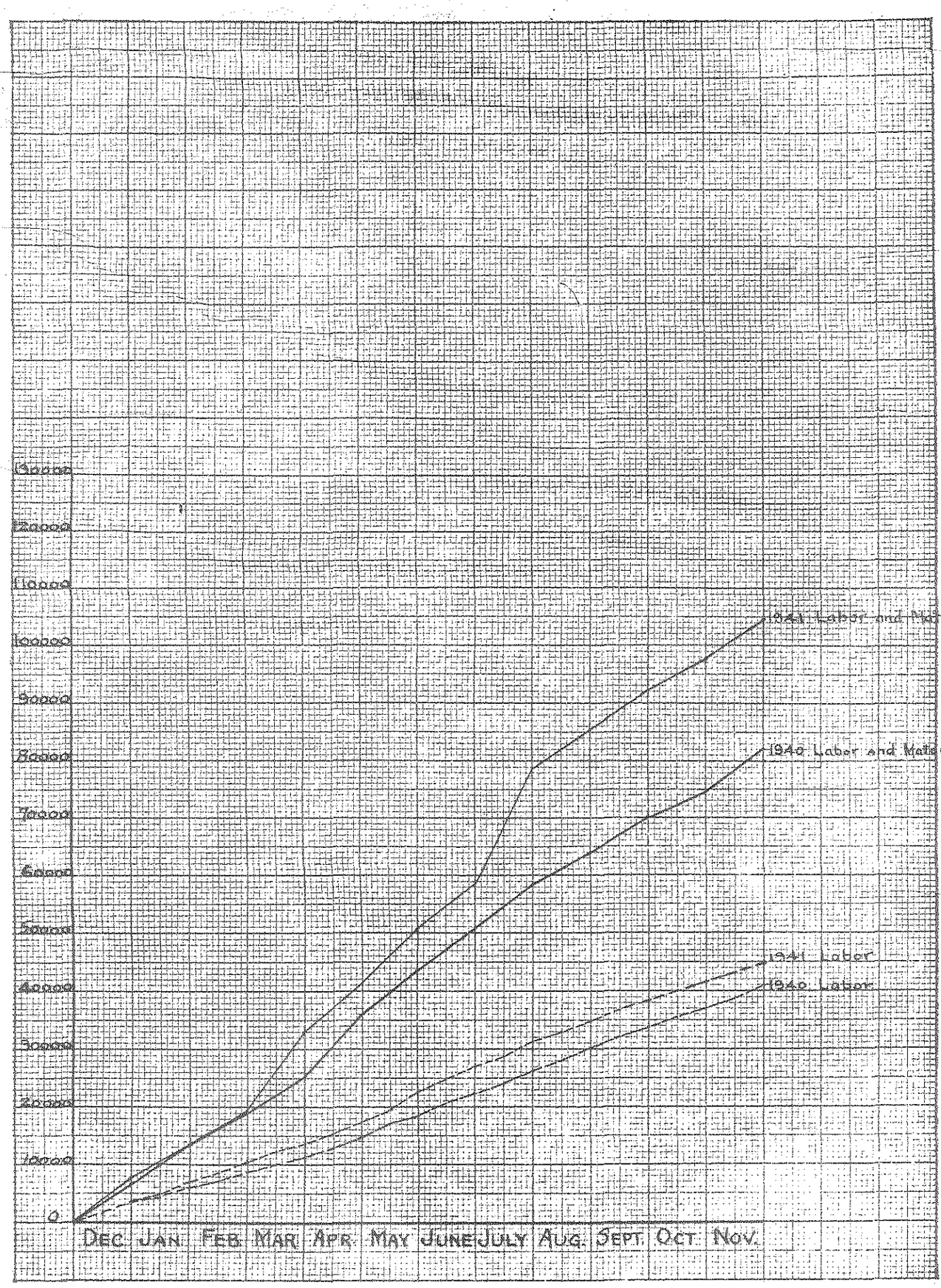
J.D. Mac Kay

City Engineer.

TOTAL YEARLY EXPENDITURE

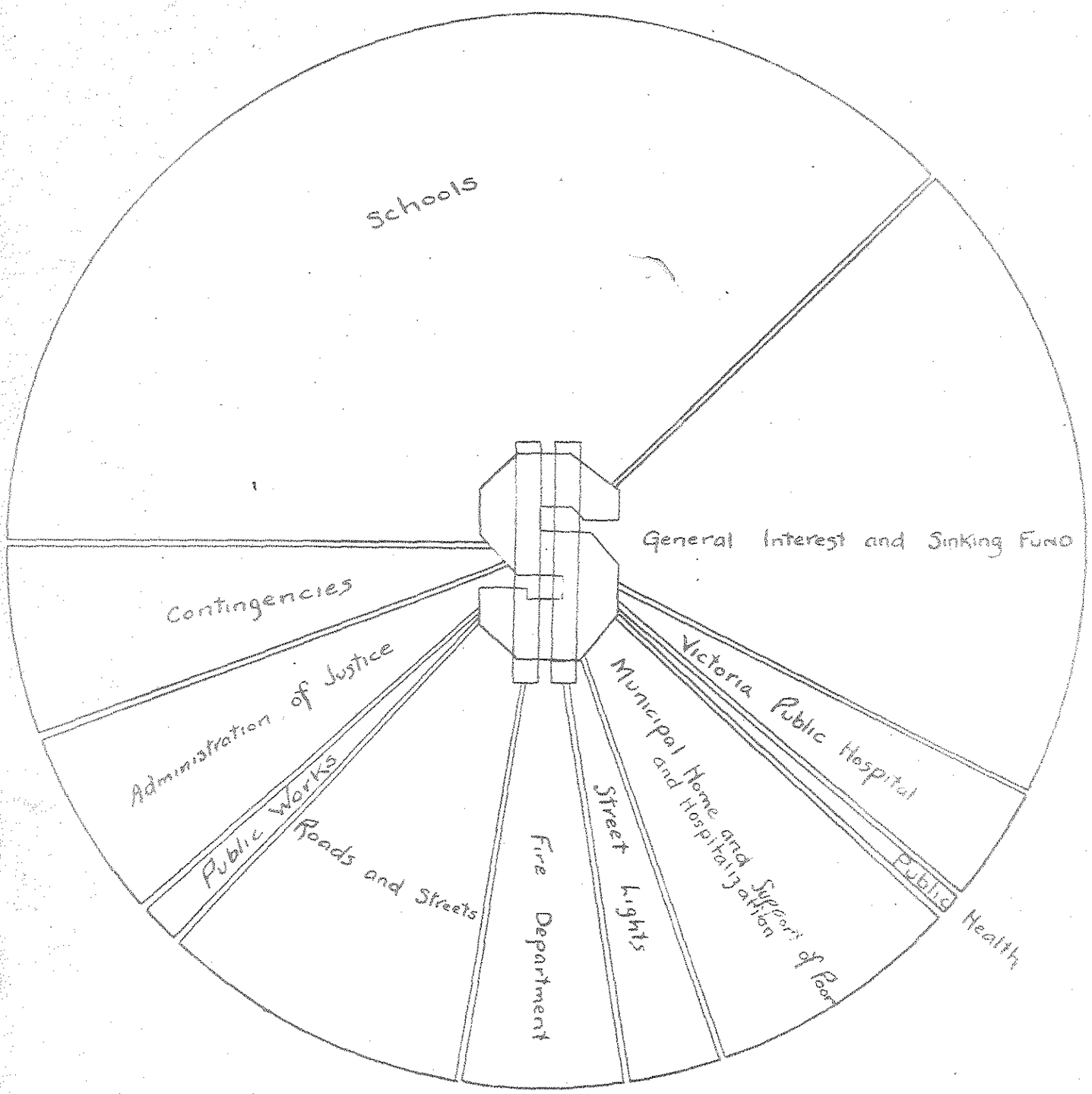
The total yearly net expenditure under the direct supervision of the City Engineer this year amounted to $104,659.63. This expenditure will be taken up in detail under the different headings in this report.

A graphic comparison of expenditure for labour and material for the year 1941, and a chart showing the distribution of the 1941 Fredericton Tax Dollar are shown here:-



TOTAL NET EXPENDITURE 1940 AND 1941.

DIVISION
OF
FREDERICTON TAX DOLLAR
1941
SHOWN GRAPHICALLY



ROADS AND STREETS

This year we had an appropriation for Roads and Streets of $28,000. This is the same appropriation as last year. We over-expended this appropriation this year by $9,233.34. This is due primarily to the purchase of a motorized road patrol, payment for which was made out of this year's Roads and Streets appropriation. This road patrol cost $6,668.50. The additional expenditure is due to the construction of Brick Kiln Road and other extra work done by the Roads and Streets Department which was not contemplated when the estimate for Roads and Streets was made up.

The City of Fredericton Roads and Streets system is for convenience divided into two parts, namely, the Urban District and the Outlying or Rural District.

The Urban District is roughly bounded as follows: on the North and East by the St. John River, and on the South and West by the line of Albert and Dundonald Streets.

The Outlying or Rural District would be the district within the city limits outside the above mentioned boundaries.

We have in Fredericton altogether some 44 1/3 miles of roads and streets and about 32 miles of sidewalk. This sidewalk all lies within the Urban District and is pretty well covered by cement sidewalks.

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

Roads and Streets

	Urban	Outlying	Total
Paved	11.85	3.46	15.31
Gravel	5.83	23.21	29.04
Total	17.68	26.67	44.35

Roads and Streets Expenditure 1941:-

Gross Expenditure	$40,283.46
Credits	3,050.12
Net Expenditure	37,233.34
1941 Appropriation	28,000.00
Dr. Balance	$ 9,233.34

The above Credits are made up as follows:-

Item 1.	Received from other City Departments for work done and material sold by Roads and Streets Department	$ 582.95
Item 2.	Work done for and material sold to private parties by Roads and Streets Department	704.17
Item 3.	Wood sold from City Forest (Odell Property)	1763.00
	Total	$3050.12

In Item No. 1 appears a Credit of $300.00 which is part of the cost of the City Engineer's car, distributed to other departments by the Roads and Streets Department. The rest of this item is made up of crushed stone and gravel sold to the Permanent Road Department and to Cement Walks by the Roads and Streets Department.

Among the Credits shown under Item No. 2 there is an amount of $401.70 received for lumber cut by the Roads and Streets Department on the City Quarry Lot and sold to the Devon Lumber Company. This work cost the City $459.50, showing a loss of some $57.00. However, as there was nothing else for the City Crew to do at this time and the men would have had to have been carried and kept busy at some unnecessary work, the amount received for the lumber can really be considered as salvage on the Payroll Account. In this Item also appears a Credit of $96.25 for work done in building a road for the Dominion Experimental Farm, and also an item of $122.40 which was received from the Canada Construction Company as rental for our No. 44 Sawyer-Massey road patrol.

Item No. 3 consists entirely of wood sold from the City Forest to other City Departments and to men on the City Payroll.

The Gross Expenditure is divided as follows:-

Labour	$22,816.69
Material charges and Workmen's Compensation Board	17,466.77
	$40,283.46

I have divided the labour charges of $22,816.69 into the following items. Although these items are made up entirely of labour costs, they give a good idea of the amount and kind of work done by the Roads and Streets Department during the year.

Snowploughing sidewalks	$ 291.24
Snow Control:-Shovelling and hauling snow, ploughing or scraping roads, cleaning gutters of ice and snow, and any other means of snow control	5,348.52
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	762.84
Surface Sewers:-Cleaning, flushing and repairing surface sewers and building new surface sewers within street limits	263.66
Sanding Walks:-Storing sand in winter storage piles and spreading same on slippery walks	325.52
Yard:-Men working at blacksmith shop and repair work in City Yard, taking summer equipment out and storing winter equipment, etc	1,481.46
Street Sprinkling:-Water cart	597.70
Stone Crushing:-Repairs to crusher and crushing stone	nil
St. John Road:-All work done on the River Road from Alexandra Street to eastern city line other than work done by power maintainer and pavement maintainer	130.71
Doak and Wilsey Roads:-All work done on these roads other than work done by power maintainer	93.95
New Maryland Road:-From C.P.R. Crossing to southern city line. All work done on this road other than that done by power maintainer	500.29
Outlying Roads:-Hanwell Road, Cross Road lying between Brick Hill and College Hill Road and Forest Hill Road. All work done on these roads other than work done by power maintainer	939.09
Street Cleaning:-All cleaning and removal of dirt, leaves, etc. from streets	5,567.61
Tarvia Repairs:-Patching and repairing asphalt and tar pavements and sidewalks and applying seal coat of light tar or asphalt to pavements	910.09
City Road Patrol	535.19
Quarry	nil
Wood Lot at Quarry	459.50
City Forest	4,609.32
Total	$22,816.69

Following is a table comparing labour expenditure in these items from 1936 to 1941.

