CITY ENGINEER'S REPORT

1913-14 1914-15 1915-16

CITY WORKS DEPARTMENT

BOARD OF CONTROL 1913-14-15.

F. P. BLIGH, *Mayor, Chairman.*
R. V. HARRIS — W. F. O'CONNOR.
C. R. HOBEN, — M. SCANLAN, JR.

1915-16.

P. F. MARTIN, *Mayor, Chairman.*
JAMES HALLIDAY — JOHN McKEEN
GEO. F. HARRIS — JOHN MURPHY

OFFICIALS.

F. W. W. DOANE, M. Can. Soc. C. E. . . *City Engineer.*
H. W. JOHNSTON, M. N. S. Soc. E. . . . *Deputy City Engineer.*
A. R. McCLEAVE, M. N. S. Soc. E. . . . . *Assistant Engineer.*
(1) T. W. J. LYNCH, Jun. N. S. Soc. E. . . . *Surveyor and Draughtsman.*
(2) W. J. DeWOLFE. . . . . *Junior Asst. Engineer.*
MISS HELEN M. DUSTAN. . . . . *Stenographer and Accountant.*

WATER WORKS.

(3) EWEN MORRISON. . . . . *Superintendent.*
(4) DANIEL J. McLEAN. . . . . *Asst. Superintendent.*
W. P. MORRISCEY. . . . . *Plumbing Inspector.*
ARTHUR L. SMITH. . . . . *Meter Foreman.*
JOHN E. BURNS. . . . . *Meter Inspector and Asst. Plumbing Inspector.*
W. H. DANIELS. . . . . *Service Foreman.*

STREETS, SEWERS, ETC.

(5) JOHN McDONALD. . . . . *Superintendent.*
(6) JAMES DOWNIE. . . . . *Asst. Superintendent.*

OFFICE.

(7) JAMES J. HOPEWELL. . . . . *Clerk of Works.*
(8) A. F. MESSERVEY. . . . . *Clerk of Works.*
MISS MINNIE HUNTER. . . . . *Asst. Clerk of Works.*

Notes.

(1) Employment terminated August 5, 1915.
(2) Appointed August 13, 1915.
(3) Deceased Feb. 27, 1916.
(4) Appointed Supt. March 16, 1916.
(5) Superannuated May 1, 1914.
(6) Appointed Supt. May 1, 1914.
(7) " City Treasurer Feb. 10, 1916.
(8) " March 9, 1916.

City Engineer's Office, City Hall,

Halifax, May 1st, 1916.

To His Worship the Mayor,

Sir:—I have the honor to submit a report on the public works of the City under the supervision of the City Works Department for the civic years 1913-14-15 and 16.

War conditions affecting the City Engineering staff have made it practically impossible to prepare the necessary records on time but they are now brought up to date.

WATER WORKS.

Amt. of funded debt on water account	$1,368,441.00
" transferred from revenue	96,000.00
" of funded debt redeemed by sinking fund	8,000.00
" " " " " revenue	30,000.00
" " " " " premiums on loans	4,073.33
	$1,506,514.33
Total cost of water works to Apr. 30, 1916	1,505,395.04
Balance on hand Apr. 30, 1916	1,119.29
Amt. paid into sinking fund in excess of debt redeemed	95,437.76

COST OF MAINTENANCE.

	1913	1914	1915
Interest	$ 56,130.99	$ 58,324.53	$60,193.36
Sinking Fund	6,277.49	7,348.04	7,963.74
Maintenance of System	41,373.92	42,909.60	42,992.68
	$103,782.40	$108,582.17	$111,149.78

As the statement shows, the cost of Maintenance is naturally increasing from year to year, but the revenue keeps pace with any average increase in maintenance cost. At the same time, a reduction in rates without any regard to probable increase in demand for the future, is a financial error in judgment. The rate should not be cut down so far that revenue and expenditure will just balance. There should

always be ample margin on the maintenance side so that the legitimate demands of the service can be met without any fear of a balance on the wrong side of the account.

This is not intended as a recommendation for extravagance but the legitimate demands of the service should come first, and the rate is so low that nothing should be left undone to give the consumers the best supply possible, and to maintain the whole system so that it will be beyond criticism. There are some absolutely necessary expenditures, as, for instance, the acquiring of pollutted lands on the watershed which should be met without delay, and any surplus in revenue should be preserved until such expenditures are provided for.

Renewals and Repairs.

All necessary work during the three years was attended to as usual, and the system maintained in its usual condition.

New Work.

All petitions which complied with the regulations, were granted and extensions made on the usual conditions.

Meters.

The policy already established by the City Council was carried out and meters installed on all new services. In addition, meters were installed wherever property owners petitioned for them and on special, large pipes.

Condition of Supply.

In the last published annual report (for 1912-13) the statement was made that the High Service system continues to supply satisfactorily since the installation of meters. Since that date, the reservoir on Shaffroth's Hill has been completed and the High Service supply has been doing better still.

Your Engineer is fully aware that this statement will be contradicted. Paradoxical as it may seem, both contentions are correct. The supply in the High Service system is unsatisfactory, to-day not through any failure in the meters to accomplish what they were intended to accomplish or in the reservoir to perform the service it was intended to perform, but because the legitimate demand in the High Service system has so increased that it has begun to exceed the supply. The statement is again made, most emphatically, that the meters accomplished the purpose for which they were installed.

When the installation of meters was decided upon, the consumption in the High Service system was reaching 2,300,000 gallons a day. The consumption was reduced by the installation of the meters so that some months the daily average consumption was 1,000,000 gallons less a day than the quantity named, or 1,300,000 gallons. It is stated, without fear of successful contradiction, that by no other possible means could such a result have been accomplished. Further, the Reservoir has served to equalize the supply. which is exactly what it was recommended to do, and not to increase the supply. It was never stated by your Engineer that the reservoir would increase the quantity of water supplied to consumers.

The criticism that is being made now is, that notwithstanding the installation of the meters and the reservoir, the supply is as bad as ever. No engineer or practical man in his sober senses would claim that the improvement indisputably made by the installation of the meters and the construction of the reservoir, could be maintained in the face of the increase in the demand. In the last ten years there has been an increase in population in the High Service district of from 60 to 75%. The consumption of water in the High Service district has increased in the same proportion. This is a legitimate increase, one that cannot be avoided and one that must be provided for in the future. Notwithstanding the fact that the number of consumers has almost doubled. the high service system is giving a better supply to-day than it did twenty years ago. It can

be fairly claimed, then, that the installation of the meters and the construction of the reservoir, has accomplished far more than was claimed by the most sanguine supporters of the improvements.

Estimating as carefully as possible with the data we have from year to year, the population of the City has increased in the last five years about 10,000. It is estimated that about three-quarters of this additional population is in the High Service district. This increase has caused a more rapid change than usual, because it is a much more rapid increase in growth than the City of Halifax ever experienced before. We are facing, therefore, the necessity for an increase in supply which cannot be made by a conversation of the existing high service supply.

The Board of Control have asked for a report on the cost of a pumping plant for improving the high service supply, and a report was made on March 1, 1916, recommending that such a plant be located on the City property near the Incinerator. The 27-inch low service main and the railway line pass through this property. A pump installed there could be connected with the High Service system without much difficulty, and the water pumped from the low service main directly into the high service system, or to the reservoir, as might be desired. The plant would be available in case of fire or when the water is turned off the high service system. Surplus steam from the boilers at the Incinerator could be used as far as practicable. Such a pumping plant would enable the Water Department to maintain the pressure in the High Service system during the cold weather, which is the season when the greatest demand is made upon the service, but under present conditions an improvement would be made in the high service system at the expense of the low service system. The latter is unsatisfactory now, and for the same reason as already given for the decrease in efficiency, in the high service system the low service system must continue to decrease in efficiency, although the increase in population in the low service system is not as rapid as on the high service district.

