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Annual report

Chicago (Ill.). Dept. of Public Works

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FORTIETH ANNUAL REPORT

OF THE

Department of Public Works

FOR THE YEAR ENDING
DECEMBER 31, 1915

To the CITY COUNCIL *of the*
CITY OF CHICAGO

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THE CITY COUNCIL

WILLIAM HALE THOMPSON,
Mayor.

JOHN SIMAN,
City Clerk.

EDWARD J. PADDEN,
Chief Clerk.

ALDERMEN—1915-1916

1st Ward—
John J. Coughlin
Michael Kenna

2nd Ward—
Hugh Norris
Oscar De Priest

3rd Ward—
Nathaniel A. Stern
Edward J. Werner

4th Ward—
John A. Richert
David R. Hickey

5th Ward—
Thomas A. Doyle
Charles Martin

6th Ward—
Willis O. Nance
Alex. A. McCormick

7th Ward—
John N. Kimball
Chas. E. Merriam

8th Ward—
Ernest M. Cross
John E. Tyden

9th Ward—
Eugene H. Block
Hiram Vanderbilt

10th Ward—
James McNichols
Frank Klaus

11th Ward—
C. F. Pettkoske
E. F. Cullerton

12th Ward—
Rudolph Mulac
Otto Kerner

13th Ward—
Frank H. Ray
John R. Anderson

14th Ward—
Jos. H. Smith
James H. Lawley

15th Ward—
W. E. Rodriguez
Henry Utpatel

16th Ward—
John Szymkowski
Vincent S. Zwiefka

17th Ward—
S. S. Walkowiak
Lewis D. Sitts

18th Ward—
William J. Healy
Carl T. Murray

19th Ward—
James B. Bowler
John Powers

20th Ward—
Henry L. Fick
Herman E. Miller

21st Ward—
Hugo Krause
Ellis Geiger

22nd Ward—
John H. Bauler
Wm. P. Ellison

23rd Ward—
John Kjellander
Thos. O. Wallace

24th Ward—
John Haderlein
Herman E. Gnadt

25th Ward—
Frank J. Link
Henry D. Capitain

26th Ward—
George Pretzel
William F. Lipps

27th Ward—
Oliver L. Watson
John C. Kennedy

28th Ward—
M. J. Dempsey
Harry E. Littler

29th Ward—
Frank McDermott
John Hrubec

30th Ward—
Wm. R. O'Toole
Wm. J. Lynch

31st Ward—
Henry P. Bergen
James A. Kearns

32nd Ward—
James Rea
Albert J. Fisher

33rd Ward—
M. A. Michaelson
Robert M. Buck

34th Ward—
John Toman
Joseph C. Blaha

35th Ward—
Thos. J. Lynch
Conrad H. Janke

WILLIAM H. BROWN,
Sergeant-at-Arms.

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PAST COMMISSIONERS OF PUBLIC WORKS

WATER BOARD

1851-54—John B. Turner, Prest., Horatio G. Loomis, Alson S. Sherman.
1854-56—James H. Woodworth, Prest., John C. Haines, George W. Dole.
1856-58—Geo. W. Dole, Prest., Orrington Lunt, John C. Haines.
1858-60—Geo. W. Dole, Prest., Orrington Lunt, Noah Sturtevant.
1860-61—Orrington Lunt, Prest., Edward Hamilton, Benjamin Carpenter.

SEWERAGE BOARD

1855-59—Wm. B. Ogden, Prest., James D. Webster, Sylvester Lind.
1859-61—James D. Webster, Prest., Sylvester Lind, Philip Conley.
Water and Sewerage Boards merged May 6, 1861, into

BOARD OF PUBLIC WORKS

1861-63—Benjamin Carpenter, Prest., John G. Gindele, Frederick Letz.
1863-65—Francis C. Sherman, Mayor, ex-officio member of the Board.
1863-67—John G. Gindele, Prest., Frederick Letz, Orrin J. Rose.
1865-69—Wm. Gooding and Roswell B. Mason, members of the Board in matters pertaining to the cleansing of the river.
1867-69—Aug. H. Burley, Prest., Wm. H. Carter, John McArthur.
1869-71—John McArthur, Prest., Wm. H. Carter, Redmond Prindiville.
1869-71—Wm. Gooding and Edward B. Talcott, members of the Board in matters pertaining to the cleansing of the river.
1871-73—Wm. H. Carter, Prest., Jas. K. Thompson, Redmond Prindiville.
1873-76—Redmond Prindiville, Prest., Louis Wahl, Jas. K. Thompson.
Board of Public Works abolished September 18, 1876, and on the same date there was established by the City Council

THE DEPARTMENT OF PUBLIC WORKS

1876-78—Monroe Heath, Mayor, Acting Commissioner.
January 7 to May 18, 1879—E. S. Chesbrough.
May 19, 1879, to October 18, 1881—Charles S. Waller.
October 19, 1881, to February 4, 1882—Carter H. Harrison, Mayor, Acting Commissioner.
February 4, 1882, to January 31, 1886—Dewitt C. Cregier.
February 1, 1886, to June 28, 1886—Carter H. Harrison, Mayor, Acting Commissioner.
June 28, 1886, to April 11, 1887—W. H. Purdy.
April 12, 1887, to April 15, 1889—George B. Swift.

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April 16, 1889, to April 27, 1891—W. H. Purdy.
April 28, 1891, to December 24, 1892—J. Frank Aldrich.
December 24, 1892, to April 25, 1893—E. Louis Kuhns, Acting Commissioner.
April 25, 1893, to November 21, 1894—Hiram J. Jones.
November 21, 1894, to November 28, 1894—John A. Moody, Acting Commissioner.
November 28, 1894, to April 8, 1895—John McCarthy.
April 8, 1895, to July 20, 1896—William D. Kent.
July 20, 1896, to April 15, 1897—Joseph Downey.
April 16, 1897, to May 21, 1901—L. E. McGann.
May 21, 1901, to May 24, 1905—F. W. Blocki.
May 24, 1905, to March 1, 1906—Jos. M. Patterson.
March 1, 1906, to April 15, 1907—Wm. L. O'Connell.
April 16, 1907, to May 9, 1910—John J. Hanberg.
May 9, 1910, to April 17, 1911—B. J. Mullaney.
April 18, 1911, to April 26, 1915—L. E. McGann.

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DEPARTMENT OF PUBLIC WORKS
CITY OF CHICAGO

W. R. MOORHOUSE,
Commissioner

WM. BURKHARDT,
Deputy Commissioner

HEADS OF BUREAUS

City Engineer..... JOHN ERICSON

Harbor Master..... .....ADAM F. WECKLER

Superintendent of Sewers.....GEO. E. McGRATH

Superintendent of Water..... WM. J. McCOURT

Superintendent of Streets..... WALTER G. LEININGER
(January 1 to November 8, 1915)

Acting Superintendent of Streets .....W. J. GALLIGAN
(November 9 to November 11, 1915)

Superintendent of Streets.....A. W. MILLER
(November 12 to December 31, 1915)

Superintendent of Compensation. .....H. V. McGURREN

City Architect..... CHARLES W. KALLAL

Superintendent of Maps and Plats..... .....JOHN D. RILEY

Department Chief Clerk.....JOHN A. KLEINE

Head Accountant.....CHAS. W. HIBBARD

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ANNUAL REPORT

COMMISSIONER OF PUBLIC WORKS

CITY OF CHICAGO

1915

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COMMISSIONER'S REPORT

OFFICE OF THE COMMISSIONER OF PUBLIC WORKS, CITY HALL

March 1, 1916.

The Honorable, The Mayor and City Council.

GENTLEMEN:—

As required by ordinance, I have the honor to submit herewith the Fortieth Annual Report of the Department of Public Works for the fiscal year ending December 31, 1915.

The total expenditures from authorized appropriations of the Department of Public Works for the year 1915, aggregate the sum of $15,093,091.01, accounted for as follows:

	Ordinary	Extraordinary	Total
Corporate fund.	$5,815,664.21	$ 111,108.12	$ 5,926.772.33
Bridge bond fund.....		795,756.78	795,756.78
Water Fund.	3,441,955.08	4,928,606.82	8,370,561.90
Total.....	$9,257,619.29	$5,835,471.72	$15,093,091.01

In addition to the total expenditures above indicated, expenditures aggregating $665,377.10 were certified during the year 1915 on construction contracts executed by the Department of Public Works for work done chargeable to authorized appropriations of other departments, as follows: Department of Health, $329,860.18; Department of Fire, $163,-640.33; Special Park Commission, $156,581.39; Municipal Market, $10,-233.20; Department of Gas and Electricity, $5,062.00.

411 contracts, aggregating $4,950,986.66, were entered into during the year 1915, as follows:

169 contracts for construction.....	$2,407,391.00
61 contracts for equipment.....	185,740.00
181 contracts for material and supplies.....	2,357,855.56

The following comparative statement of ordinary revenue and ordinary expense of the water works system shows a net decrease of ordinary revenue resulting from the operation of the water system in comparison with the revenue of the year 1914, which is accounted for, first, by reason of an increase in discount allowed for prompt payment of water bills under assessed and metered rates in effect by ordinance November 1,

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1914, and, second, because the meter controlled consumption and revenue was materially affected by a period of business depression and an unusually cold and rainy summer:

COMPARATIVE STATEMENT OF ORDINARY REVENUE AND EXPENSE OF WATER WORKS SYSTEM FOR 1914 AND 1915.

ORDINARY REVENUE.

	1914	1915
Assessed rates collections	$3,392,674.39	$3,376,350.57
Metered rates collections	3,020,437.88	2,761,367.60
Miscellaneous revenue	328,097.97	304,297.40
Total ordinary revenue resulting from the operation of the water system	$6,741,210.24	$6,442,015.57

ORDINARY EXPENSE.

	1914	1915
Operation of the water system	$1,735,354.37	$1,833,337.38
Repairs and maintenance	1,443,549.22	1,445,300.71
Interest on certificates and judgments	14,978.16	8,708.69
Total ordinary expense for operation, repairs, maintenance and interest	$3,193,881.75	$3,287,346.78
Excess of ordinary revenue over ordinary expense	$3,547,328.49	$3,154,668.79

This item includes expense amounting to the sum of $278,356.11 for the year 1915, and $249,327.29 for the year 1914, for services of City departments as authorized by appropriations made by the City Council.

The expenditures for additions, extensions, and betterments of the Water Works system during the year 1914 aggregated the sum of $2,727,-108.88, and for the year 1915 the sum of $4,811,606.82.

WILSON AVENUE WATER TUNNEL SYSTEM.

The Wilson Avenue Water Tunnel System under construction was commenced in August, 1913, and consists of a lake intake crib located about 16,128 feet east of the shore shaft at Wilson and Clarendon avenues; 5,880 feet of thirteen foot diameter tunnel, and 37,750 feet of twelve foot diameter tunnel, connecting the above crib with the Mayfair Pumping Station, at Wilson and North Lamon avenues. The work of construction is progressing rapidly.

26,715.5 feet, or 63% of the total length of the tunnel, exclusive of the part (2,128 feet) to be constructed by contract, have been excavated and the foundations for the Mayfair Pumping Station partly constructed. This work is being performed by day labor and the construction of the tunnel is progressing at an unusual rate.

The construction of the intake crib and 2,128 feet of thirteen foot diameter tunnel is being done by contract. The crib has been placed in its proper location and practically filled with concrete.

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SIXTY-EIGHTH STREET CONNECTING TUNNEL.

An eight foot diameter connecting tunnel 2,700 feet in length is being constructed in Oglesby avenue, from the southwest land tunnel in 73d street to the pumping station at 68th street and Oglesby avenue, for the purpose of furnishing an additional supply of water to that already obtained from the old tunnel leading from the 68th street crib to the 68th Street Pumping Station. 1,990 lineal feet of this tunnel were finished. This work is being done by City day labor.

NEW MARSHALL BOULEVARD MUNICIPAL PLANT.

The following buildings are completed or under construction as a part of the new Municipal Plant, located at 31st street and California avenue: New Municipal Brass and Iron Foundry, Machine Shop, Blacksmith Shop, Warehouse, Carpenter and Paint Shop and Pattern Storage, Power Plant, Garage, and Office Building.

The new Municipal Brass and Iron Foundry building was completed, equipped and in operation since August, 1915, with a result that during the last four months of the year 747.55 tons of castings were manufactured, as follows: Machine Castings, 296.10 tons; Water Pipe Castings, 133.73 tons; Manhole Castings, 317.72 tons; being an average production of 8.25 tons per working day.

The new Machine Shop building is completed and is now being equipped. This building will be ready for occupancy within a few months and will displace many of the present shops of various departments scattered about the city. This consolidation will result in a large saving in the present cost of operation.

The Blacksmith Shop building, also under construction, is nearing completion and it is expected that it will be ready for occupancy within six months.

The new Municipal Power Plant building is now being planned, and construction will start in a short time. This power station will supply power, light, and heat, etc., for all requirements of the new Municipal Plant, as well as to the House of Correction and the new Isolation Hospital.

The foundations for the Municipal Garage have been completed and further work is in progress.

The new Municipal Warehouse building is completed. This will make possible the centralization of materials, supplies, etc., for storage by all departments of the City. Facilities for distribution to various departments will be provided. Purchases in quantities are contemplated, thereby securing the benefit of better prices and more economical inspection and control.

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The foundations for the Office building have been completed.

The tunnel system for conduits and mains has been completed within the limits of the Municipal Plant, a concrete dock along the Collateral Channel has been completed, and considerable grading work done.

PUMPING STATIONS.

The total amount of water pumped was 213,205,790,000 gallons, or an average of 578,571,500 gallons per day.

The following principal work was done during the year at various pumping stations:

Lake View Pumping Station: The construction of the new boiler house and installation of equipment was completed, and also one additional 25,000,000 gallon pumping engine placed in service.

The old temporary boiler house was removed and a contract let and work started on the sea wall forming a part of the general scheme to beautify the grounds on both sides of the pumping station.

Roseland Pumping Station: Two 25,000,000 gallon pumping engines, completing the installation of four, were installed and placed in operation. Two additional boilers were also placed in operation.

Central Park Avenue Pumping Station: A contract for five new boilers was let and work started on the rehabilitation of the boiler room at this station.

68th Street Pumping Station: A contract was let for the installation of two turbine driven centrifugal pumps, to replace two of the older pumping engines.

Stony Island Avenue Sewage Pumping Station: A new additional boiler was installed and was practically ready for service at the end of the year.

Pullman Sewage Pumping Station: At this station two motor driven centrifugal pumps were installed, to replace two old steam pumps which had become very inefficient and expensive of operation.

WATER PIPE EXTENSION.

During the year 116.94 miles of water pipe of various sizes were laid.

1,870 fire hydrants and 1,304 valves of various sizes, were installed.

The distribution system at the close of the year comprised 2,641.14 miles of pipe of all sizes, 28,278 fire hydrants, and 23,998 gate valves of all sizes.

The following are some of the large and important feeder mains laid during the year 1915:

17,899 feet of 36 inch pipe were laid in Addison street, from Cicero avenue to Avondale avenue, and in Avondale avenue and other streets

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connecting with the 24 inch and 30 inch mains at Diversey avenue and Elston avenue, at a cost of $163,202.93. The construction of this main is a part of the programme as planned for the northwest section of the city.

8,948 feet of 24 inch pipe were laid in Torrence avenue, from 95th street to 109th street, at a cost of $43,194.20. This main was laid to increase the supply to South Deering, which was in need of reinforcement.

8,027 feet of 36 inch main were laid in Stony Island avenue, from 66th street to 56th street, and in 56th street, from Stony Island avenue to Harper avenue, at a cost of $84,663.29. This main was laid to cut down friction losses and increase pressures in Hyde Park.

6,686 feet of 36 inch pipe were laid in Harper avenue, from 55th street to 50th street, and in 50th street, from Harper avenue to Ellis avenue, at a cost of $80,218.65. This main is a continuation of the Stony Island avenue main.

4,621 feet of 24 inch pipe were laid in Ellis avenue, from 50th street to 43d street, at a cost of $33,429.69.

6,139 feet of 24 inch pipe were laid in 50th street, from Ellis avenue to Wabash avenue, at a cost of $37,760.54.

5,976 feet of 24 inch pipe were laid in 104th street and Vincennes road, to 103d street and Leavitt street, at a cost of $35,092.19. This main was laid for pressure purposes or to improve pressure in the high level territory of Washington Heights.

6,482 feet of 12 inch pipe were laid in 95th street, from Beverly avenue to Leavitt street, and in Leavitt street, from 95th street to 99th street, at a cost of $14,914.72. This main was laid to distribute the supply along the top of the hill at Washington Heights.

12,426 feet of 16 inch pipe were laid in Hoyne avenue and 103d street, to 119th street and Western avenue, at a cost of $38,349.08. This pipe was laid in connection with the Washington Heights system and to enable a supply to Blue Island.

11,512 feet of 36 inch pipe, 5,406 feet of 30 inch pipe, and 1,388 feet of 24 inch pipe, comprising a feeder main system in 67th street and 65th street, between Justine street and Kostner avenue, were laid at a cost of $145,660.72. The purpose of this installation was to adequately supply Chicago Lawn and vicinity.

15,583 feet of 24 inch pipe and 656 feet of 12 inch pipe were laid in Torrence avenue, from 109th street to 130th street, and in 130th street, from Torrence avenue to Baltimore avenue, at a cost of $69,234.96, for the purpose of increasing the supply to Hegewisch.

3,590 feet of 16 inch pipe, and 333 feet of 12 inch pipe were laid in Grand avenue, from Lincoln Park boulevard to Lake Michigan, and in the Lake Shore Drive, from High street to Grand avenue, at a cost of

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$14,273.85. This main was laid to furnish a supply to the Municipal Pier, principally for fire protection.

In addition to large feeder mains laid, the following important work was performed in connection with the water distribution system:

7.3 miles of pipe were laid and paid for from deposits made by owners of property benefited, and 21.33 miles of pipe were laid where a survey showed a revenue of at least six cents per foot a year.

6.28 miles of pipe were laid for fire protection purposes.

19.41 miles of pipe were laid under special assessment.

15,097 service pipes of various sizes, were installed.

18,877 taps and connections, of all sizes, were installed.

29,011 plumbing inspections were made.

560 bubbling cup drinking fountains were in service in various parts of the city during the year.

WATER WORKS SHOPS AND REPAIRS.

1,941 hydrants, of various sizes, were manufactured, being an increase of 809 over the output of 1914.

1,078 hydrants, of various sizes, were repaired in the shop, being 24 more than the previous year.

1,611 valves were manufactured, ranging in size from 4 to 36 inches, being 163 more than in 1914.

91 tons of bronze and brass castings were turned out by the brass foundry, being 16 tons more than the previous year.

In addition to the above, necessary repair work required in the maintenance of building, machinery, equipment, and property of the Water Works system, together with similar work requisitioned to be done for various departments of the City, was performed.

The extent of the work is represented by 5,543 requisitions for work performed and billed in the amount of $402,191.51.

WATER METERS.

1,250 meters were installed during the year. The total number of meters in service December 31, 1915, was 19,489, being a net increase of 1,015 in service.

The average cost of maintenance per meter has been reduced to $3.44 per meter.

ASSESSMENT AND COLLECTION OF WATER RATES.

The gross collections of the Bureau of Water during the year 1915, including special deposits, amounted to $6,319,579.58.

The assessed rates collections amounted to $3,376,350.57.

The meter rates collections amounted to $2,761,367.60.

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The general assessment levied May 1, 1915, amounted to $4,597,677.60, as against $4,403,541.35 for the year 1914.

237,708 inspections and reports were made by a force of 51 field assessors, and 202,777 meter readings and reports were made by a force of 19 rate takers.

The American Express Company and the Adams Express Company collected 176,923 water bills, aggregating $903,532.73.

CHICAGO UNION STATION.

In order to centralize the supervision over the work of the Chicago Union Station Company, so far as the jurisdiction of the department applies, the entire responsibility was placed under the general supervision of the City Engineer. The actual work of removal of buildings on the site of the new station building was begun on March 19, 1915. Work is progressing on the Monroe and Lake street viaducts. The sewer in Canal street, from Fulton to Randolph streets, has been completed. The sewer from Monroe and Clinton streets to the Washington street outfall is under construction. The retaining wall in Canal street, from Monroe to Washington streets, is under construction. Canal street, from Madison to Monroe streets, and Monroe street, from Canal to Clinton streets, are being raised to the new grade. The foundations of the freight terminal of the Pennsylvania Company, located on the west bank of the south branch of the river, between Polk and West 12th streets, are under construction.

UTILITY GALLERY.

A utility gallery was constructed by special agreement between the City and the Chicago Union Station Company, in Canal street, from Washington street to about eighty feet south of Monroe street, and in Monroe street, from Canal street to Clinton street.

Public service companies, after long negotiations, were induced to transfer their pipes and cables to this gallery. The construction of this gallery is an experiment to house underground utilities to permit ready access. It is expected that the utility gallery will be a practical success and proper solution of the problem of caring for underground installation in an orderly manner with the resultant benefits of avoiding the expense and inconvenience attending the constant opening and replacement of pavements, which has always been an annoying problem.

BRIDGES AND VIADUCTS.

The total number of bridges and viaducts in service is 120, classified as follows: movable bridges, 50; fixed bridges, 22; foot bridges, 3; viaducts, 37; viaducts (foot passage) 8.

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The policy of constructing new bridges without interruption to traffic was inaugurated with the construction of Lake street bridge. This method is more expensive, but is warranted by the resultant benefit of maintenance of traffic during construction. Under this mode of procedure elevated traffic is interrupted for about three days, street car traffic about thirty days, and team traffic about sixty days.

The following new bridges have been completed and opened to traffic during the year 1915:

South California avenue fixed bridge over the West Fork of the South Branch of the Chicago River.

Indiana avenue swing bridge over the Little Calumet River.

The following bridges are under construction:

Lake street double deck, double leaf, trunnion bascule bridge.
Webster avenue double leaf trunnion bascule bridge.
Belmont avenue double leaf trunnion bascule bridge.
Montrose boulevard fixed bridge.
Monroe street double leaf trunnion bascule bridge.
Jackson boulevard double leaf trunnion bascule bridge (being built by Sanitary District).

Plans for the following bridges and viaduct were completed during the year:

12th street direct vertical lift bridge.
Madison street double leaf trunnion bascule bridge.
La Salle street double leaf trunnion bascule bridge.
East and West Twelfth street viaduct.

Plans for the following bridges were begun during 1915:

Lawrence avenue fixed bridge.
Clark street double leaf trunnion bascule bridge.
Franklin-Orleans street double leaf trunnion bascule bridge.

Negotiations for the construction of the Franklin-Orleans street bridge and viaduct system, to the cost of which the Northwestern Railroad Company will contribute over $700,000.00, are progressing.

During the year there arose a serious contention between the New York Central Lines and the Chicago Surface Lines as to the distribution of the roadways of Clark street, between Taylor and 14th streets, where it is necessary to divide the roadways so as to secure an approach to the new Twelfth street viaduct, an upper level to be used by the Chicago Surface Lines and a lower level which would offer a satisfactory entrance to the freight yards of the New York Central Lines. This controversy had held up the completion of the plans for Twelfth street viaduct for some time, but was satisfactorily settled in a conference held with the

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disputing parties to arbitrate the differences. This was the last obstacle in the way of this improvement.

RIVERS AND HARBORS.

In order to comply properly with the provisions of the City ordinances, the Bureau of Rivers and Harbors, under the superintendence of the Harbor Master, was established July 23, 1915.

In addition to the forces previously employed under the direction of the Harbor Master, the superintendence of bridge-tenders, including the function of bridge operation, was transferred to this bureau on October 9, 1915.

1,657 scow loads of material, comprising 843,352 cubic yards, were dumped in Lake Michigan during the year.

Aggresive action is being taken to enforce the repairing and rebuilding of docks in bad condition, and the removal of obstructions.

In the latter part of the year an ordinance was introduced and subsequently passed, creating a Harbor Board, having the management and control of matters and things (except as conferred by law on the City Council) pertaining to the Municipal Pier, in Harbor District No. 1, and pertaining to all harbor utilities and appurtenances when completed or when the same are ready for use and occupation.

The new Municipal Pier, nearing completion at a total cost of about $4,000,000.00, will be managed by the Superintendent of Piers, under the jurisdiction of the Harbor Board. All matters of privileges and compensation are subject to the consideration and approval of the City Council.

It is expected that a substantial revenue will be obtained for use of space and privileges.

STREETS.

Garbage and Miscellaneous Waste: 139,493 tons of pure garbage were collected and delivered to the reduction plant, at 39th and Iron streets, by boat from the loading stations at Chicago avenue and at Oakley avenue, and by direct haul, as well as 4,475 tons of pure garbage which were delivered to the reduction plant from the loading stations (this last consisting of trade wastes from the commisison houses). This service was rendered at a total cost of $477,083.70, or $3.20 per ton ($.186 per capita.)

1,489,431 cubic yards, or 298,495 loads of ashes and refuse were collected and hauled to the City dumps, at a total cost of $1,038,209.68, or $.697 per cubic yard ($.433 per capita).

Street Cleaning: 4,488,359,027 square yards of streets were cleaned by hand (block and gang system), necessitating the removal of 777,845

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cubic yards, or 182,278 loads of street dirt, at a cost of $1,337,999.94, or $.298 per 1,000 square yards ($.559 per capita).

Flushing: 9,939.52 miles of streets were flushed by auto flushers (271,407,644 square yards), at a total cost of $11,209.87, or $1.13 per mile of street ($.041 per 1,000 square yards). This service necessitated the use of 58,990,500 gallons, or 39,297 tanks of water (5,865 gallons of water per mile of street flushed.)

This was exclusive of 9,597,208 square yards of pavement in the First Ward cleaned by auto flusher, using 3,739,400 gallons, or 154,-038 tanks of water, at a cost of $537.56, or $.056 per 1,000 square yards.

127,193,290 square yards of pavement were cleaned by horse-drawn flushers, using 82,330,550 gallons, or 154,038 tanks of water, at a total cost of $19,057.50, or $.15 per 1,000 square yards.

6,886,107 square yards of sidewalks in the downtown district were cleaned by flushing, using 4,055,600 gallons, or 5,246 tanks of water, at a cost of $1,552.15, or $.225 per 1,000 square yards, and 16,240,105 square yards of sidewalks were cleaned by squeegee flushing, using 4,849,-400 gallons, or 9,581 tanks of water, at a cost of $2,076.00, or $.127 per 1,000 square yards.

Snow Removal: 131,928 cubic yards, or 30,181 loads of snow were collected and removed from the First Ward (downtown district), from 30,938,917 square yards of streets, at a cost of $71,889.17, or $.544 per cubic yard. From main thoroughfares of other parts of the city 139,467 cubic yards, or 33,849 loads of snow were collected and removed from 23,290,720 square yards of streets, at a total cost of $62,735.58.

Miscellaneous: The sum of $7,722.23 was spent for cutting weeds, and $12,405.38 for opening and cleaning ditches in various parts of the city.

The sum of $40,792.83 was spent in emergency work on unimproved streets and sidewalks, intersections, etc.

Permits: 50,154 permits for street openings, use of streets, etc., were issued by the Bureau of Streets during the year, as well as 345 permits for the moving of houses. The work done under all of these permits was inspected by City forces.

Street Repairs: Approximately 1,457 miles of paved streets are under the jurisdiction of the Bureau of Streets, dependent upon the Vehicle Tax for repair and maintenance. The sum of $753,355.63 was expended by the Bureau of Streets from the Wheel Tax Fund for such repair and maintenance.

The yardage of street repairs on various classes of pavements was as follows: Macadam, 880,125; asphalt, 122,786; brick, 47,949; granite, 47,893; concrete, 9,994; creosoted block, 6,940; cedar block, 91.

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In addition to the foregoing street repairs, 6,293,124 square yards of street pavement were oiled, 193,224 square yards of asphaltic concrete resurfacing work, 136,907 square yards of macadam resurfacing work, and 8,532 square yards of sheet asphalt resurfacing work were done.

SEWERS.

Statistics of the Bureau of Sewers show the following in place at the close of the year 1915:

2,292.1 miles of sewers, consisting of 729 miles of brick construction and 1,563.1 miles of vitrified tile pipe; 106,905 catch basins; 86,470 manholes; and 345,989 house drains.

One hundred and one thousand, seven hundred and twelve dollars and eighty-seven cents was expended in the repair of sewers.

Six million, five hundred and forty-six thousand, eight hundred lineal feet of sewers were cleaned by flushing, at a cost of $42,175.64, or 65 cents per hundred feet (a reduction of 1 cent per hundred feet from the cost of the previous year).

Six hundred thousand one hundred lineal feet of sewers were cleaned by scraper, at a cost of $56,316.34, or $9.38 per hundred feet (a reduction of 87 cents per hundred feet from the cost of the previous year).

Forty-five thousand nine hundred and eight catch basins were cleaned, at a cost of $140,490.44, or $3.06 per catch basin (a reduction of 7 cents per catch basin from the cost of the previous year).

The total expenditures of the Bureau of Sewers for the year 1915 were $473,922.91.

The sewer system at the close of the year 1915 represents an investment of $36,255,806.

MAPS AND PLATS.

The area of Chicago, as certified, is 198.997 square miles. This is an increase in area of 4.582 square miles over 1914, due to annexations.

Two hundred seventy-eight new subdivision plats, comprising an area of 1,499 acres, were officially approved for record by the Superintendent of Maps.

A complete survey of the right of way of the Atchison, Topeka & Santa Fe Railway Company, begun in 1914, was completed in 1915. This survey shows 275,075 square feet of public streets and alleys (exclusive of 232,000 square feet reclaimed from the company in Canalport) occupied, apparently without authority, by the Atchison, Topeka & Santa Fe Railway Company. Action is being taken for the recovery of the land.

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A survey of the right of way of the Illinois Central Railroad Company is in progress, but will not be completed until some time in 1916.

A topographical survey of Twelfth street boulevard, from Michigan avenue to Canal street, was made for the Bridge Division in connection with the plans for the new Twelfth street viaduct.

Various other surveys were made for different departments. The total sum expended for survey work amounted to $18,320.71.

COMPENSATION.

The annual revenue established by new accounts during the year amounted to $268,881.96. The total revenue of the bureau for the year amounted to $437,521.10.

Compensation paid to the City for various privileges will be increased in the future as a result of information regarding privilege charges in other cities which was acquired by the Council Committee on Compensation and the Superintendent of the Bureau of Compensation in a trip to eastern cities. It was found that the charges for similar privileges in other cities were much higher than in Chicago, and a schedule increasing the rates in Chicago has now been put in force. These increases will not affect those privileges already authorized, but will apply to renewals and to those privileges authorized in the future.

Four thousand five hundred thirty-seven permits of various kinds were issued by the Bureau of Compensation during the year 1915.

ARCHITECTURE.

The Bureau of Architecture had under its charge in 1915 nearly twice as much work as in the preceding year. Plans and specifications were prepared and construction work supervised on 119 projects, on which 142 contracts were awarded, the total amount of these contracts being $935,180.26.

Contagious Disease Hospital: The Administration Building and one Ward Building, units of the Contagious Disease Hospital, located at Thirty-first and California avenue, are nearing completion, and plans for the Nurses' Home and Dining Room and Kitchen are under way. The cost will be approximately $750,000.00.

Comfort Stations: Two public comfort stations were constructed adjoining the Public Library, at a cost of about $25,000.00, and one public comfort station was completed at East End Park, Fifty-third street and East End avenue, at a cost of approximately $4,000.00.

Public Baths: Plans and specifications were prepared and contract awarded for public bath building at 1019 North Lincoln street, to cost

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approximately $50,000.00, and plans and specifications have been prepared for public bath buildings at the southwest corner of Polk and Paulina streets, and the southeast corner of Twenty-fourth street and Kedzie avenue, at a cost of approximately $50,000.00 each.

Fire Department Buildings: Fire engine and truck houses were completed at the following locations: Ninety-fifth and Charles streets (Longwood), 1405 East Sixty-second place, 2322 Foster avenue, 1052 Waveland avenue, 2111 South Hamlin avenue, Tyron and Homewood avenues (Morgan Park), Sixty-ninth street and Indiana avenue, and 1721 Greenleaf avenue (Rogers Park), at a cost of approximately $240,000.00.

Plans and specifications were prepared and construction work started on fire engine and truck houses at the following locations: Forty-third and Paulina streets, 817 East Ninety-first street, 2329 North Natchez avenue, 7313 Kingston avenue, 4426 North Kedzie avenue, 5218 South Western avenue, 2179 Stave street.

Plans and specifications will be prepared for the remaining eleven Fire Department buildings provided for in the bond issue as soon as sites are acquired.

Police Department Buildings: Plans and specifications were prepared and contracts awarded for the remodeling of the station at 2433 Warren avenue, at a cost of approximately $20,000.00.

Plans and specifications have been prepared for the remodeling of the police station at 7075 North Clark street, at a cost of approximately $15,000.00.

Plans and specifications are in preparation for police stations at the following locations: Forty-eighth street and Wabash avenue, at an estimated cost of $70,000.00; Ninety-first street and Cottage Grove avenue, at an estimated cost of $50,000.00; Twenty-third and Robey streets, at an estimated cost of $50,000.00; and Bryn Mawr and Ashland avenues, at an estimated cost of $55,000.00.

Chicago and Cook County School for Boys: This improvement is located at Gage Farm, Twenty-second street and Harlem avenue. The dormitory and the superintendent's residence are under construction and will be ready for occupancy about May 1, 1916. The cost of this improvement will approximate $60,000.00.

Bathing Beaches: At the Clarendon avenue bathing beach, the administration building, laundry building, and locker rooms are completed and will be ready for use during the 1916 bathing season. This entire improvement cost nearly $200,000.00.

Preliminary studies were made for a bathing beach improvement at the foot of Hyde Park boulevard.

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Natatoriums: Natatoriums were completed adjoining Roseland, Fillmore street, and Springfield avenue pumping stations, at a cost of approximately $30,000.00 each.

In addition to the foregoing, plans and specifications were prepared, contracts awarded, and work supervised on numerous improvements for different departments and bureaus, such as playgrounds, wading pools, etc., for the Special Park Commission; ward office buildings for the Bureau of Streets; Englewood Fire Alarm Office building for the Department of Gas and Electricity, at a cost of approximately $20,000.00; market building at Ninety-second street and Ewing avenue, for the Municipal Markets Commission, at a cost of approximately $25,000.00; alterations in the City Hall, etc.

The reports of the various bureaus of the department present the work of the year in more detail and are accompanied by statements and illustrations.

Yours very respectfully,

W. R. MOORHOUSE,

Commissioner of Public Works.

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ANNUAL REPORT

BUREAU OF ENGINEERING

CITY OF CHICAGO

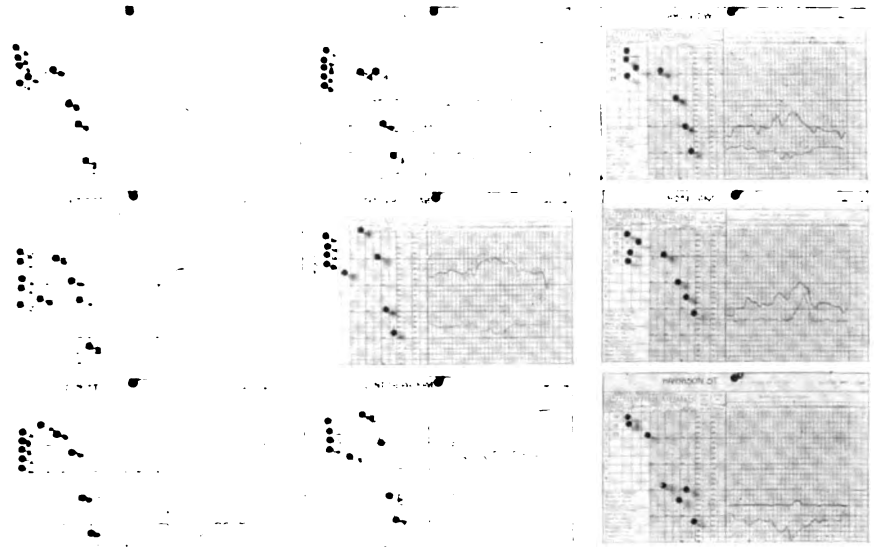
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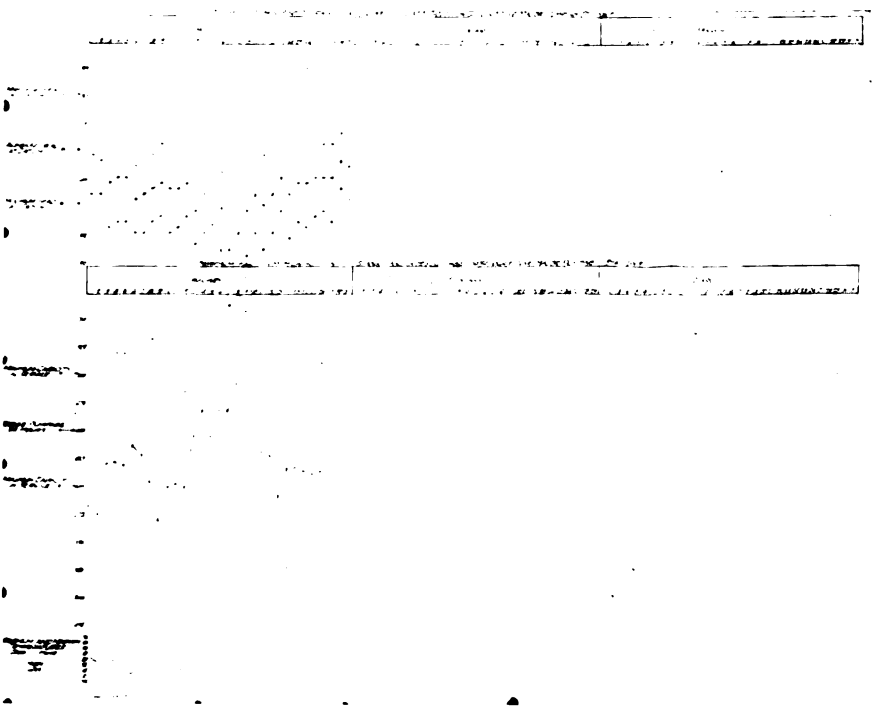
JOHN ERICSON
City Engineer

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DAILY RECORD OF PRESSURES AND PUMPS IN SERVICE

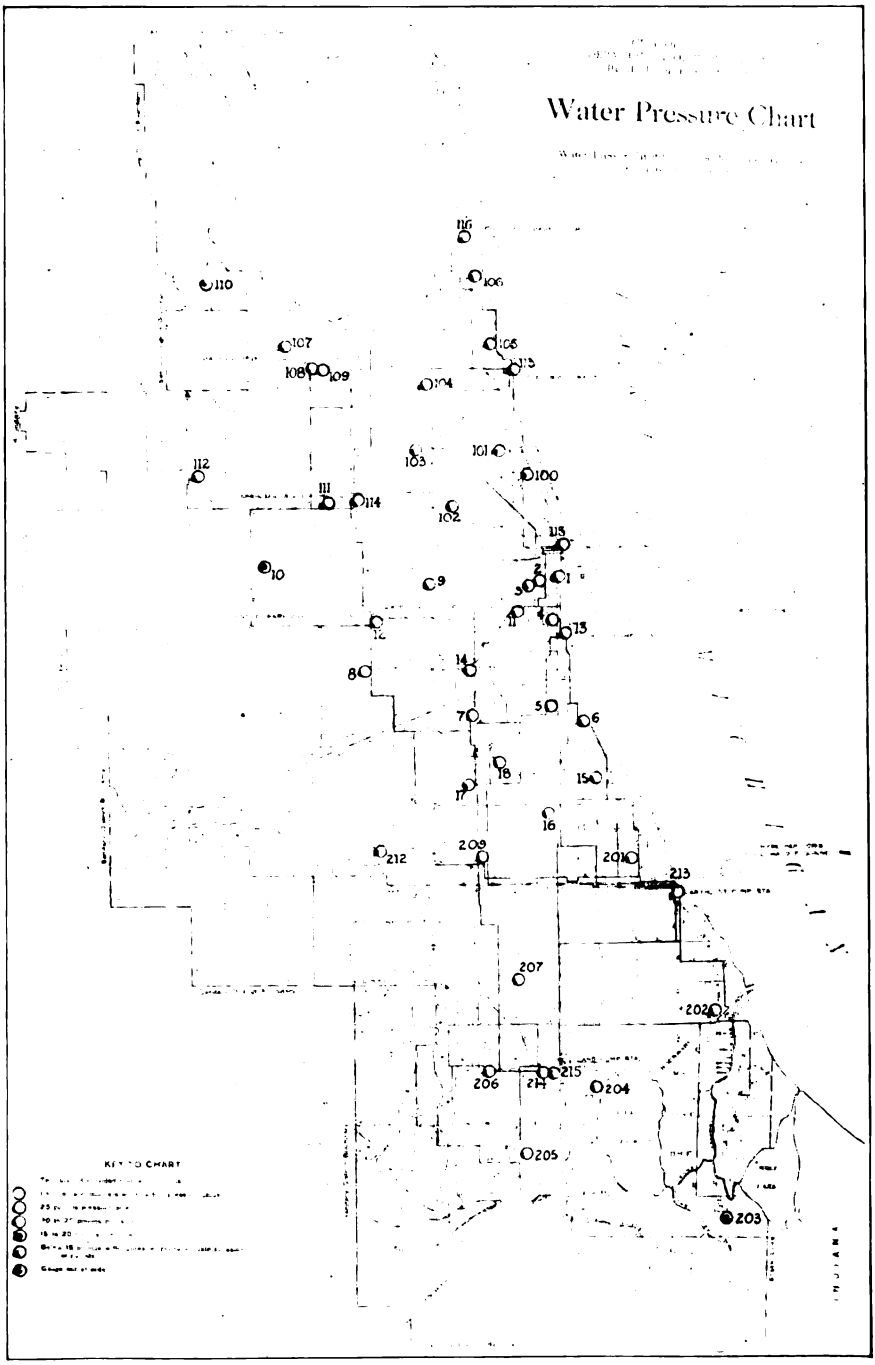




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BUREAU OF ENGINEERING

HON. W. R. MOORHOUSE,
Commissioner of Public Works.

Dear Sir:

The report of the City Engineer for the year 1915, submitted herewith, is intended to summarize clearly and concisely the information which is of interest and value to the City Council, and to the citizens of Chicago, concerning the business transacted by the Bureau of Engineering.

In former years the annual report has included a number of complete engineering reports on such matters as tests of pumping engines, boilers, etc. During 1915 these have been printed as separate bulletins, and they have proved more convenient for reference and distribution than when included in the large volume of the departmental report.

DETAILED DIVISION REPORTS.

The reports of the various divisions of the Bureau of Engineering are attached. These have been prepared as a complete record of the work of the divisions for the use of the officials and employes of the City, as such complete statements are not generally read by others.

STATISTICS OF ORGANIZATION.

The bureau employs about 3,400 persons, and if each employe is a bread-winner for a family of four the bureau represents a population of 13,600, or a city the size of Chicago Heights or Cicero.

The work of the Bureau of Engineering is increasing at a rapid rate. An indication of the rate of this increase is shown by the following:

Year	Requisitions Issued	Invoices	Vouchers and Pay Rolls	No. of Letters Written
1910	8,781	11,037		
1911	12,074	14,150		
1912	14,386	18,660		
1913	15,629	20,243		
1914	18,728	25,336		
1915	21,563	28,459	16,500	12,736

During the year 1915 there were issued 1,028 vouchers on contracts as follows:

Contracts entered into previous to and completed in 1915	79	
Contracts entered into during and completed in 1915	131	
Total completed in 1915		210
Contracts previously entered into, but not completed December 31, 1915:		
1911	2	
1912	6	
1913	10	
1914	17	
1915	122	
		157
Total contracts during 1915		367

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This steadily increasing amount of work has been performed without a corresponding increase in the force of employes.

The work of the Bureau of Engineering includes two principal functions:

First: The construction, operation and maintenance of the waterworks.

Second: The construction and maintenance of bridges.

During 1915 the Harbor Master's office was separated and became an independent bureau, having charge of harbor work and bridge operation.

WATERWORKS OPERATION.

An important part of the work of the bureau is furnishing water to the public, and, as the demand varies from day to day according to the day of the week and weather conditions, very close studies must be made to meet these conditions. These studies include all parts of the waterworks system from the time the water is taken into the cribs in the lake until it is delivered to the consumer at the tap. In order that the City Engineer may tell at a glance the condition of the water service, charts are kept in the office, showing engines in service and pressures maintained in all parts of the city during each twenty-four hours. These charts are shown in illustrations accompanying this report.

The waterworks have been operated with comparatively few complaints, due partly to increased equipment, but mainly to favorable weather. The summer was so wet that the usual excessive sprinkling and waste of water did not occur. No amount of pumpage will maintain satisfactory pressure on an uncontrolled system during extreme hot or cold weather. Irrespective of constant efforts we can expect to receive complaints in 1916 if the summer is dry and hot.

The two great problems in operation of the waterworks today are:

1. Water waste.
2. Securing increased efficiency.

WATER WASTE.

In past reports the City Engineer has pointed out repeatedly the excessive waste of water. Little direct action has been taken during 1915 to reduce water waste. The daily consumption has increased from 227 gallons per capita in 1914 to 236 gallons per capita in 1915. This increase occurred notwithstanding a cool, wet summer and improved pressure regulations at the pumping stations by which excessive night pressures were cut down, saving leakage at night, while a schedule of day pressures has been adopted, designed to maintain a constant pressure on the mains during twenty-four hours.

Careful studies of flow in certain feeder mains have been continued, and requests for 1916 appropriations for feeder mains are based on thorough studies of the requirements in each case.

The fire protection studies have been continued during the year, embracing particularly the district between Harrison street, 22d street, Halsted street and Ashland avenue. Studies have been made from the plans, together with field inspections and fire flow tests. The necessary data were tabulated, and the improvements have been made.

It is necessary that specific work on water waste eliminations be taken up during the season of 1916, in order to counteract the increasing rate of consumption, which is really increasing waste. It is not necessary to make

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further studies to show that water is being wasted. This fact has been proved and the remedies are known; the waste inside of buildings can be controlled by extending the use of meters, while the underground leakage can be located by pitometer surveys, and can be corrected by repairs to mains and service pipes. Detailed plans have been made for handling this work if the necessary appropriation is granted as requested.

Over five thousand meters were purchased after careful tests of all types of meters offered in a public bidding. This purchase enabled the bureau to fill most of the old orders for meters under existing ordinances and to replace many meters of obsolete types on which the cost of maintenance had become excessive. The gradual extension of the metered system should be provided for by an ordinance requiring all new service pipes and a certain proportion of old services each year to be metered.

The total amount of water pumped in 1915 was 213,205,790,000 gallons, or an average of 578,571,500 gallons per day, as against 200,163,933,000 in 1914. To pump this amount of water required 193,812 tons of coal at a cost of $403,884.51. The cost per million gallons per foot head was $.0369, as compared with $.0342 in 1914. The fuel cost per million foot gallons was $.0175 as against $.0162 for the year 1914.

Of the total amount of water pumped a conservative estimate places the waste through leaky fixtures, wilful wastage and underground leaks at 50 per cent. In order to illustrate what this wastage represents, if it could all be eliminated, it may be pointed out that four out of the nine major pumping stations would be unnecessary, reducing the expense about $700,000.00 per year. This does not take into account the greatly reduced cost of tunnel constructions. This amount of saving could run the United Charities each year and leave $300,000.00 for other purposes such as playgrounds and parks. The United Charities extend help to 22,000 families a year, or about 100,000 individuals. With the saving that could have been made by a systematic effort to eliminate water waste 38,000 families, or 175,000 individuals, could have been aided.

The water wasted each day fills the capacity of 18 36-inch cast iron pipes flowing simultaneously at a velocity of 3 feet per second, or the equivalent of eleven 25,000,000 gallon pumps working twenty-four hours a day.

The total amount of coal used in 1915 would make 38,760 five-ton wagon loads, and if the wastage could have been eliminated 19,380 wagon loads of coal burned could be diverted to some useful purposes.

The generally recognized remedy for wasting of water is the installation of meters. I submit that any merchant would be considered peculiar if he should offer to supply sugar, butter or lard to a family for so much a month regardless of the quantity used. The electric light and gas companies do not furnish their commodities for a flat rate irrespective of the quantities used. The city, however, in supplying water adheres generally to this policy, and, although there are arguments advanced to continue this method, the arguments are extremely weak.

Meters should be liberally installed, and the daily per capita consumption reduced from the present high rate of 236 gallons to something near the rate of our neighbor, the City of Milwaukee, whose daily per capita consumption is about 100 gallons per day, and whose people are as clean and healthy as are the people of Chicago, and whose business is not less thriving.

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IMPROVEMENTS IN EFFICIENCY.

The operation and maintenance of the waterworks have been systematized in several respects. The improved pumping station cost system has been in operation throughout the year, and detailed costs of operation, with the maintenance of each unit in every station, are available. These records have been provided at small expense by the use of the Hollerith system of mechanical tabulations, the reports being sent to the main office and cards punched there, while they are classified on the comptroller's tabulation machines.

The cost system of the Water Pipe Extension Division has been further developed by regular reports on classified expenditures which have formerly been kept in the books for many years, but so that no ready use could be made of them. This system will be extended by providing better forms for the recording of information in the field, with a simple code for distribution of expenditures, so that the classification can be done on the machines. We plan to make this improvement during 1916.

These cost records are merely the first necessary step toward increased efficiency. Standards of cost and standard methods of doing work, together with standards of equipment, are being established. Carefully written instructions are being prepared, with the object of doing all work in a standard manner—to be the best possible that can reasonably be expected in each particular case.

The operation and maintenance of the Waterworks System offer a wonderful opportunity for savings and improvement of service by genuine scientific management, but this can only be attained by unremitting effort extending over a number of years and by securing the co-operation of all concerned.

New liquid chlorine plants have been installed at Chicago avenue and at 22d street pumping stations and the temporary hypochlorite installations at the Lake View, 68th and Edward F. Dunne Cribs have also been replaced with liquid chlorine plants.

MUNICIPAL FOUNDRY.

The Municipal Foundry has been in operation since August, 1915, and has produced the following:

Machine castings	296.10 tons
Water pipe castings	133.73 tons
Manhole castings	317.72 tons
Total	747.55 tons

The average production has been 8.25 tons per working day.

The detailed report shows that the shop cost has slightly exceeded the value of the castings when they are figured at former contract prices, which were low. This excess can be ascribed principally to the high wages paid the mechanics. It is believed that this and the necessary expenses of starting up the foundry caused higher costs than we need expect during 1916. No allowance has been made in these costs for interest and depreciation on the investment.

The foundry work has been conducted with energy and skill by the foremen and the mechanics, and the castings produced have been of excellent quality.

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NEW SHOPS.

The new shop buildings and warehouse at the Marshall Boulevard Plant have been nearly completed, practically all the construction work having been done by city day labor. The character of construction has been excellent and costs are reasonable, as shown by unit cost statements in the Construction Division report. It is expected that the new shops will all be placed in operation during the first half of 1916.

WILSON AVENUE WATER TUNNEL.

The constructions of the Wilson Avenue Water Tunnel and the Mayfair Pumping Station have been carried on by day labor, and progress, workmanship and costs are satisfactory, as shown by the following summary:

Cost of labor and material	$ 880,134.54
Depreciation on tools and machinery	98,000.00
Overhead expenses, supplies, etc	140,877.20
	$1,119,011.74
Lineal feet excavated	26,715.5
Total length lineal feet to be excavated	42,240.
Per cent. excavated	63.
Cost of excavation per lin. ft. to date	$41.88
Estimated cost of lining per lin. ft	15.00
Estimated cost of cleaning per lin. ft	2.00
Estimated cost of removing plant, lin. ft	.60
	$59.48
Contingencies	2.00
Total estimated cost (including all engineering and inspection)	$61.48

These costs include all costs in starting the work and bringing it to the present state of efficiency, and a reduced cost should be expected for the balance of the work. The workmanship is also superior to any tunnel contract work with which I have had experience.

The Wilson Avenue Crib has been placed in the proper location and practically filled with concrete. The design was new, consisting entirely of steel and concrete, as described in detail in the report of the Construction Division. The novel design and especially the lateness of the season when the crib was placed caused some apprehension among those responsible for the work, but the design proved to be entirely practicable, and the filling of the crib with concrete progressed so that it will withstand the winter storms without difficulty.

The total work in 1915, performed by the Construction Division alone, on tunnels, pumping stations and other buildings represents actual expenditures of $2,247,649.01.

FIRE HYDRANTS.

A series of tests on various well known makes of fire hydrants were made, as described in a bulletin issued in October, 1914. As a result of these tests, a design of fire hydrant has been developed and some sample hydrants made. Similar tests have been made of these new hydrants, proving them more

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efficient than any other type tested. Service tests have been made by the Fire Department with equally satisfactory results, and it is proposed to commence the general use of the new hydrant during 1916.

VALVES.

Standard designs for gate valves have been adopted, and complete working drawings prepared. By this plan the city secures a standard type of valve, and is at liberty to manufacture valves or to purchase them as may appear most expedient from time to time, and in either case have the adopted standard design.

CHICAGO UNION STATION WORK.

The general supervision over the work of the Chicago Union Station Company has been assigned to the City Engineer. The work was started on March 19, 1915, the first work being the removal of buildings on the site of the station building. The Chicago Union Station Company has started work on Monroe Street Bridge and on Lake Street Viaduct, while the sewer in Canal street from Fulton to Randolph streets has been built, and the sewer from Monroe and Clinton streets to the Washington street outfall is under construction, also the retaining wall in Canal street from Monroe to Washington streets. Canal street is being raised to its new grade from Madison to Monroe streets, also Monroe street from Canal to Clinton streets.

The magnitude of the improvement to this part of the West Side can hardly be seen as yet by the general public, but will appear more clearly with each step in the progress of the work.

The Pennsylvania Company has started work on its freight terminal on the west bank of the south branch between Polk and West 12th streets. At the end of the year the pile and concrete foundations for the freight houses were under construction.

PUBLIC UTILITY GALLERY.

By special agreement between the city and the Chicago Union Station Company a gallery for public utilities was constructed in Canal street from Washington street to about 80 feet south of Monroe street, and in Monroe street from Canal to Clinton streets. The cost of the gallery north of the south curb line of Madison street was met by the city, and the Chicago Union Station Company paid for the remainder and for placing the pipes and cables in the gallery. After long negotiations the public service companies were persuaded to make use of this gallery, and, from present indications, the gallery will be practicable and a success. A detailed report on this gallery is attached.

NEW BRIDGES.

No new river bridges have been put in service during 1915.

Work has progressed on the following:

West Lake Street Bridge over the South Branch: Substructure complete; superstructure 93 per cent. complete.

Webster Avenue Bridge over the North Branch: Substructure 98 per cent. complete; superstructure 90 per cent. complete.

Belmont Avenue Bridge over the North Branch: Substructure complete; superstructure, structural steel fabricated and delivered, erection started.

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West Monroe Street Bridge over the South Branch: Work done by the Chicago Union Station Company under city supervision; substructure 43 per cent. complete; superstructure, steel being fabricated in shop.

BRIDGE PLANS.

Plans have been prepared for West Twelfth Street Bridge and Viaduct, north La Salle Street Bridge and general plans for Franklin-Orleans Street Bridge, and Lawrence Avenue Bridge. General studies were made for North Clark Street Bridge and bridge approach grade improvements.

BRIDGE MAINTENANCE.

Several improvements in maintenance methods have been adopted, particularly in improved bridge floor designs, repair of bridge protections, new bridge houses, and general inspection of bridges.

On account of insufficiency of funds only one bridge was painted. This means that the bridges are deteriorating from lack of protection. The painting of bridges should be increased each year until all the bridges are well protected from the elements. The annual loss caused by the omission of the proper protection of the steel structures far exceeds the cost of painting, while the improved appearance of bridges should alone be worth the cost of keeping them painted.

During the year a departure was made in getting all the division heads together periodically. The division heads, the chief clerk and others in the bureau meet at luncheon every Wednesday noon. During these luncheons important matters pertaining to the bureau are discussed. The division heads are brought closer together, and better co-operation is the result.

Respectfully submitted,

JOHN ERICSON,
City Engineer.

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SUMMARY OF STATISTICS
of the
CHICAGO WATER WORKS

For year ending December 31, 1915.

In Form Recommended by the New England Waterworks Association.

GENERAL STATISTICS.

Population by census, 1910.....2,185,283
Date of construction.....1852
By whom owned.....City of Chicago
Source of supply.....Lake Michigan
Mode of supply.....By gravity from intakes, 2 to 4 miles out in Lake Michigan through tunnels to pumping stations. Direct pumping to mains.

STATISTICS OF CONSUMPTION OF WATER.

*Estimated total population to date.....2,447,504
Estimated population supplied in Chicago.....2,447,504

Total consumption for the year 1915, by plunger displacement....221,448,300,000

Deduct pump slip—3.72%..... 8,242,510,000

213,205,790,000

Deduct water delivered through meter to communities outside of Chicago. 2,027,190,000

211,178,600,000

Passed through meters..... 44,115,774,840

Percentage of consumption metered.....$\frac{44,115,774,840}{211,178,600,000}$=20.8%

Average daily consumption in Chicago.....578,571,500 gallons
Gallons per day to each inhabitant..... 236
Gallons per day to each tap in use..... 1,979

*United States Census estimated for July 1, 1915.

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Cost of supplying water per million gallons, figured on total operating and maintenance costs, and on gross pumpage.

Total cost of supplying water per million gallons, figured on total operating and maintenance costs, plus sinking fund and interest on bonds (based on gross pumpage). (See Table 36 Accounting Division.)

STATISTICS REGARDING DISTRIBUTION SYSTEM.

Kind of pipe	Cast iron
Sizes, from	4 inch to 48 inch
Extended	124.55 miles
Discontinued	7.52 miles
Total now in use	2,641.14 miles
Length of pipe less than 4 in. in diameter	0.44 miles
Number of hydrants added during the year	1,204
Number of hydrants abandoned during the year	20
Number of public hydrants now in use	28,278
Number of stop gates added during the year	1,383
Number of stop gates abandoned during the year	21
Number of stop gates now in use	23,998
Number of stop gates smaller than 4 inches	None
Range of pressure on distributing mains	25 lbs. to 60 lbs.

SERVICES.

Kind of pipe	Lead and Cast Iron
Sizes	¾", 1", 1¼", 1½", 2", 3", 4", 6", 8" and 12"
Extended	15,097
Total now in use (estimated)	292,215
Number of service taps added during year (⅝" to 1" in diameter)	18,135
Number of meters added	1,015
Revised list of meters now in use	19,489
Percentage of service pipes metered	6.6
Percentage of receipts from metered water	44.5

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DIVISION OF OPERATION AND MAINTENANCE

OF

PUMPING STATIONS, CRIBS AND WATER SUPPLY TUNNELS

F. J. McDonough, Assistant Mechanical Engineer.

This division, in addition to the operation of water pumping stations, cribs and water supply tunnels, took over the operation of sewage pumping stations in 1915. Brief summaries of the maintenance of each pumping station and crib for the year ending December 31, 1915, and the statistical tables are submitted herewith, which fully set forth the results of operation:

14TH STREET PUMPING STATION.
Hugh Martin, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

A 16" brick wall was built in the coal storage room for the purpose of making a store room. Part of the floor in this room was built of wood and this was removed and a cement floor was placed.

New brick pier was built under discharge pipe of No. 5 main pump and subway under discharge pipe was built to allow passage to the main pumps of No. 2 engine.

The brass railing around generator, engine and switch board was removed and cut down to conform with other hand railing in engine room, and lengthened to take in all of the switchboard. All brass railing on engine room floor was overhauled and new sections were installed where necessary.

ENGINES AND PUMPS.

The engines and pumps have been overhauled and necessary repairs were made. All repairs were of a minor nature.

BOILERS AND FURNACES.

The brickwork in back arches and furnaces was repaired as needed. Minor repairs as needed were made to boilers.

CHICAGO AVENUE PUMPING STATION.
William J. Burns, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

The buildings and grounds around the station have had necessary repairs made and have been kept in first-class condition.

Four chlorine gas instruments were installed at this station during the year for the purpose of treating the water as pumped with chlorine gas for the purpose of purification.

Three instruments are located in sub-basement and same connected to suction mains of engines Nos. 1, 2 and 3. The fourth instrument is located in

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Holly engine room and same is connected to wet well of engines Nos. 4 and 5. Instruments are enclosed in panel booths with glass doors and painted white enamel and same electrically lighted.

ENGINES AND PUMPS.

During the year the engines and pumps have been overhauled and kept in the best working order. All steam vacuum gauges were tested regularly during the year in order to keep them in the most accurate condition. Slip tests were made regularly during the year.

Indicator cards were taken from Nos. 1, 2, 3, 4 and 5 pumping engines from time to time for the purpose of keeping them in the best and most economical condition.

BOILERS AND FURNACES.

The entire six boilers, together with six live steam purifiers, were inspected by the Bureau of Steam Boiler Inspection.

COAL AND ASH HANDLING PLANT.

The machinery was given minor repairs during the year. Forty-six new axles, 76 links, 72 track wheels and 12 pressed steel buckets were provided.

Sprinkler system was installed at superheater coal hopper for the purpose of sprinkling the coal to prevent coal dust from blowing into the boilers.

68TH STREET PUMPING STATION.

Fred W. Sadler, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

The buildings have been repaired where necessary, repainted and put in first-class condition.

The grounds have been given careful attention. The streets have been improved, adding materially to the appearance of the station.

ENGINES AND PUMPS.

No. 1 Engine: Several new gibs and keys were machined and installed; several sets of brasses also were machined and installed. Water end was overhauled and valve seats were refaced.

No. 2 Engine: Two new beam pins were machined and pressed in, new brasses, gibs and keys were installed, water end was overhauled and valve seats were faced. New valves were installed.

Engine No. 3: New brasses and new valves were installed and gibs, keys and valve seats were faced in water end.

Engine No. 4: Valve seats were faced and new valves were installed.

Engine No. 6: Plungers were repacked and priming valves were machined and reinstalled. The water end was overhauled, valve seats were faced and some new valves were installed.

Engine No. 7: One thousand Boyd turbine valves were installed in place of Snow valves, which were removed. The pistons in cylinders were reset and six new tubes in receiver were expanded.

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Engine No. 8: Steam turbine and centrifugal pump: New governor was installed on turbine and the pump was packed.

Engine No. 9: Steam turbine and centrifugal pump: The centrifugal pump was packed.

BOILERS AND FURNACES.

The boilers had few repairs. A few new tubes were installed. The brickwork was renewed from time to time, only one arch being lost during the year.

MISCELLANEOUS.

All machinery, boilers, steam piping, electric equipment and coal and ash handling devices were given usual repairs.

A 10½x10½ Westinghouse cross compound air compressor was installed for boiler cleaning, doing away with water power for this purpose.

The railroad tracks were given a complete overhauling and a renewal of parts where needed.

22ND STREET PUMPING STATION.

Joseph O'Connell, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

A Wallace & Tiernan chlorine control apparatus for water purification was installed in the basement over wier well.

ENGINES AND PUMPS.

Engine No. 2: A set of new 33", 29" and 6" rubber air pump valves was installed.

Engine No. 4: The plunger bucket and suction cages were removed and an entire set of new springs was installed and the plungers and buckets were repacked.

All necessary packing was provided for, on the main pump plungers, pistons, valve stems, etc.

BOILERS AND FURNACES.

New tubes were installed where necessary and all necessary repairs of furnaces and brick work, such as furnace linings, arches, side walls, bridge walls, etc., were made on boilers Nos. 1, 2, 3, 4, 5, 6.

The globe and check valves, water combinations, fittings and feed piping were refitted or renewed as found necessary.

BOILER FEED PUMPS.

All boiler feed and bilge pumps were thoroughly overhauled. New brass liners were installed, piston rods were renewed or returned, valve seats were refaced and valves were refitted. The main steam headers and the branch steam and exhaust lines were recovered with non-conducting covering.

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ROSELAND PUMPING STATION.

Thomas Kavanagh, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

A complete new set of doors and transoms are now being installed, in all outside entrances of the station, replacing worn out doors.

The general condition of the building and grounds after receiving minor repairs is good.

The switch track entering the station was reset, new ties were placed where needed and tie plates were put in.

ENGINES AND PUMPS.

Engine No. 1: General repairs were made on this engine.

Engine No. 2: General repairs were made on this engine.

Engine No. 3 was put in service February 17, 1915, by the erectors.

Engine No. 4 was put in service June 22, 1915, by erectors.

(This does not signify that engines Nos. 3 and 4 were put on probation.)

A new Bowser oiling system was installed for all units.

Hand railings were placed around poppet valves of engines Nos. 1, 2 and 3 for safety purposes.

BOILERS AND FURNACES.

Traveling grates and stoker engine received minor repairs. Repairs were made on all boiler units.

Iron frames and ladders were installed on each unit to enable easy access to steam drums for cleaning purposes.

New boiler units Nos. 1 and 6 were put in service during the year.

The boiler breeching received approximately 2,900 feet of 8 ounce canvas covering, which was afterward painted with two coats of paint.

PIPING.

Approximately 150 feet of steam pipe was recovered with 1" and 1½" asbestos covering, recanvassed and repainted.

COAL AND ASH HANDLING MACHINERY.

Lower run chairs and guides on coal conveyor were painted and given minor repairs.

Four new Universal toggle joint bin bottoms and coal spouts were installed on bunkers 2, 3, 4 and 5.

SPRINGFIELD AVENUE PUMPING STATION.

*Philip Petrie, Chief Operating Engineer.

Timothy W. Faherty, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

Repairs were made where required on buildings and the buildings and grounds are in first-class condition.

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*Philip Petrie entered the service of the city in June, 1900, as fifth grade mechanical engineer, and was promoted to the position of Chief Operating Engineer in December, 1905, which position he filled efficiently and creditably until his death May 19, 1915.

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ENGINES AND PUMPS.

The engines and pumps have been overhauled and only necessary repairs have been required.

BOILERS AND FURNACES.

Only necessary repairs have been required to keep the boiler and furnace plant in the best working condition. All boilers, purifiers and superheaters were inspected by the City Boiler Inspector and passed.

CENTRAL PARK AVENUE PUMPING STATION.

Frederick Gielow, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

A new concrete retaining wall, extending from railroad track scale to alley driveway was constructed by the Construction Division. The buildings and grounds have been maintained in first-class condition.

ENGINES AND PUMPS.

The engines and pumps have been overhauled during the year and are working in a very efficient manner.

BOILERS AND FURNACES.

All the boilers have been overhauled as needed and necessary repairs have been made. New ash pit and fire doors were installed on Hawley furnaces Nos. 2, 3, 5 and 6. Eighty new grate bars were installed in boiler furnaces Nos. 1, 2, 6 and 7.

LAKE VIEW PUMPING STATION.

Frederick Parker, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

Owing to the reconstruction work and changes that have been made at this station during 1915 there have been only minor repairs made.

One new twenty-five-million gallon pumping engine was installed by the Bethlehem Steel Company and put in operation on October 11th.

The temporary boiler room has been abandoned and a new boiler room was built and put in operation on July 8, with five new boilers of 320 horsepower each, Sederholm type with automatic stokers, new superheater and new boiler feed pump.

ENGINES AND PUMPS.

Engine No. 1: No repairs were made.

Engine No. 2: Water plungers were packed, new governor was put on air pump and new drip pans were put on new steam poppet valve stems. New rubber valves were installed on air pump and minor repairs made.

Engine No. 3: The water plungers were packed and lost motion was taken up. Minor repairs were made where necessary.

Engine No. 4: Water plungers were packed, new steam poppet valve stem was put on and new rubber valves and new valve and stem were put on air pump. Other minor repairs were made.

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HARRISON STREET PUMPING STATION.
William Sullivan, Chief Operating Engineer.

BUILDINGS AND GROUNDS.

Nothing was done to buildings or grounds, all that work being done in 1914.

ENGINES AND PUMPS.

All necessary minor repairs were made to keep the engines in first-class working order.

Engine No. 3 (Centrifugal): The pump end was overhauled so far as the diffusion vanes and impeller were concerned, which remedied our previous trouble with the diffusion vane sections working loose.

BOILERS AND FURNACES.

Boiler No. 1: The furnace was rebuilt twice during the year.

Boiler No. 2: The furnace was rebuilt twice during the year. A new steel mud drum was installed to take the place of a cast iron one ordered out by the Boiler Inspector.

Boiler No. 3: The furnace was rebuilt twice during the year, and eleven tubes were installed. A new steel mud drum was put on in place of a cast iron one, same as on boiler No. 2, and grates were overhauled.

Blouck Efficiency meters were put in each boiler and a "Backlund" damper regulator was installed which controls all three boilers, stoker engines and gates at the same time, or any one separately.

Stoker Engine: Miscellaneous repairs were made.

Boiler Feed Pump: Miscellaneous repairs were made. Fischer pump governors were put on both of the pumps to work in conjunction with the Copes feed water regulator.

BILGE PUMPS.

New piston rods were installed in both pumps. New packing glands, new water plungers and new valves were installed.

ROGERS PARK PUMPING STATION.
Patrick Fleming, Second Assistant Operating Engineer in Charge.

ENGINES AND PUMPS.

Only minor repairs were made to engines and pumps.

BOILERS AND FURNACES.

Minor repairs were made to boilers and furnaces.

FILTERING SYSTEM.

Seven tanks, including piping, were scraped and painted.

SHONE EJECTORS.

Six ejectors were overhauled and necessary repairs were made.

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STONY ISLAND AVENUE SEWAGE PUMPING STATION.
William Donlan, First Assistant Operating Engineer in Charge.

BUILDINGS AND GROUNDS.

Pointing of the stone facing of the station was completed during the year.

During the year the ground around the building was improved, all rubbish and ashes were removed, the yard was leveled, graded and covered with about five inches of black dirt and grass seed was planted. About 150 small bushes and shrubs were set in.

ENGINES AND PUMPS.

The shaft on No. 2 engine was lined up. The crank pin was turned true. Crank brasses were rebabbitted and connecting rod brasses were refitted. Cross heads were lined up.

BOILERS AND FURNACES.

A new 190-horsepower water tube boiler was installed, equipped with Combustion Engineering Company's Type "E" under feed stoker, which is controlled by a Mason regulator.

PIPING AND STEAMFITTING.

New extra heavy boiler feed lines were installed from engines Nos. 2, 3 and 4 to manifold in boiler room and from there to each of the boilers, replacing old, worn out pipes.

95TH STREET SEWAGE PUMPING STATION.
John M. Golden, First Assisting Operating Engineer in Charge.

BUILDINGS AND GROUNDS.

The boiler room was whitewashed, all pipe covering was painted and all interior woodwork in engine room was cleaned and revarnished.

The wooden floor back of the boilers was replaced with one of steel plates.

ENGINES AND PUMPS.

Valve motion on all engines was overhauled and discharge gates on same were repaired.

Old by-pass connections and valves between high and low pressure cylinders were replaced with new on all engines.

BOILERS AND FURNACES.

All old blow-off pipe on boilers, between blow-off cock and blow-off basin, was replaced with new, blow-off basin was raised and a solid concrete foundation put under same.

The water level gauge on suction side was reconstructed by putting in two pieces of 8" pipe, 14 feet long, making the gauge more accurate and dependable.

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PULLMAN SEWAGE PUMPING STATION.

David S. Williams, Second Assistant Operating Engineer in Charge.

ENGINES AND PUMPS.

The water ends of both pumps were overhauled twice during the year, new pins were put in clam shell valves, new leather cups and new rubber hoods were installed where necessary. Lost motion was taken up in brasses where required on connecting rods.

BOILERS AND FURNACES.

One boiler compound feeder to boilers Nos. 1 and 2 was installed.

One boiler feed pump water end was installed and a new set of valves and new followers were put in.

KENSINGTON SEWAGE PUMPING STATION.

Charles Naylor, Second Assistant Operating Engineer in Charge.

BUILDINGS AND GROUNDS.

All engines, pumps, piping and woodwork in engine and boiler rooms were painted and the boiler room was whitewashed.

ENGINES AND PUMPS.

Engine No. 1: Two new steam rings were put on piston valve. One new steam chest and cylinders, with all parts complete except piston rod and valve movement, were installed on vacuum pump.

BOILERS AND FURNACES.

New piston rings were installed in boiler feed pump No. 2.

New steam chest cover was put on boiler feed pump No. 1.

HEGEWISCH SEWAGE PUMPING STATION.

John T. Duffy, Second Assistant Operating Engineer in Charge.

BUILDINGS AND GROUNDS.

The exterior of the building, the fence and fence posts were painted.

ENGINES.

The two gas engines were overhauled, pistons were removed from cylinder, the carbon cleaned from rings and piston and connecting rod brasses were refitted.

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On hand Jan. 1, 1915....
Total received during yeau
Total available during yea
Total consumed.....
Coet consumed.....
On hand—tons—Dec. 31.

On hand Jan. 1, 1915....
Total received during yeau
Total available during yea
Total consumed.....
Coet consumed.....
On hand—tons—Dec. 31.

On hand Jan. 1, 1915....
Total received during yeau
Total available during yea
Total consumed.....
Coet consumed.....
On hand—tons—Dec. 31.

On hand Jan. 1, 1915....
Total received during yeau
Total available during yeu
Total consumed.....
Coet consumed.....
On hand—tons—Dec. 31.

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refitted.

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TABLE C

COAL ACCOUNT

14TH STREET PUMPING STATION

	Price Per Ton	Tons	Cost	Operation	Other Purposes	Total
On hand Jan. 1, 1915	$2.443	2322.3875	$ 5673.15	.....	.....	.....
Total received during year	2.4692	21887.38	54043.54	.....	.....	.....
Total available during year	2.4666	24209.7675	59716.69	.....	.....	.....
Total consumed	.....	.....	.....	22551.605	221.5	22773.105
Cost consumed	2.4666	.....	.....	$55625.79	$546.35	$56172.14
On hand—tons—Dec. 31, 1915	2.4666	1436.6625	.....	.....	.....	3544.55

68TH STREET PUMPING STATION

On hand Jan. 1, 1915	$1.6367	4415.4625	$ 7226.96	.....	.....	.....
Total received during year	1.6744	37605.85	62965.58	.....	.....	.....
Total available during year	1.6704	42021.3125	70192.54	.....	.....	.....
Total consumed	.....	.....	.....	39218.565	.....	39218.565
Cost consumed	1.6704	.....	.....	$65510.69	.....	$65510.69
On hand—tons—Dec. 31, 1915	.....	.....	.....	.....	.....	.....

22ND STREET PUMPING STATION

On hand Jan. 1, 1915	$2.0912	2153.825	$ 4505.78	.....	.....	.....
Total received during year	2.1115	13608	28732.68	.....	.....	.....
Total available during year	2.1088	15761.825	33238.46	.....	.....	.....
Total consumed	.....	.....	.....	12389.5675	2127	14516.5675
Cost consumed	2.1088	.....	.....	$26127.12	$4485.42	$30612.54
On hand—tons—Dec. 31, 1915	2.1088	1245.2575	.....	.....	.....	$2625.92

CHICAGO AVENUE PUMPING STATION

On hand Jan. 1, 1915	$2.472	2375.825	$ 5879.15	.....	.....	.....
Total received during year	2.4379	16044.15	39114.48	.....	.....	.....
Total available during year	2.4426	18419.975	44993.63	.....	.....	.....
Total consumed	.....	.....	.....	17014.28	81.12	17095.4
Cost consumed	2.4426	.....	.....	$41559.08	$198.14	$41757.22
On hand—tons—Dec. 31, 1915	2.4426	1324.575	.....	.....	.....	$3236.41

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TABLE C—Continued

COAL ACCOUNT

SPRINGFIELD AVENUE PUMPING STATION

	Price Per Ton	Tons	Cost	Operation	Other Purposes	Total
On hand Jan. 1, 1915	$2.0614	3155.2125	$ 6505.72	.....	.....	.....
Total received during year	2.0146	24071.35	48495.27	.....	.....	.....
Total available during year	2.0201	27226.5625	55000.99	.....	.....	.....
Total consumed	.....	.....	.....	26176.6475	44.035	26220.6825
Cost consumed	2.0201	.....	.....	$52879.44	$88.96	52968.40
On hand—tons—Dec. 31, 1915	2.0201	5100.88	.....	.....	.....	2032.59

CENTRAL PARK AVENUE PUMPING STATION

On hand Jan. 1, 1915	$2.044	4010.25	$ 8200.05	.....	.....	.....
Total received during year	2.0219	25458.7	51475.93	.....	.....	.....
Total available during year	2.025	29468.95	59675.98	.....	.....	.....
Total consumed	.....	.....	.....	27913.505	45.36	27958.865
Cost consumed	2.025	.....	.....	$56524.85	91.85	$56616.70
On hand—tons—Dec. 31, 1915	2.025	1510.085	.....	.....	.....	$3059.28

HARRISON STREET PUMPING STATION

On hand Jan. 1, 1915	$2.1252	247.4425	$ 526.53	.....	.....	.....
Total received during year	2.0633	11857.625	24466.39	.....	.....	.....
Total available during year	2.0647	12105.0675	24992.92	.....	.....	.....
Total consumed	.....	.....	.....	11906.8425	2.55	11909.3925
Cost consumed	2.0647	.....	.....	$24584.06	$5.26	$24589.32
On hand—tons—Dec. 31, 1915	2.0647	195.675	.....	.....	.....	$403.60

LAKE VIEW PUMPING STATION

On hand Jan. 1, 1915	$2.7829	1937.965	$ 5393.63	.....	.....	.....
Total received during year	2.6208	19688.4475	51599.73	.....	.....	.....
Total available during year	2.6354	21626.4125	56993.36	.....	.....	.....
Total consumed	.....	.....	.....	18752.075	1420	20172.075
Cost consumed	2.6354	.....	.....	49419.22	$3742.27	$53161.49
On hand—tons—Dec. 31, 1915	$2.6354	1454.3375	.....	.....	.....	3831.87

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TABLE C—Continued

COAL ACCOUNT

ROSELAND PUMPING STATION

	Price Per Ton	Tons	Cost	Operation	Other Purposes	Total
On hand Jan. 1, 1915	$1.6642	1274.825	$ 2121.60	.....	.....	.....
Total received during year	1.6052	13734.13	22046.60	.....	.....	.....
Total available during year	1.6103	15008.955	24168.20	.....	.....	.....
Total consumed	.....	.....	.....	13947.195	.....	13947.195
Cost consumed	1.6103	.....	.....	$22459.17	.....	$22459.17
On hand—tons—Dec. 31, 1915	1.6103	1061.76	.....	.....	.....	1709.03

MAJOR PUMPING STATIONS

On hand Jan. 1, 1915	$2.1025	21893.195	$ 46032.57[1]	.....	.....	.....
Total received during year	2.0817	183955.6325	382940.20	.....	.....	.....
Total available during year	2.0839	205848.8275	428972.77	.....	.....	.....
Total consumed	.....	.....	.....	189870.2825	3941.565	193811.8475
Cost consumed	2.0839	.....	.....	$394689.42	$9158.25	$403847.67
On hand—tons—Dec. 31, 1915	2.0939	12036.98	.....	.....	.....	$25125.10

ROGERS PARK PUMPING STATION

On hand Jan. 1, 1915	$3.3312	27	$ 90.10	.....	.....	.....
Total received during year	2.9534	1124.4475	3320.90	.....	.....	.....
Total available during year	2.9624	1151.4475	3411.00	.....	.....	.....
Total consumed	.....	.....	.....	1063.95	.....	1063.95
Cost consumed	2.9624	.....	.....	$3151.85	.....	$3151.85
On hand—tons—Dec. 31, 1915	2.9624	87.4975	.....	.....	.....	259.15

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TABLE D

STATEMENT OF OPERATION OF ELECTRIC DRIVEN PUMPS, 1915, 22ND STREET PUMPING STATION.

Month	Pumpage in Mill. Gallons	Head	Foot Gallons in Millions	Cost of Electric Power
January	1,248.1	111.08	138,638.948	$4,361.21
February	1,267.2	108.95	138,061.440	5,193.80
March	1,347.3	110.52	148,904.701	4,170.53
April	1,336.9	109.91	146,938.679	4,265.49
May	1,367.9	112.64	154,080.256	4,200.84
June	1,354.1	112.30	152,065.430	4,388.42
July	1,289.1	113.08	145,771.430	4,120.25
August	1,276.0	114.03	145,502.280	3,928.54
September	1,277.3	114.17	145,829.350	4,097.18
October	1,259.1	115.09	144,909.820	4,124.84
November	1,184.8	115.24	136,536.350	4,239.74
December	1,145.4	114.16	130,758.860	3,603.83
Total	15,353.2	112.60	1,727,997.544	$50,694.67

Cost of Electric Power per Million Gallons Pumpage **$3.301**

Cost of Electric Power per Million Foot Gallons **$0.0293**

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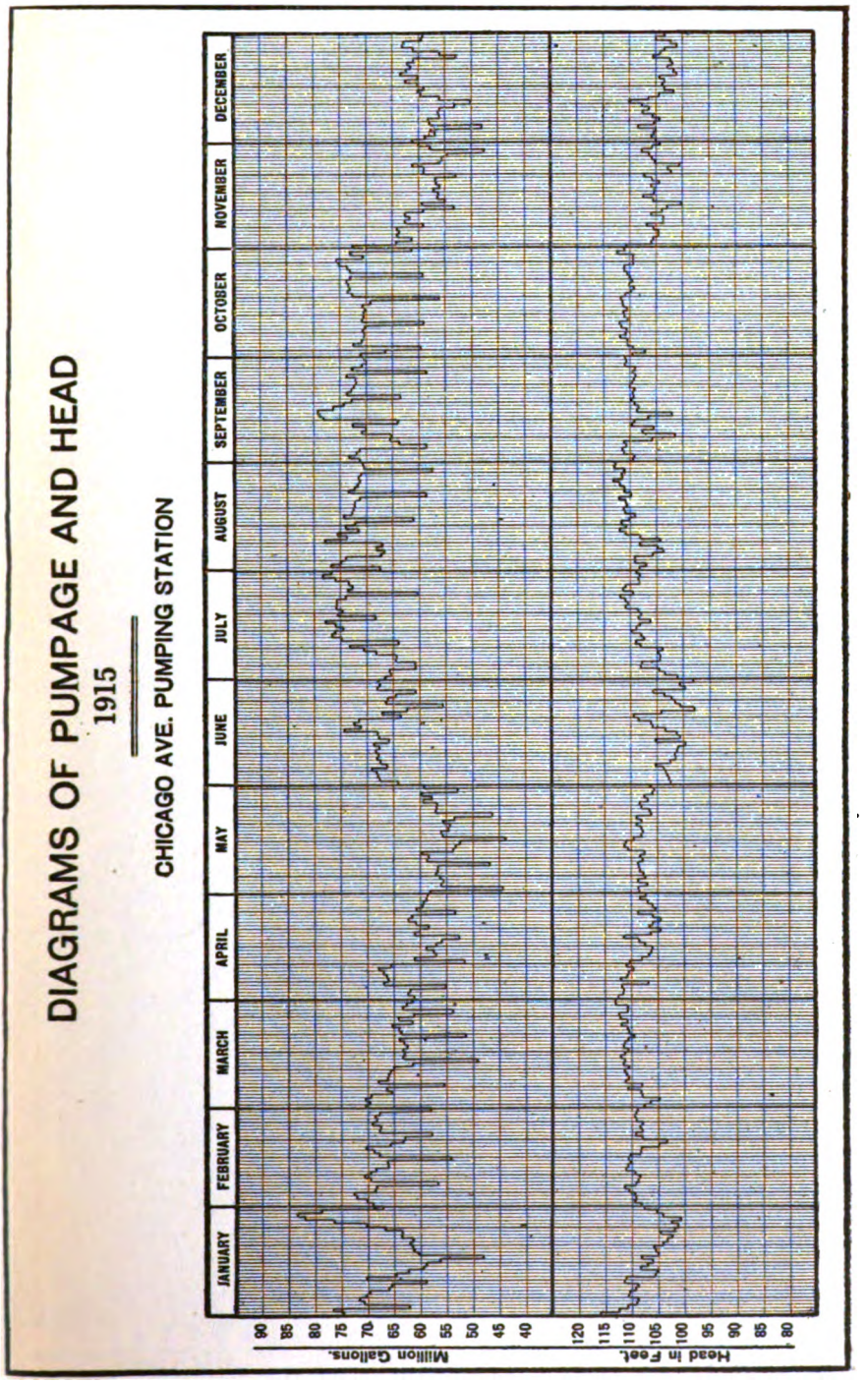
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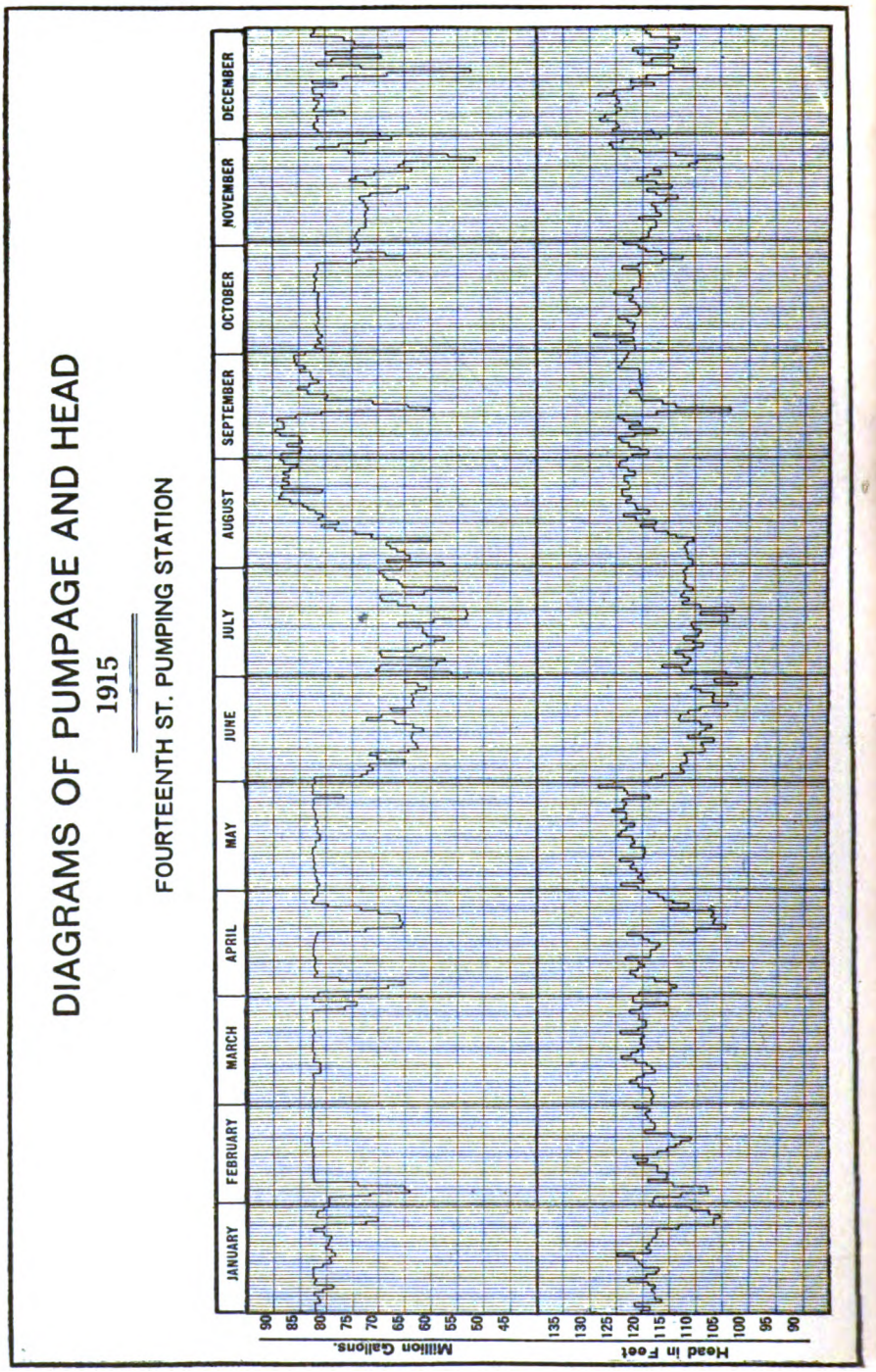
Head in Feet. Million Gallons.