TABLE COMPARING YEARLY COSTS IN ROADS AND STREETS
LABOUR ITEMS

	1936	1937	1938	1939	1940	1941
Snowploughing sidewalks	247.05	54.43	366.43	218.74	195.30	291.24
Snow Control	3,195.55	1,263.06	3,146.37	3,659.33	2,760.65	5,348.52
Streets	1,526.75	3,162.53	1,332.94	818.07	1,703.53	762.84
Surface Sewers	198.75	911.68	206.26	240.64	526.81	263.66
Sanding Walks	154.10	621.94	277.05	484.82	324.06	325.52
Yard	1,202.68	1,377.97	1,399.56	2,067.65	1,689.70	1,481.46
Gravel	58.99	41.62	54.07			
Street Sprinkling	815.10	772.93	418.70	502.15	554.36	597.70
Stone Crushing	2,990.43	1,926.04	61.92	245.19	152.28	
St. John Road	425.21	81.73	34.07	23.05	1.20	130.71
Doak & Wilsey Rd.	239.45	417.07	2,282.07	126.78	30.02	93.95
New Maryland Rd.	98.21	157.35	76.41	195.40	127.86	500.29
Outlying Roads	594.51	651.36	212.64	491.20	932.81	939.09
Street Cleaning	2,662.17	3,522.89	4,546.64	5,024.94	6,293.55	5,567.61
Tarvia Repairs	738.07	931.35	678.43	2,059.88	940.05	910.09
City Road Patrol	602.45	780.16	507.82	486.73	634.88	535.19
Quarry	1,737.85	1,277.23		37.31	90.30	
Relief	869.78					
Richardson Con.Co.		109.14				
Wood Lot					999.00	459.50
City Forest						4,609.32
Total	18,357.05	18,060.48	15,801.78	16,681.88	17,956.36	22,816.69

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

Snow Control:-

Snowploughing roads and streets	$ 632.65
Shovelling and hauling snow	3,335.92
Scarifying walks	13.75
Draining streets	80.20
Catch basins	320.27
Snow fences	334.70
Picking ice and hauling from streets	293.55
Thawing culverts	13.60
General Expenses	323.88
Total	$5,348.52

Snow Fences:-

In our snow fencing this year we used 4800 feet of lath-made snow fence which we had manufactured the year before last. Besides this premade fence, we also erected 2500 feet of brush fence.

Streets:-

Repairs (maintenance of gravel streets)	$397.15
Painting traffic lines on streets	102.55
Gravelling streets	39.90
Concrete curb and gutter construction (East side Odell Avenue)	155.65
Surface sewer on Odell Avenue	21.70
General Expenses	45.89
Total	$762.84

The curbing on Odell Avenue and surface sewer consisted of curb and gutter on the East side of Odell Avenue from Woodstock Road to Saunders Street and some 180 feet of 8" surface sewer at the intersection of Charlotte and Odell Avenue. This item should really have been a charge to Permanent Roads Account, but as the money in the Permanent Roads Account had beem entirely expended we made this construction under the ordinary roads and streets appropriation.

Stone Crushing:-

During the year we did not run the City stone crusher but bought 417 tons of 3/4 stone from Currier Construction Company at $1.50 per ton f.o.b. City Yard. We also purchased about 50 tons of crusher dust at $.50 a ton f.o.b. City Yard.

Outlying Roads:-

The labour expenditure of $939.09 is made up as follows:

Hanwell Road	$ 17.85
Cross Roads	12.00
Forest Hill	17.20
Brick Kiln	835.55
General Expenses	56.49
	$939.09

The only large labour item in the above is the $835.55 for Brick Kiln Road. This labour item along with a material charge of $886.93 made a total expenditure of $1722.48 for this piece of construction. For this amount of money we built the Brick Kiln Road from the First Cross Road to the City Back Drain at the foot of the hill, a distance of some 3200 feet. This piece of road has recently been considerably built upon and it became necessary to put the road in fit condition for travel. A well ditched gravel road was constructed 30 feet wide and substantial cedar or creosote hardwood culverts were installed both across the road where necessary and in the private entrances at the side of the road.

Street Cleaning:-

The labour cost of $5567.61 shows a decrease of $725.94 over last year's labour expenditure. It is pleasing to note this decrease in this item, but it cannot be attributed to the lowering of the services but rather to the fact that during the previous year we had a number of bad storms to contend with.

Tarvia Repairs:-

The labour expenditure of $910.09 is divided as follows:-

Patching streets	$760.90
Tarring streets	64.55
Unloading and barrelling R.C.3 Asphalt	25.00
Patching asphalt walks	4.90
General Expenses	54.74
Total	$910.09

This year our paved streets were in fairly good condition except that again the St. John Road between Forest Hill and the Valley Railroad Track was badly broken up. We started patching this year before the snow was entirely off using a pre-mixed patch of R.C. 3, gravel and crushed stone and we had very good results with this mixture by throwing it in the holes and letting traffic roll it down. When patching conditions became better later in the season we had to go over these early applications and touch them up, but I found most of them in surprisingly good shape.

Tarring and sealing our streets this year was a rather small item. The streets were sealed with R.C. 3 Asphalt. The work was done in the following locations:-

York Street from C.N.R. Track to Needham Street
York Street from ~~Brunswick to~~ King To Carter
King Street from Church to Regent (centre only)
Waterloo Row from Subway to Lansdowne (over new gutter only)
Lansdowne at both ends of new pavement.

Small applications were made on York Street near St. Paul's Church; King Street midway between Carleton and Regent; and Needham Street near York Street.

The following table shows the bituminous material used in 1941:

	Heavy Tar or Asphalt Tarvia X	Light Tar or Asphalt R. C. 3	Road Oil or Cutback M C-1 Asphalt	Asphalt Emulsion Colas
Gals. in stock Spring 1941	0	0	0	o
Gals. purchased in 1941	0	5991	5160	0
Available for season 1941	0	5991	5160	0
Stock on hand Fall of 1941	0	1900	0	0
Used in season 1941	0	4091	5160	0

Gravel:-

This year 1993 cubic yards of gravel was purchased from the Devon Lumber Company at 85¢ per cu. yd. delivered where and when required in the City of Fredericton. On November 5th, 1941 we made an agreement with the Devon Lumber Company that in the future gravel and sand would be delivered at 90¢ per cu. yd. excepting that delivered between the 15th of December and the 15th of April, during which time the City would pay $1.00 per cu. yd. f.o.b. Fredericton.

Surface Sewers:-

All surface sewers in the City were flushed and all catch basins cleaned and repaired during the summer season. No surface sewers were constructed with the exception of a short sewer on the corner of Odell Avenue and Charlotte Street which has already been mentioned in this report.

City Forest:-

Under the heading City Forest appears a labour expenditure of $4609.32. This expenditure is made up of wages of City employees working in what is known as the Odell Woods. The City Forest or Odell Woods as it is commonly called consists of some 360 acres of land which the City has agreed to purchase from the Estate of the late Miss Mary Kearney Odell. This property, which the City intends to hold as a City Forest, is all that part of what has been known as the Odell Property in Fredericton lying South of the Valley Railroad Tracks.

This proposed City Forest consists of:-

Roadways	3.5 acres
Cultivated land	27.2 acres
Pasture	17. acres
Soft wood, old growth	18.4 acres
Hard wood, old growth	82.5 acres
Mixed wood, old growth	178.9 acres
Soft wood, second growth	21.2 acres
Hard wood, second growth	1.6 acres
Mixed wood, second growth	3.3 acres
Alder flats	7. acres
Total	360.6 acres

A cruise of the property before the City agreed to purchase it reported the wood products on this piece of land as follows:

Fir	merchantable 10" and over on stump	20,000 Bd. Ft.
Spruce	merchantable 12" and over on stump	115,000 Bd. Ft.
White Pine	merchantable 12" and over on stump	5,000 Bd. Ft.
Hemlock	merchantable 12" and over on stump	165,000 Bd. Ft.
Tamarac	merchantable 10" and over on stump	600 Bd. Ft.
Hardwoods	merchantable 12" and over on stump	55,000 Bd. Ft.
	Total	360,000 Bd. Ft.

Spruce pulpwood 6" to 12" stump diameter	87 cords
Fir pulpwood 6" to 10" stump diameter	57 cords
Fuelwood 6" and over stump diameter	3476 cords
Cedar posts 8" and over stump diameter	165 posts

On the property is located in a very pleasing setting one large dwelling house and out-buildings all in a not very good state of preservation, and some little distance away is located a farm house and barns which are in a poor state of repair.

The City has agreed with the Odell Estate to pay $12,000 for this property, which would be about $33 per acre.

During the past summer the maritime section of the Canadian Society of Forest Engineers met in Fredericton. The members attending the meeting spent the best part of a day in this City Forest. A committee of the Society was set up to further study and make a report to the City regarding this piece of forest land, the idea of the Society being that because of their natural interest in forestry they wished to be of assistance to the City in seeing that this project was properly and carefully developed. I would like to quote from their report as follows:

> "The forest consists to a large extent of mature or over mature, more or less virgin, stands of a kind which is becoming rare. Such stands, however, are susceptible to insect damage unless their vigour is maintained by judicious cutting methods and a considerable number of the trees are dead and dying from the activity of three species of insects attacking the birch, beech and fir. It will be necessary to make heavy cuts during the next few years to salvage the affected trees and restore the forest to a healthy productive condition. This will unavoidably impair the appearance of some parts of it but the beauty of much of the area, particularly where the larger hemlocks grow, can be preserved by careful logging. In a number of years the growth of the younger trees will more than repair the damage done. Proper management will produce fuel and lumber which should yield a good return on the investment, and at the same time enhance its value as a recreational area. Neglect may result in destruction of its value for either purpose."

The report went on further to speak of protection, cutting, etc. and made the following recommendations which I will quote.

"1. That regulations be drawn up:

(a) Prohibiting the use of fire except at prepared picnic places.

(b) Prohibiting the removal or injury of plants or animals.

(c) Prohibiting the carrying of firearms.

(d) Controlling the parking of cars.

2. That these regulations be posted at entrances and on the boundary with signs urging the public to protect this property.

3. That the area be created a Game Refuge.

4. That a permanent resident caretaker be appointed to enforce regulations, act as fire and game warden, assist in protecting and improving park facilities, and in cutting operations. Such a man should be fully authorized for these duties.
(It is understood that a suitable man has already been placed on the property.)

5. That steps be taken to control the cutting to maintain the health and productivity of the forest and ensure the maximum yield of fuel and lumber consistent with the use of the area as a park. To this end, a management plan should be prepared and its execution supervised by a competent forester. It is suggested that the co-operation of the Department of Forestry of the University of New Brunswick be sought in accomplishing this.

6. That wood used by the City should be credited to the woodlot at prevailing market prices, and a careful record kept of the value of fuel and other products balanced against costs of operation.

7. That the large spring and rocky outcrop on the property be carefully prepared and protected as a beauty spot and provided with suitable fire places and picnicking facilities.

8. That a permanent advisory committee, including one or two members of the Council, citizens of the City, and a forester resident in the City, be appointed to give special consideration to the management, protection, and improvement of the property.

9. That the drains on the swampy area north of the property be cleaned out and improved as a measure of mosquito control for the benefit of the City as a whole, as well as the park area, and that standing water be oiled in the spring."

I think these recommendations are excellent and that the City will make no mistake in following them closely. A caretaker has already been installed and is living in the farm house on the property and although he has no written instructions, I have verbally instructed him along the lines of the above recommendations.

Considerable cutting has already been done on the property and in this work I have had the advice of Prof. B.F. Flieger of the University of New Brunswick, Mr. K. E. Brown of the Provincial Government Forestry Department, and Mr. R. E. Balch the Dominion Entomologist. However, I think further steps should be taken by the City Council to set up a more or less permanent committee to be in charge of this City Forest and if they think proper to see to the following out of the above mentioned recommendations.

During 1941, when the labour expenditure of $4609.32 was made up, some 332½ cords of wood were cut and delivered from the City Forest. Deliveries were made as follows:-

Victoria Public Hospital.....	13½ cords
Municipal Home Department.....	125 cords
Fire Department.....	2 cords
City Employees.....	161 cords
Used by Roads and Streets Department.....	31 cords
Total.....	332½ cords

Besides the above, there were about 100 cords of 4-ft. wood cut and piled on the property at the first of December 1941. The 332½ cords of wood mentioned were all cut and split when delivered, most of it into 16-in. stove wood and the rest into 2-ft. furnace wood. In making these cuttings no wood was taken from trees which were considered to be sound. All the yellow birch on the property has been affected by the Bronze Birch Borer and shows advance signs of decay, so that most of our cuttings were of yellow birch and the rest was made up of beech which appeared to be faulty.