The higher parts of the low service district have very weak pressure now, and in cold weather it practically disappears. Pumping from the low service main during the cold weather would take the water away from these districts entirely and transfer the unsatisfactory conditions from the high service system to the low service. If, however, the low service system were entirely metered, as the high service is, there should be ample water available to supply a pump for years without affecting the efficiency of the low service system.

If the conditions of waste in the low service system are allowed to continue as at present, the main will not carry the water fast enough to supply the waste and increase the pressure also. A pumping plant would be required only to provide water to waste, as the reservoir maintains a satisfactory service except during cold snaps or when there are serious leaks in the main pipes. What the reservoir loses during the day, is replaced during the night.

Purity of Supply.

Typhoid Outbreak

During the season of 1913 there was an outbreak of typhoid fever in the City, which threatened to be serious. As soon as notice was received that conditions were alarming, the construction of apparatus to apply hypochlorite of calcium to the water supply, was begun, and as soon as it was ready, it was put in operation. At first it was regulated to discharge into the supply main at the rate of three pounds per million gallons, 24 hours. Later, the quantity was increased gradually to six pounds and as complaint began to be general, the quantity was reduced somewhat. It was continued until the cold weather, when the disease disappeared.

Again in 1914 there was a slight outbreak, but it did not reach serious proportions.

There has been a great deal of speculation as to the cause of the outbreak. Some of the medical profession have decided that it is beyond question that it was conveyed through the water supply. Typhoid can be communicated by ice, milk infection, contact, drinking infected surface or spring water, it may be contracted outside the City and brought in, or it may be conveyed by birds or fowls, flies, foodstuffs and other carriers. It can be readily contracted by bathing in sewage infected water.

In the reports made to the City Health Board, the Doctors decided that it must have been the water supply, but to do so, they ignored conditions which even they, cannot satisfactorily explain.

The first cases of typhoid occurred in June and the medical report stated that they were undoubtedly of outside origin. The two medical reports appended, base their conclusion, one on the analysis of the water supply, the other on the alleged finding that there had been a typhoid case on the watershed.

To deal with the analysis first, the condition of the water in the high service supply was found to be satisfactory, yet the first cases occurred in houses supplied with high service water; further, the outbreak was not located all over the low service system but a large section of the City south of Spring Garden Road, where all classes are supplied with the low service water, had practically no cases at all. The analysis of the water, in the opinion of your Engineer, is by no means conclusive in fixing the source, as he is confident that intestinal organisms can be found in the low service water every season during the period of low water and warm weather, yet we never had such an outbreak before. The doctor who confidently convicted the low service system, admitted that it was difficult to account for the cases on the high service supply, but dismisses it with two reasons, which he assumes are conclusive, namely—

First, that the two services were united about the 1st of September.

Second, that for a short space the main of the high service system passes through the low service lake and in another place a brook which flows into the low service, flows over the high service main.

Respecting the first, when any valve between the high and low service systems is opened, there is always heavy pressure in the high service system and a very low pressure in the low service system; consequently, the flow is always from the high into the low and could not possibly be reversed.

Second, where the pipe passes under the lake, the water had not been turned off during the season and is under a pressure of not less than 35 or 40 pounds, so that it would be equally impossible for the water of the lake to flow into the pipe, even if there were a leak in the pipe. For a similar reason, the water of the brook could not enter the high service main, as it was not turned off during the period of the outbreak of the disease, and being always under pressure, the water of the brook could not enter it even if there were a leak in it.

It is to be regretted that a more thorough investigation was not conducted so that the real cause of the outbreak could have been determined and demonstrated to the satisfaction of all. However, the fact remains, as already stated, that owing to the conditions of the watershed of the low service lakes, it is a practical certainty that during every season, intestinal organisms are carried into the lakes by the streams flowing from Beech Hill and the neighborhood of houses on other parts of the watershed.

While such conditions exist, it will be impossible to combat the sentimental belief, backed up by the assertion of the doctors, whether logical or otherwise, that the watershed is the cause of any outbreak of typhoid. We should be absolutely sure, as far as it is within our power to make it so, that any such menace is removed. Even if there were no

danger of disease resulting from such conditions, the sentimental objection is not lessened, and your engineer would strongly recommend that the City acquire, as early as possible, all properties on the watershed which are near water courses flowing into the lakes. The cost is really of little importance, when compared with the danger to life.

Samples of the water were analyzed in Sept. 1915 with the following results.—

Clinical and Physical Examination.

	High	*Low.*
Colour	Slightly Yellow	Slightly yellow
Odour	None	None
Deposit	Floceulent	Flocculent
Reaction	Neutral	Neutral
Hardness	110.88 parts per million	92.18 parts per million
Chlorine	6.5 " " "	7 " " "
N. as Nitrates	Not estimated	Not estimated
N. as Nitrates	" "	" "
Free Ammonia	0.0045 parts per million	0.007 parts per million
Albuminoid Ammonia	" " "	" " "
Albuminoid Ammonia	0.1083 " " "	0.208 " " "
Required Oxygen	4.4 " " "	4.9 " " "

Bacteriological Examination.

Agar Plates

	21 per C Cm.	46 per C. Cm.
Average number of colonies on Gelatine Plates	Not tried	Not tried.

Cultures on McConkey's medium.
B. Coli was not present in either of the samples.
Microscopic examination of deposit
Deposit was entirely vegetable matter.

(Sgd.) A. G. NICHOLLS, M. D.
Provincial Pathologist.

Pavement on Hillsides.

The City is paying a considerable sum every year for the renewal of roadways washed out by the heavy rains, which could be spent to far better advantage in interest on the cost of paving with some kind of more permanent material, the most important hillside streets.

Water bound macadam is not only a poor material to withstand the wash of the heavy rains, but is also very unsatisfactory in dry weather. The binding material dries under the summer sun and wind so that it is ravelled by the calks of the horses' shoes as they climb the hills, and blown away entirely by the wind or washed out by heavy rain. Loose stones are raked or swept off and the wearing surface of the road more or less gradually disappears. This process is repeated over and over again and nobody is satisfied with the expenditure except for a few days after the street is repaired.

A new hillside catchpit is to be tried out this year, which it is expected will prevent the water from running farther than the nearest street corner, but at certain seasons of the year, temporary obstructions on the street, cause the water to leave the gutter. Falling leaves are the worst trouble but a single newspaper or a paper bag will sometimes cause the water during a storm or heavy down-pour, to leave the gutter and tear up the roadway.

The only real cure or prevention is the paving of the roadway with a material that will not wash out. The Bitulithic pavement laid on the hills has been voted a failure by every critic. There seems to be no sheet pavement which can be made satisfactory for hillside roadways. The Rocmac laid on Sackville Street, while it has more permanency than the water-bound macadam, has not stood as well as the tar concrete laid between Barrington and Granville Streets on Sackville and Prince Streets. Before any programme is adopted for paving hillside streets, all the different materials which are looked on with favor for such roadways, should be tried out where traffic conditions are most severe, as in the selection of the paving material which will be satisfactory, after all it is the general public who really make the choice.

The same material will not be satisfactory for every street; for instance, the laying of granite blocks on Cogswell Street seems to have been satisfactory, and observation of

the traffic from time to time does not indicate any dissatisfaction on the part of the owners of traffic vehicles. On the other hand, on North Street between Lockman Street and the station there has been a great deal of criticism.