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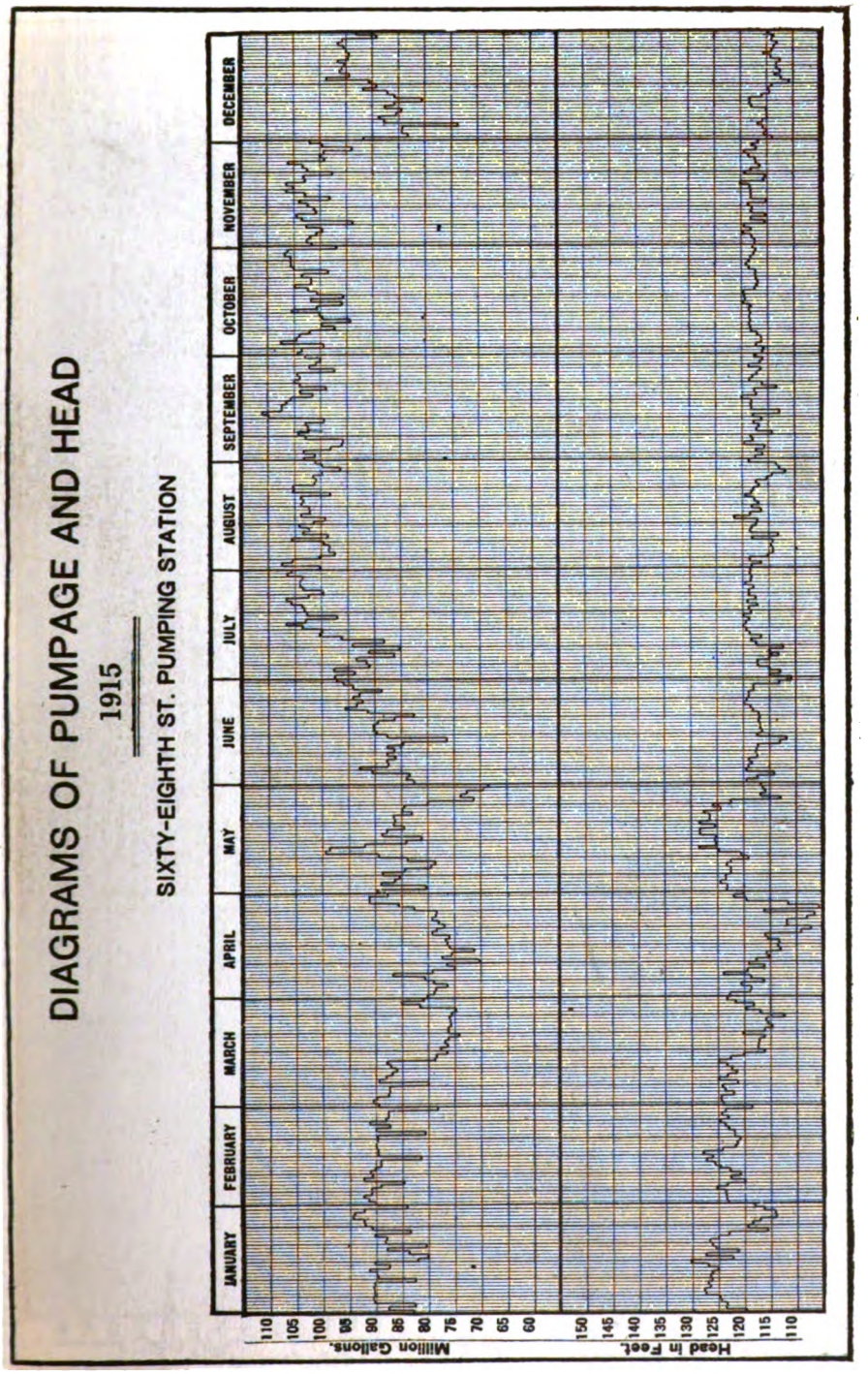
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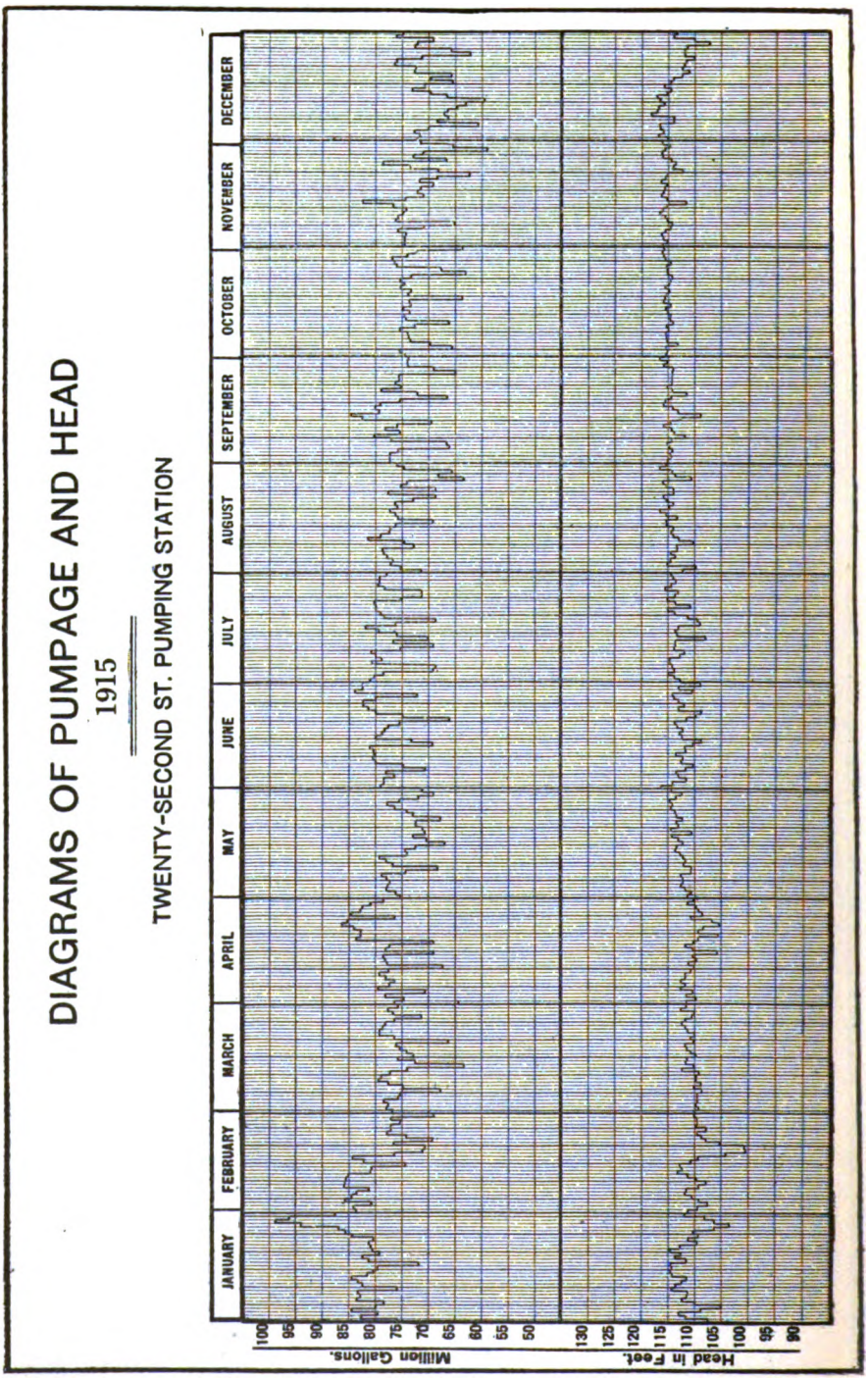
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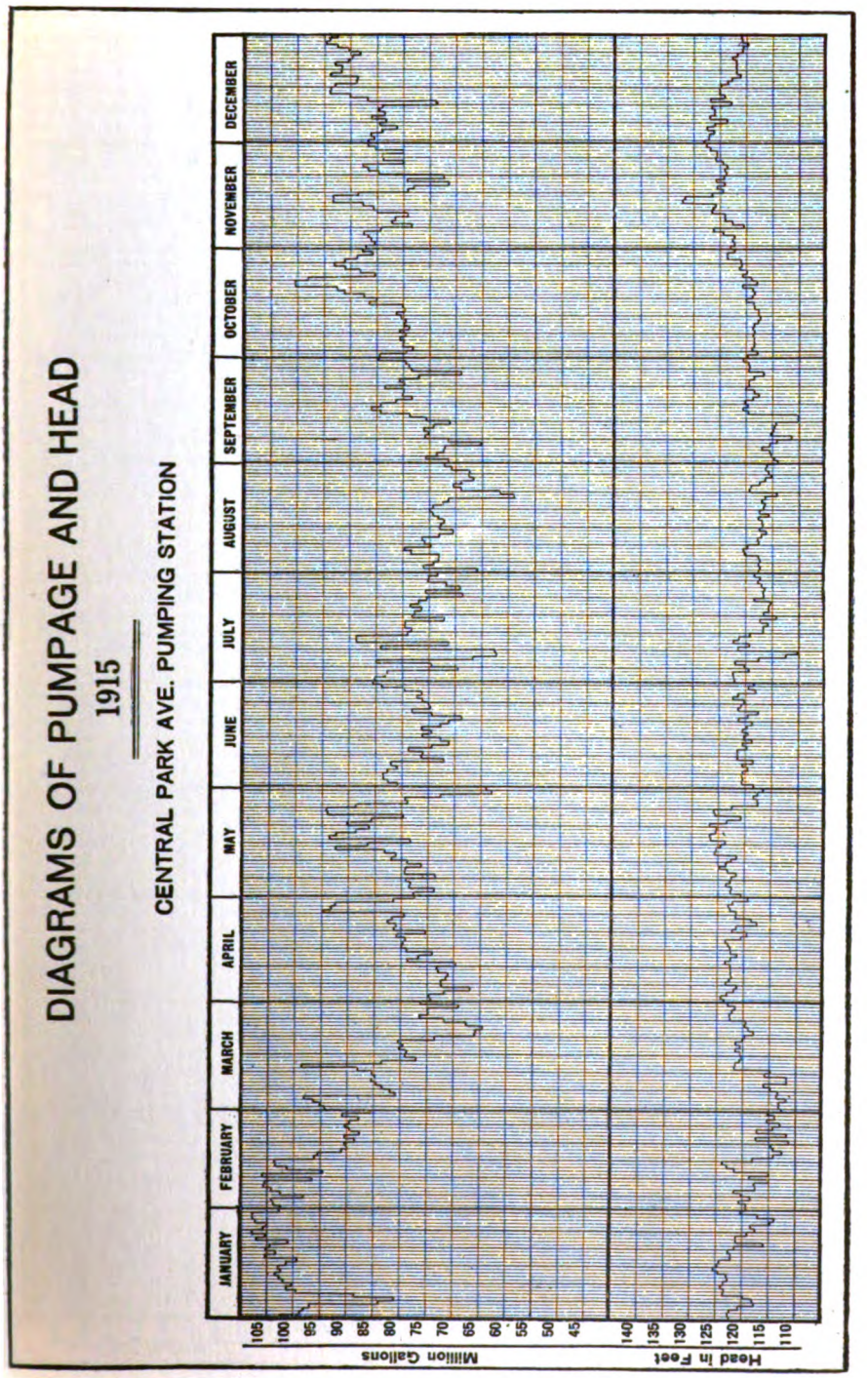
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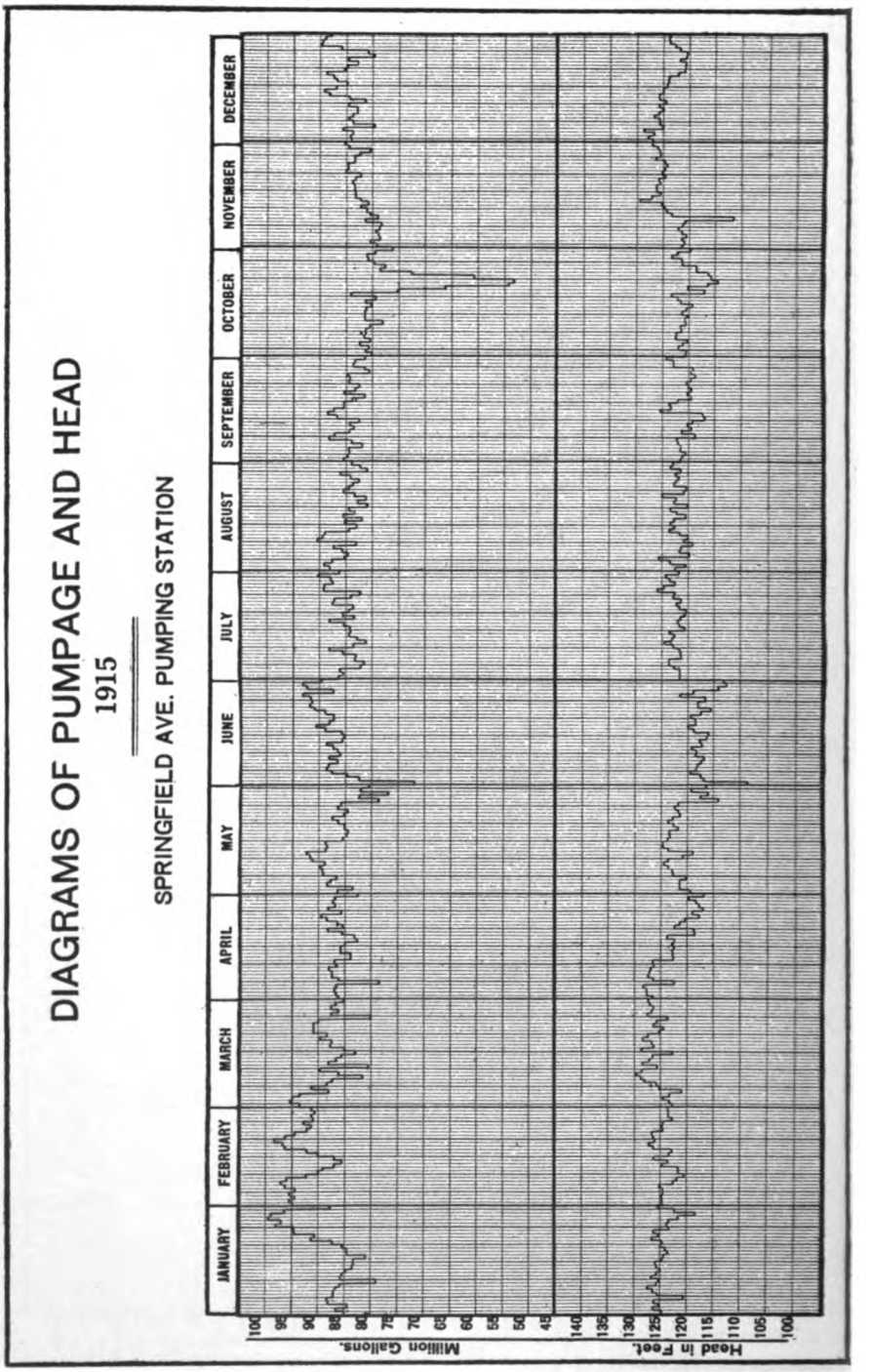
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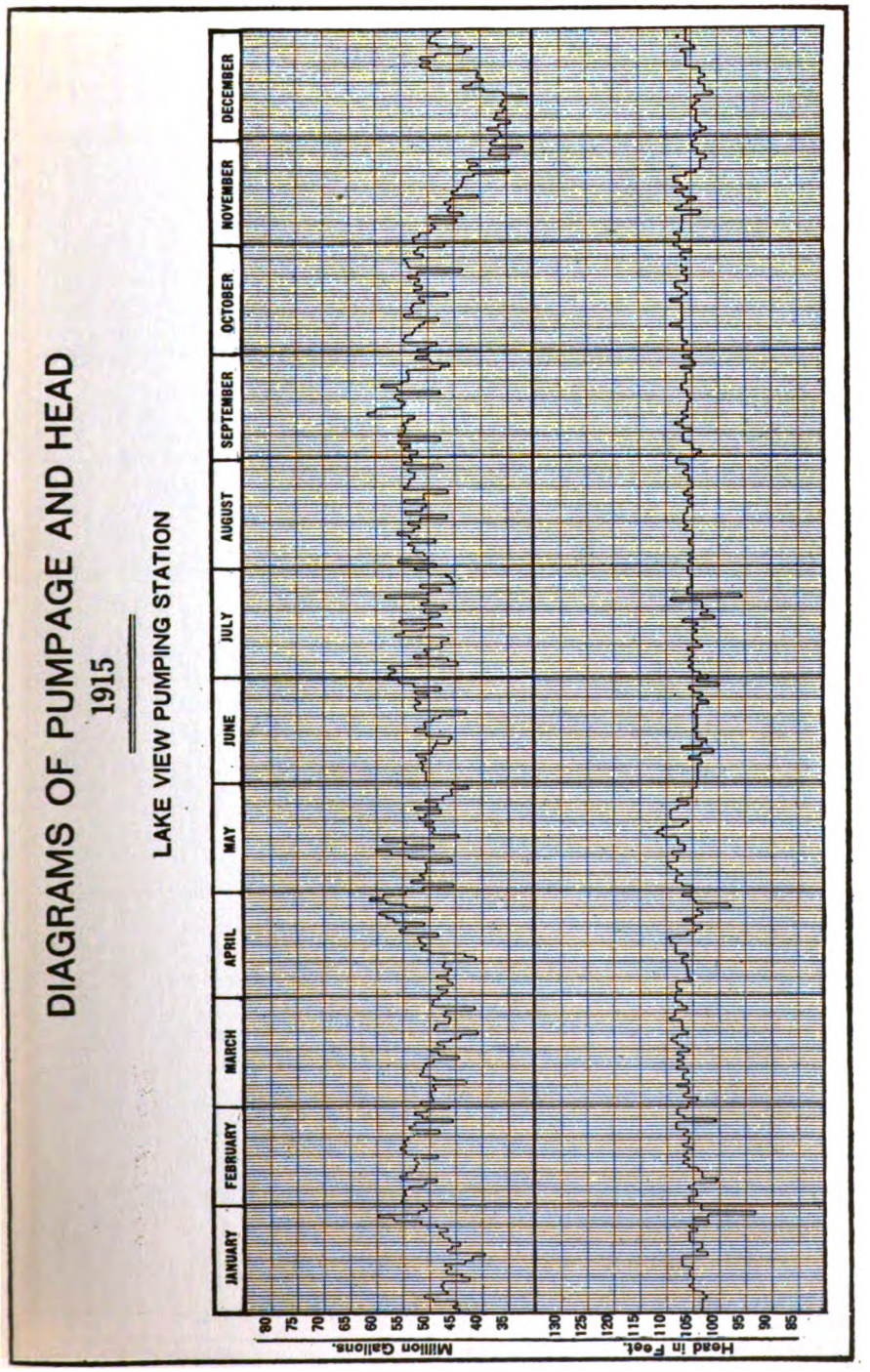
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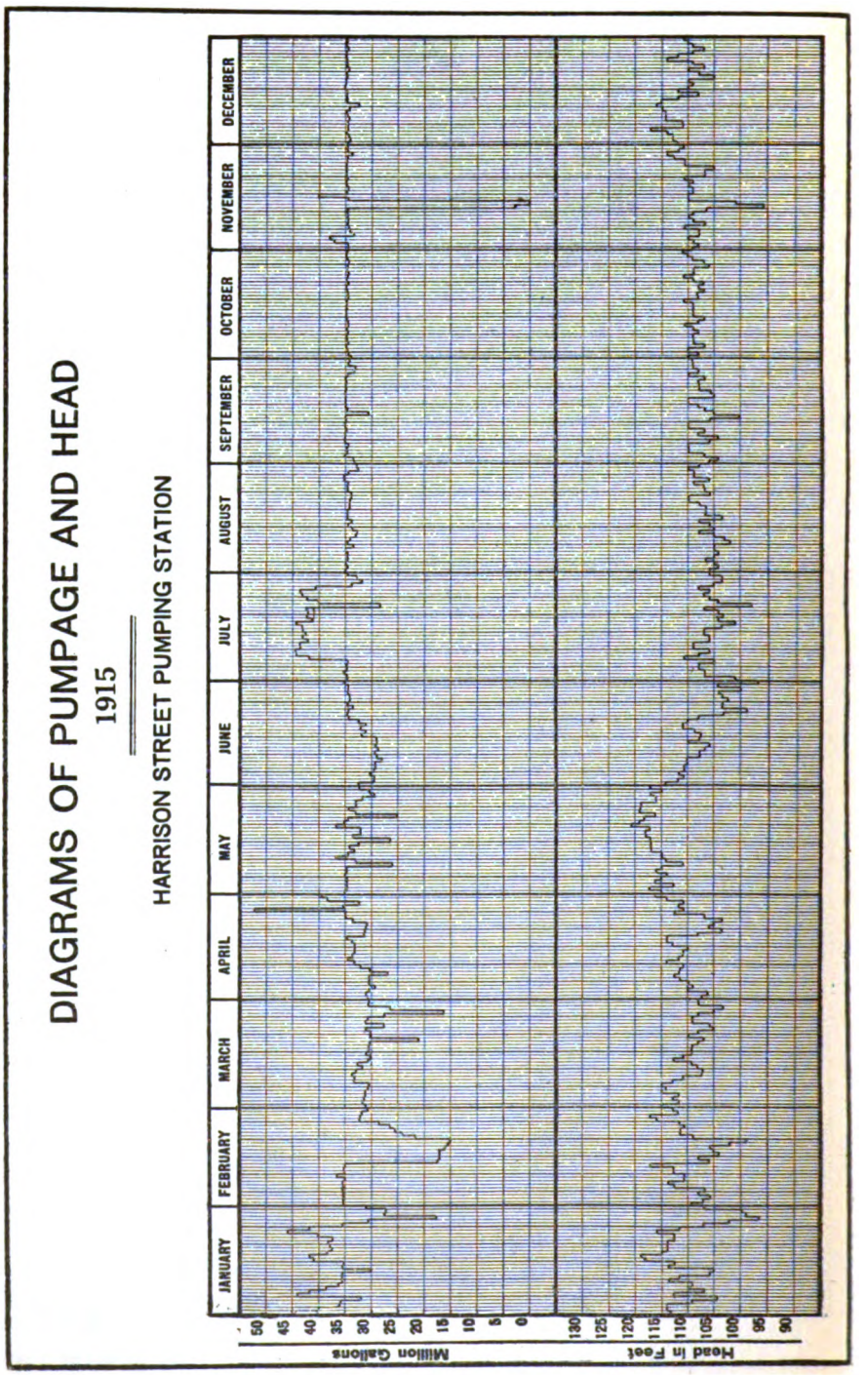
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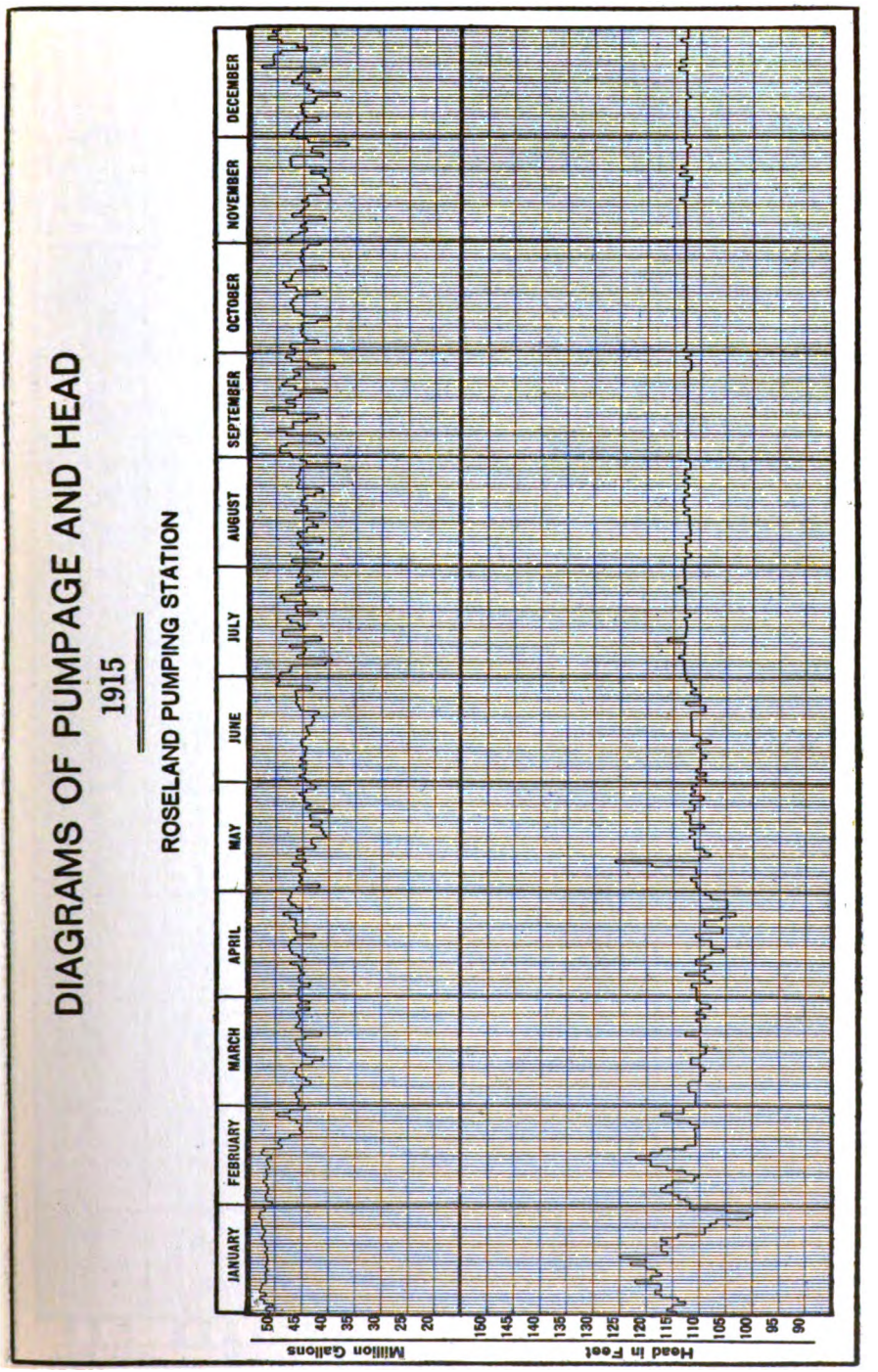
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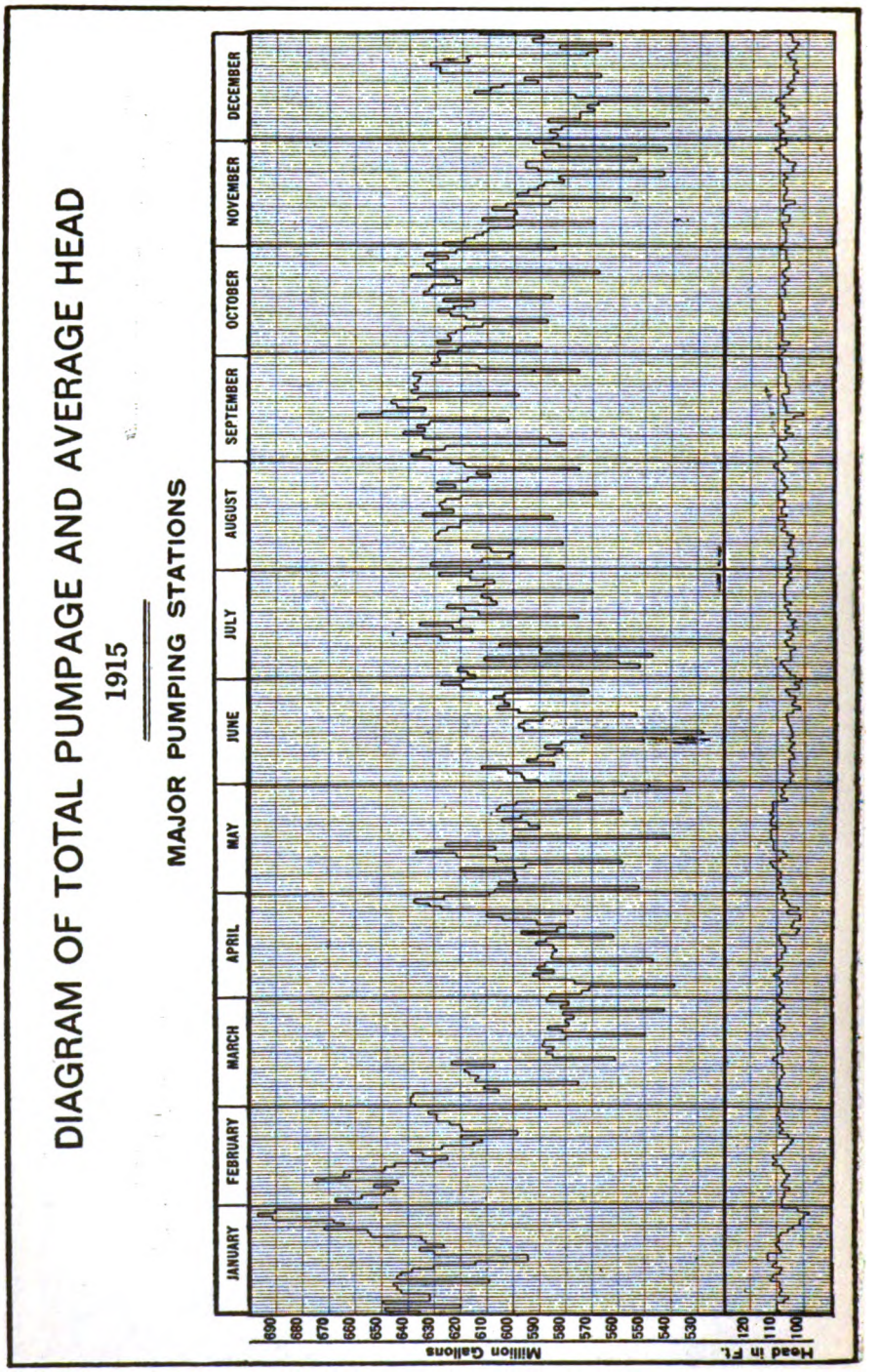
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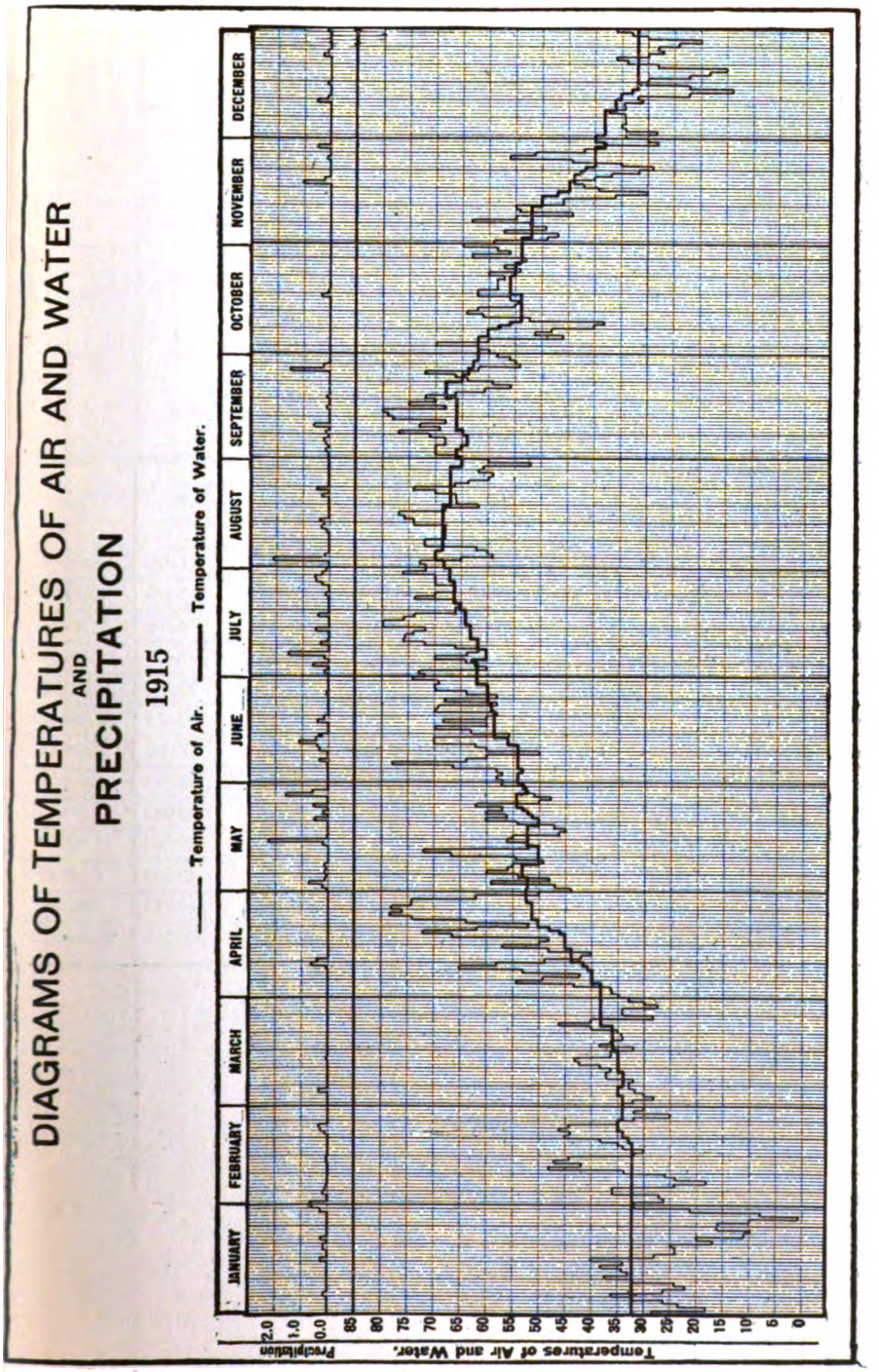
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TABLE AA

MONTHLY PUMPAGE IN MILLIONS OF GALLONS—1915—
SEWER PUMPING STATIONS

Month	Stony Island Ave. Pumping Station	95th St. Pumping Station	Kensington Pumping Station	Pullman Pumping Station	Hegewisch Pumping Station	Total
January	927.915	1,321.360	118.611	77.785	41.020	2,486.
February	832.776	1,306.940	113.850	73.810	45.150	2,372.5
March	798.712	1,319.154	93.407	64.168	40.670	2,316.1
April	764.485	1,199.604	88.061	59.412	33.425	2,144.9
May	849.297	920.774	107.743	67.657	39.550	1,985.0
June	899.348	1,887.950	101.067	64.712	49.875	3,002.9
July	853.191	1,039.897	116.507	70.476	57.680	2,137.7
August	840.240	1,825.376	118.489	81.691	98.745	2,964.5
September	843.934	608.242	97.914	68.697	55.685	1,674.4
October	832.271	626.164	95.530	68.431	44.520	1,666.9
November	795.894	668.889	94.651	65.982	40.090	1,665.5
December	800.084	599.423	93.823	66.263	43.155	1,602.7
Total	10,038.147	13,323.773	1,239.653	829.084	589.565	26,020.2

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On hand Jan. 1, 1915.	
Total received during year.	
Total available during year.	
Total consumed.	
Cost consumed.	
On hand, tons, Dec. 31, 1915.	

On hand Jan. 1, 1915.	
Total received during year.	
Total available during year.	
Total consumed.	
Cost consumed.	
On hand, tons, Dec. 31, 1915.	

On hand Jan. 1, 1915.	
Total received during year.	
Total available during year.	
Total consumed.	
Cost consumed.	
On hand, tons, Dec. 31, 1915.	

On hand Jan. 1, 1915.	
Total received during year.	
Total available during year.	
Total consumed.	
Cost consumed.	
On hand, tons, Dec. 31, 1915.	

On hand Jan. 1, 1915.	
Total received during year.	
Total available during year.	
Total consumed.	
Cost consumed.	
On hand, tons, Dec. 31, 1915.	

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	Total
On hand Jan. 1, 1915.	
Total received during year.	
Total available during year	
Total consumed	1022.005
Cost consumed.	$526.70
On hand, tons, Dec. 31, 1915.	104.62
On hand Jan. 1, 1915.	
Total received during year.	
Total available during year	
Total consumed	1108.2445
Cost consumed.	$2727.28
On hand, tons, Dec. 31, 1915.	382.52
On hand Jan. 1, 1915.	
Total received during year.	
Total available during year	
Total consumed	1662.575
Cost consumed.	$3572.87
On hand, tons, Dec. 31, 1915.	159.65
On hand Jan. 1, 1915.	
Total received during year.	
Total available during year	
Total consumed	1700.875
Cost consumed.	$3556.19
On hand, tons, Dec. 31, 1915.	254.74
On hand Jan. 1, 1915.	
Total received during year.	
[illegible] during year	
[illegible]	5493.6995
consumed.	
[illegible] ons,	901.53

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	Price Per To	Total
On hand Jan. 1, 1915.		
Total received during year.	$2.49	
Total available during year	2.47	
Total consumed		1022.005
Cost consumed.	2.47	$2526.70
On hand, tons, Dec. 31, 1915.	2.47	104.62

On hand Jan. 1, 1915.		
Total received during year.	$2.48	
Total available during year	2.46	
Total consumed		1108.2445
Cost consumed.	2.46	$2727.28
On hand, tons, Dec. 31, 1915.	2.46	382.52

On hand Jan. 1, 1915.		
Total received during year.	$2.14	
Total available during year	2.14	
Total consumed		1662.575
Cost consumed.	2.14	$3572.87
On hand, tons, Dec. 31, 1915.	2.14	159.65

STC

On hand Jan. 1, 1915.		
Total received during year.	$2.07	
Total available during year	2.09	
Total consumed		1700.875
Cost consumed.	2.09	$3556.19
On hand, tons, Dec. 31, 1915.	2.09	254.74

On hand Jan. 1, 1915.		
Total received during year.	$2.25	
Total available during year	2.25	
Total consumed		5493.6995
Cost consumed.		
On hand, tons, Dec. 31, 1915.		901.53

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TABLE CC

COAL ACCOUNT

KENSINGTON PUMPING STATION

	Price Per Ton	Tons	Cost	Operation	Other Purposes	Total
On hand Jan. 1, 1915		103.25	$230.72			
Total received during year	$2.4978	961.08	2400.60			
Total available during year	2.4723	1064.33	2631.32			
Total consumed				1022.005		1022.005
Cost consumed	2.4723			$2526.70		$2526.70
On hand, tons, Dec. 31, 1915	2.4723	42.325				104.62

PULLMAN PUMPING STATION

On hand Jan. 1, 1915		112.682	$250.00			
Total received during year	$2.4846	1151.015	2859.80			
Total available during year	2.4609	1263.697	3109.80			
Total consumed				1108.2445		1108.2445
Cost consumed	2.4609			$2727.28		$2727.28
On hand, tons, Dec. 31, 1915	2.4609	155.4525				382.52

95TH STREET PUMPING STATION

On hand Jan. 1, 1915		16.625	$36.91			
Total received during year	$2.1484	1720.20	3695.61			
Total available during year	2.149	1736.825	3732.52			
Total consumed				1662.575		1662.575
Cost consumed	2.149			3572.87		$3572.87
On hand, tons, Dec. 31, 1915	2.149	74.25				159.65

STONY ISLAND AVENUE PUMPING STATION

On hand Jan. 1, 1915		71.00	$169.00			
Total received during year	$2.0791	1751.7	3641.93			
Total available during year	2.0908	1822.7	3810.93			
Total consumed				1700.875		1700.875
Cost consumed	2.0908			3556.19		$3556.19
On hand, tons, Dec. 31, 1915	2.0908	121.825				254.74

TOTAL SEWAGE PUMPING STATIONS

On hand Jan. 1, 1915		303.557	$686.63			
Total received during year	$2.2561	5583.995	12597.94			
Total available during year	2.2564	5887.552	13284.57			
Total consumed				5493.6953		5493.6995
Cost consumed	2.254					
On hand, tons, Dec. 31, 1915	2.289	393.8525				901.53

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LAKE CRIBS AND TUNNELS SECTION.
Daniel Donovan, City Diver.

GENERAL.

The shafts on tunnels and connections in the vicinity of the Chicago Avenue Pumping Station were opened up for inspection and the shafts of each were fitted with necessary pipes and connections to vent the same.

Inspection was made of each shaft on the Southwest Land Tunnel and arrangements were made for placing vent pipes in the shafts during the paving of the streets.

The name of each crib was painted on the structure, or breakwater surrounding the crib, in plain white letters twenty-four inches in diameter on a dark background, as a guide to the navigators of Lake Michigan.

The use of acetylene gas for lighting of the beacon lights was extended to the Four Mile, the Lake View and the 68th Street Cribs, it having previously been in use on the C. H. Harrison and the Two Mile Cribs.

The gas gives a white flame of greater intensity and is more reliable than kerosene oil.

Each crib was equipped with a large filter for purifying the wastes of the kitchen sinks before the same are allowed to drain into the lake.

An examination was made of the condition of each port in the various cribs and repairs were made as required.

Minor repairs were made to the timber work of the various landings and breakwaters, no extensive repairs being required. The concrete and masonry work of each crib was thoroughly gone over and repairs were made where necessary.

The iron work of all of the cribs was painted to protect the same from corrosion and the interior of the well room and all of the living rooms on the Four Mile, C. H. Harrison and 68th Street Cribs were repainted.

C. H. HARRISON CRIB.

On June 3d, during a heavy fog, the steamship "Tuscarora" of the Lehigh Valley Railroad Company, ran into the crib structure and jarred about twenty coping stones off the parapet wall, caused the joints in the same to be broken and moved several of the stones inward about one inch out of line.

WATERWORKS SHOPS AND REPAIR DIVISION.
Frank A. Miller, Superintendent.

During the year 1915 the Waterworks Shops and Repair Division received 5,543 orders and requisitions, and billed $402,191.51 in warrants to departments, bureaus and divisions of the city government.

The machine shop, Mr. W. A. Saunders in charge, manufactured 1,941 hydrants of various sizes, which was an increase of 809 over the output of 1914. The shop repaired 1,078 hydrants, being 24 more than the previous year. There were 1,611 valves manufactured, ranging in size from 4" to 36", being 163 more than in 1914.

The increase in efficiency gained by the speeding up of the line shafts and machines and by substituting electric group drive and the addition of new tools, enabled the shops to increase the production as shown.

There was installed a 48 x 48 x 14" variable speed motor driven planer which has lowered the cost of the work about 40 per cent. The 21" turret

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lathe, motor driven, has enabled the shops to increase the output and decrease the cost of same.

The new machine shop at the Municipal Plant is nearly completed. There are three large Niles-Bement-Pond lathes set and wired. The double headed shaper is also set and wired. The Cincinnati Milling Machine Drill Presses have been delivered. The building will be ready for occupancy in two months' time. The blacksmith shop is nearly completed and will be ready in about the same time.

The new Municipal Foundry has been in operation since the latter part of August. In the last four months of the year there was poured 747½ tons of machinery castings, special pipe for the Water Pipe Extension Division and curbs and lids.

The brass foundry during the year turned out approximately ninety-one tons of bronze and brass castings—about sixteen tons more than the previous year.

The new carpenter shop, which will contain space for the tinners, painters, pattern makers and pattern storage, will be ready for occupany in six months. Quite a few new tools have been delivered to these different shops.

When all the trades are located in these shops the city will have one of the most modern up-to-date shops in existence.

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WATER WORKS SHOPS AND REPAIR DIVISION—STATEMENT OF WORK PERFORMED AND BILLED YEAR 1915

Division		Kind	Material	Labor	Operation	Total
Chicago Avenue Pumping Station	Operation	General	339.67	6,563.69	.....	6,903.36
Chicago Avenue Pumping Station	Operation	Shop	268.10	5,395.60	.....	5,663.70
Chicago Avenue Pumping Station	Const. Div.	General	57.71	184.71	6.51	248.93
14th Street Pumping Station	Operation	General	1,424.56	11,459.04	.. ..	12,883.60
14th Street Pumping Station	Operation	Shop	537.58	4,758.31	.....	5,295.89
14th Street Pumping Station	Const. Div.	General	5.00	170.80	26.37	202.17
68th Street Pumping Station	Operation	General	123.23	8,903.47	.....	9,026.70
68th Street Pumping Station	Operation	Shop	20.48	4,774.52	.....	4,795.00
22nd Street Pumping Station	Operation	General	320.50	4,298.82	.....	4,619.32
22nd Street Pumping Station	Operation	Shop	856.06	4,189.96	.....	5,046.02
22nd Street Pumping Station	Const. Div.	General	.....	32.06	4.81	36.87
Central Park Pumping Station	Operation	General	465.48	7,332.27	.....	7,797.75
Central Park Pumping Station	Operation	Shop	687.10	7,390.36	.....	8,077.46
Central Park Pumping Station	Const. Div.	Foundry	259.98	.....	39.00	298.98
Springfield Avenue Pumping Station	Operation	General	389.41	6,745.36	.....	7,134.77
Springfield Avenue Pumping Station	Operation	Shop	471.97	6,368.35	.....	6,840.32
Harrison Street Pumping Station	Operation	General	48.04	3,479.33	.....	3,527.37
Harrison Street Pumping Station	Operation	Shop	88.35	2,051.88	.....	2,140.23
Harrison Street Pumping Station	Const. Div.	General	421.67	353.05	.....	774.72
Lake View Pumping Station	Operation	General	271.13	5,711.40	.....	5,982.53
Lake View Pumping Station	Operation	Shop	15.34	3,944.94	.....	3,960.28
Lake View Pumping Station	Const. Div.	General	297.17	1,312.58	83.00	1,692.75
Lake View Pumping Station	Const. Div.	Shop	430.47	719.19	162.43	1,312.09
Roseland Pumping Station	Operation	General	354.79	6,012.39	.....	6,367.18
Roseland Pumping Station	Operation	Shop	81.12	2,278.48	.....	2,359.60
Roseland Pumping Station	Const. Div.	General	157.97	1,117.29	96.76	1,372.02
Roseland Pumping Station	Const. Div.	Shop	1.80	316.14	47.72	365.66
Rogers Park Pumping Station	Operation	General	56.12	608.00	....	664.12
Rogers Park Pumping Station	Operation	Shop	.20	4.59	.....	4.79
Fullerton Avenue Pumping Station	Operation	Shop	.....	11.00	1.65	12.65
Norwood Park Pumping Station	Operation	General	11.54	17.94	.....	29.48
Stony Island Avenue Pumping Station	Operation	General	.....	463.39	15.85	479.24
Stony Island Avenue Pumping Station	Operation	Shop	13.47	222.91	.....	236.38
Kensington Pumping Station	Operation	General	41.48	247.71	.....	289.19
Kensington Pumping Station	Operation	Shop	.....	60.09	.....	60.09
Pullman Pumping Station	Operation	General	3.82	110.84	.73	115.39
Pullman Pumping Station	Operation	Shop	.....	47.44	.....	47.44
95th Street Pumping Station	Operation	General	80.89	690.13	3.65	774.67
Hegewisch Pumping Station	Operation	Shop	1.08	236.21	19.28	256.57
Jefferson Park Pumping Station	Operation	Shop	1.30	58.80	.....	60.10
Two Mile Crib	.....	General	3.91	45.70	7.44	57.05
Four Mile Crib	.....	General	35.81	674.20	106.50	816.51
Carter H. Harrison Crib	.....	General	24.36	470.95	74.30	569.61
C. H. Harrison Crib	.....	Shop	.33	1.72	.31	2.36
Edward F. Dunne Crib	.....	General	2.00	602.80	90.72	695.52
68th Street Crib	.....	General	109.33	656.54	64.91	830.78
Lake View Crib	.....	General	3.76	28.10	4.78	36.64

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WATER WORKS SHOPS AND REPAIR DIVISION—STATEMENT OF WORK PERFORMED AND BILLED
YEAR 1915—Continued.

Division		Kind	Material	Labor	Operation	Total
Lake View Crib	.....	Shop	.10	3.19	.49	3.78
W. P. Extension Division—New Hydrants	.....	Shop	87,392.93	607.88	13,213.65	101,304.46
W. P. Extension Division—New Valves	.....	Shop	31,480.62	359.57	4,776.49	36,616.68
W. P. Extension Division—Hydrants Repaired	.....	Shop	10,145.23	9,803.29	3,092.60	23,041.12
W. P. Extension Division—General Work	.....	General	1,078.37	2,378.51	46.76	3,503.64
W. P. Extension Division—Miscellaneous	.....	Shop	14,501.94	15,913.20	4,558.99	34,974.13
W. P. Extension Division	.....	Foundry	6,009.75	.....	901.45	6,911.20
Amount Carried Forward	.....	.....	159,393.02	140,278.69	27,447.15	327,118.86

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WATER WORKS SHOPS AND REPAIR DIVISION—STATEMENT OF WORK PERFORMED AND BILLED YEAR 1915—Continued.

Division	Kind	Material	Labor	Operation	Total
Amount Brought Forward	.....	159,393.02	140,278.69	27,447.15	327,118.86
Bridge Division	General	718.92	3,082.71	530.52	4,332.15
Bridge Division	Shop	1,545.46	2,247.99	567.52	4,360.97
Bridge Division	Foundry	190.02	.....	28.50	218.52
Fire Department	General	181.88	1,188.94	166.41	1,537.23
Fire Department	Foundry	78.70	.....	11.81	90.51
Police Department	General	2,285.59	8,728.51	471.00	11,485.10
Police Department	Shop	1,022.29	2,113.15	356.82	3,492.26
Police Department	Foundry	25.50	.....	3.82	29.32
Bureau of Water	Shop	5.22	15.59	3.12	23.93
Bureau of Sewers	General	1.69	36.91	5.79	44.39
Bureau of Sewers	Shop	1.50	2.39	.59	4.48
Bureau of Streets	General	3.39	7.26	1.60	12.25
Bureau of Streets	Shop	144.46	524.29	99.70	768.45
Public Service Department	General	.21	2.60	.42	3.23
Testing Division	Shop	.66	31.74	4.86	37.26
Public Welfare Department	General	8.16	39.56	.....	47.72
Board of Education	General	3.96	.....	.59	4.55
Board of Education	Shop	2.86	.....	.43	3.29
Board of Local Improvements	Shop	.....	16.50	2.48	18.98
Meter Mechanical Division	General	14.38	66.33	12.12	92.83
Meter Mechanical Division	Shop	294.57	90.69	50.72	435.98
Health Department	General	1,144.32	3,221.11	369.12	4,734.55
Health Department	Shop	95.60	525.89	93.22	714.71
Gas and Electric Department	General	52.29	183.36	1.36	237.01
Gas and Electric Department	Shop	8.74	31.92	6.11	46.77
Division of Operation	General	.....	285.37	42.81	328.18
Special Park Commission	General	.10	.70	.12	.92
Special Park Commission	Shop	21.93	4.79	4.01	30.73
Civil Service Commission	Shop	.....	38.50	.....	38.50
City Hall Bureau	General	2,956.54	2,824.07	387.66	6,168.27
City Hall Bureau	Shop	30.63	187.80	32.77	251.20
Construction Division	General	1,756.57	700.85	121.75	2,579.17
Construction Division	Shop	1,479.38	3,852.41	775.15	6,106.94
Construction Division	Foundry	166.05	.....	24.91	190.96
Tunnel Connections—Wilson Ave. Shore Shaft	General	5.90	34.40	6.05	46.35
Tunnel Connections—Wilson Ave. Shore Shaft	Shop	35.36	16.75	7.82	59.93
Department of Boiler Inspection	General	.82	.65	.22	1.69
Department of Finance	General	10.00	34.50	6.67	51.17
House of Correction	Shop	1.52	32.63	5.12	39.27
Hydrants and Valves—Sold	Shop	25,055.84	.....	.....	25,055.84
14th Street Shops—Empty Bags Returned	.....	170.60	.....	.....	170.60
14th and 22nd Street Shops—Building Repairs	.....	54.83	319.21	56.11	430.15
Credits—Material Received	.....	746.34	.....	.....	746.34
Total	.....	199,715.80	170,768.76	31,706.95	402,191.51

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WATER WORKS SHOPS AND REPAIR DIVISION
COMPARATIVE STATEMENT OF WORK PERFORMED AND BILLED

DESCRIPTION	1913	1914	1915
Water Pumping Station Repairs	$ 121,931.28	$ 133,687.83	$ 117,755.38
Sewer Pumping Station Repaired	.....	2,139.40	.....
Crib Repairs	10,120.32	9,003.04	3,012.25
New Hydrants	64,938.33	93,021.24	101,304.46
New Valves	14,504.34	31,582.84	36,616.68
Hydrant Repairs	11,199.71	23,033.78	23,041.12
Miscellaneous Water Pipe Repairs	30,436.02	42,531.21	45,388.97
Bridge Repairs	8,717.47	10,845.84	8,911.64
Hydrants and Valves sold to Contractors	18,494.95	24,790.55	25,055.84
Vacations	7,608.85	9,758.77	9,932.08
Total	$ 287,952.27	$ 380,394.50	$ 371,018.42
Other Departments	$ 43,304.04	$ 41,131.30	$ 31,173.09
Total	$ 331,256.31	$ 421,525.80	$ 402,191.51

STATEMENT OF HYDRANTS AND VALVES MANUFACTURED—YEAR 1915

	HYDRANTS				VALVES							
	Single	2½ in.	4 in.	4 in. Frost	4 in.	6 in.	8 in.	12 in.	12 H. P.	16 in.	24 in.	36 in.
On hand Jan. 1, 1915	0	8	29	0	0	9	7	4	4	0	0	0
Manufactured 1915	0	82	1859	0	93	474	768	243	0	32	0	1
Total	0	90	1888	0	93	483	775	247	4	32	0	1
Hydrants and Valves Shipped 1915	0	59	1852	0	93	470	759	222	0	26	0	1
On hand Jan. 1, 1916	0	31	36	0	0	13	16	25	4	6	0	0

STATEMENT OF HYDRANTS AND VALVES REPAIRED—YEAR 1915

	HYDRANTS				VALVES							
	Single	2½ in.	4 in.	4 in. Frost	4 in.	6 in.	8 in.	12 in.	12 H. P.	16 in.	24 in.	36 in.
Hydrants and Valves Repaired 1915	91	871	116	0	0	1	1	0	0	0	0	0

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MUNICIPAL IRON FOUNDRY PRODUCTION.

	Machinery Castings Lbs.	W P Extension Castings Lbs.	Curb Castings Lbs.	Total Castings Lbs.
September	52,794	3,772	288,350	344,916
October	154,383	27,064	233,050	414,497
November	156,750	110,392	112,450	379,592
December	228,269	126,223	1,600	356,092
	592,196	267,451	635,450	1,495,097

	Cost of Labor	Cost of Material	Total Cost
September	$ 2,222.03	$ 2,284.32	$ 4,506.35
October	3,869.10	2,853.20	6,722.30
November	5,344.39	2,719.72	8,064.11
December	6,057.76	2,600.58	8,658.34
	$17,493.28	$10,457.82	$27,951.10

WATER METER SHOPS.

Frank D. Anderson, General Meter Foreman.

During the year 1915, with an average monthly force of 47.55 employes in office, shop and field, there were performed 36,209 jobs of repairs, replacements and installations of water meters at a cost of $50,092.44 for mechanics, motor truck drivers, laborers and team hire; $11,539.25 for supervision and clerk hire; a total cost of $61,631.69 and $49,692.26 for meters, meter parts and material. (See tables 1 and 2.) As a reimbursement for expenditures made for overtime work and installation of emergency and fire meters, etc., there were billed to consumers the amount of $3,559.68. (See table No. 3.)

The average cost of maintenance per meter was again decreased. Average net cost for 1915 was $3.44, as against $3.57 during the year 1914. Several hundred new meters were used to replace old worn out meters in service. The cost of new meters used is included in the maintenance cost. (See table 4 and 6.)

There were 1,250 meters installed during the year and 235 permanent removals.

The total number of meters in service December 31, 1915, was 19,489, as compared to 18,474 at the close of 1914; an increase of 1,015 in service.

Table No. 6 is a comparative summary of the work performed and costs for the years 1909 to 1915 inclusive.

During the year 784 emergency jobs were taken care of at a cost of $1,154.08; an average of $1.47 per job; 530 of these jobs were completed on the first visit; 254 were repaired temporary and a second visit was necessary to complete the job. The greater part of these emergency jobs were due to meters filling up with sand, fish and other substances and required immediate attention.

During the year 6,203 meters of the ⅝-inch to 2-inch size inclusive were purchased on contract.

A contract was also entered into for the exchange of 1,000 old model Worthington meters, which had worn out in service. The new meters received were used to replace old meters, removed from service.

Five hundred old meters of various makes were removed from service, condemned and scrapped, and replaced by new up-to-date meters. The majority of these meters were of the old piston and rotary types. These particular types when in service and are worn to any extent allow considerable water to pass through without registering. Many more of these same types will be replaced during 1916 and will increase the revenue for the coming year.

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TABLE NUMBER ONE

WATER METER SHOPS—SALARIES, 1915

Position	Rate	Cost of Labor for Repairs and Replacements	Cost of Labor for Construction and Betterments	Totals	Monthly Average No. of Men Employed
General Meter Foreman	$2,520.00 per year	$2,235.00	$ 285.00	$2,520.00	1
Assistant General Meter Foreman	1,800.00 " "	1,596.42	203.58	1,800.00	1
Meter Shop Foreman	1,800.00 " "	1,596.42	203.58	1,800.00	1
Senior Clerk	1,440.00 " "	1,277.14	162.86	1,440.00	1
Junior Clerk	1,200.00 " "	1,064.30	135.70	1,200.00	1
Junior Clerk	960.00 " "	982.54	125.30	1,107.84	1.15
Junior Clerk	840.00 " "	630.95	80.46	811.41	.85
Junior Stenographer	960.00 " "	851.42	108.58	960.00	1
Motor Truck Drivers	960.00 " "	831.70	250.17	1,081.87	1.13
Machinists	5.50 per day	3,858.01	785.53	4,643.54	3.07
Meter Setters	5.50 " "	23,612.19	2,821.14	26,433.33	17.50
Meter Tester	5.20 " "	1,050.99	131.68	1,182.67	.88
Laborers	3.00 " "	8,547.60	1,212.68	9,760.28	11.85
Teams	4.50 " "	6,071.14	919.61	6,990.75	5.12
		$54,205.82	$7,425.87	$61,631.69	47.55

Supervision and Clerical	$11,539.25
Mechanics, Motor Truck Drivers, Laborers and Team hire	50,092.44
Total	$61,631.69

Note.—The above monthly averages are based on 274.5 actual working days in 1915 for Machinists, Meter Setters, and Laborers, and 303 days for teams.

TABLE NUMBER TWO

Recapitulation of number of jobs performed, cost of labor and material used in repairs and replacements and construction and betterments of water meters by the Water Meter Shops during the year 1915.

REPAIRS AND REPLACEMENTS—FIELD WORK.

Description of work performed	No. of Jobs	Labor Cost	Material Cost	Total	Av. Cost per Job
Investigations	1499	$1,569.61	.....	$1,569.61	$1.04
Meters removed permanently	235	355.77	$ 4.48	360.25	1.53
Meters repaired on premises	5892	8,127.67	523.43	8,651.10	1.47
Meter locations changed	5	21.68	6.35	28.03	5.61
Meters replaced	4149	9,229.14	1,759.62	10,988.76	2.65
Leaks repaired	127	195.86	30.23	226.09	1.78
Meters removed for safekeeping	154	279.85	.....	279.85	1.82
Fish traps installed	18	176.87	348.86	525.73	29.20
Check valves installed	1	12.14	6.03	18.17	18.17
Cost of 530 new meters used for replacements	.....	.....	8,289.50	8,289.50	....
Maintenance of two auto trucks, 7 months	.....	.....	368.45	368.45	....
Supervision and clerk hire	.....	4,605.39	.....	4,605.39	....
Totals	12080	$24,573.98	$11,336.95	$35,910.93	$2.97

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SHOPWORK

Description of work performed	No. of Jobs	Labor Cost	Material Cost	Total	Av. Cost per Job
Meters tested before repairs	811	$ 357.76	.....	$ 357.76	$0.44
Meters tested and sealed after repairs	3513	1,434.64	$ 91.12	1,525.76	.43
Meters repaired in shop	3523	12,445.66	2,660.84	15,106.50	4.29
Meter parts rehabilitated	6288	2,389.13	238.10	2,627.23	.41
Material rehabilitated	3991	84.45	.45	84.90	.02
Repairs and replacements to building and apparatus	....	399.53	12.21	411.74	....
General work	....	5,253.26	.....	5,253.26	....
Supervision and clerk hire	....	5,628.80	.....	5,628.80	....
Totals	18126	$27,993.23	$3,002.72	$30,995.95	$1.71

SPECIAL EXTRAORDINARY EXPENSE

Description of work performed	No. of Jobs	Labor Cost	Material Cost	Total	Av. Cost per Job
Scrapping old meters	500	$ 205.80	.....	$ 205.80	$0.41
Vacation, mechanical force	....	1,417.78	.....	1,417.78	....
Time off (City Law Business)	....	15.03	.....	15.03	....
Total	500	$1,638.61	.....	$1,638.61	....

CONSTRUCTION AND BETTERMENTS—FIELD WORK

Description of Work Performed	No. of Jobs	Labor Cost	Material Cost	Total	Av. Cost per Job
Meters installed	1,250	$3,542.41	$ 2,996.20	$ 6,538.61	$ 5.07
Cost of new meters	....	.....	27,574.00	27,574.00	.....
Vacations (mechanical force)	....	178.37	.....	178.37	.....
Maintenance 2 autos, trucks, 7 months	....	.....	50.25	50.25	.....
Supervision and clerk hire	....	783.04	.....	783.04	.....
Totals	1,250	$4,503.82	$30,620.45	$35,124.27	$28.10

SHOP WORK

Description of Work Performed	No. of Jobs	Labor Cost	Material Cost	Total	Av. Cost per Job
Meters tested and sealed (new)	4,253	$945.63	$126.75	$1,072.38	$0.25
Work on new city meter	....	184.96	.....	184.96	.....
General work	....	679.56	.....	679.56	.....
Inspector, meter contract	....	589.88	.....	589.88	.....
Supervision and clerk hire	....	522.02	.....	522.02	.....
Totals	4,253	$2,922.05	$126.75	$3,048.80	$0.71

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SUMMARY

Description of Work Performed	No. of Jobs	Labor Cost	Material Cost	Total
Repairs and replacements—field	12,080	$24,573.98	$11,336.95	$35,910.93
Repairs and replacements—shop	18,126	27,993.23	3,002.72	30,995.95
Special extraordinary expense	500	1,638.61	.....	1,638.61
Construction and betterments—field	1,250	4,503.82	30,620.45	35,124.27
Construction and betterments—shop	4,253	2,922.05	126.75	3,048.80
Grand Totals	36,209	$57,026.30	$49,692.26	$106,718.56

TABLE NUMBER THREE

AMOUNT OF LABOR AND MATERIAL BILLED BY THE WATER METER SHOPS DURING 1915

METER MECHANICAL BILLS

Description of Work Performed	No. of Jobs	Labor Cost	Material Cost	Total
Overtime on repairs and replacements	44	$188.15	.....	$188.15
Overtime on installation	1	2.45	.....	2.45
Meters removed and repaired account frosen	131	668.02	293.75	961.77
Meters removed and tested at owners expense	6	16.71	.....	16.71
Meters removed and repaired account disc warped	2	9.88	10.25	20.13
Meters billed account lost	3	.....	43.00	43.00
Meters installed	1	24.95	27.72	52.67
Iron covers and frames sold	3	.....	19.60	19.60
Private meters repaired	2	48.00	7.73	55.73
Opening, closing and sealing fire valve	1	1.38	.....	1.38
Installing fish traps	2	53.18	66.81	119.99
Meter chamber billed account lost	1	.....	16.40	16.40
Meter removed and repaired account unfair usage	1	1.00	1.12	2.12
Totals	...	$1,013.72	$486.38	$1,500.10

SPECIAL DEPOSIT BILLS

Description of Work Performed	No. of Jobs	Labor Cost	Material Cost	Total
Private meters installed	68	$1,210.53	$678.22	$1,888.75
Check valves installed	1	12.99	2.01	15.00
Testing private meters	1	5.00	.....	5.00
Changing locations—repairs and replacements	1	21.28	15.95	37.23
Meters removed, repaired and reset, repairs and replacements	2	95.93	7.58	103.51
Meters repaired for private parties—repairs and replacements	1	2.96	7.13	10.09
Totals	...	$1,348.69	$710.89	$2,059.58

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TABLE NUMBER FOUR.

Net cost of maintenance per meter and net cost of installation per meter 1915:

REPAIRS AND REPLACEMENTS.

Total salaries and wages for repairs and replacements	$54,205.82
Total cost of material for repairs and replacements	14,339.67
Total	$68,545.49

CREDIT.

Total amount billed for labor and material in repairing meters	$ 1,595.81
Total net cost of maintenance	$66,949.68

Average net cost per meter $3.44.

Note—Average net cost of maintenance is derived by taking the total net cost of maintenance and dividing by total number of meters in service December 31, 1915.

CONSTRUCTION AND BETTERMENTS.

Total salaries and wages	$ 7,425.87
Total cost of meters installed during year	27,574.00
Total cost of material used in installing 1,250 meters	3,122.95
Total maintenance 2 auto trucks	50.25
Total	$38,173.07

CREDIT.

Total amount billed for labor and material installing 68 private meters: labor, $1,255.92; material, $707.95.	$ 1,963.87
Total net cost of installing	$36,209.20

1,250 meters installed (1,182 city owned and 68 private meters):

Average cost city owned meters used in installations	$23.33
Average cost material to install 1,182 city meters	2.09
Total cost per meter	$25.42

This does not include labor and material used by Plumbing Shops, Water Pipe Extension Division, installing 1,120 meter connections of ¾" to 2" inclusive, on which meters were installed during the year.

TABLE NUMBER FIVE.

Number and sizes of Water Meters in service December 31, 1915:

Sizes, in.:	⅝	¾	1	1¼	1½	2	3	4	6	8	10	12	Total
In service Dec. 31st 1914	2,656	2,719	4,762	804	2,861	2,790	879	603	305	70	17	8	18,474
New Meters Installed 1915	4	278	456	7	149	254	30	25	29	14	2	2	1,250
Permanent Removals	40	59	45	3	18	30	21	10	9	..	..	..	235
In service Dec. 31st 1915	2,620	2,938	5,173	808	2,992	3,014	888	618	325	84	19	10	19,489

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TABLE No. VI

COMPARATIVE TABLE OF SUMMARIES, 1909, 1910, 1911, 1912, 1913, 1914 and 1915

YEAR	Number of meters in service	Number of new installations	Number of permanent removals	Number of meters overhauled in shop	Number of meters repaired on premises	Number of meters relocated	Number of meters tested	Total net cost of installation	Total net cost of maintenance	Average cost of maintenance per meter
1909	14,883	482	323	3,354	8,168	156	6,024	$ 62,385.38	$ 89,750.02	$6.03
1910	15,032	756	607	2,495	8,056	207	7,334	61,965.69	79,219.60	5.26
1911	16,628	1,141	400	3,765	5,197	89	7,532	40,501.84	78,713.23	4.73
1912	16,053	422	248	3,973	6,831	16	8,207	14,211.83	71,560.39	4.45
1913	16,969	1,197	280	3,522	6,389	5	6,323	30,386.64	67,465.71	3.97
1914	18,474	808	294	3,921	6,572	5	5,751	36,021.07	65,966.42	3.57
1915	19,489	1,250	235	3,523	5,892	5	8,577	36,209.20	66,949.68	3.44

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TESTING DIVISION

L. S. Marsh, Engineering Chemist in Charge.

The year 1915 being the first year in which the Testing Division operated under a Capital Account the closing up of the year's work indicates very definitely that this method of operating, so far as the Testing Division is concerned, is the logical one, as by this method it has been possible to furnish services to other Bureaus, Departments, and Divisions of the City, and charge for these services on the basis of cost plus a nominal sum for supervision.

The supervision charge was probably a trifle higher this year that will be necessary for the coming year.

Bills receivable on December 31st, 1915, amounted to $52,744.27, while the expenses of operating, including salaries, materials and supplies, amounted to $47,438.60. The following totals of bills rendered will show very clearly the amount and distribution of work done:

Department of Public Works,	
Bureau of Engineering	
Operating Division	$ 5,491.37
Water Works Repair Shop	1,845.65
Water Pipe Extension Division	16,909.92
Bridge Division	10,292.40
Construction Division	7,521.49
Bureau of City Hall	222.15
Bureau of Sewers	147.38
Bureau of Streets	230.03
Bureau of Architecture	56.64
Department of Fire	1,009.73
Department of Police	617.01
Department of Health	445.66
Department of Gas and Electricity	31.05
Board of Education	2,346.82
Harbor and Subway Commission	3,548.56
City Waste Commission	55.20
Municipal Tuberculosis Sanitarium	235.76

Inspection of cast iron water pipe for private contracts on special assessment work, $1,236.05.

As usual the larger part of the work of the Testing Division, and in fact of the sampling force of the Division is incident to the testing and sampling of coal.

During the year 1915 a total of 4,835 samples were collected from which 1,492 laboratory tests were made. The unit cost of sampling being .89c, and the unit cost for laboratory being $1.81. The unit cost for complete coal test being $4.71. The apparent discrepancy between the figures is due to the fact that a number of coal samples are collected and merged into one sample for laboratory test. The quality of the coal delivered during the year has been very good, and there have been very few complaints in this direction. Two or three cars were rejected because of failure to comply with the requirements of the specifications relative to size. Tabulations are appended showing the average price and average tests of coal delivered to the Pumping Stations, Board of Education, Fire Department, Police Department, and other City Departments. The number of samples of coal tested during the year was fewer than in the year 1914, and this was due to the fact that the Board of Education let a contract for the sampling and testing of coal to an outside testing company for the latter part of the year 1915.

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LUBRICATING OIL.

In volume of work entailed lubricating oils take second place. The number of tests during the year 1915 being 455, representing a total of 1,052 barrels. The unit cost per test on oil, including the sampling and laboratory work being $1.90.

The lubricating oil delivered has been uniform in quality, and there have been very few rejections, such rejections as were made came at the commencement of the contract for 1915.

CEMENT.

A very large quantity of cement was sampled and tested during the year 1915, being a total of 129,901 barrels of Portland cement and 3,469 barrels of natural cement. The total number of laboratory tests was 665, the cost per barrel being 1.9c. The greater portion of the cement tested represented deliveries for use in the construction of Harbor Pier No. 2, and the various new bridges under construction during the year 1915.

CAST IRON WATER PIPE.

On inspection work the greatest single item is that of cast iron water pipe. The total inspected during the year 1915 being 44,769 tons, and the percentage of pipe rejection being 34.4%, so that it is clearly seen that inspection on this class of material is of vital importance. The cost of inspection on cast iron water pipe has greatly increased over that of last year, due principally to the fact that a large number of foundries were operating, necessitating the placing of more inspectors in the field, while the tonnage did not increase in proportion to the number of inspectors required. The cost per ton for all pipe inspected was 27.8c.

During the year 1915 the actual erection work on the Belmont Ave. bridge, Webster Avenue bridge, and Lake Street Bridge was started, and all the machinery for these bridges was inspected by representatives of the Testing Division at the plants where same was manufactured.

Other items of inspection covered the inspection of engines for the Roseland Pumping Station, pumping engines for the Mayfair Pumping Station being made at Milwaukee, Wis., boilers for the New Central Park Avenue Pumping Station. 8,924 tons of structural steel was inspected during the year 1915. Practically all of this material being for use in the Harbor Pier No. 2, and the cost of inspection averaged about 7c per ton. 148 tons of reinforcing bars were inspected and tested for use in the Mayfair plant and the new Municipal Plant.

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A large number of miscellaneous laboratory tests were made during the year as the following statement will indicate:

5 tests on air
1 test on asbestos
5 tests on babbitt metals
6 tests on scrap brass
32 tests on bronze
10 tests on coke
8 tests on earths
17 tests on corp. ferrules
5 tests on garbage
28 tests on gasoline
1 test on gasoline improver
7 tests on grease
5 tests on kerosene
27 tests on pig lead
10 tests on red lead paint
2 tests on white lead
17 tests on pig iron
212 tests on cast iron
8 tests on water meters
2 tests on creosote oil
5 tests on fuel oil
5 tests on black paint
3 tests on library paste
1 test on pewter
15 tests on lead pipe
3 tests on bleaching powder
4 tests on washing powder
11 tests on rubber valves & gaskets
3 tests on sand
2 tests on boiler scale
2 tests on solder
11 tests on soap
2 tests on sponges
2 tests on crushed stone
3 tests on street signs

LUMBER INSPECTION.

During the year 1915 the inspection of lumber was turned over to the Testing Division. A large quantity of lumber and timbers was delivered on contract in carload lots, the total approximating 750,000 board feet. In addition, a large amount of lumber was delivered to the various yards in the City. A total of 480 inspections of lumber delivered by team were made.

It is expected that the work of the Testing Division can be largely increased as soon as the new laboratory, now under construction, will be ready for occupancy. With the enlarged space and more adequate facilities for work of the Division, many other classes of materials now purchased by the City without test may be taken over by the Testing Division.

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AVERAGE ANALYSIS AND AVERAGE PRICES PAID FOR TESTED COAL DELIVERED TO PUMPING STATIONS DURING THE YEAR 1915.

Stations	Kind of Coal	Moisture Percent	Ash Percent	B.T.U. Dry	Earned Price	Contract Price
22nd St.	Lump.	9.8	9.8	13,057	$2.1619	$2.168
22nd St.	Screenings.	8.5	14.9	12,295	1.6440	1.631
Spring Ave.	Lump.	8.9	11.4	13,003	1.9740	2.02
68th St.	Screenings.	8.6	12.2	12,781	1.6145	1.59
73rd St.	Mine Run	10.1	13.5	12,503	2.0763	2.15
Roseland	Screenings.	11.4	12.3	12,695	1.6088	1.583
Rogers Park.	Lump.	8.6	11.6	12,861	2.9437	2.92
Lake View.	Nut.	9.6	10.8	13,013	2.5525	2.61
Harrison St.	Screenings.	9.4	13.3	12,664	2.0674	1.96
14th St.	Lump.	7.9	9.4	13,281	2.4626	2.394
City Hall.	Screenings.	8.9	14.1	12,503	2.0830	1.95
Chicago Ave.	Lump.	8.9	10.6	12,973	2.4060	2.42
Central Park.	Lump.	10.1	10.8	12,876	1.9320	1.97
Pullman.	Mine Run	8.7	13.7	12,365	2.4284	2.52
Kensington.	Mine Run	9.6	13.0	12,414	2.3999	2.52
95th St.	Mine Run	9.5	12.4	12,782	2.1367	2.17

AVERAGE ANALYSIS AND AVERAGE PRICE PAID FOR TESTED COAL FOR THE FIRE DEPARTMENT DURING THE 1015.

District	Kind of Coal	Moisture Percent	Ash Percent	B.T.U. Dry	Earned Price	Contract Price
1	Small Egg	3.7	12.1	13,266	$7.1999	$7.35
1	Chestnut	3.9	12.5	13,033	7.2008	7.47
1	Lump.	7.3	9.1	13,146	3.9423	4.00
1	Range.	3.7	12.3	13,128	7.2892	7.47
2	Small Egg	3.6	12.5	13,172	7.1467	7.35
2	Chestnut	4.1	13.2	12,999	7.1679	7.47
2	Lump.	7.6	9.1	13,183	3.9241	4.00
2	Range.	3.6	13.6	12,907	7.1651	7.47
3	Nut.	8.1	10.9	12,767	2.7134	2.67
3	Lump.	7.9	8.2	13,059	3.4140	3.50
3	Small Egg	3.6	12.9	12,084	6.8637	7.151
3	Chestnut	3.8	11.8	12,956	6.7961	7.098
3	Range.	4.0	11.5	13,228	6.9469	7.098
4	Chestnut	3.5	13.1	12,953	7.3270	7.47
4	Lump.	7.7	10.7	12,964	3.6074	4.00
4	Small Egg	3.7	11.2	13,304	7.2206	7.35
5	Lump.	4.3	8.8	13,585	4.4503	4.00
5	Chestnut	3.7	14.2	12,819	7.5061	7.72
5	Small Egg	3.7	11.6	13,251	7.5826	7.60
5	Large Egg.	4.2	14.5	12,754	7.3205	7.35

AVERAGE ANALYSIS AND AVERAGE PRICE PAID FOR TESTED COAL FOR THE POLICE DEPARTMENT DURING THE YEAR 1915.

District	Kind of Coal	Moisture Percent	Ash Percent	B.T.U. Dry	Earned Price	Contract Price
1	Mine Run	2.1	6.5	14,726	$4.4936	$4.076
1	Range.	3.6	8.6	13,656	7.4821	7.35
1	Chestnut	3.3	13.6	12,869	7.4758	7.60
2	Range.	3.6	13.2	13,027	7.1069	7.35
2	Small Egg	3.3	12.2	13,119	7.1695	7.35
2	Mine Run	2.1	5.9	15,943	4.1188	4.076
2	Chestnut	2.9	13.0	13,029	7.6029	7.60
3	Smithing.	1.2	6.9	14,649	5.0939	5.05
3	Nut.	7.5	10.1	12,896	2.6862	2.70
3	Mine Run	1.7	7.7	14,563	3.8824	3.956
3	Range.	3.5	12.7	12,953	6.8579	7.098
3	Chestnut	3.4	12.9	13,041	6.8859	6.909
4	Nut.	7.2	9.0	13,237	2.8798	2.70
4	Range.	3.3	13.2	12,975	6.9869	7.098
4	Mine Run	2.3	7.0	14,667	3.9314	3.956
4	Chestnut	3.2	13.2	13,053	6.9009	6.909
5	Nut.	1.5	10.2	14,075	2.9089	2.799
5	Mine Run	2.2	7.2	14,625	4.0703	4.076
5	Chestnut	2.9	14.0	12,857	7.4948	7.60
5	Range.	2.8	12.4	13,137	7.6216	7.35

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AVERAGE ANALYSIS AND AVERAGE PRICE PAID FOR TESTED COAL FOR THE HEALTH DEPARTMENT DURING THE YEAR 1915.

District	Kind of Coal	Moisture Percent	Ash Percent	B.T.U. Dry	Earned Price	Contract Price
1	Small Egg	3.8	10.7	13,449	$7.2710	$7.35
2	Small Egg	3.9	11.7	13,218	7.1378	7.35
2	Mine Run	3.2	6.2	14,710	4.0951	4.076
3	Small Egg	4.0	11.8	13,790	7.0365	7.151
3	Mine Run	3.2	8.3	14,460	3.7900	3.956
3	Range	3.8	10.9	13,383	7.0241	7.096
4	Mine Run	3.5	6.3	14,694	3.8943	4.00
4	Nut	9.0	13.8	12,463	1.9084	2.00
4	Lump	5.6	8.2	13,630	.....	.....
4	Screenings	8.2	11.7	12,817	.....	.....
4	Chestnut	3.7	10.6	13,336	7.0539	7.30
4	Small Egg	3.4	11.7	13,236	7.0184	7.30

AVERAGE ANALYSIS AND AVERAGE PRICE PAID FOR COAL DELIVERED TO BUREAU OF STREETS DURING 1915.

District	Kind of Coal	Moisture Percent	Ash Percent	B.T.U. Dry	Earned Price	Contract Price
1	Chestnut	3.5	15.0	12,593	$7.2922	$7.60
1	Lump	1.3	6.4	14,757	5.3083	5.35
2	Lump	1.4	7.1	14,619	5.2527	5.35
2	Chestnut	3.6	13.1	15,003	7.5363	7.60
3	Lump	4.7	7.7	13,994	4.8585	5.35
3	Chestnut	4.1	13.9	12,866	7.4606	7.60
3	Lump	2.0	6.8	13,583	4.6586	5.35
4	Chestnut	3.3	13.8	12,814	7.4401	7.60
4	Lump	1.4	5.1	14,986	5.3972	5.35
4	Smithing	1.8	7.4	14,557	5.0283	5.05
5	Chestnut	3.9	14.3	12,812	8.1230	8.35
5	Lump	1.6	9.3	14,220	5.9471	6.35
	BRIDGE DIVISION.					
	Lump	3.5	10.4	13,785	4.7510	4.75
	Range	3.4	12.8	13,000	7.4419	7.50
	CRIBS.					
	Mine Run	2.9	6.1	14,677	4.2277	4.35
	Chestnut	3.8	13.3	12,928	7.4736	7.60
	WATER WORKS SHOPS.					
	Smithing	1.6	7.4	14,655	5.0707	5.05
	Mine Run	2.5	5.8	14,796	4.2136	4.076
	Range	4.0	12.3	13,165	7.1547	7.35
	WATER PIPE EXTENSION.					
	Chestnut	3.2	11.3	13,339	7.7719	7.60
	Range	3.8	12.3	13,127	7.1512	7.35
	Mine Run	2.7	6.8	14,674	4.1604	4.076
	Bit. Lump	9.5	9.9	13,018	3.5317	5.375
	Bit. Egg	7.9	8.3	13,343	3.4139	3.20

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AVERAGE ANALYSIS OF COAL AND AVERAGE PRICES PAID DURING 1915. BOARD OF EDUCATION.

District	Kind of Coal	Moisture Percent	Ash Percent	B.T.U. Dry	Earned Price	Contract Price
1	Mine Run	5.5	11.2	13,907	$3.7007	$4.20
1	Chestnut	3.9	11.1	13,338	8.0590	7.85
1	Nut	12.7	13.5	12,249	2.4884	2.695
1	Lump	10.3	13.7	12,694	2.6230	2.87
1	Small Egg	4.3	10.5	13,259	7.4474	7.60
1	Range	3.9	12.6	13,123	7.5179	7.60
2	Lump	13.5	13.7	12,113	2.4873	2.745
2	Range	3.8	12.0	13,213	7.8309	7.85
3	Chestnut	3.3	15.0	12,673	7.4038	7.818
3	Lump	13.8	11.9	12,530	2.4438	2.575
3	Range	3.3	12.0	13,221	7.5009	7.75
3	Screenings	11.0	16.6	11,761	2.1113	2.318
4	Chestnut	3.8	12.5	13,076	8.1422	8.10
4	Lump	12.9	12.4	12,349	2.4691	2.643
4	Mine Run	1.8	6.5	14,645	4.0725	4.05
4	Range	4.4	13.9	12,922	7.6005	7.85
4	Small Egg	4.1	10.9	13,358	7.7775	7.85
4	Washed Nut	11.3	12.7	12,449	2.7021	2.943
5	Chestnut	3.3	15.1	12,676	7.3958	7.82
5	Lump	11.3	12.1	12,543	2.4877	2.575
5	Mine Run	2.6	7.0	14,666	4.0447	4.05
5	Range	3.1	13.9	12,908	7.3304	7.75
6	Chestnut	2.8	14.8	12,767	7.5126	7.6535
6	Lump	9.9	12.7	12,618	2.4969	2.6847
6	Range	3.3	12.9	12,977	7.0134	7.3965
7	Chestnut	3.4	14.2	12,772	7.4732	7.817
7	Lump	11.3	11.4	12,629	2.5132	2.575
7	Mine Run	1.6	6.6	14,684	4.0995	4.05
7	Range	3.4	14.6	12,750	7.2146	7.75
7	Washed Nut	11.7	10.4	12,800	2.7647	2.80
8	Chestnut	3.3	13.6	12,866	7.5918	7.817
8	Lump	12.4	12.5	12,543	2.4584	2.575
8	Range	3.4	13.4	13,053	7.3946	7.75
8	Screenings	14.1	12.8	12,631	2.2678	2.379
8	Washed Nut	10.7	9.2	13,268	2.9203	2.957
9	Chestnut	3.0	12.6	13,119	7.6117	7.817
9	Lump	12.6	12.7	12,383	2.4131	2.575
9	Mine Run	1.8	7.4	14,596	4.0446	4.10
9	Nut	12.7	17.2	11,807	2.2521	2.575
9	Range	3.2	12.3	13,156	7.3458	7.75
10	Chestnut	3.8	13.1	12,842	7.5235	7.817
10	Lump	13.0	12.3	12,306	2.4598	2.69
10	Range	3.6	12.5	13,018	7.3639	7.75
11	Chestnut	3.2	12.3	12,987	8.4902	8.56
11	Lump	11.7	13.8	12,371	2.0471	2.642
11	Range	3.8	14.5	12,707	7.8646	8.293
11	Small Egg	3.7	10.4	13,346	8.1063	8.107
12	Lump	9.1	11.5	12,753	2.6618	2.775
12	Screenings	9.7	12.5	12,614	2.2365	2.321
12	Range	3.0	10.4	13,505	8.0564	7.90
13	Range	3.7	11.0	13,390	9.1862	9.10
13	Lump	10.3	13.0	12,428	2.6994	2.906
14	Lump	11.3	11.5	12,706	2.6774	2.87
14	Mine Run	2.6	5.9	14,796	4.3723	4.399

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WATER PIPE EXTENSION DIVISION

H. L. Lucas, Superintendent.

The work performed by the Water Pipe Extension Division during the year 1915, consisting of the maintenance, operation and extension of the water distribution system, is described in detail in the following report and tables.

The tables included herewith show in detail the mains, hydrants, valves and service pipes added to the system in 1915 and the total amount included in system at the close of 1915.

ADDITIONS TO SYSTEM.

During the year 1915 there were laid 617,468 feet or 116.94 miles of pipe. In addition, 7.61 miles of main were acquired by the annexation of Clearing and a small section of Evanston, making a total increase of 124.55 miles of pipe.

The total mileage of the system at the close of 1915 was 2,641.14 miles.

There were also added to the system by installation 1,870 hydrants and 1,304 valves.

FEEDER MAIN EXTENSIONS.

Several large and important feeder mains were laid during the year 1915. They are as follows:—

Addison Street Feeder Main—17,899 feet 36" pipe:

This main was laid in Addison street from Cicero avenue to Avondale avenue and southeast in Avondale avenue and other streets connecting to the 24 inch and 30 inch mains at Diversey avenue and Elston avenue. The construction of this main is a part of the program as planned for the northwest section of the City. It is all completed except the intersection at Belmont avenue and Avondale avenue. The trench excavator, locomotive crane and air compressor were used on this job.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 91,857.37	$5.132
Special Castings	5,751.51	0.321
Valves	2,487.10	0.139
Hydrants	1,012.00	0.057
Lead	4,329.50	0.242
Mason Material	2,189.16	0.122
Miscellaneous Material	2,607.24	0.146
Supervision	2,517.02	0.141
Caulkers	5,845.41	0.326
Gang "A" Laborers	26,320.75	1.471
Mason District Laborers	2,433.50	0.136
Masons and Mason Foremen	1,403.75	0.078
Plumbers	501.75	0.028
Hoisting Engineers	3,337.00	0.186
Teams and Pipe Yard Hauling	5,552.97	0.310
Mason District Teams	904.50	0.051
Repaving	3,670.40	
Repairing Sidewalks	482.00	
Total	$163,202.93	$9.18

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Torrence Ave.—95th St.—109th St. 8,948 feet of 24" main:

This main was laid to increase the supply to South Deering which was badly in need of reinforcement. Conditions have been greatly improved by putting this main into service. The work was done by hand.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 24,926.78	$2.786
Castings	1,147.37	0.128
Valves	1,110.80	0.124
Hydrants	822.25	0.092
Lead	1,454.44	0.162
Mason Material	1,012.93	0.113
Miscellaneous Material	66.00	0.007
Supervision	601.25	0.067
Calkers	1,588.53	0.178
Laborers	8,799.00	0.983
Masons and Mason Foremen	426.75	0.048
Plumbers	321.00	0.036
Teams	595.70	0.067
Mason Teams	321.00	0.036
Total	$ 43,194.20	$4.827

Stony Island Ave.—66th St. to 56th St.
56th St.—Stony Island Ave. to Harper Ave.

8,027 feet of 36" main:

This feeder was laid to increase pressures in Hyde Park and to cut down friction losses. It has accomplished this to a marked degree.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 42,206.56	$5.258
Castings	2,728.88	0.340
Valves	2,026.30	0.253
Hydrants	506.00	0.063
Lead	2,147.50	0.268
Mason	1,033.39	0.129
Miscellaneous Material	1,615.85	0.202
Supervision	1,153.42	0.142
Calkers	3,037.50	0.378
District Laborers	18,952.50	2.361
Mason Laborers	900.00	0.112
Masons and Mason Foremen	372.75	0.046
Plumbers	93.00	0.012
Miscellaneous Labor	30.40	0.004
Teams and Pipe Yard Hauling	3,625.44	0.452
Mason Teams	282.00	0.035
Repaving	1,623.05	
Repairing Lawn	1,153.75	
Repairing Sidewalks	1,175.00	
Total	$ 84,663.29	$10.547

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Harper Ave.—55th St. to 50th St.
50th St.—Harper Ave. to Ellis Ave.

6,686 feet of 36" main:

This main is a continuation of the Stony Island Ave. pipe.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 35,716.90	$5.342
Special Castings	2,670.03	0.399
Valves	1,036.24	0.155
Hydrants	442.75	0.066
Lead	1,665.40	0.249
Mason Material	788.16	0.118
Miscellaneous Material	522.86	0.078
Supervision	1,076.77	0.161
Calkers	2,866.50	0.429
District Laborers	17,233.25	2.578
Mason Laborers	591.75	0.089
Masons and Mason Foremen	306.75	0.046
Plumbers	217.00	0.032
Miscellaneous Labor	58.90	0.009
Teams and Pipe Yard Hauling	2,543.52	0.380
Mason Teams	193.50	0.029
Repaving	12,213.37	
Repairing Sidewalks	75.00	
Total	$ 80,218.65	$11.988

Ellis Ave.—50th St. to 43rd St. 4,621 feet of 24" main.

This main is a part of the Hyde Park Feeder System. It was laid through asphalt pavement the entire distance, which added greatly to the cost. The work was done entirely by hand.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 12 383.03	$2.680
Castings	800.02	0.173
Valves	575.55	0.125
Hydrants	442.75	0.096
Lead	731.09	0.159
Mason Material	381.63	0.083
Miscellaneous	246.54	0.053
Supervision	607.72	0.132
Calkers	1,246.50	0.270
District Laborers	6,605.25	1.427
Mason District Laborers	367.50	0.080
Masons and Mason Foremen	173.63	0.038
Plumbers	192.00	0.042
Miscellaneous	80.03	0.017
Teams and Pipe Yard Hauling	1,235.95	0.267
Mason Teams	130.50	0.028
Repaving	6,930.00	
Repairing Sidewalks	300.00	
Total	$ 33,429.69	$7.234

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508t.—Ellis Ave. to Wabash Ave. 6,139 feet of 24"Main.

This main is also a part of the Hyde Park Feeder System serving to connect that system with the 36 inch main in Wabash Ave.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 16,474.07	$2.683
Castings	1,314.72	0.214
Valves	577.59	0.094
Hydrants	442.75	0.072
Mason Material	536.47	0.087
Lead	831.16	0.136
Miscellaneous Material	312.22	0.051
Supervision	857.39	0.140
Calkers	1,761.74	0.286
District Laborers	10,476.00	1.707
Mason District Laborers	483.25	0.079
Masons and Mason Foremen	239.75	0.040
Plumbers	141.50	0.023
Teams and Pipe Yard Hauling	1,585.48	0.258
Mason District Teams	183.00	0.030
Repaving	1,543.35	
Total	$ 37,760.54	$6.15

104th St. and Vincennes Road to 103rd St. and Leavitt St.
5,976 feet of 24" pipe.

This main was laid to carry the pressure direct from high pressure pumps at Roseland Station to the high level territory of Washington Heights. It was laid with trenching machine.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 16,498.44	$2.761
Castings	1,024.12	0.171
Valves	500.80	0.084
Hydrants	316.25	0.053
Lead	1,131.07	0.189
Mason Material	647.95	0.108
Miscellaneous Material	184.21	0.031
Supervision	548.54	0.092
Calkers	1,228.51	0.206
Laborers	6,897.75	1.154
Masons and Mason Foremen	315.75	0.053
Carpenters	10.40	0.002
Plumbers	118.50	0.020
Hoisting Engineers	270.00	0.045
Teams and Pipe Yard Hauling	1,595.00	0.267
Mason Teams	195.00	0.032
Repaving	3,509.89	
Repairing Sidewalks	100.00	
Total	$ 35,092.18	$5.872

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95th St.—Beverly Ave. to Leavitt St.
Leavitt St.—95th St. to 99th St.
6,482 feet of 12" Main.

This main is part of the Washington Heights feeder system and was laid to distribute the supply along the top of the hill. It was laid with trenching machine.

The cost is as follows:—

Pipe	$ 6,127.80	$0.945
Castings	311.36	0.048
Valves	689.40	0.106
Hydrants	759.00	0.117
Lead	527.64	0.083
Mason Material	456.61	0.070
Miscellaneous	83.84	0.013
Supervision	360.14	0.055
Calkers	560.25	0.088
Laborers	2,886.75	0.445
Mason District Laborers	358.50	0.055
Masons and Mason Foremen	213.00	0.033
Hoisting Engineers	160.00	0.025
Teams and Pipe Yard Hauling	768.18	0.118
Mason Teams	185.25	0.028
Repaving	432.00	
Repairing Sidewalks	35.00	
Total	$ 14,914.72	$2.301

Hoyne Ave. and 103rd St. to 119th St. and Western Ave.
12,426 feet of 16" main.

This pipe laid as a part of Washington Heights system and to enable us to give a supply to Blue Island. All except 1,900 feet of this pipe was laid with trenching machine.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 17,892.90	$1.440
Castings	973.81	0.078
Valves	1,033.90	0.083
Hydrants	1,138.50	0.092
Lead	1,260.59	0.101
Mason Material	603.85	0.049
Miscellaneous Material	256.12	0.021
Supervision	545.07	0.044
Calkers	1,842.75	0.148
Laborers	9,096.75	0.732
Masons and Mason Foremen	288.00	0.023
Plumbers	123.00	0.010
Hoisting Engineers	375.00	0.030
Teams and Pipe Yard Hauling	1,942.70	0.156
Mason Teams	243.00	0.020
Repaving	631.14	
Repairing Sidewalks	102.00	
Total	$ 38,349.08	$3.086

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67th St. Feeder Main.

11512 feet of 36"main.
5406 feet of 30" main.
1388 feet of 24" main.

This main was connected to the 36" main in Justine St. and laid west in 67th St. and 65th St. to Kostner Ave. This feeder was planned to increase the supply in Chicago Lawn and vicinity which has been inadequate.. The full capacity of this main is not needed at present, but the territory it supplies is growing very rapidly. There are about 1,300 feet of 36" pipe yet to be laid to complete the job. The exacavation on this job was made with trenching machines.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 82,863.61	$4.527
Special Castings	5,296.64	0.290
Valves	4,233.95	0.231
Hydrants	759.00	0.041
Lead	4,311.80	0.235
Mason Material	2,216.06	0.121
Miscellaneous Material	2,479.23	0.135
Supervision	2,604.11	0.142
Calkers	4,482.56	0.245
District "A" Laborers	24,778.75	1.354
Mason District Laborers	1,992.50	0.110
Masons and Mason Foremen	876.13	0.048
Carpenters	101.50	0.006
Plumbers	223.50	0.012
Hoisting Engineers	2,443.00	0.133
Teams and Pipe Yard Hauling	5,233.38	0.285
Mason District Teams	765.00	0.042
Total	$145,660.72	$7.957

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Torrence Ave.—109th St. to 130th St.
130th St.—Torrence Ave. to Baltimore Ave.

15583 feet of 24" pipe.
656 feet of 12" pipe.

This main was an extension of the main laid in Torrence Ave. from 95th St. to 109th St., earlier in the season. It was laid for the purpose of increasing the supply to Hegewisch and furnishing better fire protection. The tunnel section under the river at 128th St. and Torrence Ave. has not been completed. This main was laid by hand.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 42,329.81	$2.607
Castings	873.18	0.054
Valves	917.94	0.057
Hydrants	316.25	0.020
Lead	2,632.69	0.163
Mason Material	370.14	0.023
Miscellaneous Material	302.05	0.018
Supervision	945.31	0.059
Calkers	1,977.19	0.122
District Laborers	16,058.25	0.984
Mason Laborers	278.25	0.018
Masons and Mason Foremen	181.25	0.011
Plumbers	219.00	0.014
Hoisting Engineers	322.00	0.020
Teams and Pipe Yard Hauling	1,328.45	0.082
Mason Teams	183.20	0.011
Total	$ 69,234.96	$4.263

Grand Ave.—Lincoln Park Boulevard to Lake Michigan.

Lake Shore Drive—Ohio St. to Grand Ave.

3590 feet of 16" pipe.
333 feet of 12" pipe.

This main was laid to furnish a supply to Municipal Pier principally for fire protection. It was laid by hand.

The cost is as follows:—

	Total Cost	Cost Per Ft.
Pipe	$ 5,802.66	$1.479
Castings	305.73	0.078
Valves	371.92	0.095
Hydrants	253.00	0.065
Lead	427.84	0.109
Mason Material	190.12	0.048
Miscellaneous Material	84.07	0.021
Supervision	426.20	0.109
Calkers	486.00	0.124
District Laborers	4,503.75	1.148
Mason Laborers	175.50	0.045
Masons and Mason Foremen	119.25	0.030
Miscellaneous Labor	11.20	0.003
Teams and Pipe Yard Hauling	232.00	0.059
Mason Teams	90.00	0.023
Repaving	794.61	
Total	$ 14,273.85	$3.638

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MAINS LAID ON DEPOSIT AND REVENUE.

During the year 1915 there were 38,546 feet or 7.3 miles of pipe laid by deposit, the money being advanced by the property owners or other interested parties. This money is refundable when a permanent annual revenue of six cents per foot is shown.

In addition there were 112,617 feet or 21.33 miles of pipe laid where reports from the Water Assessor had indicated that there was an available revenue of six cents per foot per year.

MAINS LAID BY SPECIAL ASSESSMENT.

A separate list is included herewith of all mains laid by special assessment showing the total cost of each job and the average cost per foot.

There were 102,486 feet or 19.41 miles of pipe laid under special assessment, the total cost being $128,273.17.

FIRE PROTECTION WORK.

During the year there were 33,156 feet or 6.28 miles of pipe laid in various parts of the City to improve fire protection. Under this head a large number of fire hydrants were added to the system where investigation had shown that the fire protection was weak.

The district between Harrison street, 22nd street, Halsted street and Ashland avenue, was covered with a careful fire protection survey. This survey included fire flow tests on the mains, studies of the character of buildings and their occupancy, the location of fire hydrants with reference to the buildings to be protected, size of mains and their capacity, the location of valves, and also the location of connections between the large and small mains.

After this survey was completed, reports and recommendations were made showing the necessary changes to bring this part of the system to a high state of efficiency with regard to fire protection.

These recommendations were approved and the work ordered. A large part of this work has been completed, consisting of replacing 4" mains, setting additional hydrants and valves and making new connections. This work has been rather expensive in this district on account of the good asphalt pavements which had to be disturbed.

WORK DONE ACCOUNT OF PAVING.

The rehabilitation of the system in streets which are to be paved is one of the most important parts of the work of this division. It includes replacing mains which are too small, overhauling mains, replacing hydrants, setting new hydrants and valves, cutting off abandoned service connections and any other necessary work to put the system in good order.

In car line streets this work has also included the laying of a double main system, and the retapping of service pipes to the nearest main.

CONSTRUCTION GANG.

A construction gang was operated during the past year to lay mains in all parts of the City. The jobs assigned to this gang were all those which could be laid with trenching machines. The division has three machines—one large Austin trench excavator operated by steam and capable of digging trench for

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36" pipe, and two small Austin excavators operated by gasoline engine and used for laying 6", 8" and 12" pipe. In addition to these a Parsons machine was rented for a short period to work on the 67th street job.

In connection with the Large Austin excavator the gang uses a locomotive crane on the large pipe laying jobs for laying pipe in trench, and pneumatic hammers supplied with air from portable air compressors for caulking the joints. The division has two compressors for this purpose.

During the year there were 152,858 feet or 28.95 miles of pipe laid by the Construction Gang.

MAINTENANCE WORK.

The maintenance work of the Water Pipe Extension Division consists in repairing defective mains, hydrants, valves and service pipes, and the necessary inspection, testing and investigation to keep the system in equipment in operating condition. The total amount expended in this work during 1915 was $736,507.27. There is appended hereto a table showing an analysis of maintenance costs by districts and sections.

During the past year a thorough study has been made of the subject of hydrant inspection and a new system of inspection and reports installed. A study was also made of the use of hydrants by contractors, sprinklers, and others throughout the City with a view to eliminating as far as possible, this source of damage to the fire hydrants.

By putting into operation the recommendations arising from these investigations it is expected that a great saving in the expense of hydrant maintenance can be effected during 1916.

ENGINEERING WORK.

The engineering work of the Water Pipe Extension Division has been increased in scope and usefulness during the year 1915. The City is divided into three engineering divisions, each in charge of an assistant engineer.

The work of each division includes giving line and grade for construction and contract work, making recommendations for improvements to the system, making fire protection and feeder main surveys, study of pressure and flow conditions in the mains, and the preparation of all plans and estimates for new work.

A number of important reports have been made and submitted by the engineering organization during the past year. Some of these are as follows:

Report on Pitometer Test at Hegewisch:—Shows a high rate of consumption in Hegewisch, the night rate being 101 per cent. of the day rate in January, 1915, indicating great wastage of water. Installation of meters recommended.

Report on Water Supply at South Deering:—Showing improved fire protection supply after laying 24" main in Torrence avenue. Also shows high rate of consumption and high night rate indicating great waste of water.

Report on Proposed Supply to Blue Island:—An investigation was made of the requirements of Blue Island for a water supply to be taken from the Chicago system.

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Report on Effect of Pressure Control in South Division:—Showing the great benefit of reducing night pressures at the pumping stations by corresponding reduction in total pumpage, and by constant pressures maintained at points in system remote from station.

Report on Water System of Village of Clearing:—This was a report showing the amount of pipe, number of valves and hydrants in Clearing and their condition.

Report on Hyde Park Feeder Mains:—Showing the benefits derived from laying the Hyde Park feeder mains through the reduction of friction losses, the pressure throughout the section being increased while the pressure at pumping station was lower. Tests made under similar conditions in 1913 and 1915.

Report on Installation of Regulating Valves in Lake View District:—Discussion of the proposal to install regulating valves on connections from feeder mains in vicinity of station with a view to equalizing pressure to consumers, and giving better service to districts farthest from pumping station.

Report on Feeder Main Surveys in South Division:—A report on tests covering about 135 miles of feeder mains, showing the rates of flow and direction. This report indicates the great value of this kind of work.

Report on Fire Protection:—Covering district between Harrison street, 22nd street, Halsted street and Ashland avenue. Work recommended to improve fire protection estimated at $69,000.00.

Lake View Feeder System:—Showing plan of ultimate layout for feeder mains in Lake View District with estimates of cost.

Recommendations for Feeder Mains for 1916:—A careful investigation and study was made to determine what feeder mains were required to be laid in 1916. Reports were submitted with estimates of cost.

Report on Hydrant Drains:—A discussion of the methods of draining hydrants and their relative merits and costs.

Report on Valve Operations:—A report recommending a system of records for valve operations so that every operation will be recorded.

Report on Hydrant Inspection:—Recommending a standard method of hydrant inspection, with a view of getting a record of inspections and repairs to hydrants and also of decreasing the cost of hydrant inspection.

Numerous other reports and investigations were made. A large number of slip tests on pumps at various pumping stations were made for the operating division. Weekly pressure reports were also submitted by each division.

The valve gang was used during the year to test out and operate all small valves, starting at the north side of City and working south. This work served a two-fold purpose—to test the operating condition of valves and to check the records as to locations of valves and connections between mains. All of the mains north of Madison street were covered by this work.

All mains laid by special assessment and all large feeder mains were tested after being laid by applying a pressure of 100 pounds per square inch. A new automobile testing outfit was purchased late in the year and it is expected that practically all mains laid during 1916 can be tested with this equipment.

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The subject of cost analysis has received considerable attention during the year, monthly reports being prepared showing a detailed analysis of both construction and maintenance costs.

A new design of fire hydrants, and standard design of gate valves 4 inch to 36 inch in diameter, was made during the year in co-operation with the designing division.

The new hydrant was tested for loss of head and showed much better results than all other types tested. In addition to the comparatively low friction loss the new type of hydrant has the advantage of low first cost, and easy removal of working parts without excavation.

PIPE YARDS.

All material for the use of the various gangs throughout the City was received and disbursed by the Pipe Yards. New yards were opened at 95th street and Baltimore avenue and at 75th street and Western avenue and the pipe yard at 68th street and Yates avenue was closed.

The Pipe Yards Section supervised the delivery of pipe and castings on the streets for the large feeder mains. The motor trucks were also operated under the direction of the Superintendent of Pipe Yards.