Other work done on the property was the cutting and storing in the barns of some 17 tons of hay. Repairs were made to the main roads into the property and a creosoted wood culvert was installed in one of the roads inside the property.

A financial statement for the year would show as follows:

	Credit	Debit
332½ cords of wood @ $6.00	$1995.00	
100 cords of wood @ $5.00	500.00	
* 432½ cords of wood @ $2.00	865.00	
17 Tons of hay @ $9.00	153.00	
48 cu. yds. field stone @ 25¢	12.00	
Labour Costs		4609.32
	$3525.00	$4609.32

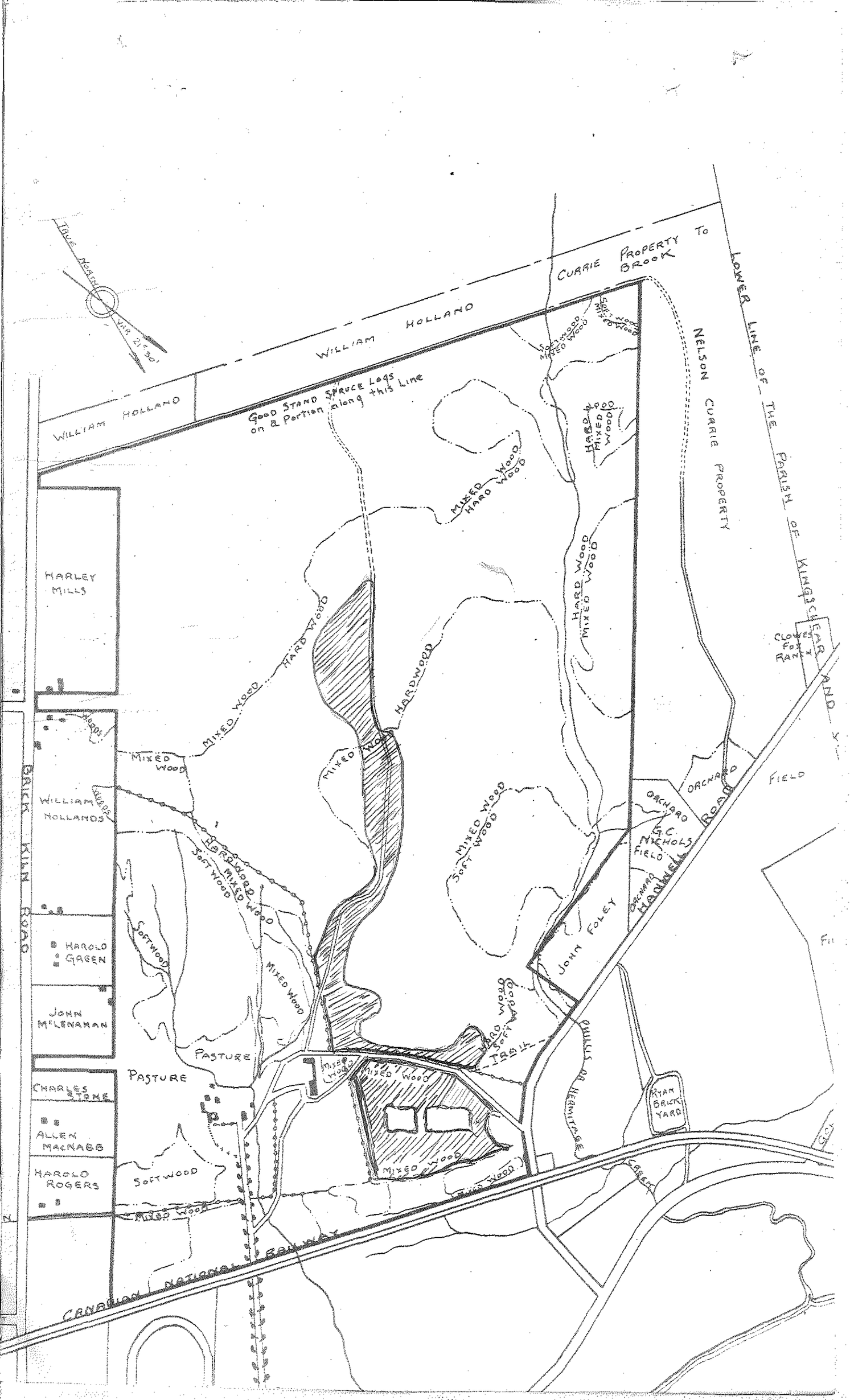
8 6 4

* Note:- As the 332½ cords of wood sold to the men and departments was charged at $6.00 delivered and the 100 cords was charged at $5.00, I feel that this total 432½ cords should be credited to the project at $2.00 a cord more to make it equalize the lowest present market price for wood.

The financial statement shows a debit balance of $1084.32. For this money a considerable amount of road work and cleaning up was done, also it must be remembered that this project was used as an outlet for extra labour (men were only sent there to work when the other work in the city was slack) and for this reason it is not always possible to balance these woods crews properly. At the present time, when the men necessary to handle the regular city work are not easily rehired if they are once laid off, it is very convenient to have a place where there is always work for them to do.

For the next few years a considerable amount of work will have to be done which will not show any immediate financial return. In our fuelwood operations we have been taking only the faulty trees which have returned about 75% of actual fuel. To follow out the recommendations suggested by the Forestry Society will also take a certain amount of labour which will not show any immediate financial return.

Following is a map of this Odell Property with locations of the 1941 cuttings marked. in Red.


True North
Var 21° 30'
William Holland
William Holland
Currie Property To Brook
Lower Line of the Parish of Kingsclear
Nelson Currie Property
Good Stand Spruce Logs on a Portion along this Line
Soft Wood Mixed Wood
Soft Wood
Hard Wood Mixed Wood
Mixed Wood Hard Wood
Hard Wood Mixed Wood
Harley Mills
Hard Wood
Mixed Wood
Hardwood
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Hard Wood
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Trail
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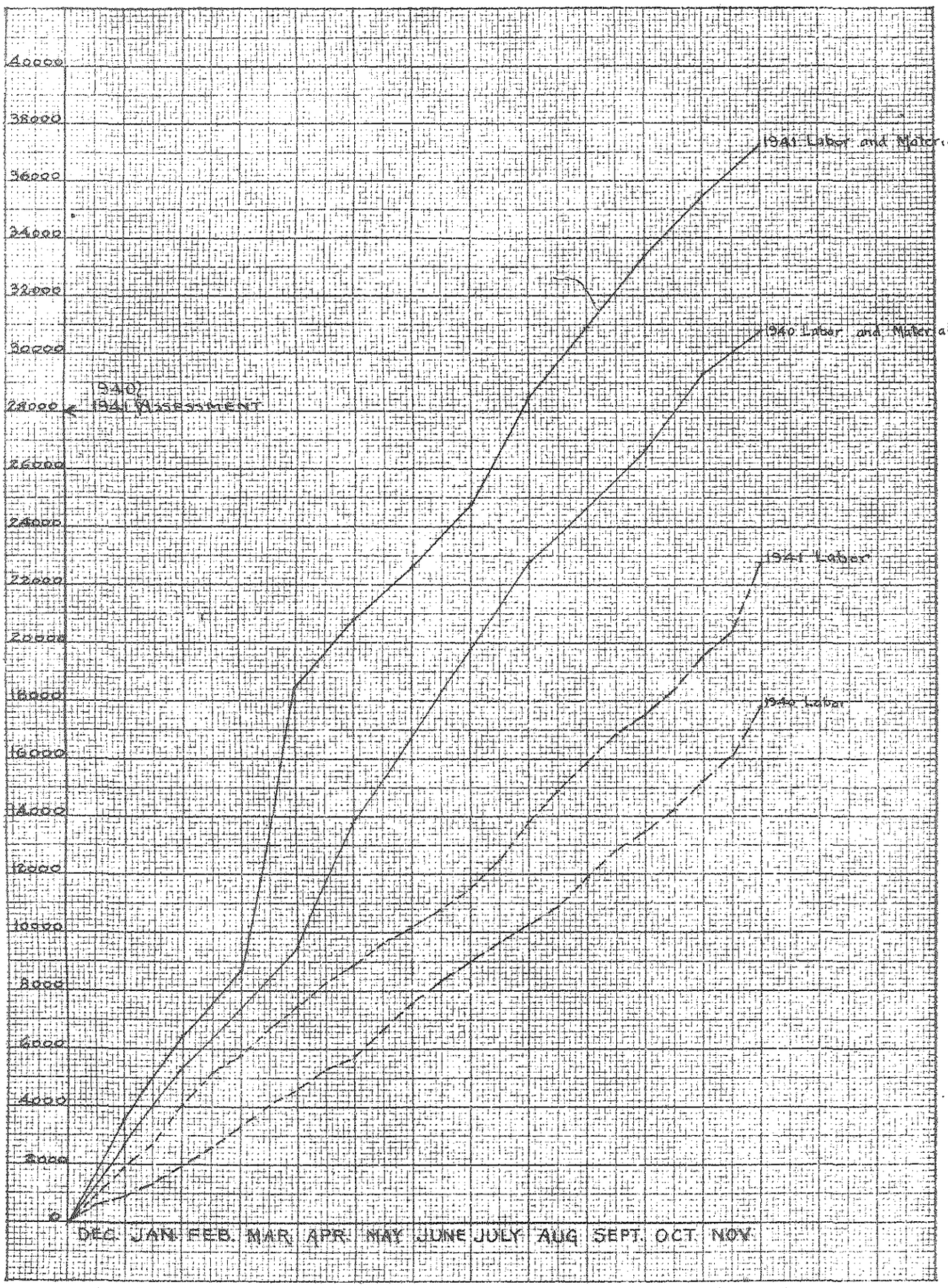
Mixed Wood
Mixed Wood
Soft Wood
Mixed Wood
Clover Farm Ranch
Orchard
Orchard
Field
Road
G.C. Nicholls Field
Orchard
Hackett
John Foley
Gullies or Hermits
Ryan Brick Yard
Creek
Baker Kiln Road
Harold Garen
John McLenaman
Pasture
Pasture
Charles Stone
Allen MacNabb
Harold Rogers
Softwood
Mixed Wood
Canadian National Railway

TABLE SHOWING COMPARATIVE COSTS OF ROADS AND STREETS

Years 1927 to 1941

Year	Expenditure for Labour	Gross Expenditure Labour and Materials	Credits	Net Costs Labour and Materials	Appro-priation
1927	15,692.00			24,245.00	26,000.00
1928	17,122.45			26,058.70	26,000.00
1929	14,490.47			26,682.98	31,000.00
1930	16,553.53			34,556.33	32,000.00
1931	26,024.54	50,849.60	15,511.97	35,337.63	31,000.00
1932	25,430.96	39,101.62	4,822.19	34,279.43	25,000.00
1933	10,607.99	19,161.38	333.28	18,829.10	19,000.00
1934	13,332.51	23,665.94	2,311.50	21,354.36	20,000.00
1935	25,264.14	46,588.85	21,502.31	25,086.54	23,000.00
1936	18,357.05	33,238.01	11,059.77	22,178.24	23,000.00
1937	18,060.48	34,931.68	12,641.95	22,289.73	20,000.00
1938	15,601.78	24,273.83	781.88	23,491.95	22,000.00
1939	16,681.88	32,509.93	1,762.67	30,747.26	28,000.00
1940	17,956.36	33,058.59	2,190.50	30,868.09	28,000.00
1941	22,816.69	40,283.46	3,050.12	37,233.34	28,000.00

The following plate shows graphic comparison of Roads and Streets costs for years 1940 and 1941.



ROADS AND STREETS COSTS 1940 AND 1941.

PUBLIC WORKS

Gross Expenditure	$7,204.65
Credits	204.95
Net Expenditure	6,999.70
1941 Appropriation	4,000.00
Dr. Balance	$2,999.70

The Credits of $204.95 are made up as follows:-

Grading around Victoria Public Hospital from April 30 to May 5	$ 59.65
Building stone wall and fence along the north-east side line of the Fredericton High School property	126.45
Repairing surface sewer for New Brunswick Liquor Control Board	7.65
Cutting trees on private property	11.20
Total	$204.95

The Gross Expenditure of $7204.65 is made up as follows:-

Labour	$4751.76
Material and Workmen's Compensation	2452.89
	$7204.65

The above labour item is divided as follows:-

Dump	$1578.91
Back Drain	35.20
Trees	346.60
Surface Sewers	281.38
Unforeseen Account	2509.67
	$4751.76

Dump:-

The labour charged to Dump is for the wages of a dump tender every week day throughout the year and also that of a night tender who is on duty during the summer season. In July of this year the City Dump caught fire and has been burning all summer and fall. It is almost impossible to put the fire out, so we isolated the part of the dump which had caught fire by trenching it and permitted it to continue to burn.