There are so-called hillside block pavements; concrete pavements, with steel strips to catch the calks of horses' shoes; paving setts laid in different ways; bituminous macadam; Rocmac; Hassam and other materials; the best of which should be tried out before a recommendation could be made safely. There is so much difference of opinion among roadway experts, that it is not safe to reach a decision in any other way. The problem, however, should be solved without delay, as the dust nuisance can never be reduced until the hillside streets are permanently paved.

Sewers.

The statement appended gives detailed information respecting the sewers constructed since the last report. The construction of the proposed intercepting sewer along the Arm, to dispose of the sewage of the western slope of the City was obstructed by inconsistent legislation with which the City Engineer was unable to comply. An effort was made to obtain repeal of the amendment but without success. During the session of Parliament this year, an amendment has been obtained which makes it possible for the City to proceed with this work which is becoming more urgent every year. The merits of the different proposals have been dealt with in former reports, and it is unnecessary to go further into details at this stage.

Internal Health.

The Incinerator contract was completed by Longard Brothers and the plant handed over to the City after a thorough test had been made. It was demonstrated that the plant was capable of carrying out the claims of the contractors, but at the same time it was shown that the conditions of garbage collection in Halifax were such that the

collection would have to be made and disposed of in less than twelve hours, and that consequently the temperature of the Incinerator could not be kept up to the desired degree for best service during the whole twenty-four hours. This means that night soil cannot be disposed of satisfactorily until the quantity of garbage to be consumed is sufficient to operate the Incinerator during the whole 24 hours. As it would not be economical to run the plant by private fuel for the remainder of the twenty-four hours, a recommendation was made that provision be made on the public property between Bell Road and Summer Street for a flush tank to dispose of night soil into the main sewer passing the property This has been approved, and appropriation provided and the work ordered.

Streets.

The usual average length of concrete sidewalks with curb and gutter usually of concrete, were laid during the three seasons. No important street extensions were made, and the extension of paved roadways, a considerable area of which work was ordered, was postponed in consequence of the outbreak of the war.

In severing my connection, temporarily at least, with the City Works Department, with which I have been connected for one-quarter of a century, I desire to place on record my sincere appreciation of the assistance I have had from the members of the Council and the officials and especially from those more intimately connected with the work of the Department. While such work must always be difficult, the burden of the official is lightened by ready support from those who are in a position to give it. I gratefully acknowledge the generous share of such support which has been accorded.

Respectfully submitted,

F. W. W. DOANE, *City Engineer.*

Certificate No. 23.

This is to Certify that the lines of railway of the Halifax Electric Tramway Company, Limited, situate on the streets hereinafter specified, to wit—

Beginning at a point on Gottingen Street near to and South of Cunard Street; thence running northerly along Gottingen Street to Kaye Street.

Also Beginning at a point on Hollis Street at Morris Street; thence running southerly along Hollis Street to the South side of South Street, being all the single track constructed by the Halifax Electric Tramway Company, Limited on the above named streets between the points mentioned, under authority of a permit granted by the City Engineer dated June 13th, 1912, have been constructed to my satisfaction.

F. W. W. DOANE,
City Engineer.

I, Frederick P. Bligh, Mayor of the City of Halifax, do hereby approve of the above certificate.

F. P. BLIGH,
Mayor.

Dated at Halifax, seventeenth day of April, 1914.

Certificate No. 24.

This is to Certify that the lines of railway of the Halifax Electric Tramway Company, limited, situate on the streets hereinafter specified, to wit—

Morris Street between Pleasant and Hollis Streets
Hollis Street between Salter and Prince Streets,
Buckingham St. between Granville and Brunswick St.
Brunswick St. between Buckingham and Cogswell St.
Cogswell St. between Brunswick and Gottingen St.

Gottingen St. between Cornwallis and Cunard St,
Cunard Street between Gottingen and Agricola Streets
Agricola Street between Cunard and West Streets and between Charles and Almon Streets,
Almon Street between Agricola and Windsor Streets,
Windsor Street between Almon and Quinpool Road
Quinpool Road between Windsor Street and Oxford St.
Oxford Street between Quinpool Road and Coburg Road.

being all double track constructed by the Halifax Electric Tramway Company, Limited, on the above named streets between the points mentioned under authority of a permit granted by the City Engineer of the City of Halifax dated Apr. 19th, 1912.

have been constructed to my satisfaction.

(Sgd.) F. W. W. DOANE,
City Engineer.

I, Frederick P. Bligh, Mayor of the City of Halifax, do hereby approve of the above certificate.

(Sgd.) F. P. BLIGH,
Mayor.

Dated at Halifax, seventeenth day of April, 1914.

BUILDING PERMITS.

Month	1913–14 New Bldgs. No.	1913–14 VALUE	1913–14 Alterations No.	1913–14 VALUE	1914–15 New Bldgs. No.	1914–15 VALUE	1914–15 Alterations No.	1914–15 VALUE	1915–16 New Bldgs. No.	1915–16 VALUE	1915–16 Alterations No.	1915–16 VALUE
May.....	17	$51100	38	$16900	20	$61875	50	71101	23	$107200	37	$6070
June.....	18	113700	31	21500	14	46300	53	14307	27	100400	46	2128
July.....	14	191900	29	9500	34	142900	49	32125	16	64000	40	64817
Aughst.....	11	31000	29	16350	6	19400	11	1200	15	50100	27	1877
September..	5	9700	26	28900	3	10348	17	6152	17	65350	25	4570
October....	15	136800	33	28700	12	55700	22	10060	11	126850	56	8465
November..	8	21700	22	23700	11	33800	27	14855	12	73400	40	16850
December..	6	26300	10	7900	6	28000	20	49600	31	116500	34	10628
January....	5	9300	10	1910	4	13400	5	5700	5	20600	9	4280
February...	4	13500	5	800	5	14700	17	24130	5	11000	25	5580
March.....	18	110300	27	5275	13	42100	35	19458	1	1200	12	3122
April.....	20	174700	28	8955	20	67000	24	58890	23	73250	48	22774
	151	890000	398	170390	148	535523	330	307578	186	809850	399	151161

Total Value 1913-14 equals $ 1060390.00
" 1914-15 " 844061.00
" 1915-16 " 961011.00

VIOLATIONS OF THE LAW REPORTED TO THE CITY SOLICITOR DURING 1913-1914-1915.

Date	Owner	Street	Remarks.
1913			
Jan. 16	G. A. Wootten	Robie	Encroaching on bldg. line.
" 16	A. Webber	Brunswick	Repairing bldg. without permit.
Mar. 13	G. A. Wootten	Robie	2nd report.
June 14	A. Webber	Brunswick	"
Aug. 8	F. Reardon	Sackville	Erecting bldg. without permit.
" 19	Wm. Orr	Gottingen	Houses encroaching on street.
Sep. 5	Cook Construction Co	Millers Fields	Erecting 4 houses without permit.
" 5	H. V. Wier	South Park	Step encroaching on street.
Dec. 9	John H. Duff	Robie	Erecting bldg. without permit and in violation of Building Act.
1914			
Mar. 27	Robert Davie, Sr.	E. Young	Erected bldg. without permit.
" 30	Sydney Drysdale	Quinn	Erected bldg. without permit.
Apr. 14	Foster Geizer	Quinn	Erected stable without permit.
" 30	C. A. Proctor	Dutch Village Rd	Erected house without permit.
May 11	Lynch's Ltd	Campbell Rd	Installed boiler without permit.
" 19	Wm. Orr	Gottingen	Houses encroaching on street—2nd report.
June 1	W. J. Hopgood	Argyle	Erected 2 boilers and smoke oven without permit.
" 12	St. Mary's College	Windsor	Constructed addition without permit.
July 6	Mr. McDowell	Jubilee Road	Erecting barn without permit.
" 6	T. H. Andrews	Stairs	Erecting 3 houses without permit
" 6	W. Duff	Robie	Chimney does not conform with Act.
Aug. 14	Thompson & Theakston	Cherry	Completing bldg. without inspection of floors.