Deliveries of material of all kinds were made to all parts of the City not only for the Water Pipe Extension Division but for all Divisions of the Bureau of Engineering and for other City departments. The motor trucks were operated very economically.

SERVICE PIPES AND TAPS INSTALLED.

There were 15,097 service pipes installed in 1915. Of these 10,376 were installed by private contract and special assessment for future use in streets which were about to be paved; 7,400 of this number were installed under special assessment the total cost being $82,207.64, and the average cost per pipe being $11.11. There were 18,877 taps and connections of all sizes installed during the year. Connections larger than two inches were installed by machinists.

The cost of installing taps is as follows:—

Tappers Salaries	$ 22,073.41
Team Hire	19,293.50
Corporation Ferrules & Plugs	11,604.29
Taps & Drills	342.00
Shop Repairs	1,580.45
Miscellaneous Material	249.28
Operating Automobiles July to Dec.	947.86
	$ 56,090.79

Taps installed ¾" to 2"	18078
Brass Plugs installed ¾" to 1½"	419
Iron Plugs installed ⅝" to 1"	317
	19444

Actual number of man days worked	4397
Average operation per man per day	4.4
Average cost per operation	$2.88

A reduction of approximately 30 cents per operation per day during 1915 as compared with cost during 1914 is mostly due to the use of automobiles during part of this year.

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PLUMBING INSPECTION.

The work of the plumbing inspection section has consisted of the inspection of all service pipe installation, investigation of complaints, installing and repairing drinking fountains, inspection of service pipes in streets about to be paved, and other special inspections. The following list shows the number of inspections made in 1915, together with the cost:—

Character of Inspections	Number Inspections	Cost	Average Cost
Installation in new buildings	4692	$7,706.92	$1.64
Installations by special assessment	7400	7985.79	.77
Installations by private contract	2976		
Retapping	3325	4,371.50	1.31
Large service applications	168	312.00	1.85
Defective or abandoned pipes	1515	2,625.02	1.73
Meters	4667	7,476.62	1.60
Recording guages		1,056.25	.....
Drinking Fountains		1,620.14	.....
Inspections account paving		6,369.72	.....
Flushing mains		1,591.52	.....
Supervising plumbing work		3,376.78	.....
Complaints	4268	7,131.35	1.66
Miscellaneous		4,662.80	.....
	29011	$56,286.41	

In connection with many of the inspections indicated above it is necessary for the inspector to make more than one trip.

Inspections were made at 860 places where it was thought possible to find cross-connections between City water service and pipes from the river, wells, lagoons, cisterns, etc. The inspectors found 179 places with such connections which were ordered cut-off.

Approximately 1418 miles of main were flushed during the year, the party doing this work consisting of a plumbing inspector and two laborers, equipped with a single rig. This work was done where complaints of foul water or snails were received. The total cost of this work was $4,773.02.

Inspections of service pipes in streets about to be paved and inspections of buffalo boxes in streets where sidewalks are proposed are important features of the work.

DRINKING FOUNTAINS.

There were 560 drinking fountains in use in various parts of the City during 1915. These fountains require constant attention to keep them in operating condition. During the year 49 fountains were broken beyond repair and 430 required minor repairs. The fountains were taken out and stored for the Winter.

PLUMBING WORK.

A considerable amount of plumbing work was done for other divisions and departments of the City, consisting of installing fixtures in new buildings and repairs to old plumbing. The total cost of this work was $18,267.02.

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METER CONNECTIONS INSTALLED.

The following meter connections were installed on service pipes as required by ordinance:—

Size	Number Installed	Average Cost
¾"	239	$15.12
1"	380	14.22
1¼"	7	12.03
1½"	100	11.96
2 "	158	13.66
	884	

In addition meter connections were furnished to plumbers for installation on new service pipes, the only cost to the City being the cost of material and inspection. They are as follows:—

Size	Number Installed	Average Cost
¾"	41	$ 1.98
1 "	90	1.60
1½"	46	3.00
2 "	71	4.90
	248	

LOCATING GANG.

The following is a summary of the work performed by the Locating Gang during year 1915:—

Number of service pipes located incident to street improvements	2,483
Number of iron service pipes located	58
Number of vacant lots examined prior to stubbing	8,646
Number of street examined to be paved	131
Number of special locations made	2,275
Number of street openings made	72
Number of openings made inside curb	4,616
Number of buffalo boxes installed	694
Number of buffalo box extensions put in	252
Number of buffalo box covers put on	211

ELECTROLYSIS.

Investigations were made and surveys conducted to determine the source of electrolytic action, with a view to preventing it as far as possible and also to collect for damage done. The work was carried on under the direction of the Commissioner of Gas and Electricity.

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RECAPITULATION OF MAINTENANCE EXPENDITURES. (PIPE DISTRICTS).

Item	Expense.	Number	Average Cost of each.
HYDRANTS:—			
Repairing	$106,930.59	26505	$ 4.03
Oiling and Packing	15,404.28	35120	.44
Inspecting and Testing	43,790.52	507485	.086
Refilling Basins and Thawing	8,639.45	4107	2.10
Repairing Fire Cisterns	597.39	147	4.06
Filling and Emptying Hydrant Basins.	25,700.83	26836	.96
Banking Hydrants	543.76	1653	.33
VALVES:—			
Repairing	20,567.19	4347	4.73
Replacing	2,241.67	72	31.13
Oiling and Testing	19,295.01	15861	1.22
WATER MAINS:—			
Repairing Leaks	88,982.00	3221	27.63
Flushing Water Mains	2,695.94	3065	.88
SERVICE PIPES:—			
Repairing	83,857.90	5874	14.28
Shutting off Abandoned Taps	18,180.01	1490	12.20
OTHER MAINTENANCE COSTS:—			
Watchmen and Yardmen	48,037.53		
Locating Leaks	22,077.48		
Protecting System	12,480.25		
Vacations	19,284.28		
Monthly Men, Sundays & Holidays	5,098.63		
Time Lost on Pay Day	2,309.34		
Sickness and Injuries	578.87		
Cleaning Fountains	10,093.49		
Hauling and Loading	4,126.25		
Work done on account of Sewer Construction	8,374.02		
Miscellaneous Cost	27,307.93		
TOTAL COST FOR YEAR	**$597,194.61**		
TOTAL COST PER MILE PER YEAR	**$ 236.59**		

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RECAPITULATION OF MAINTENANCE EXPENDITURES (MASON DISTRICTS).

Item	Expense	Number	Average Cost of each
HYDRANT BASINS:—			
Repairing	$ 5,669.63	502	$11.29
Rebuilding	327.33	11	29.76
Draining	8,547.91	8805	9.71
Grading	24.78	3	8.26
VALVE BASINS:—			
Repairing	6,613.26	656	10.08
Rebuilding	621.74	19	32.72
Grading	3,439.69	579	5.94
Draining	447.79	32	13.99
Repairing Cement Walks	2,073.27		
Watchmen	323.25		
Vacations	1,866.00		
Miscellaneous Cost	4,673.41		
Filling Basins	44.00		
Work Done, account of Sewer Construction	127.48		
TOTAL COST	$ 34,799.54		

—Work by others than regular Districts—

Repairing Service Pipes	14,104.07	1239	11.38
Repairing Drinking Fountains	4,537.28		
General Plumbing Shop Work	2,774.14		
Flushing Mains	1,846.43		
General Pipe Yard Work	42,896.69		
Pipe Yard, Watchmen and Yardmen	12,271.61		
Engineering Work	9,357.18		
Vacations	2,143.88		
Miscellaneous Work	10,945.31		
Sick and Injured	25.04		
Wiping Tap Couplings, Plumbing Shop	499.50		
Work Done, account of Sewer Construction by Gang "A"	3,111.99		
TOTAL EXPENDED	$104,513.12		
COST PER MILE	41.41		

SUMMARY.

Eight Districts	$597,194.61
Mason Districts	34,799.54
Other Sections	104,513.12
	$736,507.27

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STREET	FROM	TO	CONTRACTOR	Size	No. Feet	Price Per Foot	Valves and Basins	Hydrants	Cost
Avers ave	Argyle ave	Lawrence ave	Simon Ryan	8″	1330	$0.875	$120.00	$210.00	$1,493.75
Bennett ave	75th st	77th st	Jas. J. Lynch	8″	1258	.98	60.00	292.00	1,584.84
Blaine Place	Sacramento av	Albany ave	Tiritilli & Till	8″	642	1.08	55.00	150.00	898.36
Cornelia ave	Ridgeway ave	Central Park ave	Malachy Murphy	8″	985	.93	180.00	.....	1,096.05
Crystal st	LaVergne ave	Cicero ave	Simon Ryan	8″	1298	.88	60.00	350.00	1,552.24
Chauncey ave	93rd st	94th st	Malachy Murphy	8″	639	1.02	.....	140.00	791.78
Claremont ave	61st st	62nd st	Garrett Barry	8″	669	.84	.....	160.00	721.96
Crawford ave	62nd st	63rd st	Simon Ryan	12″	631	1.38	80.00	144.00	1,080.98
Cahokia ave	75th st	78th st	Jas. J. Lynch	8″	1962	.97	120.00	360.00	2,383.14
Ellis ave	80th st	81st st	Malachy Murphy	8″	663	.90	60.00	140.00	796.70
Essex ave	83rd st	87th st	Malachy Murphy	8″	2594	.875	240.00	560.00	3,069.75
Francisco ave	58th st	59th st	Simon Ryan	8″	629	.93	60.00	140.00	777.53
Green st	103rd st	104th st	Malachy Murphy	8″	644	1.04	60.00	140.00	869.76
Greenview ave	Elmdale ave	Ridge ave	Simon Ryan	8″	939	.90	60.00	280.00	1,185.10
Haddon ave	Lamon ave	Cicero ave	Simon Ryan	8″	632	.96	60.00	140.00	805.72
Houston ave	95th st	96th st	Simon Ryan	8″	581	.88	.....	144.00	655.28
Iowa st	Kostner ave	Krall ave	Tiritilli & Till	8″	631	.99	55.00	148.00	827.69
Jackson blvd	Lockwood ave	Leamington ave	Tiritilli & Till	8″	1182	.98	110.00	150.00	1,418.36
Jackson blvd	Central ave	Lotus ave	Theo. De Vito	8″	803	1.01	55.00	76.00	942.03
Justine st	86th st	87th st	Simon Ryan	8″	615	.90	60.00	140.00	753.50
Kostner ave	63rd st	65th st	Malachy Murphy	8″	1304	.95	60.00	280.00	1,578.80
Kolin ave	63rd st	65th st	Malachy Murphy	8″	1303	.88	120.00	280.00	1,546.64
Kostner ave	Wrightwood ave	Da Tample ave	Tiritilli & Till	8″	601	1.02	55.00	.....	668.02
Kedzie ave	63rd st	67th st	Malachy Murphy	12″	2606	1.44	140.00	.....	4,231.18
				6″	59				
NOTE: This includes $253.58 allowed account extra hand work.									
Karlov ave	Lawrence ave	Ainslie st	**Simon Ryan**	8″	621	.97	60.00	140.00	802.37
Kingston ave	107 N. 85th st	87th st	**Simon Ryan**	8″	1450	.97	186.00	320.00	1,912.50
Leavitt st. Note	99th st	101st st	**Simon Ryan**	12″	1319	.91	58.00	296.00	1,554.20
Leavitt st. Note	101st st	103rd st	**Simon Ryan**	12″	1269	.94	60.00	296.00	1,548.86
NOTE: 16c per ft. extras allowed account changing from 8″ to 12″ pipe. See Council order 12-28-14, page 2596.									
Luna ave	North ave	Lemoyne ave	Simon Ryan	8″	573	.90	.....	210.00	725.70
Lotus ave	North ave	Lemoyne ave	Simon Ryan	8″	567	.90	.....	210.00	720.30
Loomis st	103rd st	104th st	Simon Ryan	8″	626	.90	120.00	72.00	755.40
Mozart st	Archer ave	300 S. 42nd st	Malachy Murphy	8″	967	.87	59.00	140.00	1,040.29
Manistee ave	81st st	82nd st	Jas. J. Lynch	8″	741	.94	60.00	72.00	828.54
Marshfield ave	89th st	91st st	Malachy Murphy	8″	1308	.97	60.00	280.00	1,608.76
Montrose ave	Albany ave	Kedzie ave	Simon Ryan	8″	866	.....	.....	.....	.....
Montrose ave	Sawyer ave	Kimball ave	Simon Ryan	8″	529	1.28	120.00	210.00	2,115.60
Merrill ave	77th st	79th st	Jas. J. Lynch	8″	1327	.84	130.00	232.50	1,477.18
Menard ave	Dickens ave	Grand ave	Simon Ryan	8″	602	1.03	60.00	210.00	890.06
Mansfield ave	Dickens ave	Grand ave	Simon Ryan	8″	639	.94	60.00	140.00	800.66
Marmora ave	Montrose blvd	Berteau ave	Simon Ryan	8″	1308	.94	60.00	300.00	1,610.20
Menard ave	Montrose blvd	Irving Park blvd	Simon Ryan	8″	2572	.94	120.00	675.00	3,218.32
Mansfield ave	Montrose blvd	Berteau ave	Simon Ryan	8″	1329	.94	60.00	300.00	1,609.26
Mason ave	Montrose blvd	Berteau ave	Simon Ryan	8″	1331	.94	60.00	300.00	1,611.14
Mayfield ave	Hirsch st	Division st	Simon Ryan	8″	1277	.88	60.00	280.00	1,463.76
Newcastle ave	Irving Park blvd	Byron st	Simon Ryan	8″	600	.90	60.00	140.00	740.00
120th st	Michigan ave	Indiana ave	Malachy Murphy	8″	744	1.20	120.00	70.00	1,082.80

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PIPE LAID BY SPECIAL ASSESSMENT—Continued.

STREET	FROM	TO	CONTRACTOR	Size	No. Feet	Price Per Foot	Valves and Basins	Hydrants	Cost
Oakley ave	71st st	72nd st	Malachy Murphy	8"	640	$ .99	$ 60.00	$140.00	$ 833.60
106th Place	Wood st	Drew ave	Tiritilli & Till	8"	649	1.12	55.00	74.00	855.88
Princeton ave	80th st	81st st	Malachy Murphy	8"	713	.88	60.00	140.00	827.44
Phillips ave	83rd st	87th st	Malachy Murphy	8"	2588	.84	177.00	486.50	2,837.42
Rockwell st	69th st	71st st	Malachy Murphy	8"	1348	.885	60.00	70.00	1,522.98
Racine ave	79th st	81st st	Malachy Murphy	8"	1301				
NOTE: Includes $20.40 extras for locating connections				12"	34	.98	120.00	210.00	1,658.70
Robey st	99th st	100th st	Simon Ryan	6"	645	.83	50.00	180.00	765.35
66th Place	Spaulding ave	Kedzie ave	Simon Ryan	8"	664	.97	58.00	148.00	850.08
67th st	Kedzie ave	Central Park ave	Malachy Murphy	8"	2637	.97	180.00	630.00	3,367.89
School st	Springfield ave	Harding ave	Tiritilli & Till	8"	366	1.22	60.00	.....	506.52
Sayre ave	Palmer st	Belden ave	Simon Ryan	8"	403	1.04	60.00	70.00	549.12
64th st	71 ft. W. of W. L. of Kedzie ave	12 ft. E. of W. L. of Kedzie ave	Simon Ryan	6"	83	1.09	58.00	74.00	222.47
79th st	Yates ave	So. Chicago ave		8"	5279				
Chappell ave	N. L. of 79th st	S. L. of 79th st	Malachy Murphy	6"	6	1.08	512.00	210.00	7,474.16
79th st	Kingston ave	Yates ave		12"	967				
Troy st	45th st	200 ft. N. of N. L. of 46th st	Malachy Murphy	6"	466	.78	.....	70.00	433.48
22nd st. N. S	Kostner ave	Belt R. R.	Simon Ryan	8"	1140	.99	180.00	280.00	1,588.60
Throop st	92nd st	95th st	Malachy Murphy	8"	2040	.895	180.00	350.00	2,355.80
Union ave	99th st	102nd st		8"	1924				
			Simon Ryan	6"	46	.90	120.00	350.00	2,239.40
Whipple st	44th st	45th st	Theo. De Vito	8"	730	.98	55.00	75.00	845.40
Wabansia ave	Leclaire ave	Laramie ave	Alfonso Scully	8"	771	1.00	60.00	140.00	971.00
Winchester ave	89th st	90th st	Malachy Murphy	8"	867	.93	60.00	140.00	1,006.31
Yates ave	79th st	81st st	Jas. J. Lynch	8"	1061	.84	55.00	232.50	1,188.74
Yale ave	123rd st	124th st	Simon Ryan	8"	635	1.18	60.00	148.00	957.30
Yale ave	99th st	103rd st	Simon Ryan	8"	2603	.97	180.00	560.00	3,264.91
87th st	Luella ave	Crandon ave		12"	336				
Luella ave	87th st	88th st	Malachy Murphy	8"	608	1.09	60.00	280.00	1,368.96
Jeffery ave	84th st	87th st		12"	1965				
Anthony ave	84th st	Jeffery ave	Malachy Murphy	6"	206	1.36	320.00	490.00	3,752.66
Lafayette ave	79th st	84th st		8"	3292				
83rd st	Wentworth ave	State st	Malachy Murphy	12"	1238				
LaSalle st	81st st	84th st		8"	1944				
Federal st	81st st	84th st		8"	1944	1.19	910.00	1,920.00	12,487.42
Mansfield ave	Hirsch st	Division st	Simon Ryan	8"	1264				
Division st	Mansfield ave	Mayfield ave		12"	320	1.06	195.00	350.00	2,233.58
Natchez ave	Grand ave	Dickens ave		8"	1814				
Nagle ave	153 ft. N. of Belden ave	McLean ave	Tiritilli & Till	8"	2009				
Palmer st	Natchez ave	Nagle ave		8"	341	.94	240.00	1040.00	5,194.16
69th st	Washtenaw ave	Rockwell st		8"	670				
Washtenaw ave	69th st	71st st	Malachy Murphy	8"	1347				
Talman ave	69th st	71st st		8"	1347	.89	300.00	700.00	3,993.96
65th Place	Lawndale ave	Hamlin ave							
Hamlin ave	65th Place	135 ft. Northward	Malachy Murphy	8"	856	.96	60.00	140.00	1,021.76
Winchester ave	100th st	101st st		8"	677				
101st st	Winchester ave	Longwood blvd	Malachy Murphy	8"	326	.99	120.00	140.00	1,253.97
			Total		100,854				$128,272.17

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PIPE LAID IN FIRST DISTRICT

LOCATION ON	FROM	TO	CHARGE	Size	No. Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft.
Aberdeen st.	Harrison st.	Polk St.	Fire Protection.	8"	837	0	3	$1,874.98	$2.24
Benton place.	Wabash Ave.	200 ft. West	Replacement.	8"	173	1	0	1,106.59	6.05
Elizabeth st.	Kinzie st.	Austin ave.	Replacement.	8"	365	0	0	860.64	2.36
Elburn ave.	Laflin st.	Throop st.	Fire Protection.	8"	1,364	2	2	3,273.86	2.40
Ellsworth ave.	Harrison st.	Sebor st.	Deposit	6"	321	2	0	1,103.03	3.43
Fulton st.	Ada st.	Morgan st.	Circulation	8"	2,364	10	6	5,321.96	2.25
15th st.	Morgan st.	Racine ave.	Replacement.	8"	1,210	1	3	2,386.50	1.97
Gilpin place.	Lytle St.	Sibley st.	Fire Protection.	8"	527	1	1	923.58	1.75
Grand ave.	Sangamon st.	May st.	Replacement.	8"	1,274	13	8	7,471.01	5.86
Grand ave.	Pine St.	City Pier.	Circulation	12"	333				
				16"	3,590	7	4	14,273.85	3.64
Hope ave.	Blue Island ave.	Morgan st.	Fire Protection.	8"	686	0	2	1,493.90	2.18
Illinois st.	Peshtigo ct.	519 ft. East.	Deposit	8"	26				
				16"	519	0	0	1,853.43	3.19
Indiana ave.	14th st.	310 ft. North	Fire Protection.	8"	263	1	0	702.28	2.67
Laflin st.	16th st.	15th st.	Fire Protection.	8"	632	1	2	1,567.24	2.48
Miller st.	Harrison st.	Taylor st.	Fire Protection.	8"	1,658	0	4	3,500.40	2.11
Peoria st.	Harrison st.	Vernon Park	Fire Protection.	8"	433	0	1	753.11	1.74
Photo place.	Loomis st.	Throop st.	Circulation	6"	293	1	0	404.94	1.38
Plum st.	Loomis st.	Laflin st.	Fire Protection.	6"	634	0	2	1,340.76	2.11
Sangamon st.	12th st.	16th st.	Fire Protection.	8"	2,130	3	8	5,441.53	2.55
Sangamon st.	Harrison st.	Vernon Park	Fire Protection.	8"	435	0	1	787.35	1.81
Sholts st.	Harrison st.	Polk st.	Fire Protection.	8"	874	1	4	2,104.52	2.40
Van Buren st.	Market st.	State st.	Replacement.	8"	1,050				
				12"	2,589	23	9	22,710.61	6.24
Vernon Park.	Blue Island ave.	Morgan st.	Fire Protection.	8"	828	2	4	2,357.89	2.85
Washington st.	State St.	Dearborn st.	Circulation	8"	772			3,378.79	4.35
				12"	783	8	2	4,264.53	5.45
		Total feet laid by District			26,963				
		Pipe laid for hydrant branches.		6"	1,525				
		Total pipe laid in District			28,488				

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PIPE LAID IN SECOND DISTRICT

LOCATION ON	FROM	TO	CHARGE	Size	No. Feet	No. of Valves	No. of Hydrants	COST Total	Per Ft.
Adams st.	Cicero ave.	Laramie ave	Circulation	8″	2,670	1	0	$5,886.12	$2.21
Campbell ave	Madison st	Harrison st	Replacement	8″	2,395	4	3	5,797.58	2.42
Fillmore st.	Central Park ave.	300 ft. West.	Revenue	8″	325	1	1	712.69	2.19
Gladys ave	Lockwood ave	Lotus ave	Circulation	8″	1,131	2	2	1,836.05	1.62
Harrison st	Kilpatrick ave	Cicero ave.	Circulation	6″	60	0	0	207.14	3.45
Jackson boul.	Kenton ave	Central Park ave.	Circulation	8″	171	1	0	482.18	2.82
Lavergne ave	25 ft. E. W. L. at	Adams st.	Circulation	8″	70	0	0	144.50	2.06
Lockwood ave	Lake st	Madison st	Replacement	8″	2,410	2	8	7,584.72	3.15
Lotus ave	Lake st	Madison st	Replacement	8″	2,336	1	8	4,881.33	2.09
LaCrosse ave.	Park ave	West End ave.	Revenue	8″	476	1	1	1,036.10	2.18
Laramie ave	12 ft. W. E. L. of	Jackson st.	Circulation	12″	70	0	0	207.18	2.96
Lincoln st	14th st.	425 ft. South	Replacement	8″	375	1	2	1,228.58	2.62
			Replacement	12″	94				
Monroe st	Western ave	Rockwell st.	Circulation	8″	60	1	1	413.77	6.89
Monroe st	Cicero ave	Laramie ave	Circulation	8″	67	1	1	135.87	2.03
Osborn st.	Ohio st.	Grand ave.	Replacement	8″	459	0	1	1,071.94	2.34
Pine ave	Madison st.	South blvd	Replacement	8″	2,322	0	8	4,942.55	2.13
Quincy st.	Laramie ave	Central ave.	Circulation	8″	70	1	0	190.93	2.72
Tripp ave	14th st.	16th st.	Circulation	8″	68	0	1	134.99	1.99
Waller ave.	Madison st	South blvd	Replacement	8″	2,350	1	8	5,194.09	2.21
Waller ave.	Washington blvd	Parkside ave.	Circulation	8″	438	1	0	796.85	1.82
	Total feet laid by District				18,417				
	Pipe laid for hydrant branches			6″	669				
	Pipe laid by Special Assessment			8″	1,985				
				6″	25				
	Total feet laid in District				21,096				

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PIPE LAID IN THIRD DISTRICT

LOCATION ON	FROM	TO	CHARGE	Size	No. Feet	No. of Valves	No. of Hydrants	COST Total	Per Ft.
Albert st	19th st	18th st	Fire Protection	8"	342	1	1	$1,442.38	$4.22
California ave	39 ft. N. 31st st	450 ft. N. 31st st	Fire Protection	12"	60	0	0	327.80	5.45
Crawford ave	31st st	33rd st	Circulation	8"	82	0	0	404.33	4.93
Canal st	Archer ave	29th st	Circulation	12"	13				
			Replacement	8"	31	4	0	223.38	5.03
Homan ave	25 ft. S. N. L. 38th st	38th st	Circulation	8"	46	0	3	284.08	6.18
Hermitage ave	34th st	35th st	Replacement	8"	1,237	3	4	3,394.88	2.74
Kolmar ave	28th st	300 ft. N. 28th st	Circulation	8"	42				
			Revenue	8"	258	1	1	880.17	2.93
Lincoln ave	31st st	33rd st	Circulation	8"	282	1	0	681.61	2.42
Loeffler court	19th st	20th st	Fire Protection	8"	505	1	1	2,266.02	4.49
Robinson st	Archer ave	31st st	Replacement	8"	1,227	1	3	3,827.55	3.12
Rockwell st	23rd st	Crossing	Circulation	8"	70	0	0	537.60	7.68
Stewart ave	33rd st	39th st	Replacement	6"	33	3	3	448.20	13.58
Sacramento ave	8 ft. N. N. bank river	14 ft. S. S. bank river	Deposit	8"	123	2	0	865.37	7.04
20th st	Rockwell st	480 ft. East	Deposit	6"	546	0	2	1,207.72	2.21
28th st	Kedzie ave	Troy st	Circulation	8"	295	1	0	1,300.61	4.41
28th st	Kostner ave	45th court	Circulation	8"	281	0	0	1,085.55	3.87
30th st	Lawndale ave	Ridgeway ave	Circulation	6"	327	1	0	623.66	1.91
31st st	495 ft. W. of	California ave	Deposit	6"	449	2	0	818.62	1.82
32nd place	Racine ave	Benson st	Replacement	8'	900				
			Replacement	6"	20	4	4	2,464.58	2.74
38th st	Kedzie ave	Central Park ave	Circulation	6"	26				
			Circulation	8"	12	7	2	8205.42,	3.10
			Circulation	12"	2,648				
Wentworth ave	26th st	39th st	Circulation	6"	34				
			Circulation	8"	7,923	21	13	20,257.93	2.56
		SYSTEM							
California ave	31st st	390 ft. North	Fire Protection	12"	413				
31st st	Sacramento ave	California ave	Fire Protection	8"	1,366	3	3	3,768.20	2.12
		Total feet laid by District			19,591				
		Pipe laid for hydrant branches		6"	1,068				
		Pipe laid by Special Assessment		6"	24				
				8"	1,140				
		Total pipe laid in District			21,823				

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ON	LOCATION FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	Per Ft.
Attrill st	**Milwaukee ave**	**Stave st**	Replacement	8"	408	0	1	$ 724.12	$ 1.77
Barry ave	**Hoyne ave**	**Robey st**	Revenue	8"	612	2	1	977.67	1.60
***Belmont ave**	**Nagle ave**	**Harlem ave**	Circulation	12"	5272	4	7	10,541.34	2.00
Barry ave	**Devlin ct**	**Harding ave**	Revenue	8"	328	1	0		
Barry ave	**Harding ave**	**Crawford ave**	Revenue	6"	144	0	0	609.23	1.29
***Belmont ave**	**Kilpatrick ave**	**Knox ave**	Circulation	12"	285	0	0	789.70	2.81
Cicero ave	**Fullerton ave**	**Palmer st**	Circulation	8"	73				
			Circulation	6"	2721	10	2	5,276.62	1.89
Central ave	Division st	North ave	Circulation	8"	121	0	0	247.62	2.05
Costello ave	Kilpatrick ave	350 ft. East	Revenue	6"	348	0	1	364.99	1.05
Cromwell st	Milwaukee ave	Fullerton ave	Replacement	8"	48	1	1	222.44	4.63
Diversey ave	Alley w. of Crawford ave.	West	Revenue	12"	300	0	1	583.41	1.94
Fletcher st	225 ft. S. of Lavergne ave.	Lavergne ave	Revenue	8"	204	0	0	333.69	1.64
Grand ave	Menard ave	Mansfield ave	Circulation	8"	416	2	0	637.91	1.53
Harding ave	Belmont ave	Barry ave	Revenue	8"	636	2	1	990.89	1.56
Julian st	Elston ave	Noble st	Replacement	8"	486	1	1	1,042.77	2.15
Kilpatrick ave	Belmont ave	Wellington ave	Deposit	12"	20				
			Deposit	8"	1263	2	4	1,736.05	1.37
Kostner ave	**Fullerton ave**	**Wrigthwood ave**	Circulation	8"	30	0	0	73.56	2.45
Karlov ave	**Palmer st**	**Belden ave**	Circulation	8"	74				
			Revenue	8"	583	1	1	1,074.01	1.63
Keating ave	Belmont ave	Wellington ave	Deposit	8"	300	0	0	485.04	1.62
Keating ave	Belmont ave	Wellington ave	Revenue	8"	725	0	0	949.52	1.31
Keating ave	Belmont ave	Wellington ave	Deposit	8"	247	2	5	435.39	1.76
*Knox ave	Belmont ave	940 ft. South	Revenue	8"	940	1	3	1,172.87	1.25
*Knox ave	Belmont ave	Wellington ave	Deposit	8"	325	1	2	483.67	1.49
*Keating ave	Wellington ave	George st	Revenue	8"	486	1	1	666.15	1.37
*Kilpatrick ave	Wellington ave	George st	Revenue	8"	486	1	1	603.84	1.24
*Kilpatrick ave	Wellington ave	180 ft. North	Reposit	8"	180	0	1	215.34	1.20
*Keating ave	George st	North ave	Deposit	8"	180	0	1	260.40	1.45
Lavergne ave	Barry ave	Wilson ave	Revenue	8"	963	1	3	1,463.41	1.52
Long ave	Wrightwood ave	Schubert ave	Fire Protection	8"	1301	3	3	2,066.57	1.59
Lockwood ave	Thomas st	Division st	Revenue	8"	664	1	2	957.95	1.44
Leclaire ave	Division st	Thomas st	Revenue	8"	708	1	1	961.15	1.36
La Porte ave	Dickens ave	Northward	Revenue	8"	180	0	0	219.34	1.22
Lavergne ave	North ave	Le Moyne st	Revenue	8"	567	1	3	928.23	1.64
Linder ave	North ave	Le Moyne st	Deposit	8"	573	1	3	887.00	1.55
Laramie ave	Belmont ave	Belmont ave	Circulation	12"	55	1	0	263.83	4.80
Luna ave	LeMoyne st	Hirsch st	Deposit	8"	654	1	2	936.50	1.43
Lowell ave	North ave	250 ft. North	Revenue	6"	222	0	0	181.84	.82
LeMoyne st	Leavitt st	California ave	Circulation	6"	216	0	0	261.56	1.21
Luna ave	North ave	North	Circulation	8"	32	0	0	227.75	7.12
Milwaukee ave	at Bloomingdale ave		Deposit	6"	76	0	0	7,422.24	97.66
Monticello ave	Bloomingdale ave	Courtland st	Circulation	6"	352	1	0	481.52	1.37
Mulligan ave	Diversey ave	Schubert ave	Revenue	8"	660	1	2	998.18	1.51
Maynard ave	Grand ave	South	Revenue	8"	240	1	0	357.03	1.49
Mobile ave	North ave	250 ft. North	Revenue	8"	252	1	0	369.63	1.47

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LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft.
Mobile ave	North ave	Wabansia ave	Revenue	8"	326	0	1	$ 446.82	$1.37
Montclaire ave	Wrightwood ave	Schubert ave	Revenue	8"	648	1	2	981.20	1.51
*Mobile ave	Wrightwood ave	Diversey ave	Revenue	8"	1286	2	4	1,915.44	1.50
Merrimac ave	Schubert ave	300 ft. North	Revenue	8"	300	0	1	320.31	1.07
Metropole st	Lamon ave	510 ft. East	Circulation	8"	267				
			Revenue	8"	241	0	1	599.78	1.18
Nelson st	Lavergne ave	129 ft. west	Revenue	8"	148	1	0	209.42	1.41
North ave	Lavergne ave	Lawler ave	Circulation	8"	362	1	0	448.87	1.24
North ave	Linder ave	Lotus ave	Circulation	8"	340	0	0	356.71	1.05
*Narragansett ave	Grand ave	St. Paul ave	Circulation	12"	2162	2	7	4,346.47	2.01
North ave	Long ave	Lotus ave	Revenue	8"	444	4	0	1,121.50	2.52
Oak Park ave	Belmont ave	418 ft. South	Revenue	6"	420	1	2	989.94	2.36
Palmer st	Laurel ave	Lockwood ave	Circulation	8"	581	3	0	887.21	1.53
Potomac ave	St. Louis ave	Central Park ave	Revenue	8"	481	0	2	761.21	1.58
Palmer st	C. M. & St. P. Ry	Crawford ave	Circulation	8"	62				
			Revenue	8"	233	1	1	481.73	1.60
Prindiville st	Milwaukee ave	Stave st	Replacement	8"	408	0	1	750.66	1.84
Rice st	Oakley ave	Western ave	Circulation	6"	250	0	0	428.54	1.71
Rutherford ave	Fullerton ave	440 ft. North	Revenue	8"	440	1	2	706.67	1.61
Sayre ave	Wellington ave	Noble ave	Revenue	8"	736	2	2	1,183.85	1.61
Schubert ave	Springfield ave	Harding ave	Revenue	8"	308	1	0	457.28	1.49
Springfield ave	Belden ave	Palmer st	Circulation	8"	570	1	1	815.63	1.43
Spaulding ave	Wrightwood ave	Milwaukee ave	Revenue	8"	966	2	2	1,368.87	1.42
Surf st	Sheridan Road	Broadway	Replacement	8"	42	0	0	279.60	6.68
Tripp ave	Wrightwood ave	Fullerton ave	Circulation	6"	166	1	1	235.95	1.42
Ward st	Belden ave	Fullerton ave	Replacement	8"	1170	1	3	1,994.55	1.70
Wolfram st	Sawyer ave	Sayre ave	Revenue	8"	352	1	1	573.63	1.63
Wrightwood ave	Newcastle ave	New England ave	Circulation	8"	32				
			Revenue	8"	258	1	1	516.14	1.78
Wrightwood ave	Keeler ave	Kostner ave	Circulation	6"	1308	4	0	1,534.08	1.17
Wabansia ave	Cicero ave	Westward	Revenue	8"	194	1	0	341.76	1.76
Winnebago ave	Bloomingdale ave	Eastward	Circulation	6"	40	0	0	88.01	2.20
		Total feet laid by District			41,497				
		Pipe laid for hydrant branches		6"	1,092				
		Pipe laid by Special Assessment		6"	279				
				8"	13,422				
				12"	329				
		Total feet laid in District			56,619				

*Trench dug by excavator.

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PIPE LAID IN FIFTH DISTRICT.

LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	Per Ft.
*Calumet ave	75th st	73rd st	Circulation	8"	1330				
			Circulation	6"	1270	4	4	$ 2,816.07	$ 1.08
Clyde ave	74th st	75th st	Revenue	8"	676	1	1	948.63	1.40
Colfax ave	74th st	South	Revenue	8"	240	0	1	630.40	2.63
Drexel blvd	Oakwood blvd	293 ft. South	Fire Protection	8"	333	1	1	622.54	1.87
Drexel blvd	47th st	48th st	Deposit	8"	626	1	1	1,146.33	1.83
Ellis ave	50th st	43rd st	Feeder Main	24"	4621	6	7	33,429.69	7.23
50th st	Ellis ave	Wabash ave	Feeder Main	24"	6139	8	8	37,760.54	6.15
54th st	Drexel blvd	Woodlawn ave	Circulation	6"	192	0	1	475.45	2.48
Harper ave	55th st	Ellis ave	Feeder Main	36"	6686	16	7	80,218.65	12.00
Merrill ave	71st st	South	Revenue	8"	365	1	2	705.41	1.93
Oglesby ave	67th st	68th st	Circulation	8"	880	2	1	1,508.34	1.71
Paxton ave	71st st	75th st	Circulation	8"	336	1	0	458.50	1.37
Paxton ave	70th st	71st st	Revenue	8"	673	2	0	927.86	1.38
Stony Island ave	66th st	59th st	Feeder Main	36"	8027	22	8	84,663.29	10.55
63rd pl	Dante ave	I. C. Ry	Revenue	6"	150	0	1	262.34	1.75
*73rd st	State st	Vernon ave	Circulation	8"	3057	5	0	3,454.45	1.14
Vernon ave	73rd st	75th st	Circulation	6"	48	0	0	101.32	2.11
			Total feet laid by District		35,649				
			Pipe laid for hydrant branches	6"	545				
			Total feet laid in District		36,194				

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ON	LOCATION FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft.
Avenue H	473 ft. S. 108th st.	569 ft. S. 108th st	Revenue	6″	96	0	0	$ 95.71	$1.00
Brainard ave.	Houston ave.	Carondolet ave.	Circulation	8″	480	0	1	862.26	1.80
Buffalo ave.	106th st.	282 ft. S. 106th st	Fire Protection	8″	320	0	0	550.07	1.72
Constance ave.	95th st.	South	Deposit	8″	648	3	0	1,276.49	1.97
Constance ave.	95th st.	95th st.	Fire Protection	8″	34	0	1	172.40	5.07
Constance ave.	78th st.	79th st.	Circulation	8″	662	1	1	965.60	1.46
Champlain ave.	83rd st.	79th st.	Deposit	8″	2463	3	7	3,552.36	1.44
Cottage Grove ave.	113th st.	114th st.	Circulation	8″	380	1	1	944.87	2.49
Champlain ave.	Alley N. 83rd st.	83rd st.	Revenue	8″	142	1	1	377.49	4.30
Cahokia ave.	75th st.	75th st.	Circulation	8″	20	0	0	107.81	5.39
Carondolet ave.	Brainard ave.	134th st.	Circulation	8″	218	0	0	455.14	2.04
Drexel blvd.	90th st.	91st st	Revenue	8″	648	1	1	1,025.82	1.58
Dobson ave.	79th st.	79th st.	Circulation	8″	54	0	0	133.90	2.48
Escanaba ave.	99th st.	99th st.	Circulation	8″	73	0	0	143.75	1.97
Exchange ave.	84th st.	87th st.	Circulation	6″	30	0	1	89.86	3.00
Eberhart ave.	83rd st.	83rd st.	Circulation	8″	20	1	0	132.53	6.63
Eberhart ave.	83rd st.	132 ft. North	Circulation	8″	132	0	0	298.40	2.26
Evans ave.	Alley N. 83rd st.	83rd st.	Revenue	8″	157	1	1	396.81	2.53
81st st	Cottage Grove ave	South Park ave	Circulation	8	2622	7	0	3,670.34	1.40
87th st.	Commercial ave.	So. Chicago ave	Circulation	8″	1426				
			Circulation	12″	3867	12	6	12,438.39	2.35
89th st.	Baltimore ave.	Houston ave.	Fire Protection	8″	325	1	1	786.43	2.42
89th st.	Saginaw ave	So. Chicago ave	Circulation	8″	216	1	0		
89th st.	Manistee ave	Marquette ave	Circulation	8″	390	1	0	1,520.71	2.51
89th st.	Buffalo ave.	Burley ave	Circulation	6″	323	1	0	671.75	2.08
Forrest ave.	134th st.	395 ft. East	Revenue	6″	384	1	1	605.09	1.58
Greenwood ave.	79th st.	79th st.	Circulation	8″	78	1	0	334.71	4.29
Harper ave	90th st.	91st st	Circulation	8″	720	1	2	1,200.27	1.67
Indiana ave.	134th st. and river		Deposit	12″	593	2	2	6,596.29	11.12
Jeffery ave	94th st.	93rd st.	Circulation	8″	65				
			Revenue	8″	579	0	2	1,925.12	2.99
Kimbark ave	82nd st.	486 ft. south	Revenue	8″	190				
			Deposit	8″	254	0	1	486.97	1.10
Kingston ave	117 ft. N. 85th st.	145 ft. N. 85th st.	Circulation	8″	28	0	0	68.33	2.44
Lake Park ave	75th st.	76th st.	Revenue	8″	652	0	1	1,169.51	1.79
LaSalle st	119th st.	120th st.	Circulation	8″	24	0	1	176.53	7.35
Loomis st	120th st.	121st st	Revenue	8″	624	0	2	1,294.37	2.07
Langley ave.	79th st	81st st	Deposit	8″	1464	3	4	2,114.07	1.44
Langley ave.	81st st	82nd st.	Revenue	8″	510	0	2	781.01	1.53
Langley ave.	82nd st.	83rd st.	Revenue	8″	678	1	2	1,047.66	1.54
Mackinaw ave.	134th st.	135th st.	Circulation	8″	41				
			Revenue	8″	233	1	2	487.05	1.78
Mackinaw ave	135th st.	South	Revenue	8″	240	0	0	270.07	1.12
Merrill ave	79th st.	79th st.	Circulation	8″	96	1	0	504.06	5.25

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PIPE LAID IN SIXTH DISTRICT—Continued.

LOCATION. ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft.
Merrill ave	Crossing	79th st	Circulation	8"	24	1	0	$ 220.12	$ 9.17
91st st	Cottage Grove ave	Drexel ave	Fire Protection	12"	853	0	0	2,447.10	2.87
95th st	Calumet ave	Forrest ave	Circulation	6"	17				
			Revenue	6"	275	0	0	474.26	1.62
*97th st	South Park ave	Michigan ave	Circulation	8"	1680	2	1	2,150.30	1.22
101st st	Ewing ave	Avenue M	Circulation	12"	549	1	0	1,678.97	3.06
111th st	Cottage Grove ave	942 ft. E. of Langley ave	Circulation	12"	723	3	2	2,881.08	3.99
119th st	Loomis st	Bishop st	Fire Protection	8"	250	1	1	644.12	2.58
120th st	State st	State st	Circulation	8"	60	0	1	177.03	2.95
120th pl	Michigan ave	State st	Revenue	8"	557	1	2	1,034.35	1.86
122nd st	Halsted st	Peoria st	Revenue	8"	684	1	0	1,166.63	1.70
123rd st	Wentworth ave	Yale ave	Circulation	8"	355	1	0	625.49	1.76
133rd st	Baltimore ave	Carondolet ave	Circulation	12"	648	1	0	1,658.10	2.56
134th st	Indiana ave	South Park ave	Circulation	8"	36	0	0	66.57	1.85
123rd st	Halsted st	Peoria st	Fire Protection	8"	678	2	0		
Peoria st	122nd st	123rd st	Fire Protection	12"	614	1	2	2,985.21	2.25
*Rhodes ave	79th st	83rd st	Deposit	8"	2664	4	8	4,051.30	1.56
Rhodes ave	83rd st	83rd st	Circulation	8"	20	0	0	119.11	5.96
So. Chicago ave	Jeffery ave	Stony Island ave	Circulation	8"	3636	7	4	5,268.54	1.45
Stony Island ave	75th st	75th pl	Circulation	6"	148				
			Revenue	6"	116	0	0	358.76	1.36
St. Lawrence ave	79th st	82nd st	Deposit	8"	1991	6	4	3,252.61	1.63
Stony Island ave	75th st	South	Revenue	6"	282	1	1	519.76	1.63
St. Lawrence ave	82nd st	83rd st	Revenue	8"	680	1	0	1,021.84	1.50
75th st	25 ft. W.E.L. Bennet ave. (from South)	25 ft. W.E.L. Bennet ave. (from North)	Circulation	8"	166	0	0	192.50	1.16
77th st	Constance ave	Constance ave	Circulation	8"	73	1	0	604.58	8.28
79th st	Stony Island ave	Luella ave	Revenue	8"	21	0	0	703.21	33.49
79th st	Saginaw ave	Yates ave	Circulation	8"	1782	9	1	3,981.54	2.23
Torrence ave	95th st	109th st	Feeder Main	24"	8948	9	0	43,194.20	4.83
Torrence ave	109th st	109th st	Feeder Main	24"	48	0	0	652.98	13.60
Torrence ave	Feeder main		Feeder Main	24"	15583				
			Feeder Main	16"	12			66,891.99	4.28
			Feeder Main	8"	32				
			Feeder Main	12"	701	15	5	2,342.97	3.34
University ave	332 ft. N. 90th st	North	Revenue	8"	96	0	0	180.12	1.88
University ave	89th st	170 ft. South	Revenue	8"	170	0	1	415.76	2.45
Wabash ave	80th st	81st st	Revenue	8"	1132	2	4	1,847.31	1.63
Yates ave	79th st	79th st	Circulation	8"	30	0	0	151.33	5.04
Yates ave	75th st	79th st	Circulation	8"	24	1	0	197.25	8.22

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PIPE LAID IN SIXTH DISTRICT—Continued.

LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft.
			—SYSTEM—						
*Calumet ave.	95th st.	99th st.	Revenue	8"	2553	3	9	$16177.81	$1.25
*Forrest ave.	95th st.	99th st.	Revenue	8"	2549	3	9		
*Indiana ave.	95th st.	99th st.	Revenue	8"	2640				
*Indiana ave.	95th st.	99th st.	Revenue	6"	2639	8	7		
*Perry ave.	95th st.	99th st.	Revenue	8"	2555	3	9		
		Total feet laid by District			82493				
		Pipe laid for hydrant branches		6"	1744				
		Pipe laid by Special Assessment		6"	556				
				8"	22843				
				12"	3268				
		Total pipe laid in District			110904				

*Trench dug by excavator.

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PIPE LAID IN SEVENTH DISTRICT.

LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	Per Ft.
Aberdeen st	89th st	90th st	Revenue	8"	666	0	2	$ 1,249.97	$ 1.88
Aberdeen st	99th st	152 ft. North	Circulation	8"	246	1	0	409.69	1.67
Central Park ave	55th st	59th st	Fire Protection	12"	2740	6	0	6,083.18	2.22
Clifton Park ave	Archer ave	47th st	Circulation	8"	96				
			Revenue	8"	316	1	1	728.16	1.77
Crawford ave	46th st	47th st	Circulation	6"	600				
			Circulation	8"	60	1	0	800.93	1.32
Eggleston ave	63rd st	65th st	Replacement	8"	1330	2	4	2,832.65	2.13
83rd st	Morgan st	Carpenter st	Circulation	12"	365	1	0	898.84	2.46
87th st	Ashland ave	Robey st	Circulation	8"	137	0	0	478.08	3.49
Fairfield ave	57th st	North	Revenue	8"	92	1	0	191.77	2.08
Fairfield ave	58th st	57th st	Fire Protection	8"	352	1	2	775.44	2.20
Fairfield ave	53rd st	178 ft. South	Revenue	8"	244	1	0	408.51	1.67
*Francisco ave	51st st	338 ft. N. 53rd st	Revenue	8"	900	0	2	1,246.31	1.39
*Francisco ave	53rd st	192 ft. South	Revenue	8"	230	1	0	260.42	1.13
Fairfield ave	53rd st	54th st	Revenue	8"	424	0	2	732.42	1.73
Fairfield ave	51st st	50th st	Deposit	8"	626	1	2	1,024.81	1.61
40th pl	Rockwell st	200 ft. West	Revenue	6"	233	1	0	297.36	1.27
49th st	Seeley ave	Seeley ave	Circulation	6"	28				
			Circulation	8"	70	1	0	245.78	2.51
49th st	Bishop st	Laflin st	Circulation	8"	272	0	0	459.60	1.69
55th st	Kildare ave	West	Revenue	12"	177	1	0	398.91	2.25
53rd st	Trumbull ave	Westward	Revenue	8"	114	1	1	354.54	3.11
54th st	Union ave	Union ave	Circulation	6"	27	1	0	118.35	4.38
Alley N. of 55th st	Hermitage ave	Wood st	Deposit	8"	598	2	0	859.42	1.43
56th st	Western ave	Campbell ave	Circulation	8"	219				
			Revenue	8"	275	1	0	808.64	1.64
56th st	Central Park ave	Lawndale ave	Fire Protection	8"	578	1	3	1,084.30	1.88
57th st	Central Park ave	Lawndale ave	Revenue	8"	283				
			Fire Protection	8"	295	1	3	1,057.03	1.83
Green st	53rd st	North	Revenue	8"	518	1	1	797.67	1.54
Hamlin ave	59th st	62nd st	Circulation	8"	1300	2	1	1,989.89	1.53
Hamlin ave	63rd st	65th st	Circulation	8"	1391	3	0	2,276.87	1.64
Hamilton ave	91st st	92nd st	Fire Protection	8"	637	1	2	1,254.58	1.97
Homan ave	63rd st	65th st	Circulation	8"	1267	1	0	2,278.99	1.80
Homan ave	59th st	63rd st	Circulation	8"	2580	3	0	4,308.87	1.67
Hermitage ave	54th st	55th st	Circulation	8"	528	1	2	1,056.80	2.00
Hoyne ave	50th pl	50th pl	Circulation	8"	73	1	1	248.98	3.41
*Hoyne ave	Feeder Main		Feeder Main	16"	12446				
			Feeder Main	8"	107	20	18	38,349.08	3.09
Justine st	79th st	81st st	Revenue	8"	24	1	0	49.28	2.05
Justine st	81st st	82nd st	Deposit	8"	648	1	2	925.99	1.43
Keeler ave	46th st	47th st	Revenue	8"	241				
			Fire Protection	8"	377	1	2	1,077.98	1.74
Kedvale ave	62nd st	63rd st	Fire Protection	8"	624	1	2	1,143.94	1.83
Kedvale ave	46th st	47th st	Revenue	8"	475				
			Fire Protection	8"	512	3	3	1,031.72	1.96

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LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft
Kedzie ave	39th st	39th st	Circulation	8"	25	0	0	$ 174.53	$6.98
Kedzie ave	44th st	Archer ave	Circulation	8"	490				
			Circulation	6"	10689	29	23	23,438.77	1.68
			Circulation	12"	2777				
Knox ave	63rd st	61st st	Revenue	8"	1313	2	4	1,990.10	1.52
Kilpatrick ave	62nd st	61st st	Revenue	8"	548	0	1	807.41	1.47
Kilpatrick ave	63rd st	61st st	Revenue	8"	705	1	2	1,114.91	1.58
Kolin ave	52nd st	53rd st	Revenue	8"	705	1	2	1,080.53	1.53
*Kilbourn ave	Archer ave	240 ft. S. 53rd st	Revenue	8"	1385	3	4	2,220.25	1.60
Loomis st	73rd st	73rd st	Circulation	8"	66	1	0	136.90	2.07
LaFayette ave	75th st	74th st	Circulation	8"	185				
			Revenue	8"	200	1	1	655.42	1.70
Laflin st	79th st	81st st	Revenue	8"	24	1	0	49.29	2.05
Lincoln st	119th st	150 ft. North	Revenue	6"	219	0	0	287.66	1.36
Loomis st	46th st	45th st	Circulation	12"	334	1	1	1,354.54	4.06
Mozart st	52nd st	53rd st	Revenue	8"	533				
			Fire Protection	8"	135	1	2	1,497.74	2.24
Millard ave	55th st	North	Circulation	8"	380	1	0	637.96	1.68
Maplewood ave	44th st	45th st	Revenue	8"	685	1	1	1,229.09	1.80
Mozart st	63rd st	65th st	Deposit	8"	1255	3	4	1,964.84	1.57
Maplewood ave	40th st	South	Revenue	6"	562	1	1	721.53	1.28
Morgan st	3rd st	Ashland ave	Circulation	6"	48	1	0	81.88	1.71
Normal ave	97th st	99th st	Circulation	12"	48				
			Circulation	8"	90	0	0	264.71	1.99
*95th st	Beverly ave	Leavitt st	Circulation	8"	78				
			Feeder Main	12"	6482	21	12	14,914.72	2.30
97th st	Carpenter st	Sangamon st	Circulation	8"	674	1	1	1,253.65	1.86
97th st	Throop st	344 ft. West	Deposit	8"	349	0	1	502.90	1.44
97th st	264 ft. W. Throop st	100 ft. West	Deposit	8"	100	0	0	143.15	1.43
99th st	Hamilton ave	Leavitt st	Circulation	12"	66				
			Circulation	8"	361	1	1	953.37	2.23
99th st	Wallace st	Halsted st	Circulation	12"	1338				
			Circulation	8"	319	6	0	3,064.23	1.85
100th pl	Prospect ave	Malta st	Circulation	8"	895	4	1	1,852.65	2.07
101st st	May st	Aberdeen st	Revenue	8"	262	2	0	577.93	2.21
101st st	Normal ave	Wallace st	Circulation	8"	501	3	1		
101st st	Wallace st	Lowe ave	Circulation	8"	268	3	0	2,422.16	1.73
101st st	Union ave	Halsted st	Circulation	8"	631	3	0		
101st st	Hoyne ave	Leavitt st	Circulation	8"	495	2	0	949.20	1.92
*104th st	Feeder Main		Feeder Main	24"	5976				
			Feeder Main	12"	42	3	5	35,092.18	5.87
			Feeder Main	8"	42				
107th st	Throop st	Racine ave	Revenue	8"	912	1	2	1,767.95	1.93
Perry ave	247 ft. N. 75th st	75th st	Circulation	8"	190				
			Revenue	8"	100	1	0	432.99	1.49
Richmond st	55th st	56th st	Fire Protection	8"	180	0	1	509.96	2.83

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PIPE LAID IN SEVENTH DISTRICT—Cont'd.

LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	Per Ft.
Richmond st.	55th st.	400 ft. South.	Revenue	8"	350				
			Fire Protection	8"	113	1	1	$ 908.20	$ 1.96
Rockwell st.	Alley N. of 50th st	North.	Revenue	6"	368	1	1	605.80	1.65
Richmond st.	Archer ave	40th pl.	Revenue	8"	750	1	2	1,307.09	1.74
Rockwell st.	51st st	50th st.	Circulation	6"	23				
			Revenue	6"	241	1	0	426.51	1.62
Sawyer ave.	59th st.	61st st	Circulation	8"	1324	2	3	2,137.62	1.62
Sangamon st.	87th st.	88th st.	Fire Protection	8"	643	1	2	1,231.61	1.92
Spaulding ave.	60th st.	61st st.	Circulation	6"	44				
			Circulation	8"	704	3	0	1,147.99	1.63
St. Louis ave.	52nd st.	53rd st.	Revenue	8"	600	0	3	1,184.11	1.97
Springfield ave.	46th st.	285 ft. N. 46th st.	Revenue	8"	356	0	1	554.80	1.56
*Sawyer ave	56th st.	57th st.	Revenue	8"	664	1	2	864.03	1.30
Sacramento ave.	40th pl.	42nd st.	Circulation	6"	145				
			Revenue	8"	1020	2	0	1,606.55	1.38
60th st.	Hamlin ave.	C. G. T. Ry.	Circulation	8"	24	0	0	53.04	2.21
61st st.	Sacramento ave	Richmond st.	Circulation	8"	815	2	0	1,652.79	2.03
61st st.	Kedzie ave	Spaulding ave.	Circulation	8"	636	2	4	983.92	1.55
62nd st.	25 ft. E.W.L. Hamlin ave.	Crossing.	Circulation	8"	28	0	0	85.96	3.07
62nd pl.	Hamlin ave.	Central Park ave.	Circulation	8"	1269	1	4	2,087.71	1.65
62nd st.	Hamlin ave.	C. G. T. Ry.	Circulation	8"	24	0	0	79.08	3.30
63rd st.	Central Park ave.	Lawndale ave.	Circulation	12"	7				
			Circulation	16"	720	0	2	3,717.34	5.15
64th pl.	80 ft. E. Hamlin ave.	West.	Revenue	8"	433	1	2	772.81	1.79
64th st.	Hamlin ave.	West.	Revenue	8"	434	1	1	763.91	1.76
64th st.	Central Park ave.	Kedzie ave.	Circulation	8"	234	2	3	464.06	1.98
65th st.	Spaulding ave.	Kedzie ave.	Circulation	8"	727	2	5	1,202.09	1.65
65th st.	Central Park ave.	Kedzie ave.	Circulation	8"	874	2	4	1,474.53	1.69
65th st.	Kedzie ave.	Sacramento ave.	Circulation	8"	1225	5	2	2,324.02	1.90
66th st.	Spaulding ave.	Kedzie ave.	Circulation	8"	885	1	3	1,548.95	1.75
*67th st.	Feeder Main.		Feeder Main	24"	1388				
			Feeder Main	30"	5406	63	12	145,651.60	7.96
			Feeder Main	36"	11512				
70th pl.	Princeton ave.	C. R. I. & P. Ry.	Replacement	8"	282	1	1	658.97	2.34
77th st.	Racine ave.	Morgan st.	Circulation	8"	1286	2	0	2,679.92	2.08
Tripp ave.	60th st.	59th st.	Revenue	8"	341				
			Fire Protection	8"	323	1	2	1,023.99	1.54
Talman ave.	51st st.	50th st.	Deposit	8"	650	1	2	1,154.74	1.78
Tripp ave.	52nd st	53rd st.	Revenue	8"	670	1	1	983.74	1.47
Troy st.	55th st.	400 ft. South.	Revenue	8"	437	1	1	735.98	1.68
Trumbull ave.	58th st.	North.	Revenue	8"	600	0	1	908.39	1.52
39th pl.	Archer ave.	Kedzie ave.	Circulation	8"	75	1	2	186.38	2.49
39th st.	St. Louis ave	470 ft. West	Deposit	8"	536	0	1	812.43	1.52
Washtenaw ave.	57th st	59th st.	Revenue	8"	208				
			Fire Protection	8"	602	1	2	1,561.99	1.93
Wentworth ave.	130 ft. S. 74th st.	South.	Revenue	8"	231	0	1	406.43	1.76
Western ave.	57th st.	56th st.	Replacement	8"	516	1	1	1,217.86	2.36
Washtenaw ave.	51st st	50th st.	Deposit	8"	627	1	2	1,052.90	1.68

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PIPE LAID IN SEVENTH DISTRICT—Continued.

ON	LOCATION FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft.
			—SYSTEMS—						
*Albany ave	61st st	59th st	Revenue	8"	1270	2	3		
*California ave	61st st	59th st	Revenue	12"	1266	2	3		
*Francisco ave	61st st	59th st	Revenue	8"	1270	2	3		
*Fairfield ave	61st st	59th st	Revenue	8"	1270	2	3		
*Mozart st	61st st	59th st	Revenue	8"	1266	2	3		
*Richmond st	61st st	59th st	Revenue	8"	1269	2	3	$16,852.59	$1.22
*Sacramento ave	61st st	59th st	Revenue	8"	1269	2	3		
*Troy st	61st st	59th st	Revenue	8"	1270	2	3		
*Talman ave	61st st	59th st	Revenue	8"	1270	2	3		
*Washtenaw ave	61st st	59th st	Revenue	8"	1266	2	3		
*Whipple st	61st st	59th st	Revenue	8"	1270	2	3		
*Francisco ave	338 ft. North	53rd st	Revenue	8"	420	2	3	1,335.50	1.78
*53rd st	Richmond st	Francisco ave	Revenue	8"	330	0	0		
Hamlin ave	65th st	135 ft. N. 65th pl	Circulation	8"	196	0	0	1,441.18	1.63
65th st	Lawndale ave	Hamlin ave	Circulation	8"	690	1	2		
		Total feet laid by District			136974				
		Pipe laid for hydrant branches		6"	4625				
		Pipe laid by Special Assessment		6"	2029				
				8"	35871				
				12"	7097				
		Total feet laid in District			186596				

*Trench dug by excavator.

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PIPE LAID IN EIGHTH DISTRICT.

ON	LOCATION FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft.
Agatite ave	Lockwood ave	Westward	Revenue	8"	398	0	1	$ 520.86	$ 1.31
Addison st	Oak Park ave	Harlem ave	Feeder Main	12"	2904				
			Feeder Main	8"	439	6	9	6,731.32	2.00
*Addison st	Feeder Main		Feeder Main	36"	17899	33	0	163,202.93	9.18
*Addison st	Crossing	Milwaukee ave	Feeder Main	36"	120	0	0		
Addison st	Crossing	Crawford ave	Feeder Main	36"	96	0	0	3,983.55	18.44
Ainslie st	Irving ave	Oakley ave	Circulation	8"	24	2	0	43.00	1.80
Ainslie st	Albany ave	370 ft. East	Revenue	8"	203	0	1	276.50	1.36
Argyle st	Rockwell st	West	Circulation	8"	29				
			Revenue	8"	241	1	1	634.34	2.35
Argyle st	Spaulding ave	Spaulding ave	Circulation	8"	76	1	0	231.88	3.05
Argyle st	116 ft. W. Rockwell st	West	Revenue	8"	259	0	1	371.27	1.43
Argyle st	Claremont ave	Oakley ave	Circulation	8"	1857	7	1	2,052.02	1.10
Hoyne ave	Crossing	Argyle st	Circulation	6"	21				
Seeley ave	Crossing	Argyle st	Circulation	6"	26	0	0	86.31	1.66
Argyle st	Washtenaw ave	Rockwell st	Revenue	8"	465	0	1	661.60	1.85
Argyle st	Troy st	Troy st	Circulation	8"	93	1	0	199.47	2.14
Agatite st	Lockwood ave	Central ave	Revenue	8"	1427	2	6	1,835.98	1.28
Albany ave	Argyle st	Carmen ave	Deposit	8"	650	1	2	843.78	1.30
Avers ave	Addison st	Avondale ave	Circulation	8"	103				
			Revenue	8"	683	2	1	1,488.16	1.89
Artesian ave	Addison st	Waveland ave	Deposit	8"	394	0	2	613.47	1.56
Ashland ave	Germania pl	135 ft. North	Circulation	6"	160				
			Circulation	8"	90	1	4	630.63	2.52
Ashland ave	Albion ave	Schreiber ave	Revenue	8"	496	1	2	707.91	1.43
Ashland ave	300 ft. S. Albion ave	South	Revenue	6"	120	0	0	103.03	8.58
Ainslie st	840 ft. S. Sheridan rd	100 ft. East	Revenue	6"	105	0	0	118.49	1.13
Blaine pl	542 ft. W. Lincoln ave	75 ft. W. Lincoln ave	Revenue	8"	208	0	1	472.69	2.27
Belle Plaine ave	Laramie ave	Lockwood ave	Fire Protection	8"	276	0	1	498.50	1.80
Belle Plaine ave	Lockwood ave	West	Revenue	8"	229	0	0	271.95	1.19
Balmoral ave	Winthrop ave	West	Revenue	8"	153	0	1	314.83	2.06
Blaine pl	750 ft. W. of Lincoln ave	Rockwell st	Revenue	8"	414	1	2	729.29	1.76
Belle Plaine ave	Milwaukee ave	Cicero ave	Revenue	8"	577	2	1	831.62	1.44
Buena Terrace	Broadway	Hazel ave	Replacement	8"	516	1	2	858.58	1.66
Buena Terrace	Clarendon ave	East	Revenue	6"	148	0	1	327.43	2.21
Belle Plaine ave	Lockwood ave	Long ave	Revenue	8"	456	1	2	731.17	1.60
Belle Plaine ave	Cicero ave	Cicero ave	Circulation	8"	30	0	0	489.55	16.32
Bryn Mawr ave	Central ave	Parkside ave	Circulation	12"	312				
			Revenue	12"	20	1	0	719.10	2.17
Castlewood ter	950 ft. E. of Sheridan rd	1000 ft. East	Revenue	6"	50	0	1	199.55	3.99
Central ave	Irving Park blvd	Montrose ave	Circulation	8"	2650	4	5	4,395.34	1.66
Chase ave	Clark st	Sheridan rd	Replacement	8"	2827	1	6	5,777.57	2.00
Cicero ave	Addison st	Milwaukee ave	Circulation	6"	2447				
			Circulation	8"	14	9	0	4,123.92	1.69
*Cornelia ave	Narragansett ave	Melvina ave	Revenue	8"	1321	1	4	1,585.44	1.20
Cullom ave	Keeler ave	170 ft. East	Revenue	6"	212	0	0	273.33	1.29
Claremont ave	Ainslie st	Argyle st	Circulation	8"	495	1	1	697.32	1.41
Dakin st	Broadway	Sheridan Road	Replacement	8"	1160	1	4	1,964.83	1.69

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LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	COST Per Ft.
Dakin st	Normandy ave	Oak Park ave	Circulation	8″	64				
			Revenue	8″	575	1	2	$1,009.54	$1.58
*Drake ave	Bryn Mawr ave	Ardmore ave	Deposit	8″	1278	2	5	1,999.98	1.56
Eddy st	Lockwood ave	482 ft. West	Revenue	8″	482	0	1	668.37	1.39
Elston ave	Lawrence ave	Montrose ave	Circulation	8″	50				
			Circulation	6″	3858	6	3	5,182.78	1.34
*Eddy st	Narragansett ave	Melvina ave	Revenue	8″	1319	1	4	1,475.76	1.12
Foster ave	Lovejoy ave	East	Revenue	8″	268	1	1	522.32	1.95
Grace st	Nottingham ave	Neva ave	Circulation	8″	353				
			Revenue	8″	650	2	3	1,783.42	1.78
Grace st	Long ave	Lockwood ave	Circulation	8″	190				
			Revenue	8″	475	0	0	830.37	1.25
Giddings st	Hamlin ave	East	Revenue	8″	485	1	1	763.40	1.57
Giddings st	227 ft. W. of Lawler ave.	117 ft. West	Revenue	6″	108	0	0	119.37	1.10
Germania pl	Hermitage ave	Paulina st	Circulation	8″	317	1	0	395.87	1.25
Giddings st	Major ave	Central ave	Revenue	8″	620	0	2	738.22	1.19
Hamlin ave	Addison st	Cornelia st	Circulation	8″	559	1	0	718.34	1.28
Hermitage ave	Birchwood ave	Germania pl	Circulation	8″	492	1	2	808.29	1.64
Haskins st	Birchwood ave	Hermitage ave	Circulation	8″	504	1	1	676.35	1.34
Howard ave	Paulina st	C. M. & St. P. Ry	Circulation	6″	27				
			Circulation	8″	101	5	0	594.93	4.34
Hollywood ave	Broadway	Broadway	Circulation	8″	36	0	0	82.89	2.30
Irving Park blvd	Troy st	Albany ave	Revenue	8″	186	0	0	307.48	1.65
Irving Park blvd	Kedzie ave	Sawyer ave	Revenue	8″	264	0	0	423.22	1.60
Irving ave	Argyle st	Argyle st	Circulation	8″	81	0	0	204.01	2.52
Irving Park blvd	Broadway	280 ft. E. of Frontier ave	Circulation	6″	243	0	1	346.32	1.42
Janssen ave	Argyle st	Ainslie st	Circulation	6″	17	0	0	146.20	8.60
Kolmar ave	Elston ave	233 ft. N. East	Revenue	8″	234	1	0	343.69	1.47
*Kildare ave	Lawrence ave	Argyle st	Deposit	8″	1285	2	4	1,571.17	1.25
*Kimball ave	Bryn Mawr ave	Ardmore ave	Deposit	8″	1280	2	4	1,602.80	1.26
Karlov ave	Eastwood ave	North	Circulation	6″	4				
			Circulation	8″	570	0	1	820.44	1.44
Kenmore ave	Balmoral ave	Bryn Mawr ave	Circulation	8″	142				
			Replacement	8″	1326	8	15	3,380.03	2.30
			Circulation	12″	24				
Kilbourn ave	Roscoe st	Schoo lst	Revenue	8″	986	1	3	1,370.84	1.39
Kewanee ave	Kelso ave	Leland ave	Circulation	6″	106				
			Circulation	8″	187	0	1	442.51	1.51
Kedvale ave	Kennicott ave	Kasson ave	Circulation	8″	98				
			Revenue	8″	366	2	1	789.79	1.70
Kasson ave	Kiona ave	Lowell ave	Circulation	8″	598	1	1	828.36	1.39
Knox ave	Addison st	Addison st	Circulation	8″	90	1	0	180.38	2.00
Leland ave	Drover st	Beacon st	Revenue	6″	236	0	0	257.24	1.09
Laramie ave	Milwaukee ave	Leland ave	Circulation	8″	448				
			Revenue	8″	100	1	1	706.79	1.29
Lafayette ave	Sheridan rd	1075 ft. East	Circulation	6″	28	0	1	25.32	.90
*Lavergne ave	Irving Park blvd	Belle Plaine ave	Revenue	8″	600	1	3	1,125.60	1.88
*Lavergne ave	Irving Park blvd	South	Revenue	8″	96	0	0	180.48	1.88

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PIPE LAID IN EIGHTH DISTRICT—Continued.

LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	Per Ft.
Lawndale ave	Wilson ave	South	Revenue	8"	328	1	1	$ 595.44	$1.81
Long ave	Montrose ave	Montrose ave	Circulation	8"	70	0	0	225.54	3.22
Long ave	Leland ave	Wilson ave	Circulation	8"	358	2	1	550.61	1.54
Lincoln st	Sunnyside ave	Lawrence ave	Replacement	8"	1974	6	6	3,579.98	1.81
Lawrence ave	Milwaukee ave	Central ave	Circulation	8"	30	0	0	72.04	2.40
			Circulation	12"	1847	5	2	3,645.07	1.97
Lamon ave	Hutchinson st	Hutchinson st	Circulation	8"	73	0	0	150.01	2.05
Linder ave	Addison st	Waveland ave	Deposit	8"	719	1	1	1,107.25	1.54
Loyola ave	Clark st	E. Ravenswood ave	Revenue	8"	954	1	3	1,409.88	1.48
Lawndale ave	300 ft. S. of Wilson ave	Sunnyside ave	Revenue	8"	308	0	1	472.80	1.53
Lawler ave	Wilson ave	205 ft. North	Revenue	8"	203	1	0	278.94	1.38
Laramie ave	Gunnison st	Argyle st	Circulation	6"	46				
			Circulation	12"	1061	2	0	2,091.60	1.97
Lavergne ave	Gunnison st	Argyle st	Circulation	8"	1017	7	0	1,242.12	1.22
Laramie ave	Giddings st	Leland ave	Revenue	8"	279	0	1	498.67	1.79
Luna ave	Giddings st	Lawrence ave	Circulation	8"	176				
			Revenue	8"	300	1	1	731.62	1.54
Marshfield ave	Germania pl	Birchwood ave	Circulation	8"	764	1	3	1,058.55	1.38
*Monticello ave	Roscoe st	Cornelia ave	Deposit	8"	700	1	2	1,058.08	1.51
Menard ave	Irving Park blvd	Irving Park blvd	Circulation	8"	29	0	0	102.24	3.50
Montrose ave	510 ft. E. of Clarendon av	East	Revenue	6"	166	0	0	222.53	1.34
*Newport ave	Narragansett ave	Melvina ave	Revenue	8"	1321	1	4	1,899.02	1.44
Natoma ave	Addison st	Cornelia ave	Revenue	8"	642	1	2	927.97	1.44
Nordica ave	Addison st	Waveland ave	Revenue	8"	642	1	2	819.19	1.28
Nottingham ave	Addison st	441 ft. North	Revenue	8"	496	1	1	640.40	1.29
*Newcastle	Roscoe st	Grace st	Revenue	8"	2591	1	4	3,464.14	1.34
*Newport ave	Laramie ave	Long ave	Revenue	8"	1285	2	4	1,681.86	1.31
Nagle ave	161 ft. N. N. L. School st.	Roscoe st	Revenue	8"	396	0	1	487.11	1.23
Nora ave	Grace st	Waveland ave	Revenue	8"	728	1	2	1,448.83	1.99
Norwood Park ave	Foster ave	Parkside ave	Revenue	8"	665	0	2	873.82	1.31
Oakley ave	Berteau ave	Cullom ave	Revenue	6"	360	1	0	379.33	1.05
Paulina st	Birchwood ave	Joymore ave	Circulation	8"	744	1	3	1,137.46	1.53
*Pensacola ave	Laramie ave	Longwood ave	Revenue	8"	598	1	2	861.60	1.44
Parkside ave	Belle Plaine ave	North	Revenue	8"	252	0	0	310.32	1.23
Pratt ave	Sheridan rd	Lake Michigan	Fire Protection	8"	708	0	2	1,161.49	1.64
Parkside ave	Bryn Mawr ave	Seminole ave	Revenue	8"	634	1	4	1,101.50	1.74
Patterson ave	Narragansett ave	East	Revenue	8"	511	1	1	747.72	1.46
Pingree ave	Estes ave	Estes ave	Circulation	8"	91	1	0	168.66	1.85
Ridge ave	Kenilworth ave	Pratt ave	Circulation	6"	23	0	0		
Rodgers ave	Ridge ave	Robey st	Circulation	12"	3667	11	8	9,070.95	2.20
Robey st	Kenilworth ave	Rodgers ave	Circulation	8"	163				
			Circulation	12"	84	1	0	736.90	1.65
			Revenue	8"	240				
St. Louis ave	500 ft. S. of Foster ave	800 ft. S. of Foster ave	Revenue	8"	325	0	1	406.16	1.25
St. Louis ave	Foster ave	500 ft. S. of Foster ave	Deposit	8"	509	1	2	744.07	1.46
Seminary ave	Waveland ave	Waveland ave	Replacement	6"	72	0	0	126.76	1.76
*St. Louis ave	Bryn Mawr ave	Ardmore ave	Deposit	8"	1281	2	4	1,491.34	1.16
Slocum st	260 ft. W.L. Central ave	233 ft. W. W.L. Central ave	Revenue	8"	72	0	0	94.83	1.32

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LOCATION ON	FROM	TO	CHARGE	Size	Feet	No. of Valves	No. of Hydrants	COST Total	Per Ft.
Sawyer ave	Carmen ave	Carmen ave	Circulation	8"	96	0	0	$ 180.53	$1.88
*Tripp ave	Lawrence ave	Argyle st	Deposit	8"	1284	2	4	1,500.44	1.25
*Trumbull ave	Bryn Mawr ave	Ardmore ave	Deposit	8"	1283	2	5	1,550.84	1.21
Windsor ave	Milwaukee ave	Leclaire ave	Revenue	8"	804	1	3	1,085.01	1.35
*Waveland ave	Lockwood ave	Linder ave	Circulation	8"	2340	4	5	2,729.50	1.17
*Wilson ave	Central ave	West	Circulation	8"	29				
			Circulation	12"	133	1	1	866.37	1.27
			Revenue	8"	518				
Western ave	Chase ave	Howard st	Circulation	8"	1447	0	1	1,699.53	1.18
Wilson ave	Linder ave	Central ave	Deposit	8"	671	1	2	1,000.35	1.49
Wilson ave	Lincoln st	205 ft. West	Circulation	6"	4				
			Circulation	8"	255	2	0	403.68	1.58
Wilson ave	Leclaire ave	Lavergne ave	Circulation	8"	596	1	2	886.91	1.49
Wilson ave	Long ave	East	Deposit	8"	267	1	1	549.94	2.06
Western ave	735 ft. South	Bryn Mawr ave	Circulation	8"	30	0	0	45.95	1.53
Western ave	Foster ave	Lincoln ave	Circulation	6"	2383	4	0		
Western ave	Lincoln ave	Foster ave	Circulation	12"	2383	5	2		
Winnemac ave	and Western ave		Circulation	6"	28	0	0		
			Replacement	6"	48	0	0	7,482.39	1.57
Winnemac ave	Lincoln ave	Rockwell st	Revenue	8"	129	0	1	260.67	2.02
Washtenaw ave	Blaine pl	Ainslie st	Revenue	8"	407	0	1	608.93	1.50
			—SYSTEMS—						
Addison st	Elston ave	Drake ave	Circulation	12"	1876	2	4		
Christiana ave	Addison st	94 ft. North	Circulation	8"	117	1	0	4,546.92	2.42
Kimball ave	Addison st	Addison st	Circulation	8"	72	0	0		
Ainslie st	Rockwell st	Talman ave	Revenue	8"	315	1	1		
Talman ave	Blaine pl	Ainslie st	Revenue	8"	372	0	1	1,048.55	1.53
Bryn Mawr ave	Central Park ave	Kedzie ave	Deposit	8"	24	0	0		
			Deposit	12"	2647	5	3	7,218.75	1.81
Central Park ave	Ardmore ave	Bryn Mawr ave	Deposit	12"	1330	2	4		
Keating ave	Winnemac ave	Foster ave	Deposit	8"	793	1	2		
Winnemac ave	Elston ave	Keating ave	Deposit	8"	257	1	1	1,424.62	1.33
Central ave	Dakin st	Byron st	Revenue	8"	330	0	1		
Byron st	Central ave	140 ft. West	Revenue	8"	163	0	0	706.39	1.43
*Addison st	Cicero ave	Maynard ave	Feeder Main						
*Maynard ave	Addison st	Grace st	Feeder Main	12"	9213	9	0	26,184.66	1.98
*Irving Park blvd	Maynard ave	66th ave	Feeder Main	8"	4018	7	30		
*Laramie ave	Irving Park ave	Belmont ave	Fire Protective	12"	5193	5	5		
*Henderson st	Laramie ave	90 ft. East	Fire Protection	8"	133	8	0	10,152.62	1.89
*Warwick ave	23 ft. E.W.L. Laramie ave.	Laramie ave	Fire Protection	8"	40	2	0		
			Total feet laid by District		138829				
			Pipe laid for hydrant branches	6"	3301				
			Pipe laid by Special Assessment	6"	200				
				8"	13418				
			Total feet laid in District		155748				

*Trench dug by excavator.

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CORPORATION FERRULES INSTALLED AND LARGE CONNECTIONS MADE DURING YEAR 1915

	¾ in.	1 in.	1½ in.	2 in.	3 in.	4 in.	6 in.	8 in.	12 in.	16 in.	Total
Scattering	3,859	154	248	209	29	78	38	8	8	1	4,632
Street Improvement by Special Assessment	7,400	.....	.....	.....	....	....	....	....	....	....	7,400
Street Improvement by Private Contract	2,976	.....	.....	.....	....	....	....	....	....	....	2,976
Retapping for Replacing Mains	3,214	36	46	29	....	....	....	....	....	....	3,325
Retapping for Repairing Services	165	7	1	3	....	....	....	....	....	....	176
Pitometer and Tests Taps	.....	238	.....	.....	....	....	....	....	....	....	238
Drinking Fountains	35	.....	.....	.....	....	....	....	....	....	....	35
For Use of Park Commissioners	4	23	14	.....	....	....	....	....	....	....	41
Council Orders	7	.....	1	4	....	5	1	1	....	....	19
Miscellaneous	3	14	5	13	....	....	....	....	....	....	35
Totals	17,663	472	315	258	29	83	39	9	8	1	18,877

WATER SERVICE PIPES INSTALLED DURING YEAR 1915

	¾ in.	1 in.	1½ in.	2 in.	3 in.	4 in.	6 in.	8 in.	12 in.	16 in.	Total
Installed at cost of City*	35	24	6	17	....	5	1	1	....	....	89
Installed at cost of Owner	....	4,013	248	209	29	78	38	8	8	1	4,632
Installed by Private Contract	....	2,976	.....	.....	....	.....	....	....	....	....	2,976
Installed by Special Assessment	....	7,400	.....	.....	....	.....	....	....	....	....	7,400
Totals	35	14,413	254	226	29	83	39	9	8	1	15,097

*Installed by Council Order for religious and charitable institutions, public fountains, etc.

COMPLAINTS RECEIVED BY THE WATER PIPE EXTENSION DIVISION DURING 1915

	DISTRICTS								
	1st	2nd	3rd	4th	5th	6th	7th	8th	Total
Leaks: Main	255	53	176	105	47	243	451	67	1,397
Leaks: Service	142	185	177	303	53	130	348	172	1,510
Leaks: Hydrants	149	127	124	155	59	157	1061	76	1,908
Hydrants out of order	208	79	311	184	30	360	516	74	1,762
Taps shut off: Abandoned	79	6	15	19	3	.....	88	12	222
Taps shut off: Vacant	22	21	21	20	7	2	21	10	124
Miscellaneous	750	370	283	537	131	99	380	195	2,745
Valve basins repaired	9	5	4	3	3	4	3	2	33
Valve basin covers put on	25	11	6	9	3	4	12	2	72
Totals	1,639	857	1,117	1,335	336	999	2,880	610	9,773

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TOTAL NUMBER AND SIZE OF VALVES IN USE AT CLOSE OF 1915

DISTRICTS	4-inch	6-inch	8-inch	10-inch	12-inch	14-inch	16-inch	18-inch	20-inch	24-inch	30-inch	36-inch	42-inch	48-inch	Total
First	127	910	982	6	254	.....	64	.....	.....	25	2	34	.....	1	2,405
Second	101	1,364	733	1	196	.....	24	.....	.....	18	5	31	1	.....	2,474
Third	56	1,496	873	2	158	.....	43	.....	1	50	4	25	.....	.....	2,708
Fourth	95	2,384	1,419	.....	403	.....	50	.....	.....	63	9	34	1	.....	4,458
Fifth	41	1,065	438	22	156	3	103	1	4	18	13	34	.....	.....	1,898
Sixth	11	798	593	.....	139	.....	29	.....	.....	35	7	17	.....	.....	1,629
*Seventh	69	2,550	1,736	9	257	23	115	1	15	74	8	42	2	.....	4,901
*Eighth	46	1,824	1,313	.....	231	.....	25	.....	9	47	7	23	.....	.....	3,525
Totals	546	12,391	8,087	40	1,794	26	453	2	29	330	55	240	4	1	23,998

*Includes valves acquired by Annexation—
Village of Clearing 36— 6 in. Valves.
" " " 22— 8 " "
" " " 2—10

Section of Evanston 14—6 in. Valves
" " " 5—4 " "

STOP VALVES PUT IN DURING THE YEAR 1915, INCLUDING THOSE USED TO REPLACE VALVES OF DIFFERENT SIZE

DISTRICTS	4-inch	6-inch	8-inch	10-inch	12-inch	16-inch	20-inch	24-inch	30-inch	36-inch	Total
First	1	28	52	.....	22	5	.....	.....	.....	2	110
Second	5	19	31	.....	1	.....	.....	.....	.....	.....	56
Third	3	41	51	.....	13	.....	.....	.....	.....	1	109
Fourth	4	30	59	.....	11	.....	.....	.....	.....	1	105
Fifth	.....	20	36	.....	16	1	.....	6	6	5	90
Sixth	.....	40	93	.....	22	4	.....	9	.....	.....	168
Seventh	1	101	199	.....	41	10	1	8	.....	6	367
Eighth	.....	78	144	.....	60	8	.....	8	1	.....	299
Totals	14	357	665	.....	186	28	1	31	7	15	1,304

Total number of valves replaced 80.
" " " abandoned 21.

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TOTAL NUMBER OF FIRE HYDRANTS AT CLOSE OF 1915

DISTRICTS	2½-inch Single	2½-inch Double	3½-inch Double	4-inch Double	TOTAL

Total Number of Hydrants Replaced 231.
" " " Abandoned 20.

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RE

WHY LAID

Paid 6 cents per foot reve	
Laid on deposit.	
Laid by special assessme	
Laid to replace mains of s	
Laid for fire protection...	
Laid for circulation	
Laid for feeder mains .	
Laid for hydrant branches	
Totals.....	

RECA

DISTRICTS

First.....	
Second.....	
Third.....	
Fourth	
Fifth.....	
Sixth.....	
Seventh.....	
Eighth.....	
Totals.....	

CHES,

	36 in.	Total
...	.....	112,617
...	.....	33,546
...	.....	102,486
...	.....	35,463
...	.....	23,156
...	.....	151,744
	44,340	128,887
....	.....	14,569
	44,340	617,468

BRANCHES

	36 in.	Total
....	.....	28,488
....	.....	21,096
....	.....	21,823
....	.....	56,619
....	14,713	36,194
....	.....	110,904
	11,512	186,596
....	18,115	155,748
	44,340	617,468

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TOTAL NUMBER OF FIRE HYDRANTS AT CLOSE OF 1915

DISTRICTS	2½-inch Single	2½-inch Double	3½-inch Double	4-inch Double	TOTAL

Abandoned 20.

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RECAPITULATION OF PIPE LAID DURING 1915, INCLUDING HYDRANT BRANCHES, DIVIDED TO SHOW WHY IT WAS LAID

WHY LAID	DIAMETER OF PIPE IN INCHES							
	6 in.	8 in.	12 in.	16 in.	24 in.	30 in.	36 in.	Total
Paid 6 cents per foot revenue	8,204	102,650	1,763					112,617
Laid on deposit	1,392	33,045	4,590	519				39,546
Laid by special assessment	3,113	88,679	10,694					102,486
Laid to replace mains of smaller size	173	32,607	2,683					35,463
Laid for fire protection	634	22,649	9,873					33,156
Laid for circulation	28,855	84,849	33,730	4,310				151,744
Laid for feeder mains		4,638	19,312	12,458	42,703	5,406	44,340	128,857
Laid for hydrant branches	14,569							14,569
Totals	56,940	368,117	82,675	17,287	42,703	5,406	44,340	617,468

RECAPITULATION OF PIPE LAID DURING 1915, INCLUDING HYDRANT BRANCHES

DISTRICTS	DIAMETER OF PIPE IN INCHES							
	6 in.	8 in.	12 in.	16 in.	24 in.	30 in.	36 in.	Total
First	2,773	17,901	3,705	4,109				28,488
Second	754	20,178	164					21,096
Third	2,537	16,162	3,134					21,833
Fourth	7,634	40,562	8,423					56,619
Fifth	2,305	8,516			10,760		14,713	36,194
Sixth	6,610	67,887	11,816	12	24,579			110,904
Seventh	19,890	106,519	22,739	13,166	7,364	5,406	11,512	186,596
Eighth	14,547	90,392	32,694				18,115	155,748
Totals	56,940	368,117	82,675	17,287	42,703	5,406	44,340	617,468

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TABLE SHOWING AMOUNT OF WATER PIPE IN THE CITY OF CHICAGO AT THE CLOSE OF 1915

Diameter in Inches	1914	1915				
	Amount in Use in Feet	Amount Taken Up	Amount Laid in Feet	By Annexation	Grand Total, Feet	Grand Total, Miles
48	22,705	.....	.....	.....	22,705	4.30
42	6,423	.....	.....	.....	6,423	1.21
36	399,254	.....	44,340	.....	443,594	84.01
30	102,860	.....	5,406	.....	108,266	20.51
24	468,611	.....	42,703	.....	511,314	96.84
20	48,710	.....	.....	.....	48,710	9.23
18	840	.....	.....	.....	840	0.16
16	383,788	.....	17,287	.....	401,075	75.96
14	28,615	.....	.....	.....	28,615	5.42
12	999,105	45	82,675	.....	1,081,735	204.88
10	39,044	.....	.....	1,413	40,457	7.66
8	3,860,360	3,903	368,117	9,268	4,233,842	801.86
6	6,547,367	3,668	56,940	29,534	6,630,173	1,255.72
4	417,237	32,120	.....	.....	385,117	72.94
3	2,360	.....	.....	.....	2,360	0.44
Total in feet	13,327,279	39,736	617,468	40,215	13,945,226	.....
Total in miles	2,524.11	7.52	116.94	7.61	.....	2,641.14

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DESIGNING DIVISION

Myron B. Reynolds, Engineer of Waterworks Design.

The following is a resume of the work done in the Designing Division for the year 1915:

LAKE VIEW PUMPING STATION.

Plan and estimate was made of a seawall protecting the easterly and northerly limits of the grounds.

A plan was made of the arrangements for flower plots, trees, drinking fountains and other lawn improvements.

Plans were made for miscellaneous work about the building and boilers, such as stoker gear casing, service pump arrangement, enclosure of coal receiving hopper, elevator, heating system for coal storage room, and specifications for the removal of the temporary boiler house, with boilers, appurtenances, etc., to the ground line.

CHICAGO AVENUE PUMPING STATION.

Plans were made for structural steel platforms for shafts J, K and M.

Plan and specifications were made for a plant to treat the water pumped by this station with liquid chlorine.

First general plans have been made for a new boiler plant.

22D STREET PUMPING STATION.

Plans were made for the automatic regulation of draft through boilers.

Plans and specifications were made for a plant to treat the water pumped at this station with liquid chlorine.

68TH STREET PUMPING STATION.

Plans and specifications were completed for two 30-million gallon, steam turbine driven, gear connected, centrifugal pumps, together with necessary foundation plans and building changes, due to the installation.

Power piping plans will be completed early in 1916.

HARRISON STREET PUMPING STATION.

A fish screen was designed and plan made for the suction pipe.

ROSELAND PUMPING STATION.

Miscellaneous plans and specifications were completed for improvements of this station as follows: Enlargement of the east sump, bypass to feed water heater, boiler and engine room lighting systems, boiler feed pumps, gravity oiling system for main pumping engines, and a connection from the boilers to the swimming pool of the Small Parks Commission.

CENTRAL PARK AVENUE PUMPING STATION.

Plans, specifications and estimates were made for five 500 H. P. boilers, together with stokers, fans, heaters, meters and all appurtenances, and for a new power piping system. Foundation plans were completed for the above installation.

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Plans for new coal bunkers, coal handling equipment and building changes will be finished early in 1916.

SPRINGFIELD AVENUE PUMPING STATION.

First general plans have been made for a new boiler plant.

MAYFAIR PUMPING STATION.

Plans and specifications were finished for three 25-million gallon and two 17½-million gallon vertical triple expansion engines.

Plans and specifications for six 500-horsepower water tube boilers, with appurtenances, were finished, and the plans for power piping and coal handling equipment will be finished early in 1916.

Plans were completed for the suction tunnel, chimney, and for the foundations of the engine room, boiler room and coal storage room.

The structural steel plans for the superstructure are sufficiently advanced that bids can be invited during January, 1916.

This office has worked in conjuction with the city architect's office in the making of the architectural plans which are, at the end of 1915, well worked up in detail.

JEFFERSON PARK PUMPING STATION.

Plans and specifications were completed and contract let for two 2-million gallon, 75-horsepower motor driven centrifugal pumps.

ROGERS PARK PUMPING STATION.

Plans and specifications were completed and contract let for the installation of two 50-horsepower motor driven air compressors for operating the Shone ejector system of sewage disposal. The motors operate on a 3-phase, 60-cycle, 230-volt, alternating current, and the compressors have a capacity of 375 cubic feet of free air per minute compressed to 40 pounds.

PULLMAN SEWAGE PUMPING STATION.

Plans and specifications were completed and contract let for two 3-million gallon motor driven centrifugal pumps for handling sewage.

STONY ISLAND AVENUE PUMPING STATION.

Plans and specifications were completed and contract let for stoker engine and fan to operate the Keeler cross drum boiler installed in 1915.

MARSHALL BOULEVARD MUNICIPAL PLANT.

The following list gives the numbers and corresponding name of the buildings which comprise the Marshall Boulevard Municipal Plant at the end of 1915: 1, foundry; 2, machine shop; 3, blacksmith shop; 4, warehouse; 5, carpenter, paint and pattern shop, which includes also sheet metal shop, auto body shop and pattern storage; 6, administration building, which includes also the substation, laboratory and lunch room; 7, power house, located within the House of Correction grounds; 8, store house; 9, garage.

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BUILDING NO. 1, FOUNDRY.

Plans and estimates were made for roofing and enclosing the area spanned by the south crane, thus enlarging the molding floor space.

Plan was made for struts to support the cupola, and for jib cranes.

BUILDING NO. 2, MACHINE SHOP.

Plans and specifications were made for the heating and ventilating system; plans made of the machine tool layouts, and for the extension of one bay on the northwest corner of the building.

BUILDING NO. 3, BLACKSMITH SHOP.

Plan was made for the foundation of the 75-pound power hammer.

BUILDING NO. 4, WAREHOUSE.

Plan was made for the rearrangement of the offices on the first floor. Specifications for a composition roof were drawn up and contract let.

BUILDING NO. 5, CARPENTER, PAINT AND PATTERN SHOPS.

Studies were made of the costs of different types of buildings, and complete designs were made of a two-way flat slab construction.

Plans were completed for heating, lighting, sprinkling systems and machine tool layout.

The City Architect made the architectural and plumbing plans.

BUILDING NO. 6, ADMINISTRATION BUILDING.

Plans were completed for the foundations and structural steel for this building.

The plans for heating and ventilating and also the architectural plans will be completed early in 1916.

BUILDING NO. 7, POWER HOUSE.

The general layout of the turbo-generator, boiler and coal receiving room has been made. Specifications were completed for the electrical generating equipment, and the boilers and their appurtenances. The principal equipment entering into this plant is: Two 35 K. W. Exciters, one motor driven, one turbine driven; one 200 K. W. Turbo-Generator; two 500 K. W. Turbo-Generators; four 500-horsepower Water Tube Boilers; two Feed Water Heaters; two Boiler Feed Pumps.

BUILDING NO. 8, STORE HOUSE.

The structural frame work of this building was formerly the temporary boiler house at the Lake View Pumping Station. Foundation plans were made for its present location.

BUILDING NO. 9, GARAGE.

Foundation, structural, heating, lighting, plumbing and architectural plans were completed for the garage. In the east end of this building a basement has been provided to accommodate tanks for oil storage, on account of the present policy of the city to buy lubricating oils, gasoline, etc., by carload lots.

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IMPROVEMENT OF GROUNDS.

Plans were completed for pavements, ornamental street lighting posts, a retaining wall on the line of the anchor piles of the dock and supporting a railroad track, and an iron fence with concrete posts around property. Comparative estimates were made of a wooden truss and a suspension foot bridge for crossing the river at 31st street.

TUNNELS AND CRIBS.

Plans were completed for an eight-foot connecting tunnel between 68th Street Pumping Station and the Southwest Land Tunnel, together with six-foot gate and ten-foot shafts.

Plans were completed for a water pipe tunnel under the Calumet river at Torrence avenue.

Plan was made to close up with a concrete bulkhead the shaft over the Four Mile Tunnel at the government breakwater.

The condition of the tops of all shafts over water tunnels were tabulated for permanent record.

TESTS.

Men were furnished for tests as follows:

New boilers at Roseland Pumping Station.

New boilers at 22d Street Pumping Station.

New centrifugal pump at Central Park Avenue Pumping Station.

MISCELLANEOUS.

Tentative plans and estimates commenced late in December, 1914, of the contemplated subway under the north branch of the river at North Ashland avenue were completed early in January, 1915.

Plans on file in this office of utilities under Canal street were brought up to date and plans were made for a utilities gallery in Canal street between Washington and Madison streets.

Plans of the Chicago City Railway Company for the lowering of the west end of Van Buren Street Traffic Tunnel were checked.

Coal specifications were revised and made ready for advertising for contracts for 1915 and 1916.

Design was made of a four-inch double gate hydrant.

Drawings were made of a 6, 8, 12, 16, 24, 30 and 36-inch gate valve.

DESIGN AND TEST OF HYDRANT.

Objects of design:

First: To reduce the loss of head due to friction when delivering water.