Back Drain:-

The labour shown against back drain amounted to only $35.20 which was spent on the back drain during the spring, cleaning out culverts and cutting ice to get ready for the spring thaw.

Trees:-

No spraying was done on the City Trees this year, but the labour cost of $346.60 was spent in cutting and pruning work.

Unforeseen Account:-

The labour cost is divided as follows:-

Queen Square Skating Rink	$ 295.35
College Field Skating Rink	20.75
Soldiers' Rink	7.50
Boys' Private Rink	3.50
Rural Cemetry (cleaning front)	8.10
Victoria Public Hospital	97.10
St. John River (ice roads)	34.05
Canadian Legion for Military Camp	11.20
Department National Defence	16.25
War Savings Campaign (painting signs)	16.20
University of New Brunswick Gymnasium Grounds	10.15
Old Burial Ground	35.80
Painting Park Benches	19.80
Care of City Greens	1261.37
Band Stand on Green	8.40
Spraying for Mosquitoes	27.80
Repairs to Carleton Street Light Station	4.10
Playgrounds (Queens Square)	56.75
Surveying Air-Port Barker's Point	63.00
Civilian Volunteer Corps	4.45
A. & B. Club House	69.05
Fredericton High School	126.45
Experimental Farm	56.15
Cutting Bushes on River Bank	39.00
Salvage Warehouse for Salvation Army	43.50
Cutting Grass	14.00
New Brunswick Liquor Control Board (repairs to sewer)	5.85
General Expenses	154.05
Total	$2509.67

A. & B. Club House:-

This spring the A. & B. Club found that because of financial difficulties they could no longer carry on as a Club. They asked the City to take over the Club House. This the City agreed to do. The Club House was in a very poor state of repair--the sills, boat house storey, veranda, and main storey required a lot of work to make them serviceable and the entire building, including the veranda, had to be reroofed. This work was done for a total expenditure of $1417.28 made up of a labour cost of $596.80 and a material charge of $820.48. The labour item of $596.80 is included in the $1261.37 labour charge for the care of City Greens.

Public Works

Construction of 24" Box Drain from Park To Woodstock Road extending 690' of which 231 was Boxed and 459' was left open.

2 Catch Basins.

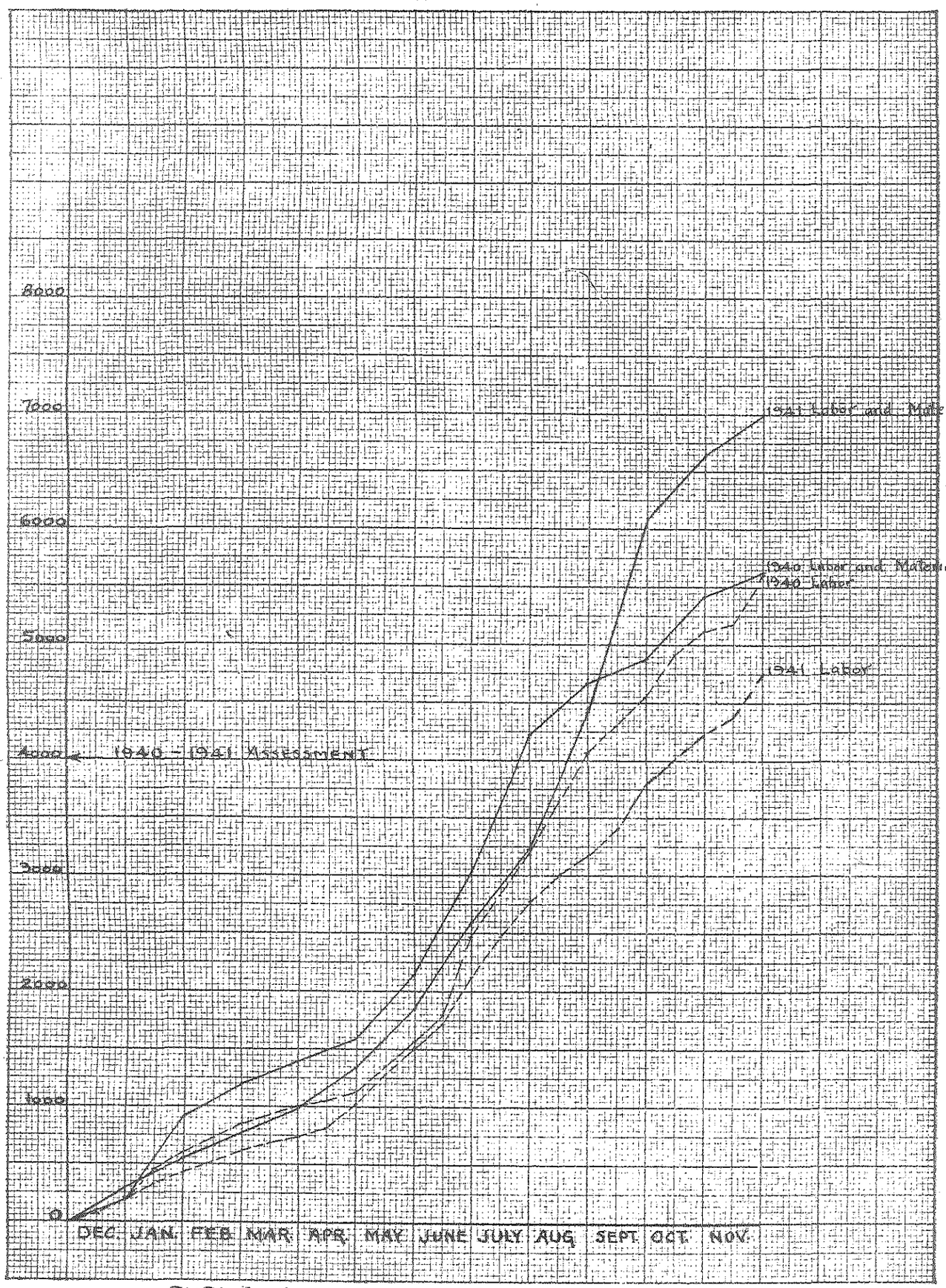
5-11-30

TABLE SHOWING COMPARATIVE YEARLY COSTS OF PUBLIC WORKS

Years 1927 to 1941

Year	Expenditure for Labour	Gross Expenditure Labour and Materials	Credits	Net Costs Labour and Materials	Appropriation
1927	1,204.90			2,520.00	4,000.00
1928	2,470.39			3,156.87	3,000.00
1929	1,685.59	2,606.00		2,626.00	5,000.00
1930	2,729.82	3,379.09	237.90	3,159.19	5,000.00
1931	1,574.17	1,982.91	61.95	1,920.96	2,500.00
1932	3,797.65	4,992.98	322.35	4,670.63	2,500.00
1933	3,948.39	5,394.06	474.89	4,919.17	4,500.00
1934	3,734.85	4,929.00	1,302.36	3,626.64	4,000.00
1935	2,906.24	4,425.84	2,776.96	1,648.88	3,000.00
1936	2,867.38	4,211.33	2.73	4,208.60	3,000.00
1937	3,673.48	4,283.52	123.45	4,160.07	5,000.00
1938	5,135.07	8,631.67	664.00	7,967.67	4,000.00
1939	3,937.07	4,606.53	255.10	4,361.43	4,000.00
1940	5,610.71	6,826.22	1,204.89	5,621.33	4,000.00
1941	4,751.76	7,204.65	204.95	6,999.70	4,000.00

The following plate shows graphically a comparison of 1940 and 1941 Public Works costs.



PUBLIC WORKS COSTS 1940 AND 1941

PERMANENT ROADS

Gross Expenditure	$20,214.37
Credits	257.80
Net Expenditure	$19,956.57

The above Credits are made up of work done for and charged to private parties.

The permanent work this year consisted of some 1.03 miles of pre-mixed asphalt pavement with the necessary accompanying concrete curb and gutter and surface sewerage.

The work of grading, curb and gutter, sidewalk, sewer, etc. was done by the City Crews. The primer and Asphalt pavement was laid by the Canada Construction Company at a price of $3.36 per ton, in place, for the Asphalt paving and 15¢ a gallon, in place, for the M.C.-1 Asphalt Primer. We endeavoured to lay this asphalt pavement four inches thick. In most places the sub-base was prepared by grading and shaping the existing road surface into place. In a few cases clay deposits had to be dug out and refilled with gravel, but the general condition did not require this as most of the streets either had enough gravel surface to make a cushion for the pavement or were graded down practically to the original underlying gravel. This pavement in place, that is the asphalt and primer pavement only, cost 65¢ per sq. yd. The pavement in place taking all costs of grading, curb and gutter, surface sewer, etc. cost 93¢ per sq. yd. for the total yardage, including gutter, of 21,444 sq. yds.

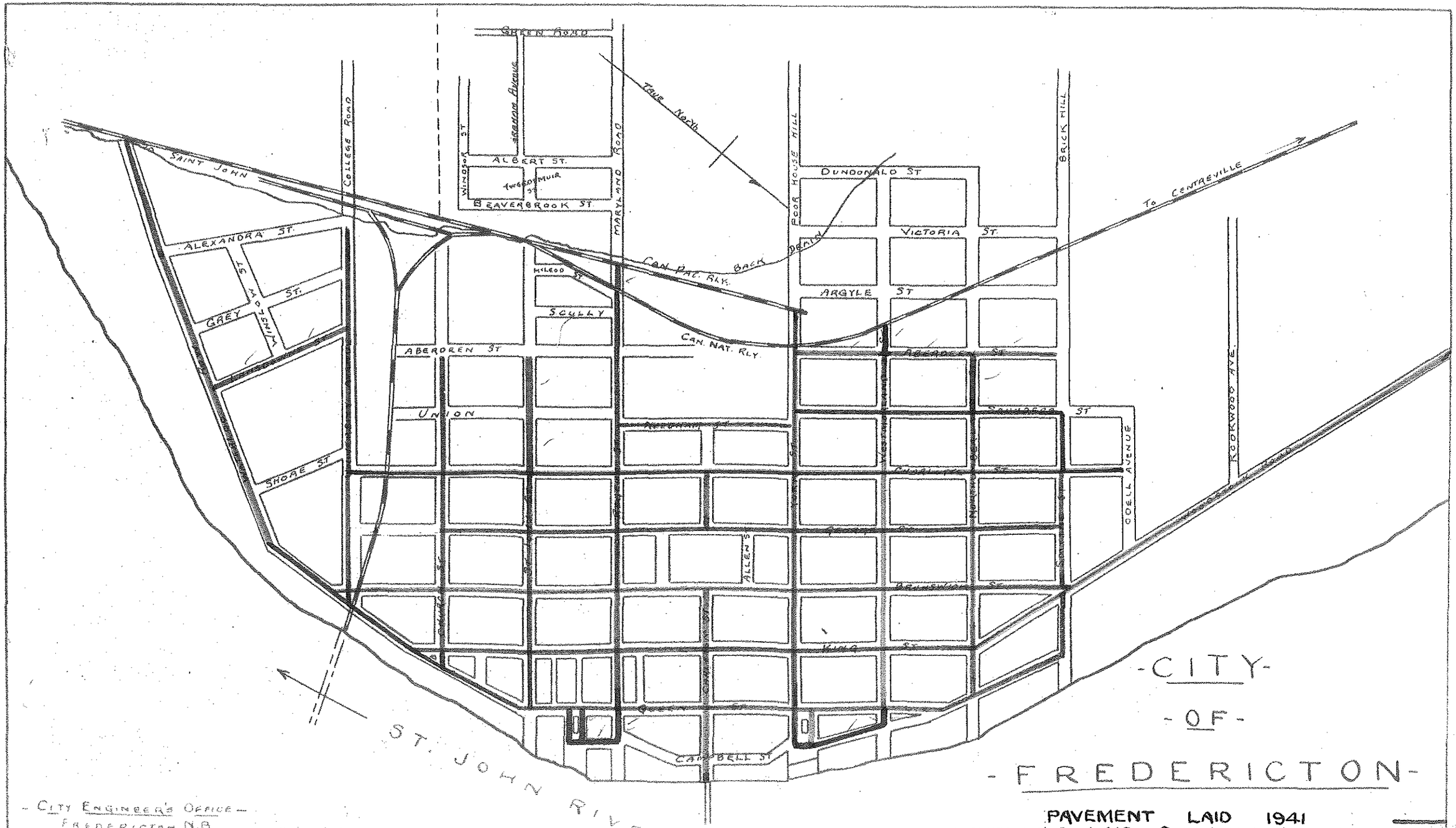
On the next page is a table showing the location and quantity of work done under this Permanent Road heading.

Immediately following the table is a map with these locations marked in red, and also showing previously laid pavement marked in blue.