VIOLATIONS OF THE LAW REPORTED TO THE CITY SOLICITOR DURING 1913-1914-1915.

Date	Owner	Street	Remarks.
1915			
Feb. 12	Mr. Webber	Proctor	Doing work in violation of Act.
Mar. 9	Dennis Realty Co	Argyle	Erected wood covering to water tower in violation of Act.
" 24	Monaghan	Shirley	Altering bldg. without permit.
May 12	Chas. Andrews	Stairs	Erecting bldg. without permit and violation of the Act.
June 8	W. J. Ward	Cornwallis	Altering and extending bldg. with out permit and in violation of Act
" 26	J. L. McDuff	312 Robie	Erecting bldg. in violation of garage ordinance.
" 30	R. P. Bell	Bloomingdale Ter.	Erected foundation in violation of Act.
July 23	W. Jeans	Duffus	Erecting house without permit.
" 28	Hfx. Hotel Co	Hollis	Erecting canopy on street without permit.
Sep. 24	Dept. Mil. & Def.	Cogswell	Erecting bldg. in violation of the Act and without permit.
Oct. 20	Mrs. Andrews	Edward	2nd Report
" 26	W. J. Ward	46 Cornwallis fit.	2nd Report.
Nov. 6	E. Gibson	LeMarchadt	Erected bldg. in violation of Act.
" 12	C. M. Saunders	Yukon	Erected bldg. without permit.
" 29	Pliskon & Kitz	44 Cornwallis	2nd report.
Oct. 30	C. AuCoin	Up. Water	Encroachment—windows.
1916			
Jan. 28	Allison Ltd.	Gottingen	Erected bldg. without permit.
Mar. 8	East. Inv. Corporation	Harvard	Ditto.
Apr. 3	Dept. Mil. & Def.	Bedford Row	Erected 2 bldgs. without permit and in violation of the law.
" 12	Jewish Synagogue	Proctor	Erecting Building without permit and in violation of the law.
" 27	Archibald King	Lot No. 9 Kings Place	Erecting bldg. without permit.

NEW MAINS LAID 1913-1914-1915.

STREET	FROM	TO	Service	CAST IRON MAIN PIPE 6" Feet	9" Feet	12" Feet	15" Feet	20" Feet	Joints	COST.
1913										
Almon	West of Robie	Walker	H	....	590	....	....	....		$ 1053 30
Connaught Ave	End of pipe	Jubilee Rd	L	....	39	....	....	....		231 93
Creighton	" "	Northwardly	H	60	....	....	....	....		155 17
Jubilee Rd	Connaught	Eastwardly	L	....	145	....	....	....		469 43
" "	"	Westwardly	L	285	....	....	....	....		865 61
" "	Chestnut	Eastwardly	H	72	....	....	....	....		121 04
" "	Louisburg	Westwardly	H	519	....	....	....	....		340 97
Kline	Oak	Chebucto	H	802	....	....	....	....		2278 81
Longard	West Young	Opp. No. 93	H	....	....	....	....	1972	Turned and Bored	9087 91
Oxford	End of pipe	Fleming Gate	L	....	....	144	....	....		954 90
Seaforth	Windsor	Westwardly	H	450	....	....	....	....		565 67
South	Wellington	Robie	L	....	....	1000	....	....		1798 38
Stairs	End of pipe	Eastwardly	H	420	....	....	....	....		526 23
Summit	" "	Westwardly	H	27	....	....	....	....		47 96
Waegwoltic	Oxford	"	L	240	....	....	....	....		319 $9\frac{2}{0}$
West Young	Kempt Rd	"	H	....	....	....	350	....		917 $0\frac{0}{0}$
Totals for year 1913				2875	774	1144	350	1972		$19714 23
1914										
Almon	Windsor	Westwardly	H	450	....	....	....	....		406 92
Cabot	End of pipe	Foundry	H	460	....	....	....	....		772 96
Chebucto	Connolly	Swaine	H	365	....	....	....	....		985 49
Cherry	End of pipe	Eastwardly	H	96	....	....	....	....		77 72
Clifton	" "	Northwardly	H	120	....	....	....	....		121 30
Cork	Oxford	Eastwardly	H	662	....	....	....	....		1664 08
**Fern Lane	End of pipe	Northwardly	H	54	....	....	....	....		47 24
Henry	N. of Binney	Northwardly	H	48	....	....	....	....		88 88
Ivanhoe	Inglis	Southwardly	L	236	....	....	....	....		242 14
Jubilee Rd	End of pipe	Eastwardly	L	108	....	....	....	....		167 24
Kane	Agricola	Longard Rd	H	497	....	....	....	....		566 48
Livingstone	Agricola	Gottingen	H	910	....	....	....	....		1162 51
London	Oxford	Westwardly	H	744	....	....	....	....		1159 21
"	End of pipe	"	H	36	....	....	....	....		37 02
Longard Rd	Opp. No. 93	Opp. Reservoir	H	....	....	....	....	348	Turned and Bored	2064 71
" "	Main pipe	Reservoir	H	....	....	....	....	160		893 86
Morris	LeMarchant	Dal. College	H	424	....	....	....	....		555 59
Oxford	West Young	Chebucto Rd	H	....	....	....	2832	....		12857 80
Oxford	Quinpool Rd	"	H	....	....	....	1638	....		4692 55
Payzant	Lilac	Westwardly	H	18	....	....	....	....		158 41
Preston	Jubilee Rd	Southwardly	H	....	....	....	489	....		1387 00
Robie	South	Southwardly	H	480	....	....	....	....		663 53
West Young	End of pipe	Oxford	H	....	....	....	456	....		1360 99
Totals for year 1914				5708			5415	508		$32133 99
1915										
Almon	End of pipe	Westwardly	H	76	....	....	....	....		124 03
Beech	Oak	Northwardly	H	408	....	....	....	....		1011 85
Bloomingdale	Quinpool Rd	S. of Norwood	L	1207	....	....	....	....		2834 45
Charles	Gottingen	Westwardly	H	174	....	....	....	....		197 65
Cork	Dublin	Eastwardly	H	128	....	....	....	....		259 18
Cornwall	Oxford	"	H	535	....	....	....	....		615 97
*Dundonald	Queen		L	157	....	....	....	....		257 76
Henry	Binney	Northwardly	H	44	....	....	....	....		68 24
Henry	S. of Cedar	Southwardly	H	120	....	....	....	....		117 31
Ivanhoe	End of pipe	"	L	36	....	....	....	....		57 69
Jubilee	Oxford	Westwardly	L	....	382	....	....	....		1169 66
"	End of pipe	Eastwardly	H	45	....	....	....	....		99 68
Kings Place	"	St. Albans	H	160	....	....	....	....		202 52
Lawrence	"	Westwardly	H	30	....	....	....	....		79 35
Larch	Jubilee Rd	Payzant	L	991	....	....	....	....		1078 92
"	Payzant	Southwardly	L	109	....	....	....	....		352 78
Merkel	Gottingen	Westwardly	H	307	....	....	....	....		654 57
Mott	Seldon	"	H	199	....	....	....	....		458 $0\frac{2}{0}$
NorthCreighton	Kane	S. of Cabot	H	1453	....	....	....	....		1278 47
Oxford	Chebucto Rd	Southwardly	H	....	....	....	103	....		501 $4\frac{8}{0}$
Payzant	Lilac	Larch	H	186	....	....	....	....		170 52
Pepperell	Louisburg	Eastwardly	H	637	....	....	....	....		366 44
Pepperell	Oxford	Preston	HL	695	....	....	....	....		1008 $8\frac{8}{0}$
Preston	Jennings	S. of Watt	H	....	....	....	370	....		1599 $0\frac{0}{0}$
Rosebank	Connaught	Northwardly	L	337	....	....	....	....		727 $6\frac{7}{0}$
School	End ofpipe	Southwardly	L	18	....	....	....	....		48 $0\frac{5}{0}$
Stanley	Longard Rd	Eastwardly	H	....	....	312	....	....		676 $4\frac{7}{0}$
Stanley	Gottingen	North Creighton	H	....	470	....	....	....		651 $7\frac{7}{0}$
St. Alban	Kings Place	Westwardly	H	174	....	....	....	....		133 $5\frac{8}{0}$
St. Alban	Clifton	Eastwardly	H	24	....	....	....	....		43 $7\frac{4}{0}$
Totals for year 1915				8250	852	312	473			$16845 $7\frac{1}{0}$