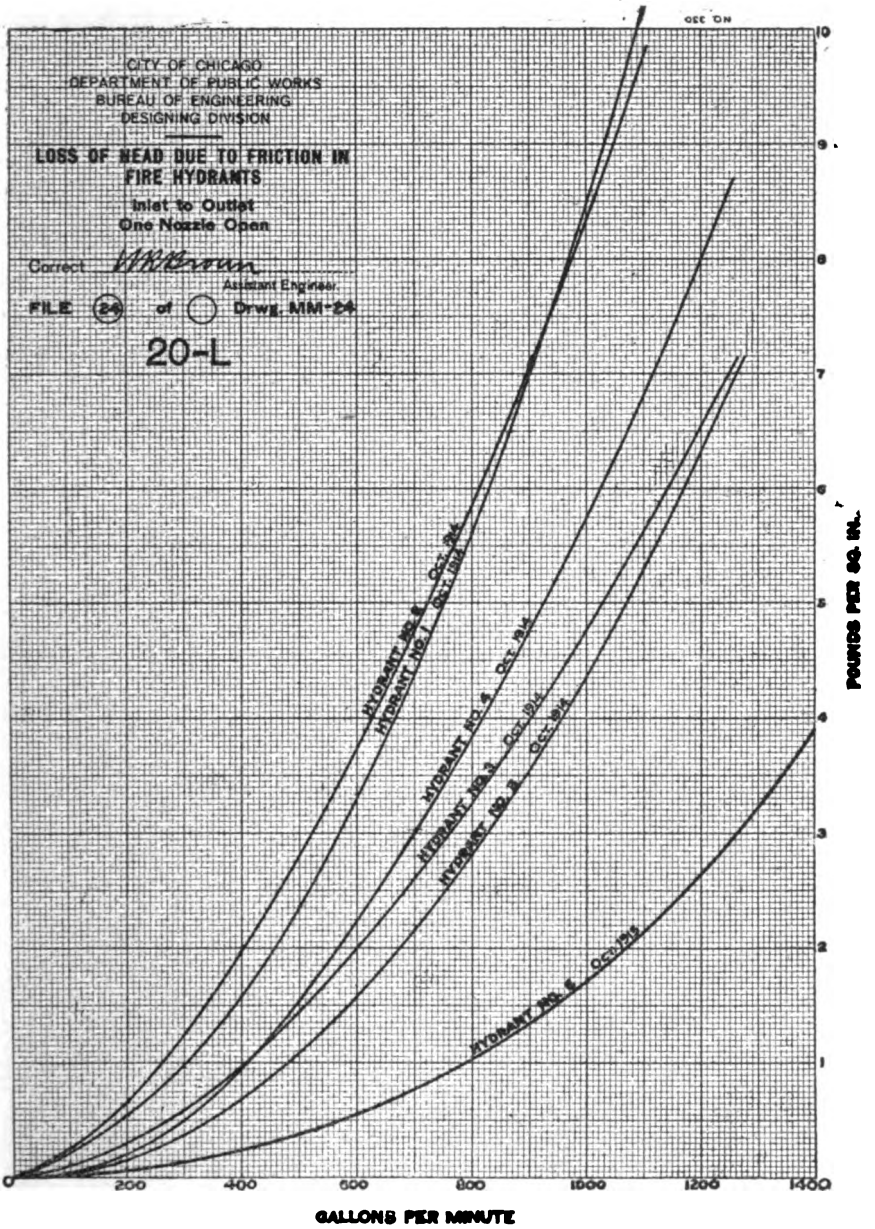
Second: To reduce the amount of wasted water and to secure reliable operation at all times for fire purposes.

Third: To reduce the cost of maintenance.

Fourth: To obtain the above objects at lowest cost of manufacture.

To accomplish the first object fire hydrants of different makes were tested for lost head through different parts of the hydrant, and from studies of these tests improvements were made in the design as shown by the results of tests on pages 120 a and 120 b accompanying this report. Curve No. 6 represents the friction loss in the hydrant designed by the city.

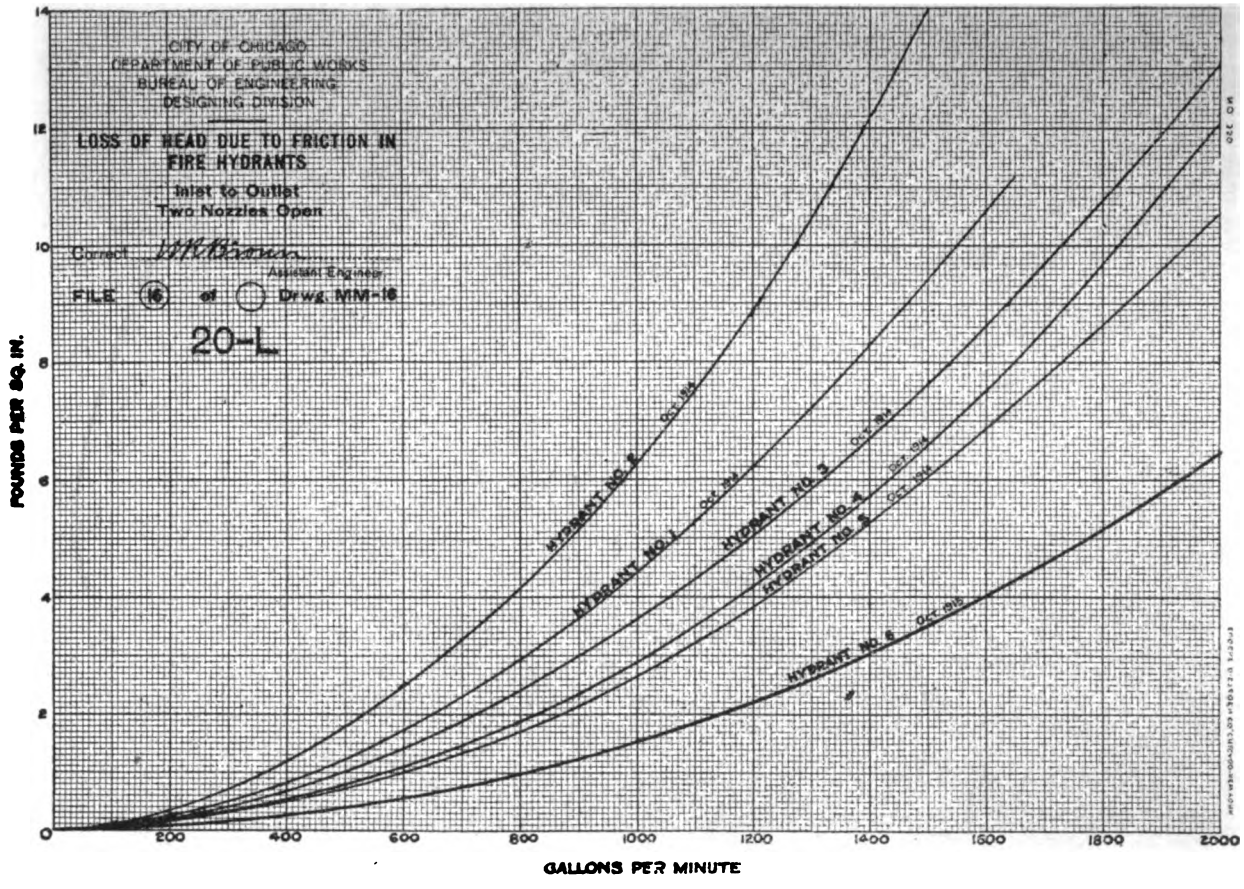
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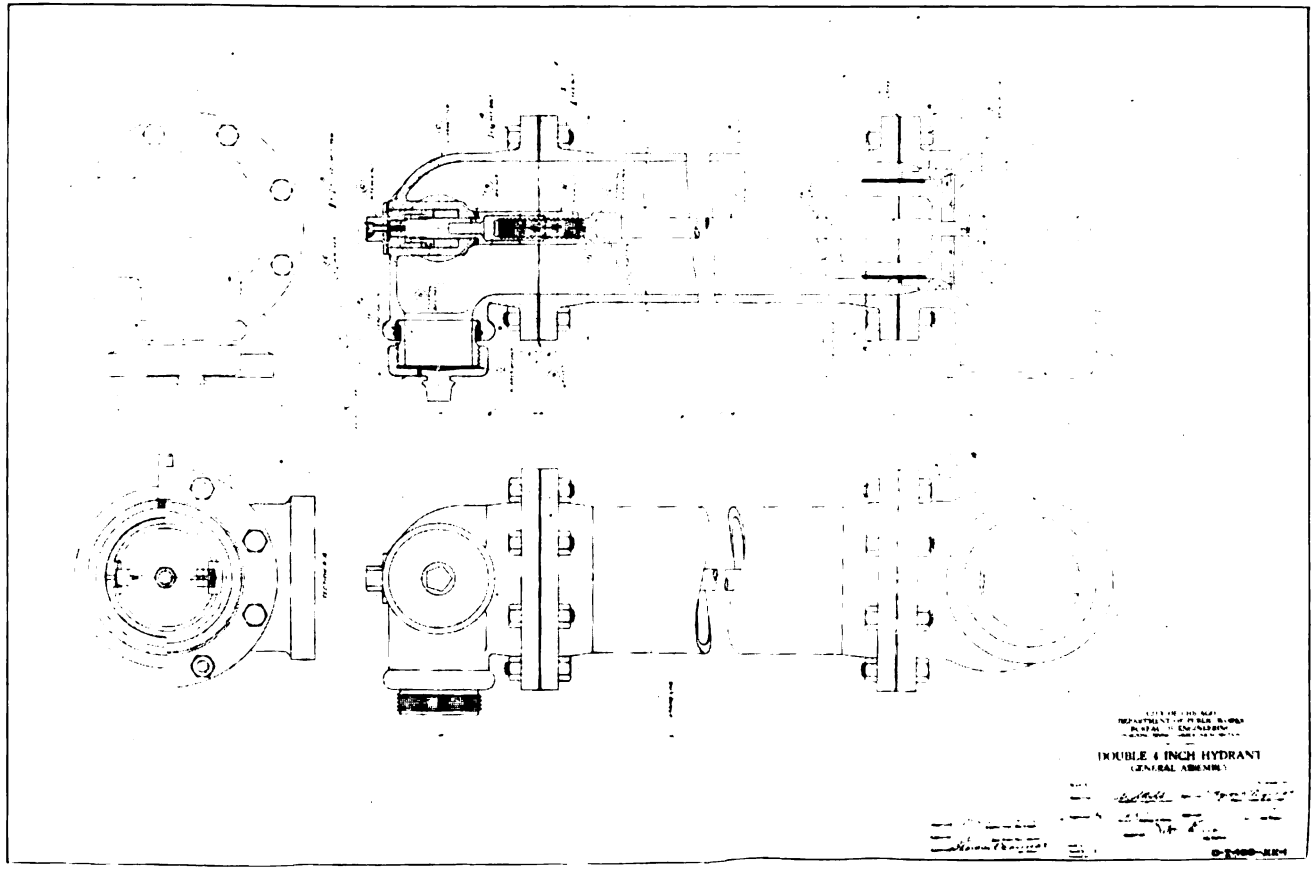


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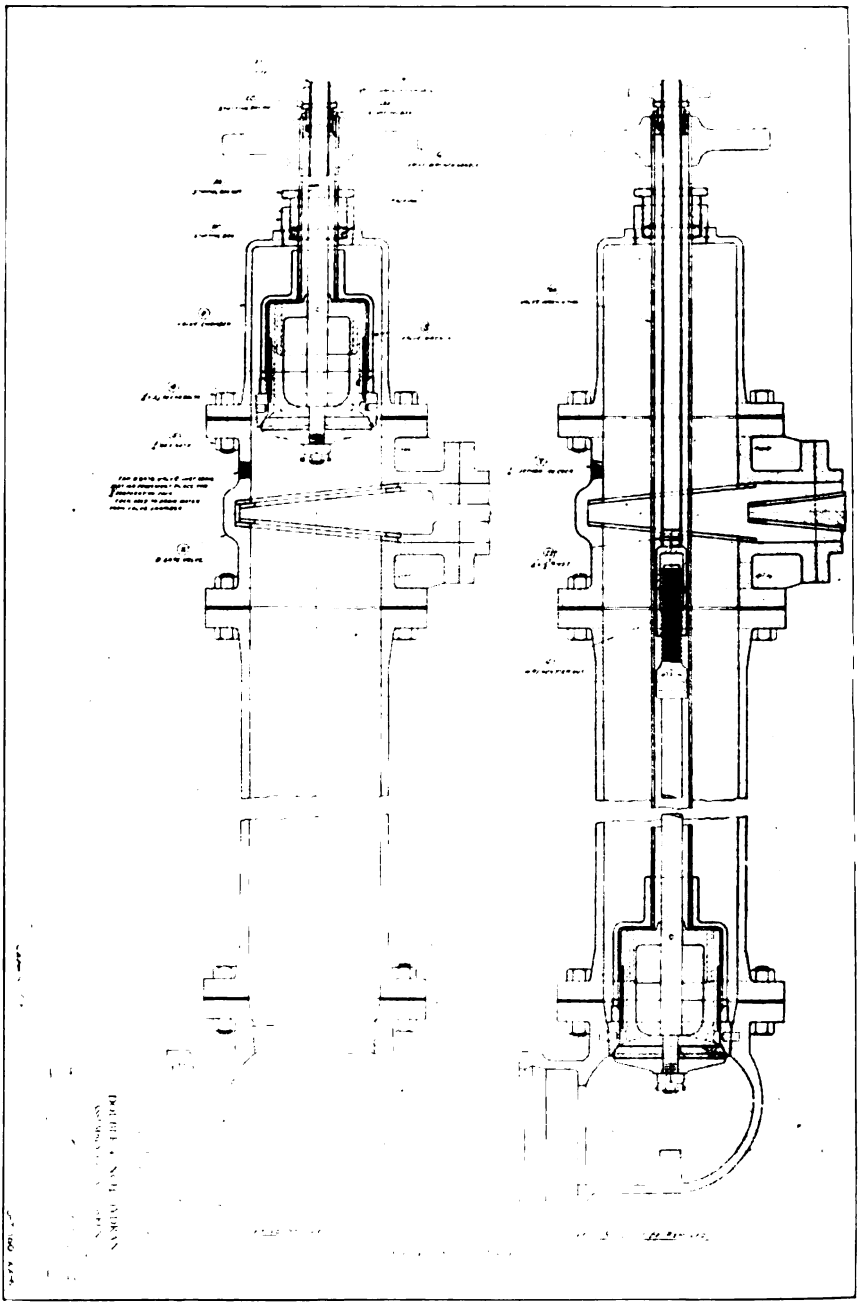

CITY OF CHICAGO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
DESIGNING DIVISION
LOSS OF HEAD DUE TO FRICTION IN FIRE HYDRANTS
Inlet to Outlet
Two Nozzles Open
Correct
Assistant Engineer
FILE 16 of Drwg. MM-18
20-L
POUNDS PER SQ. IN.
GALLONS PER MINUTE
HYDRANT NO. 5
HYDRANT NO. 1
HYDRANT NO. 3
HYDRANT NO. 4
HYDRANT NO. 2
HYDRANT NO. 6
0
2
4
6
8
10
12
14
200
400
600
800
1000
1200
1400
1600
1800
2000



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But little change was made in the drain valve from that used by five or six manufacturers, which scheme is the use of a flat leather surface sliding over a round part. To secure reliability of operation the number of parts were materially reduced. The hydrant was also constructed without self-contained nozzles. Separate, light, detachable nozzle valves are used.

The third object has been accomplished by so designing the hydrant that all working parts can be removed without excavation or removing the hydrant barrel.

The inlet valve seats have been so threaded that valve seats are interchangeable.

To further facilitate repairs we have designed an auxiliary equipment, through the use of which the working parts can be readily removed and replaced without the necessity of shutting down the pipe section on which the hydrant is installed.

The hydrant has been put under an actual working test by the Fire Marshal and pronounced satisfactory.

General drawings of the hydrant accompany this report.

UTILITY GALLERY IN CANAL STREET.

In connection with the construction of the new Union Depot, the public utilities along Canal street, from Washington street to Monroe street, and along Monroe street, from Canal street to Clinton street, were required to be moved on account of new grades and improvements. An agreement was entered into between the Chicago Union Station Company and the city, whereby the Chicago Union Station Company would construct a gallery for these utilities in Canal street from the south curb line of Madison street to a point eighty feet south of the south line of Monroe street, and on Monroe street from the gallery in Canal street to the east curb line of Clinton street, and the city would construct the gallery from the south curb line of Madison street to the south building line of Washington street, except three manholes just north of the curb line at Washington street, which were to be paid for by the Chicago Union Station Company.

A contract was entered into between the Chicago Union Station Company and W. J. Newman Company to construct the gallery south of Madison street, and on October 14th the city entered into a contract with the same contractor for their share of the work.

The gallery was practically completed by December 31st, with the exception of some minor changes made in the manholes in Madison street. The cost of expenditures for the work up to January 1, 1916, has been as follows:

W. J. Newman Company, contract	$12,276.03
W. J. Newman Company, extra work	1,544.22
Moving plumbing in N. W. Station	1,650.00
Merchandise accounts	945.86
	$16,416.11

The location and details of the gallery are shown on page 121 a.

The Chicago Postal Pneumatic Tube Company installed two tubes in the gallery and placed them in operation early in December. The other utilities had not been placed by December 31st, although preparation was being made for installing them. The following utilities are expected to use the gallery: Water, Commonwealth Edison, Telephone, Sanitary District, Police and Fire Alarm Telegraph and City Light.

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CONSTRUCTION DIVISION

Henry W. Clausen, Engineer of Waterworks Construction, in Charge.

WILSON AVENUE TUNNEL.

The new Wilson Avenue Tunnel, the construction of which was commenced in August, 1913, will extend from a point in Lake Michigan about 16,250 feet east of the shore shaft, located at Wilson and Clarendon avenues, to the proposed new Mayfair Pumping Station at Wilson and N. Lamon avenues.

The work carried on during the year 1915 is as follows:

SECTION ONE.

Section One includes the construction of the intake crib with intake shaft and 2,128 feet of thirteen-foot diameter tunnel.

The construction of this section is being done under a general contract by the Fitzsimons & Connell Dredge & Dock Company. The cost is estimated at $404,000.00.

The work done during the year has been the construction and placing of the substructure steel for the crib and the placing of 3,287 cubic yards of concrete in same.

The steel substructure for the crib consists of two concentric steel shells, the inner shell being 40 feet in diameter and the outer shell 90 feet in diameter at bottom, tapering to a diameter of 70 feet at the top. The height of the steel shells is 45 feet, and they are braced by radial water-tight diaphragm plates and cross bracing. The steel was floated by placing temporary oak bulkheads over both ends of the eight intake ports and using same for floating chambers, by eight special ten-foot floating cylinders and by eight special six-foot floating cylinders.

The steel was fabricated by the Chicago Bridge & Iron Works, and erected by the Ketler-Elliott Erection Company, under sub-contract from the general contractor.

The erection of the steel shells was started on April 20, 1915, in Slip C of the Illinois Central Railroad, located on the south bank of the Chicago River about four blocks east of Michigan avenue. The slip was first dredged out to a depth of nineteen feet, and the erection of the steel shells started on a foundation of timbers resting on a large scow and two pontoons. The work progressed favorably until May 1st, when the ironworkers went out on a strike, and no work was done until June 21st, when work was resumed with non-union ironworkers. On July 6th the strike was called off and work was started with union ironworkers.

From July 6th to August 14th, the lowest seventeen feet of steel was completed including caulking and final field coat of paint and the structure was towed out into the lake to the south side of the Municipal Pier, where the pontoons and scows were removed from under same. This was done by boring two 4-inch holes in bottom of scow and removing 4-inch plugs in pontoons. The structure settled evenly in the water until water washed over deck of scow into hatchway, causing scow to fill rapidly on one end. The whole structure then tipped up to one side and settled immediately, the pressure of the air blowing portion of deck off high end of scow. The scow and pontoons were then pulled out from under steel shell by means of a tug and the crib towed back into the slip. After the removal of scow and pontoons the steel structure drew twelve feet three inches of water.

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WILSON AVENUE TUNNEL. DRIFT UNDER THE LAKE, LOOKING EAST. SHOWING VENTILATING PIPE, TRACK AND HIGH PRESSURE AIR LINE

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The work from August 14th to October 4th consisted of erecting, riveting and painting the upper twenty-eight feet of steel shells and the erection of a timber watchman's tower on one edge of crib.

On October 4th the steel substructure was dragged to end of slip and on October 5th was towed out into the basin south of new Municipal Pier. Owing to the extra weight of watchman's tower, and probably owing to some water in the ports on the same side as tower, it was necessary to hold up that side of structure with a pile driver. After reaching the basin, the structure was anchored and the lifting cable from the pile driver removed when that side of crib settled to bottom in about thirty feet of water. Owing to the strong east winds prevailing for the next five or six days, it was impossible for the contractor to again hitch onto structure with the pile driver with the result that the crib buried its low side in the soft clay bottom of the harbor to a depth of about six feet.

As soon as the weather became favorable, the contractor attempted to lift the crib by means of two pile drivers lifting on cables passed through the twelve-inch sea valve openings. At same time, the water was removed from bulkheaded ports by steam ejectors. It was found impossible to lift the structure with two pile drivers and, after several days' delay in making the attempt, a third pile driver was obtained on October 20th, the crib lifted to a nearly level position and towed east about 500 feet, where it grounded on a ridge on bottom of basin. On October 21st the contractor attempted to drag the structure off into deep water, but was able to move it only about 150 feet east, using two tugs. On October 22d, a dump scow was obtained, one end of the scow was placed against the crib, the end of the scow submerged, fastened to crib with steel cables, and then pumped out. The scow in conjunction with the two pile drivers succeeded in lifting the crib until it drew only twenty feet of water and contractor started to tow out into the lake immediately—about 6:30 p. m., October 22d. The pile drivers and scow remained fastened to and supporting crib and crib was towed by two tugs hitched up tandem, the nearest tug being 500 feet away from the crib. The crib reached the location buoys about 11:45 p. m., and preparations were made for sinking, which was accomplished by taking strain off pile drivers and then releasing wire cable on scow. The crib immediately settled to the bottom on the side where watchman's tower was located. The sea valves in the floating chambers were opened and the crib settled slowly until it rested on the bottom and with top of steel about ten feet eight inches above level of water.

Owing to the rough weather and to the fact that the contractor's concreting plant had to be raised to enable placing concrete over top of steel shell, which was three feet eight inches higher than anticipated, the contractor was unable to place any concrete until October 30th.

The concreting plant consists of a derrick scow with two steam driven concrete mixers and hopper on one end and two material scows, one each side of derrick scow. The material is removed from material scows by derricks with a ¾-yard clamshell bucket and dumped into hopper over concrete mixer from which it is fed into measuring hopper over the mixers. The mixers are a ¾-yard Marsh-Capron and a 1-yard Ransome. From the mixers the concrete is chuted into the top of the spout, the bottom of which is in contact with concrete placed and spout is kept full. The total concrete placed amounted to 3,287 cubic yards, and the contract is about 28 per cent. completed.

The construction work of this section of the tunnel was in local charge of Mr. John S. Dean, Assistant Engineer.

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SECTION TWO.

SHORE SHAFT.

Drift No. 2.

Excavating in this drift has been continued throughout the year.

The bore of the tunnel for the greater part of the time has been through solid limestone rock. Clay seams have occasionally been encountered, but only one caused delay or gave much trouble. This soft pocket, composed of clay, mixed with boulders, was opened up on June 21st at station 43+47 and necessitated the timbering of the roof and side walls for a distance of 45 lineal feet. A large quantity of water was encountered adding to the difficulty in securing the roof and walls of the tunnel.

As an additional precaution, the timber work was lined in turn with a concrete arch and side walls, resembling the completed tunnel section, but having the neat size of the excavation. Over a month elapsed before solid rock was again encountered and the blasting out of the regular lengths could be resumed. No further trouble from bad ground has since been experienced in this heading. Average daily progress in drift was 18.1 feet.

Station of face, December 31, 1915, 70+61.5.
Station of face, December 31, 1914, 20+04.2.

Progress. . . . . 5057.3 feet.

The concreting of the footing walls for the Blaw steel forms was started at station 3+46 in the east drift on November 15th, and by the close of the year had been completed to station 39+06, a total distance of 3,560 feet. The top of the walls are six feet below the springing line of the tunnel. The concrete is a mixture of Portland cement and the finer portions of rock taken from the excavation with four bags of cement to one yard of rock.

The cost of constructing the footing wall was as follows:

Labor cost per lineal foot of tunnel	$0.49
Material cost per lineal foot of tunnel	0.36
Labor and material per lineal foot of tunnel	0.85
Cubic yard per lineal foot of tunnel	0.234
Labor and material per cubic yard	3.65

The lining of the concrete arch and side walls of the tunnel was started at station 3+46 in the east drift and by the close of the year 729.5 lineal feet of tunnel had been thus lined or to station 10+75.5.

The arch and side walls of the tunnel are lined with concrete by means of a concrete handling machine especially designed for this purpose by the Bureau of Engineering.

By the use of this machine, the cars are loaded with the excavated rock from the face of the tunnel and are taken up an incline by means of an electric hoist and are then dumped into a hopper from which the rock falls into a perforated plate screen, with holes about 4 inches in diameter, onto a belt conveyor by which it is conveyed to a hopper where the cement is added.

From this hopper the mixture is dumped into the mixer from which it is forced by compressed air through an eight-inch pipe into the space between the sides of the steel forms and the tunnel excavation.

The steel forms used are each thirty feet in length, mounted on a traveler which moves on wheels as required. The concrete is conveyed through an eight-inch pipe to a maximum distance of 800 feet.

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WILSON AVENUE TUNNEL. DRIFT UNDER THE LAKE. SHOWING CONCRETED TUNNEL. GASOLENE LOCOMOTIVE AND TRAIN OF CARS

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Footing walls are constructed on each side of the tunnel in advance of the lining. The forms extend about three inches above the bottom of the side plates of the steel forms, and serve as guide walls, also as bulkheads to prevent the concrete from passing below the sides of the steel forms.

It was found by experiment before starting the work that the rock passing through the four-inch screen contained the necessary gradation of sizes to make a satisfactory mixture.

Two steel forms are used, one during the day and one during the night. The time taken to fill and move the forms is about eight hours, thus allowing sixteen hours for the concrete to set.

When the forms are collapsed and moved the arch and side walls with the exception of a very small percentage of the surface is practically free from voids.

The concrete handling machine is moved sufficiently far in advance of the forms so as to require moving only about once in two weeks.

Cost of concrete lining arch and side walls for first period of twenty-one days:

Labor cost per lineal foot of tunnel	$ 7.30
Material cost per lineal foot of tunnel	3.62
Cost of labor and material per lineal foot of arch and side walls including the cost of erecting concrete forms and conveying machinery	10.92
Average lineal feet lined per day	34.5

DRIFT NO. 3.

As soon as the progress of excavation in the east drift was checked, due to striking the clay strata on June 21st, work was resumed in Drift No. 3, no excavating west of the shaft having been done prior to that time for approximately one year.

Work in this heading was continued for an interval of twenty-eight working days, two shifts each, or until July 25th, when active work was resumed in the east heading and excavation in Drift No. 3 discontinued until August 12th.

Two-shift work was then carried on simultaneously in both drifts for a space of three days, when the shifts in this heading were cut down to one and thus continued until November 6th, when all work in this drift was shut down for the balance of the year. The drift was shortly after used to assemble the conveyor and equipment for the pneumatic placing of the concrete lining for the tunnel and the excavation was discontinued for the remainder of the year.

Station of face, December 31, 1915	17+90.3
Station of face, December 31, 1914	5+80.2
Progress	1,210.1 ft.

The rock excavated from the tunnel during the year amounted to 62,984 yards, of which 33,282 cubic yards were taken by the Peoples Crushed Stone Company, and the balance hauled away to various dumps.

The installation of the ventilating system for the tunnel was started on February 8th and first put into service on March 20th.

Each drift of the tunnel is ventilated by means of a centrifugal compressor with a capacity to deliver 5,000 cubic feet of air per minute through an eighteen-inch steel pipe especially designed for this purpose. Each of these compressors

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are designed to work against a maximum pressure of 1½ pounds per square inch, which is sufficient to force the air for a length of from five to seven thousand feet.

Where the lengths of the drifts exceed this the two compressors are connected in series giving a maximum working pressure of three pounds per square inch, which is sufficient to force the air through the eighteen-inch pipe to the face of the longest drift, which is about 16,000 feet in length.

The centrifugal compressors are connected up by by-passes in the pipe line so that the air can be exhausted together with the powder smoke after shooting and then reversed to force fresh air into the tunnel as desired.

Prior to May 14th, the hauling of rock in the east heading was done by mules. A gasoline locomotive, made by the Geo. D. Whitcomb Company, of Rochelle, Illinois, was put into service on that date and operated until August 1st. As it was not considered adapted for this class of work, it was returned and mules again put on until October 18th, when a gasoline locomotive, made by the Baldwin Locomotive Works, of Philadelphia, Pennsylvania, was put into service, which did all of the hauling from this heading up to the close of the year.

The gasoline locomotive weighs five tons, and readily pulls from twenty to twenty-five cars loaded with rock, each car weighing when loaded about 5,000 pounds.

The capacity of the locomotive, however, is much greater than this and is capable of pulling forty cars on a level track.

The gas from the locomotive is passed through a tank containing water which modifies the unburned gasoline and practically all smoke and water from the exhaust.

A small quantity of carbon-monoxide and carbon dioxide in the exhaust is not absorbed by the water, but these quantities are so small as to be unobjectionable with the quantity of air used in ventilation.

Two 1,000-gallon centrifugal pumps have been installed at the bottom of the shaft, the first one having been in operation since October 4th and the second one ready for service since December 3d.

The concrete conveyor, used in connection with the pneumatic placing of the concrete lining for the tunnel, was delivered on November 10th. The assembling of the main parts of the conveyor was started in the west drift on November 11th, and on November 20th was pulled over by the locomotive into the east drift to station 7+50, where the balance of the assembling was completed.

The steel work for two concrete forms was delivered November 13th, and the work of erection started in the east drift at station 3+46 and forms were ready for service by December 3d.

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Total expenditures for labor and material on the tunnel and plant during the year 1915 for excavation and lining were as follows:

Amount expended for 6,267.4 lineal feet of tunnel:

Cost of material—	
Powder	$31,467.00
Fuses and wire	3,453.07
Tamping bags	75.26
Coal	4,469.98
Electric power and light	23,870.87
Oils and grease	967.28
Waste	102.07
Repairs on rock drills	2,229.50
Small tools and miscellaneous	1,783.51
Packing	543.90
Tool steel for drills	576.49
Cement	1,882.00
Lumber	565.33
Air and water hose	796.91
Total cost of material used	$72,783.17
Cost of labor	$162,236.81
Total for labor and material	$235,019.98

Amount expended on excavation for 6,267.4 lineal feet of tunnel:

Cost of material—	
Powder	$31,467.00
Fuses and wire	3,453.07
Tamping bags	75.26
Coal	4,469.98
Electric power and light	23,870.87
Oils and grease	967.28
Waste	102.07
Repairs on rock drills	2,229.50
Small tools and miscellaneous	1,783.51
Packing	543.90
Tool steel for drills	576.49
Air and water hose	796.91
Total cost of material used	$70,335.84
Cost of labor	$155,185.37
Expended for excavation	$225,521.21

Expended per lineal foot for excavation as above, $225,521.21÷6,267.4=$35.66.

Material per lineal foot	$11.00
Labor per lineal foot	24.66
Labor and material per lineal foot	35.66

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Amount expended on plant during 1915:		
Material—		
Lumber	$ 2,935.05	
Machinery	1,330.62	
Electrical equipment	5,562.53	
Ventilating pipe and fittings	10,413.81	
Repairs to equipment	2,541.27	
Three-inch wrought iron pipe and over	5,293.74	
Rails and ties	4,493.69	
Pipe fittings and valves	920.53	
Mild steel	772.92	
Portland cement	82.15	
Miscellaneous items	2,433.73	
	$36,780.04	
Less credit	95.42	
		$ 36,684.62
Labor		7,946.75
Total amount		$ 44,631.37
Hauling rock on surface to dumps		10,245.52
Engineering and inspection		5,196.04
Amount expended on tunnel and plant during 1915		$295,092.91

SUMMARY.

Amount expended for labor and material for tunnel and plant during 1915	$295,092.91	
Overhead charges	17,605.83	
Total expenditures during the year		$312,698.74
Labor chargeable with 15% overhead	$184,094.36	
Vacations	1,530.84	
Bills chargeable with 15% overhead	84,425.12	
Bills chargeable with 2% overhead	2,324.02	
Operation, which included $22,718.57 expended for tools and equipment and $1,530.84 for vacations charged to capital account and included under amount expended for tunnel	40,324.40	$312,698.74

The total amount expended on Drifts 2 and 3 to December 31, 1915, was $454,518.12, and has been distributed as follows:

Engineering and inspection	$ 10,145.00
Labor	267,383.46
Material charged to appropriation	118,747.43
Operation, including $27,305.25 for material, and $1,667.24 for vacations and charged to capital account	58,242.23
	$454,518.12

Total lineal feet of tunnel excavated to December 31, 1915, are as follows:

Drift No. 2	7,061.5
Drift No. 3	1,790.3
Total lineal feet	8,851.8
Amount expended per lineal foot of tunnel to December 31, 1915	$51.35

The construction work at the Shore Shaft of the Wilson Avenue Tunnel was under local charge of E. P. Scott, Assistant Engineer.

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LINCOLN AVENUE SHAFT.

Excavation of the tunnel was carried on in the east heading during the entire year, and in the west heading from January 1st to July 17th. On February 16th, clay was encountered in the west heading at station 2+25.8. This continued up to station 3+27.0. In this section of the tunnel the sides and arch were lined with concrete. Clay and loose rock were encountered in the east heading on October 5th, at station 34+55.6, and continued to station 37+35.8, making necessary the timbering of the sides and arch of the tunnel between these stations. With these two exceptions the work of excavation during the year was through solid rock.

EAST DRIFT—NO. 4.

Station of face, December 31, 1915	48+80.0	
Station of face, December 31, 1914	0+15.0	
Progress for the year, feet		4,865.0

WEST DRIFT—NO. 5.

Station of face, December 31, 1915	17+44.0	
Station of face, December 31, 1914	0+15.0	
Progress for the year, feet	1,729.0	
Total progress for the year in both drifts, feet		6,594.0

Total number of shifts in both drifts, 810, distributed as follows:

East Drift—309 mining days—	55	of 1 shift each	55
	248	of 2 shifts each	496
	6	of 3 shifts each	18
West Drift—153 mining days—	65	of 1 shift each	65
	88	of 2 shifts each	176
Total			810

Average progress per shift, 8.14 ft.

Amount expended per lineal foot for excavation: Labor, $20.55; material, $9.47; total, $30.02.

Number of yards of muck hoisted to surface, 68,764; average number of yards of muck per lineal foot, 10.8.

FOOTING COURSE.

A footing course, as a guide for concrete forms, was constructed in the east drift between stations 1+00.0 and 5+50.0 and in the west drift between stations 0+17.0 and 2+25.8 and between station 14+00.0 and 16 30.0—a total of 888.8 feet.

LINING TUNNEL.

The sides and arch of the tunnel were concreted in the east drift between station 2+25.8 and 3+23.0, a distance of 97.2 feet.

PLANT.

A new low pressure boiler and a stack 24 inches by 75 feet, for heating the plant, was installed. A shed, 20 feet by 40 feet, for the storage of cement, was erected in March. An extension to the locker building, 12 feet by 47 feet, containing 46 lockers, was constructed in April. Two centrifugal compressors, to be used for supplying air for ventilation, were installed complete with heater and panel boards fitted with recording wattmeters and pressure gauges. On May 22d it became necessary in order to secure storage space for the excavated rock

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to increase the height of the rock pile. This was accomplished by erecting a 7-foot trestle and installing a hoist on top of pile. On June 4th another similar trestle was erected. In July the headhouse was raised an additional 16 feet for the accommodation of stone. Trestle with tracks, switches, etc., at the new level, was constructed. In October, a water heater, to be used in connection with the shower bath in dry room, was installed. A 1,000-gallon double suction centrifugal pump, complete with 75-horsepower motor, was installed at the foot of the shaft. A thaw house was built on the rock pile and covered steam pipes were connected up to heat it. The 18-inch ventilating pipe was carried forward to a point about 120 feet from the face of each drift, a total distance of about 6,354 feet.

Bills passed during the year chargeable to tunnel and plant were as follows:

For Tunnel Excavation—

	Material	Labor	Total
Powder	$28,957.54	Including hauling rock to surface Not including engineering and inspection	
Fuses and wire	4,206.79		
Coal	73.75		
Power	18,094.65		
Oil	708.48		
Grease	61.25		
Waste	64.21		
Repairs to drills	3,637.53		
Small tools	2,029.88		
Packing	190.65		
Air and steam hose	830.46		
Drill steels	2,550.09		
Miscellaneous	1,000.47		
	$62,405.75	$135,533.63	$197,939.38

For Plant—

Lumber	$ 3,491.38	Not including engineering and inspection	
Machinery and foundations	16,667.60		
Rails and ties	4,728.77		
Electric lighting, etc.	4,025.12		
Vent pipes	5,775.41		
Heating plant	346.32		
Repairs to boiler, track, etc.	715.35		
Repairs to buildings	776.06		
Air and water pipe	6,272.80		
Coal for heating plant	536.27		
Repairs to cars	96.50		
Repairs to damaged buildings	274.51		
Drill machines	3,762.99		
Steel tunnel forms	468.00		
Tunnel cars	4,335.00		
Sluice gates	1,575.05		
Miscellaneous	818.99		
	$54,666.14		
Credit, stone sold	448.03		
	$54,218.11	$11,264.97	$65,483.08

	Material	Labor	Total
For lining tunnel, 97.2 feet	$ 1,181.10	$ 1,509.52	$ 2,690.62
For hauling on surface		1,307.83	1,307.83
For concrete footing course, 893'		676.96	676.96
For engineering and inspection		4,852.27	4,852.27
	$117,774.08	$155,145.18	$272,950.14

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SUMMARY.

Amount expended for material charged to Construction Division Capital Account	$ 40,088.68	
Amount expended for labor and material for tunnel and plant	233,309.49	
Overhead charges, minus quantity	5,404.23	
Credit for stone sold, minus quantity	448.03	
Total expenditures during year		$267,545.91
Labor—pay rolls	$155,145.18	
Bills chargeable with 15% overhead	75,764.56	
Bills chargeable with 2% overhead	2,399.75	
Operation, including $40,088.68 expended for tools and equipment charged to Construction Division, Capital Account, and included under amount expended for plant	34,684.45	
Credit for stone sold, minus quantity	448.03	
Total expenditures during year		$267,545.91

The total expenditures on the tunnel proper to December 31, 1915, Drifts Nos. 4 and 5, Lincoln Avenue Shaft, are distributed as follows:

Engineering and inspection	$ 7,378.30
Labor	165,970.98
Material charged to appropriation	86,149.37
Operation, including material charged to Construction Division Capital Account	38,592.77
Credit for stone sold, minus quantity	448.03
Total	$297,643.39

The construction work in the Wilson Avenue Tunnel, Lincoln Avenue Shaft, was carried on under the local charge of C. D. Golden, Assistant Engineer.

LAWNDALE AVENUE SHAFT.

Drifts Nos. 6 and 7.

During the year ending December 31, 1915, the work done at the Lawndale Avenue Shaft of the Wilson Avenue Tunnel consisted of the completion of the plant, the sinking of the shaft, driving of gate drift, and the driving of Drifts Nos. 6 and 7 to stations 31+98.8 and 28+71.9, respectively.

Drift No. 7 was connected at the above station to Drift No. 8 on December 17th, which completed the excavation between the shafts at Mayfair and Lawndale avenue.

Three air compressors, with a capacity of 500 cubic feet per minute each, used for driving drills and pumps, were erected and installed.

The head frame and trestle were framed and erected. Tracks and switches and a lighting system were installed on this trestle from the head frame to dump.

Foundations for the two centrifugal air compressors, used for ventilation, were built, and the compressors erected and connected to the ventilating system.

The finished plant is all under one roof. On the ground floor is located the blacksmith shop, the boiler room with the low pressure boiler, and the general power room in which are installed the three electrically driven centrifugal air

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compressors, the electric hoist, and the distributing switchboard and panels. Lockers for hoisting engineers, a small tool and pipe fitting store room and an oil room are also located on this floor. The upper floor contains the lockers, toilets, shower baths and a store room for material. In connection with the foregoing there is also a general office, a foreman's office and two magazines that were built or completed during the year.

SHAFT.

Ground was broken on February 8th and sinking operations in clay started and continued until rock was reached on February 11th, at elevation—17.11 or 26.2′ from the ground surface. The shaft is circular in section, 13 feet in diameter, and lined with 12 inches of concrete.

The shaft lining in earth began at 8:00 a. m., February 12th, and this portion of shaft was completely lined with concrete at noon, February 13th.

The average progress made in mining per 24 hours was 10.86 feet.

The forms were removed and the shaft excavation in rock was commenced on March 16th, and continued until the elevation of bottom was —104.66, when the eyes were turned for all drifts and the excavation continued until the sump was at —114.0 feet. An additional 16 feet of shaft was excavated for skip pocket, and as it was subsequently found impracticable to use skips, this skip pocket was filled to an elevation of —119.0, which is the bottom of the sump.

GATE DRIFT.

Driving the eight-foot tunnel directly south from the shaft commenced on April 9th, and was continued to April 14th, when the station at the face was 0+31.5. At the south end there was a powder magazine eight feet square driven west.

DRIFTS NOS. 6 AND 7.

The eye of these drifts were turned April 2d and enough top heading was driven to give sufficient working space for miners. There was several days' delay in order to complete the shaft and gate drift, and when this work was finished the drive was commenced. This was carried on by three shifts of eight hours each, the shifts alternating in both headings, and this system continued until July 25th, when the work was carried on by four shifts—two shifts of eight hours working in each heading. This system was continued to the end of the year.

The average progress per twenty-four hours, together with the various items of cost, are shown in the totals below.

General statement of average progress and cost, Drift No. 6:

Tunnel completed, December 31, 1915	3,198.80 feet
Tunnel completed, January 1, 1915	0.00 feet
Progress for period	3,198.80 feet

Number of mining days in above period, 168; average daily progress, 19.04 feet; cost per lineal foot of excavation: Labor, $17.96; material, $7.51; total, $25.47.

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Drift No. 7—

Tunnel completed, December 31, 1915	2,871.90 feet
Tunnel completed, January 1, 1915	0.00 feet
Progress for period	2,871.90 feet

Number of mining days in above period, 155 5-6; average daily progress, 18.43 feet; cost per lineal foot of excavation: Labor, $18.91; material, $8.36; total, $27.27.

Gate Drift—

Tunnel completed, December 31, 1915	38.00 feet
Tunnel completed, January 1, 1915	0.00 feet
Progress for period	38.00 feet

Average daily progress, 10.36 feet; number of mining days in above period, 3⅔; cost per lineal foot of excavation: Labor, $18.61; material, $1.98; total, $20.59.

Shaft—

Excavation in clay in 1915: Progress in clay from +19.09 to —17.11=36.20 feet; number of mining days, 3⅓; average daily progress, 10.86 feet. Cost per foot for excavation: Labor, $24.50; material, $10.65; total, $35.15. Total cost of excavation in earth, $1,372.25.

Concreting in 1915: Concreted from —17.11 to +13.77=30.88 feet. Number of days of concreting, 1⅓. Cost per foot of lining: Labor, $9.11; material, $12.31; total, $21.42. Cost of lining, 30.88 feet=$661.60.

Progress in rock from —17.11 to —130.00=112.89 feet. Number of mining days, 20; average daily progress, 5.64 feet. Cost per foot of shaft excavation: Labor, $35.72; material, $11.01; total, $46.73. Total cost of excavating 112.89 feet=$5,274.98.

Plant Costs in 1915:

	Material	Labor	Total
Lumber	$ 1,644.51	Not	
Machinery and foundations	593.30	Including	
Rails and ties	183.53	engineering	
Electric lighting, lamps, fixtures, wires, etc.	1,996.78	and inspection	
Ventilating pipes			
Heating plant	504.47		
Repairs to boiler, track, machinery, etc.	283.52		
Air, water and sewer pipes	961.38		
Forms for concrete			
Repairs to buildings	7.97		
Miscellaneous	1,273.52		
		Vacations	
		692.80	
Machinery, tools and office supplies	32,294.44	7,690.15	
Totals	$39,443.42	$8,382.95	$47,826.37

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Drift No. 6, 1915—Expenditures for excavating 3,198.8 feet.

	Material	Labor	Total
Powder. .	$11,273.57		
Fuses and wire	1,338.81		
Coal. .	238.61		
Power. .	4,631.46		
Oil. .	224.45		
Grease. .	34.09		
Waste. .	23.38		
Repairs on drills	775.13		
Small tools.	1,293.17		
Packing. .	47.01		
Air and steam hose	370.67		
Miscellaneous. .	3,766.35		
Credit, subtract.	4.87		
	$24,011.83	$57,445.785	$81,457.615

Cost per lineal foot of excavation: Labor, $17.96; material, $7.51; total, $25.47.

Drift No. 7, 1915—Expended for excavating 2,871.9 feet.

	Material	Labor	Total
Powder. .	$11,273.58		
Fuses and wire	1,338.87		
Coal. .	238.68		
Power. .	4,631.45		
Oil. .	224.49		
Grease. .	34.10		
Waste. .	23.36		
Repairs on drills	775.12		
Small tools.	1,293.15		
Packing. .	47.00		
Air and steam hose	370.68		
Miscellaneous. .	3,766.26		
Credit, subtract.	4.88		
	$24,011.86	$54,309.14	$78,321.00

Cost per lineal foot of excavation: Labor, $18.91; material, $8.36; total, $27.27.

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Gate Drift, 1915—Expenditures in 1915 for excavating 380 feet:

	Material	Labor	Total
Powder	$66.25		
Fuses and wire	9.05		
Coal	0.00		
Power	0.00		
Oil	0.00		
Grease	0.00		
Waste	0.00		
Repairs on drills	0.00		
Small tools	0.00		
Packing	0.00		
Air and steam hose	0.00		
Miscellaneous	0.00		
	$75.30	$707.01	$782.31

Expended per foot of excavation: Labor, $18.61; material, $1.98; total, $20.59.

Shaft Costs, 1915:

	Material	Labor	Total
Powder	$ 420.00	Not	
Fuses and wire	162.07	including	
Coal	26.80	engineering	
Power	0.00	and	
Oil, grease and waste	0.00	inspection	
Repairs on drills	124.08		
Small tools	42.84		
Packing	9.11		
Air and steam hose	0.00		
Miscellaneous	1,223.25		
	$20,008.15	$5,200.67	$7,208.82
Sluice gates	$ 1,544.16		$ 1,544.16
Engineering and inspection		6,964.87	6,964.87
Totals	$91,094.72	$133,010.43	$224,105.15

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LAWNDALE AVENUE SHAFT

Total Cost of Shaft to December 31st, 1915

Material	Excavation in Clay 36.2 Ft.			Excavation in Rock, 112.9 Ft.			Lining in Clay, 30.9 Ft.			Totals		
	Cost of Material	Labor Not Incl. Eng. & Ins.	Total	Cost of Material	Labor Not Incl. Eng. & Ins	Total	Cost of Material	Labor Not Incl. Eng. & Ins.	Total	Cost of Material	Labor Not Incl. Eng. & Ins.	Total
Powder	.....	.....	.....	420.00	.....	.....	.....	.....	.....	420.00	.....	.....
Fuses and Wire	.....	.....	.....	162.07	.....	.....	.....	.....	.....	162.07	.....	.....
Coal	.....	.....	.....	26.80	.....	.....	.....	.....	.....	26.80	.....	.....
Power	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oil	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grease	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waste	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Repairs on Drills	.....	.....	.....	124.08	.....	.....	.....	.....	.....	124.08	.....	.....
Small Tools	7.50	.....	.....	35.34	.....	.....	.....	.....	.....	42.84	.....	.....
Packing	.....	.....	.....	9.11	.....	.....	.....	.....	.....	9.11	.....	.....
Air and Steam Hose	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous	†542.80	.....	.....	465.25	.....	.....	*380.20	.....	.....	1,388.25	.....	.....
Totals	550.30	886.95	1,437.25	1,242.65	4,032.325	5,274.975	380.20	281.40	661.60	2,173.15	5,200.675	7,373.825

*For Sand, Gravel, Cement and Forms.
†Includes $165.00 for Lagging paid before first of year.

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SUMMARY.

Amount expended for labor and material for plant, shaft and tunnel in 1915	$224,105.15	
Overhead charges	4,869.25	
Total expenditures during year		$219,235.90

Labor—pay rolls, including engineering and inspection, chargeable with 15%—1915	$132,317.63	
Bills chargeable with 15% overhead	54,571.85	
Bills chargeable with 2% overhead	4,228.43	
Operation, including $692.80 and $32,294.44 expended for vacations and material included under plant charged to Const. Div. Cap. account	28,117.99	
Total expenditures during year		$219,235.90

The total pay roll is really $133,285.54, but from this must be subtracted $255.11, tunnel foreman's time carried on Lawndale pay roll and charged to Lincoln Avenue, and $20 carried on Lawndale pay roll and charged to Central Park Avenue Pumping Station. This gives the sum obtained by adding the above $132,317.63 and $692.80—pay rolls chargeable with 15% and vacations.

$132,317.63	$255.11	$133,285.54
692.80	20.00	275.11
$133,010.43	$275.11	$133,010.43

EXPENDITURES FOR TUNNEL, SHAFT AND PLANT

to December 31, 1915,

LAWNDALE AVENUE SHAFT.

Labor and material for excavating 6,108.7 feet of tunnel	$160,560.93	
Excavating shaft in earth, 36.2 feet	1,437.25	
Excavating shaft in rock, 112.9 feet	5,274.97	
Lining shaft, 30.9 feet	661.60	
Plant	52,718.24	
Engineering and inspection	7,820.61	
Sluice gates	1,544.16	
Total		$230,017.76
Expended in 1914	5,912.61	
Expended in 1915		$224,105.15

The construction work at the Lawndale Avenue Shaft of the Wilson Avenue Tunnel was in local charge of Paul Lippert, Assistant Engineer.

MAYFAIR SHAFT.

The sump of the main gate shaft had been completed and the tunnel eye turned December 22, 1914, and by January 1, 1915, 44 feet of top heading had been driven. During the year 1915, until December 3rd, mining was carried on continuously, making a progress of 4,840.5 feet eastward in Drift No. 8

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and 184.6 feet westward from the intersection in Drift No. 9, or a total of 5,025.1 feet.

The following is a schedule of mining progress:

Period ending		Advance	Working days	Advance per day
December	31, 1914	22.0	6	3.7
February	3, 1915	244.0	34	7.2
March	3	171.3	20	8.5
April	3	466.3	27	17.3
May	3	319.6	26	12.3
June	3	471.1	27	17.5
July	3	548.9	26	21.1
August	3	550.3	25	22.0
August	26	434.0	20	21.7
September	26	518.5	27	19.2
October	26	596.1	26	22.9
November	26	573.2	26	22.1
December	3	109.8	6	18.3
		5,025.1	296	16.9

The highest rate of advance was from September 23rd to October 23rd, a period of 26 working days of three 8-hour shifts, when 602 feet, or an average of 23.2 feet per day, were driven.

Dumping buckets, which emptied into end dumping cars, running onto rails on counterweighted trap doors at upper level of headhouse, were used to February 21, when the cage was installed and special one-yard steel side dump tunnel cars were put in service and used in the remainder of the tunnel. Drift No. 9, going westward, was started January 6, and was completed to the east line of North Lamon avenue March 15.

The west gate shaft, which had previously been sunk through clay from ground elevation+31.0 C. D. to rock at—50.0 C. D., was driven upward in rock at a much lower cost. This work was started February 5 and completed on February 10. The mining was carried to station 8+69 by the three-shift method without any ventilation until April 18. On account of the need of ventilation the two-shift method was then used until May 3, when at station 10+53 the three-shift method was resumed. The ventilating fan was put in service on April 28.

The bottom heading method was used the entire length of the tunnel. Two Sullivan piston drills for down holes and two Sullivan hammer drills for the up holes, mounted on horizontal mining bars, drilled an average of 26 holes per heading to a depth of 10 feet. From 6 to 8 holes were drilled with a single hammer drill, mounted on a bar, in the roof.

The dynamite used was of 50 and 60 per cent strength. An average of 40 pounds per foot of tunnel was used, amounting to 4 pounds per yard. The delay type exploders were used wherever possible and gave good satisfaction, removing the necessity of reconnecting for successive charges of the same advance.

For the purpose of permitting quicker access to the bottom heading after the roof had been blasted, an attempt was made to provide a structural steel platform upon which the rock from the roof could fall. This platform was mounted on flanged wheels and was provided with a series of springs on each side supporting a series of channels whose webs were reinforced with I-beams. The platform failed after about a week's service. While the nature of the failure

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VIEW OF SITE OF MAYFAIR PUMPING STATION, LOOKING SOUTH, SHOWING ROCK EXCAVATED FROM TUNNEL, TRESTLE AND HEAD-HOUSE AND EXCAVATION FOR FOUNDATION OF PUMPING STATION

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indicated a possible improvement in the design, it was not thought advisable to make further experiments. The cost of the platform was $366.75.

The following is an analysis of expenditures during the year 1915:

ROCK TUNNEL:

Expended for plant:

	Material	Labor	Total
Lumber	$ 1,242.73		
Air and water pipe	3,105.32		
Office supplies	424.68		
Repairs to boiler and machinery	671.55		
Heating plant	494.39		
Ventilating pipe	4,592.68		
Machinery and foundations	13,527.23		
Electric lights, wire, etc	2,422.81		
Rails and ties	3,110.16		
Repairs to buildings	29.08		
Totals	$29,620.63	$3,069.42	$32,690.05

Expended for tunnel excavation—

Dynamite	$24,710.59		
Fuses and wire	3,559.14		
Coal	204.63		
Electric power	13,320.53		
Oils, grease and waste	508.06		
Drill repairs	3,905.06		
Small tools	471.48		
Packing	143.85		
Air and water hose	387.12		
Drill steel	1,581.83		
Miscellaneous supplies	487.49		
Totals	$49,279.78	$135,658.49	$184,938.27

Cost of material per foot of excavation of 5,003.1 foot of tunnel	$ 9.82
Cost of labor per foot of excavation	27.00
Cost per foot of excavation	$36.82
Total cost per foot of plant	6.53
Total	43.35

	Material	Labor	Total
Cost of plant	$29,620.63	$ 3,069.42	$ 32,690.05
Excavation	49,279.78	135,658.49	184,938.27
Trimming	86.58	599.61	686.19
Lining	149.44	4,337.77	4,487.21
Rock pile	217.41	5,112.00	5,329.41
Drill sharpening, all shafts	3,251.71	4,740.28	7,991.99
Suction tunnel, pumping station	8,502.33	18,143.44	26,645.77
Two-gate shafts	946.07	4,660.38	5,606.45
Two-screen shafts	.....	446.22	446.22
Sluice gates	4,632.50	102.35	4,734.85
	$96,686.45	$176,869.96	$273,556.41
Engineering	.....	5,717.18	5,717.18
Vacations	.....	1,484.31	1,484.31
Totals	$96,686.45	$184,071.45	$280,757.90

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The following are the total expenditures ending with December 31, 1915, for labor and material on Mayfair screen and gate shafts, branch and suction tunnels, omitting the rock tunnel:

	Material	Labor	Total
Drill sharpener	$ 848.92	$ 4,530.48	$ 5,379.40
Sluice gates	4,632.50	102.35	4,734.85
Screen shafts	3,260.94	5,369.10	8,630.04
Gate shafts A and B	4,158.12	14,249.33	18,407.45
Branch tunnels, 170 feet long	1,116.75	4,155.63	5,272.38
Suction tunnel, 284 feet long	8,223.62	18,153.48	26,377.10
	$22,240.85	$ 46,560.37	$ 68,801.22

Engineering	$ 3,234.45
Operation, which includes items charged to capital account	9,408.45
Total	$81,444.12

Amount expended during the year 1915 and charged to Construction Division Capital Acct.	$ 24,225.55	
Amount expended for labor and material for tunnels, shafts and plant	280,757.90	
Overhead charges	12,688.22	
Total expenditures during the year 1915		$293,446.12

Labor—total pay rolls, omitting vacations	182,587.14	
Bills carrying 15%	52,601.97	
Bills carrying 2%	21,343.24	
Operation, which included $22,741.24 expended for tools and equipment, and $1,484.31 for vacations charged to capital account	36,913.77	
Total expenditures during the year 1915		$293,446.12

* * * * *

The following are the total expenditures on the rock tunnel only, Drifts Nos. 8 and 9, ending with December 31:

Engineering and inspection	$ 7,191.36
Labor	160,503.60
Material charged to appropriation	68,442.55
Operation, which includes $16,361.95 and $1,965.91 for vacations charged to capital account	35,246.13
Total	$271,383.64

The station suction tunnel is a circular 8-foot tunnel with a heavily reinforced 20-inch lining. It runs the full length of the station directly underneath the suction pipes from the pumps with its centerline at elevation —24.0. Fourteen openings are provided in the roof of the tunnel for the suction pipes. Two branch tunnels run at right angles to the main tunnel connecting the same with the screen shafts.

The east screen shaft was used as a working shaft. The entire tunnel was excavated, using a single drum 50 H.P. electric hoist, dumping buckets and flat cars on 18-inch gauge track. The tunnel was completely excavated and then

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lined with steel lining plates. The concrete lining was placed beginning at the west end, thus permitting of the placing of the 1-inch circular bars, which were 4 feet larger in diameter than the inside of the form braces. Steel forms were used for the concrete lining.

General Data.

Length, feet	291
Inside diameter, feet	8
Outside diameter, feet and inches	11' 4"
Excavation per lineal foot of tunnel, cubic yards	3.74
Concrete per lineal foot of tunnel, cubic yards	1.875
Reinforcing per lineal foot of tunnel, pounds	478

The following is a distribution of all charges against suction tunnel:

Description	Pay Rolls	Bills	Total
Foreman	$ 1,056.46	.....	$ 1,056.46
Plant installation	397.39	$ 98.43	495.82
Excavation	2,470.10	.....	2,470.10
Steel lining	975.98	2,413.00	3,388.98
Timbering	810.55	329.27	1,139.82
Hoisting	3,310.68	464.55	3,775.23
Disposing	1,057.40	.....	1,057.40
Pumping	258.64	.....	258.64
Lights	28.24	11.26	39.50
Track	126.72	59.40	186.12
Forms	1,205.67	906.15	2,111.82
Reinforcement	1,967.94	1,989.64	3,957.58
Mixing concrete	1,483.93	1,908.48	3,392.41
Placing	1,547.46	.....	1,547.46
Wrecking forms	217.00	.....	217.00
Patching and finishing	102.20	.....	102.20
Tunnel eye	326.03	.....	326.03
Miscellaneous	313.50	43.44	356.94
Cost analysis	497.59	.....	497.59
	$18,153.48	$8,223.62	$26,377.10

Engineering	$ 403.15
15% on $22,395.84	3,338.09
2% on $ 4,385.11	87.70
Grand Total	$30,206.04

Items charged to capital account are distributed as follows:

Concrete mixer	$234.00
Small tools	10.08
Hoist material	34.63
Total	$278.71

Unit Costs	Pay Rolls	Bills	Total
Excavation, per foot	$24.66	$10.00	$34.66
Excavation, per yard	6.58	2.67	9.25
Concrete, per foot	22.40	16.50	38.90
Concrete, per yard	11.95	8.80	20.75
Hoisting, per foot	11.38	1.60	12.98
Total cost per foot	$62.30	$28.15	$90.45
Overhead charge	.....	.....	$13.62

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Drill Sharpener:

A Leyner pneumatic drill sharpener was installed at this site for the purpose of sharpening drill steels and fabricating shafts for use in all of the headings of the tunnel. A blacksmith shop was constructed and a Bradley coke forge and water-cooled oil tempering bath installed. For the purpose of making collections and delivering a Ford auto truck, with rebuilt body, was purchased.

The expenditures on this account are as follows:

Plant—	Pay Rolls	Bills	Total
Building	$ 308.24	$ 431.53	$ 739.77
Drill sharpener— purchase original equipment	.....	1,325.55	1,325.55
Drill sharpener repairs	11.49	172.37	183.86
Additional equipment	134.83	377.84	512.67
Coke forge	.....	54.22	54.22
Auto truck	.....	498.00	498.00
Auto truck repairs	22.89	15.70	38.59
Operation—			
Labor for sharpening tools	$ 3,888.43	.....	$ 3,888.43
Labor for hauling by auto	337.40	73.30	410.70
Labor for hauling by team	31.95	.....	31.95
Fuel	5.25	199.46	204.71
Tempering supplies	.....	49.22	49.22
Steel	.....	54.52	54.52
	$ 4,740.48	$3,251.71	$ 7,991.99

The above charges are distributed as follows:

Lawndale Avenue Shaft	$1,655.36
Lincoln Avenue Shaft	1,252.75
Shore Shaft	1,342.49
Mayfair Shaft	3,741.39
Total	$7,991.99

The total charges to end of year against tunnel appropriation account 502X37, which includes rock tunnel, branch tunnels, suction tunnel, two gates and two screen sluice gates, and drill sharpening for all drifts on the tunnel, are as follows:

Engineering and inspection	$ 10,425.81
Labor	207,063.97
Material	90,683.40
Operation, which includes items charged to capital account	44,654.58
Total	$352,827.76
Net amount of material charged to capital account	$ 25,770.40
Vacations charged to capital account	$ 1,965.91

Total lineal feet of tunnel excavated to December 31=5,025.1.

Amount expended per lineal foot of rock tunnel to end of year, including cost of material and labor, engineering and inspection, hauling on surface, lining and overhead charges, $52.25.

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SUMMARY.

Total expenditures, 1914	$ 59,917.23
Total expenditures, 1915	275,992.26
	$335,909.49
Overhead charges	16,918.27
	$352,827.76

* * * * *

The total expenditures are distributed as follows:

West Gate Shaft:			
In earth—			
Excavating 81 ft. 10′ shaft	$ 2,245.00		
Hauling excavation	328.00		
Lining 61 ft. of 10′ shaft	914.00	$ 3,487.00	
In rock—			
Excavating 68 ft. 10′ shaft	$ 1,759.18		
Lining 68 ft. 10′ shaft	2,689.43	$ 4,448.61	$ 7,935.61
East Gate Shaft:			
In earth—			
Excavating 83 ft. 12′ shaft	$ 3,361.00		
Lining 57 ft. 12′ shaft	1,826.00	$ 5,187.00	
In rock—			
Excavating 66 ft. 12′ shaft		5,284.84	$ 10,471.84
East and West Screen Shafts:			
In earth—			
Excavating 126 ft. 10′ shaft	$ 5,377.00		
Hauling excavation	308.00		
Lining 88.5 ft. 10′ shaft and 37.5 ft. 13′ and 18′ vault	2,945.04		8,630.04
Branch Tunnels in Earth 170 feet:			
Excavating 171 ft. 8′ tunnel	$ 2,837.00		
Lining 10″ thick	1,986.00		
Hauling excavation	449.38		5,272.38
Suction Tunnel in Earth 291 feet:			
Excavating 8′ tunnel	$ 12,478.96		
20″ reinforced concrete lining	14,166.81		26,645.77
Amount forwarded			$ 58,955.64

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Amount brought forward.....		$ 58,955.64
Rock Tunnel, 5,025 ft. 12′ Tunnel—		
Excavating, including hauling.....	$192,057.68	
Trimming	686.19	
Lining 90 ft. 12′ tunnel and 2,200 ft. footing wall	4,487.21	197,231.08
Drill sharpening for all sections of the tunnel.		7,991.99
Sluice gates		4,734.85
Mayfair plant		54,604.21
Engineering.		10,425.81
Vacations.		1,965.91
Total		$335,909.49

The construction work at the Mayfair Shaft of the Wilson Avenue Tunnel was in local charge of F. C. Martini, Assistant Engineer.

MAYFAIR PUMPING STATION.

A pumping station is to be constructed at Mayfair, to supply water to the northwest portion of the city and parts of adjacent suburbs.

This station is to be equipped with seven vertical triple expansion pumping engines of 25,000,000 gallons capacity each, together with necessary boilers and accessories. A contract for five of the pumping engines and one for six boilers has been let.

The property purchased by the City for the station site measures 364.58 feet on the south front along Wilson avenue, 599.58 feet on the west front along North Lamon avenue, and 148.68 feet on the north front, which is the south line of Leland avenue. The east boundary is the west right-of-way line of the Chicago, Milwaukee & St. Paul Railway Company.

The station and excavation for the same occupies a space of 286 feet by 164 feet, fronting on Wilson avenue, the south line of the station being 45 feet north of the north line of Wilson avenue.

The excavation for the pumping station was started September 16th and has been carried on continuously since that time by City day labor. The estimated quantity of earth to be removed is 56,000 yards in place. The excavation is being carried on by means of a steam shovel loading into wagons that are hauled by teams belonging to a private contractor. The progress of the excavation to December 31, 1915, is as follows:

	Sept.	Oct.	Nov.	Dec.	Total
Yards excavated, in place.....	1,600	8,370	8,900	10,850	29,720
Yards excavated, loose.....	2,090	13,200	13,710	16,714	45,714
Number of working days of 9 hours each..	7	25	27	30	90
Yards per day.....	298	628	508	555	508
Cost of labor and shovel per yard for loading	36.1	15.2	20.8	30.6	23.8
Cost per yard for hauling (cents).....	.0	38.5	38.5	39.5	36.9
	36.1	53.7	59.3	70.1	60.7

The gradual increase in the unit cost is due to the increase in quantity of hand digging and bracing for the wall trenches.

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The construction equipment consists of one Marion-Osgood ¾-yard steam shovel, one stiff leg steel derrick, one 90 H.P. electrically operated double drum hoist, two 50 H.P. electrically operated single drum hoists, one concrete mixer of 28 cubic feet capacity and one locomotive crane.

The placing of concrete for coal receiving room footings was started November 18 and to December 31, 1915, 945 cubic yards of concrete were placed.

The following is an analysis of labor costs:

		Forms		Wrecking Forms					
	Cubic yds.	per yd.	per sq. ft.	per yd.	per sq. ft.	Mix and placing	Placing rods	Finish	Total cost of labor per cu.yd.
Coal Room:									
Footings	139	$ .28	....	....	....	$1.77	$ .63	....	$2.68
Walls	282	.84	$ .02	$1.94	$ .05	1.94	.21	$ .58	5.52
Girders	158	1.90	.30	.32	....	2.21	.38	....	4.81
Boiler Room:									
Wall-footings	185	....	....	....	....	1.21	.29	....	1.50
Wall	181	4.40	1.41	.52	.02	1.75	.28	.38	7.33
Average cost per cubic yard for 945 cu. yds.		1.43	.78	.01	.04	1.72	.33	....	4.47

The construction work at the Mayfair Pumping Station was in local charge of F. C. Martini, Assistant Engineer.

68TH STREET CONNECTING TUNNEL.

A connecting tunnel is being constructed in Oglesby avenue from the Southwest Land Tunnel, in 73d street, to the pumping station at 68th street and Oglesby avenue, for the purpose of furnishing a supply of water in addition to that already obtained from the tunnels leading from the old 68th Street Crib to the 68th Street Pumping Station. The new connecting tunnel is eight feet in diameter, and will be lined with fourteen inches of concrete.

The work is being done by City day labor. Work on this tunnel was begun in March by bringing timbers for the headhouse from the Mayfair Shaft and some old wooden push cars from the Shore Shaft of the Wilson Avenue Tunnel, as well as some old rails and switch material from the last mentioned shaft. The old cars were repaired and put in condition ready for service.

A survey was made tying in the suction shaft of No. 1 engine of the 68th Street Pumping Station to the center line of Oglesby avenue. A wire fence was built around the proposed shaft and working grounds. The shaft was started in the center of Oglesby avenue, but on account of a sewer and two water mains it was shifted easterly about eighteen feet. The excavation was made in the form of a hexagon and was made of 14-foot sheeting driven, braced by three sets of 10"x12" waling.

In addition to the above, a headhouse, tool shed, blacksmith shop, a temporary 12'x16' office, as well as quarters for the men, were erected.

Considerable water was encountered in excavating the shaft through sand, and a steel shell was sunk through the sand into clay which effectively shut off the water. The sinking of the steel shell was accomplished by loading it with pig iron, and as the excavation proceeded, the weight on the shell forced it downwards. It took a final load of ninety tons of pig iron to force the shell into place.

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A three-inch steam line from the boilers at the 68th Street Pumping Station was installed for the operation of the hoisting engine, which was set upon a concrete foundation.

On June 29th, the steel shell reached its proper depth at elevation —25.47, giving it nearly ten feet in clay. Excavation of the shaft below this level continued, using three-inch lagging with 12'3" diameter iron rings to support the excavation.

While this work was under way the sinking of the 73d Street Shaft was begun on June 11th, which was done in a similar manner to the work at the 68th Street Shaft. The excavation was sheeted, using a hexagonal section with 8"x10" waling, and 2x12x14' sheeting was driven about twelve feet into the sand.

The Lasker Iron Works placed a steel shell, which was finally sunk down to proper depth by the use of the ninety tons of pig iron obtained from the 68th Street Shaft. The top of east edge of steel shell was driven to four feet below west edge of sidewalk. The sheeting was withdrawn and the steel shell backfilled with clay to top. The shaft was then covered over with planking and fence removed, leaving Oglesby avenue in satisfactory condition for traffic. Pig iron, lumber, etc., were moved back to 68th street and Oglesby avenue, and the pig iron was sorted and loaded on cars and shipped back to the Municipal Foundry, from which it had been borrowed.

The 68th Street Shaft was excavated to elevation —43.0, below which a sump 5'x5'x5' was dug and concreted. The eyes for the two tunnels were then excavated for an invert at —40.0, and the floor and walls lined with concrete, using a mix of 1:1½:3. A steel ladder was also placed as the concreting progressed and the headhouse was erected, using concrete piers as a foundation. Guides and a cage were placed in position in shaft with safety devices and signal appliances, and a concrete chute was built to drop concrete on dump cars in bottom of shaft. Two narrow-gauge eighteen-inch tracks were laid from the shaft, one running east to the Illinois Central R. R. tracks for the unloading of material and the other running southeasterly to be used for unloading the excavated material.

Beginning with August 11th, the work was carried on day and night in three shifts—shifts Nos. 1 and 2 for mining and shift No. 3 for concreting tunnel. Up to August 25th, timber forms were used, and after that date steel forms, furnished by the Blaw Steel Construction Co. The concrete laid with the use of the steel forms shows a much smoother finish than with timber forms.

The excavation is principally in hard clay with an occasional boulder. The material excavated was used to fill low places in adjacent streets.

The shed over the hoisting engine was extended easterly to cover an air compressor, which was placed in operation August 22d.

The work of furnishing two steel shells for the two shafts of this tunnel was finished in August, and final estimate issued to the Lasker Iron Works. The cost of these two shells is $2,060.11, including 2 per cent. for overhead expenses.

During the month of September, 389.5 feet of eight-foot tunnel was finished, averaging 16.2 lineal feet per day. Excavated material varied from very stiff clay at the top of the heading to a very hard clay in the bottom, all of which has to be picked and grubbed.

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A survey was made during the month of September along Yates and Oglesby avenues, tying in the two shafts and well No. 1 in the 68th Street Pumping Station.

During the month of September 333.84 cubic yards of concrete, composed of 1 part cement, 2 parts torpedo sand and 4 parts of gravel were placed at a total cost of $2,755.38, making the cost $8.25 per cubic yard.

During the month of October 450 lineal feet of tunnel was completed in twenty-seven working days, or 16.67 lineal feet per day. Preparations were made for the winter and for improving facilities for the disposal of excavated material. The shed over the concrete mixer was extended to provide storage for gravel and sand, to keep it dry and to protect it against frost. A line of hoppers was built for the storage of excavated material and for easy loading of dump wagons. Much of the excavated material was hauled away by paving contractors, free of charge, for filling along new curbs and paving.

During the month of November 418 lineal feet of eight-foot tunnel was finished, including a curve 33 feet long on a 57.30 foot radius at 71st street, where there is an offset in Oglesby avenue. This curve is joined by a tangent to another curve in Oglesby avenue south of 71st street, which arrangement kept the tunnel entirely in a public street.

During December 385 lineal feet of tunnel was excavated and 383 feet of tunnel was lined with concrete, the face of heading having reached station 19+95, and concrete lining to station 19+90, by midnight of December 31st.

The total cost of this work is as follows:

Engineering and inspection	$ 2,169.25
Labor.	39,416.25
Materials.	9,326.07
Overhead.	8,021.90
Total	$61,670.13
New tools and equipment, $2,308.57.	
Subtracting new material on hand	$ 3,297.60
Amount of expenses to be accounted for	$58,372.53

In addition to this, the two steel shells for the two shafts should be added to the cost of the shafts and the rental paid for the use of the Blaw steel forms apportioned to the amount of tunnel finished. These items are shown below in the analysis of cost.

Cost of Plant—

Engineering.	$ 185,00
Labor.	1,482.94
Lumber.	1,559.12
Hardware.	349.21
Hauling by auto truck	32.75
New tools.	81.80
Concrete materials.	92.49
Miscellaneous.	70.25
Overhead expenses.	578.04
Total	$4,431.60

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Cost of 68th Street Shaft—10′ diameter:

Engineering	$ 150.00
Labor	1,537.45
Steel shell	1,030.05
Sheeting and wales	191.40
Freight on cast iron	33.00
Cement	122.50
Gravel	87.80
Sand	43.00
Overhead expenses	46.35
Total	$3,656.45

Cost of 73d Street Shaft—10′ diameter:

Engineering	$ 75.00
Labor	840.00
Steel shell	1,030.05
Sheeting and wales	197.40
Freight on cast iron	33.00
Miscellaneous	258.73
Overhead expenses	365.18
Total	$2,799.76

This shaft is only partially completed having been sunk thirty-four feet to put down steel shell.

After the 68th Street Shaft had been excavated, a twenty-five-foot long drift north for a six-foot tunnel, and a thirty-three-foot long drift south for an eight-foot tunnel was excavated and finished before the regular tunnel gangs were organized.

Cost of the Six-Foot Tunnel—25 feet long:

Engineering	$ 50.00
Labor	300.00
Material	128.26
Overhead	71.74
Total	$550.00

Cost of first thirty-three feet of eight-foot tunnel:

Engineering	$ 72.00
Labor	696.40
Material	323.77
Overhead	163.83
Total	$1,256.00

Cost of 1,962 lineal feet of eight-foot tunnel:

The remainder of the tunnel completed was constructed on the three-shift system—two shifts excavating while the third shift followed lining the tunnel with a concrete shell ten inches thick of a composition of 1, 2 and 4.

The cost of this work is as follows:

Engineering	$ 1,640.25
Labor	34,703.06
Material	5,886.05
Overhead	5,509.43
Total	$47,738.79

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The cost of fifty lineal feet of Blaw steel forms should be added. The rental cost for the whole job, including 2 per cent. overhead charge, amounts to $837.98; for 2,720 feet of tunnel this charge amounts to 31 cents per lineal foot.

The actual cost of building 1,962 lineal feet of tunnel is $24.33 per lineal foot, including engineering and overhead expenses.

RECAPITULATION.

Cost of plant	$ 4,431.60
Cost of 68th Street Shaft	3,656.45
Cost of 73d Street Shaft—not completed	2,799.76
Cost of 25 feet of 6′ tunnel	550.00
Cost of 33 feet of 8′ tunnel	1,256.00
Cost of 1,962 feet of 8′ tunnel	47,738.79
Cost of steel forms for 8′ tunnel	837.98
Total	$61,270.58

This includes $2,060.10 for the steel shells of the two shafts and $837.95 for the steel forms, which were paid for by contract.

The construction work of the 68th Street Connecting Tunnel was in local charge of F. A. Smith, Assistant Engineer.

MARSHALL BOULEVARD MUNICIPAL PLANT.

The Marshall Boulevard Municipal Plant is located on a tract of land comprising twenty-eight acres, acquired by the city, south of the West Fork of the South Branch of the Chicago River, extending from Marshall boulevard to the Collateral Channel of the Sanitary District Canal.

The centerline of West 31st street forms the south boundary of the tract from the boulevard to South Sacramento avenue, and the centerline of South Sacramento avenue forms the east boundary from West 31st street to the right-of-way of the Chicago & Illinois Western Railroad.

On these grounds has been constructed a number of shops and other buildings which are to combine in one place a number of municipal industries now being carried on in different parts of the city.

The buildings already constructed are the brass foundry, reinforced concrete warehouse, machine shop, blacksmith shop, carpenter shop, garage, office building and pipe tunnel.

In addition to the above, it is contemplated to construct a paint shop and central heating and power station, which will supply not only the above buildings but also the Isolation Hospital, which is being constructed under contract on the same grounds at Marshall boulevard.

The work done during the year consists of the completion of the iron and brass foundry; the practical completion of the machine shop, the blacksmith shop and the warehouse; the partial completion of the carpenter shop; the building of foundations for the garage and for the office building, and such smaller work as is hereinafter mentioned.

The work is described under the following heads:

City Day Labor—Permanent structures: Iron and brass foundry; warehouse; machine shop; blacksmith shop; carpenter shop; garage; office building; pipe tunnel.

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General work: Sewers; improvement of grounds; temporary power plant; laying water pipe; paving; retaining wall; railroad track; sub-station; fence; work for others.

Contracts of special note, which include some City Day Labor: Store house; dock.

List of unit costs on various work.

Day labor costs of jobs.

General list of contracts.

IRON AND BRASS FOUNDRY.

Work began with the removal of the building hoist to the machine shop. The coke, stone and sand bins were completed, and crane extension erected. Electric cranes were set in place. Floors were concreted and all tile partition set. Plastering was begun March 30th and completed June 3d. The contractors for the various foundry equipment installed their work, and on May 25th fire was started in all ovens in order to dry out the brickwork. The foundry was put in operation August 19th, and has since been making castings. A few doors still remain to be hung under contract. The remaining city day labor consists of connecting up blower and oil pump for brass foundry and completing sheet metal guards for machinery.

WAREHOUSE.

On January 11th concrete on first floor was poured and progressed steadily until May 4th, when the sixth floor or tower forms were poured. Brickwork commenced on May 4th and was completed in July. Two 5,000-pound electric elevators are in use. Plastering is practically completed.

Work remaining to be done by city day labor consists of painting sash and making changes in steam and toilet piping for office on first floor.

Work remaining to be done under contract consists of hanging steel doors, painting fire escape, and glazing elevator enclosures and borrowed light partitions.

MACHINE SHOP.

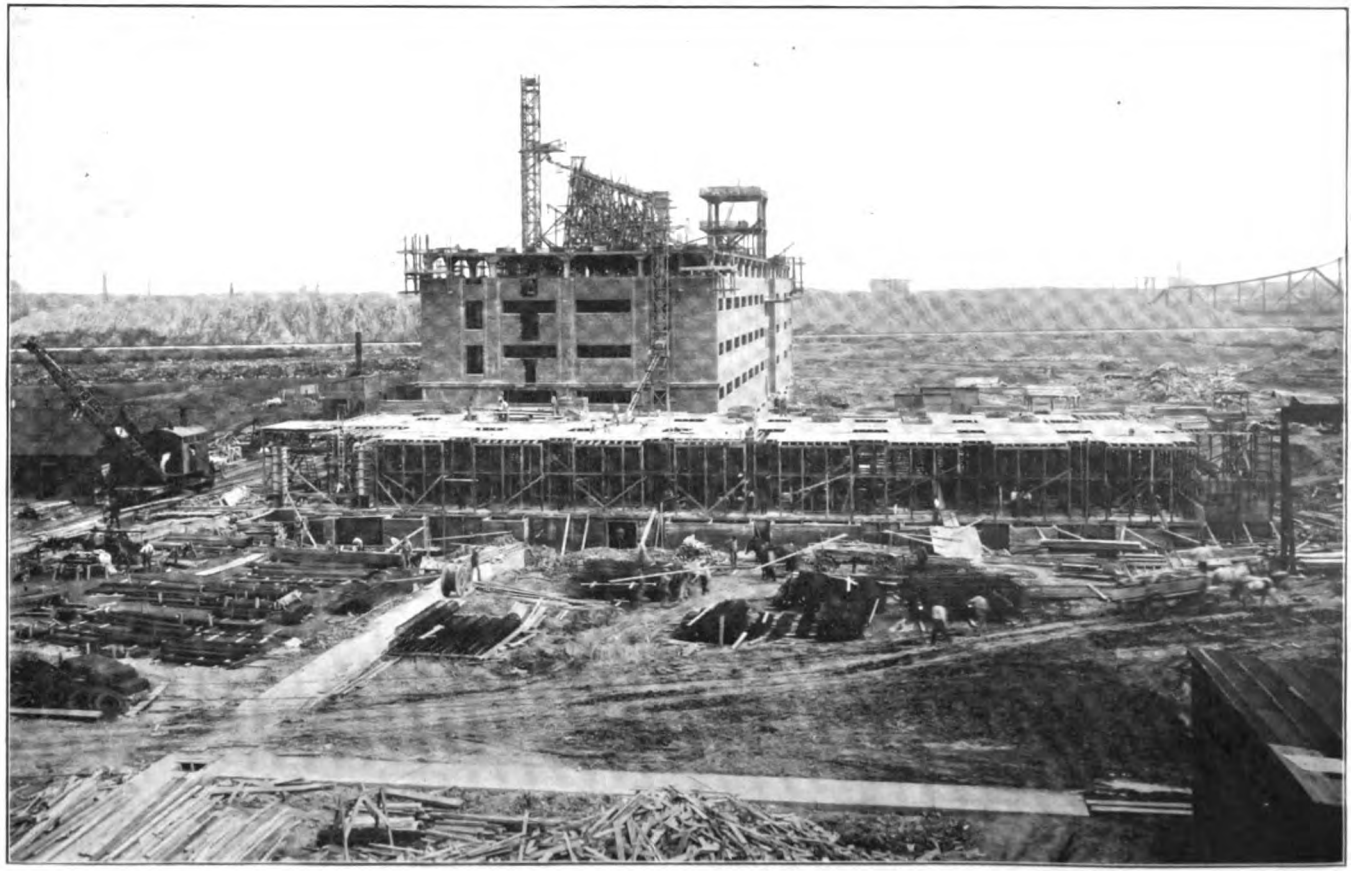
During the previous year the structural steel had been set and work for the year 1915 began with the completion of concreting foundation walls. On February 17th, bricklaying was begun and completed in June. The twenty-five-ton crane was put in operation in August.

With the exception of a small amount of wall on the south clere floor, all tile partitions have been set and plastered. All exterior brick and stone have been cleaned. Heating ducts are in and painting of all structural steel completed. Seven new machine tools are set in place. Two 4,000-pound electric elevators are in operation.

Contract work remaining to be done: Setting wire mesh partition, plumbing fixtures, machine tools, and hanging steel doors.

City day labor work remaining to be done: Setting of motors, hooking up belting, making changes in floor of northeast wing, and putting in mastic floors.

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VIEW OF CARPENTER SHOP AND WAREHOUSE LOOKING SOUTH

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BLACKSMITH SHOP.

The upper two feet of concrete foundations were put in during February and bricklaying begun. Basement was excavated in March and wall forms put in. In August the tile section of the underground heat duct was put in and also underground blast pipes for all forges. During September tile partitions were built on the second floor for toilet and locker rooms. The concrete floor in the foreman's office and at landing were put in during October. The new blower platform was built on the second floor, the blower set in and old platform taken down. The air tank was set and lines run for power hammer. All outside brick and stone cleaned. Plastering is nearly completed. Concrete foundations for nine forges were put in and forges set. The wooden foundation for power hammer was set and machine mounted in December.

Work remaining to be done by city day labor: Spreading cinders on floor, putting in foundations for large power hammer, erecting motor, shafting and countershafting, painting steel work and plastering office walls.

Work remaining to be done by contract: Glazing borrowed light partitions, hanging doors and installing plumbing fixtures.

CARPENTER SHOP.

Forty-two concrete caissons for the foundation were built during April. Three shifts were organized on April 12th, working eight wells at a time. The caissons were carried down to solid footing, three down to solid rock. Work was completed in exactly three weeks. Excavation for foundation walls was immediately begun, reinforcing steel was set, and concrete commenced on June 28th. The steel was placed by construction laborers until the fifth floor was reached, when a new agreement between structural iron workers and laborers became effective, compelling the employment of structural iron workers on this class of work. Work by them cost 75 per cent. more than formerly, due not so much to higher wages as to unfamiliarity with this kind of work. All concrete was deposited by means of a tower on the adjacent warehouse. Last concrete was poured in the tower forms on September 23d. Brickwork could have been started on August 1st, but the cut stone, metal sash and door frames furnished by other contractors were not ready for delivery, and the brickwork was at a standstill until November 1st, when stone sills for the first floor arrived and setting of same proceeded. Bricklaying was begun on November 4th, but was again held up because of a strike at the plant of the Thomas Moulding Co. In December brick again began to arrive and work has progressed until the end of the year, when the walls were completed to the middle of third floor. All cut stone has been delivered and I-beam trolley set on second floor. Two machines, furnished by Neidow & Payson and Dreis & Krumf, set temporarily on first floor.

Work remaining to be completed by contract: Setting and glazing of sash, plumbing, heating, setting of steel doors, roofing, etc.

Work remaining to be done by city day labor: Tile partitions, preparing roof and miscellaneous jobs.

GARAGE.

Form work was started on September 23d, excavation on September 24th, and concreting of footings on September 30th. It was decided not to build a separate building for the storage of oil, but to put in a basement under the

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garage. The change in plans of the garage foundations necessitated taking out concrete footings for two panels which were broken up by dynamite. During November forms were completed for basement walls, and walls and areaways concreted, together with stairs to basement. Basement excavation completed and column piers concreted. The foundations are now ready for first floor steel, cut stone water table and brickwork.

OFFICE BUILDING.

Foundations for office building were excavated during November and wall footings concreted. Forms were built during December and concrete wall and column foundations poured. The work is now ready for stone, steel and brickwork. Plans for superstructure have not been received.

PIPE TUNNEL.

Six hundred ninety-seven feet of tunnel is at present in, being completed from the south line of West 31st street through the carpenter shop to the warehouse, and cross-connections have been made to the garage, foundry, blacksmith shop and machine shop. The extension under 31st street has been excavated. This is a part of tunnel which will eventually connect this plant with the Central Power Station inside of the House of Correction.

SEWERS.

A twelve-inch tile sewer, with manholes, was laid from the existing sewer to the north and west sides of the warehouse. All drainage lines with catch-basins for pavement were completed. A twelve-inch tile sewer along east side of machine shop was taken up and lowered to meet grades of building drainings; this line was extended to east end of northeast wing of machine shop, from which all drains were connected. Part of the twelve-inch sewer along north side of warehouse had to be relaid because of settlement. Lines about the carpenter shop connecting areas, floor drains and downspouts were laid. The sewer lines, manholes and catch-basins on east side of warehouse were put in as soon as removal of concreting plant from east side of building permitted. Sewers of office building and garage remain to be done.

IMPROVEMENT OF GROUNDS.

The grade of the grounds having been established at +12.5, the general work of grading was begun. The intention is to cover all grounds with six inches of cinders. Work was begun with wheeled scrapers, but these were discarded in favor of dump wagons, with which the work could be done much more economically. Some filling has been hauled from the House of Correction, and several carloads of cinders and slag spread. This work is done as fast as material is available from excavation and other sources. All scrap and refuse lumber has been hauled to the extreme south of the premises.

TEMPORARY POWER PLANT.

During July a 90 horse-power boiler was moved into place east of the foundry, air compressor was set, and machinery roofed over with a shed. Three additional 90 horse-power boilers, complete with 50-foot stacks, were delivered by the Brownell Company, under contract, in December. These were set

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and bricked in. A Marsh vacuum pump was set. The existing boiler house was extended to contain the new equipment. This power house is intended to furnish steam to the Municipal Plant awaiting completion of Central Power Plant at House of Correction.

LAYING WATER PIPE.

Eight-inch water mains and hydrants were installed throughout the grounds. High pressure pipe and fittings were used. Temporarily, the eight-inch system is connected with old water main and every hydrant can be used. Eventually the eight-inch system will be connected at three points with water main in tunnel.

PAVING.

The concrete curb was started on 31st street on October 14th, and with the exception of two small pieces it is completed. Grading of roadways was followed by steam roller, but because of loose condition of ground satisfactory sub-grade could not be arrived at and rolling was abandoned. Ten thousand square yards of brick paving are to be laid with grout filler. This will be done as soon as weather permits.

RETAINING WALL.

The switch track to the west of the machine shop and foundry was taken up to make way for dock work and was replaced temporarily, to serve both Municipal Plant and the contractor building the dock. An entire change of alignment of track from northwest corner of machine shop to switch east of Sacramento avenue was necessitated by the building of the northwest bay of the machine shop. New location has been brought to sub-grade. Minor repairs have been made on track from time to time.

SUB STATION.

Concrete piers and walls were built at the north end of the pipe tunnel at south line of 31st street to carry concrete floors and temporary frame building which contains switchboard and a motor generator installed June 4th. This building is temporary, is located inside of the new office building, and will be a part of the latter when completed.

FENCE.

Some grading for fence has been done along the west line of S. California avenue and north side of 31st street, but no fence has been erected.

WORK DONE FOR OTHERS.

This consisted of plowing grounds for Bridewell farm, unloading lumber for the Water Pipe Extension Division, unloading pig iron for the Foundry, making flasks for the Water Works Shops, and miscellaneous small work.

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The concreting plant was shipped to Mayfair Pumping Station. This includes boiler, tower, etc.

The Brownell crane was shipped to Mayfair in December, when the Orton & Steinbrenner crane arrived from the 95th Street Incinerator.

Six sluice gates, with fittings, for installation in the Wilson Avenue Tunnel, have been unloaded and stored.

A small shed was built for the Repair Section in the basement of the Carpenter Shop.

STORE HOUSE.

The temporary boiler house from the Lake View Pumping Station was received and re-erected under contract by John O'Brien. All foundations were built by day labor. This building with grading of adjacent grounds is now complete, and all that remains to be done is the erection of a rolling lift door by the William Horn Company.

CONCRETE DOCK AND BACKSTOP.

This was built under contract by the Nash-Dowdle Co., who started driving test piles on March 8th at points 300 and 600 feet south of 31st street along the Collateral Channel. These were driven almost to refusal at depths of 26 and 28 feet below city datum. In the latter part of March excavation was commenced at south end of the dock, which was 1,084 feet long and extended north to 31st street. In May, the entire length of dock was excavated to an elevation of +4.0. All wooden piling was furnished by the City, but of those delivered only 25% could be used. These were driven and concreting completed October 2d. Ground was terraced, backfilling put in, dry material outside of dock line dredged and Collateral Channel dredged to a depth of 20 feet at the center.

LIST OF CONTRACTS ON VARIOUS JOBS.

	Total contracts	Paid 1914	Paid 1915	Total paid	Remaining to be paid
Machine Shop	$100,921.45	$22,887.72	$72,196.43	$95,084.15	$ 5,837.30
Blacksmith Shop ..	13,624.94	.....	11,972.30	11,972.30	1,652.64
Foundry	62,918.53	3,770.00	57,096.90	60,866.90	2,051.63
Carpenter Shop....	37,419.92	.....	21,464.81	21,464.81	15,955.11
Warehouse	52,329.00	10,142.07	37,677.31	47,819.38	4,509.62
Garage	18.20	.....	18.20	18.20	.....
Dock	75,711.92	.....	75,711.92	75,711.92	.....
Boiler House	3,765.00	.....	3,765.00	3,765.00	.....
Tunnel Piping.....	9,843.00	.....	5,950.00	5,950.00	3,533.00
Track	8,857.96	5,913.98	2,943.98	8,857.96	.....
Storehouse	1,980.00	.....	1,020.00	1,020.00	960.00
Sub-station	3,762.00	.....	3,762.00	3,762.00	.....
Crane (B. E. Co.)..	5,850.00	.....	5,850.00	5,850.00	.....
	$376,641.92	$42,713.77	$299,428.85	$342,142.62	$34,499.30

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COST OF JOBS, 1915.

LABOR, MATERIAL PLUS 15 PER CENT.

	Previously reported	1915	Total expended to date
Foundry	$65,316.55	$ 41,922.18	$107,238.73
Warehouse	59,772.97	115,216.49	174,989.46
Machine Shop	16,553.36	58,139.98	74,693.34
Blacksmith Shop	1,952.77	8,673.97	10,626.74
Carpenter Shop	.....	78,822.43	78,822.43
Garage	.....	7,744.33	7,744.33
Office Building and Sub-Station	.....	4,882.43	4,882.43
Pipe Tunnel	1,843.63	11,012.65	12,856.28
Sewers	19,132.94	4,861.03	23,993.97
Improvement of grounds	2,569.49	9,338.27	11,907.76
Laying water pipe	44.16	12,012.34	12,056.50
Temporary power plant	.....	1,956.60	1,956.60
Paving	.....	7,561.36	7,561.36
Retaining wall	.....	2,812.67	2,812.67
Railroad track	8,595.39	1,630.94	10,226.33
Work for others	606.96	1,959.93	2,566.89
Storehouse	.....	985.39	985.39
Dock	237.18	8,575.65	1,462.44
Miscellaneous	2,075.08	8,575.65	10,650.73
Jobs reported 1914 but not appearing in 1915	6,337.89	.....	6,337.89
Fence	.....	1,004.88	1,004.88
	$185,038.37	$380,338.78	$565,377.15

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UNIT COSTS.

	Total Cost.	Amt. of Work.	Unit.	Cost per Unit.
Carpenter Shop—				
Excavation caissons	$ 6,751.98	1,480	cu. yds.	$ 4.56
Concrete caissons	1,661.87	810.5	cu. yds.	8.55
Concrete in superstructure, floor finish included	19,376.94	2,508	cu. yds.	12.916
Concrete in basement floor	1,805.10	10,000	sq. ft.	.1805
Warehouse—				
Concrete in superstructure	22,673.35	4,090.4	cu. yds.	11.55
Concrete floor finish — poured separately	4,324.32	85,800	sq. ft.	.0504
Concrete basement floor	3,310.63	21,000	sq. ft.	.1577
Concrete saddles on cinders, roof	860.43	22,260	sq. ft.	.0387
Brickwork, pressed and common	16,568.84	650,000	M.	25.45
Cleaning and pointing outside walls	654.90	45,000	sq. ft.	.015
Machine Shop—				
Brickwork, pressed and common	10,628.00	400,000	M.	26.57
Cleaning and pointing outside walls	311.48	235.09	sq. ft.	.014
Concrete in first floor	6,216.00	35,000	sq. ft.	.1776
Blacksmith Shop—				
Brickwork, pressed and common	2,602.55	1,032.20	M.	25.20
Cleaning and pointing outside walls	90.31	7,530	sq. ft.	.012
Garage—				
Excavating and back-filling footings	1,080.10	689	cu. yds.	1.567
Excavating basement	818.72	540	cu. yds.	1.514
Concrete in footings and basement walls	3,992.70	280	cu. yds.	14.27
Office Building—				
Excavating and back-filling footings	569.41	385	cu. yds.	1.48
Concrete in foundations and piers	2,290.19	162	cu. yds.	14.12
Pavement—				
Concrete curb in place	1,749.28	3,700	lin. ft.	.473
Retaining Wall—				
Concrete	2,700.54	618.44	lin. ft.	4.37
		165.	cu. yds.	16.35
Pipe Tunnel	10,444.28	696.2	lin. ft.	14.98
		698	cu. yds.	14.96

The construction work done at the Marshall Boulevard Municipal Plant has been in local charge of William H. Dean, Assistant Engineer.

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LAKE VIEW PUMPING STATION.

The work of reconstructing the boiler room and installing five new boilers, three new pumps, coal storage, pipe vault, etc., started February 24, 1912, and on January 1, 1915, the discharge pipe vault and discharge pipe system had been completed, the foundations for the coal storage and boiler house had been completed, the erection of structural steel for boiler house and coal storage was completed, the walls and roof of the boiler house and coal storage superstructure were nearly finished, the new sewer system for boiler house was completed, the chimney was finished, the five Sederholm type boilers had been placed in position, the three new pumping engines were in service and the suction chambers for the fourth engine were erected, the light and power system was 71% completed, the plumbing and drainage work was 78% completed, and work had started on the heating system for boiler house and system for operating hydraulic valves in engine room and vault.

The above is in addition to the temporary boiler plant and other work of a temporary nature which was fully described in the Annual Report for 1912 and 1913.

The work done during the year 1915 has been as follows:

Completion of boiler house and coal storage superstructure.
Completion of light and power system.
Boilers completed and put in service.
New No. 1 pumping engine put in service.
Completion of power piping contract.
Steam heating system in boiler house and engine room completed.
Heating system in coal storage started and completed.
Completion of coal handling machinery.
Erection of condenser platforms.
Erection of feed pumps.
The covering of smoke breeching and all steam and water piping with non-conducting covering.
The erection of two sump and two bilge pumps.
Completion of plumbing and drainage work.
Laying of tile floor in boiler house.
Erection and placing in service of electric freight elevator.
Construction started on retaining and sea wall.

PERMANENT BOILER HOUSE.

The work done in 1915 on the permanent boiler house consisted of:

By City day labor:

Laying of finished cement floor throughout the basement and miscellaneous concrete and masonry work.
The installation of steam ash handling system.
The installation of miscellaneous piping and equipment.
Minor alterations and cutting of openings for doors and piping.

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By contract:

The completion of erection of steam generating equipment by the L. K. Sherman Co.

The completion of the light and power system by the Cuthbert Electrical Mfg. Company.

The completion of the plumbing and drainage work by Carl John Stein.

The completion of the heating system by the American Heating and Plumbing Corporation.

The covering of all smoke breeching and all steam and water piping with non-conducting covering by the Illinois Fire Proof Covering Co.

The erection of sump pumps by the Economy Pumping Machinery Co.

The laying of tile floor in boiler room by the Interior Tiling Co.

The installation of an electric freight elevator by the Otis Elevator Co.