Date Started: 24th April/41
Date Finished: June 17/41

PAVEMENT 1941

Location of Streets	Sq. Yds. Black Base	Lbs. Black Base	Lbs. per Sq. Yd. of Black Base Used	Gals. Primer Used	Lin. Ft. Curb and Gutter Laid	Lin. Ft. of 5-ft. Sidewalk Concrete	Sq. Ft. Extra Concrete	Gals. Primer per Sq. Yd.
Aberdeen--York to West'ld	1925.0	635,050	330	570				
Aberdeen--West'ld to North'ld	2055.0	705,650	343	930				
Aberdeen--North'ld to Smythe	2134.7	775,030	363	600				.34
St. John--Charlotte to Union	1152.5	436,475	378	300	745	54		
St. John--Union to Aberdeen	1181.8	432,270	364	300	778	30.5	153	.26
West'ld--Aberdeen to Railway	313.0	113,270	361	0	0	0	0	
Lansdowne--Univ. Ave to Waterloo	2846.5	1141,160	400	750	2024	24.0	305	.26
West'ld--Campbell to Queen	573.5	250,270	436	150	0	0	0	
Campbell--West'ld to Phoenix Sq.	2006.5	729,170	363	500	0	0	0	.25
Regent--Queen to Campbell	776.0	303,950	391	187	138	0	0	
Regent--Queen to Campbell (Parking)	137.0	46,255	338	141	212	0	0	
Campbell--Regent to Court House Sq.	608.0	234,895	386	185	373	7.5	0	
Court House Sq.--Both sides	1307.0	512,210	391	187	300	153.0	0	.25
Cenotaph	233.5	84,320	361	0	213	2.0	0	
Regent St.--C.N.R. & C.P.R.	550.0	232,070	426	0	0	0	144	
Phoenix Sq.--Resurface	803.0	187,590	223	0	0	0	0	
North'ld--Saunders to Aberdeen	1056.0	381,450	360	0	0	0	0	
Queen St.--Patch by Eaton's	25.0	9,930	397	0	0	0	0	
Aberdeen--Regent to Carleton					1297	32.0	789	0
Waterloo Row--Subway to Shore					959	10.0	325	
Waterloo Row--Shore to Lansdowne					600	0	226	0
Miscellaneous Patching		43,000						
	19,684.	7,254,000		4800	7639	313.	1942	



-CITY-
-OF-
-FREDERICTON-

PAVEMENT LAID 1941
PAVEMENT LAID PREVIOUS TO 1941

-CITY ENGINEER'S OFFICE-
FREDERICTON N.B.
Nov. 1941

Scale - 1 in. equals 800 ft.

BATHING BEACH

Our bathing beach expenses this year ran to $137.88. The beach was open from July 4th to July 28th. The short season was due to the fact that infantile paralysis was an epidemic in the City and it was decided not to keep the beach officially open.

STREET LIGHTS

The City street lighting system at the present time consists of:-

1. A series lighting system which lights most of the City.
2. A multiple lighting system on Queen Street.
3. A multiple lighting system in C.N.R. Subway.

System No. 1, the series lighting system, consists of some 17.9 miles of line and 362 lamps. This system is divided into four circuits two of which are controlled each by a 25 K.W. constant current transformer, the other two of which are each controlled by a 15 K.W. constant current transformer. These transformers, along with the main switchboard, are housed in a transformer room in the old street lighting building on Carleton Street.

The four circuits are made up as follows:-

		Transformer Size
Lower Front Circuit:-		
26-600 C.P. Lamps at .372 K.W. demand.....	10.004	
39-250 C.P. Lamps at .155 K.W. demand.....	6.045	
9-100 C.P. Lamps at .0716 K.W. demand.....	.644	
	16.693 K.W.	25 K.V.
Lower Rear Circuit:-		
129-250 C.P. Lamps at .155 K.W. demand.....	19.995 K.W.	25 K.V.
Upper Front Circuit:-		
10-600 C.P. Lamps at .372 K.W. demand.....	3.720	
63-250 C.P. Lamps at .155 K.W. demand.....	9.765	
	13.485 K.W.	15 K.V.
Upper Rear Circuit:-		
3-600 C.P. Lamps at .372 K.W. demand.....	1.116	
82-250 C.P. Lamps at .155 K.W. demand.....	12.712	
	13.828 K.W.	15 K.V.
Total Demand.....	64.001 K.W.	

During the year there have been 14 additional lamp installations on this series lighting. To make up the 14 lamp installations, 21 new 600 units were installed but as 7 of these took the place of 250 units already in use, only 14 new locations were lighted. The locations where the street lighting was improved this year are Regent Street, Carleton Street, York Street, and Westmorland Street from King Street to Queen Street. Improvements were also made at the corners of Regent and George Streets, Brunswick and York Streets, and George and York Streets.

System No. 2, the multiple lighting system on Queen Street, consists of 21 units located on Queen Street between Westmorland and ~~Regent~~ St John Streets. Each unit consists of a 500 W. 115 volt lamp set in a novaulex luminar fixture and hung on a bracket attached to the pole. These units go on and off at the same time as the ordinary street lights, being controlled by a control switch which is energized by our series street lighting system. This system was installed and is owned, maintained, and energized by the Maritime Electric Company, the City paying the Company $75.00 per year for each unit.

System No. 3 consists of six multiple lights, each of 250 W. strength, located in the C. N. R. Subway. This system is also controlled by a control switch which is energized by the series street lighting system.

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

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

This above mentioned contract does not apply to System No. 2. These twenty-one multiple fixtures on Queen Street are, as I stated previously, owned and maintained by the Maritime Electric Company at a cost of $75.00 each per year to the City.

The street lighting costs for the year 1941 are as follows:-

Expenditure	$9,888.78
1941 Appropriation	8,500.00
Dr. Balance	$1,388.78

This Expenditure is made up as follows:-

Lamps for replacement:-

60-600 C.P. lamps at $1.68	$101.25
264-250 C.P. lamps at 97½¢	257.40
19-150 W. lamps used in Subway	5.70
Current on Subway lighting, armoury lights, and series fixtures from Nov. 2/40 to Nov. 28/41 (239,710 K.W.H.)	6482.89
Charges on multiple fixtures installed on Queen Street at the contract price of $75.00 a light per year	1424.83
Maintenance, labour as per contract price	330.96
Material purchased for new installation and maintenance of lamp fixtures (including only such articles as lamp standards, lamp brackets, heads, sockets, shades, etc.)	898.34
Material used and extra labour supplied by Maritime Electric Company in line maintenance extension	288.37
Miscellaneous charges (part of engineer's car expenses)	89.08
Telephone in transformer room	9.96
Total	$9888.78

The total per capita charge for street lighting for 1941 assuming population of 11,000 persons $\frac{9888.78}{11000}$ = 89.9¢

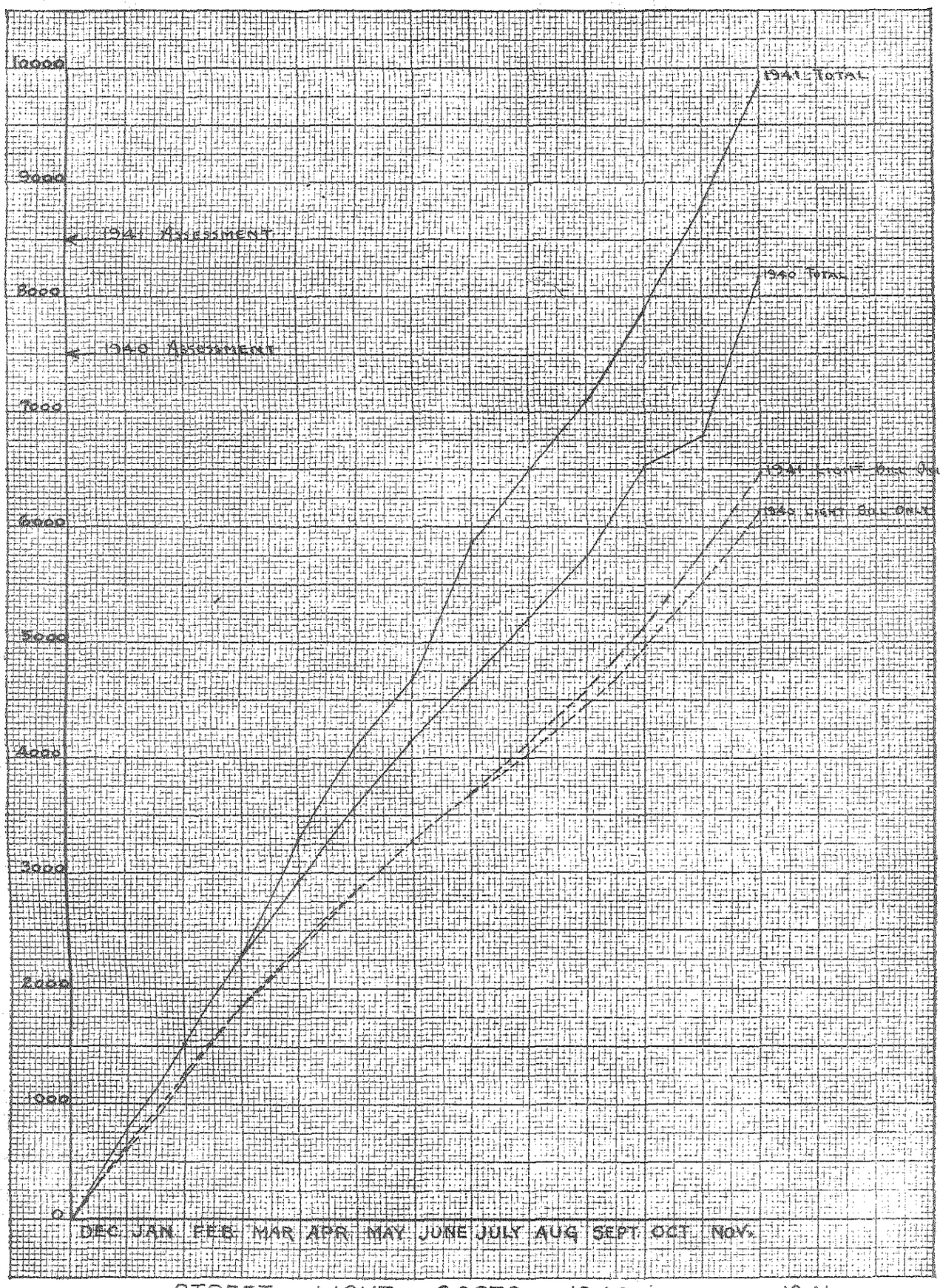
TABLE SHOWING CURRENT CHARGES FOR 1941
ON SERIES LIGHTING

Date of Bill	K.W.H.	Demand in K.W.	Average No. of Burning Housr per Night	Bill per Month
Nov. 30/40 to Dec. 30/40	25,049	58.2	14¾	630.51
Dec. 30/40 to Jan. 30/41	25,137	58.9	14½	634.11
Jan. 30/41 to Feb. 28/41	22,643	58.9	13	584.22
Feb. 28/41 to March 28/41	18,591	58.2	11¼	501.61
March 28/41 to April 30/41	18,448	60.9	9½	504.63
April 30/41 to May 30/41	14,134	62.2	8½	420.60
May 30/41 to June 27/41	14.230	62.2	7¼	422.99
June 27/41 to July 31/41	14,324	64.9	7½	430.23
July 31/41 to August 27/41	15,472	64.9	8¾	453.95
August 27/41 to Sept. 30/41	20,900	68.9	10½	570.59
Sept. 30/41 to Oct. 30/41	23,121	70.9	12	619.32
Oct. 30/41 to Nov. 28/41	27,661	70.9	13½	710.13
	239,710			$6,482.89

TABLE SHOWING COMPARATIVE YEARLY
COSTS IN STREET LIGHTING

Year	Total Yearly Cost	Yearly Appropriation
1927	$ 8,088.41	$ 8,000.00
1928	7,323.41	7,000.00
1929	7,434.72	7,000.00
1930	7,115.40	7,000.00
1931	6,672.23	10,000.00
1932	6,532.51	6,000.00
1933	6,425.87	6,000.00
1934	6,165.28	6,000.00
1935	6,632.33	6,000.00
1936	6,957.72	7,000.00
1937	9,688.62	7,000.00
1938	8,314.06	9,000.00
1939	8,645.97	7,500.00
1940	8,173.25	7,500.00
1941	9,888.78	8,500.00

A graphic comparison of 1940 and 1941 street light expenditure and power cost is shown on the following plate: the curve for power cost includes the bill for the series lighting and the lighting of the Subway and Armoury Parade Ground only, and does not include the bill for the multiple fixtures installed on Front Street and owned by the Maritime Electric Company.