*4" Pipe. ** 3" Pipe.

STREET MAINS REPLACED WITH LARGER MAINS

1913-1914-1915.

LOCATION			Size in inches		Length in feet	Cost.
Street	From	To	Old	New		
1913						
Almon	Robie	220′ West	6	9	220	$ 407 10
Bilby	Robie	Agricola	4, 6	9	420	699 37
Hollis & Water	Salter	Jacob	4,6,9	12	2576	8476 43
Robie	May	West Young	6	15	2105	6444 20
Robie	Quinpool Rd.	South	6	15	3888	13059 95
South	Robie	Seymour	6	15	700	2155 40
Windsor	W. Young	Southwardly	6	9	24	86 87
Young (West)	Longard	Kempt	6	15	216	565 92
Young (West)	350′ W. Kempt	Dublin	6	15	1705	4467 10
1914						
Coburg Rd.	Le Marchant	Lilac	9	15	972	2203 26
Lilac	Coburg Rd	Payzant	6	15	340	1329 21
Le Marchant	South	Coburg Rd	6	15	1310	3470 27
Preston	Quinpool	Southwardly	9	15	216	1004 34
South	Robie	Westwardly	12	15	48	286 27
South	Seymour	Le Marchant	6	15	320	1179 99
1915						
Preston	Shirley	Jubilee Rd.	6	15	1200	3790 34

Total Length (in feet) of Cast Iron Water Mains in the Water Supply System of the City of Halifax.

	Size of Pipe in Inches.											
	27	24	20	15	12	9	8	6	4	3	Less than 3	Total Length in feet
Length Dec. 31-1912.....	14560	20524	6732	47788	43235	50086	663	158029	34439	29548	898	406502
Laid 1913-1914-1915.....	.....	.....	2480	6238	1456	1626	....	16632	157	54	.....	28648
Taken up 1913-1914-1915...	.....	.....	....	.....	48	2013	....	13063	1035	.....	.....	16159
Hydrant Pipes.....	.....	.....	....	.....	.....	.....	....	32	.....	.....	.....	32
Total to Dec. 31-1915.....	14560	20524	9212	54026	44643	49699	663	161630	35317	29602	898	419023

Equal to 79 1903-5280 miles.

N. B. Pipe from Main to Hydrant (except on wharves) laid previous to 1897 not included in above summary.

PIPES CLEANED BY MECHANICAL SCRAPERS 1913

Date	Location	Diam. of Pipe in in inches	Length cleaned in feet	Recleaned
Aug. 27	High Service	20″ 15″	6712 29628	$ 26 69

LENGTH OF SERVICE PIPES LAID DURING 1913.

Size	½″	¾″	1″	2″	Total length in feet
New	66	230	63	553	7525 ft.
Renewed	2643	53	53		2749 "

912

VALVES SET DURING 1913.

Street	Location	Size	Service
Connaught Ave	N, of Jubilee Rd. N. E. Cor. 55'6"	9	Low
Hollis	N. of Prince St. N. E. Cor. 17'6"	12	Low
"	Appraiser's Office E. side 12'10"-15'11"	4	Low
"	Province Bldg. to W. line 29'	3	Low
"	South of S. Line Cheapside 19'6"		
Jubilee Rd	Cor. Chestnut St. N. E. Cor. 20'	6	High
"	W. Cor. Louisburg	6	High
"	E. of Connaught Ave. N. E. Cor. 19'6"	9	Low
"	W. of Connaught Ave N. W. Cor. 24'	6	Low
Kline St	N. of Oak E. line 26"	6	High
"	S. of Chebucto Rd. S. E. Cor. 28'10"	6	High
Longard Rd	Between 6" x 20" S. E. Cor. 44'7" N. E. Cor. 35'	6	High
Longard Rd	Cor. Stanley S. E. Cor. 22'3"	20	High
Longard Rd	N. S. West Young 266'	15	High
Livingston	E. of Longard Rd. N. E. Cor. 25'	6	High
Robie	N. side Morris St. N. W. Cor. 30'7" N. of Cor 1'9"	15	High
Robie	S. side Cob'g Rd to curb W. side 5'10"	15	High
"	N. side Jubilee Rd. N. W. Cor. 19'7"	15	High
"	S. side Bloomfield St. S. E. Cor. 21'8"	15	High
Sackville	Hollis St. E. side line 21'6" S. of N. line 15'	9	Low
Seaforth	W. of Windsor St. N. W. Cor. 29' S. W. Cor 278'	6	High
South	E. side W. of Seymour-S. W. Cor 26'6"	15	High
South	E. Cor Robie—S. W. Cor. 26'6"	12	Low
South	W. of Welling. S. W. Cor. 18"E. 2'4"	12	Low
Stairs	Cor. Creigh. St. N. W. Cor, 24 W. of N. E. Cor. 60'	6	High
Waegwoltic Ave	W. of Oxford St. S. W. Cor. house 66'6" W. of W. cor. H. 13'6"	6	Low
Water	N. of Buckingham to E. side wall 14'1" N. 6'	12	Low
"	S. of Jacob S. W. Cor. 14'4"	12	Low
Windsor	Cor. West Young S. E. Cor. 21'8"	9	High

VALVES REPLACED—1913.

Street	Location	Old	New	Service
Almon	W. of Robie St. N. E. Cor. N. side Door 32' E. of cor. 2'	6	9	High
Bilby	Cor. Agricoln N. W. Cor 20'6"	6	9	High
"	Cor. Robie St, N. E. Cor. 17' E. O. 6'	4	9	High
Hollis	Cor. Sackville, S. E. Cor. 19'3"	6	12	Low
"	N. Cor. Sackville N. E. Cor. 17'11"	4	12	Low
"	S. of Prince, S. E. Cor. 17'6"	4	12	Low
"	S. of George S. E. Cor 19'6"	6	12	Low
"	N. of George, N. E. Cor. 19'6"	4	12	Low
"	S. of Duke, S. E. Cor. 19'	4	12	Low
"	N. of Duke, N. E. Cor. 18'8"	4	12	Low
Longard Rd	Cor. West Young to fire plug 15'10" N 3'10".	6	15	High
North	W. of Robie St. S. E. Cor. 20'2"	6	9	High
"	E. of Clifton St. S. W. Cor. 19'6"	6	9	High
"	W. of Clifton St. S. E. Cor. 22	6	9	High
Robie	Cor. South N. W. Cor. 27'9" in line cor. h'se.	6	15	High
"	Cor. Spr. Gar. Rd. to west side curb 5'10"	6	15	High
"	Cor. May S. E. Cor. 27'6"	6	15	High
"	Cor. Almon N. E. Cor. 22'8"	6	15	Hihg
"	N. Cor. Almon N. E. Cor. 21'8"	6	15	High
South	W. of Robie N. W. Cor. to house 27'9" in line. with porch	6	15	High
Young (W)	E. of Windsor N. E. Corner 21'3"	6	15	High
"	W. of Windsor to S. W. Cor. 21'10"	6	15	High

VALVES REMOVED.