The completion of boiler house and coal storage and superstructure by the Warner Construction Co.

The complete installation of the coal-handling machinery by the Stephens-Adamson Mfg. Co.

The erection of five feed pumps by the Nordberg Mfg. Co.

The new boiler house and equipment were described in detail in the Annual Report for 1914.

The work on the light and power system for the boiler house and coal storage started on May 2, 1914, and was completed in September, 1915. This work was done by the Cuthbert Electrical Mfg. Co., under contract, at a total cost to the City of $13,666.

The construction of the superstructure of the boiler house and coal storage was started by the Warner Construction Co., under a contract in July, 1914, and was completed in September, 1915. The contract price was $117,998, and there was an extra of $487 for special roof tile, making a total cost of $118,485.

The work of installing a plumbing and drainage system in the boiler house and coal storage was started by Carl John Stein under a contract on August 10, 1914, and was completed July 22, 1915, at a total cost of $4,086.

The installation of a heating system in the boiler house, engine room and vault was started on November 25, 1914, by the American Heating & Plumbing Corporation, and was completed July 14, 1915. The contract price was $4,009.

The erection of the five Sederholm type boilers and superheater was started by the L. K. Sherman Co., under a contract on September 30, 1914, and contract was completed May 1, 1915, at a total cost to the City of $73,075.

Two bilge pumps in engine room and two sump pumps in boiler room were installed by the Economy Pumping Machinery Co., under a contract for the sum of $1,779.

A 500-gallon per minute steam turbine driven centrifugal pump was furnished by the Kerr Turbine Co. under a contract for the sum of $1,595.

A cement tile floor was laid on main boiler room floor by the Interior Tiling Co. under a contract at a total cost of $2,600.

The coal handling machinery was erected by the Stephens-Adamson Mfg. Co. under a contract for the sum of $35,970.

An electric freight elevator was installed by the Otis Elevator Co. under a contract for the sum of $1,537.

The total cost of all work on the boiler house, exclusive of contracts, including labor, material, engineering and 15-per cent. operation charge, amounted to $31,276.14.

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PERMANENT COAL STORAGE.

The only work done during the year on the coal storage building consisted of finishing laying industrial track in basement and laying top on basement floor at west end. The cost of all work, including labor, material and 15 per cent. operation charge, amounted to $74.24.

ENGINE ROOM.

The work done in the engine room consisted of the completion of erection of the new No. 1 pumping engine by the Bethlehem Steel Co. under contract; the erection of platforms around condensers, etc., by the Frandsen Construction Co. under contract; the starting of painting of pumping engines by the City by day labor; the erection of new piping connection from new boiler house and the removal of connections to temporary boiler house by the City by day labor, and various miscellaneous steam-fitting and masonry work by the City, by day labor.

The temporary boiler house was shut down on July 15, 1915.

The engines were started with steam from new boiler house, as follows:

Engine No. 3, on July 9, 1915.
Engine No. 4, July 14, 1915.
Engine No. 2, on July 15, 1915.

The Bethlehem Steel Co. started the erection of the new No. 1 pumping engine under contract on December 7, 1914, and engine was completed and probation period started on November 15, 1915. The contract price was $89,900.

The condenser platforms, stairs, railings, etc., were completed by the Frandsen Construction Co., under a contract, on July 10, 1915. The contract price was $2,587.

The total cost of all work on the engine room, exclusive of contracts, amounted to $6,868.91.

SYSTEM FOR OPERATING HYDRAULIC VALVES.

The work done on system for operating hydraulic valves consisted of connecting up the four-way cocks and connecting the control lines to valves. Most of the work was completed in 1914.

The total cost of labor, material and 15 per cent. operating charge during the year was $1,312.44.

IMPROVEMENT OF GROUNDS.

The work done on improvement of grounds has consisted of the construction of a brick and concrete driveway for bringing in coal, the replacing of old cement sidewalks, the wrecking of old engine room foundations and temporary boiler house foundations with dynamite, and removal of wrecked material from station grounds, the construction of a Bedford stone and granite drinking fountain, the removal of all the old willow trees and the planting of new elm and other trees, the building of concrete seat and wall around drinking fountain and curb wall at north end of station grounds, the building of concrete foundation for 100-foot flagpole, the grading of entire station grounds except east of driveway and filling in with black dirt, etc.

All of the above work was done by City day labor.

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The new driveway is fourteen feet wide, and is constructed of paving brick on concrete base with concrete curb walls. The concrete for base and curb walls was made from stone obtained from the Wilson Avenue Tunnel without using any sand except for top finish. The driveway is 553 feet long, and total cost per linear foot, including concrete walls, was $6.03.

The total cost of all labor, material and 15 per cent. operation charge for the year was $22,002.79.

OUTSIDE SEWER SYSTEM.

The only work done on the outside sewer system consisted of laying 125 feet of 6-in. tile sewer with a 3-ft. trap manhole for connecting the downspouts at east end of coal storage with sewer on east side of engine room.

The total cost of all work done during the year was $350.07.

STEAM ASH HANDLING SYSTEM.

The steam ash handling system consists of an 8-in. extra heavy flanged steel pipe in front of boiler ash pits, with an opening underneath each ash pit gate. The pipe extends to a point just north of the coal receiving hopper where there is an elbow and 8-in. riser up into the top of ash hopper. There is an 8-in. ring steam jet at center of horizontal run and one near bottom of vertical run. The elbows have removable wearing backs and it is possible to easily remove any section of pipe that shows signs of wear. The system was installed by the City by day labor, at a total cost of $1,813.90.

STEAM HEATING SYSTEM IN COAL STORAGE.

The steam heating system in the coal storage consists of steam coils in basement of coal storage, radiators on all floors at east end of coal storage and steam coils on fourth floor of boiler house and coal storage building. This work was all done by the City by day labor, at a total cost of $1,314.57.

RETAINING AND SEA WALL.

This work was started by John O'Brien and William D. Scott, under a contract, on September 15, 1915, and should have been completed before the end of the year. Owing to the difficulty encountered in driving the foundation piles the work was delayed and finally abandoned on November 11, 1915. The contract is about 30 per cent. completed.

EXTRA WORK AND MISCELLANEOUS.

The work done has consisted of cleaning streets and grounds around station, watchmen, taking care of tools, men on vacations, etc. The total cost was $2,141.82.

The construction work at the Lake View Pumping Station was in local charge of John S. Dean, Assistant Engineer.

ROSELAND PUMPING STATION.

The work done at this station during the year consisted principally of the completion of work started in 1913 and 1914 in connection with the installation of the new pumping engines, new boilers and new coal bunkers.

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ENGINES AND PUMPS.

The two 25-million gallon triplex pumping engines installed by the Bethlehem Steel Co. were both placed in operation during the year. The installation of this machinery was commenced in 1914. The cost of the two pumps was $118,000.

One of these pumps, which was removed from the Lake View Pumping Station and re-erected at the Roseland station, was first placed in operation on February 12th. This is designated as the No. 3 unit. Considerable repair work was required on this engine before it could be operated satisfactorily and as detailed below several of the wearing parts were renewed. This repair work was not included in the contract for re-erection and was done by City labor.

The No. 4 unit, or new engine, was first placed in operation on June 19, 1914. The completion of this engine was delayed considerably by labor trouble and by difficulties in replacing steel lagging, the first shipment of which was rejected.

Considerable effort has been expended to locate the cause of a knock in the intermediate crankpin of No. 3 engine. The cause was found to be faulty fitting of new drag link boxes furnished by the City. Owing to operating conditions no opportunity has yet been found for remedying same. In other respects the work has been completely satisfactory, and the engine is in regular operation.

The No. 4 engine is completely erected, and in satisfactory operating condition except for the water valves. The contractor is now making changes in the valves to improve their operation.

The following is a summary of the work done by City forces in connection with the above installation:

Rebuilding the jacket and drain piping of the No. 3 engine to a system suitable for the use with the independent vacuum pumps; cost, $96.19 for labor and $75.75 for material.

Placing new packing of the LaFrance marine type on the low pressure exhaust valves of the No. 3 engine and placing a new stem on the upper valve; cost, $148.40 for labor and material. New stems on the Corliss valves and new Lubra packing; cost $147.55 for labor and material.

Oil splash pans under the connecting rods and pans under the water plunger aprons; cost $356.47. Part of this work, to the amount of $149.83, is to be charged to the Bethlehem Steel Co., who, because of labor troubles, were not able to have pans placed on the new engine when they were needed. In order to avoid delay, the work was done by the City.

New dowel pins were required for the housings of the No. 3 engine, because of the relining of this engine. This cost $45.50.

New gallery plates for the No. 3 engine, not included in the Bethlehem Steel Co.'s contract, were purchased and installed at a cost of $480.

Cleaning and adjusting the throttle valve and changing the oil piping cost $23.75 for labor.

The hydraulic controls on the suction valves of the Nos. 3 and 4 engines cost $63.33.

The door openings through the foundation walls into the pipe vault were enlarged to permit the entrance of large pipe at a cost of $85.20.

Concrete piers under the discharge lines cost $45.40.

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Fitting the brasses on the No. 3 engine cost $94.88. These brasses were furnished new by the City during the previous year and were accurately fitted after the engine was started.

The installation of a water supply line for hose connections in the pump pit cost $47.48.

A new Westinghouse air compressor was installed for use in connection with the new engines. This installation, inclusive of steam, exhaust and air piping, cost $188.81 for labor and $341.84 for material.

Replacing the floor in the engine pit, which was destroyed in building the foundations for new engines, cost $533.37 for labor and material.

The entire water pipe discharge system of the station was cleaned and painted at a cost of $645.61.

Engineering, superintendence and inspection of this installation during the year cost $763.39. Other expenses for labor and material incidental to the installation of these engines amounted to $654.06. This expenditure was for cleaning after the construction work, repairing concrete on beams in the pipe vault, removing the old cement storage shed, pipe covering, electrical work, installing bronze tablets at the station entrance, progress photographs, a cover for the car pulling machine, and other miscellaneous work.

A centrifugal sump pump, having a capacity of 200 gallons per minute, driven by a direct-connected steam turbine, was purchased from the Swaby Mfg. Co. for $725. This pump, with an automatic control, was installed in a new concrete sump at the bottom of the engine pit, in connection with a No. 3 Nye pump as an auxiliary.

The cost of the concrete sump, 5 feet in diameter and 8 feet deep, was $151.10 for labor and material. The cost of setting these pumps was $37.95, and steam, exhaust and discharge piping cost $423.40 for labor and material. Insulating covering to the amount of about $100 has been ordered for this pipe, but has not yet been furnished.

To connect the discharge lines of Nos. 3 and 4 units with the general discharge system of the station, special 42-inch off-set pipe castings were necessary. These castings were purchased by this division and were installed by the Water Pipe Extension Division. Labor and material to install these connections cost $848.45.

The above described work, done in connection with the new pumping engines, cost during the year $8,128.99. These charges were divided between work orders as follows: No. 180, $5,891.55; No. 285, $1,320.30 and No. 136, $917.14.

Inclusive of work done in 1913 and 1914 the total cost of work done in connection with this installation is $19,863.14.

BOOSTER PUMPS.

These units, consisting of two turbine driven centrifugal pumps, were installed and placed in operation in 1914.

The painting of the machinery, which was commenced in December, 1914, was completed in January of this year. The cost of the work was $270.84.

Electrical work to complete the lighting system cost $15.80.

Pipe covering was paid for to the amount of $25.28.

The suction ends of the vacuum pumps of these units were cross connected to permit the use of either pump on both condensers. This work cost $55.97 for material and $34.44 for labor.

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These units were designed to deliver each 5,000,000 gallons per 24 hours and since they would not operate efficiently under present conditions, which demand only 2,500,000 gallons per 24 hours, a special small impeller was purchased at a cost of $320, to be used until growth in territory requires a greater capacity. Pipe covering for the drain lines previously installed cost $69.98.

Total charges made against work done in connection with these units during the year, inclusive of operation percentage, were $861.50.

The total final cost of the installation was $38,301.

NEW BOILERS.

These boilers, designated as No. 5 and No. 6, the installation of which was commenced in 1914, were completed and official test run on the No. 6 boiler on February 25th and 26th. Both boilers have been in satisfactory operation since the test:

Expenditures to complete this installation were made during the year as follows:

For insulating covering on boiler headers and breeching	$ 712.50
Electric lighting system	274.54
Changes in plumbing and floor drains	106.52
Pits under stokers	245.22
Services of expert, labor, meals and miscellaneous items in connection with test	403.37
Platforms and ladders to permit access to coal bunkers	70.44
Drying out and cleaning boilers	32.40
Painting insulating covering	34.96
Miscellaneous items	34.45
The total amount of all charges made during the year, inclusive of operation, was	2,139.60
The total cost of the installation of these boilers was	$23,724.24

NEW BOILER FEED PUMPS.

Two new horizontal boiler feed pumps have been delivered by the Warren Steam Pump Company, which are to be installed by the city. Material has been ordered for the installation, but the work is not yet started.

COAL BUNKERS.

The two 90-ton capacity concrete lined steel coal bunkers, erected during 1914, were placed in commission in connection with the new boilers.

Bottoms for these bunkers, of the universal toggle joint type, with gates and spouts, were placed on the bunkers at a cost of $192.65.

Painting the steel work of the bunkers with one coat of red lead in linseed oil cost $106.26.

Together with operation cost, the total charges made against this installation during the year amounted to $329.94, and the total final cost of the two bunkers was $5,344.72.

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CONCRETE LINING IN OLD COAL BUNKERS.

The steel coal bunkers in connection with boilers installed when this station was first placed in operation have been in use for about four years and despite the fact that they have been painted every year, were found to be badly pitted on the inner surface from the effects of the coal. In some places the steel was eaten through entirely.

To protect this steel and avoid the expense of painting, the bunkers were given a lining of concrete. The lining consists of from 2½" to 3½" of Portland cement plaster, reinforced with wire mesh. On the vertical side the reinforcing was attached by 3/8" rods run through holes drilled in the stiffener angles.

The mortar was applied with a cement gun, and was coated with an application of a hardening paint.

The cost of covering the 3,424 square feet of surface was as follows:

Scaffolding, at 4c per sq. ft.	$ 137.76
Reinforcing at 6c per sq. ft.	209.73
Plaster material at 6c per sq. ft.	203.63
Placing at 18c per sq. ft.	608.40
Hardening paint at 2c per sq. ft.	74.00
Cleaning and miscellaneous at 2c per sq. ft.	68.02
Engineering and superintendence at 2c per sq. ft.	52.15
Operation, 5.4c.	203.05
Total, 45c per sq. ft.	$1,556.74

AIR PUMP EXHAUST AND HOT WATER RETURN PIPING.

This piping to provide exhaust lines from the vacuum pumps of the new pumping units and return discharge lines from hot well pumps to feed water heater was completed during the year.

All material used in this work was purchased by requisition and the piping was erected by City day labor.

The total cost of the work was $1,608.64, including $601.71 for insulating, covering and painting.

STEAM POWER PIPING.

The piping to connect the new boilers to the station distribution system and piping in connection with the soot blowers on the boilers was purchased partly by contract and partly by Business Agent's order, and all was installed by City day labor. This work, commenced in 1914, was completed during the past year.

The cost was as follows:

Pipe and fittings purchased under contract	$ 825.00
Labor of cutting openings in concrete walls and floors	191.60
Pipe, fittings, valves and miscellaneous material purchased on Business Agent's order.	1,357.37
Insulating covering and painting.	937.38
Steam fitting labor.	624.50
Engineering and operation.	401.53
Total	$4,337.38

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STEAM FLOW METERS.

A steam flow meter was installed on each of the new boilers at this station. A Levin meter with recording device was installed on the east or No. 6 boiler, and a Republic steam flow meter with electrical recording devices was provided on the No. 5 boiler.

These meters cost $220 and $225 respectively. Labor, engineering services and material used in this installation cost $104.06, and the operation charges were $82.36. The total cost was $631.42.

FLAG POLE FOUNDATION.

Material used in this foundation, which was built in 1914, paid for during this year, amounted to $33.48. The total final cost of the foundation was $293.73.

The construction work at the Roseland Pumping Station previous to October 15, 1915, was in local charge of A. G. Anderson, Junior Engineer; after October 15th, the work was placed under supervision of William A. Nelson, Mechanical Engineer, Mr. Anderson being transferred to the work at the Municipal Reduction Plant.

CENTRAL PARK AVENUE PUMPING STATION.

The construction work done in connection with the installation of a new boiler plant at this station during 1915 consisted of the installation of five new 500 horse-power boilers, complete with stokers, superheaters, appurtenances and accessories; the construction of foundations for boilers, ash and conveyor trenches; the installation of coal handling machinery, coal bunkers, etc.; the installation of new power piping and accessories, and the erection of new breeching connections.

The above work involved considerable work of a temporary nature, such as temporary steam piping, breeching connections, etc.

The work of reconstruction started on November 4, 1915, with the building of a plank platform and runway to permit station force to place its storage coal without interference with storage space for boilers and other construction material.

Two construction sheds have been built, each 14'x37', one for use of steam fitters and storage of steam fitting tools and supplies, the other for office, men's locker room, cement storage and tool room.

The excavation for foundation of boiler No. 2 started on November 11th, and was accomplished under considerable difficulty, owing to the nature of the material to be excavated, water, and the necessity of not interfering with the operation of boiler room. The total quantity of material excavated, consisting of clay and old cement floor, amounted to 233 cubic yards, and the cost of excavation and removal to yard outside of boiler room was $2.97 per cubic yard.

After completion of the excavation, the forms were built for foundation, and concrete placed on December 30th.

The total concrete placed amounted to 54½ cubic yards, and cost $22.31 per cubic yard. The high cost is due to the number of openings for pipes, doors, etc., and to the great amount of reinforcement and complicated nature of forms.

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The furnishing and erection of the boilers is to be done by William A. Pope, under contract, but the only work done at end of year was the unloading of material for one boiler.

All the above work has been done by City day labor, and the total cost of all work including labor, material and 15 per cent. operation charge was $3,056.17.

The construction work in connection with the installation of boiler plant at this station was in local charge of John S. Dean, Assistant Engineer.

RETAINING WALL.

This work consisted in building a concrete retaining wall along the coal track of the station. The coal track was taken up along the proposed extension of retaining wall and excavation made taking care of the railway embankment by proper shoring. The first plan called for a wall 50 feet long, but it was decided to increase this to 81 feet in order to bring the wall past a driveway near the east end of the rear. The concrete work was finished May 8th and the pipe railing on top of wall was finished May 15th. The forms were taken down and backfilling finished ready for the relaying of the coal track. The total cost of the work amounted to $1,207.84. The total concrete placed was 96 cubic yards, and unit cost per cubic yard in place was $12.58.

The work in connection with the construction of the retaining wall was in local charge of F. A. Smith, Assistant Engineer.

68TH STREET PUMPING STATION.

Wrecking No. 1 Pumping Engine.

This work was started December 28, 1915, and is preparatory to the work of installing two new steam turbine engines and two centrifugal pumps. It is intended to take down both No. 1 and No. 2 pumps, break up castings, and ship them to the Municipal Foundry. The cost of the work done on this job at the end of the year amounted to $40.83.

SURVEY.

A survey was made of the 68th Street Pumping Station beginning in March for the purpose of getting definite information of actual conditions. This survey included a complete plan of the basement and main floor, including steam piping, suction wells, etc. The work was done by employes of the Construction Division and a draftsman of the Designing Division. The work was finished April 18th and cost $124.62.

The above work was in local charge of F. A. Smith, Assistant Engineer.

STONY ISLAND AVENUE SEWAGE PUMPING STATION.

New Boiler Installation.

A contract for the furnishing and installation of a 190 horse-power water tube boiler in this station was let to the E. Keeler Company, of Williamsport, Pennsylvania. The concrete foundations were started on August 19th and finished August 20th. Work was resumed September 8th, when new boiler arrived, and the work of erection continued without interruption through the entire month of September up to October 11th, when the brickwork, including firewalls and furnace lining, also connection to breeching, was completed.

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The steam piping in connection with this boiler was installed by J. E. Russell & Company, sub-contractors, in the early part of December. All the steam piping was covered with asbestos covering and a light fire was kept going in the boiler for some time to dry it out thoroughly before raising steam.

UNDERFEED MECHANICAL STOKER.

In connection with the new water tube boiler, an automatic underfeed stoker was installed by the Combustion Engineering Corporation. The city built foundation for engine, blower and air duct, and the contractor installed all the other apparatus. Amount of contract, $1,750.

The work of providing a foundation for the engine and fan for the new underfeed stoker was started July 19, 1915, by making forms for blower duct and by cutting necessary holes in concrete floor, setting beams and bolts and placing concrete foundation for blower and blower engine. The expenditures on this work, which was done by City day labor, including overhead expenses, amounts to $122.19.

The construction work at the Stony Island Avenue Pumping Station was in local charge of F. A. Smith, Assistant Engineer.

22D STREET PUMPING STATION.

Repairs to Dock.

This work, which had been started in December, 1914, was finished during the month of January of this year. The work consisted of planking over an area 6 feet wide by 180 feet long along the west side of the coal track and east of the slip. The 2" planking was supported by 6"x6" timbers extending across and anchored to the track. A railing was erected on the west line of walk the full length of the dock to insure the safe use of same by switchmen while switching cars.

The expenditures made on this work, including overhead expense, amounted to $337.82.

The above work was in local charge of F. A. Smith, Assistant Engineer.

CHICAGO AVENUE PUMPING STATION.

Installing Steel Platforms in Shafts J, K and M—Also Placing Steel Door and Frame for Shaft K.

This work consisted of taking out the timber platforms resting on I-beams in shafts J. K and M of the Chicago Avenue Pumping Station and in installing of steel platforms instead. Much cutting was required in the walls of the shafts for the setting of base plates and 15" channels, which support the new platforms. The work of erecting the steel work was done by structural steel employes of the Bridge Division. The erection of the steel work was completed in August and painting was finished in September.

The platforms, door and frame were furnished under a contract by the Sprague Iron Works, who delivered the material at the station, at a cost of $549. The cost of the City day labor work in connection with this installation amounted to $573.12, which includes overhead expense.

The above work was in local charge of F. A. Smith, Assistant Engineer.

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PULLMAN SEWAGE PUMPING STATION.

Pumps.

On July 2d a contract was let to the United Engineering Company, in an amount of $3,979, for the designing, constructing and erection of two three-million gallon motor driven centrifugal sewage pumps. The contractor commenced work on same on October 27th and completed the installation November 27th.

Each pump is of the single stage horizontal shaft, centrifugal type with single suction, single impeller and single discharge.

The motors are of the slip ring, induction type, 60 cycles, 230 volts, alternating current. Each motor has a capacity of 75 horse-power at full load.

The above work was in local charge of F. A. Smith, Assistant Engineer.

95TH STREET INCINERATOR PLANT.

The work of constructing this plant for the Department of Health, commenced in 1914, was continued throughout the year. The work done in 1915 consisted of the following:

FOUNDATION AND BASEMENT.

On account of lack of funds and a change in plans, the work on the foundations was at a standstill from January 1st to April 9th. Prior to this time the excavation was about one-half completed and braced, but due to rains and the nature of the swampy grounds the sides sloughed in, breaking all timbering and practically filling up the excavation. Work was resumed on April 9th and completed on September 7th.

The basement is 28 feet deep, 160 feet long, and 29 feet wide. The south half consists of six ash pits and a concrete runway, while the north half has two floors for storage purposes. The top floor area is 92 feet wide and 160 feet long. The top floor, which is 4 feet deep, consists of a series of tunnels, beams, air ducts, chutes and holes.

A 2-foot brick sewer, 2,100 feet long, and 18 manholes were constructed from the plant to the 99th street sewer.

On account of the swampy land surrounding the plant, a cinder road was constructed from 95th street to the plant, a distance of about 500 feet, and a roadbed for two switch tracks was also laid. The tracks on the roadbed were laid by the Chicago & Western Indiana Railroad.

RADIAL BRICK CHIMNEY.

Contract let by Health Department to Heine Chimney Company, December 18, 1914, at a price of $11,050.

The contractor commenced work on April 1st and completed the same June 9th. This work consisted of erecting a radial brick chimney 200 feet high, inside diameter 6'6". The outside of the chimney tapers from 21 feet at the bottom to 8 feet 10 inches at the top. The brickwork used was reinforced radial with circular surfaces on the outside and inside. The buff glazed face brick was laid in dark maroon colored mortar. Iron ladders were erected both

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inside and outside. This chimney is erected on a concrete foundation 21 feet square and 10 feet high, resting on four concrete piles 4 feet in diameter and extending about 60 feet to bed rock.

The construction work at the 95th Street Incinerator Plant prior to April 19th was in local charge of F. A. Smith, Assistant Engineer; after that time, the work was in charge of Jerome Cermak, Junior Engineer.

CHICAGO AND COOK COUNTY SCHOOL FOR BOYS.

Removal and Erection of Water Tank.

On September 2d, the Memphis Steel Construction Company of Pennsylvania received a contract for taking down a 100,000 gallon steel water tank at the Morgan Park Pumping Station and transporting and re-erecting same at the Chicago and Cook County School for Boys at Berwyn, Illinois, for the sum of $2,490. At the end of the year the work was not yet completed.

In connection with this above contract, the city forces constructed concrete piers for the tank at Berwyn.

The above work was in local charge of Jerome Cermak, Junior Engineer.

CONTAGIOUS DISEASE HOSPITAL.

Boring and Test Pits.

The work of making borings and tests pits at the site of the hospital, 31st street and South California avenue, was started March 9th, by making a boring thirty-four feet north of north wall of Administration Building, and boring down to bed rock through strata as follows:

14 feet soft yellow clay.
2 feet hard clay mixed with gravel.
10 feet stiff blue clay.
2 feet sand.
2 feet stiff clay.
2 feet sand.
— feet bed rock.

Another boring was made fifteen feet south of south wall of Administration Building foundation, boring down to bed rock through strata as follows:

13 feet soft yellow clay.
28 feet stiff blue clay.
to bed rock.

A third boring was made midway between Administration Building and the Contagious Disease Hospital, thirty-eight feet east of hospital, giving the following indications:

13 feet soft yellow clay.
22 feet stiff blue clay.
3 feet sand and boulders
to bed rock.

Two test pits were excavated eight feet square to a depth equal to foundation footings and two timber platforms were built having a loading

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area of sixty-four square feet and a bearing area of five square feet. This was by special request of the City Architect in order to get a reliable comparison with the foundation footings which are five feet in width. For loading material we used eighteen cubic yards of torpedo sand, which was placed in cement sacks and weighed. Observations of settlement were taken by the City Architect's office. The cost of the work, including overhead expense, amounted to $448.89.

The above work was in local charge of F. A. Smith, Assistant Engineer.

HEATING SYSTEM.

This work consisted of changing over the heating system from a high to a low pressure system. This necessitated removing the engine running the laundry machines, boiler feed pump and receiver pump and erecting motors instead of same. All traps and certain parts of the header, valves and piping were also changed. While this work was in progress it was necessary to keep up steam for heating the hospital. At the end of the year the work was practically completed and cost at that time $1,550.66, which includes overhead expense.

This work was in local charge of Jerome Cermak, Junior Engineer.

REPAIR SECTION.

The following is a report of the work done by the Repair Section of the Construction Division from the time the repair work was taken over from the Water Works Shop and Repairs Division on October 7, 1915, to December 31, 1915.

On October 7th the Water Works Shops turned over twenty-two jobs to this division, twenty of which have been completed, one is in progress and one has been canceled.

Eighty-five jobs have been received through the Construction Division office; of these seventy-one have been completed, ten are in progress, and four have been canceled.

The following is a tabulation of the money expended:

	Labor	Material	15%	Total
Mason work.	$3,726.03	$ 149.02	$ 581.29	$4,456.34
Plastering jobs.	255.64	31.86	43.12	330.62
Painting jobs.	2,485.29	1,503.40	598.33	4,587.02
Roofing jobs.	186.73	44.64	34.71	266.08
	$6,653.69	$1,728.92	$1,257.45	$9,640.06

Overhead expense.	$1,150.29		
Vacations.	160.40		
Total pay rolls	$1,310.69	+ $6,653.69 =	$7,964.38

Materials and supplies purchase	$2,985.92
Materials and supplies on hand, as per inventory	1,765.97

The work of this section has been in local charge of Jerome Cermak, Junior Engineer.

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MISCELLANEOUS TESTS, INSPECTIONS, ETC.

During the year 1915 tests were made and inspection work carried on at various locations as follows:

Lake View Pumping Station: Inspection of new boiler plant and of pumping engine No. 1 being installed by the Bethlehem Steel Company was carried on throughout the year.

22d Street Pumping Station—Four 225 Horse-power Boilers: A number of preliminary and three official tests have been conducted on the new boilers installed by the E. Keeler Company. A complete account of the tests and a description of the installation is contained in a special official report on file in the Bureau of Engineering. The final official tests, conducted September 28th, proved satisfactory.

A careful investigation of the boiler installation and operating conditions at this station has been made to the City Engineer.

Central Park Avenue Pumping Station: Official acceptance tests of the 25,000,000 gallon steam turbine driven centrifugal pump, built and installed by the Allis-Chalmers Company, were conducted on February 10th. A special report has been published and is on file in the Bureau of Engineering.

14th Street Pumping Station: The twenty-five-million gallon steam turbine driven centrifugal pump, built and installed by the Allis-Chalmers Company, started its probation period February 4th and satisfactorily completed same on October 2d. Much difficulty was found in locating the cause of excessive vibration in this unit and elaborate studies were undertaken for this purpose. The trouble was finally located and remedied after which no further difficulty was experienced.

Harrison Street Pumping Station: Investigated trouble with new twenty-five-million gallon centrifugal pump due to air entering suction. Trouble was stopped when injection valve on old pump was closed. Pump has operated satisfactorily, completing probation period. The above in connection with steam turbine driven centrifugal pump, installed by the Allis-Chalmers Company.

Official acceptance tests were conducted on the new 340 horse-power water tube boiler, built and installed by the Oil City Boiler Works. A special report is published and on file in the Bureau of Engineering.

68th Street Pumping Station: Official tests of the Boyd turbine valve seats installed in the No. 7 pumping engine were conducted and the results completely reported in a special report on file in the office of the Bureau of Engineering.

Jefferson Park Pumping Station: Official acceptance tests were conducted of two motor driven centrifugal booster pumps. A special report is on file in the Bureau of Engineering.

Pullman Sewage Pumping Station: Official shop tests were conducted of the two new motor driven centrifugal pumps. A special report is on file in the Bureau of Engineering.

Technical Board—Vessel Safety: The mechanical engineer in charge of tests was appointed a member of the Technical Board Vessel Safety, and has helped to conduct stability tests on twenty-three lake passenger steamers entering the port of Chicago.

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Miscellaneous Tests: Tests of lubricating oils used on the air compressors at the Wilson Avenue Tunnel have been conducted.

Special work was also done for the City Engineer in connection with the safety of the water supply against contamination in or near the pumping stations.

The above work was in local charge of William A. Nelson, Mechanical Engineer.

MUNICIPAL REDUCTION PLANT.

Dryer House No. 3.

At the beginning of the year 1915, construction work was still being carried on at this building; stairs and balconies were erected around the hoppers and a scaffolding was built for the lining of the two stacks with fire brick. Trap doors were built for the garbage tanks and a wall built around the conveyor; also a conveyor connection was erected from Dryer No. 3 to Dryer No. 1.

All scaffolding and debris were removed and Dryer House No. 3 was ready for operation about March 1, 1915.

The above building was completed at a total cost of $35,009.26.

39TH STREET PAVEMENT AND COAL BUNKERS FOR NO. 3 DRYER.

Thirty-ninth street, from Iron street to the receiving building, which had never been paved, was improved with a granite block pavement, sidewalk and curb and sewer. A new concrete pit was also built for the wagon scale. All of this work, except the laying of the blocks, was done by this division and cost $5,581.90 for supervision, labor, material and operation charges.

Plastering on the No. 3 dryer house, which had not been previously completed because of cold weather, was finished, and the coal bunker was lined with 2½ inches of concrete on metal lath. This work cost $572.75.

TANK HOUSE.

A one-story addition, 21'x49' in plan, was built to the extractor plant for the housing of grease percolator tanks. The structural steel and steel sash and doors for this building were furnished by the Health Department. All other material and all labor for erection was furnished by this division.

Clearing the site and building the foundations, floor and sewer system for this building cost $1,447.52. The superstructure cost $1,906.43.

HOUSING FOR FUEL OIL STORAGE TANKS.

A one-story concrete and brick structure, 50'x18' in plan, was built near the dock for housing fuel oil storage tanks. All material and labor in this building, except for the metal roof, was furnished by this division.

The excavation for this building and the construction of a concrete floor and a sewer cost $554.46. The concrete walls cost $562.39 and other work on the superstructure cost $255.07.

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REHABILITATION OF MILL BUILDING.

The contract for the disposal of the dried garbage from this plant expired on July 28th, and in order to place the old mill building and the grease extraction plant in condition for operation considerable work was done by this division. This work, consisting of the construction of conveyors and housings, hoppers, screen tables and temporary shelters, the repair of mill foundations and other miscellaneous work, was commenced on July 14th, and at the request of the Health Department was rushed as much as possible, a great deal of two-shift and overtime labor being necessary. The total cost of this work was $4,010.66.

CONVEYOR HOUSING BETWEEN NO. 2 AND NO. 3 DRYER HOUSES.

A scaffold and housing for a garbage conveyor was built from the roof of the No. 2 dryer house to the No. 3 dryer building. This structure is supported by wood and steel trusses between the two buildings. The construction of this conveyor was completed on September 26th, but fire destroyed the structure, except for the trusses, shortly afterwards, and it was rebuilt.

The original cost of building this structure was $671.60, and the cost of rebuilding amounted to $318.73.

FOUNDATIONS FOR GREASE TANKS.

Two concrete foundations, four feet deep and twenty feet in diameter, with valve vaults and concrete stairs, were built for steel tanks to be used for the storage of extracted grease. Cleaning the site and building these foundations cost $1,220.70.

PAVEMENT FOR WASHING WAGONS.

A trowel-finished concrete pavement, 6 inches thick and 2,000 square feet in area, was built at the dock to be used for washing wagons and garbage boxes. The surface was marked off in six-inch squares, to provide footing for horses.

This work, inclusive of grading and excavation, cost $353.24, or at the rate of 17.6c per square foot.

CONCRETE FLOOR IN NO. 1 DRYER HOUSE FEED ROOM.

The concrete floor of this room on the second floor of the No. 1 dryer house leaked badly and was very rough. The floor was resurfaced with from 5" to 3" of trowel-finished concrete at a cost of $290.60, or at the rate of 24.7c per square foot.

In order to avoid interference with the operation of the plant, the work was done outside of the regular working hours.

NAPHTHA STORAGE TANKS.

Excavation was commenced on October 7th for a structure to house naphtha storage tanks. Because of a necessary change in the plans this was stopped on October 14th, but was commenced again with revised plans on November 16th. At the end of the year work was completed so far as was possible before the tanks were set.

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The work in connection with these tanks involved the excavation of 970 cubic yards of earth, the placing of about 145 cubic yards of concrete in forms, and the casting of concrete beams and manholes.

All excavation was completed at a cost $1,633.42. Six hundred yards of the material was disposed by scow, and the remainder stored for backfill over the tanks.

A reinforced concrete retaining wall was built along the street side of these tanks at a cost of $501 for 40 cubic yards of concrete in forms; reinforcing for same cost $135.13. This wall will act as a foundation for a brick fence to be built later.

A concrete pit, involving 40 cubic yards of concrete in wall forms, cost $555.53 for concrete and forms and $103.12 for reinforcing.

The foundations for tanks cost $143.80 for the 16 cubic yards of concrete placed.

Sheeting the excavation, to protect the street, railroad track and a nearby building, cost $192.08.

Casting the reinforced concrete beams, to be set later, cost $112.75 for eight beams 10"x15" x about 10' long.

Other miscellaneous labor and material purchased but not used at the end of the year brought the total expenditures to $3,589.31 for work in connection with these tanks.

COAL HOPPER FOR NO. 3 DRYER HOUSE.

To provide for the installation of a coal hopper and an ash and coal conveyor in connection with the No. 3 dryer house, a pit was excavated under the railroad switch track adjacent to the dryer house and necessary concrete foundations built and steel girders set to support the track.

In order to avoid interference with the use of the track, a temporary wooden trestle structure was used while the concrete walls to support permanent steel girders were built.

All work in connection with the coal pit is completed as far as is possible before the steel hoppers, furnished by others, are set.

Openings for coal chutes were also cut in the concrete floor of the dryer house.

Total expenditures to date for work in connection with this conveyor amount to $879.10.

NEW DRYER HOUSE.

Work was commenced on August 17th on the foundations for a new dryer house. The progress of this work was stopped by the Department of Health on August 23d, pending a change in plans. Excavation was resumed on December 1st under new plans which doubled the size of the building and at the end of the year about 1,900 cubic yards, or 80 per cent. of the excavation was completed, and about 115 cubic yards, or 15 per cent. of the concrete foundations placed.

All excavation is being done by shovel and wheelbarrow, the excavated material being removed directly to a scow at the dock, the average wheel being about 200 feet. Excavation and loading has cost $2,330.75, or at the rate of $1.23 per cubic yard, inclusive of operation charges. Because of the proximity of other buildings, considerable sheeting was required, the labor on this amounting to $131.27.

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The concrete placed, the work being done in freezing weather, has cost $714.97, or at the rate of $6.14 per cubic yard, for labor. This includes cost of forms and operation charges.

Unloading 533 cubic yards of gravel from cars and hauling in wagons to the site of the building has cost $184, or 34c per cubic yard. Unloading 271 cubic yards of sand cost $130.55, or 48c per cubic yard. Part of this sand was badly frozen in the cars.

Other expenditures for miscellaneous labor and for material purchased for this building bring the total charges to the end of the year to $5,352.93.

NEW MILL HOUSE.

Excavation for the basement and foundations of this building was commenced September 10th. All work in connection with this was completed in November except for the floors. The basement floor was laid in December and the forms built for the floor at the ground level. The completion of the latter is delayed pending plans for electric conduits.

The work involved 1,848 cubic yards of very wet excavation, placing 564 cubic yards of concrete in forms, the construction of a sewer system, 2,200 square feet of basement floor, and the construction of forms for 2,100 square feet of reinforced concrete floor.

Clearing the site for this building and removing rubbish and old structures cost $354.91.

The excavation, which was done to a depth of about eight feet with wheeled scrapers and the remaining four feet with shovels and wheelbarrows, cost $2,778.67 for removal to the dock, a distance of about 500 feet. Loading the excavated material on scows for disposal cost $1,582.04.

To protect the foundations of surrounding buildings it was necessary to sheet nearly all of the basement excavation. This prevented the completion of the excavation below a depth of eight feet before the concrete walls were placed. The sheeting was used as back-forms for the basement walls, and cost $754 for labor and material, or at the rate of 23c per square foot.

The concrete placed in forms cost $5,890.45, or at the rate of $10.44 per cubic yard for labor and material.

The cost of the sewer system of about 400 lineal feet of 12" and 8" pipe, with three manholes, was $891.06. All excavation for this sewer was sheeted.

The concrete floor in the basement cost $173.27 for labor and operation charges, or at the rate of 8c per square foot. The basement sewer system, with a five-foot concrete sump and iron sump ring, cost $121.53.

Building forms for 2,100 square feet of reinforced concrete floor cost $432.17, or at the rate of 20½c per square foot.

Other miscellaneous work and expenditures for material for industrial track, reinforcing steel and concrete material now on hand, bring the total charges for work in connection with this building to $16,060.87.

OFFICE AND SHOP BUILDING.

A building, to be used for shops, storeroom, offices and laboratory, is under construction on the ground at the corner of 39th and Iron streets.

This building is 177 feet 3 inches long by 38 feet wide, and covers 6,735 square feet of ground. The front portion, covering 1,377 square feet, is two stories in height, and is to be utilized for the offices and laboratory. The rear,

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covering 5,358 square feet, is utilized for shops and storerooms, and is one story high with a monitored gable roof.

The structural steel, the shop roof of Federal cement tile, all doors and sash and frames, and the plumbing, heating and sheet metal work are being furnished by the Department of Health. All other material and labor is being furnished by this division.

Work was commenced on this building in July, and at the end of the year was completed except for wood trim and floors in the offices and plastering the shop toilet and corridor. Progress was delayed a great deal by difficulties in obtaining the structural steel and other material.

The site of this building was occupied by an old frame building used for shops and storerooms, and in order to avoid interference with plant operations the old building was not completely wrecked until the new one was finished. Wrecking this old building and moving the material stored on the ground cost $563.86.

Excavation and concrete for the foundations cost $2,099.14.

The brickwork, cut-stone and tile partitions cost $6,592.79.

Reinforced concrete slabs, for office roof and for floors, cost $1,893.16, inclusive of roofing, etc.

Ground floors of concrete in the office and shop cost $852.70.

The reinforced concrete vault in the office cost $346.09.

A concrete trench in the shop covered with steel plates cost $537.54. This is to be used for heating and plumbing pipes.

Setting the sash, doors and frames in the building and glazing cost $771.81.

The suspended ceilings in the office building, furring, metal lath, metal beading and plastering, cost $1,999.92.

Painting for outside metal and wood work and filling oak trim for interior has cost $257.39.

A temporary construction office and tool and storeroom cost 293.86.

Other expenditures for labor and material used on miscellaneous work charged to this building make total charges of $17,818.58.

FLOOR IN CRANE REPAIR SHOP.

A two-inch floor, of D&M yellow pine, was laid on the old floor of the monorail crane repair shop. This work cost $120.14, or at the rate of 13c per square foot.

GLAZING IN OLD MILL BUILDING.

The Health Department requested this division to close all window and door openings now open in the old mill building. This was to provide for the possible operation of the plant during the winter.

Work was commenced on this on December 2d, but at the request of the Health Department was discontinued the next day, it having been found that the building would not be required. The work done cost $44.50.

WASH TANK IN RECEIVING BUILDING.

Work on the construction of a concrete and steel wash tank for garbage boxes in the receiving building was commenced on December 15th. The structural steel for this tank was furnished by the Department of Health; all other labor and material was supplied by this division.

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To provide footings for the steel columns for these tanks it was necessary to excavate considerable of the old concrete. This has been completed and necessary new concrete for these footings have been placed and steel will be set at an early date.

Expenditures made on this work at end of year amounted to $122.65.

WRECKING OLD MILL BUILDING.

At the request of the Department of Health the wrecking of the stack and other portions of the old mill building, which interfered with the construction of the new dryer house, was commenced on December 7th. All of this building is to be wrecked later. Lumber in this building is being salvaged for use in concrete forms.

Expenditures at end of year on this work amounted to $352.99.

BRICK FENCE AND WATCHMAN'S STATION.

The Department of Health has requested this division to construct a watchman's station at the Iron street entrance and a brick fence along Iron street from the office building to the railroad switch track. The Department of Health is furnishing coping stone for this work, and all labor and other material is being furnished by this division.

No work has been done on this order as yet, but brick to the amount of $100.20 has been purchased.

PLACING CONCRETE PLUG IN BREAKWATER SHAFT.

This work consisted in placing a concrete plug in an old shaft over the Four Mile Tunnel off the Government Breakwater opposite 12th street. The work started June 18, 1915, by assembling material in the Kinzie street yard of the Bridge Division where a double oak platform was prepared to fit the ten-foot diameter shaft. A scow was rented from the Bridge Division to store the necessary cement, torpedo sand and gravel. The tug service was done by the Carter H. Harrison, which took the scow to the shaft June 22d. The top had been cut off the shaft and the city diver made an examination of the interior of shaft below the water and found that one of the heavy castings with which the shaft was lined was wedged in between a timber guide and a flange of the cast iron lining at a point about twenty-six feet below top of shaft. The water level in the shaft being at or near lake level proved that the shaft must be arched over below, and the tug "Racine" was hired to pump out the shaft. The water lowered readily until —20.5, when the water remained stationary, water appearing to come from below. When pumping stopped, water rose slowly. At this elevation the top of the wedged in casting was plainly in sight, but it was wedged in so tight it could not be moved either way with available tools. The timber platform was then placed at —20.5, fitting it to the casting and placed concrete plug on top of this platform, leaving about eight inches of casting exposed above the top of concrete. There is now 16.1 feet of water above top of concrete plug while the water outside of shaft is only six feet deep.

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The top of shaft has been covered with planking. The cost of this work has been as follows:

Engineering	$ 42.00
Labor	306.27
Material	334.26
Overhead	95.00
Total cost	$777.53

The above work was in local charge of F. A. Smith, Assistant Engineer.

FOUR MILE TUNNEL SYSTEM.

Checking Capacity.

The purpose for this work was to determine the loss of head due to friction in the Four Mile Tunnel System, which is supplying water to the 14th Street and Harrison Street Pumping Stations.

As part of the water supply for Harrison Street Pumping Station comes from the Blue Island Avenue Tunnel, the gate admitting water from that tunnel was closed September 13th and tests were made September 14th and 15th, reading water levels at the Four Mile Crib, the Shore Shaft at Park Row, in the Indiana Street Well, opposite the 14th Street Pumping Station, and also pump well in Harrison Street Pumping Station. Simultaneously the pumpage was carefully checked and observations were taken for the slip in the pumps. Tests were conducted September 14th from 10 a. m. to noon; also September 15th from 9 p. m. to 11 p. m.

The tests were made for variable velocities to secure checks on the co-efficient of roughness under different conditions.

The computations showed that the lake section of the Four Mile Tunnel System is in good condition, the co-efficient of roughness being about .014; the conditions between Shore Shaft and the 14th Street Pumping Station are not as good, the co-efficient of roughness being .018 and the condition in the seven-foot tunnel between Shore Shaft and Harrison Street Pumping Station are very bad, the co-efficient of roughness being .024, much too high for even very bad tunnel work. This would indicate either an obstruction in the tunnel or loss of water from some unknown source, or both causes.

The cost of the work amounted to $101.95.

The above work was in local charge of F. A. Smith, Assistant Engineer.

FILLING CROSSTOWN TUNNEL AND BUILDING BULKHEADS.

This work was started in 1914 and was finished in June, 1915. A shaft was sunk under the Metropolitan Elevated Railway just southwest of the Burlington Building, in the block bounded by Jackson Boulevard, Jefferson, Van Buren and Clinton streets. From this shaft the filling of the old Crosstown Tunnel between Jefferson street and the Burlington Building was done, while the shaft at Madison street, which had been sunk in 1914, was used to pump the water from the tunnel. An old concrete bulkhead at Jefferson street was found to leak badly. A four-inch pipe was required to take care of this flow, while a grout bulkhead was placed after a ring had been cut in brickwork twelve inches wide and eight inches deep.

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A gravity concrete mixer was installed by digging a circular well 6'2" in diameter, intersecting the 4'6" shaft so as to give a 15" common chord, the top receiver of the mixer being just level with the ground, so that the wheeling of sand, gravel and cement was easily done and the mixing of the ingredients was accomplished while passing through the mixer.

A chute attached to the discharge end conveyed the concrete to the bottom of shaft where it was wheeled away in barrows to points wanted. All work underground was done by electric light. The flow of water continued through the filling and pipe and it was decided to place an additional grout bulkhead near the north curb of Van Buren street and a ring 2½ feet wide and 14 feet in diameter was cut in the tunnel. While this work was being done a 3" diameter grouting pipe was sunk from the street level into the tunnel. The excavated clay was used to form a bulkhead southwesterly in the tunnel. Back of this for 108 feet the tunnel was filled with 1-4-8 concrete up to within 12 feet of the grouting pipe, which 12 feet were filled with 1-2-4 concrete, and the 14-foot diameter collar was filled with grout consisting of one part cement, one part torpedo and one part bank sand. This rich grout was poured through the 3" pipe until the bulkhead was completely filled. Beginning then on the south line of the Burlington Building, a timber bulkhead was placed as a form and a concrete bulkhead 11 feet thick was placed of one part cement, two parts torpedo sand and four parts gravel; next 17 lineal feet of 1-4-8 concrete was placed; then a clay bulkhead 6 feet thick and again concrete of 1-4-8 composition for 11 feet; this work was done while the grout bulkhead on Van Buren street was given time to set. Large rings for the principal bulkhead under the shaft were being cut out and after it was found that the flow of water from the southwest had stopped entirely the balance of tunnel was filled up to the principal bulkhead under the working shaft. This work shaft was finally filled with grout of one part cement, one part of torpedo sand and one part of bank sand, which finished the filling of 474 lineal feet of 7 feet diameter tunnel between the Burlington Building and the Jefferson street bulkhead.

While part of the gang dismantled the plant at the Burlington Shaft other divisions were getting ready for the sinking of a shaft on the west bank of the river on the south line of Monroe street, and were also making preparations for the sinking of a working shaft over the old Polk Street Tunnel south of Harrison street and just east of Ellsworth street.

The Burlington Shaft, after the removal of the rings and lagging, was filled in with clay and sand and excavation was begun on the Monroe street and Ellsworth street shafts on March 29th.

At the Madison Street Shaft the tunnel was once more pumped out and there being very little water coming in the pump was taken out and with the boiler removed to the Ellsworth Street Shaft where a considerable quantity of water had to be pumped out.

The No. 2 Emerson pump was unable to gain on the water after pumping steadily day and night for a week, so that it was decided to install a No. 3 Emerson pump, which quickly gained on the water, enabling the completion of the shaft.

In the meantime the Monroe Street Shaft had been finished, the triple bulkhead had been cut out, timber forms had been set and the bulkhead was successfully poured on April 22d.

The grout was composed of one part cement, one part torpedo and one part bank sand. After one day's setting the rings and lagging were removed

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and shaft filled, work being done to the full satisfaction of the Pennsylvania Railroad Company, who had an inspector on the job while in progress.

Another bulkhead was to be placed in the abandoned Polk Street Tunnel, which crosses Canal street near the intersection of Harrison street. The sinking of a shaft was impracticable on account of street cars being run on both streets and a three-inch grout pipe was sunk at the southwest corner of Canal and Harrison streets, piercing the cover of the tunnel. Meantime the No. 3 Emerson pump at the Ellsworth Shaft had lowered the water sufficiently to enable the workmen to pass to Canal street pipe to cut the three rings for the bulkhead.

A heavy leak was observed at the concrete bulkhead at Jefferson street, the water coming down in the form of a cascade from the top. It was decided to pour one ring of the Canal street bulkhead first and a two-inch pipe was placed to permit the water to pass through after bulkhead had been placed. This bulkhead forming a cylinder fourteen feet in diameter and three feet thick was poured on May 5th; the grout being mixed one part cement and two parts of sand, on the sidewalk on the southwest corner of Harrison and Canal streets, and poured down the three-inch grouting pipe. The two-inch grouting pipe was capped on May 11th and no water appeared to seep through the west ring of the bulkhead. .

With the water closed off from the west there seemed to be no further use for the pump as hardly any water was coming from the east and pump was pulled out of shaft May 13th.

The cutting of the two east rings of the Canal street bulkhead was finished on May 14th and filled with grout May 15th through the three-inch grout pipe from Canal street. Just as the bulkhead was filled and the grout was rising in the pipe the upper part of the east timber form broke and let part of the grout down into the tunnel. This left the upper part of the east ring only partially filled.

After consultation with the officials of the Burlington road it was agreed to add another ring easterly to bulkhead which was put in and filled completely with grout on May 21st. The inspector for the railway company pronounced this bulkhead satisfactory in every way.

The bulkhead at Ellsworth street in the C. & A. yard was completed on May 26th by filling it with grout of one part cement and two parts sand. The lagging and rings were removed from the shaft which was filled with clay and sand. The site of shaft was cleaned up and the material, tools and office removed to 68th street and Oglesby avenue.

This work was completely finished June 5, 1915, at a total cost of $17,777.79.

The above work was in local charge of F. A. Smith, Assistant Engineer.

EXAMINATION OF OLD POLK STREET TUNNEL.

For the purpose of ascertaining the condition of this tunnel where it crosses underneath private property from Federal street to Dearborn street, the Sherman street Shaft was opened up. The cover of this shaft was found down ten feet below the level of the street and was covered over with planking resting on four ten-inch I-beams. The planking was mostly rotten and part of the filling over the shaft fell into the shaft.

A pump was moved to the site of the shaft for pumping out water in the tunnel sufficient to admit of an investigation. On June 2d the pump was

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removed from the shaft and a photographer went down and took photographs, one on the west line of Dearborn street looking west and another on the east line of Federal street looking east. The tunnel was found to be in excellent condition at this location.

The shaft at Sherman street was then covered over with a concrete cover, reinforced with steel beams and then filled up to street grade with bank sand.

The cost of the work amounted to $542.42.

The above work was in local charge of F. A. Smith, Assistant Engineer.

REPLACING SIDEWALKS ON 56TH STREET.

This work was done for the Water Pipe Extension Division and consisted in building about 2,400 square feet of standard sidewalk, 6 feet wide and 400 feet long, along the south line of 56th street between Stony Island avenue and Lake Park avenue. A sidewalk slab of 180 square feet was replaced at the southwest corner of 56th street and Lake Park avenue and 27 feet of curb was built at this location.

The total cost of this work was $381.02, or at the rate of 11⅛c per square foot for new walk, 25c for patch work and $1.18 per lineal foot of curb.

An Archer No. 1 concrete mixer was used on this work to good advantage.

The above work was in local charge of F. A. Smith, Assistant Engineer.

STATEMENT CONSTRUCTION DIVISION CAPITAL ACCOUNT

December 31, 1915.

		Debits	Credits
Amount due Water Fund		$ 200,000.00	
Labor and material—			
Year ending 12-31-14	$ 864,015.61		
Year ending 12-31-15	2,254,426.14		
		3,118.441.75	
Amount paid for tools and equipment, etc., to Dec. 31, 1915		229,138.09	
Liabilities on contracts to Dec. 31, 1915		28,085.49	
Capital Account			$ 200,000.00
Warrants for collection credited to Capital Account to Dec. 31, 1915—			
Year ending 12-31-14	$ 956,276.25		
Year ending 12-31-15	2,502,506.57		3,458,782.82
Inventory, Dec. 31, 1915			189,137.89
Surplus earnings—			
Year ending 12-31-14	$ 46,577.91		
Year ending 12-31-15	64,625.07		
	$ 111,202.98		
Less liabilities	28,085.49	83,117.49	
Inventory valuation (net)		189,137.89	
Total		$3,847,920.71	$3,847,920.71

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DIVISION OF BRIDGES.

Mr. Thomas G. Pihlfeldt, Engineer of Bridges.

The Engineer of Bridges and Harbor has charge of the construct all new bridges and viaducts and the repairs and maintenance of all ex bridges and viaducts. The operation of bridges and supervision of the h which were formerly under the Bridge Engineer, were taken over b Harbor Master under a separate bureau created July 23, 1915.

The total number of bridges and viaducts is 120, representing a present value of $6,700,000.00, and divided as follows:

Movable bridges	5
Fixed spans	2
Foot bridges	
Viaducts	3
Viaducts (foot passage)	
Total	12

Additions during the year: One viaduct at South Crawford avenue "(ing" over C. & W. I. R. R. tracks.

Expenditures during the year were:

Operation	$ 246,364.4
Repairs and maintenance	232,166.2
Construction	797,301.6
Total	$1,275,832.4

The division strives continually to replace old and worn out bridges new spans of modern construction, and has now but three of the old bri remaining, i. e., Lawndale avenue, Addison avenue, and Carondolet avenu

The work for the year is given under the sections into which the div is sub-divided, as follows:

DESIGNING SECTION NO. 1.

Mr. Alexander von Babo, Engineer of Bridge Design.

12TH STREET VIADUCT.

This viaduct was designed to suit conditions of 12th street, when wid It is 118 feet in width and extends from Wabash avenue on the east to C street on the west. It is to be a concrete-covered steel frame structure solid concrete railings, designed with a view to protecting pedestrians the smoke nuisance where the viaduct passes over railroad tracks. The s ture will provide two sidewalks, each 17 feet wide, two team roadways, ea feet 6 inches wide, and one centrally located roadway 25 feet wide, the l for the exclusive use of street cars. This roadway will be raised 6 i above the team roadways, thereby preventing vehicle traffic from usi and allowing a more rapid transit for the street cars.

The plans and specifications for the east portion of the structur nearly completed, and similar plans and specifications for the west portio well under way.

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LAKE STREET BRIDGE AND VIADUCT.

Numerous drawings and sketches were prepared for this bridge which has been in course of construction since March, 1914. Most of this work was required by the fact that during the construction of the new bridge, the traffic of the elevated railroad had to be maintained.

The counterweights of the leaves were recalculated for changes made in the floor construction, and for the first lowering of the leaves before the roadway floor and the sidewalks are completed.

Plans for the approaches to this bridge were prepared. The approaches on the west side of the river in Lake street, Canal street and Milwaukee avenue are designed to conform with the Union Station ordinance; the approaches on the east side of the river in Lake street, Market street and South Water street are designed to conform with an ordinance passed especially for this improvement. The work consists in raising the roadway and sidewalk grades. This involves raising and reinforcing the existing curb retaining walls, filling and repaving the roadways, and reconstructing the sidewalks and their supports.

Plans for the approach viaduct prepared by the Pennsylvania Railroad Company were examined and corrected. This viaduct is a two-level structure, the lower level carrying the roadway and sidewalks, and the upper level, carrying the elevated railroad.

MADISON STREET BRIDGE.

The plans for the operating houses were made in conformity with drawings submitted by George W. Maher, Architect, using glazed terra cotta tiling for outside covering of the walls and roofs of these houses. Drawings for minor details of the machinery and signal devices and for their location in reference to the operating houses were well advanced.

LAWRENCE AVENUE BRIDGE.

Plans were started for a fixed bridge over the North Branch of the Chicago River at Lawrence avenue. The bridge will be similar in appearance to those built at Wilson avenue and Irving Park boulevard. It will be 240 feet long and 65 feet wide with one roadway 38 feet clear and two sidewalks each 13.5 feet wide over all. The distance between centers of river piers is 99 feet and 4 inches, and the vertical clearance under bridge is 17 feet. The east abutment will be of special design on account of the 16-foot outlet of the Lawrence avenue intercepting sewer.

SOUTH SHORE IMPROVEMENT.

To assist the Council Committee on Harbor, Wharves and Bridges, to prepare an ordinance covering the proposed park improvement of the south shore of Lake Michigan between 12th and 53d streets, studies, layouts and estimates were made and much time spent in preparing the necessary engineering provisions to be incorporated in the ordinance. All of the above work was performed jointly with the South Park Commissioners and the Chicago Plan Commission.

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WEBSTER AVENUE BRIDGE.

Shop drawings for this bridge were checked. A plan was also prepared showing the sidewalk construction and required pavement of the approaches to the bridge. Hard sandstone blocks will be used for paving the approaches which have a grade of about 3 per cent., since this will give a better foothold than granite blocks. Specifications for this improvement are being prepared.

BELMONT AVENUE BRIDGE.

The shop drawings for this bridge were checked.

BRIDGE APPROACH GRADES.

A study was made with a view to improving all existing bridge approach grades which are steeper than 3 per cent., particularly bridges located in the downtown district. This required a thorough investigation of the effects which the proposed changes would have on all properties abutting the approaches, both from a real estate and from a building standpoint. Account was also taken of the effect of changing the grades of approaches to bridges now in course of construction. The resulting damages to abutting property were also treated, in conjunction with the Corporation Counsel's office.

DESIGNING SECTION NO. 2.

Mr. Hugh E. Young, Engineer of Bridge Design.

WEST MONROE STREET BRIDGE.

The plans and specifications for a trunnion bascule bridge over the South Branch of the Chicago River at West Monroe street, which were started in the preceding year were completed in April. The bridge is being constructed by the Union Station Company, in accordance with the Union Station ordinance passed March 23, 1914. Bids were advertised for in May and the contracts were let in June. All shop drawings for substructure and superstructure steel received for this bridge were examined and checked; also plans for cofferdams and other miscellaneous work were examined and checked. Studies and plans were made in connection with supports for the adjacent buildings, and plans of bridge decking were revised to take care of increased loads due to adoption of new type of floor.

The bridge is 241 feet 7½ inches long between anchor columns, and has a width overall of 60 feet, one roadway 36 feet wide and two 8 feet 8 inch clear sidewalks. The clearance between piers is 165 feet 6 inches, and the clear head room under the bridge is 16 feet 6 inches for 80 per cent. of the distance between masonry.

The bridge is the city type having the usual construction for the east leaf. The counterweight arm, however, of the west leaf is a short arm having a solid cast iron counterweight. This unusual design was necessary in order to provide a by-pass in accordance with the requirements of the Sanitary District.

The alternative of increasing the span and placing the abutment back of the dock line was excluded as the space back of the dock line was required by the Union Station Company in connection with the proposed new station improvements.

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The final plans for the east approach to the bridge were prepared. The proposition of maintaining entrances to the buildings required extensive and careful studies on account of property rights affected by the change in grade. Plans were also made for sewer outlets connecting with the present three-foot sewer with provision for connecting with a future six-foot sewer. The plans for the approach contemplate retaining walls along the curb, provision for sub-sidewalk space and a filled approach between retaining walls. The roadway between curb is thirty-eight feet and the two sidewalks are fourteen feet wide.

NORTH LA SALLE STREET BRIDGE.

The studies and layouts started in the preceding year were continued and the final plans practically completed in November. Complete and detailed estimates were made for this bridge, and specifications prepared. The bids for this bridge have not yet been advertised for. The bridge is 308 feet 2 inches between anchor columns and has a width over all of 72 feet, affording one 38-foot roadway and two 13-foot 2-inch clear sidewalks. The clearance between protections is 200 feet. The clear headroom under the bridge is 16 feet 6 inches for 80 per cent. of the distance between masonry.

The design of the substructure was complicated by the location of the Chicago Surface Lines tunnel, the city water tunnel and the Chicago Telephone tunnel under the river at this crossing. The design is unusual in that the dead loads of the counterweight pits, including the river pier and anchor piers, are carried to the sub-piers supporting these pits by means of steel trusses which are embedded in pit walls, it being necessary to carry these loads independent of the tunnels during construction. Due to these conditions, nearly 200 preliminary layouts, studies and stress sheets were made, covering clearances, details, operator's houses, stresses, approaches, channel, traffic outlet, connection to adjacent buildings, tunnels and traffic in addition to about 120 permanent drawings.

Plans and estimates for the south approach, both preliminary and permanent, were made. The work covered by these plans will be let under a separate contract from the bridge. Approval of these plans is being held in abeyance pending a decision in regard to damages caused by the changes in grade. Studies and layouts were made for the north viaduct approach to the bridge, which extends from the bridge to Carroll avenue; also for the inclined approach which extends from Carroll avenue to the alley north of Kinzie street. These contemplate a deck viaduct and incline for the full width of the street having a 48-foot roadway and two 16-foot sidewalks. The lower street level is maintained from the bridge to the alley north of Carroll avenue. Studies have been made in regard to the outlet of traffic from the lower level at Carroll avenue and La Salle street, as this traffic will be cut off when the inclined approach is constructed. The work of building the viaduct and inclined approach is to be done by the Chicago & Northwestern Railway.

TWELFTH STREET BRIDGE.

As a result of the studies and investigations made, in the preceding year, the Strauss direct lift bridge was adopted as the bridge to be built at 12th street over the South Branch of the Chicago River. The bridge consists of a simple span 241 feet 6 inches between end bearings and a lifting mechanism at each end mounted on braced tower posts between which the span moves

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vertically. The width of the bridge is 90 feet over all. It has one roadway 56 feet between curbs, and two 13-foot 4-inch clear sidewalks. Preliminary drawings and estimates submitted by the Strauss Bascule Bridge Company were checked and additional studies were made. The final general plans for this bridge were prepared by the Strauss Bascule Bridge Company under the immediate direction of this section. Final plans and specifications were furnished in accordance with the terms of the contract.

This bridge will be a leading feature of the 12th street improvement, and will correspond with the character of the chain of improvements of which it is a part including the Field Museum and the new Union Terminal.

NORTH FRANKLIN STREET BRIDGE.

Further preliminary studies and general layouts for various spans ranging from 210 feet to 308 feet clear between protections were made, including figuring of deflections and preliminary estimates. The latter plans contemplate the bridge to be built on a line joining Franklin street and Orleans street. The final plans for the superstructure prepared in the preceding year can be modified to suit the new alignment providing the span is not changed in length or width. Miscellaneous studies and general layouts were made of the south approach to the bridge in connection with damages caused by the change in grade, and for the purpose of co-ordinating this approach with those of Lake street, Wells street, La Salle street, Clark street and Dearborn street. South Water street between Lake street and Dearborn street should be raised to meet the new grades that will be required on the south approaches to these new bridges thus avoiding inclines to these approaches which otherwise would be required. The changes in grade are necessitated by the change from the three-truss to two-truss construction, which obviously requires deeper floors. Furthermore, the 16-foot 6-inch clear headroom under the bridge required by the government must be adhered to. Studies were made of the viaduct connecting the bridge with the proposed viaduct in Kinzie street at Orleans street, being a part of the terminal improvement. The design and construction of the viaduct work is to be done by the Chicago & Northwestern Railway without cost to the city.

KINZIE STREET BRIDGE.

The Union Station ordinance provides for a new two-level bridge at Kinzie street and the North Branch of the Chicago River. The lower deck is to carry Kinzie street traffic as at present; the upper level to connect on the west side with the proposed elevated roadway in Canal street and on the east side with the elevated roadway in Kinzie street connecting with the Franklin-Orleans street viaduct at Orleans street. Studies were made for a double-deck, single-leaf trunnion bascule bridge with a view to using the substructure of the present bridge thereby greatly reducing the cost and the time of construction.

NORTH CLARK STREET BRIDGE.

Studies were made for a new trunnion bascule bridge over the Main Branch of the Chicago River at Clark street and the hinged type of counterweight was compared with the fixed type. Studies were made with the view of solving the problem of constructing the bridge under maintenance of traffic except for a few months' delay. The problem of maintaining traffic over river

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crossings during the construction of new bridges has become a very important, in fact, a serious problem by reason of the rapidly increasing traffic in Chicago's main business district. This problem is aggravated by the absolute necessity of maintaining an unobstructed river channel which is imperative as long as the Chicago River is to be utilized by masted vessels. The present plans contemplate a bridge 327 feet 4½ inches long between anchor columns, having a width of 72 feet. The clearance between protection will be 215 feet 6 inches, and the clear headroom under the bridge 16 feet 6 inches for 80 per cent. of the distance between masonry. The bridge will have one 38-foot roadway and two 13-foot 2-inch clear sidewalks.

MISCELLANEOUS WORK.

Miscellaneous plans, sketches and estimates incidental to construction work were made for the new bridges now being constructed at Belmont avenue, Webster avenue and Lake street. Miscellaneous work was done on layouts for a new two-level bridge at Wells street relative to the location of the bridge and to the proposition of maintaining traffic during construction of a new bridge. Studies and general layouts of the Main Branch of the Chicago River were made with the view of making a comprehensive plan covering the most suitable locations of bridges for river traffic and the co-ordination of grades, approaches, and other factors affecting the handling of traffic over the proposed new bridges in the best possible manner.

BRIDGE CONSTRUCTION BY CONTRACT.

Mr. Clarence S. Rowe, Assistant Engineer.

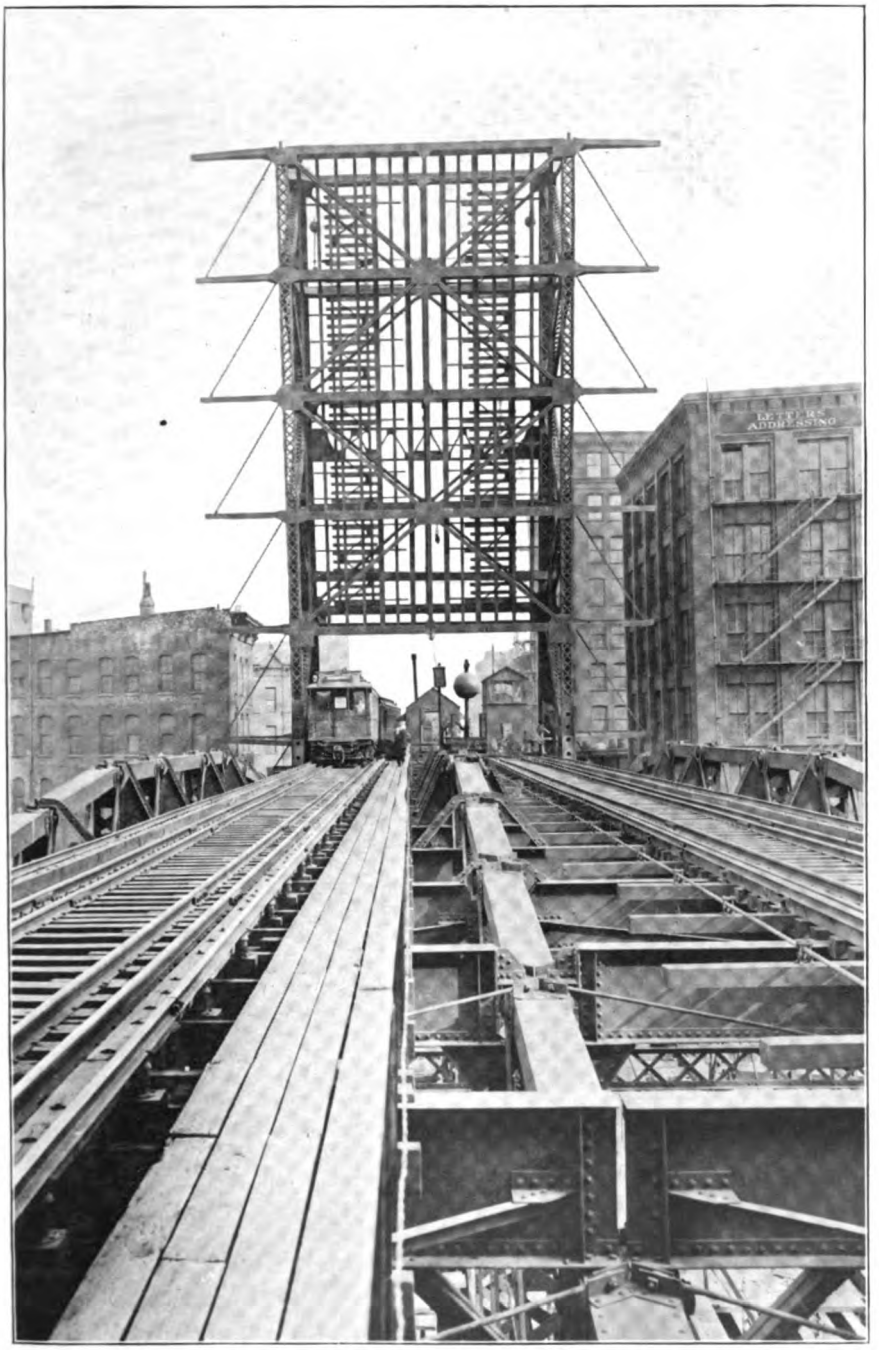
The following is an account of the bridge construction work done by contract during the year 1915. Names of contractors, contract prices and dates when work was commenced and completed are shown in table, "Summary of Bridge Construction Contracts 1915."

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SUMMARY OF BRIDGE CONSTRUCTION CONTRACTS, 1915

BRIDGE	SUBSTRUCTURE		SUPERSTRUCTURE		Total Contract Cost	Work Commenced	Bridge Completed	Remarks
	Contractor	Contract Cost	Contractor	Contract Cost				
Indiana Ave., Little Calumet R. Unfinished portions of substructure.	Fitzsimons & Connell Dredge & Dock Co.	*$46,379.67 †5,098.00	Jno. O'Brien assigned to Chicago Bridge & Iron Co.	$34,958.54	$86,436.61	Nov. 21, 1913	June 21, 1915	* Substructure contractor paid for work completed in 1914. Opened to traffic Oct. 31, 1914. † New Contract for completing unfinished portions of substructure.
Lake St. Double Deck Bascule Bridge	Fitzsimons & Connell Dredge & Dock Co.	*203,363.10	The Ketler-Elliott Erection Co.			Mar. 31, 1914		* Substructure Completed April 28, 1915. Superstructure under construction.
Webster Ave. Bascule Bridge	Great Lakes Dredge and Dock Co.		The Ketler-Elliott Erection Co.			July 6, 1914		Under construction.
Belmont Ave. Bascule Bridge	Great Lakes Dredge and Dock Co.		Great Lakes Dredge and Dock Co.			Nov. 2, 1914		Under construction.
Montrose Ave. Bridge	Cullen, Friestedt Co.	*27,609.56	John E. Burns. Frandsen Const. Co. Modern Struct. Steel Co. Superstructure to be erected by City.	§4,321.21 ‖1,448.00 †11,197.00		Feb. 15, 1915		§ For creosoted lumber. ‖ For sidewalk railing. † For fabrication of structural steel. * Superstructure completed Dec. 29, 1915.
*Monroe St. Bascule Bridge	Fitzsimons & Connell Dredge & Dock Co.		The Ketler-Elliott Erection Co.			June 10, 1915		* Under construction contract awarded by and work being done under supervision of Union Station Co

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LAKE STREET BRIDGE, LOOKING EAST

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LAKE STREET (DOUBLE-DECKED) TRUNNION BASCULE BRIDGE.

The elevated traffic across the river at this point has been maintained with practically no interruptions by leaving the old draw span in service during the construction of the foundations and the erection of the superstructure. The east main piers were completed during November, 1914. At the beginning of 1915, the steel sheeting forming the walls of the cofferdam used in the construction of the foundations on the west side of the river was driven and the space between the two lines of sheeting partly filled with clay; the east cofferdam was entirely removed; east pier protection completed; and the east draw cleared of all obstructions.

As the presence of cofferdams on both sides of the river simultaneously and the old center pier in place, would have been a serious menace to boats passing through the draws of this bridge and would have practically precluded the navigation of large boats at this point, it was found advisable to construct the foundations on the east side of the river first, leaving the west draw clear for the passage of vessels. Upon the completion of the east piers, the east draw was cleared of all obstructions and work on the cofferdam for the west pier was commenced. Temporary timber bents were constructed to support the elevated structure during the removal of the old masonry, etc., and the construction of the west piers. The west bridge seat of the old draw span and the elevated structure at that point were supported by timber bents and steel girders as described for the east side work in the report for the year 1914.

The excavation at the site of the west main pier was completed and the sinking of the wells for the sub-piers commenced January 23, 1915. In one of the wells a water bearing strata was encountered at an elevation of about —101.0 feet C. D., but no serious difficulty was encountered in sinking the wells. The placing of concrete in the sub-piers on the west side of the river was commenced February 7, 1915. All the sub-piers on the west side of the river were completed February 15, 1915. These sub-piers rest on rock at elevations varying from —108.8 feet C. D. to —110. feet C. D. and so located as to avoid interference with future subway construction at this point. The placing of concrete in the west main piers was commenced February 16, 1915, and completed March 29, 1915. The test of the west tail pit as regards waterproof qualities proving satisfactory, the west cofferdam was removed; pier protection constructed and the west draw dredged and cleared of all obstruction April 21, 1915.

The substructure contract was completed April 28, 1915. The substructure contract included the steel and concrete sidewalk construction and the placing of the pavement on the roadway on the east approach, but owing to this work being interfered with by the presence of the plant for the erection of the superstructure, these items were eliminated from the substructure contract. This work will be done in connection with the readjustment of the sidewalk and pavement grades on Lake street, Market street and South Water street. Work on the superstructure was commenced on the east side of the river January 13, 1915. The steel was delivered by rail, unloaded and stored on Wolf Point, at the junction of the Main River and the North Branch and transferred to the bridge site on scows. The first steel was erected February 8, 1915, comprising the longitudinal carrying trusses and the machinery girders on the east side of the river. With the beginning of the work of erection of the steel, the maintenance of the elevated structure on

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the east side of the river devolved upon the contractor for the superstructure. During the progress of the work the temporary timber bents were replaced by permanent steel columns resting on the new structure, with the exception of the piles and timber bents at both bridge seats of the old draw span, which will remain in place until the draw span is put out of service. The first steel was erected on the west piers April 24, 1915.

On the evening of April 30, 1915, the bridge and structural iron workers went on a strike. At this time the longitudinal trusses and the machinery girders on the east side of the river were erected ready to proceed with the movable leaf. On the west side the machinery girder and the longitudinal carrying truss were in place on the south side of the west piers. The work on the superstructure was resumed July 8, 1915. The erection of the east leaf was completed, August 7, 1915, with the exception of two panels of the floor system omitted to allow the passage of elevated trains. The west leaf was topped out September 21, 1915, and erection and riveting completed. Installation of machinery for the operation of both leaves has been practically completed. Trial runs of the gear trains were made with the racks disengaged from the main pinions, with very satisfactory results. Both leaves are ready for the initial lowering.

The work on the concrete enclosure walls, operator's house walls, stairway, etc., was commenced September 2, 1915, and work on the electrical equipment was commenced September 11, 1915. Both leaves were erected practically complete, with the exception of the two panels of floor system in each leaf left out to allow passage of elevated train. There has been practically no interference or delay to elevated traffic up to the present time, with the exception of two days during the year 1914. The street traffic in the lower deck was necessarily abandoned April 1, 1914, when work on the substructure was commenced. The painting of the steel is about 90 per cent. completed. The ties for the elevated railway tracks have been placed on the upper deck as far as practicable, until the leaves are lowered. The operators' houses, enclosure walls, stairways, railings, etc., are practically completed with the exception of some bush hammering to be done. About 75 per cent. of the concrete walks on the east fixed parts has been placed, but no concrete walks on the west fixed part.

This is a trunnion bascule bridge with a lower deck providing one roadway 38 feet clear width and two sidewalks each 14 feet clear width and an upper deck to provide for the elevated railroad tracks. The span consists of two leaves with a span of 245 feet 3 inches from center to center of trunnions. The two trusses are spaced 42 feet from center to center. The clearance between piers is 209 feet 3 inches, and gives an absolutely clear channel 195 feet in width for the passage of vessels. The motors for the operation of the movable leaves are 100 horse-power each at 550 volts, two motors connected in multiple, being used for each leaf, with magnetic type of control. Electrical interlocking is being installed, so arranged as to prevent the operation of the bridge until the signals on the upper deck are set at danger and to insure the operation of the center and rear locks, roadway gates, signals and operating motors in their proper sequence, both in raising and lowering of the leaves. The roofs and the upper portions of the operators' houses are sheathed with copper. The walls of the houses and the pit enclosure walls are of concrete, finished in panels and bush hammered.

In the construction of the operators' houses, enclosure walls, stairways and railings, the plans submitted by the Chicago Plan Commission were fol-

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lowed as closely as possible, and the portions now completed, present an ornamental and pleasing appearance.

The tail end of both leaves are loaded with sufficient counterweight to allow for the initial lowering. When completed, this counterweight consisting partly of punchings concrete and partly of slag concrete will amount to about 1,075 tons in each leaf.

The movable bridge leaves were erected in the raised position. The derricks for the erection of the steel were placed on towers extending above the tracks of the elevated with the posts of the towers arranged to provide car clearances.

Mr. Wm. A. Mulcahy, Assistant Engineer, is in local charge of this work.

WEBSTER AVENUE TRUNNION BASCULE BRIDGE.

On January 1, 1915, the retaining walls on the approaches were practically completed; the filling of the approaches advanced as far as practicable; and the main piers on the west side of the river brought up to an elevation of about —5.0 feet C. D. The driving of the steel sheeting in the walls of the east cofferdam, similar in construction to the cofferdam used in constructing the substructure on the west side of the river was nearly completed during the year 1914. The west main piers and tail pit were completed February 20, 1915, and the test of the tail pit proving entirely satisfactory, the removal of the west cofferdam was commenced March 9, 1915.

The driving of the foundation piles for the east main piers was completed January 27, 1915; the front wall of the east cofferdam closed in, and the space between the two lines of steel sheeting filled with clay March 13, 1915. All concrete work on the west side of the river called for in the contract for the substructure was completed March 20, 1915. Excavation at the site of the east main piers was commenced March 31, 1915. The carpenters engaged on the substructure work went on a strike on April 15, 1915. The excavation at the site of the east piers was carried down to about —17.0 feet C. D. on April 22d, when all further work on the substructure was abandoned until carpenters could be secured to continue the bracing of the cofferdam. Work on the substructure contract was resumed August 16, 1915, and the excavation at the site of the east main piers completed August 31, 1915. The placing of concrete in the east main pier and tail pit was commenced September 1, 1915, and completed October 27, 1915. The test of the tail pit proved entirely satisfactory and the east cofferdam was removed. All concrete work on the east side of the river called for in the contract for the substructure was completed November 11, 1915. The dredging of the river channel at the site of the walls of the cofferdams was completed November 29, 1915.

The piers are of reinforced Portland cement concrete, resting on foundation piles driven to an elevation of from —29.3 feet to —36.5 feet C. D. The finished excavation ended in very hard clay mixed with gravel. The items of pavement, sidewalks and curb and gutter on the approaches were eliminated from the contract for the substructure, owing to the presence of the plant and material for the erection of the superstructure, and further owing to the fact that it was found to be advisable that a change be made in the character of the pavement. This work will be done under a separate contract. Awaiting the completion of the substructure, the steel for the superstructure was stored on Wolf Point. The contractor for the superstructure commenced the installation of the plant for erecting the steel on the west side of the river March 27,

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1915. The first steel was erected April 5, 1915. Machinery girders and pivot trusses were placed on the west piers and trunnions set and lined up April 17, 1915.

With the pivot trusses, machinery girders, trunnions and a portion of the tail end of the west leaf erected, the bridge and structural iron workers went on a strike on the evening of April 30, 1915. Work on the erection of the superstructure was resumed July 6, 1915. The erection of the steel on the west side was practically completed July 24, 1915. The machinery for the operation of the west leaf was assembled, trial runs made with the rack disengaged from the main pinion and the leaf lowered for the first time November 1, 1915. The concrete walls of the west pit enclosure and west operator's house have been poured but the forms have not yet been removed. The erection of steel on the east side of the river was commenced November 22, 1915. Practically all the steel in the east leaf is erected and practically all of the machinery for the operation of this leaf is in place. Painting of steel is about 40 per cent. completed. The decking of the roadway of the west leaf was commenced December 28, 1915, and about 33 per cent. of the subplanking is placed.

This is a trunnion bascule bridge consisting of two leaves with a distance of 188 feet 9 inches from center to center of trunnions. The two trusses are spaced 39 feet 6 inches from center to center. On the movable part a roadway of 36 feet clear width is provided, and two sidewalks 8 feet 6 inches in clear width. The distance from face to face of river piers is 161 feet 3 inches, providing an absolutely clear channel 128 feet in width for the passage of vessels. The conduits for the underground cables supplying power for the operation of this bridge were completed as far as practicable during 1914. During the year 1915, the cables were installed in the conduits; operating equipment for west leaf installed and work of installing electrical equipment for the east leaf is now progressing.

Mr. Frank A. Berry, Assistant Engineer, is in local charge of this work.

BELMONT AVENUE TRUNNION BASCULE BRIDGE.

At the beginning of the year about 75 per cent. of the concrete retaining walls on Rockwell street were completed; the footings of the south retaining wall on Belmont avenue west of the river were in place; the foundation piles for the west abutment driven and the steel sheeting to form the walls of the west cofferdam driven with the exception of about 75 lineal feet in the front line. The cofferdams used in the construction of the foundations consisted of a single line of steel sheeting, with the exception of the south side of the east cofferdam where a double line of sheeting was driven and clay placed between the lines of sheeting. Some Wakefield sheeting was used in the construction of this puddle wall. The driving of the west cofferdam was completed January 12, 1915. The excavation at the site of the west main piers and tail pit was commenced February 22, 1915. The excavation for the sub-piers on the west side of the river was commenced March 1, 1915. Excavation completed and the placing of concrete in these sub-piers commenced March 5, 1915.

The sub-piers on the west side of the river, with the exception of one sub-pier on the west approach, were completed March 6, 1915.

These sub-piers rest on rock at elevations varying from —32.1 feet C. D. to —38.5 feet C. D.

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The placing of concrete in the west main piers and tail pit was commenced March 10, 1915.

The east cofferdam was closed in, the site of the east main piers excavated and the sinking of the wells for the sub-piers of the east main piers was commenced April 7, 1915.

The placing of concrete in these sub-piers was finished April 10, 1915. These sub-piers rest on rock at elevations varying from —29.5 feet to —36.4 feet C. D. The three sub-piers under the curtain wall on the south side of the east approach rest on rock at an elevation of about —29.0 feet C. D.

The carpenters employed on this work went on a strike April 15, 1915. All work on the substructure contract was abandoned April 22, 1915, with the concrete in the west piers brought up to about —3.5 feet C. D. and the concrete in the east main piers and tail pit brought up to the top of the tail pit floor (—14.5 to —15.0 feet C. D.). Work on this contract was resumed August 16, 1915. The east main piers and tail pit were completed September 18, 1915. This work was again delayed by labor troubles from September 18th to September 27, 1915. The east cofferdam was removed. Work on the west side of the river was not resumed until October 8, 1915. During the cessation of work on this contract the dam in the sewer on the west side of the river gave way, allowing the sewage to flow inside of the west cofferdam, doing considerable damage to the cofferdam and the forms for the west piers. The cofferdam was repaired and pumped out and placing of concrete in the west main and tail pit resumed. The west main piers and tail pit was completed November 3, 1915. The west abutment and the retaining walls on the west approach and on Rockwell street were completed, and the substructure on the west side of the river was ready to receive the superstructure November 23, 1915.

The east abutment is completed as far as possible at the present time. Maintaining the approach to the temporary bridge precludes the completion of the north end of the abutment, and also a portion of the retaining wall on the north side of Belmont avenue east of the river. The south retaining wall on the east approach is completed with the exception of the placing of about 70 cubic yards of concrete. No work has been done on the retaining wall along the north line of Belmont avenue east of the river. About 1,500 cubic yards of filling are yet to be placed in Rockwell street. The gas pipe railings on the approaches have not been placed. The removal of the north wall of the west cofferdam and the completion of the west pier protection is interfered with by the presence of the approach to the temporary bridge.

The foundations of this bridge are constructed of reinforced Portland cement concrete supported by sub-pier resting on rock, as above described. The distance from face to face of the river piers is 161 feet 3 inches, but owing to the angle made by the street and the river at this point, an absolutely clear channel of only 75 feet in width is provided. The superstructure of this bridge is practically identical with that for Webster avenue. The first steel for the superstructure was delivered on the site of the bridge September 24, 1915. This steel was brought from Deering on a derrick scow. The actual erection of steel on the east piers was commenced October 5, 1915. The machinery girders and pivot trusses were placed on the east piers, trunnions set and lined up and the erection of the east leaf commenced October 19, 1915. The east leaf is erected to the fourth post above the trunnions. The west piers were ready to receive the superstructure November 23, 1915. Machinery girders,

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pivot trusses and trunnions are set, and the west leaf erected to the second post above the trunnions.

The erection of the superstructure is being accomplished by the use of a combined derrick and dump scow described briefly as follows: The hull is of steel 129'6"x30'8"x11' containing 8 pockets aggregating 500 cubic yards capacity. On one end is a steel derrick with a mast 33 feet high and a 50-foot boom which can be extended to 65 feet or 125 feet by adding sections. To insure the stability of the scow when using the derrick, the scow is equipped with 4 wooden spuds 18 inches square that may be forced against the bed of the river. It is equipped with a double hoisting engine 10"x12"; a double slewing engine 7"x8"; a deck engine 6"x7"; four engines for operating the spuds; a vertical tubular boil 103"x47"; a compressor 8"x10"; air tank 30"x5'6"; and a Morse steam turbine generator.

Mr. Carl O. Johnson, Assistant Engineer, is in local charge of this work.

MONTROSE BOULEVARD BRIDGE (FIXED SPAN).

The old span was moved to the temporary supports and approaches, constructed just north of Montrose boulevard, to be used as a temporary bridge during the construction of the new bridge. The construction of the approaches and the transferring of the old span was done by the City Bridge Division day labor force. The temporary bridge was opened to traffic January 19, 1915. The first work on the contract for the substructure of the new bridge was done February 15, 1915. The old approaches, masonry, etc., were removed and excavation at the site of the west abutment commenced March 22, 1915. The walls of the cofferdams on both sides of the river consisted of a single line of interlocking steel sheeting, except near the river banks where short pieces of Wakefield sheeting was used. The placing of concrete in the east abutment was commenced March 29, 1915. The east river piers were brought up to +2.83 feet C. D., including the reinforced concrete strut between the piers; also the sewer outlet and the north half of the east abutment brought up to +3.33 April 14, 1915.

The carpenters engaged on this work went on a strike on the evening of April 15, 1915. The footing of the south half of the east abutment was placed May 1, 1915. The work proceeded very slowly until June 29, 1915, when all work on the contract was abandoned. Work on this contract was resumed July 14th and the west river piers were brought up to +2.83 feet C. D. All the river piers were completed September 1, 1915. The existing sewers were connected with the sewer outlets through the new abutments. All concrete work including the hand railings on the approaches was completed November 2, 1915. With the filling of the approaches and the dredging of the river channel and banks this contract was completed December 29, 1915. The abutments of reinforced concrete rest on foundation piers driven to about —19 feet to —20 feet C. D. The river piers extend to —16.0 feet C. D. in hard clay, mixed with gravel and boulders and rest on foundation piles driven to about —22.0 feet C. D. by using pile shoes.

The bridge consists of three plate girder fixed spans, the center span being constructed to allow its removal, if necessary, for the passage of vessels, dredges, pile drivers, etc. The superstructure was fabricated by the Modern Steel Structural Company and is now being erected by the City Bridge Division day labor force. The sidewalks on the approaches will also be placed by

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the City Bridge Division by day labor. The pavement on the approaches is under reserve to the Board of Local Improvements.

Mr. Howard W. Meyers, Junior Engineer, is in local charge of this work.

INDIANA AVENUE SWING BRIDGE (OVER LITTLE CALUMET RIVER).

This bridge was completed with the exception of the pavement on the approaches during the year 1914. The placing of the pavement was deferred until spring, to allow the filling to become thoroughly compacted, and also on account of the weather conditions.

The bridge has been in use by the cars of the Chicago Surface Lines since October 31, 1914. All traffic was diverted to the new bridge and the removal of the temporary bridge, just west of Indiana avenue, was commenced by the City Bridge Division day labor force, March 22, 1915. Cinders were placed on the roadway of the approaches by the contractor for the substructure last fall to provide a suitable roadway for use by teams, automobiles and other street traffic, until the placing of the pavement became feasible. With the placing of the asphaltic macadam on the approaches, which was commenced June 10, 1915, and finished June 21, 1915, the contract for the substructure of this bridge was completed. The retaining walls on the south approach, and the cement sidewalks; the concrete curbs and gutters and the gas pipe railings on both approaches were constructed by the City Bridge Division day labor force.

Mr. J. L. Erwin, Junior Engineer, was in local charge of this work.

MONROE STREET BRIDGE.

Under the direction of the Union Station Company the work of constructing the substructure of the bridge was commenced June 10, 1915. The west cofferdam was constructed, pumped out and the site of the west main piers and by-pass excavated. This cofferdam consisted of two rows of interlocking steel sheeting with the space of about four feet between the lines of sheeting filled with clay. The excavation for the sub-piers on the west side of the river was commenced July 30, 1915. The sub-piers of the west anchor pier were excavated to rock at an elevation of about —95.0 feet C. D. and the placing of concrete completed August 12, 1915. The excavation for the sub-pier of the west river pier was then started, carried down to final depth and the placing of concrete in same completed August 28, 1915. Two sub-piers five feet in diameter were constructed under the west operator's house walls.

These sub-piers rest on rock at elevation as follows:

South sub-pier, west anchor pier	—95.92 feet C. D.
North sub-pier, west anchor pier	—96.27 feet C. D.
South sub-pier, west river pier	—95.80 feet C. D.
North sub-pier, west river pier	—95.60 feet C. D.
West sub-pier at west operator's house walls	—95.60 feet C. D.
East sub-pier at west operator's house walls	—95.19 feet C. D.

The placing of concrete in the west main piers and by-pass was commenced September 9, 1915, and completed October 11, 1915. The removal of the cofferdam used in constructing the substructure on the west side of the river was commenced October 29, 1915, and completed December 9, 1915. The dredging around the west piers at the site of the puddle walls of the west dam was completed December 10, 1915.

In connection with Union Station work, the west draw of the Madison Street Bridge was dredged; three new 23-pile clumps were driven in the center pier protection, and one 19-pile clump at south end of west abutment was

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driven and 6 piles added to the 13-pile clumps north of the west abutment. The creosoted piles in the four clumps in the west pier protection are driven. The dock on the west side of river has been repaired and partly backfilled.

This work was not affected by the carpenters' strike, with the exception of about four days in September. On September 16, 1915, an attempt was made by the contractor for the substructure to commence operation on the east side of the river, but upon a notice being received by the city of an application for an injunction to restrain the city from changing the grade on Monroe street, all work was immediately stopped. In accordance with an agreement with the Union Station Company an assistant engineer was placed at the site of the bridge to watch this work.

Mr. H. B. Anderson, Assistant Engineer, was assigned to this work.

LAKE STREET VIADUCT.

The viaduct just west of the Lake Street Bridge is being reconstructed under the direction of the Pennsylvania Railroad Company. At the end of the year the substructure contractor had practically finished the east abutment and had placed concrete in the east intermediate pier up to the ground level. The concrete in the north half of the west intermediate pier is practically completed. The contractor for the superstructure has removed the old concrete floor and a portion of the steel floor, and is now preparing to move the structure south to allow the placing of the new superstructure. During the progress of the work the elevated structure at this point is being closely watched for settlement.

Mr. H. B. Anderson, Assistant Engineer, is assigned to this work.

SURVEYS, ETC.

During the year portions of the field engineering force were engaged on the following work:

Surveys in connection with proposed new grades in streets affected by proposed new bridge construction along the main river and along the south branch of the river. The following surveys were made in connection with proposed new bridge construction:

Survey at Carpenter street and the North Branch of the Chicago River.

Survey of docks at Kinzie street and the North Branch of Chicago River.

Survey at La Salle street and the Chicago River, including the excavation of test holes to determine the character of the soil.

Supplemental survey at 12th street and the South Branch of Chicago River.

Survey at Lawrence avenue and North Shore Channel.

Location of bridge abutment along the South Branch of the Chicago River from Lake street to 12th street.

Survey to locate docks and center pier protections along the South Branch from Adams street to Washington street and along the main river from Wells street to Dearborn street.

Survey at Franklin-Orleans streets and the main river.

Survey on west approach to Lake Street Bridge.

Survey at Clark street and the Chicago River.

Traffic count at various bridges.

Assistant engineers and rodmen were assigned to represent the Department of Public Works on the work of raising the Eastland wreck.

Observations made at the 92d Street Bridge and the Chicago Avenue Bridge to determine difference in deflection in the trunnion supports.

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CONSTRUCTION BY DAY LABOR.

Mr. Harry J. McDargh, Bridge Designing Engineer.

The diversified work done by this section is largely in connection with that of general repairs, additions and repairs, and construction by contract.

INDIANA AVENUE BRIDGE (RIVERDALE).

A cofferdam of steel sheeting was driven at this bridge to allow the Water Pipe Extension Division to lay a water main across the Calumet River.

The temporary bridge was removed and old piling, timbers and steel girders that could be used again were taken on scows to Kinzie Yard. Placed concrete retaining walls on both sides of the south approach. Cement curbs, gutters and walks on both approaches were laid and an iron pipe railing erected on both sides of the north approach.

MONTROSE AVENUE TEMPORARY BRIDGE.

This bridge was started in September, 1914, but due to delays in securing the right of way for the Chicago Surface Lines, was not opened to car traffic until January 19, 1915. Following are some of the unit costs and total cost:

Assembling rented pile driver	$ 257.19	
Rental of pile driver	192.00	
Dismantling	79.16	
Driving piling	209.23	
Watchman	77.12	
3,430 lin. ft. of piles driven at 23.7c		$ 814.70

The piles used were discarded piles from old protections and cost as follows:

Loading	$ 51.72	
Unloading	63.00	
Towing charges (city tug)	20.00	
Or 3.9c, which added to 23.7c gives a total of 27.6c		134.72

Material used:

Lumber (city contract)	$3,946.75	
Nails	48.00	
Bolts	126.82	
Coal	53.50	
Miscellaneous	8.05	
		4,183.12

Labor—Lining up piling, capping, etc	$ 233.35	
Framing (151,000 F.B.M. at $18.76)	2,832.15	
Removing material from old bridge and placing of temporary	122.65	
Replacing old center span and repairing	346.05	
Building approaches	591.45	
Watchman and plant charges	618.27	
		4,743.92
		$9,876.46

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S. CRAWFORD AV. AND W. F. SOUTH CHICAGO RIVER BRANCH.