STREET LIGHT COSTS 1940 AND 1941.

THIS MARGIN RESERVED FOR BINDING.

IF SHEET IS READ THIS WAY (HORIZONTALLY) THIS MUST BE TOP.
IF SHEET IS READ THE OTHER WAY (VERTICALLY) THIS MUST BE LEFT-HAND SIDE.

CEMENT WALKS

Total Expenditure.....$177.50

Two small pieces of concrete sidewalk were laid this year, one on the upper side of Court House Square from Queen to Campbell Streets, and one on the lower side of Court House Square in front of the residence of Thomas Rainsford.

Besides the above mentioned new construction, a number of our previously laid cement walks had to be repaired.

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

- City Engineer's Office -
Fredericton N.B.
Nov. 1941

Scale 1 inch equals 800 ft

The number of new customers connected to the City Sewerage System this year ——— 8

Old sewerage connections dug out and relaid : 7

TOTAL = 15

SEWERAGE DOMESTIC

Gross Expenditure	$2,274.32
Credits	634.33
Net Expenditure	$1,629.99

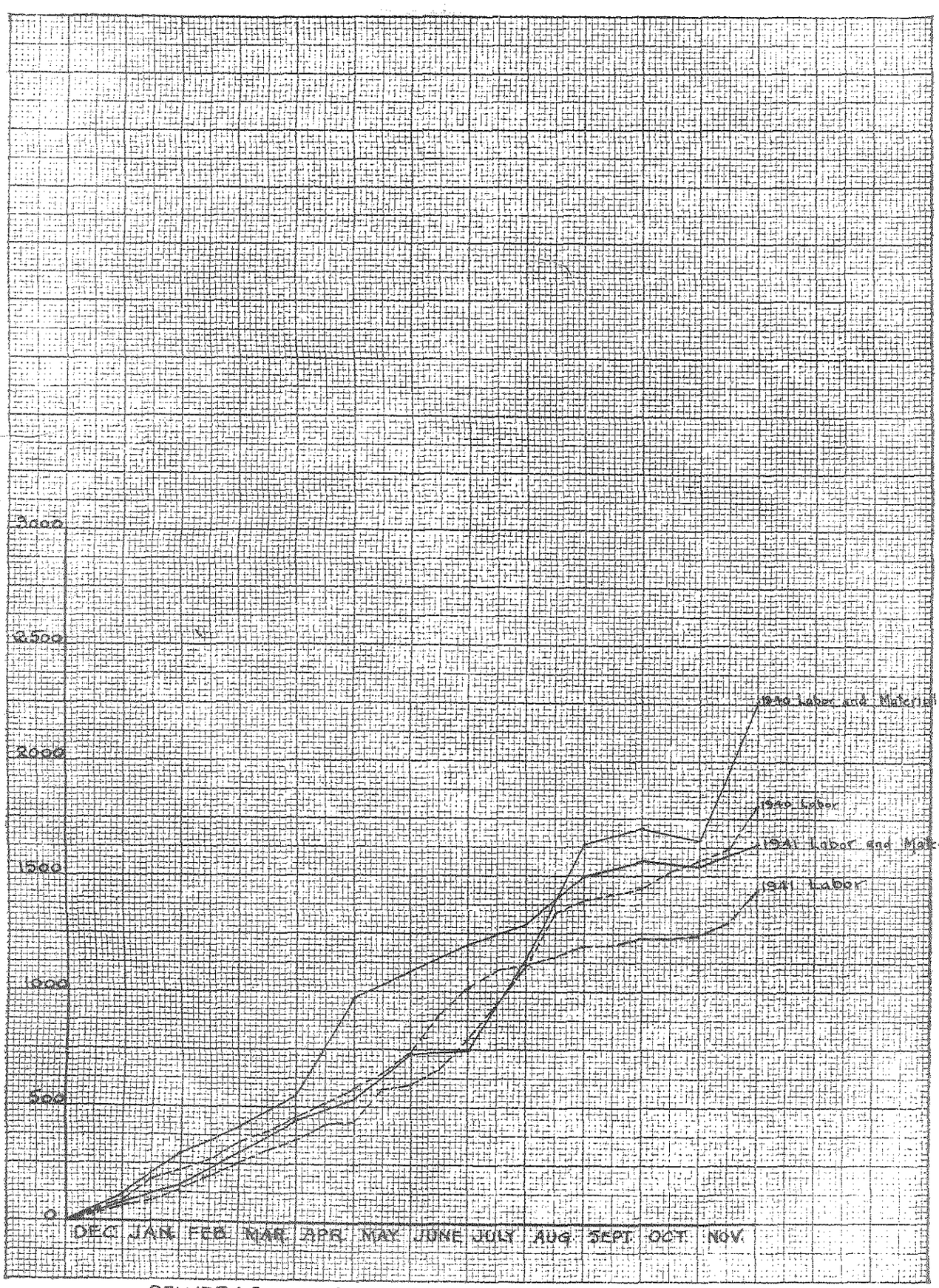
The credit of $634.33 is made up of work done on the domestic sewerage for private parties. This work consists of all sewerage installation and sewerage maintenance other than that done on the principal sewerage main which serves the street.

The only extension of sewerage mains made this year, other than a small extension on Aberdeen Street to pick up a new customer, were sewers for military purposes to serve the new military encampments built on the Woodstock Road. These sewers were emptied into the City sewerage system but all costs of construction were borne by the Military Authorities.

The entire domestic sewerage system was flushed out once during the summer between May 29th and June 7th at a labour cost of $134.30.

The number of new customers connected with the City Sewerage System this year	13
Old sewerage connections dug out and relaid	6

A graphic comparison for domestic sewerage costs for 1940 and 1941 is shown on the following plate:-



SEWERAGE DOMESTIC COSTS 1940 AND 1941

WATER

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

Water Ordinary:-

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

Gross Expenditure.....	$5,354.64
Credits.....	459.08
Net Expenditure.....	$4,895.56

The credits are made up of work done for and material sold to private parties when installing a water service over grounds other than city property or when the material is to be used on parts of systems which do not belong to the City. Among the above credits appears an item of $206.57 which was the cost of putting in a 6-inch lead to a sprinkler system at G. E. Barbour Co. Ltd.

The gross expenditure is made up as follows:-

City Payroll for hydrants.....	$ 398.15
City Payroll for meters.....	1307.77
City Payroll for water ordinary.....	1202.45
Total Payrolls.....	2908.37
Material and other charges.....	2446.27
Gross Expenditure.....	$5354.64

Hydrants:-

We have in the City 149 hydrants plus three hydrants which have been installed by the Military Department which makes in all 152 hydrants which must be maintained by the City crews.

The labour costs show an average cost per hydrant for labour only of $2.62.

Meters:-

Of all our water service in the City 552 are charged under flat rate and 1148 are on meter, giving us altogether 1700 services.

The labour cost this year per meter for installing, reading, repairing, etc. is $1.14.

Thirty-five meters were stopped this year and had to be repaired.

All meters are read twice a year and bills are sent out twice a year. We have about 50 customers whose meters are read once a month although they also are billed only twice a year. These are customers who ordinarily have large consumptions and where a stopped meter or a meter turned over without being noticed would mean considerable loss of revenue to the City. All meters on military buildings are included in this group of monthly read meters.

Private meters in service 1940.....	1110
Services metered for first time 1941.....	15
Military Training Centre No. 70.....	20
Military Depot No. 7.....	3
Services on meter Nov. 1941.....	1148

This year we purchased from the Neptune Meter Company the following new water meters:-

15 - 5/8 Meters with 3/4" connections, readings shown in Imperial Gallons, @ $12.90 plus 8% Sales Tax. The Serial No. on these meters were 6170251 - 6170265.

Meters in store room January 1st, 1942:-

5/8 meters repaired and fit for service.....	3
5/8 meters that can be repaired and made fit for service.....	2
New 5/8 meters.....	1
3/4 meters fit for service.....	0
1-in. meters that can be repaired.....	2
New 1-in. meters.....	0
1½ in. meters fit for service.....	0
Compound meters fit for service.....	0
Compound meters not fit but which can be repaired.....	1
2-in. Crest meters.....	1

DISTRIBUTION SYSTEM

New water services installed this year.....	14
Old services relaid this year.....	20
Frozen services which had to be thawed.....	8
Services discontinued.....	0

We had in the City on the 30th day of November 1941, 1700 water services of which 1148 were on meter and 552 flat rate.

The Fredericton distribution system consists of 16.71 miles of water main made up of the following sizes:-

10 inch main.....	1.53 miles
8 inch main.....	4.21 miles
6 inch main.....	9.09 miles
4 inch main.....	1.60 miles
3 inch main.....	.28 miles

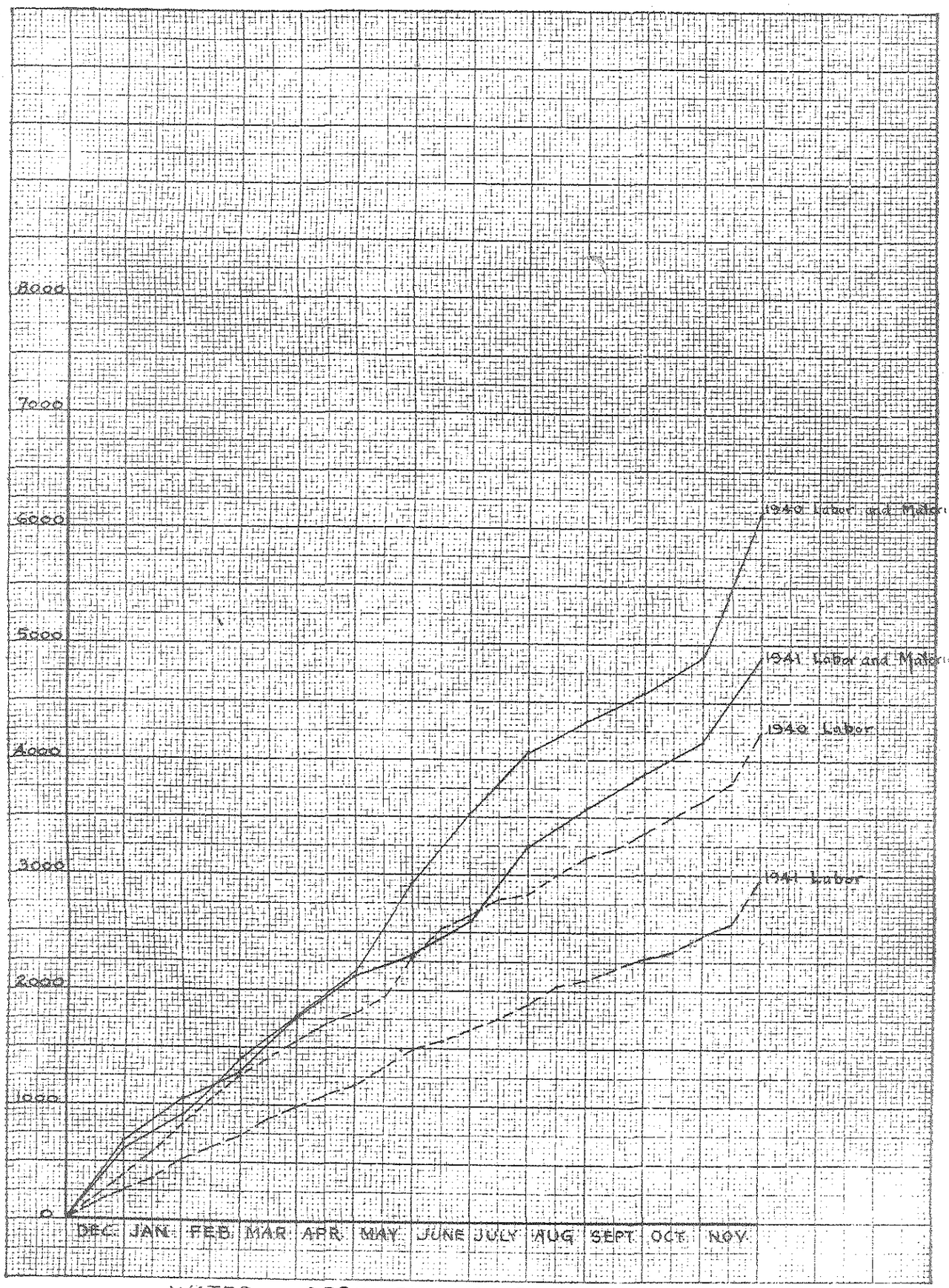
The water mains as a whole were not flushed out this year other than the flushing they received due to the watering carts, sewer flushing, etc. The dead ends were flushed when necessary.