Robie Street	Cor. College	6		
" "	North of May	6		

SERVICE PIPES LAID, 1913.

No.	Name of Owner or Agent	Locality of Premises	No. of Stopcocks	Size	Purpose for which water is intended
1	John F. Corston	N. side Lawrence	7913	½	Dwelling
2	Marshall Bros	E. " Maynard	7914	2	Laundry
3	T. I. Williamson	E. " "	7915	½	Dwelling
4	Geo. Henderson	S. " Kenny	7916	"	"
5	S. A. Smith	S. " South	7917	"	"
6	Jas. Barnes	N. " Charles	7918	"	"
7	Geo. A. Fraser	W. " Louisburg	7919	"	"
8	Margy. Rocket	E. " Henry	7920	"	"
9	D. Hennigan	" " "	7921	"	"
10	H. H. Holland	S. " Waverley Ter	7922	¾	Can. Bioscope
11	H. S. Freeman	W. " Edward	7923	½	Dwelling
12	Geo. J. Hilchie	S. " North	7924	"	"
13	F. Smeardon	" " "	7925	"	"
14	A. Burbridge	" " Lawrence	7926	"	"
15	A. Wootten	W. " Windsor	7927	"	Shop
16	Wm. Smith	E. " Agricola	7928	"	Dwelling
17	John R. Snow	S. " South	7929	"	"
18	R. E. Carmichael	" " Lawrence	7930	"	"
19	M. Pettipaw	E. " Brussels	7931	"	"
20	W. J. Ward	N. " York	7932	"	"
21	Mark Moors	" " Duncan	7933	"	"
22	Wm. Duff	E. " Robie	7934	"	"
23	C. H. Cornish	" " Beech	7935	"	"
24	Rich. Giles	S. " Morris	7936	"	"
25	Mrs. Murphy	" " Stairs	7937	"	"
26	S. McAulay	W. " Henry	7938	"	"
27	A. J. Penny	" " Robie	7939	"	"
28	H. Martin	S. " Almon	7940	"	"
29	F. A. Garrigan	" " Bilby	7941	1½	"
30	J. Mosher	W. " Seymour	7942	½	"
31	Geo. E. Publicover	E. " Maynard	7943	"	"
32	Robie Isnor	W. " Agricola	7944	"	"
33	J. M. Butler	S. " Gerrish	7945	"	"
34	Gray & Flinn	" " Quinpool Rd	7946	"	"
35	S. Baker	N. " Seaforth	7947	"	"
36	Fred Greenough	E. " Henry	7948	"	Dwelling & Shop
37	D. P. McNeil	S. Side Pepperell	7949	"	"
38	Dr. Lewis Saunders	W. " Oakland	7950	"	"
39	H. V. Wier	E. " South Park	7951	"	"
40	Wm. Cumberlee	N. " Livingston	7952	"	"
41	Gab. Pitcher	" " Chebucto Road	7953	"	"
42	W. H. McDowell	S. " Jubilee Road	7954	"	"
43	A. J. Hiltz	W. " Seymour	7955	"	"
44	G. E. Butler	E. " Wellington	7956	"	"

SERVICE PIPES LAID 1913—*Continued.*

No.	Name of Owner or Agent	Location of Premises	No. of Stopcocks	Size	Purpose for which water is used
45	W. B. Williams	" " Union	7957	¾	Dwelling
46	M. Leafot	" " "	7958	"	"
47	A. Hubley	W. " Windsor	7959	"	"
48	A. Hubley	" " "	7960	"	"
49	E. M. Lessell	E. " Vernon	7961	"	"
50	Chas. Kennedy	" " Agricola	7962	"	"
51	W. McT. Orr	W. " Gottingen	7963	"	"
52	A. Bellefontaine	E. " Edward	7964	"	"
53	T. L. E. Piers	S. " Jubilee Road	7965	"	"
54	I. Moser	W. " Seymour	7966	"	"
55	Wm. McT. Orr	W. " Gottingen	7967	"	"
56	" "	" " "	7968	"	"
57	Thos. Vail	S. " North	7969	"	"
58	Geo. A. Cox	E. " Preston	7970	"	"
59	C. L. Nicholson	W. " Longard Rd.	7971	"	"
60	Chas. Andrews	N. " Duffus	7972	"	"
61	J. F. Chisholm	W. " Edward	7973	"	"
62	Wm. Dunbrack	" " Atlantic	7974	"	"
63	J. Hubley	" " Agricola	7975	"	"
64	W. J. O'Toole	S. " North	7976	"	"
65	J. E. Furness	N. " Jubilee Rd.	7977	"	"
66	J. W. Keddy	S. " Cunard	7978	"	"
67	Mrs. Rockett	E. " Henry	7979	"	"
68	W. Clare	W. " Union	7980	"	"
69	H. S. Freeman	W. Side Edward St.	7981	"	"
70	J. J. Tanner	W. " Pepperell	7982	"	"
71	Geo. Hiseler	E. " Maynard	7983	"	"
72	Mr. Shrum	W. " Seymour	7984	"	"
73	Chas. Carmichael	S. " Lawrence	7985	"	"
74	Mrs. Gibson	W. " Church	7986	"	"
75	W. H. McDowell	S. " Jubilee Rd.	7987	"	"
76	W. Goodwin	W. " Longard Rd.	7988	"	"
77	A. Tuura	E. " "	7989	"	"
78	H. A. Rozee	E. " Windsor	7990	"	Shop & Dwelling
79	T. A. Sullivan	W. " Maynard	7991	"	Dwelling
80	Jas. Vaughan	E. " Albert	7992	"	"
81	Geo. A. Cox	E. " Preston	7993	"	"
82	H. H. Stanford	W. " Lucknow	7994	"	"
83	A. C. Theakston	S. " Cherry	7995	"	"
84	A. C. Theakston	S. " "	7996	"	"
85	N. Evans	N. " "	7997	"	"
86	J. S. Parker	S. " West Young	7998	"	"
87	A. Young	S. " Almon	7999	"	"