A wood trestle bridge 120 feet long and 18 feet wide was erected at this location at the following cost:

Removing old bridge	$ 65.50
Material for trestle proper	763.95
Driving 10"x10" posts for bents	292.00
Labor—bracing, capping—framing, etc.	478.43
Sidewalk railing (labor and material)	62.09
4" sheeting to protect bank (labor and material)	170.57
Rebuilding culvert (labor and material)	69.64
Grading and back-filling	39.60
	$1,941.78

S. CALIFORNIA AV. AND W. F. SOUTH BRANCH CHICAGO RIVER.

This bridge is a pile trestle 335 feet long with 24 feet creosoted wood block roadway and two 8 feet walks. The river span (steel girders) is 43'0" in the clear. All timber used was creosoted. Following is the cost:

Clearing site, grading, etc.		$ 165.15
Piling (creosoted)	$2,395.50	
Unloading	199.82	
Driving	756.38	
¼ cost of shore pile driver	561.60	
		3,913.30
Cutting, capping, bracing, bolting		1,565.50
Mud sills and shore bents		476.00
Center span (steel girders)—		
Material	$ 458.00	
Labor	297.34	755.34
Y. P. lumber creosoted for caps, stringers, deck, etc.		5,224.44
Framing and placing the above timbers	1,401.40	
¼ cost of power saw	81.15	
		1,482.55
Wood block pavement with tar felt on sub plank and ½" spacing strips and covered with stone chips and tar pitch—		
Labor	$ 266.50	
Material	1,595.90	
		1,862.40
Sidewalk railing—		
Labor	$ 163.20	
Material	1,258.56	
		1,421.76
Painting		160.18
Oil, gasoline, coal, nails, bolts, etc.		310.46
Grading approaches—		
Labor	$ 145.92	
Material	28.00	
		173.92
Wood approach at southwest corner		156.20
Cement curb, gutter and walks—		
Labor	$ 232.88	
Material	121.35	
		354.23
Watchman, plant charges—vacation periods		1,332.53
Engineering, superintendent, inspection		867.17
		$20,217.13

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NINETY-SECOND STREET BRIDGE.

Built concrete retaining wall on south side of west approach and replaced cement walks $708.64

REPAIRS AND BETTERMENTS SECTION.

Mr. F. H. Avery, Engineer of Bridge Construction and Repairs.

The work of this section consists in the preparation of necessary specifications and plans and estimates for repair and betterment propositions and material therefor; as installed by contract or City forces. It works in conjunction with the Repair and Maintenance and the "Construction by Day Labor" sections in an endeavor towards economy and efficiency in the bridge repairs.

CHANNEL LIGHTS.

Early in the year steps were taken towards complying with the changes in the U. S. Government regulations affecting the lighting of bridges on the navigable portions of the Chicago Harbor. Of the movable bridges in Chicago, 47 are subject to these new laws. It was deemed advisable to devise lamps that would prove economical in point of maintenance. The bascule bridge type of lamp is composed of two lamps, combined in one unit. The lamps are electric lighted and are formed by 8" red and green Fresnel lenses respectively. The lights are changed automatically from the red to green and vice-versa at a definite point, during a lift, by a gravity actuated switch. The materials of the lamp are malleable iron and bronze, giving permanence. It is a standard for all bascule and lift bridges, being applicable in all cases. The swing bridge lamps were made of cast aluminum and the pier and abutment lamps of malleable iron. Swing bridge and pier lamps, oil lighted, could have been bought as a standard article in sheet metal, but this was not considered practical from a maintenance standpoint. Ninety-four bascule bridge lamps, 176 pier lamps and 27 swing bridge lamps of the types above described were furnished under contract for a total sum of $5,183.50.

SAFETY GATES HALSTED STREET LIFT BRIDGE.

The disregard of signals by automobilists has been the cause of fatal accidents at several of the bridges during the year, two such deaths occurring at Halsted Street Lift Bridge. As a result, two counterweighted structural steel street gates, one at each end of the bridge and spanning the entire roadway were installed. These gates raise automatically when a lift is made. Being of steel and very substantial they serve as a barrier as well as a street signal. They were designed by this section and cost fabricated $990.00. Total cost about $1,800.00 complete.

ELECTRIC GATES.

At Diversey Blvd. Bridge one set of two Buda electric gates costing $485.00 were installed and a contract has been let for installing similar gates at Rush street. This is more of a departure than appears at first sight, for these are swing bridges and heretofore the only device relied upon to stop traffic was to stretch a chain across the approach. When the policeman who attended to this was absent, there was no signal possible. The operator out in the middle of the river could not control or stop the traffic in the absence of the officer and had to take chances when he opened his bridge. The electric gate, since it could be controlled, has changed all this and the operator can now lower and raise his gates from his station at the center

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of the river. The electric gate has two more vitally important safety features which this installation brought out. They can be instantly reversed after starting down and this has greatly decreased breaking the arms by collisions due to drivers being unable to stop. The other feature is the ability to interlock the signal with the operation of the bridge, by making it impossible to get current to the main motor controller until the gate switch has been thrown in.

Two street signals of wig-wag or waving type which were installed in 1914 are giving satisfaction at the Diversey Avenue and Rush Street Bridges.

The matter of stop signals is still unsettled and the present wig-wag signals were installed merely to gain experience along this line. These are not entirely satisfactory as they are much too high above the ground and do not permit a man in an auto to see them without stooping to look under the top of his machine.

LIGHTING.

In 1914, two hand searchlights were experimented with, the object being to install them for use by the bridge operators as emergency lights when the arc lights went out. Considerable time in night tests was required before a satisfactory lamp was obtained, after which 75 lamps were ordered. Each lamp is fitted with a 6 volt, 2½ ampere nitrogen bulb and as it was desired to run these lamps from the regular operating circuit which is 600 volts, it was necessary to install resistance plates in series to effect the necessary drop in voltage. While being wasteful of current, the fact remains that the lights burn for a minute or two at a time and that only occasionally. The cost was as follows:

75 lamps, at $3.44 each	$258.00
75 resistance plates, at $9.20 each	690.00
Total	$948.00

BRIDGE FLOORS.

In the course of bridge inspection, the creosoted blocks in the pavement on the new Chicago Avenue Bridge were found to be badly cracked due to the deflection of the subplanking. This floor as constructed was made up of 4"x6" timber on 12" centers laid transversely, and a solid 2" floor laid longitudinally for supporting the 4" blocks. All the timber was surfaced four sides and creosoted. To remedy this, a solid floor of 6"x12" surfaced four sides creosoted yellow pine timber with ¼" air spaces between each plank and a pavement of 3½" or 4" creosoted hexagonal tamarack blocks was proposed by this section and adopted. Hexagonal blocks were suggested as they minimize expansion troubles. The subplanking and blocks are treated with 12# of creosote oil per cubic foot. Advantage was taken of this knowledge and the floors of Lake street, Belmont avenue and Webster avenue bridges changed to the new type.

Also many of the existing bridge floors are constructed in such manner as to meet the conditions set up by the old 6" tram street car rail. This type of rail is no longer a standard article and as it has become necessary to renew the rails it is contemplated installing either 9" rails or 7" 110# rails, both of which are standard. Along with the 9" rail are installed special manganese castings at the end and center breaks in floor, which decreases the impact due to street cars considerably. This is the practice on new bridges and it is the preferable scheme when applied to old bridges, where practical.

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Plans for alterations of the above nature have been made for N. Western avenue and Diversey avenue bridges and all the necessary materials have been delivered, but owing to the lack of funds, this work is delayed until 1916. It is planned to make similar changes on all bridges where conditions permit, should the installation of the 9" rail and new deck at Western avenue prove successful and not too expensive.

STATE STREET BRIDGE.

Numerous alterations to the State Street Bridge and viaduct were made. A 7" rail being used to replace the old 6" tram rail on the bridge as well as the viaduct. The roadway was redecked and during the progress of repairs, numerous bad spots were discovered which could not be seen until the removal of the deck. The steel on both approaches was reinforced and overhauled. The plates riveted to the car stringers and used to carry the sub-plank were found badly worn or cracked. This particular type of construction has so many defects that a remedy will be attempted by the use of an entirely new scheme originated by this section. This proposed construction will be tried out on one of the new bridges, and while uneconomical of material it is believed will prove the reverse in point of maintenance and delay to traffic, since it permits removing the rails without tearing up the entire bridge floor as at present.

The approaches to 95th Street Bridge and the north end of South Halsted Street lift bridge, were badly in need of repairs as in both cases the bridge machinery and steel suffered considerably from the mud and rain which readily found their way through the openly laid sub-planking. To offset this, a new floor of 6" sub-planking was laid over which waterproofing of 3 ply burlap in hot waterproofing was placed, and finally 2½" of concrete fill and 5" granite block paving at both bridges was laid, the granite blocks replacing oak plank paving. At South Halsted Street Bridge the 6" rail was replaced by a modern 7" rail.

BRIDGE PROTECTIONS.

The deterioration of bridge protections in previous years has vastly exceeded the repairs with the consequence that many of the bridges have been minus real protection. However, since the institution of the City pile driver, an improvement in bridge protection has become plainly noticeable.

This crusade has resulted in new protections at S. Halsted Street Lift Bridge and Throop Street Bridge. Plans for a new protection at 18th street have been made. Creosoted piles have been and will be used on all protections where permanence against weather is desired.

35TH STREET CRIB PROTECTION.

To protect the operators' house at 35th Street Bridge with its control machinery a crib was installed for Thirty-five Hundred Dollars ($3,500.00) under contract.

BRIDGE HOUSES.

The work of remodeling bridge houses started in 1914 was continued during the year. At S. Ashland Avenue (W. F.) two new houses were built and located on opposite corners of the bridge. At Randolph Street Bridge, a new house was built at the southwest corner to replace the one at the northwest. The plans for similar changes at N. Halsted Street (River) Bridge

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were completed and actual work in the field is under way. Due to the necessity of maintaining bridge operation during alterations the cost of this work exceeds the amounts ordinarily estimated. The following is a synopsis of the work done along this line during the year:

Location	Alterations	Plumbing	Furnaces	Furniture	Painting	Totals
S. Ashland Av. (W. F.)	$6,077.82	$ 257.75	$ 134.00	$ 67.00	$ 75.00	$6,611.57
Randolph St.	(2,500.00 (85% complete	350.00	58.00	30.00	124.00	3,072.00
100th St. Ferry	623.00	.....	.....	.....	70.00	693.00
95th St.	350.00	298.41	116.00	.....	.....	764.41
S. Halsted St. (Lift)	.....	.....	58.00	.....	.....	58.00
Torrence Ave.	Ordered	Ordered	58.00	.....	108.68	166.68
Cortland St.	.....	.....	58.00	.....	.....	58.00
Wells St.	300.00	358.04	.....	.....	.....	658.04
State St.	75.00	690.30	.....	.....	82.70	848.00
Harrison St.	.....	.....	.....	.....	181.82	181.82
Kinzie St.	.....	940.88	.....	.....	.....	940.88
Lake St.	.....	250.00	.....	.....	.....	250.00
Fullerton Av.	.....	.....	58.00	.....	.....	58.00
Various Bridges	.....	480.00	.....	.....	.....	480.00
N. Halsted St. (River)	1,960.00	.....	.....	66.00	.....	2,026.00
Totals	$11,885.82	$3,635.38	$540.00	$163.00	$642.20	$16,866.40

PAINTING.

Considering the immense quantities of iron, steel and wood comprised in the City's bridges, practically all of which is directly exposed to the elements, the amount of painting done is hardly a fair proportion to that really necessary.

The S. Halsted Street (Lift) Bridge was painted 1½ coats above the top of the movable span and 2½ coats below that elevation. This was done by contract for two thousand eight hundred twenty-one dollars ($2,821.00). Seventeen barrels of paint were furnished by the City at a cost of 85c per gallon. Total cost is $3,607.00, of which $2,821.00 is for labor, $731.00 for paint and $55.00 for material.

All street gates were painted in bands of red and white two feet long so as to render them more visible to traffic and thus serve as a step toward minimizing accidents. The red ball river signals were painted at the same time at a total cost of $627.50.

The following summary gives the total amounts spent for painting as well as similar work not mentioned above:

Halsted St. Lift Bridge	$3,607.00
Chicago Harbor Boats Nos. 1, 2 and 4	165.89
Bridge houses	1,545.00
Bridge gates and signals	627.50
Total	$5,945.39

This work other than that done by contract was divided between the Water Works Shops and the Construction Division.

INSPECTION.

The basic system of inspection and ordering of repairs as carried on in 1914 underwent little change during 1915. The improvement in the general condition and appearance of the bridges and a reduction in the number of

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complaints is taken as direct evidence of the benefits devolved from systematic inspection as applied to bridges.

Carpenter work only was covered by this inspection.

This work was under the direction of Mr. Roy E. Guthier, bridge designing engineer.

PLANT.

Owing to the lack of funds in the respective appropriations, the City's pile driver, land driver, tug and scows were retired for the year on June 15, 1915. The scows were used to some extent since then on emergency work, as at the time of the Eastland disaster when they were used continuously for several weeks with such other of the equipment as was available and of use. Whenever practical, Chicago Harbor Boat No. 11 was used for towing of equipment after retiring of the tug, and when not so, towing services were hired.

INCREASE IN EQUIPMENT.

The equipment was increased during the year by the addition of a shore driver and portable air compressor.

The shore driver was built by the City's forces. This driver has been very successful in driving piles on shore where working clearances have been a minimum.

STATISTICS.

For several years previous to 1915, traffic census on the main bridges in the loop only were taken. The advantages and character of information accruing from having this data on hand, were such as to have similar statistics taken for all bridges. These counts were consequently made.

When opportunity afforded as much additional data for the bridge sketch books was collected and entered in the books as could be.

ANNUAL CONTRACT FOR POWER.

After a joint inventory of the electrical equipment of the City's bridges taken by a representative of this section and the Chicago Surface Lines, it was seen that no marked deviation from the City's guaranteed list of equipment, as established in 1914, was made, and the contract was renewed under the same terms as that made for 1914, the general conditions of which were noted in the report for that year.

The plans for this work were prepared by Mr. O. W. Hansen, and the work itself was under the direction of Mr. W. R. Carmody, General Foreman of Bridge Construction and Repairs.

VII.

VIADUCT SECTION.

H. C. Beck, Bridge Designing Draftsman.

A regular semi-monthly inspection was made during the year of all viaducts in the City. One hundred and fifty-six notices were issued to the various railroad companies to make repairs, and further inspections were made to see that these repairs were done.

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CANAL STREET VIADUCT.

The entire viaduct was redecked. The B. & O. C. T. R. R. girder span was renewed and extensive repairs consisting of the renewal of seven panels of the floor steel and reinforcement of the lower chords of the trusses were made to the C. & N. W. Ry. and the C. B. & Q. Ry. portions. The work was started April 5th, and the west roadway was finished and opened to traffic May 18th. The east roadway was not opened to traffic until August 19th, on account of work being held up by the structural iron workers' strike.

CRAWFORD AVENUE VIADUCT.

The C. & W. I. R. R. constructed a viaduct over their yards in accordance with ordinance of March 2, 1914. This ordinance granted permission to construct the Clearing freight yard and specified that viaducts should be built at Cicero and Crawford avenues. Cicero avenue viaduct was built last year. Crawford avenue construction was started September 6, 1915, and at the end of the year was complete, except for paving. The viaduct consists of seven steel through girder spans, 526 ft. in overall length. These are encased in concrete and have concrete floors and sidewalks. The paving is creosoted wood block. The approaches are sand and earth fill at 3½% grade, paved with macadam.

JACKSON BOULEVARD VIADUCT.

A timber connection has been made between the old viaduct and the new river bridge. The viaduct has been moved 5 ft. south. This will permit building the north roadway of the new viaduct in place without discontinuing traffic over the south roadway of the old, and will not throw the river bridge entirely out of service through the construction of the viaduct.

An effort has been made in all cases where repairs necessitated closing the street to provide passage for traffic, either by laying out the work so that only one part of the street was closed at a time or by building temporary trestles around the work. The foot traffic is easily accommodated, but the roadway traffic is more difficult to provide for.

The viaduct sketch and data book is complete. This book consists of blue prints of each viaduct with a sheet giving all miscellaneous information available. A great part of this information had to be obtained in the field, as there were no records in the office. A viaduct ordinance book has also been prepared. This contains a copy of every ordinance relative to viaducts. These two books save an unlimited amount of time and delay by having the records of each viaduct instantly available instead of having them so scattered that a day's work is required to locate them.

Weekly or semi-weekly conferences to discuss and prepare a general viaduct specification were held. This was completed toward the end of the year and mimeograph copies will be ready early in 1916. The specifications cover all types of design and all parts of the viaduct both substructure and superstructure. When the mimeograph copies have been checked and corrected, the specifications will be printed as a guide for designing viaducts in the City of Chicago.

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ANNUAL REPORT

BUREAU OF RIVERS AND HARBORS

CITY OF CHICAGO

1915

ADAM F. WECKLER
Harbor Master

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BUREAU OF RIVERS AND HARBORS

Hon. W. R. Moorhouse,
Commissioner of Public Works.

Dear Sir:

I beg to submit herewith the annual report of the Bureau of Rivers and Harbors for the year 1915, showing permits issued, fees collected and work performed in the development of the Harbor of the City of Chicago.

The Bureau of Rivers and Harbors was established in accordance with your letter of July 23, 1915, supplemented by your letter of October 9, 1915.

I have endeavored to conduct the Bureau of Rivers and Harbors along efficient and economic lines and in accordance with all governing laws and ordinances. Plans are now being made for a comprehensive study of the dock question, with a view of recommending for passage an ordinance requiring all docks to be built of concrete in the future, in order to lessen the expense of maintaining the same. Another phase of the river to be considered will be the study of river conditions preparatory to drawing up a table showing the curves of velocity and elevation of the Chicago and Calumet Rivers. A start was made in this direction in 1915, when 21 gauges were placed on the Chicago River by our engineering force in addition to the regular current work of the Bureau.

I respectfully call your attention also to the improved system for recording the arrival and departure of vessels in Chicago's harbor. Where before the records of the vessel dispatcher showed only the name of the vessel and the time it passed his office, the new record will show date, name of vessel, kind of power, in or out, name of tug, kind of tonnage and cargo, registered tonnage and destination. The proper recording of vessel movements is one of the first steps necessary to help bring back the lake commerce, which during the past few years has been on the decline. In accordance with the plan of His Honor the Mayor to "boost Chicago," the Bureau is engaged in other work, one ultimate result of which will be to bring back Chicago's lake trade, if possible.

In the matter of improvement of the harbor $338,136.46 has been expended by the United States Government, the Sanitary District of Chicago and the City of Chicago. Most of this has been spent by the United States Government, which has been very active in improving the Calumet River under a ruling of the Secretary of War.

Regarding other river and harbor improvements the visit of the City officials to Washington last fall resulted not only in favorable recommendation for the proposed Franklin-Orleans bridge, but in a promise of appropriation of $730,000.00 additional for the construction by the United States Government of a protection breakwater to the south and east of Chicago's new $4,000,000 Municipal Pier. Without such a protecting breakwater, lake commerce would be unable to enjoy the advantages of docking at the pier except in calm weather.

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The Harbor Board, organized by ordinance of the City Council of January 10, 1915, and consisting of the Commissioner of Public Works, City Comptroller, City Engineer, Harbor Master, Superintendent Bureau of Compensation, Chairman Council Committee on Harbors, Wharves and Bridges and Chairman Council Committee on Compensation, has had several meetings and is now considering a plan of organization for the management and operation of the Municipal Pier with the view of securing the necessary appropriation therefor from the City Council. It is expected that the pier will be in full operation by the beginning of the 1916 navigation season.

For detailed information as to the work of this Bureau your attention is respectfully invited to the following detailed reports of the Divisions of this Bureau.

Very truly yours,

ADAM F. WECKLER,
Harbor Master.

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PERMITS ISSUED FOR THE CONSTRUCTION OF NEW DOCKS—YEAR 1915.

Location of work.	Number of Permits	Lineal feet Constructed	Fees Collected
Main Chicago River	..	....	.....
North Branch Chicago River	2	549	$137.25
South Branch Chicago River	1	1,082	20.00
Calumet River	2	396	20.00
Lake Michigan	1	2,270	.....
Total	6	4,297	$177.25

PERMITS ISSUED FOR THE REBUILDING OF OLD DOCKS.

Location of work.	Number of Permits	Lineal feet Rebuilt	Fees Collected
Main Chicago River	3	214	$ 53.50
North Branch Chicago River	18	3,711.5	677.88
South Branch Chicago River	12	527	127.75
Calumet River	1	160	40.00
Lake Michigan	3	390	97.50
Total	37	5,002.5	$996.63

PERMITS ISSUED FOR THE REPAIRING OF OLD DOCKS.

Location of work.	Number of Permits	Lineal feet Repaired	Fees Collected
Main Chicago River	11	813	$ 97.88
North Branch Chicago River	18	1,759	220.15
South Branch Chicago River	31	3,743	467.90
Calumet River	8	1,234	154.25
Lake Michigan	4	400	50.00
Total	72	7,949	$990.18

PERMITS ISSUED FOR DRIVING PILES,

Including piles separately driven under other docking permits but not included under the three other classifications.

Location of work.	Number of Permits	Piles Driven	Fees Collected
Main Chicago River	7	26	$ 6.50
North Branch Chicago River	5	59	14.75
South Branch Chicago River	6	292	73.50
Calumet River	7	145	36.25
Lake Michigan	2	14	3.50
Total	27	536	$134.50

SUMMARY OF PERMITS ISSUED FOR DOCKING DURING THE YEAR 1915.

Location of work.	Number of Permits	Lineal feet	Fees Collected
New construction	6	4,297	$177.25
Rebuilding	37	5,002.5	996.63
Repairing	72	7,949	990.18
Driving of piles	27	536	134.50
Total	142	17,784.5	$2,298.56

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PERMITS ISSUED FOR DREDGING DURING YEAR 1915.

Location of work.	Number of Permits No.	Days	Fees Collected
Main Chicago River	15	23	$ 56.00
North Branch Chicago River	18	222	12.00
South Branch Chicago River	27	209	100.00
Calumet River	121	366	512.00
Lake Michigan	19	255	40.00
Lake Calumet	5	42	168.00
Totals	205	1,117	$888.00

PERMITS ISSUED DURING THE YEAR 1915 FOR TOWING SCOWS LOADED WITH OTHER THAN DREDGED MATERIAL.

Location of work.	No. of Permits	No. of 8-hour days	Fees Collected
Main Chicago River	8	32	$128.00
North Branch Chicago River	2	2	8.00
South Branch Chicago River	6	39	36.00
Calumet River	5	7	28.00
Totals	21	80	$200.00

DISTRIBUTION OF TIME REQUIRED TO COMPLETE THE DREDGING WORK.

Location of work	Number Permits	Total days	Sanitary District	Days United States	Park Comm.	Private Dredging	City Work
Main Chicago River	15	23	...	9	..	14	...
North Branch Chicago River	18	222	1	197	..	10	...
South Branch Chicago River	27	209	151	15	..	17	26
Calumet River.	121	366	...	220	..	145	1
Lake Michigan.	19	255	...	75	30	10	140
Lake Calumet.	5	42	...	...	..	42	...
Total.	205	1,117	156	516	30	248	167

SUMMARY OF FEES COLLECTED DURING THE YEAR 1915.

For Dock Permits	$2,298.56
For Dredging Permits	888.00
For Towing Permits	200.00
For Special Permits	603.50
Total.	$3,990.06

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SOURCES OF MATERIAL DUMPED IN LAKE MICHIGAN IN 1915.

Months	From Disposal Stations		From Dredging and Miscellaneous Towing		Total Cubic Yards	
	Scows	Cu. yds.	Scows	Cu. yds.	Scows	Cu. yds.
January.	....		17	6,773	17	6,773
February.	....		5	1,588	5	1,588
March. 6		2,092	53	31,253	59	33,345
April.	....		205	117,407	205	117,407
May.	....		169	83,904	169	83,904
June.	....		135	67,772	135	67,772
July.	....		212	110,536	212	110,536
August.	....		136	72,227	136	72,227
September. . . .	....		256	124,449	256	124,449
October.	....		170	85,321	170	85,321
November. . . .	....		183	87,085	183	87,085
December. . . .	....		110	52,945	110	52,945
Totals. . ..6		2,092	1,651	841,260	1,657	843,352

WHERE DEPOSITED IN LAKE MICHIGAN.

Months.	13 mile Dumping Area Chicago		8 mile Dumping Area Chicago		Outer Harbor Behind bulkhead in the Lake		So. Chicago 8 mi. in Ind. waters and 13 mi. in Ill. waters		So. Chicago behind Bulkheads	
	Scows.	Cu. yds.	Scows.	Cu. yds.	Scows.	Cu. yds.	Scows.	Cu. yds.	Scows.	Cu. yds.
Jan.	13	5,857	...	.....	4	916	...	.....	..	.....
Feb. . ..	5	1,588	...	.....	.	...	...	.....	..	.....
March. ..	19	8,093	...	.....	.	...	40	25,252x	..	.....
April ..	45	19,322	...	.....	.	...	160	98,085x	..	.....
May. . ..	45	21,211	...	.....	.	...	124	62,693x	..	.....
June. ..123		63,073	...	.....	.	...	2	810o	10	3,889
July. . ..	58	28,154	131	71,892	.	...	...	.....	23	10,490
August. .	7	2,012	121	67,019	.	...	8	3,196x	..	.....
Sept. . ..	26	10,269	112	61,582	.	...	118	52,598x	..	.....
Oct. . ..	81	39,628	32	18,612	.	...	57	27,081x	..	.....
Nov.	30	12,569	...	.....	.	...	153	74,516x	..	.....
Dec. . ..	33	15,145	...	.....	.	...	77	37,800x	..	.....
Total. . .485		226,921	396	219,105	4	916	739	382,031	33	14,379

x represents yardage dumped 8 miles in Indiana waters.
o represents yardage dumped 13 miles in Illinois waters.

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SUMMARY OF SPECIAL PERMITS ISSUED IN 1915.

Location	Building Work	Bridge Work	Water Pipe Work	Sewer Work	Electrical Work	Dumping and Filling	Sand Excavation	Borings	Snow Dumping	Dock Work	Icehouse Work	Dredging Work	Miscellaneous Work	Totals	Fees Collected
Main Chicago River.	1	..	1	2	1	..	.	.	1	1	.	.	5	12	$ 18.00
North Branch Chicago River	7	4	.	5	1	1	.	.	.	3	.	.	2	23	43.00
South Branch Chicago River	9	7	2	3	.	..	.	.	.	3	.	.	6	30	89.50
Calumet River.	6	4	2	1	5	2	.	.	.	1	.	.	5	26	50.00
Lake Michigan.	9	..	2	1	1	11	.	.	1	28	.	.	20	73	128.00
Lake Calumet.	.	..	.	..	.	..	.	.	.	..	2	2	..	4	275.00
Totals. 32	15	7	12	8	14	.	.	2	36	2	2	38	168	$603.50

COMMERCE BY LAKE—CITY OF CHICAGO—YEAR 1915.

The report of the United States Collector of the Port for the year 1915 gives the following:

Entrances:

Entered at—	No. of Vessels	Tonnage
Chicago River.	4,158	4,322,869
Calumet River.	897	3,416,305
Total Entrances.	5,055	7,739,174

Clearances:

Cleared at—	No. of Vessels	Tonnage
Chicago River.	4,020	4,086,704
Calumet River.	1,077	3,747,448
Total Clearances.	5,097	7,834,152

SUMMARY TOTAL LAKE TRADE OF THE CITY OF CHICAGO.

Chicago River—				
Entered. . .4,158	vessels, 4,322,869	reg. tons		.....
Cleared. . . .4,020	vessels, 4,086,704	reg. tons.	8,178	8,409,573
Calumet River—				
Entered. . . 897	vessels, 3,416,305	reg. tons		.....
Cleared. . .1,077	vessels, 3,747,448	reg. tons.	1,974	7,163,753
Totals for the City of Chicago.....			10,152	15,573,326

Which for the year 1915 give the following values of the average cargo per vessel—

Chicago River. .....1,028.3 tons
Calumet River. .....3,629 tons
City of Chicago.....1,534 tons for the whole city trade.

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COMPARISON OF COMMERCE OF 1915 WITH 1914.

Chicago River Entrances, loss of	610	vessels of	532,776	registered tons loss
Chicago River Clearances, loss of	586	vessels of	485,268	registered tons loss
Totals. . .....loss..	1,196	vessels of	1,018,044	registered tons loss

This falling off of our trade by the Chicago River is only in part remedied by the results for the Calumet River, which gains for the year 1915 over the year 1914, 148 vessels of 572,588 tons' gain, which leaves for the whole City the net loss of 1,048 vessels of 445,456 tons as the actual loss of our trade for the year 1915, as compared with that for 1914.

The results of the trade of our southern or deep water port, the Calumet River, are improving each year. During 1915 while it had only a little over 19 per cent of the total number of vessels that carried the trade of the whole City, the Calumet River handled 46 per cent of our whole trade, lacking only 4 per cent of our total tonnage to become equal to the tonnage of the Chicago River for the year 1915.

LAKE PASSENGER TRAFFIC.

Statistics obtained from the United States Steamboat Inspector's office show that the number of passengers on lake steamboats during 1915 was 714,962, as against 1,280,238 in 1914. These passengers were carried on 31 steamboats and launches plying in and out of Chicago. Although the normal steamboat season runs from about June 15th to September 15th, several of the larger vessels were kept running during all year. The falling off in the number of passengers is apparently due to the timidity caused by the Eastland disaster on July 24, 1915.

COMMERCE OF THE CITY OF CHICAGO—1915.

Receipts by Lake of Principle Articles.

Articles.		Chicago River	Calumet River	Total
Coal, hard.	tons	582,512	225,162	807,674
Coal, soft.	"	50,735	908,031	958,766
Salt.	"	111,043	.....	111,043
Iron ore.	"	32,171	4,214,964	4,247,135
Iron, manufactured	"	82,230	615	82,845
Cement	"	480	.....	480
Lumber	M feet	134,123	764	134,887 M
Lath	M	2,472	.....	2,472
Railroad ties	pieces	37,100	.....	37,100
Wood	cord (128 cu. ft.)	3,708	3,708 M	8,966 tons
Sugar	tons	57,555	.....	57,555
Wheat	bushels	235,000	423,000	658,000
Corn	"	.....	123,250	123,250
Oats	"	.....	45,000	45,000
Flax seed	"	748,120	384,000	1,132,120
Oil	barrels	4,200	.....	4,200
Merchandise, unclassified..	tons	824,754	506,459	1,331,213

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COMMERCE OF THE CITY OF CHICAGO FOR 1915.
SHIPMENTS BY LAKE OF PRINCIPAL ARTICLES.

Articles		Chicago River	Calumet River	To
Flour	tons	206,808	54,226	261,
Wheat	bushels	5,337,502	11,105,990	16,443,
Corn	"	6,330,752	18,616,619	24,947,
Oats	"	2,015,286	1,900,881	3,916,
Barley	"	40,000	.....	40,
Rye	"	.....	23,470	23,
Grass Seed	tons	1,030	.....	1,
Mill stuff	"	191,163	44,119	235,
Oil cake	"	286	605	
Pork	barrels	1,189	425	1,
Wool and hair	sacks	200	.....	
Corn and oatmeal	tons	70	.....	
Manufactured iron	"	9,558	17,372	26,
Cement	"	200	43,448	43,
Oil	barrels	....	39,892	39,
Merchandise, unclassified	tons	432,678	26,991	459,

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Corn. . ....
Oats. . .....
Barley. . ....
Rye. . .....
Grass Seed.
Mill stuff. .
Oil cake...
Pork. . ....
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COMMERCE BY LAKE AND CANAL—CITY OF CHICAGO

From 1860 to 1915 by years, with population 1831 to 1915. Compiled from official records of the department.

	Vessels by Lake			By Ill. and Mich. Canal				
Years	Total No.	Total Tonnage	Average Cargo Ton	Boats No.	Tonnage	Tolls Dollars	Population	Remarks
1860	.....	.....	.....	201	367,437	$138,554	109,460	
1861	.....	.....	.....	194	547,295	218,040	120,000	
1862	14,687	3,847,246	262	211	673,590	264,647	137,030	
1863	17,135	4,333,832	252	240	619,599	210,386	150,000	Population Prior Years
1864	17,762	4,339,770	244	228	510,286	156,607	161,288	
1865	20,179	4,199,135	208	228	616,140	300,810	178,492	
1866	22,199	4,620,092	208	230	746,815	202,958	200,418	
1867	24,370	5,101,203	209	209	746,954	252,231	225,000	1831 60
1868	26,399	6,005,403	265	218	737,827	215,720	252,054	1832 600
1869	27,602	6,273,346	227	219	817,738	238,759	280,000	1833 350
1870	25,172	6,033,207	239	179	585,970	149,635	298,700	1834 1,800
1871	24,632	6,178,336	251	186	628,975	159,050	334,270	1835 3,265
1872	25,353	6,077,542	239	173	783,641	165,874	367,396	1836 4,000
1873	23,734	6,564,542	239	172	849,533	166,641	380,000	1837 4,179
1874	21,547	6,329,711	294	152	712,020	144,831	395,400	1838 4,000
1875	21,095	6,279,055	298	142	676,025	107,081	407,000	1839 4,200
1876	19,245	6,167,736	320	146	691,946	113,293	420,000	1840 4,470
1877	20,517	6,585,415	321	145	605,912	96,913	439,776	1841 5,500
1878	20,984	7,239,673	345	140	598,792	84,330	450,000	1842 6,590
1879	23,873	7,757,395	325	136	669,559	89,064	475,000	1843 7,580
1880	25,520	9,154,351	345	133	751,360	92,296	503,298	1844 8,000
1881	26,005	8,762,247	337	133	826,133	85,130	540,000	1845 12,088
1882	26,977	9,754,949	362	132	1,011,287	85,947	560,693	1846 14,169
1883	23,982	7,790,337	325	132	925,575	77,975	580,000	1847 16,859
1884	22,826	7,508,696	330	134	956,721	77,102	630,000	1848 20,023
1885	21,542	7,306,222	339	135	827,355	66,800	664,634	1849 23,047
1886	22,372	7,877,080	352	130	808,019	62,516	704,000	1850 28,296
1887	23,972	8,749,852	365	132	742,074	58,024	760,000	1851 34,000
1888	22,095	8,890,658	402	127	751,055	56,028	830,000	1852 38,734
1889	21,788	10,267,831	471	114	917,047	60,605	935,000	1853 60,662
1890	20,133	10,116,051	502	104	742,392	65,112	1,099,850	1854 65,872
1891	19,680	10,862,898	522	97	641,156	49,557	1,148,795	1855 80,023
1892	21,123	11,780,393	565	95	783,288	54,937	1,199,730	1856 86,000
1893	17,044	10,788,029	692	82	529,816	38,702	1,253,022	1857 93,000
1894	16,202	10,284,178	635	85	617,811	44,928	1,308,682	1858 84,000
1895	18,232	12,631,180	693	83	591,407	39,106	1,366,813	1859 94,000
1896	16,999	12,965,812	763	67	446,762	34,543	1,427,527	
1897	17,865	14,277,235	799	64	600,000	41,000	1,490,937	* These figures
1898	18,512	15,116,426	817	64	395,017	38,570	1,557,164	(1900–1910), as furnished by the U. S.
1899	16,174	12,599,239	779	64	469,352	41,022	1,626,333	Census Bureau, are
1900	16,976	13,990,894	824	60	121,759	20,866	1,698,575	based on the census
1901	16,274	13,634,904	838	41	81,456	11,151	1,747,236	of 1910.
1902	15,754	14,239,398	904	....	.....	.....	1,795,897	
1903	14,803	15,026,014	1,015	....	.....	.....	1,844,558	
1904	12,904	12,746,078	988	....	.....	.....	1,893,219	
1905	13,963	14,499,900	1,038	....	.....	.....	1,941,880	
1906	13,597	15,405,200	1,133	....	.....	.....	1,990,541	
1907	12,836	15,649,035	1,219	....	.....	.....	2,039,202	
1908	11,196	14,291,640	1,276	....	.....	.....	2,087,862	
1909	12,012	15,360,597	1,279	....	.....	.....	2,136,525	
1910	12,273	16,869,210	1,375	....	.....	.....	2,185,283*	
1911	11,868	15,957,005	1,345	....	.....	.....	2,262,756	
1912	11,500	17,065,541	1,484	....	.....	.....	2,307,638	
1913	11,981	17,999,264	1,669	....	.....	.....	2,344,018	
1914	11,200	16,018,782	1,430	....	.....	.....	2,393,325	
1915	10,152	15,573,326	1,534	....	.....	.....	2,442,632	

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TABLE SHOWING ELEVATION OF SURFACE OF LAKE MICHIGAN IN FEET, REFERRED TO CITY DATUM BY MONTHS OF YEAR 1915, FROM OBSERVATIONS TAKEN AT 2-MILE CRIB.

Months	Max.	Min.	Mean	Range	Remarks Maximum	Remarks Minimum
January.	—0.3	—1.8	—0.884	1.5	Jan. 20	Jan. 5
February.	+0.2	—1.0	—0.598	1.2	Feb. 2	Feb. 15
March.	—0.1	—1.0	—0.558	0.9	Mar. 5	Mar. 24
April.	—0.4	—1.1	—0.722	0.7	April 21	Apr. 18
May.	—0.1	—0.9	—0.577	0.8	May 26	May 10
June	—0.2	—0.7	—0.430	0.5	June 21	June 16
July.	+0.3	—0.5	—0.334	0.8	July 29	July 6,15
August.	+0.5	—0.6	—0.050	1.1	Aug. 3	Aug. 31
September. . .	+0.1	—0.8	—0.298	0.9	Sep. 27	Sep. 23
October.	+0.1	—0.9	—0.505	1.0	Oct. 1	Oct. 26
November. . . .	—0.1	—1.4	—0.812	1.3	Nov. 19	Nov. 13
December. . . .	—0.4	—1.4	—0.841	1.0	Dec. 4	Dec. 7
Year 1915...	+0.5	—1.8	—0.550	2.3	Max. Aug. 3	Jan. 5

A comparison of levels for the years 1914 and 1915 shows that the mean level for the year 1915 is 0.05 lower than that for the year 1914, which shows a continued low condition of lake levels and a drop of .52 feet below the mean elevation of the lake for 1910. There is no reason to believe that there will be any material increase in the lake level during the year 1916, but would estimate a slight decrease.

WATER TEMPERATURE—CHICAGO, 1915—MONTHLY AND ANNUAL MEANS, MAXIMUM AND MINIMUM IN DEGREES FAHRENHEIT FROM OBSERVATIONS TAKEN AT 2-MILE CRIB.

	Maximum	Minimum	Monthly Mean	Range	Maximum	Minimum
Year 1915	70°	32°	49.21°	38°	Aug. 3-5	Dec. 15-31

Table showing *surface velocity of the South Branch of the Chicago River*, as reported by the Harbor Police; observations taken at Harrison street; velocity in feet per second:

Year 1915—

	Maximum	Minimum	Mean for year
February 25 May 26 December 15	2.295 ft. sec.	Aug. 4 1.123 ft. sec.	1.703 ft. sec.

The resulting velocity at the surface being 1.703 ft. sec., which, when reduced, yields a mean velocity for the whole cross-section of the South Branch of 1.38 ft. sec.

This means velocity for a cross-section of 200 by 21 feet (taken as a standard when the widening of the river is completed), gives 5.796 feet seconds as to its discharge for 1915.

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WORK DONE BY THE UNITED STATES GOVERNMENT IN IMPROVEMENT OF THE HARBOR DURING 1915.
CHICAGO HARBOR.

There were five contracts in force during the year for the improvement of this harbor, viz.:

1. With Great Lakes Dredge & Dock Company of Chicago, Ill., dated July 24, 1914, for the construction of the outer portion (1,500 lineal feet) of the shore-arm extension of the Exterior Breakwater.

Work under this contract was begun during the previous year (on October 6, 1914) and consisted during that year of the construction of cribs, which work was done in the Indiana Harbor Canal, the cribs being towed thence to Chicago. At the close of 1914 three cribs had been partly completed. The contract was completed on October 25, 1915, at a total cost, including all materials secured in the work, except timber, which was purchased under a separate contract (see below) of $127,153.81.

The finished breakwater is 1,500 feet long and 30 feet wide. The outer five cribs, 100 feet long each, are 18½ feet high; the inner ten cribs, 16½ feet high. A sloping superstructure is built over the whole length with its highest (south) side, about 6 feet above city datum. The whole length is heavily riprapped.

2. With Union Lumber Company of Union Mills, Wash., dated August 5, 1914, for furnishing fir timber for the shore-arm extension breakwater. (See No. 1 above.)

The delivery of the lumber began on August 17, 1914, and was completed on January 23, 1915. The contract price F. O. B. cars at the mills was at the rate of $10.25 for 12"x18" lumber and $8.25 for all other dimensions.

There were delivered under the contract a total of 2,837,260 feet, B.M., at a total cost of $23,522.59.

3. With Great Lakes Dredge & Dock Company, dated August 16, 1915, for the construction of the southerly extension of the Exterior Breakwater (a rubble mound structure) at a contract price of $1.29 per ton for stone of all classes placed in the work, there being available for contract payments about $480,000.

Work was begun early in September, and there had been placed in the work up to December 1 about 39,000 tons, but no part of the work is completed to date. It is expected that the entire length of this extension, estimated at 2,270 feet, can be completed on or before December 1, 1916.

4. With Great Lakes Dredge & Dock Company, dated May 24, 1915, for the removal of the wreck of the Steamer "Iowa," sunk on February 4, 1916, in 36 feet of water, about midway between Carter Harrison and the Four-Mile Cribs, at the contract price of $6,980, for obtaining a clear depth over it of 30 feet.

Work was begun on June 1 and completed August 16. Owing to the liquidated damage clause in the contract, which became effective July 12, the payment to the contractors was but $3,455.50.

5. With Byrne Brothers Dredging & Engineering Company of Chicago, Ill., dated September 22, 1915, for placing heavy riprap where required along the lake faces of the Easterly and Exterior Breakwaters, at the rate of $1.60 per ton of 2,000 pounds.

Work was commenced on October 7 and complete on December 4, 1915. The total amount of riprap placed (mostly along the northerly face of the Exterior Breakwater) was 8,691.6 tons, at a total cost of $13,906.56.

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CHICAGO RIVER, ILLINOIS.

There was one contract in force during the year for the improvement of this river, viz.:

With Great Lakes Dredge & Dock Company, dated November 25, 1914, for dredging to 21 feet depth below city datum in the North Branch of the river between Webster and Belmont avenues.

Operations were begun on June 2 and completed on October 10, 1915. There were removed in all under the contract 277,341 cubic yards of dredged materials, and also a number of old piles, rocks, etc., the latter representing special work of the dredge during 13 hours and 47 minutes. The former was paid for at the rate of 14¾ cents per cubic yard, scow measurement; the latter at the rate of $20 per hour. The total cost of the work done under the contract was $41,183.47.

The channel was deepened to 21.0 feet below city datum to within 20 feet of existing docks, up to a point about 1,000 feet below Belmont avenue, but, owing to the soft material in this part of the river and the existence of many sewers emptying into it, the shoaling up of the dredged channel is comparatively rapid.

Under special agreement, some emergency dredging to a depth of 21 feet was done in a few places in the vicinity of the junction of the two branches of the river at an aggregate cost of $2,207.12, and three old wrecks were removed from the North Branch at an aggregate cost of $3,300.

An informal contract was entered into with the Great Lakes Dredge & Dock Company, dated August 23, 1915, for the hire by the hour of a dredge and diver to be used in removal of debris and other material projecting above the plane of 21 feet below Chicago city datum at the site of the capsizing of the Steamer Eastland, between LaSalle and Clarke streets in Chicago River, the contract price being $29.50 per hour. The work was done between August 24 and 28 at a total contract cost of $474.46.

Under verbal agreement of October 18, 1915, the Great Lakes Dredge & Dock Company removed material consisting of piles, brick, stone, etc., from the north draw span of Wells Street Bridge to a depth of 21 feet Chicago city datum, at a cost of $275.

CALUMET HARBOR, ILLINOIS.

There was one contract in force during the first part of the year for the improvement of this harbor, viz.:

With Great Lakes Dredge & Dock Company, dated July 14, 1914, for rebuilding parts of the superstructures on the breakwater and on the breakwater extension.

Operations under the contract were begun on August 25 and completed on December 12, 1914, too late to be accounted for in last year's report. Owing to several severe storms subsequent to the entering into the contract, the damages were increased and the cost increased accordingly. Thus the total cost of the work under this contract (including all materials secured in the work, except lumber, which was brought from Oregon under a separate contract) was $33,476.44, or $4,343.64 in excess of the amount originally estimated.

A contract was entered into on September 22, 1915, with Byrne Brothers Dredging & Engineering Company, for placing riprap along the lake face of the breakwater in scattered places where required.

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Work under the contract was done on September 23 and 24, 1915, but only 67 tons were placed, as more stone was found required at the Exterior Breakwater, Chicago Harbor (also covered by the contract) than the total amount called for. The cost for the work at Calumet Harbor was at the rate of $1.70 per ton of 2,000 pounds. The total cost for the riprap placed at the Calumet Harbor breakwater was $113.90.

Under a special agreement there were placed around the southerly end of the breakwater, for the protection of the lighthouse located at this place, 706.35 tons of heavy riprap at a total cost of $1,737.76.

CALUMET RIVER, ILLINOIS.

There were two contracts in force during the year for the improvement of this river, viz.:

1. With Great Lakes Dredge & Dock Company, dated June 11, 1914, for dredging to a depth of 21 feet the channel in certain detached places and for constructing, by dredging, Turning Basin No. 3, between 115th and 116th streets. The places dredged in the channel were: (a) the so-called "rock section" between 111th and 114th streets; the draws of the Calumet Western Railroad bridge near 124th street, and for a distance of about 0.6 mile below Turning Basin No. 5. The latter stretch was dredged to a width of only 100 feet, owing to lack of funds.

Operations under the contract were begun during the previous year, on June 5, 1914, and were in part accounted for in last year's report. The work under the contract was completed on August 7, 1915. The aggregate amounts of materials removed under the contract were: 341,611 cubic yards of ordinary dredging and 81.7 cubic yards of boulders, at a total cost of $55,100.80.

2. With FitzSimons & Connell Dredge & Dock Company of Chicago, Ill., dated August 27, 1915, for: (a) redredging to 21.0 feet depth the channel from the Elgin, Joliet & Eastern Railroad bridge, at the original mouth of the river, to the lower end of the "rock section"; (b) in the inner part of Turning Basin No. 1 and new dredging, to the full width of 200 feet, of the 0.6 mile of the channel below Turning Basin No. 5, which was dredged under the next previous contract to a width of 100 feet in 1914, as stated above.

Operations under the contract were begun on August 30, 1915. Up to the present date, December 8, 1915, about 52 per cent of the contract has been completed. The channel has been deepened to 21.0 feet below city datum up to 106th street, except along the east bank from the shipyard, as this space is occupied by large steamers laid up there for the winter.

The contract price for this work is at the rate of $.1440 per cubic yard, scow measurement, and under the terms of the contract all the work should be completed about the middle of July, 1916.

The estimated cost of all the work under the contract is $31,651.20.

SUMMARY OF THE WORK DONE BY THE SANITARY DISTRICT OF CHICAGO IN IMPROVING THE CHICAGO RIVER DURING THE YEAR 1915.

Chicago River—South Branch:

Dredging between Randolph and Washington streets, 3,051.5 cubic yards at $0.26½ per cubic yard, $808.65.

Dredging between Washington and Monroe streets, 9,006 cubic yards; paid for by Union Station Company.

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Dredging in and on either side of South Halsted street bridge draw and opening up south by-pass, 4,016 cubic yards; force account work, $5,524.66.

Lake Michigan:

Rubble mound construction, Lawrence Avenue Intake Crib, 4,276 cubic yards of stone placed in mound at $2 per cubic yard, $8,552.

Main Drainage Channel, Within City Limits:

Dock construction, south bank, between Campbell avenue and Kedzie avenue, 754.9 lineal feet at $26.75 per lineal foot, $20,193.58.

Backfilling behind dock, 45,551 cubic yards at $0.30 per cubic yard, $13,665.30.

Sloping north bank between California avenue and Kedzie avenue, 2,739 cubic yards at $0.13½ per cubic yard, $369.76.

EXPENDITURES FOR IMPROVEMENT OF THE HARBOR OF CHICAGO FOR THE YEAR 1915 ARE AS FOLLOWS:

City of Chicago—Dock Improvements.....$ 40,047.00 (approximate)
Sanitary District. 49,413.95
United States. 248,675.51

WORK DONE BY CITY OF CHICAGO.

The dock at the foot of Lumber street was repaired for its full width of 76 feet, at a cost of $1,198.78, putting this dock in a serviceable condition for use by the fireboat moored at this point.

An iron fence was constructed at the street end of LaFayette parkway and Lake Michigan at a cost of $72.51.

An iron fence was constructed at the street end of Kenilworth avenue and Lake Michigan at a cost of $436.62.

The City of Chicago is engaged by contract in constructing a retaining and sea wall at Lake View avenue and Lake Michigan, which will cost when completed approximately $16,000.

The concrete dock on the collateral channel fronting the new Municipal foundry was built this year. It consists of about 600 feet of dock capped with concrete above the water line and anchored to Raymond concrete anchor piles. It is about 600 feet long and cost approximately $37,550. This dock materially improves the appearance of the channel at this point.

The street end protection at North Shore avenue and Lake Michigan was rebuilt at a cost of $787.70, putting this street end in serviceable condition.

REVENUE OBTAINED FROM THE RENTAL OF CITY DOCKS DURING 1915.

The revenue obtained from the rental of city docks during the year 1915, as furnished by Mr. H. V. McGurren, Superintendent of the Bureau of Compensation, is as follows:

Location	Lessee	Expiration of Lease	Stipulation
S. S. River, between Clark and LaSalle	Chicago & South Haven Steamship Co.	Season 1915	$ 350
S. S. River, from Rush street east	Goodrich Transit Co.	April 30, 1917	6,000
S. S. River, at Dock street.	Graham & Morton Transportation Co.	April 30, 1916	1,000
S. S. River, between LaSalle and 5th avenue	Indiana Transportation Company.	Season 1916	250
			$7,600

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The amount of $7,600, as shown, represents only about 1,000 feet of dock space. It is expected that upon the completion of the new Municipal Pier that these and other firms will require docking space at this pier greatly in excess of the space occupied at present, with the result that the pier will yield a considerable sum in revenue to the City.

NOTICES SERVED BY HARBOR MASTER.

There were 71 notices served by the Harbor Master to rebuild bad docks and remove obstructions. In the cases of dock owners who were notified to make their docks serviceable and who defaulted therein, their names were sent to the Prosecuting Attorney, who commenced suit against them in consequence.

DOCK LINE ORDINANCES PASSED BY THE CITY COUNCIL IN 1915.

East side of Calumet River, between 99th and 100th streets. Passed March 22, 1915, pages 4067-68, Council Proceedings. This is the site on which it is expected that the Commonwealth Edison Company will build a large substation for the generation of electrical power for the southern portion of the city. A portion of this property is bounded on the east by the old channel of the Calumet River, which was abandoned as a navigable waterway by an act of Congress of February 27, 1915.

East side of North Branch Chicago River, between Barry avenue and the first alley south of Belmont avenue. Passed June 1, 1915, page 499, Council Proceedings. This property is owned by F. Tempel, and the dock was built for the operation of a sand yard.

West Side Calumet River, south from 95th street. Passed July 15, 1915, page 1416. This ordinance was passed to amend Section 1 of an ordinance passed June 2, 1913, pages 608-609, Council Proceedings, in order to correct an error in the distance referring to the point of beginning of the dock line.

West side Calumet River, between 118th and 123d streets. Passed November 29, 1915, pages 2368-69, Council Proceedings. This is the property owned by the Chicago and Northwestern Railroad Company, and on which the company expects to erect a large grain elevator. A concrete dock is to be built at this location and a land cut off is to be made at the southern end of the property. To insure the intentions of the company in dredging the cut-off away, the company is to place a bond for $20,000 on file with the City Clerk upon acceptance of the ordinance. This ordinance is amendatory of the general ordinance for the establishment of dock lines on the Calumet River from its mouth to the mouth of Turning Basin No. 5, which is now in the hands of the Council Committee on Harbors, Wharves and Bridges.

VACATING PORTION OF SOUTH FORK SOUTH BRANCH, CHICAGO RIVER.

An ordinance was passed on June 21, 1915, vacating that portion of the South Fork, South Branch, Chicago River, west from Ashland avenue and familiarly known as "Bubbly Creek." The object in view will be the construction of a large sewer through that portion of the river vacated and the covering over of said sewer by filling in that portion of the river when a satisfactory bulkhead has been constructed at the east line of Ashland avenue, as provided for in this ordinance.

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HARBOR BOARD ORDINANCE.

An ordinance creating a Harbor Board was introduced into the City Council in 1915, and was passed January 19, 1916, page 2952, Council Proceedings. In this ordinance the Commissioner of Public Works, the City Comptroller, the City Engineer, the Harbor Master, the Superintendent of the Bureau of Compensation, the Chairman of the Committee on Harbors, Wharves and Bridges, and the Chairman of the Council Committee on Compensation, are to be ex-officio members of and shall constitute this board, which will have executive charge and control of all matters and things except as otherwise conferred by law upon the City Council, pertaining to the Municipal Pier in Harbor District No. 1, which pier is located in Lake Michigan, off Illinois street, and is now being completed at a total cost of about $4,000,000. The pier will be managed by the Superintendent of Piers, who will report to the Harbor Board. The Harbor Board is to keep books of account to show the true and complete financial standing and results of city ownership and operation and of city ownership and leasing, as the case may be, and at all times seek to promote the fullest use and development of the pier, harbor utilities and appurtenances, to the end that the complete occupation and highest financial returns from the pier may be brought about and realized. The Board shall meet regularly, once a month, to consider all business and problems that arise. All matters of leasing and compensation shall be submitted to the City Council, and by it referred to the Committee on Compensation for its recommendation.

It is expected that by the Board the dockage space of the pier will be occupied at all times during the navigation season, and that the revenue of the City will be greatly increased, due to docks, rentals and concessions.

THE EASTLAND DISASTER.

On July 24, 1915, the steamer Eastland, loaded with about 2,500 passengers, turned over at her dock in the Chicago River, with a consequent loss of 812 lives. This accident occurring with the boat loaded with men, women and children out to enjoy a picnic excursion made the catastrophe doubly tragic.

The Western Electric Company had chartered the steamer Eastland, together with the steamers Theodore Roosevelt, Kansas, Rochester and Petoskey, to carry their employes, their families and friends to Michigan City on a picnic excursion.

The Eastland was tied up at the dock on the south side of the Chicago River, between Clark and LaSalle streets, and was the first boat to be loaded, the other boats awaiting the departure of the Eastland to take their quota of passengers.

The Eastland, it is estimated, had on board about 2,500 passengers when the gang planks were hauled in and orders given to stand by. As soon as the stern line was released the boat, which had admittedly shown signs of undue listing while being loaded, suddenly turned over away from the dock and finally rested on her port side on the bottom of the river, the upper half or starboard side, being out of the water.

The history of what follows makes up one of the most tragic pages in the annals of our City, the number of lives lost exceeding the number who perished in the memorable Iroquois theatre fire.

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All praise must be given to those who volunteered their services and gave material aid at this time of distress and to the assistants of the Harbor Master, who worked untiringly, day and night, immediately following the disaster, and did all in their power to relieve the situation.

The cause of this disaster is attributed to carelessness in the operation of the ballast tanks and overcrowding of the boat, and steps have been taken by the City, by the creation of the Board of Vessel Safety, to make impossible a similar accident in the future.

This Board of Vessel Safety since the Eastland turned over, has made inclining tests on 23 boats to determine their stability, and this work is to be continued until all passenger boats in the port of Chicago have been proven safe as to their stability.

The Bureau of Rivers and Harbors has collected data and made drawings, showing that the contention that the Eastland rested on piles in the bottom of the river, causing it to overturn, is erroneous, and that the piles as they are located in the bottom of the river could not possibly touch the bottom of the boat.

The preliminary hearing of those indicted for the responsibility of this disaster is now being heard in Grand Rapids, and the trial and determination of the causes and those responsble for the overturning of the Eastland should be completed in 1916.

The Harbor Master has been called to Grand Rapids as a witness for the United States Government, to attend the trial of those indicted for the responsibility of this disaster, and will endeavor to prove the City's contention in the matter.

The City of Chicago is under many obligations for courtesies extended by Lieutenant Colonel W. V. Judson, Corps of Engineers, U. S. Army, and his assistants; to the officers of the Sanitary District of Chicago for valuable information given from time to time during the year, and also to the United States Weather Bureau officers in charge at selected stations over the basin of the upper lakes for information regarding climatic conditions in their respective stations.

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BRIDGE OPERATION DIVISION

Patrick White, Superintendent

The following table gives a detailed account of the bridges of the city, showing the average time consumed per swing, also giving an average number of swings that each bridge makes, both monthly and annually, also by what power each bridge is operated.

BRIDGE		Average Time of each Swing in Minutes	Average Number of Swings each Month	Total Number of Swings Annually
Adams Street	Electricity	3.09	179	2145
Archer Avenue	"	3.29	53	641
Ashland Avenue (South Fork)	"			
Ashland Avenue (West Fork)	"	4.43	220	2635
Belmont Avenue	"	4.89	81	969
Canal Street	"	3.68	213	2556
Chicago Avenue	"	3.27	134	1606
Clark Street	"	2.54	298	3573
Cortland Street	"	3.40	66	788
Dearborn Street	"	3.20	319	3831
1Diversey Boulevard	"	3.92	41	492
East Division Street	"	3.73	36	431
West Division Street	"	3.14	81	971
Eighteenth Street	"	3.50	253	3034
Erie Street	"	3.28	131	1574
Fullerton Avenue	"	4.04	51	608
Grand Ave.	"	3.27	188	2259
North Halsted Street (Canal)	"	3.62	100	1196
North Halsted Street (River)	"	3.48	105	1263
2South Halsted Street (Lift)	"	3.99	195	2337
Harrison Street	"	3.13	303	3633
Indiana Ave.	"			
3Jackson Street	"			
Kinzie Street	"	3.18	888	10658
4Lake Street	"	3.58	238	2858
5Loomis Street	"	3.70	208	2501
6Madison Street	"	3.18	273	3281
Morgan Street	"			
Ninety-second Street	"	3.10	392	4610
7Ninety-fifth Street	"	3.41	315	3780
North Avenue	"	4.57	87	1041
One Hundred Sixth Street	Hand	6.73	290	3482
Polk Street	Electricity	3.20	259	3106
Randolph Street	"	3.42	245	2943
Rush Street	"	2.54	414	4964
8State Street	"	3.27	370	4441
9Taylor Street	"	3.00	242	2904
10Throop Street	"	3.35	227	2720
Torrence Avenue	Gasoline	9.99	139	1663
Twelfth Street	Electricity	4.61	170	2040
11Twenty-second Street	"	3.39	215	2580
Thirty-fifth Street	"	3.77	74	886
12Van Buren Street	"	3.23	297	3564
Washington Street	"	3.45	273	3278
Webster Avenue	"			
Wells Street	"	3.54	300	3597
North Western Avenue	"	3.53	37	441
South Western Avenue	Hand			

1—Open for dredge 1350 min. July, 1898 min. August.
2—Open to drive piles 698 min. Jan., for repairs 900 min. August; open for dredge 270 min. September.
3—New bridge being constructed.
4—Open for pile driver 599 min. Jan., for repairs 158 min. Feb., repairs 105 min. March, and 2787 min. April.
5—Open for repairs of S W 754 min. Apr., repairs 1035 min. May.
6—Open for repairs 300 min. October.
7—Open for repairs 1885 min. June.
8—Open for S W 525 min. December.
9—Open for repairs 3132 min. Feb., 115 min. March, 2250 min. May, 150 min. Sept., 1531 min. Oct., 224 min. Jan.
10—Pulling and driving piles 890 min. May, 305 min. June. Putting in armature 540 min. September.
11—Open for repairs 103 min. Oct., 933 min. Nov.
12—Open for repairs S W 745 min. Apr., 1035 min. May.

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ANNUAL REPORT

BUREAU OF SEWERS

CITY OF CHICAGO

1915

GEO. E. McGRATH
Superintendent

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BUREAU OF SEWERS

[illegible]	[illegible]	
Teams, horses and carts	14,999.08	
Material	11,959.28	
Restoration of Streets	8,025.14	
Supplies, tests and miscellaneous	943.22	
Total		101,712.87
Construction and Betterments—		
Sewerage construction, including outfalls	$ 3,243.72	
Sewer yard betterments and bench monuments	28.23	
Reimbursement of real estate account	3,450.00	6,721.95
Total Expenditures		$473,922.91

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BUREAU OF SEWERS

Hon. W. R. Moorhouse,

Commissioner of Public Works.

Dear Sir:

I beg to submit herewith the Annual Report of the Bureau of Sewers for the year of 1915.

EXPENDITURES.

Office—		
Salaries, including Bench and Grade Division	$ 23,456.83	
Railroad Transportation	2,699.30	
Supplies and Miscellaneous	1,278.47	
Total		$ 27,434.60
House Drains—		
Salaries		39,401.94
Cleaning Sewers and Catch Basins—		
Salaries and Wages	$213,320.41	
Teams, horses and carts	82,121.80	
Supplies, material and miscellaneous	3,209.34	
Total		298,651.55
Repairing Sewers and Catch Basins—		
Salaries and Wages	$ 65,786.15	
Teams, horses and carts	14,999.08	
Material	11,959.28	
Restoration of Streets	8,025.14	
Supplies, tests and miscellaneous	943.22	
Total		101,712.87
Construction and Betterments—		
Sewerage construction, including outfalls	$ 3,243.72	
Sewer yard betterments and bench monuments	28.23	
Reimbursement of real estate account	3,450.00	6,721.95
Total Expenditures		$473,922.91

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REPAIRS AND CONSTRUCTION BY THE BUREAU OF SEWERS FOR 1915.

Expenditures for Repairs and Construction.

Repairs—		
Salaries and wages—Repair Gangs and Yard Division	$ 55,224.27	
Salaries and wages—Mason Inspectors	6,563.46	
Reimbursements from Special Deposits	3,998.42	
Total		$ 65,786.15
Teams, horses and carts—Repair Gangs	$ 10,979.38	
Teams, horses and carts—Lid replacement and Yard Division	4,019.70	
Total		$ 14,999.08
Material—		
Sewer pipe	$ 913.80	
Lumber	1,746.06	
Cement	1,209.30	
Castings	5,379.94	
Brick	2,235.00	
Sand	304.46	
Miscellaneous	170.72	
Total		$ 11,959.28
Restoration of Streets		8,025.14
Supplies, Tests and Miscellaneous		943.22
Total Expenditures for Repairs		$101,712.87
Construction and Betterments—		
Reconstruction of Fullerton Ave. Sewer at Hoyne Ave.	$ 2,268.60	
Miscellaneous Construction	975.12	
Sewer Yard Betterments and Bench Monuments	28.23	
Reimbursement of Real Estate Account	3,450.00	
Total Expenditures for Construction and Betterments		$ 6,721.95

Work Done—Repairs and Construction.

Miscellaneous.

5,931	Lineal feet of sewers repaired.
786	Lineal feet of sewers built.
2,559	Catch basins repaired.
20	Catch basins built.
1,058	Manholes repaired.
30	Manholes built.
7	Bench monuments built.

Manhole and Catch Basin Lids and Covers and Inlet Grates Replaced.

Iron lids	3,589
Wooden lids	760
Iron manhole covers complete	245
Iron catch basin covers complete	612
Wooden covers	4
Iron grates	443
Iron grates and boxes	243

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SUMMARY OF SEWERS CONSTRUCTED BY SPECIAL ASSESSMENT DURING 1915.

TILE PIPE SEWERS.

Length in feet.	Internal diameter in feet.	Average cut in feet.	Cost per foot.	Amount.
56	¾	7.0	$1.00	$ 56.00
1,813	5/6	7.5	1.20	2,175.60
138,534	1	8.9	1.31	181,116.83
83,463	1¼	9.9	1.47	122,797.30
22,781	1½ DS	10.7	1.90	43,186.82
5,338	1 2/3 DS	11.8	2.09	11,154.63
5,642	1 5/6 DS	11.4	2.51	14,133.87
6,755	2 DS	12.3	2.46	16,639.09
4,347	2¼ DS	12.2	3.66	15,897.10
331	2½ DS	14.5	5.26	1,741.06
659	2¾ DS	16.5	6.29	4,145.11
269,719				$413,043.41

Total mileage of tile pipe sewers constructed by special assessment, 51.08 miles.

SUMMARY OF SEWERS CONSTRUCTED BY SPECIAL ASSESSMENT DURING 1915.

BRICK SEWERS.

Length in feet.	Internal diameter in feet.	Average cut in feet.	Cost per foot.	Amount.
1,309	2 DI	12.2	$2.97	$ 3,882.78
1,691	2 DR	14.5	3.78	6,406.00
4,516	2½ DI	13.5	3.20	14,463.27
4,486	2½ DR	12.3	4.24	19,021.00
9,238	3 2R	13.2	4.41	40,709.10
4,057	3½ 2R	15.5	4.91	19,904.30
662	3¾ 2R	15.5	5.00	3,310.00
11,371	4 2R	14.4	7.20	81,910.60
2,646	4¼ 2R	17.0	6.45	17,066.70
5,765	4½ 2R	17.3	6.86	39,514.67
3,406	4¾ 2R	16.3	7.76	26,424.20
5,535	5 2R	19.8	8.84	48,939.44
3,229	5½ 2R	18.5	9.50	30,675.50
7,336	6 2R	17.9	10.49	76,988.98
861	6½ 3R	9.0	12.36	10,641.96
1,161	8 3R	21.0	15.00	17,415.00
1,855	8¼ 3R	21.8	14.95	27,742.22
3,159	8½ 3R	15.3	14.26	45,052.55
3,621	9 3R	17.7	15.91	57,609.86
75,904				$587,681.13

Total mileage of brick sewers, 14.38 miles.

NOTE: There were no brick sewers constructed by private contract during the year 1915, and therefore this table may be considered as a summary of "Brick Sewers Constructed by Special Assessment and by Private Contract."

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SUMMARY OF MISCELLANEOUS WORK DONE IN ACCORDANCE WITH CONTRACT DURING 1915—SPECIAL ASSESSMENT.

Lumber left in trenches as sheeting and bracing, 17,880 ft. B. M. @ $15.00	$ 268.20
Rock excavation, 1,038.50 cu. yds.	4,117.00
Additional brick masonry, 114.75 cu. yds. @ $8.00	918.00
Additional concrete masonry, 180 cu. yds. @ $7.00	1,260.00
5 Concrete Bulkheads	4,060.00
2 Special Overflows	4,168.00
Catch basins—Argyle Street sewer	8,000.00
House drains built with sewer, 90 drains, total length 3,026 ft.	886.00
Total	$ 23,677.20

SUMMARY OF EXTRA WORK ORDERED BY BOARD OF LOCAL IMPROVEMENTS.

(Not included in original contract.)

Additional manholes, two	$ 81.23
Additional catch basins, two @ $40.00	80.00
Extra excavation on account of change of original conditions	2,687.29
Additional cost of labor on account of railroad tracks and utilities	643.50
Lengthening water service pipes—Albany Avenue Sewer	205.00
Refund of excessive charges for pavements—Albany Ave. Sewer System	9,605.46
Tile pipe sewer in Elston Avenue—Argyle Street Sewer	400.00
Total	$ 13,702.48

RECAPITULATION OF SEWERS CONSTRUCTED BY SPECIAL ASSESSMENT, 1915.

	Length in Feet.	Cost.
Tile pipe sewers	269,719	$ 413,043.41
Brick sewers	75,904	587,681.13
Miscellaneous work done in accordance with contract		23,677.20
Extra work ordered by Board of Local Improvements (not covered by original contract)		13,702.48
2,368 manholes.		
2,675 catch basins.		
Total	345,623	$1,038,104.22

Total mileage of sewers constructed by special assessment, 65.46 miles.

SUMMARY OF SEWERS CONSTRUCTED BY PRIVATE CONTRACT DURING 1915.

TILE PIPE SEWERS.

Length in feet.	Internal diameter in feet.	Average cut in feet.	Cost per foot.	Amount.
1,205	2/3	6.9	$1.10	$ 1,331.00
2,649	5/6	7.6	1.22	3,241.19
53,171	1	8.7	1.42	75,421.56
33,529	1¼	11.0	1.70	57,041.59
3,747	1½ DS	11.8	1.87	7,006.14
1,648	1 2/3 DS	13.7	1.95	3,218.70
659	1 5/6 DS	12.5	2.34	1,542.06
718	2 DS	13.5	2.70	1,928.60
184	2¼ DS	15.0	4.00	736.00
97,510				$151,466.84

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SUMMARY OF MISCELLANEOUS WORK DONE IN ACCORDANCE WITH CONTRACT DURING 1915.

111 cu. yds. rock excavation	@ $4.00	$444.00
30 drains, 30 ft. long	@ 9.50	285.00
Total		$729.00

Recapitulation.

Tile pipe sewers	97,510 ft.	$151,466.84
738 manholes.		
911 catch basins.		
Extra items		729.00
Total	97,510 ft.	$152,195.84

Total mileage of tile pipe sewers constructed by private contract, 18.47 miles.

SUMMARY OF SEWERS CONSTRUCTED BY PRIVATE CONTRACT AND SPECIAL ASSESSMENT DURING 1915.

Tile Pipe Sewers.

Length in feet.	Internal diameter in feet.	Average cut in feet.	Cost per foot.	Amount.
1,205	2/3	6.9	$1.10	$ 1,331.00
56	¾	7.5	1.00	56.00
4,462	5/6	7.6	1.21	5,416.79
191,705	1	8.8	1.34	256,538.39
116,992	1¼	10.2	1.53	179,838.89
26,528	1½ DS	10.8	1.90	50,192.96
6,986	1 2/3 DS	12.3	2.06	14,373.33
6,301	1 5/6 DS	11.6	2.48	15,675.93
7,473	2 DS	12.4	2.48	18,567.69
4,531	2¼ DS	12.5	3.67	16,633.10
331	2½ DS	14.5	5.26	1,741.06
659	2¾ DS	16.5	6.29	4,145.11
367,229				$564,510.25

Total mileage of tile pipe sewers, 69.55 miles.

Note: No summary of "Brick Sewers Built by Private Contract and Special Assessment" given, as no brick sewers were built by private contract. See summary of "Brick Sewers Built by Special Assessment" on page 229.

RECAPITULATION OF SEWERS CONSTRUCTED BY PRIVATE CONTRACT AND SPECIAL ASSESSMENT DURING 1915.

	Length in Feet.	Cost.
Tile pipe sewers	367,229	$ 564,510.25
Brick sewers	75,904	587,681.13
Miscellaneous work done in accordance with contract...		24,406.20
Extra work ordered by Board of Local Improvements (not included in original contract)		13,702.48
3,106 manholes.		
3,586 catch basins.		
	443,133	$1,190,300.06

Total mileage of sewers constructed, 83.93 miles.

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SEWER WORK IN CONNECTION WITH PAVING WORK DONE DURING 1915.

3,233	new catchbasins	@	$50.00	$161,650.00*
192	new manholes	@	40.00	7,680.00*
3,941	catch basins to grade	@	19.00	74,879.00
3,480	manholes to grade	@	5.00	17,400.00
3,592	new iron covers	@	10.00	35,920.00
3,477	iron gratings	@	11.00	38,247.00
44,671	lin. ft. 8-inch pipe connections	@	.70	31,269.70
5,854	lin. ft. new brick work	@	2.00	11,708.00
867	lin. ft. 8-inch main sewer	@	1.35	1,170.35*
430	lin. ft. 9-inch main sewer	@	1.45	623.50*
17,664	lin. ft. 10-inch main sewer	@	1.55	27,379.20*
1,768	lin. ft. 12-inch main sewer	@	2.25	3,978.00*
48	lin. ft. 15-inch main sewer	@	2.75	132,08*
60	lin. ft. 18-inch main sewer	@	3.50	210.00*
	Total			$412,246.83

146 catch basins abandoned.
3.95 miles of sewer built in connection with street paving.

*Included in "Cost of Construction" in table on page 236.

SEWERS BUILT BY THE BUREAU OF ENGINEERING.

At the Marshall Boulevard Municipal Plant—

1,150 lineal feet of 12-inch tile pipe sewer.
929 lineal feet of 9-inch and less tile pipe sewer.
10 manholes.
16 catch basins.
Cost $3,453.02

At the Ninety-fifth Street Incinerator—

2,200 lineal feet of 2-ft. brick sewer and 18 manholes.
Cost $6,362.89

SEWERS CONSTRUCTED UNDER THE JURISDICTION OF THE BUREAU OF SEWERS.

Street.	From.	To.	Length.	Cost.
Giddings Ave.	372 ft. E. of Hamlin Ave.	East	72 ft.	$ 86.40
W. 26th St.	Troy St.	Whipple St.	604 ft.	1,625.00
Wilson Ave.	22 ft. E. of Robey St.	East	76 ft.	75.00
Wrightwood	Cicero Ave.	Fitzpatrick Ave.	662 ft.	993.00
W. 61st St.	Hamlin Ave.	West	478 ft.	400.00
	Cost of miscellaneous catch basins built			1,080.00
		Total	1,892	$4,259.40

Catchbasins built, 20. Manholes built, 13.

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RECAPITULATION OF ALL SEWERS, MANHOLES AND CATCHBASINS BUILT IN CHICAGO IN 1915, AND THEIR COST.

Tile Pipe Sewers Built—

Board of Local Improvements—Sewer Division	367,229 lin. ft.
Board of Local Improvements—Paving Division	20,837 lin. ft.
Department of Public Works, etc.	4,757 lin. ft.
Total, 74.40 miles or	392,823 lin. ft.

Brick Sewers Built—

Board of Local Improvements—Sewer Division	75,904 lin. ft.
Department of Public Works	2,200 lin. ft.
Total, 14.79 miles, or	78,104 lin. ft.

Catch basins built—

Board of Local Improvements—Sewer Division	3,586
Board of Local Improvements—Paving Division	3,233
Department of Public Works, etc.	66
Total	6,885

Manholes Built—

Board of Local Improvements—Sewer Division	3,106
Board of Local Improvements—Paving Division	192
Department of Public Works, etc.	71
Total	3,369

Cost of Construction—

Board of Local Improvements—Sewer Division	$1,190,300.06
Board of Local Improvements—Paving Division	232,823.13
Department of Public Works, etc.	17,319.03
Total	$1,440,442.22

Sewerage Removed—

Catch basins	152
Manholes	73
Brick Sewers	923 lin. ft.
Tile Pipe Sewers	8,166 lin. ft.

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SEWERS IN PLACE AT TIME OF ANNEXATION IN TERRITORY NORTH OF HOWARD ST. AND ROGERS AVE.

Street.	From.	To.	Year Built.	Contractor.
Sheridan Rd.	Alley in Dryer's Blk. 1	Rogers Ave.	1910	M. Foley Co.
Jonquil Ter.	Sheridan Rd.	N. Ashland Ave.	1910	M. Foley Co.
N. Ashland Ave.	Jonquil Ter.	Howard St.	1910	M. Foley Co.
Howard St.	N. Ashland Ave.	25 ft. E. of C. M. & St. P. Ry.	1910	M. Foley Co.
Rogers Ave.	Sheridan Rd.	80 ft. E. of Greenview Ave.	1910	M. Foley Co.
Greenview Ave.	Jonquil Ter.	58 ft. N. of C. L. of Rogers Ave.	1910	M. Foley Co.
Bosworth Ave.	Jonquil Ter.	58 ft. N. C. L. Rogers Ave.	1910	M. Foley Co.
Alley in Dryers Blk. 1.	Sheridan Rd.	Lake Michigan	1910	M. Foley Co.
N. Marshfield Av.	Howard St.	379.5 ft. North	1911	J. A. Bickford
N. Paulina St.	Howard St.	379.5 ft. North	1911	J. A. Bickford
Juneway Ter.	Sheridan Rd.	N. Ashland Ave.	1912	M. Foley Co.
N. Ashland Ave.	Juneway Ter.	Alley South	1912	M. Foley Co.
Rogers Ave.	Eastlake Ter.	216 ft. West	1913	M. Foley Co.
Eastlake Ter.	Sheridan Rd.	Rogers Ave.	1913	M. Foley Co.
N. Ashland Ave.	Jonquil Ter.	Alley North	1913	M. Foley Co.
N. Marshfield Av.	Juneway Ter.	379.5 ft. North of Howard St.	1913	M. Foley Co.
N. Paulina St.	Juneway Ter.	379.5 North of Howard St.	1913	M. Foley Co.
N. Hermitage Av.	Juneway Ter.	Jonquil Ter.	1913	M. Foley Co.
Juneway Ter.	N. Ashland Ave.	N. Clark St.	1913	M. Foley Co.
Jonquil Ter.	N. Ashland Ave.	N. Hermitage	1913	M. Foley Co.

SUMMARY.

3,697 lineal feet of 9-inch tile pipe sewer in place.
4,044 lineal feet of 12-inch tile pipe sewer in place.
2,529 lineal feet of 15-inch tile pipe sewer in place.
1,692 lineal feet of 18-inch tile pipe sewer in place.
1,110 lineal feet of 20-inch tile pipe sewer in place.
1,015 lineal feet of 24-inch tile pipe sewer in place.

14,087 total lineal feet of tile pipe sewer in place.
44 manholes.
92 catch basins.

MISCELLANEOUS STRUCTURES.

One 10 ft. x 20 ft. settling tank complete.
Two 4-inch flush gates.
168 ft. of 30-inch cast iron outlet pipe.
Total cost of sewerage system $24,200

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SUMMARY OF DRAINS CONSTRUCTED BY PRIVATE CONTRACT DURING THE YEAR 1915.

	Number.	Length.	Av. Price.	Amount.
Drains	204	6,125 ft.	$0.35	$2,118.35

SUMMARY OF DRAINS CONSTRUCTED BY SPECIAL ASSESSMENT DURING THE YEAR 1915

	Number.	Length.	Av. Price.	Amount.
Drains	8,974	314,182 ft.	$0.28	$90,143.75

SUMMARY OF WORK BY PRIVATE CONTRACT AND SPECIAL ASSESSMENT DURING THE YEAR 1915.

	Number.	Length.	Av. Price.	Amount.
Drains	9,178	320,307 ft.	$0.29	$92,262.10

Total mileage of drains constructed, 60.7.

HOUSE DRAINS CONSTRUCTED AND JUNCTIONS SET BY THE BUREAU OF SEWERS IN 1915.

House Drains—

Extension and repair permits	4,124	
Drains laid by Council orders	1,106	
Drains laid—Regular fee permits—		
Extended from stubs	3,380	
Extended from junctions	5,468	
Total number of jobs		14,078
Total number of inspections		33,794

Junctions Set—

6-inch junctions	715	
9-inch junctions	223	
12-inch junctions and larger	15	
Total junctions set		953

Receipts.

House drain permits	$ 44,225.00
Fees for junctions set	2,972.50
Drain layers' licenses	2,420.00
Special deposits for inspection	4,568.83
Total receipts	$ 54,186.33
Expenditures	$ 39,401.94
Receipts in excess of expenditures	$ 14,784.39

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COST OF SEWER CONSTRUCTION AND SEWER MAINTENANCE SINCE ESTABLISHMENT OF SEWERAGE SYSTEM IN 1855

Year	Sewers Built, in feet	No. of Catch-Basins Built	No. of Man-holes Built	No. of House Drains Put In	Cost of Cleaning Sewers and Catch-Basins	Cost of Repairing Sewers and Catch-Basins	Cost of Construction
Previous to 1861	283,586	1,174	2,102	2,194	$ 5,619.48	Not known	$ 665,188.46
1861	2,826	18	33	243	1,715.60	$ 2,951.76	3,617.31
1862	15,676	72	66	365	4,897.24	3,024.07	57,036.42
1863	39,605	192	204	536	5,065.40	2,058.11	169,527.38
1864	25,021	189	183	512	9,417.81	4,597.63	87,221.48
1865	29,948	223	168	1,288	13,818.07	7,493.56	137,643.02
1866	48,127	327	271	3,732	28,445.16	773.65	225,564.53
1867	89,681	418	555	3,703	26,540.81	9,581.42	416,730.51
1868	47,841	480	293	3,261	26,954.06	11,287.08	197,152.92
1869	139,705	771	928	3,979	26,015.68	7,527.16	654,141.26
1870	78,166	626	468	5,187	21,464.30	10,954.74	258,664.70
1871	50,716	277	357	3,093	17,415.46	42,557.72	153,295.36
1872	47,342	245	341	1,435	21,484.16	16,975.40	173,255.76
1873	146,702	897	1,015	4,691	31,229.27	29,781.97	450,222.90
1874	222,322	1,054	1,474	6,292	36,884.57	21,996.72	587,507.38
1875	120,971	958	789	3,365	32,098.23	28,107.40	342,932.89
1876	15,248	155	75	1,172	29,545.41	19,803.29	79,545.28
1877	64,666	363	431	1,822	35,763.33	16,959.44	291,829.63
1878	88,031	492	603	1,544	25,704.37	19,259.49	37,264.97
1879	145,381	820	1,043	2,953	29,286.67	10,649.68	130,840.50
1880	79,128	271	554	4,196	25,561.48	25,068.11	92,544.08
1881	132,076	548	917	4,810	34,512.15	30,967.89	452,310.06
1882	98,515	792	725	5,677	33,969.35	26,618.05	224,450.16
1883	75,364	835	497	5,963	34,749.74	25,140.81	231,084.33
1884	101,547	751	654	5,957	43,678.03	37,893.29	258,020.91
1885	118,647	796	854	6,325	46,532.18	45,333.02	203,188.03
1886	103,193	734	723	7,441	51,110.46	50,707.64	177,647.24
1887	90,584	756	605	8,100	50,264.65	43,789.60	186,496.98
1888	104,903	816	674	8,152	52,422.41	53,782.07	228,567.57
1889	171,023	1,351	1,190	4,303	61,503.01	63,459.25	350,234.54
Annexed districts	993,573	6,102	8,620	.....	Not known.	.....	2,614,224.75
1890	379,203	2,986	2,604	9,279	107,873.34	83,383.08	826,718.67
1891	546,918	3,979	3,736	11,312	123,620.44	95,906.75	1,532,990.44
1892	549,258	3,866	3,714	12,562	142,720.52	70,747.83	1,290,017.98
Annexed districts	96,697	326	231	.....	Not known.	.....	172,846.30
1893	708,176	4,811	4,825	14,198	132,633.51	114,702.78	1,606,720.09
1894	350,944	2,597	2,259	8,928	154,225.45	130,749.03	1,014,489.86
1895	196,349	1,515	1,409	1,621	134,424.44	93,713.66	356,950.01
1896	303,172	2,201	1,990	6,161	96,901.65	91,339.54	721,869.88
1897	206,450	1,842	1,550	8,241	91,414.89	90,651.29	446,249.53
1898	256,618	1,812	1,916	2,635	92,961.88	100,986.06	682,229.10
1899	191,790	1,466	1,384	2,647	72,439.07	84,004.37	793,623.28
Annexed districts	154,895	995	1,075	.....	Not known.	.....	.....
1900	155,866	1,591	1,176	4,750	80,985.64	102,677.89	475,733.36
1901	117,546	899	906	5,598	94,369.87	Sewer Repairs 55,965.24	454,273.53
1902	138,311	1,326	927	8,482	99,372.58	57,492.79	1,398,329.60
1903	188,793	1,795	1,351	6,107	118,303.41	68,522.45	989,502.50
1904	206,542	1,913	1,498	3,986	124,260.26	77,952.77	591,402.39
1905	169,962	2,226	1,191	5,850	127,003.97	78,819.10	670,908.39
1906	226,320	2,680	1,646	7,958	150,942.10	83,969.49	1,606,248.38
1907	281,614	3,053	2,078	10,036	204,329.37	106,372.00	1,103,856.66
1908	279,483	2,920	1,956	10,438	233,093.89	110,709.17	1,009,540.44
1909	354,283	4,115	2,506	11,392	231,692.61	100,974.21	1,181,078.70
1910	301,190	4,262	2,094	17,571	213,723.78	91,907.38	1,144,277.24
Edison Park (annexed)	30,805	184	177	.....	Not known	.....	32,142.15
1911	345,186	5,242	2,643	11,562	270,445.31	86,305.31	782,603.07
1912	429,784	5,074	3,309	9,031	250,344.77	89,657.81	875,857.96
1913	358,203	4,748	2,480	14,386	287,378.87	86,120.97	1,334,526.23
Morgan Pk. (annexed)	143,617	831	951	.....	Not known.	.....	419,595.76
1914	386,184	6,511	2,712	12,725	309,662.83	91,771.98	1,161,831.79
Noman's Land (annexed)	14,087	92	44	430	.....None	.....None	24,200.00
1915	470,927	6,885	3,369	15,752	298,651.55	101,712.87	1,440,442.22
Totals	12,309,142	108,212	87,077	345,989	$ 5,107,243.94	$ 3,023,221.75	$36,255,806.83
Removed	206,638	1,307	607				
In place Jan. 1, 1916	*12,102,504	106,905	86,470				

*Of this 12,102,504 feet (2,292.1 miles), 3,849,116 feet (729.0 miles) are of brick and concrete construction and 8,253,388 feet (1 563.1 miles) are of vitrified tile pipe.

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BENCH AND STREET GRADE DIVISION.

This division maintains a system of bench monuments and bench marks within the limits of the city, which gives references to Chicago City Datum, within the limits of precise levels. It examines and submits to the City Council all street grades and records such grades after their establishment by council ordinances.

Annexation of Morgan Park.

During the past year the system of benches was extended to include the former Village of Morgan Park. A special ordinance to establish the street grades in the former village, based on levels run on the ground, was prepared, and passed by the council.

Annexation of No-Man's Land.

Complete levels were run in the annexed territory north of Howard Street and Rogers Avenue, and an ordinance to establish the grades of the streets in that territory was prepared and submitted to the City Council.

Chicago Union Station.

A line of precise levels was run along the line of this proposed improvement (from West Kinzie Street to West 12th Street) and bench monuments and marks were placed to be used in the station construction.

Bridge Approaches.

The proposed grades for the approaches to bridges under construction at West Monroe Street, West Lake Street, West Belmont Avenue and Webster Avenue were examined and special ordinances for their establishment were prepared and submitted to the City Council.

Street Paving Estimates.

During the year the grades in 575 street paving estimates were examined and approved.

Sidewalk Plats.

During the year the grades in 600 sidewalk plats were examined and approved.

Respectfully submitted,

GEORGE E. McGRATH.

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ANNUAL REPORT

BUREAU OF WATER

CITY OF CHICAGO

1915

W. J. McCOURT
Superintendent

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BUREAU OF WATER

Hon. W. R. Moorhouse,
Commissioner of Public Works.

Dear Sir:

I respectfully submit herewith the annual report covering the assessments and collections of water rates and charges during the year ending December 31, 1915.

The gross collections amounted to $6,319,579.58, as against $6,596,655.68 for 1914 and $6,680,857.01 for 1913.

The reduced collections during the last two years are due to the following causes:

First—The increase of the prompt payment discount rate from 15 per cent. to 25 per cent. on November 1, 1914, approximating decreases of 11.7 per cent. and 10.7 per cent. respectively, on assessed and meter rates and on total collections of about $850,000.

Second—Reduced meter controlled consumption and revenue of about $100,000, due to depressed business and the cold and rainy summer of 1915.

Of about 700,000 assessed, meter and miscellaneous rates bills rendered, but 448, or 6/100 of 1 per cent., amounting to $7,060.97, or 1/10 of 1 per cent. of the gross collections were uncollectible through vacancy, abandoned and wrecked buildings not supplied during period of assessment, and through bankruptcy.

The total expenses amounted to $339,474.29, as against $320,773.43 for 1914. The increase was due to salary raises of $3,486, $4,398.75 for new ledgers, $5,640 for additional help, and the balance of $5,176.11 for extra postage, stationery, etc., due to growth.

Since 1907 the growth in meters has amounted to about 58 per cent., in new buildings to about 40 per cent., in meter revenue field force to 64 2/7 per cent., and in assessed rates field force to 27½ per cent., while the increase in the meter rates clerical service has amounted to but 22 2/9 per cent., and in the assessed rates clerical force to 7 1/3 per cent., and superannuation has been growing rapidly in the clerical forces mentioned.

The annual balancing of the 270,000 assessed rates accounts, composing the general assessment amounting to $4,597,677.60, and the verification of the back taxes were completed on overtime on August 11th, as against October 25th, 1914. The services of the most competent clerks, experienced in the assessed rates work are required, and an insufficient number are provided in the regular force to complete the balancing during regular hours, and overtime hire is imperative to perform the work on time and avoid erroneous bills, delayed monthly trial balances and service strain due to overwork. There was contention as to the necessity for overtime hire for this purpose, but such contention was denied through the investigation, report and recommendation of the Efficiency Division during 1915 to the effect that overtime hire was necessary for this balancing work and the regular force was inadequate for the purpose during regular hours.

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The transcribing of the assessed rates accounts into 121 new ledgers was begun on October 4th and continued to the end of the year. About 275,000 assessed rates accounts were rearranged and skeletonized in the new ledgers and approximately 60,000 rearranged accounts were entered on new plate lists for addressograph plate changes. This work was performed in 4,684 hours at required speed standards by an average of 12 men per day.

The transcribing of the meter rates and meter mechanical accounts into 162 new ledgers was begun on October 14th and continued to the end of the year. Nearly 20,000 accounts were rearranged and transcribed and checked, 20,000 premises cards and 20,000 field slips for rate takers were rewritten and properly filed and 20,000 accounts were listed for addressograph plate changes. This meter work required 6,506 hours, with an average of 15 men per day working at speed standards.

The total extra clerk hire expense for above work amounted to $6,029.90.

The Village of Clearing was annexed on April 24, 1915, and an examination showed that there were 116 buildings and eight barns located in the annexed territory, but no revenue is being derived for the reason that water is being furnished by the Chicago Transfer and Clearing Company from artesian wells.

The Town of Stickney was annexed on September 3, 1915, and an examination shows that there are 189 buildings within the annexed territory, but as all of the premises secure water from individual wells on account of no City water mains being extended into the former Town of Stickney, no revenue is being derived.

About 700,000 frontage and meter bills were issued, about 175,000 remittances by mail were received, about 700,000 payment vouchers were receipted, registered, listed, footed, posted and audited, about 55,000 delinquency notices were mailed, and the monthly transcript of meter charges, annual balance of assessed rates ledgers, together with the entries of about 95,000 increases and decreases of assessments, were completed.

One hundred and sixty-two thousand seven hundred and forty-seven annual and 74,961 special examination reports were handled and assessments levied and revised accordingly.

Two hundred two thousand seven hundred and seventy-seven meter readings were entered and completed.

Four thousand three hundred and seventy-seven reports and adjustments were handled due to complaints of excessive meter bills.

Two thousand three hundred and ten reports of recontrols of meters to detect and correct unauthorized supply and verify revenue were entered.

Ten thousand four hundred ninety-five orders were issued for repairs to meters and reports thereof were entered.

Nine hundred and ninety-one meter control and 2,555 supplemental certificates were issued and entered.

One thousand one hundred and eight reports of leaks and waste and other complaints were received, entered and issued.

Twelve hundred additional meters were installed during the year, 235 were removed, leaving 19,439 meters in service on December 31, 1915.

Sixteen thousand and forty-one tap and curb and turnon permits were issued and $37,524.00 collected for tap permits.

Eighteen thousand six hundred and fifty-three applications for vacancy inspection and receipts for vacancy were issued to cover and records made.

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Four hundred and two miscellaneous bills and receipts, totaling $23,926.98, were issued, of which amount $15,487.50 was for sprinklers, 559 special deposits, amounting to $118,140.31, were collected and 700 reports on water surveys, 384 Council claims, 421 Council orders for refund, and 509 decreases of uncollectible water bills under Council orders were handled.

The fifty-one field assessors performed 237,708 inspections and reports, resulting in an increase of the general assessment of $162,268.25, or an average of $3,181.73 per field assessor.

The nineteen rate takers performed 202,777 readings and reports of meter registrations during the year.

Four thousand three hundred and seventy-seven premises with leaking plumbing were examined and reported by the meter and plumbing examiners on complaints of excessive meter bills and the consumers were required to make the needed repairs.

The four plumbing inspectors with four shut-off men as helpers performed 2,310 recontrols of meters to detect and correct unauthorized connections and verify the supply and revenue of large consumers.

Twelve shut-off men made 40,444 visits to enforce payments and check upon reported vacancies and one shut-off man was maintained ever ready for turnons, upon request, as required by vacancy ordinance.

Respectfully submitted,

W. J. McCourt,
Superintendent of Water.

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TABLE No. 1

COLLECTION DIVISION

DETAILED STATEMENT OF GROSS COLLECTIONS BY THE BUREAU OF WATER DURING 1915

MONTHS	Assessed Rates	Meter Rates	Meter Mechanical	Assessor's Miscellaneous	Permits	Suspense No. 1	Suspense No. 2	Totals	Special Deposits	Grand Totals
January	$ 460,695.73	$ 232,006.77	$ 150.53	$ 1,586.91	$ 544.00	.....	$ 35.93	$ 695,019.87	$ 1,215.86	$ 696,235.73
February	443,530.86	221,587.81	92.54	438.13	838.50	$ 88.53	15.52	666,591.89	565.00	667,156.89
March	121,490.04	220,111.92	344.45	580.96	2,421.00	26.50	10.86	344,985.73	4,465.00	349,450.73
April	20,437.39	250,463.46	282.72	511.80	2,557.50	.....	26.09	274,278.96	10,201.58	284,480.54
May	167,819.86	214,491.41	323.51	1,572.07	4,304.50	20.50	119.70	388,651.55	10,313.34	398,964.89
June	422,679.52	217,043.04	49.72	2,341.84	3,187.00	.....	120.94	645,413.06	5,971.17	651,384.23
July	505,167.09	240,679.39	49.99	3,094.47	2,149.00	6.00	110.46	751,256.40	15,681.29	766,937.69
August	556,250.60	198,974.87	9.49	2,496.34	3,202.50	.....	88.89	761,122.69	6,269.50	767,392.19
September	112,436.89	212,447.60	43.89	3,099.40	2,177.50	4.12	35.01	330,244.41	7,471.15	337,715.56
October	31,907.94	267,334.52	31.03	3,193.35	2,763.50	6.00	23.87	305,260.21	4,196.55	309,456.76
November	172,514.48	238,251.74	26.49	2,936.90	4,029.00	16.75	27.91	417,803.27	50,913.52	468,716.79
December	361,420.17	247,975.07	66.76	2,074.81	9,250.00	.....	24.42	620,811.23	876.35	621,687.58
Totals 1915	$3,376,350.57	$2,761,367.60	$ 1,462.12	$23,926.98	$37,524.00	$ 168.40	$ 639.60	$6,201,439.27	$118,140.31	$6,319,579.58
Totals 1914	$3,392,674.39	$3,020,437.88	$ 1,674.35	$25,157.98	$38,781.50	$ 35.97	$ 231.77	$6,478,963.84	$117,671.84	$6,596,635.68
Totals 1913	$3,467,676.08	$3,028,232.72	$ 1,758.05	$26,357.87	$35,797.00	$ 44.25	$ 176.29	$6,560,042.21	$120,814.80	$6,680,857.01
Totals 1912	$3,327,574.16	$2,877,379.90	$ 2,755.42	$25,069.64	$30,379.20	$ 60.50	$ 115.93	$6,263,234.75	$161,030.73	$6,424,265.48
Totals 1911	$3,134,700.02	$2,556,594.32	$ 2,568.65	$21,943.40	$30,287.85	$ 73.33	$ 81.03	$5,757,267.60	$130,369.13	$5,887,636.73
Totals 1910	$3,018,825.80	$3,425,735.59	$ 3,696.16	$25,633.33	$30,073.75	$ 6.32	$ 33.27	$6,504,003.21	$ 84,504.90	$6,588,508.11

NOTE—The American Express Company collected 110,441 assessed rates bills, amounting to $545,190.06, and the Adams Express Company collected 66,482 bills, totaling $358,342.67. These collections, aggregating $903,532.73, were forwarded to the Cashier of the Bureau of Water from time to time during the year within ordinance limitations.