During the fall of 1941 a new military encampment was constructed by the Military Authorities on their property between the Woodstock Road and the River. This encampment is called No. 7 Depot. The Military Authorities served the hutments with water by means of a 6-inch cast-iron water main which looped from our 10-inch main on the Woodstock Road just below the Childrens' Home to the same main at the end of Rookwood Avenue. This installation was put in and paid for entirely by the Military Authorities. As the camps are connected to the City sewerage, they are metered by the City and water bills are sent in to the Military Authorities according to these meter readings.

TABLE SHOWING COMPARATIVE YEARLY COSTS
WATER ORDINARY

Year	Labour	Material	Gross Expenditure	Credits	Net Expenditure
1929	3,236.77	2,203.13	5,439.90		5,539.90
1930	3,647.97	2,313.18	5,961.15		5,961.15
1931	3,836.33	4,376.87	8,213.20	279.65	7,933.55
1932	2,666.30	1,854.06	4,520.36	122.47	4,397.89
1933	2,333.25	1,604.17	3,937.42	30.27	3,907.15
1934	3,247.51	4,112.34	7,359.85	891.23	6,468.62
1935	5,372.83	5,897.23	11,270.06	398.42	10,871.64
1936	4,303.14	3,725.91	8,029.05	392.35	7,636.70
1937	3,718.86	3,938.81	7,657.67	256.46	7,401.21
1938	4,797.47	2,254.68	7,052.15	153.11	6,899.04
1939	4,201.24	3,248.61	7,449.85	570.44	6,879.41
1940	4,231.75	2,708.22	6,939.97	808.48	6,131.49
1941	2,908.37	2,446.27	5,354.64	459.08	4,895.56

A graphic comparison of expenditure on water ordinary for years 1940 and 1941 is shown on the following page:-



WATER ORDINARY COSTS 1940 AND 1941.

WATER PUMPING STATION

The water pumping station was as usual carried on this year under the Plant Superintendent and Chief Engineer John Malloy.

During the year we installed a new impeller and shaft complete with seal rings and bearings in one of our 6-inch low lift pumps. These parts cost us $165.75 f.o.b. Saint John and were installed by the waterworks employees. The old impeller and shafting in this pump had become so worn that it would not lift water when the river was very low. I have on order at the present time the same installation to put in our other 6-inch low lift pump.

We have for the past number of years been running a smaller impeller in one water service pump. We have been running this pump mostly in the winter as it was not necessary to have high pressure, and it showed a saving of $45.00 a month in electric and in water consumption. However, we found that this year our consumption had so increased that the demands of our customers on the higher elevations made it impossible to use our lower pressure pump, so that we reinstalled the original impeller.

During March 1941 we hauled some field rock from the Odell Property and, cutting a hole in the river ice over the intake pipe, we loaded the pipe with rock to keep it from ice damage.

The plant and equipment have been kept up by the waterworks employees in a satisfactory manner during the season, and a good pure water has been at all times delivered to the customers.

The following is the report of the City Analyist for the year 1941:-

FREDERICTON WATER SUPPLY --Year 1941

Total count of Bacteria per c.c., Agar, two days, room temp.

Dates of Tests		Raw Water	Effluent	Tap Water	Per cent Removal
1940					
December	28	120	1	2	99.2
"	31	1300	8	3	99.4
1941					
January	9	210	0	1	100.0
"	16	109	1	1	99.0
"	21	148	1	1	99.3
February	4	166	2	2	98.8
"	15	260	1	1	99.6
"	23	300	2	2	99.3
March	2	400	1	1	99.8

Dates of Tests		Raw Water	Effluent	Tap Water	Per cent Removal
1941					
March	12	390	0	4	100.0
"	19	260	0	1	100.0
"	25	130	1	2	99.0
"	27	4000	0	0	100.0
April	11	2300	2	2	99.9
"	20	4800	5	2	99.9
"	29	1500	2	1	99.8
May	8	960	1	1	99.9
"	21	2400	3	3	99.9
"	15	1100	2	1	99.8
"	21	2400	3	3	99.9
"	29	700	2	0	99.8
June	7	300	2	1	99.3
"	14	140	1	1	99.3
"	26	110	0	0	100.0
July	1	1000	14	4	98.6
"	11	270	0	2	100.0
"	22	150	1	1	99.3
"	31	110	0	0	100.0
August	7	280	1	1	99.6
"	14	300	2	2	99.3
"	22	240	0	3	100.0
"	28	140	0	2	100.0
September	7	340	1	1	99.7
"	14	200	2	1	99.0
"	26	980	6	5	99.4
October	1	1100	3	4	99.7
"	7	360	1	4	99.4
"	14	1000	4	2	99.6
"	20	1200	4	3	99.7
"	26	1650	2	6	99.6
November	2	1700	3	6	99.6
"	9	1400	4	6	99.7
"	19	1000	1	4	99.6
"	27	2000	2	2	99.9
December	5	1900	4	2	99.9
"	11	2250	1	1	99.9
"	17	2400	3	4	99.8
	Averages	988	2	2	99.6

Results of Previous Years	Raw Water	Effluent	Tap Water	Per cent Removal
1936	2218	2.7	3.3	99.9
1937	1827	1.9	3.3	99.9
1938	1738	2.1	2.4	99.9
1939	1822	1.2	2.3	99.9
1940	1460	3	3	99.8
1941	988	2	2	99.6

It will be noticed that the average count for the raw (988) is considerably lower than the general average. This is probably due to the steady level of the river last winter. The count for

the treated water (2) remains about the same.

The winter of 1940-41 was at least a 16 year record for the St. John, in that, its level scarcely varied from December 4th to March 26th. During this period of 112 days, it was not necessary to use Alum. Bleaching Solution was added so as to give 1.1 parts of available Chlorine per million parts of water.

The Orifice Boxes, which control the Alum and Bleach flow, were renewed. Due to war conditions, it seemed impossible to get replacements from the makers, so we built our own. They are of our own design and were built by the Staff of the Pumping Station. They have given us much better control of the chemicals and at a fraction of the cost of the commercial product.

Fredericton, N. B.
December 22, 1941.

E. W. Hagerman.

Water Pumping Station Cost 1941:-

Gross Expenditure	$19,474.56
Credits	4,014.64
Net Expenditure	$15,459.92

This Credit of $4,014.64 is made up as follows:-

128.845 tons of coal charged to pumping station and sold to other City Departments	$ 706.54
Water used by Roads and Streets Department (to sprinkle and flush sewers)	100.00
Water charged to Sewerage Domestic for flushing domestic sewers	70.00
Water used in City Hall Building	50.00
Water used in Old Street Lighting Building on Carleton Street	25.00
Water used in City Yard	10.00
Water used in City Alms House	25.00
Water used in City Parks	50.00
To yearly rental of 148 hydrants at $20.00	2960.00
Gasoline refund	12.50
Miscellaneous	5.60
	$4014.64

The Gross Expenditure is divided as follows:-

City Payroll for salaries of engineer at pumping station	$5580.00
Work done by other City employees in and around pumping station	435.30
Total City Payrolls	$6015.30
Material and Workmen's Compensation Charge	13459.26
Gross Expenditure	$19474.56

The material cost of $13,459.26 is itemized as follows:-

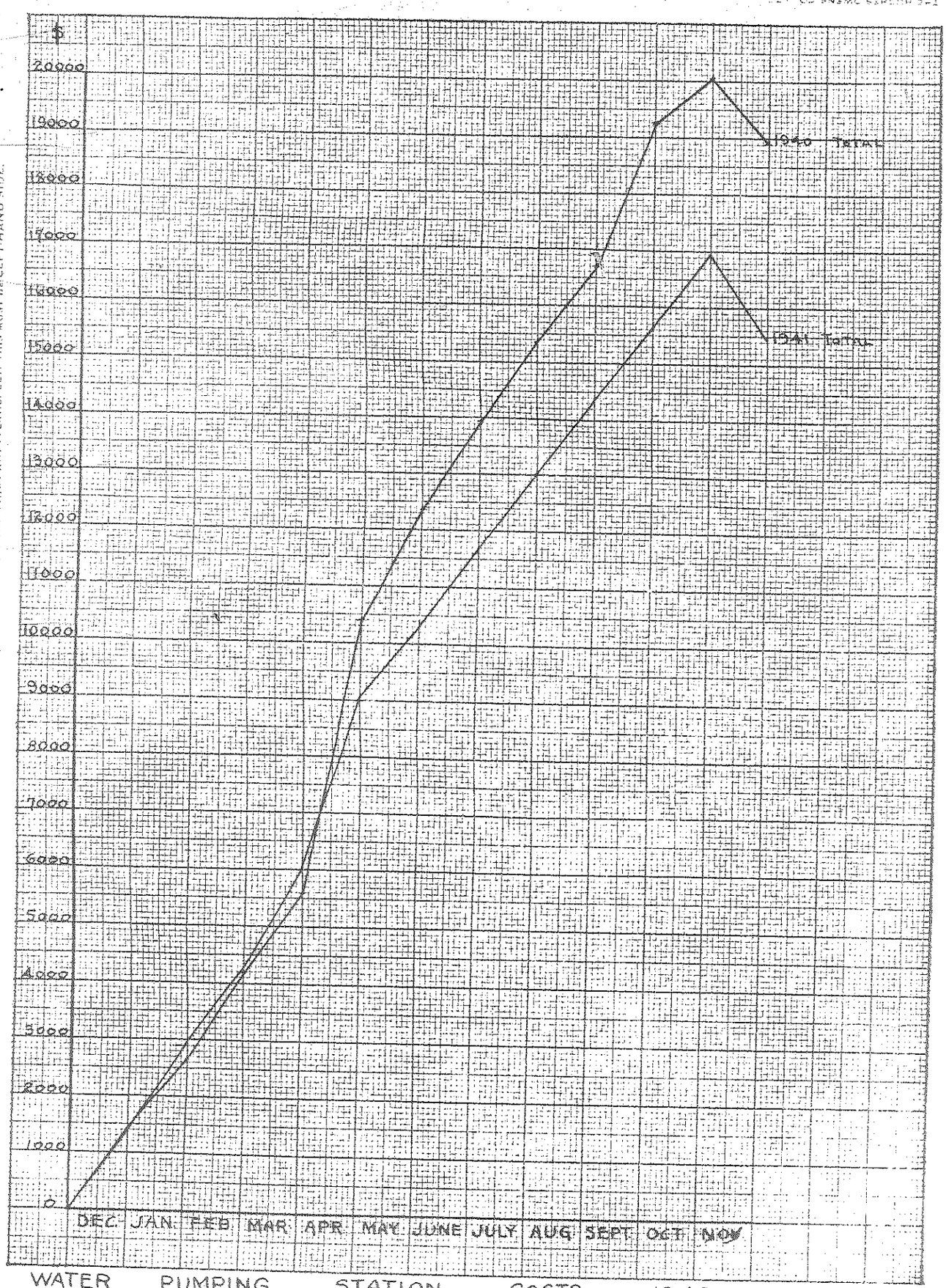
Item #1	Light supplied and power supplied by Maritime Electric Co. 331,400 K.W.H.	$7,906.24
Item #2	Transformer charges	151.92
Item #3	Lime, 7800 lbs	318.94
Item #4	Alum, 89,600 lbs	1,532.16
Item #5	Coal, 362.225 tons (128.845 tons of preceding amount sold to other City Dept.)	1,892.03
Item #6	Fuel oil, 90 gallons	13.13
Item #7	Engine oil, 172 gallons, Renown	107.25
Item #8	Motor oil	0.00
Item #9	Gasoline, 300 gallons	81.00
Item #10	Maintenance and repairs of the building and machinery	265.66
Item #11	New installations	0.00
Item #12	Supplies, packing, rags, etc	37.10
Item #13	Stationery, forms, charts, etc	23.80
Item #14	Workmen's Compansation Board	28.52
Item #15	Mr. E. W. Hagerman's salary	900.00
Item #16	Hoisting chemicals	76.00
Item #17	Miscellaneous, telephone, etc	125.51
		$13,459.26

COMPARISON OF WATER PUMPED AND COSTS FOR LAST FIFTEEN YEARS

Year	I. G. Water Pumped	Yearly Gross Expenditure at Pumping Station	Pumping Station cost per 1000 gals. (using Gross Expenditure)	Total Yearly Water Costs (net Expenditure of Water Ordinary and Gross Expenditure of Water Pumping Station)	Total Yearly Cost per 1000 Gallons
1927	198,168,000	18,040.65	9.10 cents	$24,636.62	13.0 cts.
1928	192,890,000	18,245.05	9.46 cents	26,122.73	13.5 cts.
1929	195,590,000	17,722.44	9.00 cents	32,142.34	16.4 cts.
1930	204,405,000	16,791.22	8.21 cents	22,752.37	11.1 cts.
1931	187,164,000	16,425.55	8.8 cents	24,559.10	13.0 cts.
1932	171,032,000	16,915.58	9.9 cents	21,313.47	12.5 cts.
1933	175,050,000	16,483.67	9.5 cents	20,390.82	11.6 cts.
1934	202,720,000	15,999.50	7.9 cents	22,468.12	11.1 cts.
1935	197,641,000	16,251.61	8.1 cents	27,123.25	13.6 cts.
1936	193,450,000	17,189.21	8.8 cents	24,825.91	12.6 cts.
1937	187,008,000	19,678.21	10.5 cents	27,079.42	14.5 cts.
1938	181,558,000	19,239.49	10.6 cents	26,138.53	14.4 cts.
1939	199,662,000	18,144.43	9.1 cents	25,023.84	12.5 cts.
1940	203,975,000	22,503.35	11.3 cents	28,634.84	14.0 cts.
1941	222,255,000	19,474.56	8.8 cents	24,370.12	11.0 cts.
1942	257,205,000	23,400.09	9.1	28,385.58	11.0 "

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

The following chart gives a graphic comparison of water pumping station costs for the years 1940 and 1941.