SERVICE PIPES LAID 1913—*Continued.*

No.	Name of Owner or Agent.	Location of Premises	No. of Stopcocks	Size	Purpose for which water is used
88	Geo. J. Hiseler	E. " Maynard	8000	¾	"
89	J. Fripps	N. " Atlantic	8001	"	"
90	Jas. Downey	E. " Harvard	8002	"	"
91	F. Greenough	E. " Henry	8003	"	Shop & Dwelling
92	G. A. Wootten	W. " Gottingen	8004	"	Dwelling
93	G. A. Wootten	W. " "	8005	"	"
94	F. A. Shaw	E. " Louisburg	8006	"	"
95	A. Bellefountaine	N. " Mott	8007	"	"
96	H. Matharn	E. " Agricola	8008	"	"
97	W. J. O'Toole	S. " North	8009	"	"
98	Geo. A. Wootten	E. " Brussell	8010	"	"
99	Gray & Flinn	S. " Quinpool Rd	8011	"	"
100	A. Fry	S. " Jubilee Rd	8012	"	"
101	Thos. Day	N. " Fenwick	8013	"	"
102	Eli Evans	W. " Fern	8014	"	"
103	Citk & Sub. R. Est Co	S " Quinpool Rd	8015	"	"
104	Jas. Hillis & Son	E " Veith	8016	"	Foundry
105	C. F. Longley	W. " Louisburg	8017	"	Dwelling
106	W. J. O'Toole	S. " North	8018	"	"
107	W. J. O'Toole	S. " "	8019	"	"
108	W. J. O'Toole	S. " "	8020	"	"
109	David Gray	W. " Seymour	8021	"	"
110	W. J. O'Toole	S. " North	8022	"	"
111	B. Boutilier	S. " Stairs	8023	"	"
112	Chas. Andrews	N. " "	8024	"	"
113	Chas. Andrews	S. " "	8025	"	"
114	Chas. Andrews	S. " "	8026	"	"
115	Alfred Payne	E. " LeMarchant	8027	"	"
116	P. J. Hartnett	N. " Chebucto Rd	8028	"	Shop & dwelling
117	Jn. W. Brookfield	N. " Atlantic	8029	"	Garage
118	W. J. O'Toole	E. " Gladstone	8030	"	Dwelling
119	F. Hollowell	E. " Longard Rd	8031	"	"
120	J. S. Parker	W. " " "	8032	"	"
121	H. E. Hebb	E. " Seymour	8033	"	"
122	Chas. Burbridge	S. " Summit	8034	"	"
123	David Gray	W. " LeMarchant	8035	"	Flats
124	J. W. Keddy	S. " Cunard	8036	"	"
125	J. W. Keddy	S. " "	8037	"	"
126	Frank Little	W. " Oakland	8038	"	Dwelling
127	F. W. Killam	N. " Russell	8039	"	"
128	A. Hobrecker	W. " Wellington	8040	"	"
129	A. Hobrecker	" " "	8041	"	"
130	Minnie M. Haling	" " Edward	8042	"	"

SERVICE PIPE LAID 1913—*Continued.*

No.	Name of Owner or Agent	Location of Premises	No. of Stopcocks	Size	Purpose for which water is used
131	D. P. McNeil	N. " Pepperell	8043	¾	"
132	D. P. McNeil	S. " "	8044	"	"
133	D. J. Hennigan	W. " Henry	8045	"	"
134	A. A. Burbridge	S. " Duncan	8056	"	"
135	Ticket Office	N. " Dart. Wharf	8047	"	Office
136	Rhodes & Curry	N. " West Young	8048	"	Factory.
137	D. P. McNeil	S. " Pepperell	8049	"	"
138	M. Kline	W. " Windsor	8050	"	"
139	A. O. H.	N. Side Quinpool Rd	8051	"	Hall
140	John Wright	E. " Union	8052	"	Dwelling
141	Robert Shute	E. " Edward	8053	"	"
142	John F. Ryan	W. " Oxford	8054	"	"
143	Jas. Kirkwood	E. " Tower Road	8055	"	"
144	John Brinton	W. " Wellington	8056	"	"
145	John Brinton	W. " "	8057	"	"
146	John Brinton	W. " "	8058	"	"
147	John Brinton	W. " "	8059	"	"
148	P. W. Maxner	S. " Duncan	8060	"	"
149	A. S. Austen	S. " Cherry	8061	"	"
150	J. W. Carmichael	N. " Allen	8062	"	"
151	J. E. Butler	E. " Wellington	8063	"	"
152	J. McElmon	S. " West Young	8064	"	"
153	Rhodes, Curry Co	E. " Clifton	8065	"	Warehouse
154	W. E. Hebb	E. " Seymour	8066	"	Dwelling
155	P. Hartnett	N. " Chebucto Rd	8067	"	"
156	P. Hartnett	N. " " "	8068	"	"
157	Wm. Hanrahan	W. " Harvard	8069	"	"
158	Elizabeth Sutherland	" " Brussell	8070	"	"
159	A. D. Mackintosh	E. " Creighton	8071	"	"
160	A. J. Davis	S. " North	8072	"	Laundry
161	Thos. R. Sheridan	W. " Fern	8073	"	Dwelling
162	A. P. Calnan	W. " S. Bland	8074	"	"
163	Margt. O'Connor	S. " Inglis	8075	"	"
164	E. E. Silliker	E. " Oxford	8076	"	"
165	Isaac Creighton	N. " Duffus	8077	"	"
166	A. G. Cross	S. " Allen	8078	"	"
167	Margt. Rockett	E. " Henry	8079	"	"
168	H. Lother	E. " "	8080	"	"
169	H. S. Freeman	W. " Edward	8081	"	"
170	I. Clark	E. " Kline	8082	"	"
171	Stephen, James	W. " Kline	8083	"	"
172	D. Fader	E. " Kline	8084	"	"
173	Wm. Henrion	W. " Harvard	8085	"	"

SERVICE PIPE LAID 1913—*Continued.*

No.	Name of Owner or Agent	Location of Premises	No. of Stopcocks	Size	Purpose for which water is used
174	Thos. Buckley	W. " Kline	8086	¾	"
175	Geo. Venato	E. " Kline	8087	"	"
176	C. L. Evans	E. " "	8088	"	"
177	W. Slaughenwhite	W. " "	8089	"	"
178	Johnston	W. " "	8090	"	"
179	Chas. Nicholson	W. " "	8091	"	"
180	C. S. Dawes	E. " "	8092	"	"
181	A. C. Cross	S. " Allen	8093	"	"
182	C. Gray	E. " Kline	8094	"	"
183	C. A. Jackson	W. " Beech	8095	"	"
184	Wm. Ware	N. " Jubilee Rd	8096	"	"
185	City & Sub. R. Est Co	N. " Pepperell St	8097	"	"
186	W. Ward	E. " Maynard	8098	"	"
187	W. W. Varita	N. " Cedar	8099	"	"
188	G. B. Low	E. " Waterloo	8100	"	"
189	Moirs Ltd	W. " Albemarle	8101	2	Stables
190	W. Mitchell	E. " South Bland	8102	½	Dwelling
191	J. S. Parker	N. " Cedar	8103	"	"
192	J. S. Parker	N. " "	8104	"	"
193	L. D. Payzant	W. " Agricola	8105	"	Bank.
194	A. Cox	N. " Jubilee Rd	8106	"	Dwelling
195	Mrs. M. Mann	E. " Edward	8107	"	"
196	Thom. & Theakston	N. " Waegwoltic Ave.	8108	"	"
197	A. Cox	N. " Jubilee Road	8109	"	"

NEW HYDRANTS.

Street	Locatiod	Design	Service	Size of Pipe in Inches	Length of Pipe in Feet	No. of Nozzles	Distance Valve from Hydrant	Cost
Robie.....	Cor. Binney.....	City	H	6"	4	3	2.11	$ 99.64
Robie.....	Cor. W. Young.....	"	"	"	4	"	8.6	104.92
Longard Rd...	Cor. Kane.....	"	"	"	11	"	8.0	109.12
Almon	300' W. of Robie.....	"	"	"	....	"	4.10	.....
Jubilee Rd....	Op. Connaught Ave..	"	L	"	27	"	....	180.78

PIPE STOCK ON HAND DECEMBER 31, 1913.