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TABLE No. 11

COLLECTION DIVISION

DETAILED STATEMENT OF NET COLLECTIONS FROM ALL SOURCES DURING 1915, AFTER DEDUCTING REFUNDS AND SPECIAL DEPOSITS

Months	Assessed Rates	Meter Rates	Meter Mechanical	Assessor's Miscellaneous	Permits	Suspense No. 1	Suspense No. 2	Contract	Earnings on Water Used for Cement Walks	Miscellaneous Earnings	Totals
January	$ 459,031.52	$ 231,940.82	$ 150.53	$ 1,586.91	$ 540.50	.....	$ 35.93	$ 250.00	.....	.....	$ 693,535.71
February	442,222.44	221,477.53	92.54	438.13	766.50	$ 88.53	15.52	.....	$ 2,363.27	.....	667,464.46
March	119,901.26	220,043.93	344.45	527.96	2,399.00	26.50	10 86	.....	1,822.97	.....	345,076.93
April	18,883.95	250,092.34	282.72	511.80	2,554.00	.....	26 09	250.00	.....	.....	272,600.90
May	166,828.69	214,395.12	323.51	1,572.07	4,257.50	20.50	119.70	.....	.....	.....	387,517 09
June	421,124.00	211,823.85	40.72	2,341.84	3,153.50	.....	120.94	.....	.....	.....	638,604.85
July	503,867.21	239,136.57	49.99	3,094.47	2,143.00	6 00	110.46	250.00	.....	.....	748,657.70
August	555,248.48	198,906.23	9.49	2,496.34	3,276.50	.....	88.89	.....	.....	.....	760,025.93
September	111,396.02	212,408.67	43.89	3,099.40	2,158.50	4 12	35.01	.....	.....	.....	329,145.61
October	30,933.16	267,220.74	31.03	3,193.35	2,746.00	6.00	23.87	250.00	.....	.....	304,404.15
November	170,368.87	238,177.18	26.49	2,936.90	4,015.50	16.75	27.91	.....	132.80	.....	415,702.40
December	359,154.74	246,917.34	66.76	2,074.81	9,109.00	.....	24.42	.....	649.28	.....	617,996.35
Totals 1915	$3,358,960.34	$2,752,539.82	$ 1,462.12	$ 23,873.98	$ 37,119.50	$ 168.40	$ 639.60	$ 1,000.00	$ 4,968.32	.....	$6,180,732.08
Totals 1914	$3,371,227.26	$3,015,230.12	$ 1,658.68	$ 25,157.98	$ 38,452.50	$ 25.97	$ 231.77	$ 1,000.00	$ 5,519.60	$ 10.95	$6,458,514.83
Totals 1913	$3,448,320.05	$3,023,924.54	$ 1,758.05	$ 26,321.84	$ 35,469.90	$ 44.25	$ 175.48	$ 1,000.00	$ 3,644.74	$ 11.55	$6,540,670.40
Totals 1912	$3,312,791.76	$2,872,521.48	$ 2,755.42	$ 25,055.14	$ 30,148.10	$ 60.50	$ 115.93	$ 1,000.00	$ 4,111.66	$ 177.48	$6,248,737.47
Totals 1911	$3,123,702.68	$2,549,148.83	$ 3,582.45	$ 31,905.90	$ 30,031.35	$ 73.33	$ 81.03	$ 1,000.00	$ 3,727.03	$ 1,557.62	$5,744,810.22
Totals 1910	$3,003,397.58	$2,424,938.06	$ 3,689.37	$ 25,633.32	$ 30,042.75	$ 6.32	$ 32.27	$ 1,000.00	$ 6,578.71	$ 152.12	$5,495,470.50

NOTE—The above earnings of $1,000.00 on contract were for water used by the International Harvester Co., pumped from the Fullerton Avenue conduit.

The refunds deducted from the gross collections as shown in Table No. 1 amounted to $26,675.51 distributed as follows: Assessed Rates, $17,390.23; Meter Rates, $8,827.78; Assessor's Miscellaneous, $53.00; and Permits, $404.50.

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TABLE No. III

COLLECTION DIVISION

COMPARATIVE STATEMENT OF COLLECTIONS, INCREASES OR DECREASES THEREOF, OPERATION EXPENSES AND PROPORTION OF EXPENDITURES TO COLLECTIONS, DURING 1910, 1911, 1912, 1913, 1914 AND 1915

Years	Gross Collections	Increase Over Previous Year (Decrease for 1914 and 1915).	Per Cent of Increase Over Previous Year	Net Collections	Increase Over Previous Year (Decrease for 1914 and 1915).	Per Cent of Increase Over Previous Year	Operation Expenses	Proportion of Expenditures to Gross Collections	Proportion of Expenditures to Net Collections
Totals 1915	$6,319,579.58	$277,076.10	(Decr.)	$6,180,732.08	$277,782.75	(Decr.)	$339,474.29	.0537	.0549
" 1914	6,596,655.68	84,201,33	(Decr.)	6,458,514.83	82,155.57	(Decr.)	320,773.43	.0486	.0496
" 1913	6,680,857.01	256,591.53	4.0	6,540,670.40	291,932.93	4.6	299,900.84	.0448	.0458
" 1912	6,424,265.48	536,628.75	9.1	6,248,737.47	503,927.25	8.7	329,724.88	.0513	.0527
" 1911	5,887,636.73	299,128.62	5.3	5,744,810.22	249,339.72	4.5	307,209.27	.0521	.0535
" 1910	5,588,508.11	394,367.93	7.6	5,495,470.50	445,743.62	8.8	282,412.97	.0505	.0514

NOTE—The Operation Expenses include Salaries, Extra Clerk Hire, Postage, Stationery and all other expenses pertaining to the Assessment and Collection of Water Rates.

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TABLE No. IV

COLLECTION DIVISION

GROSS COLLECTIONS BY THE BUREAU OF WATER DURING 1915 AS COMPARED WITH 1914

	1915	1914	Increase	Decrease	Net Decrease
Assessed Rates	$3,376,350.57	$3,392,674.39	.....	$16,323.82	.....
Meter Rates	2,761,367.60	3,020,437.88	.....	259,070.28	.....
Meter Mechanical	1,462.12	1,674.35	.....	212.23	.....
Assessor's Miscellaneous	23,926.98	25,157.98	.....	1,231.00	.....
Permits	37,524.00	38,781.50	.....	1,257.50	.....
Suspense Account No. 1	168.40	25.97	$142.43	.....	.....
Suspense Account No. 2	639.60	231.77	407.83	.....	.....
Special Deposits	118,140.31	117,671.84	468.47	.....	.....
Totals	$6,319,579.58	$6,596,655.68	$1,018.73	$278,094.83	$277,076.10

ANALYSIS OF DECREASE IN ASSESSED RATES COLLECTIONS.

NOTE—The discount on Assessed Rates collections at 25% from January 1st to November 1st, 1915, amounted to $901,510.94. The payments net, therefore, during said period, approximated $2,704,532.82.

Every 75 cents paid of this amount (discount 25%) meant 10 cents less in collections as compared with same period during 1914 (discount 15%). Therefore, $2,704,532.82 divided by 75 cents, times 10 equals $360,604.30, the loss in collections due to increase in discounts from 15% to 25%. The actual loss in Assessed Rates collections during said period was $11,821.44, after crediting $183,490.87 for deferred payments in wards 27 to 35, inclusive, from the fall of 1914 to 1915, because of the amendment to Section 2791 of the Chicago Code of 1911, passed July 2, 1914, and effective November 1, 1914, changing the times of payments in the several water districts. Therefore, the Assessed Rates growth for said period (January 1st to November 1st, 1915,) amounted to $166,291.99, and the decrease in Assessed Rates collections from said date to the end of the year was $4,502.38, leaving the net growth in Assessed Rates collections, $161,789.61, which represents what the increase in Assessed Rates collections would have been had there been no change in discount rate.

ANALYSIS OF DECREASE IN METER RATES COLLECTIONS.

The discount on Meter Rates collections at 25% from January 1st to December 1st, 1915, amounte to $809,191.77. The payments net, therefore, during said period, approximated $2,427,575.31.

Every 75 cents paid of this amount (discount 25%) meant 9 cents less in collections as compared with same period during 1914 (discount 16%). Therefore, $2,427,575.31 divided by 75 cents, times 9 cents, equals $291,309.03, the loss in collections due to increase in discount from 16% to 25%. The actual loss in Meter Rates collections during said period was $259,070.28, showing a Meter Rates growth to December 1st, 1915, of $32,238.75, and the increase from said date to the end of the year was $23,002.16, making the Meter Rates growth for the year $55,240.91, which represents what the increase in Meter Rates collections would have been had there been no change in discount rate.

Approximate increase in Assessed Rates collections during 1915 if there had been no change in discount rate	$ 161,789.61
Approximate increase in Meter Rates collections during 1915 if there had been no change in discount rate	55,240.91
Total	$ 217,030.52

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TABLE No. VII

COLLECTION DIVISION

TOTAL DEBIT BALANCES ON APRIL 30TH AND DECEMBER 31ST, DURING THE YEARS 1911 TO 1915, INCLUSIVE

	1915		1914		1913		1912		1911	
	April 30	Dec. 31	April 30	Dec. 31	April 30	Dec. 31	April 30	Dec. 31	April 30	Dec. 31
On Assessed Rates Ledgers	$ 41,620.03	$1,432,969.10	$ 78,089.20	$1,363,835.66	$ 22,988.24	$1,078,547.19	$ 27,255.44	$ 952,881.54	$ 19,259.10	$ 895,060.12
On Meter Rates Ledgers	354,547.43	372,172.78	351,480.47	377,765.03	349,635.82	337,151.01	321,259.71	295,944.15	270,055.91	310,954.24
In Meter Mechanical Account	293.43	.....	.....	.....	97.70	.....	111.95	.....	82.34	233.64
In Suspense Account No. 1	760.18	425.24	1,060.73	1,448.85	935.73	1,151.81	1,045.31	876.85	3,068.34	3,457.36
In Suspense Account No. 2	10,470.98	10,571.68	2,805.95	1,944.72	2,149.52	2,996.22	1,717.33	1,678.76	2,147.39	2,629.09
Totals	$407,692.05	$1,816,138.80	$433,456.35	$1,744,994.26	$375,807.01	$1,419,846.23	$351,389.74	$1,251,381.30	$294,613.08	$1,212,334.45

NOTE—The annual general assessment for frontage, fixture and miscellaneous charges is levied on the first day of May for each ensuing year ending April 30th. The final collection period ends on the last day of February of each year. The debit balances, therefore, on Assessed Rates ledgers are larger on December 31st than on April 30th.

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TABLE No. VIII

COLLECTION DIVISION—METER RATES SECTION

ANALYSIS OF GENERAL LEDGER

	DEBIT					CREDIT					
MONTHS	Balance January 1, 1915	Charges	Refunds	Discounts on Refunds	Totals	Collections	Discounts on Collections	Decreases	Transfers to Suspense No. 2	Balance December 31, 1915	Totals
January	$377,765.03	$ 342,826.31	$ 66.45	$ 3.95	$ 720,661.74	$ 232,006.77	$ 71,200.62	$ 1,423.03	$ 493.79	.....	$ 305,124.31
February	.....	248,592.41	64.00	8.28	248,664.69	221,587.81	71,588.97	1,147.83	8,309.20	.....	302,633.81
March	.....	325,999.42	60.28	7.34	326,067.04	220,111.92	70,290.87	439.91	512.16	.....	291,354.86
April	.....	290,906.88	142.53	11.33	291,060.74	250,463.46	81,006.84	943.49	378.11	.....	332,793.90
May	.....	283,312.39	62.06	2.33	283,376.78	214,491.41	69,403.62	329.61	376.05	.....	284,600.69
June	.....	310,915.77	100.96	0.93	311,017.66	217,043.04	69,998.53	291.42	467.00	.....	287,799.99
July	.....	264,304.59	162.54	3.11	264,470.24	240,679.39	78,021.36	1,245.97	307.97	.....	320,254.69
August	.....	356,855.35	68.64	2.02	356,926.01	198,974.87	63,779.09	198.09	226.09	.....	263,178.14
September	.....	331,032.93	38.93	2.04	331,073.90	212,447.60	69,209.15	252.14	62.46	.....	281,971.35
October	.....	305,432.66	113.78	18.75	305,565.19	267,334.52	87,330.97	593.36	194.02	.....	355,502.87
November	.....	317,726.65	32.83	3.43	317,762.91	238,251.74	77,309.75	324.54	312.55	.....	316,198.58
December	.....	317,017.33	56.93	8.11	317,082.37	247,975.07	80,469.79	30,946.32	752.22	$372,172.78	732,316.18
Totals 1915	$ 377,765.03	$3,694,922.69	$ 969.93	$ 71.62	$ 4,073,729.27	$ 2,761,367.60	$ 889,661.56	$ 38,135.71	$12,391.62	$ 372,172.78	$ 4,073,729.27
Totals 1914	$337,151.01	$3,682,138.43	$ 935.72	$ 53.15	$ 4,020,278.31	$3,020,437.88	$569,196.93	$ 51,523.94	$1,354.53	$ 377,765.03	$ 4,020,278.31
" 1913	295,944.15	3,684,118.98	711.60	56.30	3,980,831.03	3,028,232.72	558,812.54	54,902.74	1,732.02	337,151.01	3,980,831.03
" 1912	310,954.24	3,421,540.42	864.77	93.10	3,733,452.53	2,877,379.90	528,979.32	29,949.89	1,199.27	295,944.15	3,733,452.53
" 1911	268,563.08	3,094,643.61	1,013.33	88.80	3,364,308.82	2,556,594.32	469,252.60	26,512.63	995.03	310,954.24	3,364,308.82
" 1910	221,493.00	2,945,684.92	797.53	33.80	3,168,009.25	2,425,735.59	440,319.03	32,897.84	493.71	268,563.08	3,168,009.25

NOTE—The December decreases of $30,946.32 include a total of $30,754.11 for free water service during 1915, under the Exemption Ordinance, Section 2755, Chicago Code of 1911.

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TABLE No. IX

COLLECTION DIVISION—ASSESSED AND METER RATES SECTIONS

MISCELLANEOUS ITEMS

YEARS	Number of Assessed Rates Accounts on December 31st	Assessed Rates Collections	Average Amount of Each Assessed Rates Bill (Semi-annual)
1915	272,776	$3,376,350.57	$6.19
1914	265,928	3,392,674.39	6.38
1913	260,049	3,467,676.03	6.67
1912	255,817	3,327,574.16	6.50
1911	261,157	3,134,700.02	6.00
1910	254,027	3,018,825.80	5.94

YEARS	Number of Meters in Service on December 31st	Meter Rates Collections	Average Revenue Per Year, Per Meter
1915	19,439	$2,761,367.60	$142.05
1914	18,474	3,020,437.88	163.50
1913	16,969	3,028,232.72	178.45
1912	16,052	2,877,379.90	179.25
1911	16,628	2,556,594.32	153.75
1910	15,032	2,425,735.59	161.37

TABLE No. X

COLLECTION DIVISION—METER RATES SECTION

DISTRIBUTION OF WATER METERS IN SERVICE DECEMBER 31, 1915

	In Service Dec. 31, 1914	New Installations and Replacements for larger services during 1915	Meters removed on account of larger services installed during 1915	Other Meters permanently removed during 1915	In Service Dec. 31, 1915
Stores and Flats	3,520	315	6	35	3,794
Business Houses	1,774	17	3	4	1,784
Residence and Apartment Buildings	5,589	331	1	52	5,867
Factories	3,040	134	15	20	3,139
Railroads	791	17	2	19	787
Breweries	189	1	1	4	185
Liveries	631	.....	.....	.....	631
Packing Houses	181	9	2	14	174
Laundries	515	28	2	2	539
Hotels	351	17	3	13	352
Office Buildings	402	19	5	8	408
Theatres	90	13	.....	1	102
Charitable Institutions	82	1	.....	1	82
Miscellaneous	1,319	348	10	62	1,595
Totals	18,474	1,250	50	235	19,439

NOTE—The 1,595 miscellaneous meters comprise those controlling coal yards, garages, saloons, warehouses, amusement parks, etc.

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TABLE No. XI

COLLECTION DIVISION—METER RATES SECTION

TYPES AND SIZES OF WATER METERS IN SERVICE ON DECEMBER 31, 1915

TYPES	⅝"	¾"	1"	1¼"	1½"	2"	3"	4"	6"	8"	10"	12"	Totals
Worthington Plunger	705	105	574	3	634	662	348	22	3	.....	.....	.....	3,056
Worthington Disc	215	1,694	3,366	652	1,289	831	62	68	15	.....	.....	.....	8,192
Worthington Turbine	.....	.....	.....	.....	.....	6	64	124	105	36	6	8	349
Pittsburgh Disc	74	117	249	.....	262	156	49	24	11	.....	.....	.....	942
Pennsylvania Disc	30	60	25	.....	40	62	1	.....	.....	.....	.....	.....	218
Keystone Disc	219	307	208	148	240	403	54	72	13	.....	.....	.....	1,664
Eureka Turbine	.....	.....	.....	.....	7	68	22	27	31	10	2	.....	167
Crown Rotary	797	73	102	.....	81	90	39	83	21	1	.....	.....	1,287
Nash Disc	22	45	52	.....	47	21	3	10	1	.....	.....	.....	201
Empire Oscillating Eccentric	3	5	4	.....	3	.....	2	1	.....	.....	.....	.....	18
Gem Turbine	.....	.....	.....	.....	.....	8	3	13	15	8	2	1	50
Trident Disc	349	27	15	.....	16	105	70	22	11	.....	.....	.....	615
Trident Crest	.....	.....	.....	.....	.....	3	53	32	20	15	7	1	131
Thomson Disc	18	3	3	.....	16	5	.....	1	.....	.....	.....	.....	46
Hersey Disc	30	33	46	.....	57	54	49	27	13	.....	.....	.....	309
Hersey Rotary	8	10	24	.....	27	44	25	26	22	.....	.....	.....	186
Hersey Torrent Turbine	.....	.....	.....	.....	.....	4	36	58	40	13	2	1	154
Union Plunger	7	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....	11
Niagara Disc	31	48	12	.....	14	15	.....	.....	.....	.....	.....	.....	120
Trident Crest Compound	.....	.....	.....	.....	.....	.....	1	2	.....	.....	.....	.....	3
Empire Compound	.....	.....	.....	.....	.....	.....	1	4	.....	.....	.....	.....	5
Lambert Disc	41	125	288	.....	63	253	.....	.....	.....	.....	.....	.....	770
Badger Disc	71	285	196	.....	193	195	.....	.....	.....	.....	.....	.....	940
City of Chicago Disc	.....	.....	2	.....	.....	3	.....	.....	.....	.....	.....	.....	5
Totals 1915	2,620	2,939	5,167	803	2,990	2,988	882	616	321	83	19	11	19,439
Totals 1914	2,656	2,720	4,762	800	2,866	2,787	879	604	304	70	17	9	18,474
" 1913	1,737	2,695	4,613	805	2,749	2,571	853	575	287	58	17	9	16,969
" 1912	1,754	2,427	4,408	802	2,574	2,398	810	543	262	47	17	10	16,052
" 1911	2,540	2,468	4,327	776	2,575	2,353	803	484	243	37	13	9	16,628
" 1910	1,749	2,235	4,061	736	2,527	2,211	781	460	221	30	12	9	15,032

NOTE—In addition to above, there are 21 Hydraulic Elevator Dials.

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TABLE No. XII

ASSESSMENTS DIVISION

DETAILED STATEMENT OF ASSESSOR'S INCREASE AND DECREASE CHECKS DURING 1915

MONTHS	INCREASES			DECREASES		
	Back Tax	Current Tax	Totals	Back Tax	Current Tax	Totals
January	$ 49.50	$ 14,172.27	$ 14,221.77	$ 264.34	$ 6,284.92	$ 6,549.26
February	401.95	8,749.66	9,151.61	2,657.31	4,739.31	7,396.62
March	114.32	10,059.77	10,174.09	1,068.91	2,254.36	3,323.27
April	162.38	4,364.01	4,526.39	104.75	1,048.00	1,152.75
May	1,241.11	33,313.33	34,554.44	1,422.49	9,545.33	10,967.82
June	293.20	24,456.10	24,749.30	665.58	10,901.08	11,566.66
July	132.71	14,649.88	14,782.59	523.05	11,015.20	11,538.25
August	321.06	20,967.76	21,288.82	317.17	10,300.55	10,617.72
September	381.50	34,475.37	34,856.87	321.06	9,362.25	9,683.31
October	386.29	34,219.36	34,605.65	242.80	24,270.56	24,513.36
November	580.45	26,814.44	27,394.89	584.67	14,645.45	15,230.12
December	85.44	19,708.84	19,794.28	265.82	8,146.19	8,412.01
Ass'd Rates Charitable				3,801.82	280,781.96	284,583.78
Ass'd Rates Totals, 1915	$ 4,149.91	$245,950.79	$250,100.70	$12,239.77	$393,295.16	$405,534.93
Meter Rates Decreases						$ 7,381.60
Meter Rates Charitable (Decr.)						$ 30,754.11
Meter Mechanical Decreases						$ 278.10
Suspense Account No. 1 (Decr.)						$ 1,846.72
Suspense Account No. 2. (Decr.)						$ 3,204.93
Total Decreases, 1915						$449,000.39
Total Decreases 1914						$516,294.05
ASSESSED RATES: Totals 1914	$49,956.05	$284,527.01	$334,483.06	$ 57,962.93	$404,129.63	$462,092.56
Totals 1913	$ 11,256.84	$331,399.57	$342,656.41	$ 8,039.15	$403,328.32	$411,367.47
Totals 1912	$ 7,809.07	$322,345.90	$330,154.97	$11,474.84	$402,938.60	$414,413.44
Totals 1911	$ 4,515.23	$225,693.37	$230,208.60	$ 5,596.56	$349,498.85	$355,095.41
Totals 1910	$ 8,729.30	$271,474.81	$280,204.11	$ 6,134.54	$363,088.10	$369,222.64

NOTE—$315,337.89 was decreased during 1915 under the ordinance exempting Municipal, Charitable, Educational and Religious Institutions from the payment of water rates, and a general assessment decrease of $57,310.00 was made by reason of the transfer of Assessed Rates accounts to the Meter Rates ledgers, after meters were installed and controlled.

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TABLE No. XIII

ASSESSMENTS DIVISION
DETAILED STATEMENT OF FREE WATER SERVICE ACCOUNTS, EXEMPT FROM THE PAYMENT OF WATER RATES UNDER SECTION 2755, CHICAGO CODE OF 1911.

ASSESSED RATES

MUNICIPAL.			
Public Schools	$ 104,575.57		
Police Department	3,711.79		
Fire Department	3,256.88		
Public Baths	1,637.00		
Small Parks	1,501.87		
Municipal Tuberculosis Hospital	2,544.67		
Pumping Stations	22,675.25		
Various City Buildings	8,892.63		
Miscellaneous	2,350.51		
		$ 151,146.17	
RELIGIOUS, EDUCATIONAL AND CHARITABLE.			
Churches and Parsonages	$ 33,593.08		
Parochial, Private Schools and Colleges	42,080.73		
Hospitals	13,321.38		
Homes	10,546.78		
Miscellaneous	5,569.63		
		$ 105,111.60	
STATE AND COUNTY.			
Hospitals	$ 4,672.50		
Parks	21,100.00		
University Schools	1,893.50		
State Armories, Ill. National Guard	458.50		
Miscellaneous	201.51		
		$ 28,326.01	
Total Assessed Rates			$ 284,583.78

METER RATES.

MUNICIPAL.			
Public Schools	$ 178.53		
Police Department	240.16		
Small Parks	105.64		
Miscellaneous	253.17		
		$ 777.50	
RELIGIOUS, EDUCATIONAL AND CHARITABLE.			
Churches and Parsonages	$ 851.46		
Parochial, Private Schools and Colleges	4,246.80		
Hospitals	4,556.06		
Homes	3,444.18		
Miscellaneous	1,359.44		
		$ 14,457.94	
STATE AND COUNTY.			
Hospitals	$ 14,814.05		
Parks	3.31		
State Armories, Ill. National Guard	701.31		
		$ 15,518.67	
Total Meter Rates			$ 30,754.11
Total Free Service, 1915			$ 315,337.89
Total Free Service 1914			$ 300,518.99
Total Free Service 1913			300,243.94
Total Free Service 1912			270,399.96
Total Free Service 1911			285,312.67
Total Free Service 1910			270,598.58

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TABLE No. XIV

ASSESSMENTS DIVISION—PERMIT SECTION

PERMITS ISSUED DURING 1915

	¾"	1"	1½"	2"	Misc. Sizes	Totals
Permits issued for three-quarter inch to two-inch pipes	3,830	159	242	219	.....	4,450
Permits issued under Council Orders	7	.....	1	4	.....	12
Special Permits issued for Connections and Repairs	.....	.....	.....	.....	1,090	1,090
Permits issued for Street Improvements (Special Assessment)	6,173	.....	.....	.....	.....	6,173
Permits issued for Street Improvements (Private Contract)	2,557	.....	.....	.....	.....	2,557
Totals 1915	12,567	159	243	223	1,090	14,282
Totals 1914	13,489	145	235	205	1,367	15,441

PERMITS ISSUED FOR LARGER PIPES.	3"	4"	6"	8"	10"	12"	16"	Totals
Scattering	29	78	38	8	.....	8	1	162
On Council Orders	.....	5	1	1	.....	.....	.....	7
Totals 1915	29	83	39	9	.....	8	1	169
Totals 1914	36	53	31	16	1	1	.....	138

Service Pipes installed prior to January 1, 1915	**448,711**
" " " during the year 1915	**14,451**
Total Service Pipes installed to December 31, 1915	**463,162**
Total collections for permits issued during 1915	**$37,524.00**
" " " " " " 1914	**38,781.50**
Decrease " " " " " 1915	**$ 1,257.50**

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TABLE No. XV

ASSESSMENTS DIVISION—FIELD ASSESSING

BUILDINGS EXAMINED DURING 1915

YEARS	1 Story	2 Story	3 Story	4 Story	5 Story or Over	Special Examinations	New Buildings	Exams. for Vacancies	Pipe Petitions	Barns	Hose	Totals
1915	30,840	63,674	27,131	9,766	2,709	17,912	22,358	28,419	2,208	28,627	4,064	237,708
1914	27,823	60,697	26,047	9,709	2,908	20,527	23,427	16,589	2,573	28,377	3,355	222,032
1913	31,314	61,279	22,823	6,980	2,446	27,547	25,894	16,786	2,398	21,953	2,516	221,936
1912	24,642	59,611	25,521	7,369	2,748	22,675	25,770	15,162	1,954	21,475	3,507	210,134
1911	15,785	40,192	17,918	3,955	910	16,709	21,656	11,755	1,943	15,203	3,713	149,739
1910	7,468	13,553	6,195	1,590	436	15,853	23,659	11,739	4,621	9,399	19,048	113,560

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TABLE No. XVI

ASSESSMENTS DIVISION—SHUT-OFF SECTION

VISITS TO PREMISES BY SHUT-OFF MEN DURING 1915

Years	Services Shut-off for Non-payment	Meters Shut-off for Non-payment	Service Pipes Cut	Assessed Rates			Meter Rates	Total Visits
				Shut-off by Request of Owner or Agent	Turn-ons	Notices of Delinquency Served	Notices of Delinquency Served	
1915	1,771	569	8	6,689	947	29,430	3,378	40,444
1914	1,534	361	2	4,224	1,079	25,179	5,177	35,659
1913	1,872	195	9	3,662	1,218	26,963	3,872	35,686
1912	2,133	292	1	3,683	1,439	29,384	4,041	38,547
1911	2,166	153	2	2,751	1,590	23,939	3,233	31,513
1910	2,940	81	.....	3,300	1,723	23,449	2,578	30,949

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TABLE No. XVII

INCOME ACCOUNT

REVENUE.

From Assessed Rates:			
General Assessment, May 1st, 1915		$4,597,677.60	
Increase to Back Tax		4,149.91	
Increase to Current Tax		245,950.79	
Increase due to Cancelled Certificates.		9,328.32	$4,857,106.62
Less—			
Discount allowed for prompt payment	$1,014,351.99		
Erroneous Assessments refunded.	8,134.41		
Decreases on account of municipal, charitable, educational and religious institutions, in accordance with Section 2755, Chicago Code of 1911.	284,583.78		
Decreases on Council Orders and on account of revised assessments by reason of annual and special examination reports, fixture removals, buildings torn down, drawbacks on previous payments on account of vacancy, changes from frontage to meter rates, etc.	120,951.15		
Decreases on Suspense Account No. 1	1,846.72	1,429,868.05	
Net revenue from Assessed Rates			$3,427,238.57
From Meter Rates:			
Meter charges, as per rate takers' daily reports and increases from Assessor's checks	$3,694,922.69		
Increase to Suspense Account No. 2	32.68	$3,694,955.37	
Less—			
Discount allowed for prompt payment.	$ 889,589.94		
Erroneous charges refunded	7,857.85		
Decreases on account of municipal, charitable, educational and religious institutions, in accordance with Section 2755, Chicago Code of 1911	30,754.11		
Decreases on Council Orders and on account of estimated bills on claims supported by affidavits, etc	7,381.60		
Decreases on Suspense Account No. 2	3,204.93	938,788.43	
Net revenue from Meter Rates			2,756,166.94
From Meter Mechanical:			
Charges for labor and material in repairing meters	$ 1,673.09		
Less—			
Decreases on account of erroneous charges	278.10		
Net revenue from Meter Mechanical			1,394.99

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TABLE No. XVII—Continued.

REVENUE.

From Assessments Division:			
From sprinkling wagons, cement walks and miscellaneous charges	$ 28,895.30		
Tap permits issued	37,524.00	$66,419.30	
Less—			
Refunds of miscellaneous charges paid.	53.00		
Refunds for unused permits	404.50	457.50	
Net revenue from Assessments Division			$ 65,961.80
From contract			1,000.00
Total net revenue			$66,251,762.30

EXPENSES.

Salaries, Wages and Team Hire:			
Superintendent's Office, Salaries	$ 7,039.93		
Collection Division, General, Salaries	20,052.32		
Assessed Rates Section, Salaries	41,422.88		
Meter Rates Section, Salaries	53,770.73		
Assesssments Division, Gen'l, Salaries,	97,377.09		
Shut-off Section, Salaries	19,840.79		
Permit and Map Section, Salaries	12,672.29		
Auditing Division, Salaries	13,261.84		
Extra Clerk Hire	6,728.28		
Overtime for Emergency Work, Salaries	2,397.00		
Meter Rates Team Hire	25,629.75		
Shut-off Team Hire	9,443.25		
Total Salaries, Wages and Team Hire		$309,636.15	
Miscellaneous:			
Supplies	$ 186.89		
Material for Repairs	72.28		
Furniture, Fittings, Fixtures and Library	1,285.78		
Printing, Stationery and Office Supplies	26,167.70		
Advertising	10.80		
Street Car and Railway Transportation	1,082.90		
Personal Services other than by Employes	660.36		
Impersonal Services and Benefits	273.55		
Tools and Implements, including their repair	97.88		
Total, miscellaneous expenses		29,838.14	
Total expenses			$ 339,474.29
Net income of the Bureau of Water			$5,912,288.01

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TABLE No. XVIII

BALANCE SHEET AS OF DECEMBER 31, 1915.

DEBIT.

Debit Balances January 1, 1915		$1,744,994.26
Less: Meter Mechanical Credit Balance.		36.25
Net Debit Balances January 1, 1915		$1,744,958.01
Disbursements during 1915:		
Salaries, Wages and Team Hire (Detail in Table XVII)	$ 309,636.15	
Miscellaneous Expenses (Detail in Table XVII)	29,838.14	
Total disbursements		339,474.29
Net income, 1915 (Table No. XVII)		5,912,288.01
		$7,996,720.31

CREDIT.

Credit Balance against City Comptroller, December 31, 1915, as follows:		
Net Collections by the Cashier, Bureau of Water	$6,174,763.76	
Amounts collected on warrants for collection:—		
For water used in constructing cement walks	4,968.32	
For earnings on contract	1,000.00	
Total Net Collections		$6,180,732.08
Debit Balances December 31, 1915, as follows:		
Assessed Rates	$1,432,969.10	
Meter Rates	372,172.78	
Suspense Account No. 1	425.24	
Suspense Account No. 2	10,571.68	
Total Debit Balances	$1,816,138.80	
Less: Meter Mechanical Credit Balance.	150.57	
Net Debit Balances December 31, 1915		$1,815,988.23
		$7,996,720.31

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ANNUAL REPORT

BUREAU OF STREETS

CITY OF CHICAGO

1915

A. W. MILLER
Superintendent of Streets

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BUREAU OF STREETS

Hon. Wm. R. Moorhouse,
Commissioner of Public Works.

Dear Sir:

I have the honor to submit the annual report of the Bureau of Streets for the year ending December 31, 1915.

GARBAGE.

The rehabilitated municipal reduction plant was able to care for the city's output of garbage promptly and in a sanitary manner, making it unnecessary to send any to the clay hole dumps, these dumps now receiving only ashes and rubbish.

The garbage collection during the year has been regular and satisfactory, the schedules as arranged providing for daily, semi-weekly and tri-weekly collections in accordance with the needs of the particular section served. The establishment of transfer loading stations in wards far removed from the river stations is strongly urged. Loaded tanks of garbage could thus be transferred to motor trucks and hauled to river loading stations or reduction plant, thereby permitting of more economical operation and more frequent collections. It is to be hoped that the technical board appointed by the Commissioner of Health in accordance with a Council Resolution will reach this phase of the problem in the near future, and that its consideration by that body will result in the adoption of the plan as outlined above.

139,493 tons of pure garbage were delivered to the reduction plant at Thirty-ninth and Iron streets, both by boat and direct haul. Also 4,475 tons of garbage consisting of trade waste from commission houses were delivered to the reduction plant by boats from the Chicago avenue and Oakley avenue loading stations.

Cost of collecting and hauling	$434,411.95
Cost of handling at loading stations	13,431.75
Cost of boat hire	29,240.00
Total	$477,083.70

Cost per ton, $3.20
Cost per capita, 18.6c

ASHES AND MISCELLANEOUS WASTE.

One of the most important functions a municipality is called upon to perform is the collection and disposition of ashes and miscellaneous waste, as is shown by the great financial outlay necessary in the proper performance of the work. It vitally affects the comfort and convenience of every householder, and has an indirect bearing upon the health of the community, as well as being a most important factor in the clean street problem. Much paper and light rubbish cast into back yards and alleys is carried by the wind upon adjoining highways, where

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it gives an otherwise clean street a neglected and slovenly appearance. This indicates lack of co-operation on the part of the householder, also a lack of proper appreciation of clean streets, for it can be said in this connection that no matter how up to date our equipment or how efficient our organization a high standard of cleanliness for streets and alleys cannot be maintained without proper co-operation on the part of the householder, a co-operation that is sadly lacking in many parts of this city.

The rapidly filling clay holes have brought most forcibly to my attention the knowledge that by the middle of 1916 Chicago will face the serious situation of being without a place to dispose of its refuse, particularly in the north and northwest sides of the city.

The technical board created by the City Council and working under the jurisdiction of the Commissioner of Health recommended to the Council Finance Committee the purchase of a site for a loading station and incinerator at Bliss street and the north branch of the Chicago River, but no action has as yet been taken by that Committee.

The question of the final disposition of ashes and rubbish as it affects this city did not receive much attention at the hands of the waste commission, and the solution of the problem has yet to be worked out. It is to be hoped that immediate consideration will be given this most important matter by the proper officials.

1,489,431 cubic yards or 298,495 loads of ashes and refuse were collected and delivered to city dumps, 139,386 cubic yards of this refuse being delivered at the Fifteenth Place and Loomis street loading station, and transported by street cars to Grace street and Campbell avenue dump.

Cost of collecting and hauling	$941,690.34
Cost of motor cars and trailers	20,157.24
Maintenance of city dumps	72,928.72
Repair of cars and maintenance of tracks	2,447.13
Repairing platforms	986.25
Total	$1,038,209.68

Cost per cubic yard, 69.7c
Cost per capita, 43.3c

STREET CLEANING.

It can be said that there is no work the city is called upon to perform that has such a direct bearing upon the health, comfort and convenience of the citizen as that of street cleaning.

Well paved streets can be kept in presentable condition only by constant attention and frequent cleaning by modern methods.

Hand sweeping, supplemented by flushing, is still considered the best and most effective method of street cleaning, and therefore is still being used. Many patented street cleaning machines operated on the vacuum principle are in the course of construction, but none have reached that stage of development where their substitution for the hand and flushing method is deemed advisable.

The system of washing the downtown sidewalks at night, inaugurated last year, is still being used, and it has now become a necessary and regular part of our street cleaning operations in the business section.

The street cleaning schedules put into effect last year covering all the permanent pavements throughout the city, the frequency of cleaning being determined by the kind and condition of pavement, density of traffic, proximity of

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unpaved streets and alleys, character of people, location of public buildings, etc., are still in effect, the plan working to good advantage.

An accomplishment of the past year which we know will make for greater efficiency in all of our activities was the uniforming of section foremen. The men comprising that very important part of our force now appear in neat uniforms of black and white material with cap to match, together with a suitable identifying badge to be worn on the coat. In the discharge of their duties section foremen come in daily contact with the householder, the uniform establishing his identity at once, and rendering his work much more effective.

An additional sand spreading machine has been added to our equipment in the downtown section, which will greatly facilitate the sanding and salting of pavements after a snow storm or damp and freezing weather. This enables us to treat in the same manner all viaduct and bridge approaches.

198,303,557 square yards of alleys were cleaned, and 203,715 cubic yards of paper burned, at a total cost of $100,297.76.

4,488,359,027 square yards of streets were cleaned by hand (block and gang system) during 1915.

777,845 cubic yards or 183,278 loads of street dirt were removed.

39,905 cubic yards of said street dirt were hauled by street cars from loading station at Fifteenth Place and Loomis street to Grace street and Campbell avenue dump.

172,500 gallons or 2,752 tanks of water were used by sprinklers.

Cost of block and gang cleaning	$1,307,023.89
Material and supplies	17,494.70
Motor cars and trailers hauling street dirt	5,770.26
Laborers on platform loading station	1,852.75
Repairing cars, maintenance of track	669.00
Illinois Central railroad cars for street dirt	4,910.00
Repairing platform	279.34
Total	$1,337,999.94

Cost per 1,000 square yards, 29.8c

Cost per capita, 55.9c

STREET CLEANING BY FLUSHERS.

127,193,290 square yards of streets were cleaned by horse drawn flushers.

82,330,550 gallons or 154,038 tanks of water used.

Total cost of flushing $19,057.50

Cost per 1,000 square yards, 15c

9,597,208 square yards were cleaned in first ward by auto flushers.

3,739,400 gallons or 3,280 tanks of water used.

Cost of auto flushing	$447.75
Gasoline, oil, etc.	69.81
Total cost	$537.56

Cost per 1,000 square yards, 5.6c

SIDEWALK FLUSHING.

	Sq. Yds.	Gallons	Tanks	Expense	Cost per 1,000 Sq. Yds.
Sidewalk flushing	6,886,107	4,055,600	5,426	$1,552.15	22.5c
Squeegee flushing	16,240,105	4,849,400	9,581	2,076.00	12.7c

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AUTOMOBILE FLUSHING.

Three automobile flushers purchased in the fall of 1914 were put in operation about April 10, 1915, and remained in the service until November 19th, when weather conditions interfered with street flushing. During this period they were operated in two shifts of eight hours each, making a total of sixteen hours per day. For various reasons it was found most practical to have the drivers on the first shift report for work at noon to give their machines one hour's attention. Flushing operations would then begin and continue until 9:30 p. m. The night shifts reported for work at 9:30 p. m. and after caring for machines would commence flushing at 10:30 p. m., continuing until 7 a. m. the following morning. Flushers were operated every night except Sunday.

In order to reduce non-productive travel to a minimum and enable the flushers to cover as much territory as possible it was found advisable to house the machines in separate sections of the city, the north, south and west sides. Suitable quarters were provided in ward yards most centrally located to the section wherein the machine operated. Owing to the necessity of covering as much territory as possible scheduled streets were covered every second day or night. The main arteries leading into the business section were covered nightly, as also were the streets within the business section. The benefits derived from the operation of the automobile flushers were most apparent. On streets not covered by the automobile flushers the displacement of air caused by rapidly moving automobiles or street cars would invariably raise a cloud of dust, whereas on streets that were flushed this condition was almost entirely eliminated.

This phase of street cleaning work should be extended by the purchase of additional flushers as soon as the city's finances will permit.

During 1915 the Smoke Abatement Report of the Chicago Association of Commerce was made public. Their report is voluminous, and among other things covers all phases of the dust problem as it affects Chicago. As the consideration of dust enters largely into street cleaning activities that part of the reports dealing with the sources of dust is most interesting. The 1914 report touched upon the dust problem, enumerating many sources from which dust comes to find its way to street pavements, thence to be blown about by the wind, greatly to the discomfort of pedestrians. As shown in the 1914 report, and also as published in the report of the Association of Commerce, much dirt and dust which befouls the pavements and pollutes the atmosphere could be eliminated by the rigid enforcement of the clean street ordinance.

We believe a scientific study of the dust problem by the department of health would do much toward providing ways and means for its elimination.

It is believed that one of the principal factors in keeping down the cost of flushing was the installation of service recorders on these machines. These instruments allow no time to be lost without a proper explanation, thus preventing the idling of time by the operators.

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Following is a detailed account of operation:

During the period between April 10, 1915, and November 19, 1915, 9,939.52 miles of streets were flushed, with a total of 271,407,644 square yards cleaned, divided as follows:

North side	19,213,606 lin. ft.	96,961,529 sq. yds.	Cost	$3,303.45
South side	16,248,540 lin. ft.	93,404,220 sq. yds.	Cost	3,375.15
West side	15,491,575 lin. ft.	73,543,171 sq. yds.	Cost	3,161.87
Loop dist.	1,525,976 lin. ft.	7,768,661 sq. yds.	Cost	946.40
Totals	52,479,696 lin. ft.	271,407,644 sq. yds.	Cost	$10,786.87

Material used in this work:

12,547 gallons gasoline
572 gallons cylinder oil
642 lbs. medium cup grease

39,297 tanks of water were used, equivalent to 58,990,500 gallons, or an average of 5,865 gallons of water per mile of street flushed.

The working hours are accounted for as follows:

Productive hours	7,745.08
Non-productive hours	435.01
Time lost (all causes)	1,356.45
Total	9,536.54 hours

Efficiency 83⅓%

Total cost of operation including percentage of salary of head motor truck driver	$11,209.87
General average cost of flushing 1,000 sq. yds.	.04–1/10
General average cost of flushing per mile	1.13

CUTTING WEEDS.

There was no appropriation made for this activity and charges for this work were therefore made against street cleaning, but in order to arrive at the actual cost of street cleaning it was deemed advisable to segregate the weed cutting.

6,632,532 sq. yds. of weeds were cut, at a cost of $7,722.23

DITCHING.

In wards 5, 8, 9, 12, 25, 26, 27, 29, 32, 33 and 34, 500,585 feet of ditches were opened and cleaned.

Cost	$12,167.05
Supplies	238.33
Total	$12,405.38

SNOW REMOVAL.

Special attention is being paid to removal of snow from the streets in the business section, as well as the principal thoroughfares in most wards, the Council making a special appropriation for the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 10th, 13th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd and 23rd wards. In the down-town section our forces are so organized that all streets are kept open for traffic

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during storms and the loop practically cleared of snow in from six to twenty-four hours. Great benefits to business from snow removal, especially on business streets, is now apparent, and the business interests in the outlying wards are becoming more and more insistent in their demands that this service be extended to outlying territory.

In the first ward or loop district there were piled and removed 131,928 cubic yards or 30,181 loads of snow, and 30,938,917 square yards of streets cleaned.

Cost of piling and hauling	$68,927.39
Supplies	2,961.78
Total	$71,889.17

Cost per load, $2.38

Cost per cu. yd., .544

In wards 2, 3, 4, 5, 6, 7, 10, 13, 16, 17, 18, 19, 20, 21, 22 and 23 collectively 139,467 cubic yards or 33,849 loads of snow were removed, and 23,290,720 square yards of streets cleaned.

Cost	$62,432.97
Supplies	302.61
Total	$62,735.58

EMERGENCY.

Repairing improved and unimproved streets and sidewalks.

321,061 lineal feet of grading.
210 new and repaired aprons.
1,355 new and repaired crossings.
318 new and repaired culverts.

Using the following material:

193,167 feet of new lumber.
27,343 feet of old lumber.
32,409 cubic yards of cinders.
27¾ kegs of nails.

185 square yards of granite pavement repaired.
33 square yards of brick.
120 square yards of creosote.

Using the following material:

36 cubic yards of gravel.
2,312 cubic yards of crushed stone.
185 gallons of tar.
7 bags of cement.

Cost	$36,076.05
Material and supplies	4,716.78
Total	$40,792.83

DEAD ANIMALS REMOVED DURING 1915.

Horses	7,869
Ponies	38
Colts	11
Sheep	7
Cows	19
Dogs	13,113
	21,057

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VEHICLE TAX DIVISION.

During 1915 the activities in the Vehicle Tax Division were greatly hampered by the unsettled weather conditions. Nevertheless, the progress made by various repair forces was exceedingly gratifying, and the work went on with as few interruptions as possible. Despite this handicap, the unit costs compared very favorably with those of former years.

During the year 133 miles of various pavement were released from contractors' reserve and fell to the Bureau of Street for maintenance and repair. With this increased mileage, and also with the 70 miles of pavements which were formerly classified as Country Roads, the Bureau of Streets has under its jurisdiction 1,457 miles of paved streets. To maintain and improve these streets $753,355.63 was expended. This expenditure in detail, together with the amounts of the various kinds of street repairs, is shown in Table "A."

STATEMENT OF VEHICLE TAX FOR YEAR 1915.

Amount on hand January 1, 1915	$ 5,357.54	
Miscellaneous receipts for year ending Dec. 31, 1915	768,027.78	
		$773,385.32
Amount expended by Bureau of Streets	$753,355.63	
Amount expended by City Collector's Office	17,166.87	
Amount expended by Police Department	21,500.00	
		$790,022.50
Amount to be paid from 1916 collections		$ 18,637.18

ASPHALTIC CONCRETE.

The primary idea of resurfacing macadam streets with asphaltic concrete, with the end in view of improving their condition, both sanitary and physical, and of reducing their maintenance cost, was carried out as in previous years. 13.4 miles of pavement were so treated. In selecting these pavements, preference was given to those upon which traffic was heaviest, and those through route streets which formed logical connecting links between the central part of the city and the outlying districts. The following streets were so treated at a cost of $145,772.09 for 193,224 square yards; an average cost of $0.754 per square yard,

STREET	FROM	TO	Number Sq. Yds.
Congress st.	Western ave.	Campbell av.	2,038
Congress st.	Hoyne av.	Lincoln st.	4,739
Greenview av.	Devon av.	Pratt av.	2,115
Brainard av.	135th st.	138th st.	3,302
Emerald av.	39th st.	40th st.	1,670
Halsted st.	79th st.	86th st.	23,550
Halsted st.	86th st.	119th st.	47,354
Indiana av.	127th st.	134th st.	13,499
Jefferson st.	Jackson blvd.	Van Buren st.	2,319
Vincennes av.	95th st.	103rd st.	17,694
Western av.	111th st.	119th st.	12,422
Indianapolis av.	Ewing av.	106th st.	7,500
14th st.	Independence blvd.	Crawford av.	725
103rd st.	Longwood av.	Vincennes av	14,810
Federal st.	22nd st.	26th st.	10,562
Forquer st.	Halsted st.	Desplaines st	2,630
Gilpin pl.	Halsted st.	Desplaines st	2,161
Homan av.	Jackson blvd.	Monroe st.	170
Wilcox av.	Kilbourne av.	Kenton av.	1,760
Desplaines st.	Harrison st.	12th st.	9,325
Dorchester av.	71st st.	75th st.	12,300
Inter.	91st st.	Morgan st.	404
Inter.	95th st.	State st.	175

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Owing to the lack of funds and facilities to resurface with bituminous concrete other macadam streets which were in very bad condition, a macadam resurfacing was used. The following streets were so treated at a cost of $33,933.27 for 136,907 square yards; an average cost of $0.2478 per square yard.

STREET	FROM	TO	Number Sq. Yds.
Emerald av	39th st	40th st	1,670
Wood st	47th st	51st st	7,800
55th st	Cicero av	Central av	3,200
Indiana av	127th st	134th st	13,900
Indianapolis av	Ewing av	106th st	7,500
103rd st	Longwood av	Vincennes av	14,810
Greenleaf av	Clark st	Ravenswood av	1,700
Kenilworth av	Western av	Kedzie av	6,027
Devon av	Kedzie av	Ridge av	11,500
Devon av	Kedzie av	Lincoln av	3,800
Peterson av	Ridge av	Lincoln av	5,200
Norwood Pk. av	Raven st	Park Ridge	9,800
Raven st	Nagle av	Norwood Pk. av	4,600
Troy st	Elston av	Belmont av	2,900
Milwaukee av	Norwood Pk. av	City Limits	11,600
Central av	Irving Pk. blvd	Belmont av	9,400
63rd st	Cicero av	Central av	15,900
Cicero av	55th st	63rd st	1,300
63rd st	Central av	60th av	4,300

Although the great bulk of resurfacing was done with macadam or asphaltic concrete, the following streets were resurfaced with sheet asphalt at a cost of $10,322.40 for 8,532 square yards; an average cost of $1.21 per square yard.

STREET	FROM	TO	Number Sq. Yds.
Jefferson st	Washington blvd	Jackson blvd	8,076
Intersection	Fifth av	33rd st	140
Intersection	59th st	Dorchester av	316

It will be noticed that there is a scarcity of streets resurfaced in the northern section of the city; particularly is this true of streets resurfaced with bituminous concrete. This is due to the fact that extensive sewer operations were in progress during the year. These sewers are now completed, and it is the intention of this bureau to resurface as far as its funds will permit the main thoroughfares in this section during 1916.

GENERAL INFORMATION.

The street maintenance of a general nature consisted of repairs to the following pavements: Asphalt, brick, granite block, creosoted block, cedar block, concrete, macadam, and of the oiling of macadam pavements. The amount of work done, together with the unit costs of repair and maintenance are shown in Table "B."

In arriving at the maintenance costs, only those streets were considered which were under the jurisdiction of this bureau previous to November 1st, as those streets released after this date received no repairs.

As in previous years, a very large percentage of money expended by the Vehicle Tax Division fell to asphalt improvements and repairs. Out of a total of $753,355.63 expended, $280,697.39 was used for this purpose. Since the installation of our asphalt plants the city has continued to manufacture all its asphaltic mixtures and paving pitch. These plants consist of the Central Plant and Utilization Plants located at Fifteenth street and Ashland avenue and the Portable Railroad Plant which was located at Ninety-fifth street and Vincennes avenue, a position centrally located relative to the resurfacing activities in the southern section of the city. On account of the proposed activities in the northern section of the city for 1916 which was referred to above under the Resurfacing of Pave-

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ments, it is intended to transfer this Portable Railroad Plant to a position centrally located with reference to this proposed resurfacing. Data in connection with the operation of the asphalt plants are shown in Table "C".

At the beginning of the year the bureau equipped twenty of the old water sprinkling wagons which were used for the oiling of macadam, with a special device which consisted of a pump and spraying nozzle. With this improvement the great amount of waste of former years was eliminated and the oil was more evenly and uniformly distributed, whereby the cost of oiling was reduced to approximately one-half the cost of previous years, 6,293,124 square yards of macadam being oiled for $62,570.18, a cost of $0.0099 per square yard.

Besides the work above mentioned, the bureau built 13,405 lineal feet of curb and gutter for $6,868.80, a cost of $0.5124 per lineal foot, and 19,419 square feet of cement sidewalk for $3,622.10, a cost of $0.186 per square foot. A detailed list of all work done by this division arranged by wards is shown in the appendix.

MATERIAL.

To carry on all the activities of the Vehicle Tax Division during 1915 the following materials were used:

MATERIAL.	QUANTITY.	MATERIAL.	QUANTITY.
Brick	584,000 brick	Asphalt	3,839 tons
Granite block	3,022 sq. yds.	Stone dust	517 tons
Creosote block	4,217 sq. yds.	Cement	14,146 bbls.
Crushed limestone	61,226 cu. yds.	Road oil	961,898 gals.
Crushed granite	5,986 cu. yds.	Fuel oil	407,181 gals.
Torpedo sand	2,891 cu. yds.	Flux oil	183,809 gals.
Bank Sand	18,773 cu. yds.	Gasoline	53,200 gals.
Gravel	1,312 cu. yds.	Pitch	4,772 gals.

In the following table is shown the total yardage of pavements repaired by the Bureau of Streets for each year from 1911 to 1915 inclusive:

Kind of Pavement.	1911 Sq. Yds.	1912 Sq. Yds.	1913 Sq. Yds.	1914 Sq. Yds.	1915 Sq. Yds.
Asphalt	98,602	76,488	147,638	142,088	122,786
Brick	44,872	58,284	53,342	66,416	47,949
Granite	31,040	54,153	59,345	84,661	47,893
Macadam	1,207,426	919,080	1,880,365	471,119	880,125
Cedar block	14,842	5,902	2,595	1,253	91
Concrete	.....	.....	.....	.....	9,994
Oiling	6,019,941	5,311,144	6,310,081	6,276,504	6,293,124
Creosote block	.....	.....	49	734	6,940
Sheet Asphalt Resurfacing	.....	.....	24,038	8,659	8,532
Bituminous Concrete Resurfacing	.....	.....	.....	231,068	197,659
Macadam Resurfacing	.....	.....	327,544	362.143	136,907
	7,416,723	6,425,051	8,804,997	7,644,645	7,752,000

The bureau feels that its most important activity is the improvement of poor and impassable outlying streets, and the hastening to completion of the through route plan inaugurated during 1913. The aim of this through route plan is to build and improve, as fast as possible and as our funds permit, pavements in those streets which carry the heaviest traffic and which form logical connecting links between the central part of the city and the outlying districts, suburbs and country towns, so that we shall eventually have a

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comprehensive system of good pavements whereby it will be possible for traf to travel in any direction from city limits to city limits, and be greeted wit good pavements all the way. While this plan includes the repair of miscella eous pavements in the heart of the city, its most important function is t building of bituminous concrete pavements and the resurfacing with bitumino concrete of macadam pavements on the outlying thoroughfares.

During the year just closed the activities in this field have been very sat factory and gratifying to both the city authorities and to those having occasion travel over these streets, and the city has received a great number of commu cations from Good Roads Organizations and individuals commending the g results obtained from the expenditure of the Vehicle Tax Fund.

The collections and expenditures for this fund for the years 1908 to 1 inclusive are shown in the following table:

	Collections.	Expenditures
1908	$440,253.93	$433,056.33
1909	504,197.75	506,298.99
1910	566,191.57	501,392.18
1911	591,147.08	576,195.54
1912	603,282.70	562,358.55
1913	682,135.10	719,105.39
1914	730,536.81	813,980.42
1915	768,027.78	792,022.50

It will be noted from the above table that the Vehicle Tax collections steadily increasing from year to year, and it is directly due to this yea increase that the Vehicle Tax Division is able to develop its activities and feel that each year shows a marked improvement in the manner of doing work, and the character of the same. Attention and interest have been instil into the working forces and the result has been shown in the increased efficie and in the reduction of costs.

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TABLE 8

SHOWING AMOUNT OF WORK DONE IN 1915 AND THE UNIT COST OF REPAIRS AND MAINTENANCE ON DIFFERENT KINDS OF PAVEMENTS

KIND OF PAVEMENT	ASPHALT	BRICK	GRANITE	CREOSOTE BLOCK	CEDAR	MACADAM	CONCRETE
Out of Reserve Dec. 31, 1915	7,600,600 Sq. Yds.	1,765,200 Sq. Yds.	1,217,100 Sq. Yds.	185,800 Sq. Yds.	2,600,000 Sq. Yds.	10,472,700 Sq. Yds.	79,700 Sq. Yds.
Out of Reserve and Maintained in 1915	7,360,400 " "	1,756,300 " "	1,196,000 " "	185,800 " "	2,600,000 " "	10,461,900 " "	78,500 " "
Total Square Yards Repaired	122,786	47,949	47,893	6,940	91	880,125	9,994
Total Cost of Repairs	$117,747.66	$45,383.64	$35,976.07	$10,026.66	$73.15	$151,326.31	2,215.58
Average Cost of Repairs per Square Yard	0.959	0.946	0.751	1.445	0.804	0.172	0.222
Average Cost of Maintenance per Square Yard	0.0160	0.0258	0.301	0.0540	0.00003	0.0145	0.0282

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TABLE C

SHOWING OUTPUT OF THE ASPHALT PLANTS DURING 1915

ASPHALT

10,352.2	Tons Top at $7.50	$ 77,641.50	
8,538.7	" Binder at 4.514	38,539.22	
18,890.9			$116,180.72

ASPHALTIC CONCRETE

32,150.825	Tons Asphaltic Concrete at $3.9656	$128,139.72
	Total	$244,320.44

DETAIL OF COSTS

	ASPHALT				ASPHALTIC CONCRETE	
	TOP		BINDER			
	Total Cost	Cost Per Ton	Total Cost	Cost Per Ton	Total Cost	Cost Per Ton
Material	$29,230.38	$2.8236	$13,280.07	$1.5553	$ 75,109.54	$2.3361
Labor	10,932.14	1.0560	9,254.09	1.0838	24,096.46	0.7495
Teams	10,353.58	1.0001	8,787.73	1.0291	18,516.11	0.5759
Totals	$50,516.10	$4.8797	$31,321.89	$3.6682	$117,724.11	$3.6617

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REPORT OF HOUSE MOVING—1915

Months	Number Permits Issued	Dimensions: Stories High: One	Two	Three	Width: Lin. Feet	Kind: Frame	Brick	Division: North	South	West	Permit Fees: $1.00	$2.00	$5.00	$10.00	Misc.	Amount
January	6	3	3	..	110	6	..	..	2	4	4	..	2	..	..	$ 14.00
February	14	9	5	..	282	13	1	3	6	5	6	..	8	..	..	46.00
March	36	20	16	..	791	32	4	4	17	15	..	19	..	17	..	208.00
April	40	22	15	3	866	29	11	10	16	14	..	16	..	22	2	286.00
May	38	13	25	..	855	31	7	6	22	10	..	17	..	20	1	250.00
June	41	18	22	1	874	32	9	8	23	10	..	23	..	17	1	240.00
July	36	18	17	1	868	27	9	8	13	15	..	17	..	18	1	236.00
August	33	15	16	2	698	25	8	5	12	16	..	17	..	16	..	194.00
September	28	8	20	..	614	21	7	7	8	13	..	11	..	17	..	192.00
October	31	16	15	..	686	26	5	7	5	19	..	11	..	19	1	226.00
November	31	17	13	1	659	28	3	4	19	8	..	12	..	19	..	214.00
December	11	7	4	..	236	10	1	3	6	2	..	3	..	6	2	98.00
		166	171	8		280	65	65	149	131	10	146	10	171	8	
Totals	345		345		7539		345		345				345			$2,204.00

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PERMIT DIVISION

S. J. FISHER, Chief Street Inspector.

STATEMENT OF PERMITS ISSUED.

City Departments		9,907
Individuals—		
Plumbers, sewer builders, etc.:		
In improved streets	1,681	
In unimproved streets	7,303	8,984
Use of street		1,359
Peoples Gas Light & Coke Company		17,315
Commonwealth Edison Company		4,321
Chicago Telephone Company		2,536
Chicago Tunnel Company		43
Chicago Surface Lines		489
Various corporations		279
Inspection		62
Cement Sidewalk Contractors		187
Driveways		667
Miscellaneous		4,005
Total		50,154

CITY DEPARTMENTS.

Number of permits issued		9,907
Number of openings made:		
In improved streets	6,808	
In unimproved streets	6,056	12,864
Number of openings in various kinds of pavement:		
Asphalt	2,465	
Brick	847	
Creosoted Block	218	
Granite	996	
Macadam	1,541	
Cedar	91	
Concrete	29	
Cement Sidewalk	565	
Asphaltic-Macadam	56	6,808

Pavement restored—square yards:

	Out of Reserve	In Reserve	
Asphalt	16,762.67	2,370.99	
Brick	5,217.31	1,559.71	
Granite	3,549.33	855.65	
Creosoted Blk	220.78	780.76	
Macadam	15,717.08	.....	
Asph-Mac.	.....	2,145.26	
Asph-Concrete	.....	19.22	
Tarvia Macadam	.....	8.89	
Concrete	.....	5.10	
Cedar	53.55	.....	
Total	41,520.72	7,745.58	49,266.30

Cement walk restored—square feet..... 7,304

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INDIVIDUALS.

(Plumbers, Sewer Builders, Etc.)

Number of permits issued—

For openings in improved streets	1,681	
For openings in unimproved streets	7,303	8,984

Number of openings made—

In improved streets	1,918	
In unimproved streets	7,978	9,896

Numper of openings in various kinds of pavement—

Asphalt	564	
Brick	178	
Creosoted Block	123	
Granite	134	
Macadam	560	
Cedar	13	
Concrete	18	
Cement Sidewalks	296	
Asphaltic-Macadam	32	1,918

Pavement restored—square yards—

	Out of Reserve	In Reserve	
Asphalt	9,961.22	2,638.72	
Brick	817.38	758.13	
Granite	1,119.79	288.89	
Creosoted Block	161.66	316.33	
Macadam	4,055.57	87.55	
Asphaltic-Macadam	.....	251.41	
Asphaltic-Concrete	.....	38.30	
Concrete	.....	12	
Cedar	8.33		
	16,123.95	4,391.33	20,515.28

Concrete walk restored—square feet 17,152

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PEOPLES GAS LIGHT AND COKE COMPANY.

Number of permits issued		17,315
Number of openings made—		
In improved streets	24,973	
In unimproved streets	32,081	57,054
Number of openings in various kinds of pavement—		
Asphalt	1,603	
Brick	735	
Creosoted Block	249	
Granite	1,811	
Macadam	15,213	
Cedar	3,407	
Cement Sidewalks	1,296	
Asphaltic-Macadam	612	
Concrete	47	24,973
Pavement restored—square yards—		
Asphalt	12,309	
Brick	7,517	
Creosoted Block	1,489	
Granite	8,869	
Macadam	6,919	
Cedar	147	
Asphaltic-Macadam	2,596	
Asphaltic-Concrete	147	39,993
Concrete walks restored—sq. ft.		11,212

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COMMONWEALTH EDISON COMPANY.

Number of permits issued		4,321
Number of openings made—		
In improved streets	1,511	
In unimproved streets	510	2,021
Conduit and lateral installed	lin. ft.	164,463
Conduit and lateral installed	duct ft.	894,790
Concrete used	cu. yds.	8,264
Brick work in vault construction	cu. yds.	2,210
Poles set—		
Wood	4,096	
Iron	161	4,257
Cable installed	miles	208
Wire strung	"	1,570
Number of openings in various kinds of pavement—		
Asphalt	395	
Brick	392	
Creosoted Block	96	
Granite	440	
Macadam	60	
Cedar	2	
Concrete	54	
Cement sidewalk	72	1,511
Pavement restored—square yards—		
Asphalt	5,409	
Brick	3,467	
Creosoted Block	802	
Granite	3,764	
Macadam	4,929	
Cedar	8	
Concrete	218	18,597

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CHICAGO TELEPHONE COMPANY.

Number of permits issued		2,536
Number of openings made—		
In improved streets	1,496	
In unimproved streets	813	2,309
Conduit and lateral installed	lin. ft.	188,419
Conduit and lateral installed	duct. ft.	1,188,719
Poles set		2,161
Cable installed	miles	8,974
Wire strung	"	3,560

Number of openings in various kinds of pavement—

Asphalt	298	
Brick	158	
Creosoted Block	69	
Granite	236	
Macadam	611	
Asphaltic-Macadam	37	
Cedar	41	
Concrete	34	
Cement walks	12	1,496

Pavement restored—square yards—

Asphalt	5,900	
Brick	4,325	
Creosoted Block	1,935	
Macadam	7,290	
Granite	11,425	
Concrete	245	31,120

WESTERN UNION TELEGRAPH COMPANY.

Conduit installed	lin. ft.	24,631
Conduit installed	duct. ft	145,023
Number of vaults constructed		92
Number of brick used in underground construction		198,600

POSTAL TELEGRAPH-CABLE COMPANY.

Conduit installed	lin. ft.	2,540
Conduit installed	duct. ft.	5,080
Number of vaults constructed		26

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CHICAGO SURFACE LINES.

Number of permits issued		489
Track constructed:		
Rehabilitated—Type 2-A—miles approximate	23.95	
Rehabilitated—Type 3 —miles approximate	.86	
Rehabilitated—Type 4 —miles approximate	3.15	
Rehabilitated—Type 5 —miles approximate	.71	
		28.67
Extensions—Type 2-A—miles approximate	18.62	
Extensions—Type 4 —miles approximate	.16	
Extensions—Type 5 —miles approximate	.77	
		19.55
Track resurfaced—miles approximate		5.60
Track replaced on account of sewer work—miles approximate		3.58
Special work installed, number of layouts		101
Ties installed—wood		96,132
Poles set—steel		1,541
Poles reinforced—steel		972
Poles removed—wood		652
Conduit installed—lineal feet		16,689
Conduit installed—duct feet		74,597
Concrete used in underground construction—cubic yards		967
Brick used in underground construction		110,590
Cable installed—		
Underground, lin. ft	2,233	
Overhead, lin. ft	9,824	
Auxiliary and bonding, lin. ft	23,813	
		35,870
Trolley wires strung—		
New, lin. ft	123,989	
Renewals, lin. ft	991,121	
		1,115,110
Pavement laid inside right of way—square yards—		
Asphalt	794	
Brick	839	
Creosoted Block	7,512	
Granite	206,394	
Macadam	5,498	
		221,037

Pavement laid outside right of way—square yards:

	In Reserve	Out of Reserve		
Asphalt	5,129	4,512	9,641	
Brick	393	493	886	
Creosoted Block	307	.....	307	
Granite	20	3,590	3,610	14,444
Total				235,581

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CHICAGO SURFACE LINES.

TRACK AND PAVING RECONSTRUCTED AND EXTENDED—1915
CHICAGO RAILWAYS COMPANY.

Street	From	To	Miles Rehabilitated	Miles Extended	
26th st.	Troy st.	Springfield ave	1.86	.....	
Ashland ave.	Clybourn ave.	Fullerton ave.	....	.11	
Broadway	Foster ave.	Devon ave	1.93	....	
California ave.	Belmont ave.	Roscoe st.	.47	....	
Chicago ave.	Clark st.	Lake Shore Drive	....	1.44	
Crawford ave.	Montrose Cemetery	Bryn Mawr ave	....	.49	
Division st	Cicero ave.	Austin ave.	....	3.00	
Fulton st.	Morgan st.	Ashland ave.	1.47	....	
Grand ave.	Municipal Pier.		....	.32	
Halsted st.	O'Neil st.	Chicago River	.15	....	
Kedzie ave.	Milwaukee ave.	Elston ave.	....	2.14	
Kedzie ave.	Lawrence ave	Foster ave.	....	.99	
Lake st.	Halsted St.	Bryan pl	1.80	....	
Laramie ave.	Across.	Jackson blvd.	.04	....	
Laramie ave.	Across.	Washington blvd	.05	....	
Laramie ave.	Madison st.	West End ave.	.38	....	
Lawrence ave.	Ridgeway ave.	Crawford ave.	.58	....	
Leavitt st.	18th st	22nd st.	.68	....	
North ave.	Lamon ave.	Austin ave.	....	2.67	
Ogden ave.	22nd st.	Crawford ave.	.06	....	
Orleans st.	Chicago ave.	Division st.	.46	....	
Paulina st.	Madison st.	12th st	1.94	....	
Racine ave.	Grand ave.	Erie st.	.31	....	
Waveland ave.	Broadway	Halsted st.	....	.05	
Western ave.	Washington blvd	Grand ave.	.51	....	
Western ave.	Lincoln ave.	Devon ave.	....	3.90	
			12.69	15.11	
Total.					27.80

TRACK CONSTRUCTED PRIOR TO 1915. PAVING CONSTRUCTED 1915.

Milwaukee ave. at Broomingdale road	20

CHICAGO CITY RAILWAY COMPANY.

TRACK AND PAVING RECONSTRUCTED AND EXTENDED—1915.

Street	From	To	Miles Rehabilitated	Miles Extended	
31st st.	C.R.I.& P.Ry.Subway.	Pitney ct.	3.20	....	
38th st	Kedzie ave.	Central Park ave.	.93	....	
47th st.	Kalsted st.	Morgan st.	.44	....	
47th st	P. C. C. & St. L.	Western blvd.	.31	....	
51st st.	State st.	Wentworth ave.	.48	....	
79th st.	at	I. C. Ry. Subway	....	0.19	
79th st.	at	C. & W. I. and C. R. I. & P. Ry. Subway.	.10	....	
Ashland ave.	79th st	87th st.	....	1.99	
Kedzie ave.	I. & M. Canal.	49th st.	2.76	....	
Kedzie ave.	63rd st.	67th st.	....	.98	
Racine ave.	at subway	75th st.	.12	....	
Western ave.	56th st	63rd st.	1.78	....	
			10.12	3.16	
Total.					13.28

TRACK CONSTRUCTED PRIOR TO 1915. PAVING CONSTRUCTED DURING 1915.

79th st.	Racine ave.	Ashland ave.	.97
Ashland ave.	at subway	75th st	.20
Halsted st.	at subway	75th st	.22
Kedzie ave.	38th st	39th st	.21
			1.60

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CALUMET AND SOUTH CHICAGO RAILWAY COMPANY.

TRACK AND PAVING RECONSTRUCTED AND EXTENDED—1915.

Street	From	To	Miles Rehabilitated	Miles Extended	
67th st	Cottage Grove ave.	Stony Island ave.	1.96	.....	
87th st	Commercial ave.	South Chicago ave.	.....	.72 E. B. Track Extension	
95th st	At Calumet river.	Bridge.	.07	.....	
111th st	Watt ave.	Cottage Grove ave.	.04	.....	
111th st	Watt ave.	Cottage Grove ave.	.....	.04	
115th st	Cottage Grove ave.	South Park ave.	.....	.11	
Anthony Ave	93rd st	Commercial ave.	.13	.....	
Cottage Grove ave	114th st	115th st	.....	.03	
Torrence ave.	106th st	109th st	.70	.....	
Watt ave.	111th st	115th st	.48	.....	
			3.38	.90	
Total					4.28

TRACK CONSTRUCTED PRIOR TO 1915. PAVING CONSTRUCTED DURING 1915

			W. B. Track
87th st	Commercial ave.	South Chicago ave.	.72

SOUTHERN STREET RAILWAY COMPANY.

TRACK AND PAVING RECONSTRUCTED DURING 1915.

Street	From	To	Miles Rehabilitated	Miles Extended	Total
Ashland ave.	22nd st.	Archer ave.	1.73	.....	.....
Chicago Surface Lines			12.69	15.11	27.80
Chicago City Railway Company			10.12	3.16	13.28
Calumet & South Chicago Railway Company			3.38	.90	4.28
Southern Street Railway Company			1.73	.....	1.73
Total			27.92	19.17	47.09

CHICAGO UNION STATION COMPANY AND PENNSYLVANIA COMPANY.

ORDINANCES OF MARCH 23, 1914.

Work in connection with the Union Station was started on June 23, 1915. Most of the work done to date has been of a preliminary nature, and is as follows:

Lake st.	From Chicago river to Canal st.	Rebuilding viaduct
Canal st.	From Fulton st. to Randolph st.	Main sewer has been constructed
Monroe st.	From Canal st. to Clinton st.	
Clinton st.	From Monroe st. to Adams st.	
W. S. of Canal st.	Between Washington and Monroe sts.	Utility Galleries have been constructed to carry equipment of City and public utility corporations
N. S. of Monroe st	Between Canal and Clinton sts.	
Canal st.	Between Madison and Monroe sts.	A retaining wall is being constructed at the old east curb line, which wall, will support the sidewalk and roadway at the new elevation

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PENNSYLVANIA COMPANY.

The Pennsylvania Company is driving piles, excavating and building concrete foundations for new train sheds, which will be located just west of the Chicago River between Polk and Taylor streets.

CHICAGO & WESTERN INDIANA RAILROAD COMPANY.

ORDINANCE OF MARCH 2, 1914.

Constructed a viaduct and approaches thereto in Crawford avenue, between 71st street and 73d street.

Laid 335 square yards of asphaltic-macadam pavement in West 59th street, between the west line of Cicero avenue and the east line of the Belt Railway.

TRACK ELEVATION.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY COMPANY.
BLOOMINGDALE ROAD
between
ASHLAND AND LAWNDALE AVENUES.

ORDINANCE OF JUNE 27, 1910.

All work in connection with this elevation of tracks has been completed.

Number of grade crossings eliminated	35
Mileage of roadbed or first main track elevated	2.65
Cost of work done during 1915	$400,000
Cost of work done to December 31, 1915	$2,800,000

(Mileage of roadway and track elevated is from center to center of extreme subways and does not include length of run-off.)

The following is a statement of work done at various subways and in Bloomingdale road:

Location—	Pavement Granite sq. yds.	Pavement Brick sq. yds.	Sidewalk sq. ft.	Curb lin. ft.	Curb and Gutter lin. ft.
Hoyne avenue	194	.....	1,338	301	.....
Leavitt street	871	.....	2,893	552	.....
Milwaukee avenue	1,009	31	6,959	641	.....
Milwaukee avenue to Winnebago avenue	....	728	1,653	.....	611
Winnebago avenue	736	40	2,918	485	61
Winnebago avenue to Western avenue	....	1,428	3,333	.....	851
Western avenue	736	40	2,918	485	61
Western avenue to Artesian avenue	....	33	1,396	.....	5
Artesian avenue	....	.....	1,256	.....	.....
Artesian avenue to Campbell avenue	....	.....	3,072	.....	.....
Campbell avenue	660	66	1,596	327	47
Campbell avenue to Maplewood avenue	....	.....	1,443	.....	.....
Maplewood avenue	....	.....	2,754	.....	.....
Maplewood avenue to Rockwell street	....	.....	1,447	.....	.....
Rockwell street	....	.....	1,412	.....	.....
Rockwell street to Talman avenue	....	.....	2,917	.....	.....
Talman avenue	689	66	1,489	289	508

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Location—	Pavement Granite sq. yds.	Brick sq. yds.	Sidewalk sq. ft.	Curb lin. ft.	Curb and Gutter lin. ft.
Talman avenue to Washtenaw avenue	....	.....	2,973	.....	.....
Washtenaw avenue	....	.....	1,601	.....	.....
Washtenaw avenue to Fairfield avenue	....	604	2,894	335	529
Albany avenue to Nebraska avenue	....	720	1,425	.....	564
Kedzie avenue	....	.....	2,067	.....	.....
Kedzie avenue to Sawyer avenue	....	6	.....	.....	.....
Sawyer avenue	662	60	1,818	228	67
Sawyer avenue to Spaulding avenue	....	18	190	.....	.....
Spaulding avenue	....	.....	2,101	.....	.....
Spaulding avenue to Kimball avenue	....	5	618	.....	.....
Kimball avenue	....	.....	5,321	.....	.....
Kimball avenue to Ballou street	....	6	640	.....	.....
Ballou street	258	.....	6,275	124	.....
Ballou street to Hancock street	....	5	1,922	.....	.....
Hancock street	925	66	3,749	546	62
Hancock street to Central Park avenue	....	30	1,925	.....	.....
Central Park avenue	1,103	.....	2,702	.....	.....
Monticello avenue	1,101	.....	4,320	728	.....
Total	8,944	3,952	83,335	5,041	3,366

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY COMPANY.

EVANSTON BRANCH
between
MONTROSE AVENUE AND HOWARD STREET.

ORDINANCE OF JULY 11, 1910.

Retaining walls have been constructed on the east side of the right of way from Lawrence avenue to Pratt boulevard and from Kenilworth avenue to a point about 200 feet north of Howard street.

Abutment walls, center columns and bridges have been constructed at all streets where subways are to be located, except Pratt boulevard. This construction is on the east half of the right of way, except at Estes, Greenleaf and Farwell avenues, where it is on the west half.

Two tracks have been elevated from Wilson avenue to a point about 200 feet north of Howard street, at both of which points connections have been made with the Northwestern Elevated railroad tracks, and trains are now being operated upon these tracks.

Temporary stations and platforms at the elevated grade have been erected at all stations between Argyle avenue and Howard street.

Mileage of all tracks elevated	3.72
Mileage of roadbed or first main track elevated	3.72
Cost of work done during 1915	$1,065,000.00
Cost of work done to December 31, 1915	1,425,000.00

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CHICAGO & WESTERN INDIANA RAILROAD COMPANY

C. & W. I. MAIN LINE FROM 71ST STREET TO 90TH STREET. BELT LINE AND WABASH ALONG 75TH STREET FROM WALLACE STREET TO WOOD STREET.

ORDINANCE OF JULY 13, 1908, AND AMENDMENTS THERETO.

	C. & W. I.	Belt Line	Wabash
Number of grade crossings eliminated.	9.00	12.00	12.00
Mileage of roadbed or first main track elevated in 1915	.71	.....	.....
Mileage of all tracks elevated in 1915	3.72	.....	.92
Mileage or roadbed or first main track elevated	1.63	1.64	1.60
Mileage of all tracks elevated to December 31, 1915	7.77	6.37	2.63
Cost of work done during 1915	$926,470.00	$36,325.00	$54,937.00
Cost of work done to December 31, 1915	$1,751,455.00	$611,340.00	$267,937.00

Subways at 72d street, 73d street, 82d street, Vincennes avenue, and Holland road are in course of construction.

Pavement, sidewalks and curb and gutter constructed in following named subways:

Location—	Pavement Brick sq. yds.	Cement Sidewalk sq. ft.	Curb and Gutter lin. ft.
76th street, east of Wallace street	1,540.40	4,565.20	728.30
78th street, east of Wallace street	1,468.60	2,268.79	446.60
Wallace street from 76th street to 79th street	2,093.50	6,333.00	3,665.40
Goldsmith avenue, north from 79th street	.....	1,505.80	505.30
80th street, east of Wallace street	1,538.30	4,222.80	576.00
Alley, between 79th and 80th streets	516.09	3,263.90	664.90
81st street, west of Parnell avenue	.....	.....	354.70
Vincennes avenue, near 83d street	.....	.....	200.00
Lowe avenue and north thereof	.....	.....	200.00
Halsted and 75th streets	1,576.40	8,739.00	1,066.00
Racine avenue and 74th place	987.90	5,802.60	660.60
Ashland avenue and 75th street	695.30	3,427.50	463.70
72d street	.....	1,813.00	280.00
Peoria and 75th streets	899.60	3,271.00	363.30
Morgan and 75th streets	.....	3,252.30	364.60
Aberdeen and 75th streets	.....	3,248.70	363.10
	11,316.09	51,713.50	10,902.50

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CHICAGO, ROCK ISLAND & PACIFIC RAILWAY COMPANY

MAIN LINE
from
72D STREET TO 90TH STREET.

ORDINANCE OF JULY 13, 1908.

Number of grade crossings eliminated	5
Mileage of roadbed or first main track elevated in 1915	.60
Mileage of all tracks elevated in 1915	1.4
Mileage of roadbed or first main track elevated	1.55
Cost of work done to December 31, 1914	$1,251,131.55
Cost of work done to December 31, 1915	2,039,574.39

(Mileage of roadway and track elevated is from center to center of extreme subways and does not include length of run-off.)

Retaining walls have been constructed along the east right of way line between 74th and 89th streets and along the west right of way line between 76th and 83d streets.

Abutment walls, piers and permanent bridges are in course of construction at Halsted street, Vincennes avenue, 87th street and 88th street.

Abutment walls and piers have been completed and pavements, walks, curbs and gutters (as stated below) constructed at the following named subways:

Location—	Pavement Brick sq. yds.	Sidewalk sq. ft.	Curb lin. ft.	Curb and Gutter lin. ft.
74th street	759	2,642	380	.....
75th street	....	.....	290	.....
76th street	....	1,702	170	.....
78th street	742	390	.....	449
79th street	944	5,760	.....	564
80th street	1,143	3,815	430	.....
81st street	....	2,067	235	.....
83d street	1,305	3,064	672	.....
Total	4,893	22,140	2,177	1,013

Subways at 75th street, 76th street, 80th street, 81st street and 83d street have not been completed.

ILLINOIS CENTRAL RAILROAD COMPANY.

MAIN LINE
from
100TH STREET TO 116TH STREET.

ORDINANCE OF APRIL 5, 1911.

100th Street—No work done. Street not open for traffic.

103d Street—Abutments, piers and sewers completed. Work remaining to be done includes construction of pavement, curbs, sidewalks and decking of the bridge. Street is open for traffic.

105th Street—Abutments, piers and sewers completed. Work remaining to be done includes construction of pavement and sidewalks and decking of bridge. Street closed to traffic.

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107th Street—Abutments, piers and sewer completed. Work remaining to be done includes construction of pavement and sidewalks and decking of bridge. Street open to traffic.

108th Street (Foot Subway)—All work completed except the concrete sidewalk. Passage open for pedestrians.

109th Street. Abutments and piers completed. Work remaining to be done includes construction of sidewalks and pavement and decking of bridge. Street closed to traffic.

111th Street—Abutments, piers and sewer completed. Work remaining to be done includes construction of pavement and sidewalks and decking of bridge. Street open to traffic.

113th Street—Abutments, piers and sewer completed. Work remaining to be done includes construction of pavement and sidewalks and decking of bridge. Street open to traffic.

115th Street—All work completed to the Michigan Central tracks. Street open to traffic.

Kensington Avenue—All work completed to the Michigan Central tracks. Street open to traffic.

Detail of work done in the following named subways:

Location—	Pavement Granite sq. yds.	Sidewalk sq. ft.	Curb lin. ft.
115th street	1,800	5,800	575
Kensington avenue	1,660	6,100	600
Total	3,460	11,900	1,175

ILLINOIS CENTRAL RAILROAD COMPANY.
79TH STREET SUBWAY.

ORDINANCE OF MARCH 8, 1915.

Abutments, piers, sewer, pavement and sidewalks completed.

Work of encasing steel structure in concrete and waterproofing deck of bridge is not yet completed.

Street is open for traffic.

Detail of work done in this subway:

Pavement Brick sq. yds.	Sidewalk sq. ft.	Curb lin. ft.	Curb Wall lin. ft.
5,350	21,710	2,200	894

NEW YORK, CHICAGO & ST. LOUIS RAILROAD COMPANY.
FROM 76TH STREET TO 83D STREET.

ORDINANCE OF MARCH 8, 1915.

No permanent work done.

Temporary trestle has been constructed at the following locations:

Patzack court, 77th street, 81st street, 82d street, 83d street, and across the alley between Patzack court and 77th street.

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PENNSYLVANIA LINES (P. C. C. & ST. L. R. R.) and BALTIMORE & OHIO CHICAGO TERMINAL RAILROAD FROM 39TH STREET TO 71ST STREET and ENGLEWOOD CONNECTING LINE (PARALLEL WITH 58TH STREET) FROM HALSTED STREET TO LEAVITT STREET.

ORDINANCE OF APRIL 22, 1912.	Pennsylvania	B. & O. C. T.
Number of grade crossings eliminated	1	1
Mileage of roadbed or first main track elevated in 1915	..	0.5
Mileage of all tracks elevated in 1915	..	1.0
Mileage of roadbed or first main track elevated	..	1.0
Cost of work done in 1915	$129,860.77	$ 72,543.67
Cost of work done to December 31, 1915	703,260.93	132,679.42

(Mileage of roadway and track elevated is from center to center of extreme subways and does not include length of run-off.)

65th Street Subway—Part of the retaining walls have been constructed.

63d Street Subway—All tracks of the Pennsylvania Company, with the exception of one, have been elevated. Approximately half of the Pennsylvania Company's retaining walls have been built. All wall work to be done by the B. & O. C. T. Railroad Company has been completed. Temporary walk has been constructed and a single surface line car track has been opened for traffic in the south side of this subway. Excavating is now being done in the roadway on the south side of the street, and same will be planked and opened for traffic soon.

BALTIMORE & OHIO CHICAGO TERMINAL RAILROAD COMPANY.

(NEAR 15TH STREET—FROM LOOMIS STREET TO ROBEY STREET.)

ORDINANCE OF FEBRUARY 19, 1915.	
Number of grade crossings eliminated	..
Mileage of all tracks elevated in 1915	9.0
Mileage of roadbed or first main track elevated	9.0
Cost of work done in 1915	$1,021,781.00
Cost of work done to December 31, 1915	1,023,649.11

(Mileage of roadway and track elevated is from center to center of extreme subways and does not include length of run-off.)

Retaining walls have been built along the south side of 14th street between Robey and Lincoln streets, on the east and west sides of Lincoln street from a point 50 feet south of 14th street to the right of way, on the west side of Wood street from a point 50 feet south of 14th street to the right of way, on the south side of 15th street from the east line of Wood street to a point 271 feet east, on the west side of the alley between Wood and Paulina streets south of 15th street, on the south side of the alley south of 15th street from the west line of Throop street to the alley west of Paulina street.

Abutment walls, piers and bridges have been constructed at subways named above.

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Detail of work done at subways at the following locations:

Location—	Pavement Granite sq. yds.	Asphalt sq. yds.	Brick sq. yds.	Sidewalk sq. ft.	Curb lin. ft.
Lincoln street	1,245	1,849	..	5,318	1,326
Wood and 15th streets	2,250	.....	..	10,334	8,195
Paulina street	530	.....	48	1,425	207
Ashland avenue	....	.....	..	720	100
Laflin street	475	.....	..	1,646	188
Loomis street	349	.....	30	545	116
Total	4,849	1,849	78	19,988	10,132

CHICAGO & ILLINOIS WESTERN RAILROAD COMPANY.

"31ST STREET SUBWAY."

ORDINANCES OF MARCH 30, 1907, AND SEPTEMBER 7, 1907, AND AMENDMENT OF JULY 2, 1914.

The Pennsylvania Company is constructing a subway under the tracks of the Pittsburgh, Cincinnati, Chicago & St. Louis, the Baltimore & Ohio Chicago Terminal, and the Chicago Junction Railroads, at Traffic street north of and adjacent to West 31st boulevard.

Payment for this work will be made by the International Harvester Company, the Chicago & Illinois Western Railroad Company, and the City of Chicago, jointly. The cost to December 31, 1915, was $17,400.

The work done during 1915 consisted of the erection and decking of temporary bridges, excavating and constructing footing for north abutment wall.

NUMBER OF OPENINGS MADE IN IMPROVED STREETS DURING 1915.

Asphalt	5,325	
Brick	2,340	
Creosoted Block	755	
Granite	3,657	
Macadam	17,985	
Asphaltic-Macadam	737	
Concrete	182	
Cedar	3,554	
Cement Sidewalks	2,241	
		36,776

PAVEMENT RESTORED WHERE OPENINGS WERE MADE BY CITY DEPARTMENTS AND INDIVIDUALS DURING 1915.

	Sq. yds.	
Asphalt	32,278	
Brick	8,353	
Creosoted Block	2,827	
Granite	5,814	
Macadam	19,861	
Asphaltic-Macadam	2,406	
Asphaltic-Concrete	58	
Concrete	17	
Cedar	62	
		71,676

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PAVEMENT, CEMENT WALKS, COMBINED CURB AND GUTTER, CONCRETE CURB AND CURB WALLS CONSTRUCTED BY PUBLIC UTILITY COMPANIES DURING 1915.

Pavement	Sq. yds.	
Asphalt	35,902	
Brick	45,823	
Creosoted Block	12,045	
Granite	255,315	
Macadam	24,636	
Asphaltic-Macadam	2,931	
Asphaltic-Concrete	147	
Concrete	463	
Cedar	155	
		377,417
Cement Walks, sq. ft		222,009
Combined Curb and Gutter, lin. ft		15,282
Concrete Curb, lin. ft		20,725
Curb Walls, lin. ft		894

The results accomplished in the various divisions is gratifying.

Respectfully submitted,

A. W. MILLER,
Superintendent of Streets.

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ANNUAL REPORT

BUREAU OF COMPENSATION

CITY OF CHICAGO

1915

H. V. McGURREN
Superintendent

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BUREAU OF COMPENSATION

Hon. W. R. Moorhouse,
Commissioner of Public Works.

Dear Sir:

I transmit herewith for your consideration the Annual Report of the Bureau of Compensation for the year ending December 31, 1915.

During the past year this Bureau has established one hundred and eighty-six (186) new accounts on the books of the Comptroller, the accounts being classified as follows:

Switch Tracks	44
Canopies	30
Scales	9
Use of Streets and Alleys (Leases)	23
Sub-street Space	13
Vacation of Streets and Alleys	32
Bridges Over Streets and Alleys	8
Bulkheads and Loading Platforms	5
Space in City Water Pipe Tunnels	1
Miscellaneous	21

The number of accounts established show an increase of seven over the previous year, there being no substantial difference, except in the case of switch tracks, where an increase of nineteen accounts is shown. Revenue will be derived for a period of from three to twenty years under one hundred and fifty four (154) of the accounts established. No further revenue will be collected on the balance of the accounts—thirty-two (32)—covering street and alley vacations, the initial payment being a final one.

The statement which is appended below shows the privileges authorized, location of the same, name of the grantee and date of expiration.