WATER PUMPING STATION COSTS 1940 AND 1941.

THIS MARGIN RESERVED FOR BINDING.

IF SHEET IS READ THIS WAY (HORIZONTALLY) THIS MUST BE TOP.
IF SHEET IS READ THE OTHER WAY (VERTICALLY) THIS MUST BE LEFT-HAND SIDE.

Table compiled from Daily Pumping Station Charts
Year 1941, showing water pumped and material
and machinery used in pumping

Total Hours Month	Month of	Gallons Water Pumped	Coal Lbs.	K.W.H.	Hours power Supplied by Maritime	Low Lift Pump Hours run #1 Motor	Low Lift Pump Hours run #2 Motor	Low Lift Pump Hours run Steam	Service Pumps Hours run #1 Motor	Service Pumps Hours run #2 Motor
744	December /40	17,505,000	70,200	27,700	744		608½		2 hr. 10 min.	742
744	January /41	19,385,000	75,100	29,700	744		664¾		15 min.	744
672	February /41	16,795,000	67,200	28,400	672		585¼		55 min.	672
744	March /41	18,075,000	55,800	26,400	744	146	498		40 min.	744
720	April)41	18,270,000	40,800	29,900	720		614		1 hr. 50 min.	720
744	May /41	20,380,000	25,800	26,800	744		648	5 min.	693 hrs.	51 min.
720	June/41	20,095,000	9,900	28,300	720	392½	265	20 min.	720 hrs.	10 min.
744	July /41	20,175,000		27,900	744	660		25 min.	744 hrs.	
744	August /41	18,205,000		26,600	744	625¾		15 min.	744 hrs.	
720	September /41	16,840,000	8,700	26,500	720	591¼			720 hrs.	30 min.
744	October /41	18,275,000	26,800	26,100	744	614			744 hrs.	20 min.
720	November /41	18,210,000	42,000	27,100	720	144	464¼		720 hrs.	3 hr. 45 min
8760		222,255,000	422,300	331,400	8760	3173½	4347¾	1 hour 5 min.	5090 hrs. 50 min.	36 min. 3627 hrs.

At the conclusion of this report I am inserting the following table:-

TABLE SHOWING PRINCIPAL PURCHASES OF MATERIAL USED BY DEPARTMENTS HERE BEFORE MENTIONED

Material	Amt. Purchased in 1941	Average Price f.o.b. F'ton	Amount now in Stock
4" Soil pipe	60 feet	55¢ per foot	
4" Terra Cotta Pipe	0		
5" Terra Cotta Pipe	865 feet	30¢ per foot	560 feet
6" Terra Cotta Pipe	0		
8" Terra Cotta Pipe	250 feet	42½¢ per foot (car load lot) 60¢ per foot (less than car load lot)	
10" Terra Cotta Pipe	0		
12" Terra Cotta Pipe	357½ feet	75¢ per foot	
15" Terra Cotta Pipe	0		
20" Terra Cotta Pipe	0		
24" Terra Cotta Pipe	0		
10" Corrugated Iron Pipe	0		
12" Corrugated Iron Pipe	0		
18" Corrugated Iron Pipe	0		
24" Corrugated Iron Pipe	0		
30" Corrugated Iron Pipe	0		
36" Corrugated Iron Pipe	0		
Portland Cement	2819 bags	70¢ - 75¢ per bag	
Dynamite 50%	0		
Brick	17,800	$16 - $18 per 1000	
Crushed trap rock ¾ size	417 tons	$1.50 per ton	200 tons
Stone Dust	13 tons	50¢ per ton	10 tons
Gravel (Pit)	1993½ yards	85¢ per yard	80 cu. yds.
Calcium Chloride	5 tons	$32.86 per ton	
Road Machine Blades	26	$6.81 - $7.65 per blade	
Lime	7800 lbs.	$4.08 f.o.b. F'ton	2000 lbs.
Alum	89,600 lbs (44.8 Tons)	$1.71 f.o.b. F'ton	11 Tons
Coal (Running of Mine) Minto	11 cars (526.75 Tons)	$5 - $5.52 per ton	
(Springhill)	2980 lbs.	$9.75 per ton	
Colas	0		
Primer M C 1	5160 gallons	13½¢ - 15¢ per gallon	
Asphalt - Pre Mixed Pavement	3627 tons	$3.36 per ton in place	
Tarvia	0		
R C 3	5991 gallons	13½¢ a gal. f.o.b. F'ton (tank car)	1900 gallons
M C-1	5160 gallons	13½¢ - 15¢ per gallon	
5/8" Copper Tubing	2640 feet	14.42¢ per foot	1320 feet
3/4" Copper Tubing	660 feet	19.09¢ per foot	
1-in. Copper Tubing	0		
10" Cast Iron Pipe	0		1 jt. - 12 ft.
8" Cast Iron Pipe	0		3 jt. - 36 ft.
6" Cast Iron Pipe	0		9 jt. -108 ft.
4" Cast Iron Pipe	0		2 jt. - 24 ft.
Fittings for above 10-8-6-4	0		
Lumber	8115 feet	$32 - $42 per 1000	
	123 pieces	flatened Jack Pine or Cedar $1.00 per piece	
Lead	62 lbs.	$8.75 per 100 lbs.	
Elm trees	30	$1.75 per tree	

Material	Amount Purchased in 1941	Average Price f.o.b. F'ton	Amount Now in Stock
3/4" Galvanized Pipe	88 ft. 7 in.	10.23¢ - 13¢ per foot	
1- in. Galvanized Pipe	4 ft. 6 in.	10¢ per foot	
1¼" Galvanized Pipe	25 ft. 10 in.	19.33¢ - 23¼¢ per foot	
Sewer Rods	150 feet	$124.20	225 feet
1 Diesel Auto Patrol (equipped with doors, lighting system, cab)		$6,668.50	
1 Truck (1938 Ford 2 Ton truck, chassis & cab)		$307.00	
1 Truck (1941 Inter. Model K5, 159" W.B. Cab and Chassis)		$1545.00	
5/8" x 3/4" Trident Meters	15 meters	$13.93 per meter	
Gate Valves 6"	3	$32.50 per valve	2 vlaves
Gate Valves 4"	1	$18.53 per valve	2 valves
Lead Pipe (1"-¾"-5/8")	2008 lbs.	$10.51 per 100 lbs.	2008 lbs.
Moody Drag Saw complete with 2 saw blades		$200.00	
Catch Basin (covers and frames)	19	$24.47	
Manhole covers	6	@ 4½¢ per lb. & freight	

INSTALLATION OF WATER SERVICES YEAR 1941.

March 7 - 13	Barbour Co (Sprinkler System)		Phoenix Sq,	
" 31-- Apr.1	Barbour Co.		Phoenix Sq.	Relaid
Apr. 26	National Defence		Carleton St.	New
" 29 - 30	Alvah Good,(Corner of Church & George St.)			New
May 7 - 8	A. McNutt,		Argyle St.	New
May 9 - 10	L. W. Bailey,(Corner Charlotte ' University Ave.			Relaid
May 12 - 13	Mundle,		Woodstock Road	New
May 13 - 15	Hughes	614	Brunswick St.	Relay
May 21 - 22	U. N. B.			New
May 26 - 29	Kitchen, H. G.	274- 6	Saunders St.	Relaid
June 9 - 10	Murchland, Ken		Victoria St.	New
June 11	Frank Foster,		Charlotte St.	Relaid
June 12 - 13	Jas. Doohan,	779	Aberdeen St.	New
June 13 - 18	Batt, C. E.		University Ave	New
June 18 - 24	O. B. Miller,		University Ave.	New
June 24 - 26	Kitchen, H. G.	235	Brunswick St.	Relaid
July 3 - 7	G. T. McKnight,		University Ave.	New
July 17 - 18	H. Nason,	673	Scully St	elaid
Aug. 5 - 6	Oak Hall Bldg,		Queen Street	Relsid
Aug. 9	Hazen Dunphy		Victoria Mills	New
Aug. 13 - 15	Barker,	207	Smythe St	Relaid
Aug. 15 - 16	R. McNutt,		Charlotte St.	Relaid
Aug. 22	H. Gorman,	677	King St.	Relaid
Aug. 25 - 26	Mrs Millican,		Waterloo Row	Relaid
Sep. 2 - 3	H. Watts,	619	Scully St.	Relaid
Sep. 3 - 4	Royden Colter	421	King St.	Relaid
Sep. 4 - 5	Davis,	359 - 61	York St.	Relaid
Sep. 27 - 28	King, John		Graham Lane	New
Oct. 22 , 23 24.	Victoria Hospital Nurses Home 155 Smythe St.			Relaid
Nov.3-4-5-6	J.W.Whittingham		Maryland Hill	New
Nov 13-14	Thomas Hughes		198 Woodstock Road	New
Nov.17-18	K.Golding		828 Brunswick Street	Relaid
Nov. 22	Baptist Parsonage		421 George Street	Relaid
Nov.24th	Barker, L. W.		98 Carleton Street	Relaid
Nov.26-27-28	Globe Laundry		676 Queen Street	Relaid

Installation of Domestic Sewer Services, Year 1941,

Jan. 29 - 30	Geo. W. Coy,	North'land St.	Dug Out
Mar. 17	Lewis Barker,	Carleton St,	Dug Out
Apr. 29 - 30	Alvah Good,	(Corner of Church & George St.)	New
May 1 - 5	Royal Mills,	York St.	New
May 7 - 8	A. McNutt,	Argyle St.	New
May 19	Gorman,	108- 110 North'land St.	Dug Out
May 22 - 26	Imperial Oil Co.	Regent St.	Relaid
June 9 - 10	Murchland, Ken	Victoria St.	New
June 10	Keenan, Mrs.	527 Charlotte St.	Dug Out
June 12	Doohan, Jas.	779 Aberdeen St.	New
June 13 - 18	Batt, C. E.	University Ave	New
June 18	O.B. Miller	University Ave.	New
June 23	Nat. Defence	Carleton St.	New
July 3 - 7	G. T. McKnight,	University Ave	New

Aug. 16 - 19, Extension of Main Sewer on Aberdeen St

Sept. 27 - 28	King John	Graham Lane	New
Nov. 3 - 4 - 5 - 6	J.W.Whitingham	Maryland Hill	New
Nov. 13-14	Thomas Hughes	198 Woodstock Road	New
Nov.19-20	E.B.Savage	319 kingStreet	New
Nov.29th	Thomas Fraser	267 Smythe St.	Dug Out

	Water Services	Steam Thawing Machine	
Jan. 30/41	Between Charlotte & Needham St,	York St.	$ 8.35
Feb. 3 "	For National Defence		5.40
" 8 "	McAdam,	512 George St.	8.25
" 14 "	Bishop Morehead	Brunswick St.	5.40
" 17 "	Swedes,	King St.	8.95
" 18 "	Swedes,	King St.)	
" " "	Golding,	828 Brunswick St.)	11.90
		Total	48.25

April 16, 1941, Electric Thawing Machine at Aula Cabins, 2.40

Domestic Sewerage — Steam Thawing Machine

Jan. 28, 1941,	River View Service Station,		Regent St.	$ 6.30)
" 28 "	Geo. W. Coy,		Northumberland St.	)
" 29 "	Geo. W. Coy,		" "	2.25
" 30 "	Athertons,	299 Campbell	St.	3.70
Feb. 3 "	R. C. Church	Brunswick St		1.80
" 18 "	River View Service Sta.		Regent St.	1.70
" 26 "	Eastern Bakieries		King Street	4.95
" 27 "	Main Sewer		Argyle St.	7.80
Mar. 18 "	Main Sewer		Winslow St.	13.90
" 21 "	Main Sewer		University Ave.	13.60
Feb. 3 1941	River View Service Sta.		Regent St.	3.60
		Total		59.60