Description	Length of Each in Feet	No. of Pieces	Diam. in Inches	Weight of One in Lbs.	Total Weight	Value in Cents per Lb.	Total Value
Cast iron pipe T&B Class A.....	12	2	27	2870	5740	1½	$ 110 44
" " " B	12	3	27	3206	9618	"	168 10
" " " C.....	12	1	27	3658	3658	"	64 01
" " T&B.....	12	6	24	2360	14160	"	247 80
" " "	12	56	20	1263	70728	2½	2091 38
" " "	12	270	15	1360	367200	"	8262 00
" " "	12	201	12	968	194568	"	4377 78
" " "	12	20	9	680	13600	"	306 00
" " Plain.....	9	14	10	550	7700	1½	134 75
" " "	9	2	8	386	772	"	13 51
" " T&B.....	12	....	6	378	.....	2½	36 36
" " "	12	8	4	202	1616	"	36 36
" " "	9	609	4	156	94004	"	2115 09
	1192				783364		$17963 58

PIPE—SPECIALS.

No. of Pieces	Diameter	Description	Weight of One in Lbs.	Total Weight	Cost per Lb.	Total Cost
11	27	Thimbles	624	6864	2½	$ 154 34
2	27	Bell Mouth	831	1662	"	27 39
13	27	Bevel Collars	795	10335	"	210 05
1	27	Plain Specials Class A	404	404	1½	7 05
1	27	" " B	404	404	1½	7 05
1	27	" 3' long " B	460	460	"	8.05
1	27	" 3' long " B	700	700	"	12 25
1	27	" 4' " " B	920	920	"	16 10
1	27	" 5' " " B	1248	1248	"	21 84
2	27	" 6' " " B	1360	2720	"	47 20
2	27	" 3' " " C	820	1640	"	28 70
1	27	" 4' " " C	1068	1068	"	18 69
1	27	" 5' " " C	1332	1332	"	23 31
5	27	Saddles 2'7" x 6"	70	350	3	10 50
1	24	Bevel Collar	688	688	2½	15 48
8	24	Thimbles	396	3168	"	71 28
6	24	Split Thimbles	620	3720	2½	93 00
1	24	Cap	290	290	2½	6 32
1	24	Saddle 2'4" x9"	125	125	3	3 75
2	24	Saddle 2'4" v 6"	70	140	"	4 20
1	20	Thimble	230	230	2½	5 75
1	20	Split Thimble	453	453	"	11 32
1	20	Three-way Branch 20 x 20 x 20	1766	1766	2½	39 73
1	20	Four-way Branch 20 x 20 x 6 x 6	1052	1052	"	23 67
1	15	" " 15 x 15 x 15 x 15	987	987	"	22 21
1	15	" " 15 x 15 x 9 x 9	880	880	"	19 80
12	15	" " 15 x 15 x 6 x 6	720	720	"	18 82
6	15	Three " 15 x 15 x 15	850	5100	"	114 75
3	15	" " 15 x 15 x 12	720	2160	"	48 60
1	15	" " 15 x 15 x 9	680	680	"	15 30
20	15	" " 15 x 15 x 6	620	12400	"	279 00
2	15	Y's	1112	2224	"	50 04
1	15	Reducing to 9"	469	469	"	10 55
				41586		$1055 92

PIPE—SPECIALS.

No. of Pieces	Diameter	Description	Weight of One in Lbs.	Total Weight	Cost per Lb.	Total Cost
1	15	Reducing to 12"	490	490	2½	$ 11 02
6	15	Split Thimbles	260	1360	2½	34 00
2	15	Saddles 15" x 6"	67	134	2½	33 00
4	15	Saddles 15" x 3"	55	220	"	4 95
7	12	Four-way Branches 12 x 1* v 12 v 12	615	4205	"	94 61
4	12	" " 12 v 12 v 9 x 9	500	2000	"	45 00
4	12	" " 12 v 1* v 6 x 6	475	1900	"	42 75
10	12	Three " 12 x 12 x 12	524	5240	"	127 92
2	12	" " 12 v 12 x 6	469	938	"	21 10
9	12	Thimbles	160	1440	"	32 40
1	12	Reducing to 9"	240	240	"	5 40
12	12	Split Thimbles	222	2664	2½	66 60
2	12	Saddles 12" v 6"	100	200	2½	4 50
3	12	" 12" x 4"	90	270	"	6 07
1	12	" 12" x 2"	43	43	"	97
2	9	Six-way Branches 9 v 9 v 9 x 3 v 3	450	900	"	20 25
5	9	Four-way " 9 x 9 x 9 v 9	400	2000	"	45 00
2	9	Three-way " 9 v 9 x 6	335	670	"	15 07
5	9	" " 9 x 9 x 6	335	670	"	15 07
5	9	" " 9 v 9 x 9	355	1774	"	39 94
1	9	Reducing 9" to 6"	157	157	"	3 53
1	9	" 9" to 3"	130	130	"	2 92
12	6	Four-way Branch 6 v 6 v 6 x 6	255	3060	"	69 10
30	6	Three-way Branch 6 x 6 x 6	209	6290	"	130 17
4	6	" " 6 x e x 4	300	800	"	18 00
12	6	Offsets	140	1680	"	37 80
34	6	Thimbles	75	2550	"	57 37
12	6	Split Thimbles	92	1114	2½	27 85
5	6	Bends	140	700	2½	15 75
3	6	Y's	209	627	"	13 11
4	6	Caps	19	76	"	1 71
6	6	Reducing to 4"	114	684	"	15 39
5	6	Reducinp to 3"	110	550	"	12 37
17	4	Four-way Branches 4v 4	123	2090	"	47 02
4	4	Three-way " 4 x 4	114	456	"	10 26
5	4	Y's	96	460	"	10 35
2	4	Reducing 4" to 3"	84	168	"	3 78
6	4	Offsets	66	426	"	9 58
3	4	Bends	88	264	"	5 94
8	4	Thimbles	29	232	"	3 22
5	4	Split Thimbles	64	320	2½	7 20
7	3	Crosses	90	630	2½	14 17
2	3	Three-way Branches	60	120	"	2 70
8	3	Thimbles	29	232	"	5 22
2	3	Bends	48	96	"	1 86
4	3	Split Thimbles	48	192	2½	4 80

VALVES.

No. of Pieces	Diam. in Inches	Description	Weight of One in Lbs.	Weight of Whole	Value of Each	Total Value
1	20	Stopcock	....	....	.....	.....
2	15	"	....	....	$ 70 00	$140 00
6	12	"	....	....	53 00	106 00
....	9	"	....	....	25 75	.....
52	6	"	....	....	20 00	1040 00
17	4	"	....	....	15 00	255 00
1	3	"	....	....	12 00	12 00
1	12	Regulating valve	....	....	206 66	206 66
1	6	" "	....	....	103 33	103 33
14	1	Service stopcocks	....	....	2 50	35 00
13		" "	....	....	2 00	26 00
14		" "	....	....	1 50	21 00
90		Curb stopcocks	....	....	1 50	135 00
1	15	Gun Metal Spindles	28	28	16 80	16 80
1	12	" "	19	19	11 40	11 40
1	9	" "	14	14	8 40	8 40
11	6	" "	9	99	5 40	59 40
1	4	" "	6	6	3 60	3 60
1	3	" "	4	4	2 40	2 40

MISCELLANEOUS.

No.	DESCRIPTION	Value of each	Total Value
1	Electric Motor	.....	$ 203 00
1	Pipe Tapping Machine	.....	127 00
1	" " "	.....	100 00
1	5 H. P. Steam Engine and Pump	.....	625 00
3	Derrick Winches	$ 7 00	21 00
2	Hand Winches	8 00	16 00
2	Platform Scales	25 00	50 00
1	Boring Machine	.....	80 00
1	2" to 6" Pipe Cutting Machine	.....	22 10
4	Lathes	.....	250 00
5	Pressure Gauges	10 00	50 00
	Tape Packing for Meters	.....	40 00
	Blacksmith's Tools	.....	160 00
			$1744 70