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SWITCH TRACKS

NAME	LOCATION	ANNUAL COMPENSATION	EXPIRATION
Detroit Stove Works	(Elevated) across first north-south 10 ft. public alley east of S. LaSalle street	$40.00	Sept. 24, '34
Thomas Boal	Over and across Seeley ave. and first north-south public alley west thereof	121.00	Jan. 3, '35
Adam Kreuter	Along Nursery st.	127.50	Jan. 10, '35
Francis W. Adams	Across So. Campbell ave., So. Maplewood ave. and So. Rockwell st.	160.50	Nov. 27, '34
Albert W. Fulton	Across So. Marshfield ave	50.00	Nov. 27, '34
The Lehigh Valley Coal Company	(Elevated) across Wallace st	135.00	Mar. 12, '35
The Paragon Refining Company	In Kingsbury st.	90.00	Dec. 27, '34
Anna M. and Elsie Kummer	Across West 22d st.	115.00	Aug. 22, '34
John A. Gauger & Co.	Along the southerly side of W. 21st place, east of Laflin st.	125.00	Dec. 4, '34
Richard Loewenthal	In So. Sangamon st.	120.00	Nov. 19, '34
John Monighan	Over and across first 16 ft. public alley north of Carroll ave. and west of Robey st.	25.00	Feb. 22, '35
Chicago Junction Railway Company	Across West 15th st, west of Western ave.	59.00	Mar. 7, '35
The Frederick Post Co.	Along and across Avondale ave	100.00	Mar. 5, '35
Citizens Coal & Supply Company	(Elevated) over, along and across Wallace st., south of W. 69th st.	62.50	July 9, '34
Astrid S. Rosing	Across Cornelia ave. and alley north thereof	84.00	Apr. 7, '35
Charles H. Hill and Horace Wright Cook, Trustees	Across Carroll ave.	160.00	May 31, '35
Acme Box Company	Along and across W. 22d st. and the intersection of Loomis st.	120.00	Dec. 4, '34
Franklin Marling	In Cherry ave. bet. Rees and Eastman sts.	75.00	Mar. 12, '35
L. Wolff Manufacturing Co.	(Elevated) over and across the first alley north of Carroll ave. and west of No. Robey st.	28.00	July 9, '35
Chicago Title & Trust Company, Trustee	Across W. Ontario st.	80.00	June 20, '35
Western Plumbing Supply Co.	(Elevated) over, along and across first east-west public alley north of Fillmore st.	55.00	July 5, '35
The Cudahy Packing Co.	Over and across E. 91st st. east of Baltimore av.	65.00	July 11, '35
Central Terminal Railway Company	Across So. Jefferson st. and across W. 14th place	116.00	July 14, '16
Frank J. Ehrenheim	(Elevated) in and along Bloomingdale ave. and No. Western ave.	60.00	July 14, '35
The Pittsburgh, Cincinnati, Chicago and St. Louis Railway Company	Across No. May st., north of Carroll ave.	122.50	July 5, '35
Wilhelm Henning Co.	In and along Kingsbury st., near Clifton ave	220.00	July 4, '35
The Griess Pfleger Tanning Company	(Two) in No. Branch st.	100.00	July 14, '35
Chicago Mill and Lumber Company	(Four) in Dix st.	430.00	July 14, '35
Julius Kramer and Jacob L. Schnadig	Across W. 15th st. west of So. State st.	50.00	July 14, '35
Robert A. Uihlein	(Elevated) over and across Wallace st. north of W. 60th st.	50.00	July 9, '35
Chicago, Burlington and Quincy R. R. Company	Along W. 21st st. west of Marshall blvd.	120.00	July 4, '35
Robert M. Schrayer	Over and across W. 18th pl. east of So. Sangamon st.	41.00	June 18, '35
Chicago and Western Indiana Railroad Company	Over and across Plymouth ct. and first east-west public alley south of Polk st.	3,131.25	July 14, '20
William P. Henneberry	In Grove st. south of W. 22d st.	260.00	
Stein-Ebertshaeuser & Co.	Along and across Cherry ave.	80.00	June 4, '35
Artesian Stone and Lime Works Co.	(Two) across No. Campbell ave.	121.50	Mar. 12, '35
Sykes, Beardsley and de Coningh	Across W. 19th st. east of So. Sangamon st.	59.00	Mar. 12, '35
Roberts Sash & Door Co.	Across W. 19th pl. and alley east of So. Sangamon st.	65.00	Mar. 12, '35
Benj. Harris and Company	Across Loomis st. south of W. 21st st.	55.00	Nov. 21, '35
Allis-Chalmers Manufacturing Company	Across So. Washtenaw ave. and alley west thereof	83.00	Oct. 24, '35
Berger Brothers	Along and across Cherry ave.	120.00	Nov. 14, '35
Harder's Fire-Proof Storage & Van Co.	(Elevated) along and across E. 40th st.	50.50	Oct. 29, '35
Schillo Brothers Company	Over and across Besley ct. southeasterly of Wabansia ave.	51.00	Nov. 14, '35
Crofts & Reed Co.	Over and across W. Kinzie st.	59.00	Dec. 10, '35
	Total	$7,442.25	

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CANOPIES

Name	Location	Annual Compensation	Expiration
Caroline Schaaf	Adjoining premises at northeast corner Wabash ave. and Lake st.	$45.00	Jan. 31, '25
Sam A. Marx	6312 Harvard ave.	25.00	Feb. 4, '25
Wabash and Washington Trust	Northeast corner E. Washington and No. Wabash ave.	29.50	Feb. 12, '25
Harriett L. Sweet	505 W. Madison st.	25.00	Mar. 22, '25
Jacob Landa	2524–26 Lincoln ave.	25.00	Apr. 9, '25
Rudolph Menn	4856–58 S. Ashland ave.	27.50	Apr. 14, '25
Hugo F. Arnold, Trustee	(Two) in Union ave. and (1) in Eagle st. adj. premises at 664–70 W. Randolph st.	115.00	Apr. 5, '25
Dr. G. H. Young	3947 Crawford ave.	28.50	Apr. 22, '25
David Mayer	179 Quincy st.	25.00	June 3, '25
A. P. Canning	3308 W. Lawrence ave.	28.00	June 10, '25
Augusta Lehmann et al	79 W. Monroe st.	25.00	June 3, '25
Plough, Conners & Koffman	6254 Stewart ave.	25.00	Aug. 9, '25
Isador Cowen and Theodore Jacobs	2111–13 W. Division st.	25.00	Aug. 11, '25
Emil J. Dirks	2768 Lincoln ave.	25.00	Aug. 12, '25
Bijou Academy Company (The)	16 S. Halsted st.	36.50	Aug. 26, '25
Walter W. Ahlschlager	2644 Milwaukee ave.	25.00	Aug. 30, '25
Frank W. Mammoser and Vincent T. Lynch	6851 Stony Island ave.	25.00	Aug. 31, '25
Nathan Ascher	901 E. 55th st.	28.50	Sept. 26, '25
Albert E. Cook	4700 Broadway	25.00	Oct. 24, '25
Max Mayer	5744–50 Prairie ave.	25.00	Oct. 20, '25
Laurence J. White and Nelson Thommasson	4818 N. Kedzie ave.	25.00	Nov. 10, '25
Terminal Theatre Company	5404 N. Clark st.	25.00	Nov. 15, '25
Polish Publishing Co. of Chicago, Ill., The	1455–57 W. Division st.	38.00	Nov. 22, '25
Mollie Netcher Neuberger	(Four) attached to Charles Netcher Bldg., N. W. corner State and Madison sts.	108.50	Oct. 22, '25
Percy H. Sloan	3644–46 W. Chicago ave.	29.50	Nov. 26, '25
A. E. Cook	(Two) 4724 Broadway and 4723 N. Racine ave.	50.00	Dec. 8, '25
Fred Becklenberg	2650 W. Division st.	25.00	Dec. 13, '25
Kusel & Harris	1823 Montrose ave.	25.00	Dec. 14, '25
Madison Theatre Company	19–25 W. Madison st.	32.50	Dec. 12, '25
	Total	$997.00	

SCALES

Name	Location	Annual Compensation	Expiration
Marshall Field Estate	Alley adjoining premises at S. W. cor. W. Washington and N. Clark sts.	$25.00	Jan. 17, '25
Estate of Levi Z. Leiter	East-west alley adjoining premises at 226 S. Clark st.	25.00	Mar. 18, '25
Deaconess Institution of Swedish Evangelical Lutheran Church	Rear of 2043 Cleveland ave.	1.00	Apr. 4, '25
Sarah L. Brooks	Alley adjoining premises at 545 Federal st.	25.00	Mar. 26, '25
The Seng Company	1456 Dayton st.	25.00	May 31, '25
Kellogg Switchboard and Supply Company	Alley rear of 1066 W. Adams st.	25.00	Aug. 15, '25
Max Levy	1632 W. Kinzie st.	25.00	Sept. 24, '25
American Posting Service	Rear of 757 Jackson blvd.	25.00	May 31, '25
Charles J. Rupp & Co	902 Blackhawk st.	25.00	July 31, '25
	Total	$201.00	

USE OF STREETS, ALLEYS, AND DOCKS

Name	Location	Annual Compensation	Expiration
James J. and Robert B. Baker	Part of 16 ft. alley in block south of Hillock st. between Loomis and Bonfield sts.	$25.00	Dec. 31, '17
Consumers Company	First north-south public alley east of Clayton st.	41.12	Nov. 31, '17
Jones, Coates & Bailey	Portion of intersection of Hickory and No. Branch sts., and first north-south 20 ft. public alley east thereof.	1,367.50	Apr. 30, '17
American Car and Foundry Company	Portions of west side of S. Paulina st. and east side of S. Wood st	850.85	Dec. 31, '17
Henry Caesar	Portion of Fleetwood st. adj. N. W. cor. Fleetwood and W. North ave.	25.00	Dec. 31, '17

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USE OF STREETS, ALLEYS, AND DOCKS—Continued

NAME	LOCATION	ANNUAL COMPENSATION	EXPIRATION
Samson Steam Forge Company	East-west alley rear N. W. cor. Carroll ave. and Sacramento blvd.	94.91	Dec. 31, '17
White City Construction Co.	Calumet ave. bet. 63d st. and tracks of L. S. & M. S. R. R.	1,330.30	Nov. 15, '17
Frederick and George F. Furst	Space in Dominick north of Webster ave.	25.00	Dec. 31, '17
American Hide and Leather Company	Portions of Sangamon and Dix sts	234.64	Dec. 31, '17
Chicago and South Haven Steamship Company	Dock on south side of river bet. Clark and LaSalle sts.	350.00	Option City
Indiana Transportation Company	Dock on south side of river bet. Clark and Dearborn sts.	350.00	Option City
Amelia Cleys	So. 10½ ft. of Wilson ave. bet. Clarendon ave. and Lake Michigan.	1.00	Apr. 30, '16
Frank Martinek	Space at foot of Randolph st.	150.00	Apr. 30, '18
Goodrich Transit Company	Portion of River st.	6,000.00	Apr. 30, '17
C. C. Heisen and Channell Chemical Company	North-south 12 ft. public alley bet. Carroll ave., Sheldon st., Fulton st. and Union Park ct	51.75	Nov. 30, '17
Indiana Transportation Company	Dock on south side of River st. bet. La Salle and 5th ave.	250.00	Option City
Constantine Lembessis	Space under terminal of Chicago and Oak Park Elevated at Market and Madison sts.	1,500.00	May 31, '18
Bishop of the Protestant Episcopal Church	16½ ft. of E. 38th st. bet. Wabash ave. and first alley east thereof.	1.00	Apr. 30, '18
James Coal Company	Portion of alley bet. W. 58th, Emerald ave., W. 59th st. and So. Halsted st.	46.80	Apr. 30, '18
Roberts Sash & Door Co.	West 150 ft. of east-west alley bet. W. 19th pl., Johnson st., W. 20th st. and So. Sangamon st.	150.00	Apr. 30, '18
Mary Kerwin	Portion of Ravenswood ave. north of Irving Park blvd.	60.00	Apr. 30, '18
Graham & Morton Transportation Company	Portion of Dock st.	1,000.00	Apr. 30, '16
Chicago and Western Indiana Railroad Company	First east-west public alley south of Polk st. bet. Plymouth ct. and first alley east thereof.	772.50	July 14, '20
	Total	$14,677.37	

SUB-SIDEWALK AND ALLEY SPACE

NAME	LOCATION	ANNUAL COMPENSATION	EXPIRATION
Moir Hotel Company	Vault under alley rear of 71–79 W. Madison st.	$240.75	Mar. 8, '24
Harry Hildreth	Vault under alley in connection with building at S. E. cor. E. 33d st. and Cottage Grove ave.	10.00	No. 30, '24
Stewart-Warner Speedometer Corporation	Tunnel under alley south of intersection of Wolfram and No. Lincoln sts.	25.00	Mar. 21, '25
Quick Service Laundry Co.	Vault under alley rear of 319–23 S. Paulina st.	25.00	Apr. 27, '25
Selz, Schwab & Co.	Vault under alley rear of 501–03–05 W. Chicago ave.	50.00	Mar. 28, '25
Federal Association of Automobile Engineers	Gasoline tank in alley rear of 1214–16 Jackson blvd.	10.00	Option City
Lyndon C. Lawton	Gasoline tank in alley rear of 940 N. Clark st.	10.00	Option City
Martin A. Ryerson	Vault under alley rear of 131–41 S. Wabash ave.	89.28	June 28, '23
International Harvester Company of N. J.	Tunnel under and across Blue Island ave. bet. So. Oakley ave. and Leavitt st.	50.00	Jan. 22, '25
City Automobile Company	Gasoline tank under alley rear of 201 E. Illinois st.	10.00	Option City
J. W. Petersen Coal Company	Vault on west side of Kingsbury st. about 250 ft. north of north line of W. Division st.	25.00	Sept. 9, '25
Sears, Roebuck and Co.	Three tunnels under and across So. Homan ave.	150.00	June 4, '25
Chicago Cold Storage Warehouse Company	Tunnel under first alley west of Michigan ave. about 225 ft. north of 16th st.	25.00	Sept. 21, '25
	Total	$720.03	

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VACATIONS OF STREETS AND ALLEYS

NAME	LOCATION	FINAL PAYMENT
Paul J. Daemicke	South 1 in. of east 50 ft. of E. 79th st. bet. Coles and Commercial ave.	$ 50.00
John Neibuhr	Northeasterly 28.5 ft. of first alley west of Willits ct. in block between Logan blvd., Milwaukee ave. and N. Sacramento ave.	371.75
Carolina D. Owsley et al.	Part of Rockwell st. between Polk and Arthington sts. and part of alley between Polk st., Arthington st., So. Campbell ave. and So. Rockwell st.	4,507.48
Sheffield Foundry Company	Part of Herndon st. between Clybourn ave. and Kingsbury st.	4,455.00
The Baltimore and Ohio Chicago Terminal Railroad Company	Certain streets and alleys.	111,304.77
J. Oppenheimer	North 74 ft. of north-south public alley bet. W. 47th st., W. 48th st., S. Ashland ave. and S. Marshfield ave.	7,626.00
Charles Lens	East-west public alley bet. Station st., Manitou pl., and No. Western ave.	139.92
Colonial Chair Co.	Part of Bloomingdale ave. and certain alley	1,260.88
Carrie C. Smith	East-west alley bet. E. 21st st., E. 22d st., Prairie and Indiana aves.	739.20
White Eagle Coal Company	Part of north-south public alley bet. W. 49th st., W. 50th st., So. Winchester ave. and So. Robey st.	50.00
J. W. Fernald and Peabody Coal Company	All of east-west public alley between W. 15th st., W. 15th pl., So. Morgan st. and So. Racine ave.	64,737.23
Charles Kleinsfelder	East-west public alley in block bet. Albion ave., Sheridan road and C. E. and L. S. R. R.	50.00
Consumers Company	Part of Wilmot ave. and alleys adjacent thereto	1,740.20
W. H. Knap	Part of E. 87th st. and alley adjacent thereto.	390.75
Greitje DeVries and J. Martin Heim	Part of W. 64th st.	877.80
S. M. Gunderson	Part of Ravenswood ave. and certain alleys adjacent thereto.	50.00
Rudolph A. Cepek	Parts of Harper, Blackstone and Dante aves	50.00
John Dawney	Part of north-south public alley in block bet. E. 86th, E. 87th sts., Drexel and Maryland aves.	50.00
Waukesha Lime & Stone Company	Alleys in blocks bet. N. Central Park, N. Lawndale, Wabansia ave. and C. M. & St. P. R. R.	196.98
R. D. Roggeveen	Part of Givins ct. and alleys adjacent	50.00
Western Fuel Company	Parts of alleys in block bet. W. Adams, W. Jackson blvd., S. Rockwell and S. Washtenaw ave.	902.19
Henry Myers	Alleys in block bet. Dole ave., Wrightwood ave., Lehmann ct. and N. Clark st.	523.87
Chicago, Burlington and Quincy Railroad Company	Part of W. 20th st.	459.77
Holmes, Pyott & Company	Part of north-south alley in block bet. N. Campbell, N. Artesian aves., Fulton and W. Kinzie sts.	50.00
A. J. Franks	Part of Lincoln and Barry aves.	50.00
Carl J. and Alice V. Ringbloom	Part of east-west alley in block bet. W. 79th st., W. 80th st., So. May st. and So. Racine ave.	50.00
John A. Gardner	Part of east-west alley in block bet. Belle Plaine, Cuyler, N. Lockwood and Long aves.	50.00
Edw. J. Haley et al.	Part of W. 98th st. bet. Throop and Loomis sts.	50.00
Wm. F. Buesing and Martin J. Hohman	Part of Girard st.	198.00
Chicago Title and Trust Co., Trustee	Part of north-south alley in block bet. Medill, Belden, Nordica and Neva aves.	50.00
R. D. Roggeveen	Part of alley in block bet. Vincennes ave., Givins ct., So. Halsted and C. R. I. & P. R. R.	50.00
Justrite Mfg. Co.	Part of east-west public alley in block bet. Clybourn, Southport aves., Kingsbury and Herndon st.	129.12
	Total.	$201,260.91

BRIDGES OVER STREETS AND ALLEYS

NAME	LOCATION	ANNUAL COMPENSATION	EXPIRATION
Harry Hildreth	Structure across first east-west public alley So. of E. 33d st. bet. Cottage Grove ave. and Lake Michigan.	$25.00	Nov. 30, '24
Bauer & Black	Structure across alley connecting third floor of building at 2500-18 Dearborn st. with corresponding floor of building at 2501-19 Federal st.	25.00	Aug. 19, '25
Stewart-Warner Speedometer Corporation	Structure over and across first east-west alley south of intersection of Wolfram and North Lincoln Sts.	25.00	Mar. 21, '25

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BRIDGES OVER STREETS AND ALLEYS—Continued

Name	Location	Annual Compensation	Expiration
Sels, Schwab & Co.	Over alley between W. Chicago ave., Kingsbury st., West Superior and Roberts st.	$ 50.00	Mar. 28, '25
C. F. Nast & Company.	Across alley connecting second floor of buildings at 1817–21 Carroll ave. and 1816–18 Fulton st.	25.00	Mar. 28, '25
St. Luke's Hospital.	Across alley connecting third floor of buildings at 1430–32 Indiana ave. with corresponding floor at 1431–39 Michigan ave.	1.00	May 31, '25
Wesley Memorial Hospital.	Across alley connecting second floor of buildings at northwest cor. State and 25th sts., with corresponding floor of building at northeast corner S. Dearborn and 25th sts.	.50	Dec. 5, '25
E. H. Knoop.	Over and across Shades pl. connecting second and third floors of building at 1614–18 Vine st. with corresponding floors of building at northwest cor. North ave. and Vine st.	50.00	May 14, '25
	Total.	$201.50	

BULKHEADS

Name	Location	Annual Compensation	Expiration
Samuel Parliament.	22–24 E. Austin ave.	$64.97	Jan. 31, '16
Western Cold Storage Co.	12–20 E. Austin ave	126.91	Jan. 31, '16
John W. Keogh.	1808 Federal st.	25.00	Mar. 28, '25
Western Cold Storage Co.	3–13 E. Austin ave.	138.61	Jan. 1, '17
Monarch Refrigerating Company of Chicago.	40–60 E. Austin ave.	290.31	July 10, '16
	Total.	$645.80	

MISCELLANEOUS

Name	Location	Annual Compensation	Expiration
James S. Kirk & Company.	12 in. tile conduit under and across Pine st.	$25.00	Jan. 21, '25
Peoples Pure Ice Company.	Pipe across Kingsbury st.	25.00	Jan. 14, '25
Frank Sobota.	Breakwater crib.	50.00	Apr. 19, '18
The Atchison, Topeka and Santa Fe Railway.	Pipes under and across Purple st.	50.00	Feb. 14, '25
Link Belt Company	Three 20 in. pipes under and across W. 39th st. east of Stewart ave.	75.00	Apr. 7, '25
McAvoy Brewing Company	Water pipe under and across Lake Park ave. approximately 240 ft. north of East 24th st.	33.00	Vetoed
The Pullman Company	Pipe under and across East 111th st.	25.00	Mar. 28, '25
Jefferson Ice Company.	Electric wires across alley in rear of 2318–22 N. Robey st.	10.00	Mar. 28, '25
Huch Leather Company.	Water pipe under and across Mendell st.	39.00	Mar. 28, '25
Frank H. and William J. Ruprecht.	Pipes under and across north-south alley bet. W. Randolph, N. Jefferson, W. Washington and N. Clinton sts.	70.00	Jan. 14, '25
Daniel F. Crilly.	Conduit under N. Wells st. and wires across Crilly ct. and alley west thereof.	60.00	Apr. 7, '25
Clarence S. Piggott.	Pipe under and across Harbor ave.	25.00	July 30, '25
William Kent.	Tile conduits (3) under surface of intersection of E. 43d st. and Calumet ave.	75.00	July 9, '25
American Hide & Leather Company.	Pipes (2) under and across Elston ave. and under and across Ingraham st	50.00	July 14, '25
Samuel A. Marx.	Chimney in alley in rear of 1207 N. Dearborn st.	25.00	Aug. 26, '25
Hyde Park Hotel Co.	Conduit under and across Harper ave. south of Hyde Park blvd.	25.00	Sept. 8, '25

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MISCELLANEOUS—Continued

Name	Location	Annual Compensation	Expiration
Herbert M. Allison	Conduit across east-west alley bet. Michigan and Indiana aves	$ 25.00	Sept. 12, '25
Wesley Memorial Hospital	Conduit under alley bet. W. 24th, W. 25th, Dearborn and State sts	.50	Dec. 5, '25
Chicago and Western Indiana Railroad Company	Conduit across Plymouth ct	50.00	June 14, '20
Superior Oxygen Company of Illinois	Pipe under and across Lumber st	25.00	Nov. 21, '25
E. C. Frady	Conduit under and across north-south alley west of Indiana ave. south of E. 23d st	10.00	Nov. 28, '25
	Total	$772.50	

WATER PIPE TUNNEL PRIVILEGE

Name	Location	Annual Compensation	Expiration
Chicago Telephone Company	One 300-pair and one 600-pair cable in Harrison st. water pipe tunnel	$14.13	Option City
	Total	$14.13	

RECAPITULATION

COMPARISON OF ANNUAL REVENUE UNDER NEW ACCOUNTS ESTABLISHED DURING THE YEARS 1914 AND 1915

	1915	1914	Increase	Decrease
Switch Tracks	$ 7,442.25	$ 5,242.50	$ 2,199.75	.....
Bay Windows	.....	10.00	.....	$ 10.00
Canopies	997.00	1,071.00	.....	74.00
Scales	201.00	375.00	.....	174.00
Use of Streets, Alleys, Docks	14,677.37	3,516.22	11,161.15	.....
Sub-sidewalk and Alley Space	720.03	1,968.82	.....	1,248.79
Vacations of Streets and Alleys	201,260.91	858,372.05	.....	657,111.14
Bridges over Streets and Alleys	201.50	2,692.75	.....	2,491.25
Bulkheads, Platforms, etc	645.80	842.12	.....	196.32
Miscellaneous	772.50	1,441.00	.....	668.50
Water Pipe Tunnel Privileges	14.13	1,207.20	.....	1,193.07
Stands	35,301.47	32,842.06	2,459.41	.....
Openings	6,366.00	7,016.00	.....	650.00
Signs	282.00	440.50	.....	158.50
Total	$268,881.96	$917,037.22	$15,820.31	$663,975.57
				15,820.31
Total Decrease				$648,155.26

COMPARISON OF TOTAL REVENUE UNDER BOTH OLD AND NEW ACCOUNTS DURING THE YEARS 1914 AND 1915

	1915	1914	Increase	Decrease
Switch Tracks	$ 61,454.62	$ 56,587.76	$4,866.86	.....
Bay Windows	161.50	8,003.50	.....	$ 7,842.00
Canopies	10,207.25	9,607.00	600.25	.....
Scales	4,041.38	4,192.98	.....	151.60
Use of Streets, Alleys, Docks	26,724.64	25,933.47	791.17	.....
Sub-sidewalk and Alley Space	42,696.37	42,832.65	.....	136.28
Vacations of Streets and Alleys	201,260.91	858,372.05	.....	657,111.14
Bridges over Streets and Alleys	37,813.34	36,767.48	1,045.86	.....
Bulkheads, Platforms, etc	4,188.63	4,316.07	.....	127.44
Miscellaneous	5,256.75	5,451.59	.....	194.84
Stands	35,301.47	32,842.06	2,459.41	.....
Water Pipe Tunnel Privileges	1,766.24	1,422.78	343.46	.....
Openings	6,366.00	7,016.00	.....	650.00
Signs	282.00	440.50	.....	158.50
Total	$437,521.10	$1,093,785.89	$10,107.01	$666,371.80
				10,107.01
Total Decrease				$656,264.79

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The total revenue for the year 1915 was $437,521.10, a decrease of $656,264.79 under the amount collected in 1914. The revenue for the year 1914 was the largest ever collected during the history of the Bureau, due to the initial payment of $825,805.04 made by the Union Station Company under its terminal ordinance. Leaving this extraordinary item out of consideration, the revenue for 1915 would show an increase of $169,640.25.

Only two matters of more than ordinary size have been passed by the City Council during the last year, one the vacation of certain alleys between West 15th street, West 15th place, South Morgan street and South Racine avenue for the benefit of J. W. Fernald and the Peabody Coal Company, in which the compensation amounted to $64,737.23, and the other an ordinance granting additional right-of-way to the Baltimore and Ohio Chicago Terminal Railroad Company, providing for the vacation of certain streets and alleys in connection therewith in which the compensation amounted to $111,304.77. In this last mentioned ordinance a new departure was made by the Compensation Committee in its consideration of the amount to be charged for the privilege granted. The additional right-of-way authorized is entirely elevated and heretofore no charge had been made against railroad companies for the space occupied by their privileges over streets in ordinances of this character. The Bureau suggested to the Committee on Compensation that this was a matter which should receive consideration, with the result that the grantee was required to pay twenty (20) per cent of the valuation of the space occupied for the use of that portion above the street level, amounting to $20,080.65.

During the year just ending 4,537 permits were issued by the Bureau, an increase of 124 over the previous year, the permits being classified as follows:

Sub-sidewalk and opening permits	656
Merchandise Stands	3,731
Switch Tracks, Canopy and other permits provided by special ordinances	74
Miscellaneous permits, for which no charge is required	76

The revenue for merchandise stands still continues to show a healthy increase, amounting to $2,459.41 for the past year, or about seven and one-half (7½) per cent. This is a gain of two hundred and twenty-five (225) per cent in the last three years.

As a result of the action of the City Council in removing obstructions in the loop district, the revenue from space occupied by store fronts has been practically eliminated. The loss in this particular item during the last year was $7,842, the revenue from that source amounting to only $161.50 for the entire year. The City has ceased billing these accounts in the downtown district, practically all of the privileges having been removed. In some few instances, the orders for removal have not been complied with and there will still be some revenue due the City for use and occupation of the space when the final adjustment is made.

Under the provisions of the Union Station ordinance, there is still due the City $685,452.04 for the vacation of certain streets and alleys, payment of which has been withheld pending the adjustment of property rights between the various railroads interested in the Union Station ordinance. We have been advised that a settlement has been reached in this matter and that the money will be paid to the City in a very short time. The Union Station Company was also authorized to retain $1,100,000 of the compensation fixed in the ordinance,

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$600,000 of which was to cover the cost of the North Canal street bridge and $500,000 the cost of the Monroe street bridge, the work to be done by the railroad companies under the supervision of the City of Chicago, the obligation of the City to be limited to the amount withheld, with a provision that in the event the cost of construction was less than that amount the difference should be paid to the City. I am advised that contracts for the construction of the Monroe street bridge amount to approximately $365,000, which would leave the substantial sum of $135,000 still to be realized by the City from that source.

On November 29, 1915, an ordinance was introduced into the City Council by Alderman H. E. Littler, Chairman of the Committee on Harbors, Wharves and Bridges, creating a Harbor Board to operate the new Municipal Pier, which has just been constructed by the City. The contemplated membership of this Board consists of the Commissioner of Public Works as Chairman; Comptroller, City Engineer, Harbor Master, Chairman of the Compensation Committee, Chairman of the Committee on Harbors, Wharves and Bridges and the Superintendent of the Bureau of Compensation. The organization of this Board will naturally result in considerable additional work for the Bureau, and in addition to the Compensation Committee of the City Council, to which the Bureau acts in an advisory capacity, as all agreements relating to the leasing of space on the pier must be referred to that committee before ratification by the City Council.

In this connection a subcommittee of the Compensation Committee, consisting of Alderman James A. Kearns, Chairman; Alderman Oliver L. Watson, Alderman Carl T. Murray and Alderman Thomas A. Doyle, together with Mr. E. C. Shankland, Chairman, and Mr. W. O. Johnson, Secretary of the Chicago Harbor and Subway Commission, and the Superintendent of this Bureau made a trip of inspection to Baltimore, Philadelphia, New York, Boston, Montreal and Toronto, investigating rates charged for harbor facilities and the methods of arriving at same in an effort to determine the charge to be made for space on the new pier, with the idea in mind of fixing a rate that would be within the reach of parties desiring to lease and at the same time give returns to the City sufficient to operate the pier; amortize the same during the life thereof and pay the interest on the amount invested. Negotiations will be entered into shortly with Chicago steamship companies with that end in view.

During the visit to eastern cities the committee also spent considerable time investigating the charges made for other privileges falling under its jurisdiction, with the result that a decided increase has been made in the rates in use in Chicago. The committee has fixed the value of the subsurface space, where the same is used for tunnels, vaults, etc., at twenty-five (25) per cent of the full value of the land over same, with an annual compensation of four (4) per cent, where the space does not exceed fifteen (15) feet in depth; six (6) per cent when the depth is over fifteen (15) feet and less than twenty-seven (27) feet and an additional charge of one (1) per cent for each twelve (12) feet or fraction thereof over twenty-seven (27) feet in depth. The value of the space above the main floor where same is used for bridges or passageways is also fixed at twenty-five (25) per cent of the value of the ground under same, with an annual compensation of six (6) per cent for the first five stories in height and a charge of one-half of one (1) per cent for each additional story over that height, the minimum charge for subsurface space being increased to $50 a year under alleys and $100 a year under streets, an increase of one hundred (100) per cent, and the minimum charge for bridges being fixed at $50 a year

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for the first floor and $25 for each additional floor, an increase of about the same proportion.

An increase has also been made in the rates for pipes under streets and alleys from $10 to $25 a year under alleys and from $25 to $50 a year under streets. The rates for switch tracks have also been revised by increasing the minimum charge across alleys from $25 to $50 a year and across streets from $50 to $100 a year, and in cases where the entire track is constructed and maintained within the limits of the street and used for the purpose of storage, loading and unloading of cars, the rate has been increased from $1 per lineal foot for the first fifty (50) feet and $0.50 for each additional foot to $2 per lineal foot for the first fifty (50) feet and $1 for each additional foot. No objections have as yet been made to these rates, and the committee is of the opinion that its action is fully justified, in view of the much higher rates that are charged in New York and some of the other eastern cities. The new rates will not affect those privileges which have already been authorized until the expiration of the present grant. All new franchises, however, will be required to pay the increased rates and the old ones treated in the same manner when called upon to renew their grant. This action by the committee will result in a substantial increase in revenue during the coming year and thereafter.

Respectfully submitted,

H. V. McGURREN,
Superintendent.

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ANNUAL REPORT

BUREAU OF MAPS AND PLATS

CITY OF CHICAGO

1915

JOHN D. RILEY
Superintendent

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BUREAU OF MAPS AND PLATS

Hon. W. R. Moorhouse,
Commissioner of Public Works.

Dear Sir:

I have the honor to submit herewith the annual report of the Bureau of Maps and Plats for the year ending December 31, 1915.

During the year the following territories were annexed to Chicago:

The Village of Clearing, 1.875 square miles in area; annexation effective April 24, 1915.

All that part of the City of Evanston lying east of the east line of the original right-of-way of the Chicago, Evanston and Lake Superior Railway Company (C., M. & St. P. R. R.) and south of the south boundary line of the Calvary Cemetery and said south boundary line produced east to the east boundary line of said City of Evanston; area 0.123 square mile; effective May 5, 1915.

Part of the original Village of Norwood Park; area 0.021 square mile; effective May 13, 1915.

Part of the original Township of Calumet; area 0.3125 square mile; effective July 1, 1915.

Part of Town of Stickney; area 2.25 square miles; effective September 3, 1915.

The area of Chicago was increased by these annexations to 198.997 square miles.

New atlases were completed of all the annexed territory and house numbers extended to cover same. Ordinances covering this territory were prepared and subsequently passed by the City Council changing the street names so as to conform to the system in use in the adjoining portions of the city.

The Division of Surveys completed its third year at the end of 1915.

This division was organized to perform survey work which would operate as a basis for such action as might be necessary for the preservation of the rights of the City in public streets and alleys and waterways by disclosing the extent of encroachment or occupancy thereof.

Since the inception of the division, however, there has been a steadily increasing demand for survey work from practically all City departments. The division operates under a capital account, by means of which the cost of survey work is carried until reimbursed from an authorized appropriation. In consequence of the performance of this work from a central division, repetition of survey work by City departments is greatly minimized and frequently eliminated. The decrease in the cost of survey work is further enhanced by the advantage of an organization trained and experienced in this particular.

The survey work already performed by this division covers a large area. Many old survey references to monuments of sections of land within the City

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are now valueless for the reason that both references and monuments have long ago disappeared. To this absence of monuments, is due, in a large measure, the numerous controversies as to street lines and the lines of private property. The relocation of all section and quarter section corners should be undertaken by the City.

As an indication of the value as City records of the survey work performed attention is directed to the constant use and reference to them by various City departments.

The most important survey made during the year 1915 was a complete survey of the right of way of the Atchison, Topeka and Santa Fe Railway Company, as per authority of letter from the Committee on Local Industries under date of December 11, 1914. A report of the survey of the right of way of this railway company was made to the Council Committee on Local Industries December 14, 1915.

The survey maps show a survey of the main line of the A., T. & S. Fe Ry. Co., from Taylor street and South State street southeasterly to the City limits at South Cicero avenue and West 41st street extended, and also a survey of the 26th street branch, running from West 26th street and South Western avenue southwesterly and south to South Central Park avenue and West 47th street.

As a result of this survey, portions of streets and alleys are shown to be occupied or obstructed principally by the Santa Fe Company, apparently without authority, to the extent of 275,075 square feet of land adjoining their right of way. This amount does not include 232,000 square feet of land reclaimed from the Santa Fe Company in Canalport, which were dedicated as streets.

In addition to the survey of the Santa Fe Company's right of way, the division was authorized to make a survey of the right of way of the Illinois Central Railroad Company. This survey is well under way, but will not be completed until some time in 1916.

A large number of surveys of lesser magnitude was authorized upon requisition by City departments. Among these were the following:

A topographical survey of 12th street boulevard, from Michigan avenue to Canal street, was made for the Bridge Division for the purpose of laying out the iron work for the new 12th street boulevard viaduct.

A survey of the Union Stock Yards, showing complete and detailed occupancy of all streets and thoroughfares within this territory, was authorized by the Designing Division and was nearing completion in May, 1915, when the work was ordered stopped. The purpose of this survey was the making of accurate detailed maps to be used as a basis for the design of a high pressure system for the territory known as the Union Stock Yards. The sum of $2,269.12 was spent upon this survey during the latter part of 1914, and $1,606.73 during the first half of 1915, making a total of $3,875.85 expended upon this work.

A check survey was made by this division of the Union Station survey made by private surveyors, on the basis of which the improvements at that location will be constructed.

Ten street and alley opening surveys were made for the Board of Local Improvements.

Ten building surveys were made for the City Architect. These surveys not only show property location, but show in detail all necessary information both inside the property lines and in the streets and alleys adjoining.

Twelve surveys were made for the real estate department of the City Comptroller's office.

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Other surveys were made for the Construction Division, Bureau of Engineering, Municipal Court, Harbor and Subway Commission and Health Department.

Following is a summary of surveys and cost of same, made during 1915:

Committee on Local Industries	$12,029.58
Bridge Division	1,592.25
Designing Division	1,606.73
Chicago Union Station Company	1,235.27
Pennsylvania Railroad Company	207.45
Board of Local Improvements	545.74
City Architect	378.04
City Comptroller	367.40
Harbor and Subway Commission	170.62
Construction Division	63.53
Health Department	17.92
Municipal Court	6.18
Total	$18,320.71

The Sanborn Division is increasing in popularity in connection with the City's business, as its value becomes more apparent to the various City departments.

The Building Department, Fire Department, Board of Local Improvements, Corporation Counsel, Compensation Bureau, Water Office, Public Service Department, Public Welfare Department, etc., are given information constantly. A careful supervision over the atlases is kept to insure a continuous correctness of same. About six thousand building permits were posted during the past year. Various plats were made for the Fire Department, Corporation Counsel, Department of Public Welfare and other City offices.

In establishing the new house number system and street signs in Morgan Park and other added territory, the Sanborn atlases were of great assistance.

The general public becoming aware of the atlases in this office are applying for information more and more. They are given prompt attention.

The following tabulated statement gives in detail the work of a routine character performed during the year:

GENERAL OFFICE WORK.

John Wittenborn, Chief Draughtsman, in Charge.

New Construction Work.

	Pages
City Map Department, Town of Lake 1	18
City Map Department, Town of West Ridge	1
Territory adjoining former Village of Morgan Park	3
Part of City of Evanston, annexed to City of Chicago	2
Town of Stickney	18
Village of Clearing	18
Total	60

	Days
Constructing maps for Special Park Commission, 1 man	15
Constructing maps of City of Chicago, 1 man	45
Constructing maps of annexations, 1 man	23
Constructing maps for Harbor and Subway Commission, 1 man	42
Constructing maps for 103d street constructing work, 1 man	18
City Map Department, Jefferson and Norwood Park, 1 man	225
Work on street nomenclature, 1 man	35
Total	403

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Plats Made.

No. of plats		Miles
701	Assessment plats	251.000
26	Assessment plats for 12th street widening	78.000
844	Sidewalk plats	277.000
123	Sewer plats.	116.125
82	Drain plats.	47.500
674	Estimate plats.	244.000
55	Opening plats.	112.375
247	Water Pipe Extension plats	104.500
10	Condemnation plats.	1.750
117	Vacation plats.	14.625
149	Plats for Board of Underground Work of Public Utilities of Chicago	118.000
3028		1,364.875

Miscellaneous Plats.

	No. of plats
Plats for Aldermen	26
Plats for Board of Education	10
Plats for Corporation Counsel	44
Plats for Compensation Bureau	20
Plats for Commissioner of Public Works	1
Plats for City Clerk	3
Plats for City Attorney	1
Plats for Street Department	17
Plats for Board of Local Improvements	11
Plats for Building Department	3
Plats for Track Elevation Department	13
Plats for Special Park Commission	1
Plats for Department of Police	5
Plats for Real Estate Agent	3
Plats for City Engineer	2
Plats for Bureau of Fire Prevention	1
Plats for Department of Public Welfare	11
Plats for Bureau of Water	2
Total.	174
Forward.	3,028
Total number of plats	3,202

Maps, Charts and Certificates.

	Days
In court, 1 man	2
Ward maps, 1 man	18½
In Recorder's and County Treasurer's offices, 1 man	32
Repairing atlases, 1 man	162
Coloring maps, 1 man	6
Signs and lettering, various departments, 1 man	29
Posting atlases, 2 men, each 230 days	460

Petitions and Ordinances Verified.

	Number
For street car franchises, 1 man, 15 days	10
For saloon licenses, 1 man, 114 days	131
For house moving, 1 man, 46 days	268
For sign board, lumber yard, switch track, hospital, factory, gasoline tank, ice house, blacksmith shop, bathing beach, garage, livery, theatre, baseball park and laundry, 1 man, 105 days	214
Street and alley vacation and dedication ordinances	117
Total.	740

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Plats Approved for Record by Superintendent of Maps as (Ex-Officio) Examiner of Subdivisions.

	No. of plats
New subdivision plats	278
Vacation plats	55
Dedication plats	34
Opening plats	10
Correction notes	10
Miscellaneous plats	7
Total	394

AREA OF LAND SUBDIVIDED.

	Acres.
Resubdivisions of land comprised	286.144
New subdivisions of land comprised	1,213.144
Total	1,499.288

MISCELLANEOUS WORK.

	Number.
Legal descriptions at 25 cents each, $1,005.50	4,022
Fees for witness in court, $4.40	.....
Legal descriptions issued free, various departments	4,179
House number certificates for building permits	13,864
House numbers given without certificates	11,468
Public requiring special attention	33,533
Public having access to atlases	167,665
Entries made in atlases	607
Vacation instruments	9
House numbers changed (special cases on complaint)	637
House numbers changed in Morgan Park	1,166

MILEAGE OF STREETS AND ALLEYS.

Total miles of streets, December 31, 1914		3,092.442
Total miles of streets opened in 1915	35.340	
Total miles of streets vacated in 1915	4.640	
Increase	30.700	
Total miles of streets in Village of Clearing	9.080	
Total miles of streets in Town of Stickney	42.216	
Total miles of streets in part of Evanston	2.169	
Total increase	84.165	84.165
Total miles of streets, December 31, 1915		3,176.607
Total miles of alleys, December 31, 1914		1,592.071
Total miles of alleys dedicated in 1915	34.730	
Total miles of alleys vacated in 1915	2.380	
Increase	32.350	
Total miles of alleys in Village of Clearing	3.864	
Total miles of alleys in Town of Stickney	18.290	
Total miles of alleys in part of Evanston	2.112	
Total increase	56.616	56.616
Total miles of alleys, December 31, 1915		1,648.687

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STREET NAMES CHANGED BY ORDINANCE

Old Name of Street	New Name of Street	Between	And
Ada st.	Throop st.	South st. (107th)	Raymond st.
Adams st.	S. Bishop st.	Prairie st.	Vale st.
Anna Pl.	S. Lincoln st.	Lyon ave. (119th).	1 block north
Arlington ave.	W. 110th pl.	Longwood ave.	Western ave.
Armida ave.	S. Hoyne ave.	South st. (107th)	Lothair ave.
Arnold ave.	N. Ashland ave.	Howard st.	Birchwood terr.
Ashland ave., N.	N. Marshfield ave.	Howard st.	Birchwood terr.
Austin ave. (60th ave.).	S. Maynard ave.	W. 51st st.	W. 55th st.
Avon ave.	S. Fairfield ave.	107th st.	115th st.
Avondale ave.	Irene ave.	Belmont ave	N. Kedzie ave.
Belmont ave	S. Seeley ave.	South st. (107th)	Tasso pl.
Berkeley ave	W. 111th pl.	Crescent ave.	Western ave.
Birchwood terr.	Juneway terr.	Sheridan rd.	C. M. & St. P. Ry.
Blanchard ave.	S. Rockwell st.	109th st	115th st.
Boone st.	De Kalb st.		
Borso pl.	W. 110th st.	Longwood ave.	Armida ave.
Bruner ave.	Aberdeen st.	South st.	Morgan ave.
Cahokia ave. (Elisabeth ave.).	Clyde ave.	E. 70th st.	E. 138th st.
Center ave	S. Racine ave	South st. (107th)	Raymond st.
Centre st. (known as Wood st.).	S. Wood st.	Prospect ave.	Fairfield ave.
Centre st. (known as Wood st.).	Chelsea pl.	Fairfield ave	First st.
Centre st.	W. 109th st.	S. Morgan st.	S. Racine ave.
Churchill ave.	W. 116th pl.	Ashland ave.	Shepard ave.
Chauncey ave.	Woodlawn ave.	E. 69th st.	E. 71st st.
Clare ave.	W. 118th st.	S. Ashland ave.	Oak st.
Clarence ave.	S. Natoma ave.	W. 51st st.	W. 59th st.
Clarendon ave.	Broadway.	Grace st.	Broadway
Clifton ave.	S. Campbell ave.	107th st.	115th st.
Clinton ave.	S. Newland ave.	W. 51st st.	W. 59th st.
Clyde ave.	W. 107th pl.	Wood st.	Walnut st.
Commercial ave.	Hale ave.	Prospect ave.	Morgan ave.
Crescent ave.	S. Irving ave.	South st. (107th)	Elizabeth ave.
Diana ct. (Hamilton ct.).	Geneva terr.	Fullerton pkwy.	Deming pl.
Duane st.	W. 116th st.	C. R. I. & P. R. R.	Lothair ave.
East Creasent ave.	S. Irving ave.	Monticello ave	Crescent ave.
Ebuda ave.	W. 108th pl.	Grove st.	Longwood ave.
Ebuda ave.	W. 109th st.	Armida ave.	Western ave.
Elisabeth ave. (or Medora ave.).	W. 115th st.	Prospect ave.	Western ave.
Euclid ave.	S. Rutherford ave.	W. 51st st.	W. 59th st.
Euclid ave.	S. Maplewood ave.	107th at.	109th st.
Eulette ave.	S. Paulina st.	Churchill ave.	Lyon ave. (or 119th st.)
Fairfax ave.	W. 110th st.	Armida ave.	Western ave.
Fairfield ave.	Hermosa ave.	Prospect ave.	Walker ave.
Fairfield ave.	Homewood ave.	Raymond st.	Mendora ave (or Medora ave.)
Fairview ave.	S. Artesian ave	107th st.	Morgan ave.
Fifth st.	Loomis st.	South st. (107th)	Raymond st.
First st.	S. Ashland ave.	Court (or 108th pl.)	Morgan ave.
Foster ave.	Gettysburg st.	Milwaukee ave.	City limits
Fourth st.	S. Bishop st.	Vale st.	Raymond st.
48th ave., S.	S. Cicero ave.	W. 51st st.	W. 65th st.
52nd ave., S.	S. Laramie ave.	W. 51st st.	W. 55th st.
52nd ct., S.	S. Lathrobe ave.	W. 51st st.	W. 55th st.
53rd ave., S.	S. Lockwood ave.	W. 51st st.	W. 55th st.
53rd ct., S.	S. Lorel ave.	W. 51st st.	W. 55th st.
54th ave., S.	S. Long ave.	W. 51st st.	W. 55 thst.
54th ct., S.	S. Lotus ave.	W. 51st st.	W. 55th st.
55th ave., S.	S. Linder ave	W. 51st st.	½ block south of W. 63d pl.
55th ct., S.	S. Luna ave.	W. 51st st.	W. 55th st.
56th ave., S.	S. Central ave	W. 51st st.	W. 65th st.
56th ct., S.	S. Parkside ave.	W. 51st st.	W. 63rd st.
57th ave., S.	S. Major ave.	W. 51st st.	W. 65th st.
57th ct., S.	S. Massasoit ave.	W. 51st st.	W. 63rd st.
Prairie ave. (S. 58th ave.)	S. Menard ave.	W. 51st st.	W. 55th st.
58th ct., S.	S. Mansfield ave.	W. 51st st.	W. 63rd st.
59th ave., S.	S. Mayfield ave.	W. 51st st.	W. 63rd st.
59th ct., S.	S. Mason ave.	W. 51st st.	W. 63rd st.
Garrison ave.	Eastlake terr.		
Genevra ave.	S. Oakley ave.	Rinaldo ave.	Elizabeth ave.
Gettysburg pl.	Gettysburg st.	Lieb ave.	Milwaukee ave.
Goldsmith ave.	Fielding ave.	W. 77th st.	W. 79th st
Grand ave.	S. Washtenaw ave.	107th st.	115th st.
Grandview terr.	S. Nagle ave.	W. 51st st.	W. 59th. st.
Grave ave.	S. Newcastle ave.	W. 51st st.	W. 59th st.
Grove st.	W. 108th pl.	Wood st.	Ebuda ave.
Grove st.	Hale ave.	Ebuda ave.	Prospect ave.
Groveland ct.	Drew st	South st. (107th)	Prospect ave.

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STREET NAMES CHANGED BY ORDINANCE—Continued

Old Name of Street	New Name of Street	Between	And
Groveland ave.	Ellis ave.	E. 29th st.	E. 33rd st.
Groveland ave.	Ellis ave.	E. 28th st.	E. 29th st.
Hale st.	W. 108th pl.	S. Morgan st.	S. Racine ave.
Hermitage ave.	N. Hermitage ave.	Sheridan terr.	Birchwood terr.
Hilliard ave.	Throop st.	Vale st.	111th st.
Home ave.	S. Sayre ave.	W. 51st st.	W. 59th st.
Humphrey ave. (or S. 60th ct.)	S. McVickers ave.	W. 51st st.	W. 55th st.
Illinois ave.	Hamlet ave.	Meadow st.	Raymond st.
Isabella ave.	W. 113th st.	Crescent st.	Genevra ave.
Jean pl.	W. 116th pl.	Prospect ave.	Western ave.
Josephine ave.	W. 112th pl.	Genevra ave.	Western ave.
Joymore st.	Jonquil terr.	Sheridan rd.	Hermitage ave.
Keen pl.	W. 117th pl.	Prospect ave.	Lothair ave.
Kenilworth ave.	S. New England ave.	W. 51st st.	W. 59th st.
Lakeside terr.	Garrison ave.	Rogers ave.	Sheridan pl.
La Salle st.	Glenroy ave.	South st. (107th)	Vale st.
Longwood ave.	Longwood drive.	South st. (107th)	Prospect ave.
Loomis st.	S. Ada St.	Morgan ave.	Raymond st.
Lothair ave.	S. Irving ave.	Elizabeth ave.	Long ave or (119th st.)
Loyola ave.	Arthur ave.	N. Clark st.	Ravenswood ave.
Lyon ave. (known as 119th st.).	W. 119th st.	Ashland ave.	Western ave.
Maple ave.	S. Nagle ave.	W. 52nd st.	W. 59th st.
Marguerite ave.	W. 113th pl.	Crescent ave.	Genevra ave.
Maryben ave.	W. 114th st.	Genevra ave.	Western ave.
Maxon st.	W. 109th pl.	Center ave.	Fairfield ave.
Meadowbrook terr.	S. Neenah ave.	W. 51st st.	W. 59th st.
Medora ave.	W. 117th st.	Shepard st.	Fairfield ave. (or Railroad ave.)
Meadow ave.	W. 113th pl.	Morgan st.	Short st.
Meadow ave.	Montvale ave.	Short st.	Walker ave.
Mont Claire ave.	Mont Clare ave.	Altgeld st.	Diversey ave.
Monticello ave.	W. 108th pl.	Armida ave.	Western ave.
Morgan ave.	W. 111th st.	Commercial ave.	Ogden ave.
Morgan ave.	W. 112th pl.	Morgan st.	Short st.
Morgan st.	W. 111th st.	S. Morgan st.	S. Racine ave.
Morgan ave.	Monterey ave.	Short st.	Commercial ave.
Oak ave.	Church st.	Raymond st.	Lyon ave. (119th st.)
Oak Park ave.	S. Oak Park ave.	W. 51st st.	W. 59th st.
Ogden ave.	S. California ave.	107th st.	115th st.
Oleander ave.	Oleander pkwy.	Grand ave.	Park Ridge ave.
Park Crescent.	Homewood ave.	Prospect ave.	Park st.
Park st.	W. 112th st.	Morgan st.	Second st.
Park st.	Pryor ave.	Second st.	Prospect ave.
Paulina ave.	N. Paulina st.	Howard st.	Birchwood terr.
Pedro ave.	W. 108th st.	C. R. I. & P. R. R.	Western ave.
Perry st.	Greenview ave.	Howard st.	Sheridan terr.
Prairie st.	W. 108th st.	Center ave.	Adams st.
Prairie st.	W. 108th st.	S. Morgan st.	S. Racine ave.
Prospect ave.	Longwood drive.	Intersection of Longwood ave.)	Lyon ave. (119th st.)
Randall st.	W. 110th st.	Center ave.	First st.
Raymond st.	W. 114th pl.	Longwood drive	Lothair ave.
Raymond st.	W. 115th st.	Morgan st.	Prospect ave.
Remington ave.	W. 107th pl.	Armida ave.	Western ave.
Ridge ave.	W. 116th st.	Shepard st.	Oak st.
Rinaldo ave.	W. 112th st.	Lothair ave.	Western ave.
Sada ave.	W. 113th pl.	Genevra ave.	Western ave.
Sanborn st.	W. 110th pl.	S. Morgan st.	S. Racine ave.
Second st.	S. Ashland ave.	Morgan st.	Raymond st.
Second st.	Hamlet ave.	111th st.	Morgan ave.
Shepard st.	S. Wood st.	Raymond st.	Lyon ave. (or 119th st.)
Shepard st.	Woodland ave.	Weston st.	Raymond st.
Sheridan pl.	Sheridan rd.	Birchwood terr.	North line of city limits
Sheridan terr.	Joymore st.	Sheridan rd.	Hermitage ave.
Short st.	S. Honore st.	W. 118th st.	W. 119th st.
Short st.	Davol st.	Morgan st.	Weston st.
60th ave., S.	S. Maynard ave.	W. 60th st.	W. 63rd st.
61st ave., S. (Graham).	S. Meade ave.	W. 51st st.	W. 55th st.
61st ct., S.	S. Moody ave.	W. 51st st.	Archer ave.
62nd ave., S.	S. Melvina ave.	W. 51st st.	Archer ave.
62nd ct., S.	S. Merrimac ave.	W. 51st st.	W. 55th st.
63rd ave., S.	S. Mobile ave.	W. 51st st.	Archer ave.
63rd ct., S.	S. Mulligan ave.	W. 51st st.	Archer ave.
64th ave., S.	S. Narragansett ave.	W. 51st st.	W. 59th st.
65th ave., S.	S. Natchez ave.	W. 51st st.	W. 59th st.
66th ave., S.	S. Nashville ave.	W. 51st st.	W. 59th st.
72nd ave., S.	S. Harlem ave.	W. 52nd st.	W. 59th st.
South st.	W. 107th st.	Center ave.	Western ave.
South st.	W. 107th st.	S. Morgan st.	S. Racine ave.
Spencer st.	W. 110th st.	S. Morgan st.	S. Racine ave.
Stanley st.	W. 111th pl.	Morgan st.	Fifth st.

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STREET NAMES CHANGED BY ORDINANCE—Continued

Old Name of Street	New Name of Street	Between	And
Stephen st.	W. 110th pl.	Center ave.	Third st.
Stoner st.	W. 109th st.	S. Morgan st.	S. Racine ave.
Street (no name)	Church st.	Oak st.	Lyon ave.
Street (no name)	W. 15th st.	S. Canal st.	125 feet west
Street (no name)	Ravenswood ave.	Birchwood terr.	½ block south
Sturtevant pl.	W. 51st pl.	Home ave.	Wenonah ave.
Tasso pl.	W. 108th pl.	Longwood ave.	Armida ave.
Third st.	Laflin st.	Randall st.	Raymond st.
Throop st.	S. Elizabeth st.	Morgan ave.	Raymond st.
Tracy ave.	W. 103rd st.	Western ave.	Ogden ave.
Tremont ave.	S. Talman ave.	107th st.	115th st.
University ave.	S. Oakley ave.	Elizabeth ave	Lyon ave.
Vale st.	W. 109th st.	Center ave.	First st.
Walker ave.	Homewood ave.	Park st.	Raymond st.
Walnut st.	Hale ave.	South st. (107th)	Grove st.
Warren ave.	Waseca pl.	Short st.	Vincennes ave.
Washington ave.	Hale ave.	Morgan ave.	Lyon ave. (119th)
Wenonah ave.	S. Nordica ave	Sturtevant pl.	W. 59th st.
Wesley ave.	S. Normandy ave.	W. 51st st.	W. 59th st.
West Crescent.	S. Oakley ave.	Monticello ave.	Crescent ave.
Weston st.	W. 114th pl.	Morgan st.	Short st.
Weston st.	Wesley ave.	Short st.	Prospect ave.
Willard ave.	W. 107th pl.	Center ave.	Fifth st.
Willard ave.	W. 107th pl.	S. Morgan st.	S. Racine ave.
Wilmot ave.	St. Paul ave.	N. Robey st.	N. Hoyne ave.
Winfield ave.	W. 117th st.	C. R. I. & P. R. R.	Prospect ave.
Wisconsin ave.	S. Nottingham ave.	W. 52nd st.	W. 59th st.

Area of City.

	Sq. miles
As of January 1, 1915	194.4155
Area of Village of Clearing, annexed April 24, 1915	1.8750
Area of part of City of Evanston, annexed May 5, 1915	.1230
Area of part of Section 31-41-13, annexed May 13, 1915	.0210
Area of territory adjoining Morgan Park, annexed July 1, 1915	.3125
Area of Town of Stickney, annexed September 3, 1915	2.2500
Total area January 1, 1916	198.9970

Respectfully submitted,

JOHN D. RILEY,
Superintendent of Maps.

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ANNUAL REPORT

BUREAU OF ARCHITECTURE
AND
BUREAU OF CITY HALL

CITY OF CHICAGO

1915

CHAS. W. KALLAL
City Architect

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BUREAU OF ARCHITECTURE AND BUREAU OF CITY HALL

Hon. W. R. Moorhouse,
Commissioner of Public Works.

Dear Sir:

I have the honor to submit herewith annual report covering the work performed for the various departments and bureaus of the City of Chicago during the year ending December 31, 1915:

The activities of the Bureau consisted of preparing plans and specifications and supervising the construction of work embodied in 119 projects, on which 142 contracts were awarded in the total amount of $935,180.26.

The work was divided amongst the various departments and bureaus as follows:

Contracts	Department	Amount
7	Bureau of City Hall	$ 7,448.00
20	Department of Health	317,556.40
1	Bureau of Streets	2,527.00
8	House of Correction	57,786.00
50	Special Park Commission	319,698.24
4	Police Department	19,177.84
49	Fire Department	187,625.78
3	Municipal Markets Commission	23,361.00
142		$935,180.26

The work under the foregoing contracts was distributed amongst the various trades as follows:

67	Contracts for General work	$789,677.91
43	Contracts for Plumbing work	76,819.00
18	Contracts for Heating work	34,710.33
14	Contracts for Electrical work	33,973.02
142		$935,180.26

In addition to the above plans and specifications were prepared for various projects of the Department of Public Works as follows:

Plans and specifications were prepared for the construction of the 5th District Yard Office, platform and garage, for the Bureau of Streets; approximate cost..... $ 15,000.00

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Architectural drawings and specifications were made for the Bureau of Engineering on the following buildings of the Marshall Boulevard Municipal Plant:

Carpenter, Paint and Pattern Shop—approximate cost	$ 130,000.00
Garage Building	30,000.00
Administration Building	50,000.00
Plans, etc., are nearing completion for the construction of the new Mayfair Pumping Station, which is estimated to cost approximately	500,000.00
Architectural services were also rendered for the Department of Health on the following work:	
Office and Machine Shop, 39th Street Reduction Plant	20,000.00
Addition to Extractor Building, 39th Street Plant	20,000.00
New 95th Street Incinerator	30,000.00
Total value of work on which architectural services were rendered by this Bureau	$1,730,180.26

The expense incurred in connection with the above work was as follows:

Salaries paid from Account 104-A	$ 6,534.74
Salaries paid from Bureau of Architecture Capital Account	39,684.54
Blue prints, printing of specifications, drafting room supplies, etc., paid from Capital Account	1,924.83
Blue prints, stationery, transportation, etc., paid from Corporate Fund	594.25
Total	$48,738.36

A detailed explanation of the above summary, with a short description of the work, is given below:

DEPARTMENT OF HEALTH.

Contagious Disease Hospital—The Ward Building No. 3 and Service Corridor and the Administration Building and Connecting Corridor of the Contagious Disease Hospital are nearing completion. There also has been erected a Temporary Power Plant, which will be used to heat the buildings pending the construction of the Municipal Heating and Power Plant in the House of Correction grounds. Plans for the Nurses' Home and Dining Room and Kitchen are under way, and it is expected that contracts for the work will be awarded during the year—in addition to beginning construction of another Ward Building, which will provide for 140 additional patients.

Fifteenth Ward Bath—Plans and specifications were prepared and contracts awarded for the construction of a Public Bath Building at 1019 North Lincoln street. Construction work is under way and it is expected that the building will be completed and ready for occupancy by July 1, 1916. The estimated cost of the entire improvement is placed at $50,000.

Nineteenth Ward Bath—Plans and specifications are in course of preparation for the erection of a new Public Bath Building at the southwest corner of Polk and Paulina streets. Work of construction will be started in the near future, and it is expected that the building will be finished and ready for use by January 1, 1917. The estimated cost of this project is $50,000.

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Twelfth Ward Bath—Plans and specifications are also being prepared for a new Bath House to be erected at the southeast corner of West 34th street and South Kedzie avenue. It is expected that the work of construction will be commenced during the present year. The approximate cost of the building is $50,000.

Public Library Comfort Stations—Two public comfort stations were built on Garland court at Washington and Randolph streets, in connection with the Public Library, at a cost of about $25,000.

FIRE DEPARTMENT.

The following Engine and Truck Houses were completed during the year:

95th and Charles streets, Longwood.
1405 East 62d place.
2322 Foster avenue.
1052 Waveland avenue.
2111 South Hamlin avenue.
Tyron and Homewood avenues, Morgan Park.
69th street and Indiana avenue.
1721 Greenleaf avenue, Rogers Park.

Plans and specifications have been prepared, contracts awarded and work of construction started on the following buildings:

43d and Paulina streets.
817 East 91st street.
2329 North Natchez avenue.
7313 Kingston avenue.
4426 North Kedzie avenue.
5218 South Western avenue.
2179 Stave street.

Plans and specifications will be prepared and construction work commenced on the remaining eleven buildings provided for in the bond issue as soon as sites are acquired, as follows:

638 Blue Island avenue.
2124 West Taylor street.
744 West 35th street.
1713 North Springfield avenue.
104th street and Harvard avenue.
714 North Kedzie avenue.
Vicinity Wrightwood and Sheffield avenues.
Vicinity Monroe and Laflin streets.
Vicinity 59th street and Ashland avenue.
Vicinity Woodlawn avenue and 59th street.
Vicinity Madison street and 52d avenue.

DEPARTMENT OF POLICE.

Twenty-second District Station—Plans and specifications were prepared and contracts have been let for the remodeling of the Twenty-ninth Precinct Station, located at 2433 Warren avenue, same now being under construction. This improvement consists of a two-story cell house adjoining the station, and will cost approximately $20,000.

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Thirty-sixth District Station—Plans and specifications were made and proposals received for remodeling the Forty-fifth Precinct Station, located at 7075 North Clark street. The old combination police and fire department building will be remodeled into a modern police station. The estimated cost is placed at $15,000, and the bids are now under consideration by the Finance Committee.

Plans and specifications are being prepared for the following new Police Department buildings:

		Appropriation
6th District	48th street and Wabash avenue.....	$70,000
9th District	91st street and Cottage Grove avenue...	50,000
20th District	West 23d and South Robey streets.....	50,000
35th District	Bryn Mawr and Ashland avenues.....	55,000

HOUSE OF CORRECTION.

Chicago and Cook County School for Boys—Plans and specifications were prepared and contracts awarded for the construction of a Dormitory and Superintendent's Residence in connection with this institution, which is located at Gage Farm, 22d street and Harlem avenue. The buildings are almost completed and will be ready for occupancy May 1, 1916.

SPECIAL PARK COMMISSION.

Clarendon Avenue Beach—This improvement, consisting of an Administration Building, Laundry Building and Men's and Women's Lockers, is completed and will be ready for operation in time for the 1916 season.

Hyde Park Beach—Preliminary sketches and studies were submitted to the Special Park Commission for approval, and pending the settlement of the question of purchase of additional land, the project is being held in abeyance. The beach will be situated at the foot of Hyde Park boulevard (51st street).

East End Park Comfort Station—During the year contracts were awarded for the construction of a comfort station in East End Park, 53d street and East End avenue. The building was completed in October at an approximate cost of $4,000.

Washington Heights Swimming Pool—Plans and specifications were made and bids taken for a new office and locker building and enclosing the present open pool. It is expected that work will be started in the near future.

Natatoriums—Three natatoriums adjoining pumping stations were completed during the year at Roseland, Fillmore street and Springfield avenue at an approximate cost of $30,000 each.

Playgrounds—Orders have been received to prepare drawings and specifications for office, shelter and sand court buildings to be located at 42 school playgrounds. Contracts have been awarded and construction work has been started on 16 of these buildings at the following sites:

Avondale School
Henry School
Cameron School
Morse School
Scanlan School
McPherson School
Burley School
Ryder School
McCosh School
Emmett School
Earle School
Gallistel School
Howe School
Kohn School
Delano School
Gary School

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Wading Pools—Wading pools were completed at the Holden, Fiske and Corkery Playgrounds and turned over to the Special Park Commission in June, 1915.

BUREAU OF STREETS.

Fourteenth Ward Yard Office—A one-story and basement office building, located at 2327-35 West Erie street, was completed during the year at an approximate cost of $2,600.

DEPARTMENT OF GAS AND ELECTRICITY.

Englewood Fire Alarm Office—This project, consisting of fire alarm office, storage building, loading platform and garage, was completed during the year at a cost of about $20,000.

MUNICIPAL MARKETS COMMISSION.

South Chicago Market—This building, located at 92d street and Ewing avenue, was finished in October, 1915, at a cost of $25,000.

BUREAU OF CITY HALL.

New exit doors to comply with the Fire Ordinances were provided for the Board of Local Improvements hearing room and for the office of the Boiler Inspector.

A new toilet room was provided in the office of the Fire Marshal.

Additional counter space was provided in the Business Agent's office.

A new oak rail was installed in the City Treasurer's office.

Changes were made in the office arrangements of the Prosecuting Attorney to provide office space for the Fire Prevention Bureau.

The battery room in connection with the Fire Alarm Office was remodeled to provide additional ventilation and quarters.

The hearing room of the Election Commissioners was enlarged.

Elevator cables were renewed when necessary, according to specifications prepared in this office.

The flower boxes, which are placed on the first floor window sills during the summer months, were maintained by this bureau.

The terra cotta coping of the City Hall was repointed.

In this connection, wish to report that the attendance at the Public Comfort Stations located in the basement of the City Hall, for the year 1915 exceeded the total of 1,500,000.

The Bureau of Architecture, in addition to preparing plans and specifications and supervising the construction of municipal buildings, is charged with the maintenance and operation of the City Hall Building, including the management of the janitor, mechanical and electrical divisions and the supervision of all accounts and records of the Bureau of City Hall.

Respectfully submitted,

CHARLES W. KALLAL,
City Architect.

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ANNUAL REPORT

ACCOUNTING DIVISION

DEPARTMENT OF PUBLIC WORKS

1915

CHARLES W. HIBBARD
Head Accountant

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ACCOUNTING DIVISION

Hon. W. R. Moorhouse,
Commissioner of Public Works.

Dear Sir:

I have the honor to submit herewith the annual report of the Accounting Division of the Department of Public Works, for the fiscal year ending December 31, 1915.

The contents comprise the following series of financial statements which are self-explanatory:

Table No. 1. Statement of Appropriations and Expenditures for the year 1915—Corporate Fund.

Table No. 2. Statement of Expenditures of Bureau of Streets for the year 1915.

Table No. 3. Detailed Statement of Ward Expenditures of Bureau of Streets for the year 1915.

Table No. 4. Statement of Expenditures of Bureau of Sewers for the year 1915.

Table No. 5. Statement of Expenditures of Division of Bridges, Harbors and Viaducts during the year 1915.

Table No. 6. Statement of Corporate Fund Revenue of Department of Public Works for the year 1915.

Table No. 7. Statement of Appropriations and Expenditures for the year 1915—Water Fund.

Table No. 8. Statement of Revenue for the year 1915—Water Fund.

Table No. 9. Comparative Statement of Ordinary Revenue and Ordinary Expense of Water System for the years 1902 to 1915, inclusive.

Table No. 10. Statement of Free Water Service rendered by the Chicago Water Works during the year 1915.

Table No. 11. Statement of Water Fund Collections during the year 1915.

Table No. 12. Statement of Expenditures for Operation of Water System, including interest during the year 1915.

Table No. 13. Statement of Expenditures for Repairs and Renewals of Water Works Property and Equipment during the year 1915.

Table No. 14. Statement of Expenditures for Additions, Extensions and Betterments of Waterworks Property and equipment during the year 1915.

Table No. 15. Comparative Statement of Expenditures for Operation of Water System, including interest, for the years 1908 to 1915, inclusive.

Table No. 16. Comparative Statement of Expenditures for Repairs and Renewals of Water Works Property and Equipment for the year 1908 to 1915, inclusive.

Table No. 17. Comparative Statement of Expenditures for Additions, Extensions and Betterments of Water Works Property and Equipment for the years 1908 to 1915, inclusive.

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Table No. 18. Detailed Statement of Expenditures for Operation, Repairs and Renewals and Additions, Extensions and Betterments of Sewage Pumping Stations for the year 1915.

Table No. 19. Detailed Statement of Expenditures for Operation of Water Pumping Stations during the year 1915.

Table No. 20. Detailed Statement of Expenditures for Repairs and Renewals of Water Pumping Stations during the year 1915.

Table No. 21. Detailed Statement of Expenditures for Additions, Extensions and Betterments of Water Pumping Stations during the year 1915.

Table No. 22. Comparative Statement of Expenditures for Operations of Water Pumping Stations during the years 1906 to 1915, inclusive.

Table No. 23. Comparative Statement of Expenditures for Repairs and Renewals of Water Pumping Stations during the years 1906 to 1915, inclusive.

Table No. 24. Comparative Statements of Total Expenditures for Operation and Repairs and Renewals of Water Pumping Stations during years 1906 to 1915, inclusive.

Table No. 25. Classified Summary of Appraisement of Chicago Water Works Property and Equipment, December 31, 1915.

Table No. 26. Appraisement of Chicago Water Works Property and Equipment December 31, 1915.

Table No. 27. Trial Balance of Water Works General Ledger, December 31, 1915.

Table No. 28. Trial Balance of Water Works General Ledger, January 1, 1916.

Table No. 29. Bonds issued for Benefit of Water Works Outstanding January 1, 1916.

Table No. 30. Statement of Estimated Cost of and Revenue from Supplying Water to Consumers during the year 1915.

Very Respectfully,

C. W. HIBBARD,
Head Accountant.

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TABLE No. 1

STATEMENT OF APPROPRIATIONS AND EXPENDITURES FOR THE YEAR 1915—CORPORATE FUND

		Appropriation	EXPENDITURES			Unexpended Balance
			Ordinary	Extraordinary	Total	
COMMISSIONER OF PUBLIC WORKS—OFFICE:						
101 A	Salaries	$ 36,540.00	$ 36,129.14	.....	$ 36,129.14	$ 410.86
101 A1	Extra pay for overtime of regular employes	1,000.00	976.50	.....	976.50	23.50
101 C	General supplies	20.00	14.02	.....	14.02	5.98
101 G	Purchase of furniture, fittings and library	50.00	13.88	.....	13.88	36.12
101 H	Printing, stationery and office supplies	5,000.00	4,383.44	.....	4,383.44	616.56
101 I	Advertising	40.00	11.65	.....	11.65	28.35
101 J	Street car and Railroad transportation	20.00	18.55	.....	18.55	1.45
101 T	Impersonal services and benefits	500.00	35.85	.....	35.85	464.15
101 Y	For expenses of Commission investigating underground service system	10,000.00	3,132.78	.....	3,132.78	6,867.22
101 Y1	For services of engineers, accountants, investigators and such other employes as needed to conduct extraordinary and expert inquiries, and general monthly audits	13,000.00	8,703.35	.....	8,703.35	4,296.65
101 Y2	For services and benefits, personal and impersonal, and purchase and use of property rendered necessary by the Eastland disaster	20,000.00	15,531.88	.....	15,531.88	4,468.12
101 X	For public buildings	24,689.57	.....	.....	.....	24,689.57
101 X1	For alterations and betterments to City Hall, including unpaid contract obligations	8,000.00	.....	6,335.66	6,335.66	1,664.34
	Totals	$118,859.57	$ 68,951.04	$ 6,335.66	$ 75,286.70	$ 43,572.87
BUREAU OF COMPENSATION:						
102 A	Salaries	$ 7,560.00	$ 7,287.86	.....	$ 7,287.86	$ 272.14
102 C	General supplies	25.00	.15	.....	15.15	24.85
102 G	Purchase of furniture, fittings, fixtures and library	50.00	1.00	.....	15.00	49.00
102 H	Printing, stationery and office supplies	225.00	91.76	.....	91.76	133.24
102 I	Advertising	25.00	.....	.....	.....	25.00
102 J	Street car and railroad transportation	25.00	13.25	.....	13.25	11.75
102 S	Personal services other than by employes	75.00	.....	.....	.....	75.00
102 T	Impersonal services and benefits	25.00	1.50	.....	1.50	23.50
	Totals	$ 8,010.00	$ 7,395.52	.....	$ 7,395.52	$ 614.48

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CORPORATE FUND—Continued

		Appropriation	EXPENDITURES			Unexpended Balance
			Ordinary	Extraordinary	Total	
BUREAU OF MAPS AND PLATS:						
103 A	Salaries	$ 41,500.00	$ 38,657.88	.....	$ 38,657.88	$ 2,842.12
103 C	General supplies	350.00	220.72	.....	220.72	129.28
103 G	Purchase of furniture, fittings, fixtures and library	220.00	8.77	.....	8.77	211.23
103 H	Printing, stationery and office supplies	1,000.00	651.87	.....	651.87	348.13
103 J	Street car and railroad transportation	36.00	30.20	.....	30.20	5.80
103 T	Impersonal services and benefits	293.20	108.44	.....	108.44	184.76
103 T1	Installation and maintenance of Sanborn's atlases	650.00	474.82	.....	474.82	175.18
103 T2	Recording certified copies of Torrens plats	356.80	288.75	.....	288.75	68.05
Division of Surveys:						
103 A1	Engineer of surveys	$ 3,000.00	$ 3,000.00	.....	$ 3,000.00	.....
	Totals	$ 47,406.00	$ 43,441.45	.....	$ 43,441.45	$ 3,964.55
BUREAU OF ARCHITECTURE:						
104 A	Salaries	$ 6,540.00	$ 6,534.74	.....	$ 6,534.74	$ 5.26
104 C	General supplies	125.00	125.00	.....	125.00	.....
104 G	Purchase of furniture, fittings, fixtures and library	75.00	69.25	.....	69.25	5.75
104 H	Printing, stationery and office supplies	325.00	325.00	.....	325.00	.....
104 J	Street car and railroad transportation	75.00	75.00	.....	75.00	.....
104 S	Personal service other than by Wards	25.00	.....	.....	.....	25.00
	Totals	$ 7,165.00	$ 7,128.99	.....	$ 7,128.99	$ 36.01

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BUREAU OF CITY HALL:						
105 A	Salaries and wages	$ 167,529.20	$ 165,497.25		$ 165,497.25	$ 2,031.95
105 A1	For operation of elevators during elections and as required	500.00	460.78		460.78	39.22
105 C	General supplies	11,800.00	11,799.06		11,799.06	.94
105 D	Material for repairs and replacements	6,150.00	5,462.55		5,462.55	687.45
105 E	Repairs by contract or open order	12,000.00	11,999.08		11,999.08	.92
105 F	Apparatus, machinery, vehicles and harness	700.00	388.71		388.71	311.29
105 G	Purchase of furniture, fittings, fixtures and library	1,000.00	959.18		959.18	40.82
105 H	Printing, stationery and office supplies	250.00	247.63		247.63	2.37
105 I	Advertising	100.00	69.98		69.98	30.02
105 L	Fuel and power	25,000.00	23,762.42		23,762.42	1,237.58
105 S	Personal service other than by employes	2,870.00	2,233.31		2,233.31	636.69
105 T	Impersonal service and benefits	23,000.00	21,259.08		21,259.08	1,740.92
105 W	Tools and implements including their repairs	400.00	375.67		375.67	24.33
	Totals	$ 251,299.20	$ 244,514.70		$ 244,514.70	$ 6,784.50
BUREAU OF STREETS:						
Superintendence:						
201 A	Salaries	$ 62,455.81	$ 56,845.96		$ 56,845.96	$ 5,609.85
201 A1	Overtime for regular employes	414.00	414.00		414.00	
201 C	General supplies	185.00	150.74		150.74	34.26
201 D	Material for repairs and replacements	25.00	17.97		17.97	7.03
201 E	Repairs by contract or open order	150.00	30.89		30.89	119.11
201 G	Purchase of furniture, fittings, fixtures and library	450.00	200.13		200.13	249.87
201 H	Printing, stationery and office supplies	6,500.00	6,454.31		6,454.31	45.69
201 I	Advertising	350.00	215.80		215.80	134.20
201 J	Street car and railway transportation	900.00	891.00		891.00	9.00
201 S	Personal services other than by employes	500.00	241.89		241.89	258.11
201 T	Impersonal services and benefits	1,000.00	701.90		701.90	298.10
201 W	Claim of Thomas Frole	758.73	758.73		758.73	
	Totals	$ 73,688.54	$ 66,923.32		$ 66,923.32	$ 6,765.22
Ward Supervision:						
201 A10	Salaries of ward superintendents, clerks and yardmen, and maintenance of personally owned vehicles	$ 119,565.00	$ 115,437.15		$ 115,437.15	$ 4,127.85
	Totals	$ 119,565.00	$ 115,437.15		$ 115,437.15	$ 4,127.85
Care and Operation of Offices in Ward Yards:						
201 A20	Salaries and wages	$ 1,000.00	$ 998.17		$ 998.17	$ 1.83
201 C20	General supplies	1,000 00	999.02		999.02	.98
201 D20	Material for repairs and replacements	1,000.00	877.66		877.66	122.34
201 E20	Repairs and replacements by contract or open order	500.00	479 06		479.06	20.94
201 G20	Purchase of furniture, fittings and library	500.00	474.32		474.32	25.68
201 L20	Fuel and power	2,000.00	2,000.00		2,000.00	
201 S20	Personal services other than by employes	500.00	480.53		480.53	19.47
201 T20	Impersonal services and benefits	4,500.00	4,210.04		4,210.04	289.96
201 Y21	Maintenance of automobiles	2,173 46	1,999.95		1,999.95	173.51
	Totals	$ 13,173.46	$ 12,518.75		$ 12,518.75	$ 654.71

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF STREETS—Continued					
Operation and Maintenance of Auto Flushers:					
201 A21 Salaries of drivers	$ 3,700.00	$ 3,651.12	.....	$ 3,651.12	$ 48.88
201 A22 Laborers	2,700.00	2,671.59	.....	2,671.59	28.41
201 T22 Impersonal services and benefits	84.43	84.43	.....	84.43	.....
201 Y22 Maintenance of flushers	4,855 57	4,783.71	.....	4,783.71	71.86
Totals	$ 11,340.00	$ 11,190.85	.....	$ 11,190.85	$ 149.15
Street and Public Utility Inspection:					
201 A30 Salaries and wages	$ 60,440.00	$ 56,550.65	.....	$ 56,550.65	$ 3,889.35
201 A31 Assistant street inspectors (not to exceed $4.50 per day)	6,000.00	6,000.00	.....	6,000.00	.....
201 C30 Supplies	190.00	.....	.....	.....	190.00
Totals	$ 66,630.00	$ 62,550.65	.....	$ 62,550 65	$ 4,079.35
201 Y43 Maintenance and extension of street signs	$ 5,000.00	$ 3,964.66	.....	$ 3,964.66	$ 1,035.34
	$ 5,000.00	$ 3,964.66	.....	$ 3,964.66	$ 1,035.34
Construction and Betterments:					
209 X 6 Providing ward office in 6th ward	$ 2,731.00	.....	$ 2,118.96	$ 2,118.96	$ 612.04
209 X14 Providing ward office in 11th ward and purchase of real estate	5,000.00	.....	5,000.00	5,000.00	.....
209 X23 Providing ward office in 23rd ward	2,526.16	.....	2,523.74	2,523.74	2.42
209 X34 Providing ward office in 34th ward	3,000.00	.....	1,128.62	1,128.62	1,871.38
209 X35 Providing ward office in 35th ward	3,000.00	.....	62.80	62.80	2,937 20
201 X40 Building of concrete sidewalk intersections	4,000.00	.....	3,851.30	3,851.30	148.70
201 X41 Building and repairing of curbs	5,000.00	.....	4,449.65	4,449.65	550.35
201 X42 Building and construction of storage sheds in various wards	2,473 84	.....	2,473.84	2,473.84	.....
209 X31 Providing ward office in 31st ward	3,000.00	.....	.....	.....	3,000.00
Totals	$ 30,731.00	.....	$ 21,608.91	$ 21,608.91	$ 9,122.09

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BUREAU OF STREETS—Continued					
Removal of Snow, Street Sweeping and Refuse:					
202 T40 Cleaning of streets and removal of snow in loop district by Citizens' Street Cleaning Bureau	$ 51,000.00	$ 51,000.00	.....	$ 51,000.00	.....
202 Y40 For expenses incurred in 1914 for repairs of cars, switch tracks, etc., for 1915 contract with the Chicago Ry's Co. for hauling, etc.	8,000.00	6,976.22	.....	6,976.22	$ 1,023.78
202 T41 Cleaning Haymarket square	5,000.00	4,999.92	.....	4,999.92	.08
202 T42 Contract with Street Railways Co.	32,000.00	25,927.50	.....	25,927.50	6,072.50
202 T43 Contract with Illinois Central R. R. Co.	6,500.00	4,910.00	.....	4,910.00	1,590.00
202 X50 Construction of loading platform at 15th place and Loomis street and removal of street dirt, ashes and refuse	4,783.94	.....	$ 1,265.59	1,265.59	3,518.35
Totals	$ 107,283.94	$ 93,813.64	$ 1,265.59	$ 95,079.23	$ 12,204.71
Maintenance and Operation of Snow Dumps:					
202 A50 Salaries and wages	$ 350.00	$ 135.40	.....	$ 135.40	$ 214.60
202 B50 Hire of teams, horses and carts	150.00	60.00	.....	60.00	90.00
202 D50 Material for repairs and replacements	400.00	347.15	.....	347.15	52.85
Totals	$ 900.00	$ 542.55	.....	$ 542.55	$ 357.45
Street Cleaning Permanent Equipment:					
202 F40 Purchase of 2 squeegee machines	$ 2,600.00	$ 2,300.00	.....	$ 2,300.00	$ 300.00
202 C40 Purchase of street dirt boxes, for temporary storage of dirt	8,800 00	8,683.40	.....	8,683.40	116.60
202 W40 Purchase of paper burners, can carrying carts, wheelbarrows, etc.	3,500.00	2,513.45	.....	2,513.45	986.55
202 C41 Purchase of 300 cans for use in collecting street dirt	300.00	275.00	.....	275.00	25.00
Totals	15,200.00	$ 13,771.85	.....	$ 13,771.85	$ 1,428.15
Removal and Disposal of Garbage, Ashes and Refuse—other than by Wards:					
Maintenance and Operation of Dumps:					
203 A50 Salaries and wages	$ 71,575.00	$ 71,208.59	.....	$ 71,208.59	$ 366.41
203 B50 Hire of teams, horses and carts	2,300.00	2,046.00	.....	2,046.00	254.00
203 C50 Supplies	400.00	349.74	.....	349.74	50.26
203 W50 Tools and implements including their repair	150.00	125.22	.....	125.22	24.78
203 D50 Material for repairs and replacements	475 00	466.28	.....	466.28	8.72
203 E50 Repairs and replacements by contract or open order	75.00	38.55	.....	38.55	36.45
203 G50 Furniture, fittings, fixtures and library	85.00	68.77	.....	68.77	16.23
203 J50 Street car and railway transportation	100.00	95.40	.....	95.40	4.60
203 L50 Fuel and power	280.00	255.45	.....	255.45	24.55
203 T50 Impersonal services and benefits	210.00	155.16	.....	155.16	54.84
203 Y Unpaid bills of 1914	3,342.60	3,342.60	.....	3,342.60	.....
Totals	$ 78,992.60	$ 78,151.76	.....	$ 78,151.76	$ 840.84

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF STREETS—Continued					
Maintenance and Operation of Loading Stations, Scows, Wagons, etc.,					
204 A50 Salaries and wages	$ 40,640.00	$ 40,468.98	.....	$ 40,468.98	$ 171.02
204 B50 Hire of teams, horses and carts	500.00	403.50	.....	403.50	96.50
204 C50 Supplies	1,600.00	980.47	.....	980.47	619.53
204 D50 Material for repairs and replacements	6,400.00	6,104.68	.....	6,104.68	295.32
204 E50 Repairs and replacements, by contract or open order	250.00	243.18	.....	243.18	6.82
204 F50 Apparatus, machinery, vehicles and harness	400.00	6.63	.....	6.63	393.37
204 G50 Furniture, fittings, fixtures and library	50.00	45.28	.....	45.28	4.72
204 L50 Fuel and power	2,100.00	1,834.88	.....	1,834.88	265.12
204 T50 Impersonal services and benefits	30,200.00	17,361.30	.....	17,361.30	12,838.70
204 W50 Tools and implements including their repair	300.00	166.26	.....	166.26	133.74
Totals	$ 82,440.00	$ 67,615.16	.....	$ 67,615.16	$ 14,824.84
205 X40 For cost of lowering subway and sidewalk in 51st st. under track of Chicago, R. I. P. R. R	$ 6,500.00	.....	$ 6,416.37	$ 6,416.37	$ 83.63
Totals	$ 6,500.00	.....	$ 6,416.37	$ 6,416.37	$ 83.63
Removal of Dead Trees:					
205 A40 Salaries and wages	$ 1,000.00	$ 909.20	.....	$ 909.20	$ 90.80
205 B40 Hire of teams, horses and carts	400.00	400.00	.....	400.00	.....
Totals	$ 1,400 00	$ 1,309.20	.....	$ 1,309.20	$ 90.80
Repairs of Approaches to Bridges.					
205 A41 Salaries and wages	$ 2,000.00	$ 1,963.79	.....	$ 1,963.79	$ 36.21
205 B41 Hire of teams, horses and carts	1,000.00	657.00	.....	657.00	343.00
205 D41 Material for repairs and replacements	1,915.08	1,915.08	.....	1,915.08	.....
205 E41 Repairs and replacements, by contract or open order	384.92	.....	.....	.....	384.92
Totals	$ 5,300.00	$ 4,535.87	.....	$ 4,535.87	$ 764.13
205 U41 City's share of Morgan Park's obligation to city of Blue Island for improvement of 119th st. from Western to Vincennes aves	$ 288.15	$ 288.15	.....	$ 288.15	.....
Totals	$ 288.15	$ 288.15	.....	$ 288.15	.....
205 X41 City's share of building subway under railway tracks at 21st st. and Campbell avenue and extending to 31st st	$ 25,000.00	.....	$ 25,000.00	$ 25,000.00	.....
Totals	$ 25,000.00	.....	$ 25,000.00	$ 25,000.00	.....

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BUREAU OF STREETS—Continued

Cleaning Streets and Alleys:

202 A 1	Wages—Laborers and Sub-Foremen	$ 161,965.00	$ 161,965.00	$ 161,965.24	.....
202 A 2	" "	24,470 00	24,223.84	24,223.84	$ 246.16
202 A 3	" "	27,360.00	26,341.56	26,341.56	1,018.44
202 A 4	" "	24,865.00	22,094.17	22,094.17	2,770 83
202 A 5	" "	29,435.00	27,911.02	27,911.02	1,523.98
202 A 6	" "	28,260.00	26,737.08	26,737.08	1,522.92
202 A 7	" "	22,760.00	22,759.99	22,759.99	.01
202 A 8	" "	16,745.00	15,156.02	15,156.02	1,588.98
202 A 9	" "	18,855.00	16,965.72	16,965.72	1,889.28
202 A10	" "	22,140.00	18,356.92	18,356.92	3,783.08
202 A11	" "	25,856.00	25,251.30	25,251.30	608.70
202 A12	" "	19,080 00	17,667.02	17,667.02	1,362 98
202 A13	" "	31,545.00	31,543.95	31,543.95	1.05
202 A14	" "	29,060.00	29,060.00	29,060.00	.....
202 A15	" "	22,180.00	21,475.95	21,475.95	704.05
202 A16	" "	21,450.00	20,329.62	20,329.62	1,120.38
202 A17	" "	22,930 00	22,522.46	22,522.46	407.54
202 A18	" "	74,105.00	71,713.21	71,713.21	2,391.79
202 A19	" "	33,565.00	33,508.41	33,508.41	56.59
202 A20	" "	26,965.00	25,504.14	25,504.14	1,460.86
202 A21	" "	40,625.00	39,288.55	39,288.55	1,336.45
202 A22	" "	28,820.00	27,743.29	27,743.29	1,076.71
202 A23	" "	24,715.00	24,586.57	24,586.57	128.43
202 A24	" "	25,360.00	24,031.09	24,031.09	1,328.91
202 A25	" "	28,365.00	28,365.00	28,365.00	.....
202 A26	" "	35,535.00	30,103.45	30,103.45	5,431.55
202 A27	" "	30,475.00	30,475.00	30,475.00	.....
202 A28	" "	27,600.00	26,649.66	26,649.66	950.34
202 A29	" "	18,510.00	17,567.30	17,567.30	942.70
202 A30	" "	25,256.00	25,253.84	25,253.84	1.16
202 A31	" "	25 020.00	25,019.78	25,019.78	.22
202 A32	" "	27,795.00	27,704.19	27,704.19	90.81
202 A33	" "	26,975.00	26,975.00	26,975.00	.....
202 A34	" "	21,975.00	21,676.18	21,676.18	298.82
202 A35	" "	24,945 00	24,945.00	24,945.00	.....
	Totals	$ 1,095,410.00	$ 1,061,871.28	$1,061,871.28	$ 34,088.72

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CORPORATE FUND—Continued

	Appropriation	Expenditures			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF STREETS—Continued					
Cleaning Streets and Alleys.					
202 B 1 Hire of Teams, Horses and Carts	$ 41,480.00	$ 41,417.25	.....	$ 41,417.25	$ 62.75
202 B 2 " "	6,565.00	6,172.50	.....	6,172.50	392.50
202 B 3 " "	6,430.00	4,929.00	.....	4,929.00	1,501.00
202 B 4 " "	1,850.00	1,850.00	.....	1,850.00	.....
202 B 5 " "	1,415.00	1,254.62	.....	1,254.62	160.38
202 B 6 " "	5,590.00	5,269.50	.....	5,269.50	320.50
202 B 7 " "	4,380.00	4,377.00	.....	4,377.00	3 00
202 B 8 " "	1,560.00	1,497.00	.....	1,497.00	63.00
202 B 9 " "	3,960.00	2,010.00	.....	2,010.00	1 950.00
202 B10 " "	6,250.00	4,706.00	.....	4,706.00	1,544.00
202 B11 " "	4,995.00	4,831.00	.....	4,831.00	164.00
202 B12 " "	3,350.00	2,766.00	.....	2,766.00	584.00
202 B13 " "	6,555.00	6,540.00	.....	6,540.00	15.00
202 B14 " "	7,655.00	7,473.00	.....	7,473.00	182.00
202 B15 " "	5,850.00	5,699.25	.....	5,699.25	150.75
202 B16 " "	7,175.00	6,396.00	.....	6,396.00	779.00
202 B17 " "	8,760.00	8,725.00	.....	8,725.00	35.00
202 B18 " "	21,410.00	21,081.50	.....	21,081.50	328.50
202 B19 " "	9,465.00	9,465.00	.....	9,465.00	.....
202 B20 " "	6,430.00	4,922.00	.....	4,922.00	1,508.00
202 B21 " "	9,640.00	8,899.50	.....	8,899.50	740.50
202 B22 " "	7,000.00	7,000.00	.....	7,000.00	.....
202 B23 " "	9,290.00	9,290.00	.....	9,290.00	.....
202 B24 " "	7,045.00	6,861.00	.....	6,861.00	184.00
202 B25 " "	8,415.00	7,950.00	.....	7,950.00	465.00
202 B26 " "	7,095.00	6,669.00	.....	6,669.00	426.00
202 B27 " "	4,490.00	4,490.00	.....	4,490.00	.....
202 B28 " "	5,150.00	5,008.50	.....	5,008.50	141.50
202 B29 " "	2,070.00	2 070.00	.....	2,070.00	.....
202 B30 " "	2,820.00	2,820.00	.....	2,820.00	.....
202 B31 " "	6,230.00	5,949.00	.....	5,949.00	281.00
202 B32 " "	6,520.00	5,010.00	.....	5,010.00	1,510.00
202 B33 " "	4,809.00	4,809.00	.....	4,809.00	.....
202 B34 " "	4,760.00	4,760.00	.....	4,760.00	.....
202 B35 " "	4,980.00	4,980.00	.....	4,980.00	.....
Totals	$ 251,439.00	$ 237,947.62	.....	$ 237,947.62	$ 13,491.38

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BUREAU OF STREETS—Continued

Cleaning Streets and Alleys:

202 W 1	Tools and Implements including their Repair	$ 3,900.00	$ 3,713.36		$ 3,713.36	$ 186.64
202 W 2	" "	500.00	303.16		303.16	196.84
202 W 3	" "	450.00	434.69		434.69	15.31
202 W 4	" "	450.00	268.05		268.05	181.95
202 W 5	" "	450.00	414.99		414.99	35.01
202 W 6	" "	450.00	363.15		363.15	86.85
202 W 7	" "	450.00	436.35		436.35	13.65
202 W 8	" "	225.00	113.65		113.65	111.35
202 W 9	" "	200.00	134.89		134.89	65.11
202 W10	" "	450.00	436.22		436.22	13.78
202 W11	" "	450.00	396.52		396.52	53.48
202 W12	" "	300.00	300.00		300.00	
202 W13	" "	600.00	571.31		571.31	28.69
202 W14	" "	450.00	376.32		376.32	73.68
202 W15	" "	75.00	46.88		46.88	28.12
202 W16	" "	275.00	206.87		206.87	68.13
202 W17	" "	475.00	366.93		366.93	108.07
202 W18	" "	1,800.00	1,736.81		1,736.81	63.19
202 W19	" "	500.00	500.00		500.00	
202 W20	" "	500.00	500.00		500.00	
202 W21	" "	900.00	702.16		702.16	197.84
202 W22	" "	450.00	450.00		450.00	
202 W23	" "	500.00	351.34		351.34	148.66
202 W24	" "	450.00	411.23		411.23	38.77
202 W25	" "	500.00	426.30		426.30	73.70
202 W26	" "	500.00	391.57		391.57	108.43
202 W27	" "	475.00	430.32		430.32	44.68
202 W28	" "	350.00	293.36		293.36	56.64
202 W29	" "	350.00	348.70		348.70	1.30
202 W30	" "	450.00	435.40		435.40	14.60
202 W31	" "	450.00	214.70		214.70	235.30
202 W32	" "	450.00	372.43		372.43	77 57
202 W33	" "	450.00	450.00		450.00	
202 W34	" "	400.00	197.04		197.04	202.96
202 W35	" "	400.00	400.00		400.00	
	Totals	$ 20,025.00	$ 17,494.70		$ 17,494.70	$ 2,530.30

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CORPORATE FUND—Continued.

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF STREETS—Continued					
Cleaning Streets and Alleys:					
202 A101 Street Flushing	$ 1,170.00	$ 1,169.20	.....	$ 1,169.20	$ 0.80
202 B101 "	6,120.00	6,120.00	.....	6,120.00	.....
202 B102 "	2,700.00	339.00	.....	339.00	2,361.00
202 B103 "	1,800.00	108.00	.....	108.00	1,692.00
202 B104 "	1,700.00	69.00	.....	69.00	1,631.00
202 B105 "	800.00	219.00	.....	219.00	581.00
202 B106 "	1,800.00	369.00	.....	369.00	1,431.00
202 B107 "	1,700.00	1,700.00	.....	1,700.00	.....
202 B108 "	700.00	681.00	.....	681.00	19.00
202 B109 "	900.00	123.00	.....	123.00	777.00
202 B110 "	1,800.00	1,062.00	.....	1,062.00	738.00
202 B111 "	1,100.00	1,049.00	.....	1,049.00	51.00
202 B112 "	900.00	240.00	.....	240.00	660.00
202 B113 "	700.00	522.00	.....	522.00	178.00
202 B114 "	327.00	327.00	.....	327.00	.....
202 B115 "	153.00	153.00	.....	153.00	.....
202 B116 "	1,800.00	354.00	.....	354.00	1,446.00
202 B117 "	363.00	363.00	.....	363.00	.....
202 B118 "	825.00	825.00	.....	825.00	.....
202 B119 "	2,700.00	1,147.00	.....	1,147.00	1,553.00
202 B120 "	2,700.00	856.00	.....	856.00	1,844.00
202 B121 "	2,940.00	2,266.50	.....	2,266.50	673.50
202 B122 "	700.00	639.00	.....	639.00	61.00
202 B123 "	600.00	552.00	.....	552.00	48.00
202 B124 "	1,800.00	237.00	.....	237.00	1,563.00
202 B126 "	600.00	489.00	.....	489.00	111.00
202 B128 "	1,800.00	408.00	.....	408.00	1,392.00
202 B129 "	200.00	198.00	.....	198.00	2.00
202 B130 "	357.00	357.00	.....	357.00	.....
202 B131 "	1,800.00	108.00	.....	108.00	1,692.00
202 B132 "	900.00	30.00	.....	30.00	870.00
202 B134 "	6.00	6.00	.....	6.00	.....
202 B135 "	66.00	66.00	.....	66.00	.....
Totals	$ 44,527.00	$ 23,151.70	.....	$ 23,151.70	$ 21,375.30

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BUREAU OF STREETS—Continued

Removal of Ashes and Refuse—By Wards:

203 A 1	Wages—Laborers and Sub-Foremen	$ 2,405.00	$ 2,385.00		$ 2,385 00	$ 20.00
203 A 2	" "	2,270.00	2,270.00		2,270.00	
203 A 3	" "	1,605.00	1,605.00		1,605.00	
203 A 4	" "	1,500.00	1,347.25		1,347.25	152.75
203 A 5	" "	1,820.00	1,706.53		1,706.53	113.47
203 A 6	" "	3,585.00	3,585.00		3,585.00	
203 A 7	" "	2,280.00	2,280.00		2,280.00	
203 A 8	" "	2,270.00	2,270.00		2,270.00	
203 A 9	" "	1,605.00	1,605.00		1,605.00	
203 A10	" "	800.00	799.62		799.62	.38
203 A11	" "	1,605.00	1,595.30		1,595.30	9.70
203 A12	" "	2,040.00	2,008.75		2,008.75	31.25
203 A13	" "	1,605.00	1,570.60		1,570.60	34.40
203 A14	" "	1,060.00	1,060.00		1,060.00	
203 A15	" "	1,610.00	1,608.75		1,608.75	1.25
203 A16	" "	1,205.00	1,185.89		1,185.89	19.11
203 A17	" "	1,610.00	1,610.00		1,610.00	
203 A18	" "	2,620.00	2,530.70		2,530.70	89.30
203 A19	" "	1,465.00	1,465.00		1,465.00	
203 A20	" "	1,605.00	1,605.00		1,605.00	
203 A21	" "	2,270.00	2,270.00		2,270.00	
203 A22	" "	1,605.00	1,605.00		1,605.00	
203 A23	" "	3,495.00	3,401.90		3,401.90	93.10
203 A24	" "	1,610.00	1,610.00		1,610.00	
203 A25	" "	2,595.00	2,594.75		2,594.75	.25
203 A26	" "	2,575.00	2,574.20		2,574.20	.80
203 A27	" "	1,605.00	1,604.90		1,604.90	.10
203 A28	" "	2,055.00	2,055.00		2,055.00	
203 A29	" "	2,045.00	2,044.42		2,044.42	.58
203 A30	" "	1,605.00	1,603.07		1,603.07	1.93
203 A31	" "	1,605.00	1,604.90		1,604.90	.10
203 A32	" "	2,175.00	2,174.00		2,174.00	1.00
203 A33	" "	2,350.00	2,350.00		2,350.00	
203 A34	" "	2,740.00	2,711.07		2,711.07	28.93
203 A35	" "	2,330.00	2,330.00		2,330.00	
	Totals	$ 69,225.00	$ 68,626.60		$ 68,626.60	$ 598.40

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF STREETS—Continued					
Removal of Ashes and Refuse—By Wards:					
203 B 1 Hire of Teams, Horses and Carts	$ 29,815.00	$ 29,019.00		$ 29,019.00	$ 796.00
203 B 2 " "	28,010.00	28,010.00		28,010.00	
203 B 3 " "	24,705.00	24,705.00		24,705.00	
203 B 4 " "	19,330.00	19,330.00		19,330.00	
203 B 5 " "	14,625.00	14,610.00		14,610.00	15.00
203 B 6 " "	17,865.00	17,865.00		17,865.00	
203 B 7 " "	22,905.00	22,905.00		22,905.00	
203 B 8 " "	20,385.00	20,385.00		20,385.00	
203 B 9 " "	23,470.00	23,470.00		23,470.00	
203 B10 " "	16,920.00	16,920.00		16,920.00	
203 B11 " "	16,985.00	15,048.00		15,048.00	1,937.00
203 B12 " "	15,750.00	15,750.00		15,750.00	
203 B13 " "	24,165.00	24,165.00		24,165.00	
203 B14 " "	26,910.00	26,910.00		26,910.00	
203 B15 " "	25,540.00	25,539.00		25,539.00	1.00
203 B16 " "	16,560.00	16,560.00		16,560.00	
203 B17 " "	20,160.00	20,160.00		20,160.00	
203 B18 " "	27,990.00	27,990.00		27,990.00	
203 B19 " "	21,825.00	21,825.00		21,825.00	
203 B20 " "	21,150.00	21,071.00		21,071.00	79.00
203 B21 " "	40,025.00	40,025.00		40,025.00	
203 B22 " "	28,055.00	28,055.00		28,055.00	
203 B23 " "	30,870.00	30,870.00		30,870.00	
203 B24 " "	22,345.00	22,345.00		22,345.00	
203 B25 " "	25,265.00	25,265.00		25,265.00	
203 B26 " "	25,245.00	25,245.00		25,245.00	
203 B27 " "	14,780.00	14,780.00		14,780.00	
203 B28 " "	21,935.00	21,935.00		21,935.00	
203 B29 " "	18,090.00	18,090.00		18,090.00	
203 B30 " "	20,565.00	20,565.00		20,565.00	
203 B31 " "	20,700.00	20,700.00		20,700.00	
203 B32 " "	31,165.00	31,164.00		31,164.00	1.00
203 B33 " "	24,140.00	24,140.00		24,140.00	
203 B34 " "	22,095.00	22,095.00		22,095.00	
203 B35 " "	21,240.00	21,240.00		21,240.00	
Totals	$ 801,580.00	$ 798,751.00		$ 798,751.00	$ 2,829.00

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BUREAU OF STREETS—Continued

Removal of Ashes and Refuse:

203 A101	Alley Cleaning	$ 4,805.00	$ 4,805.00		4,805.00	
203 A102	" "	5,660.00	5,660.00		5,660.00	
203 A103	" "	3,420.00	3,420.00		3,420.00	
203 A104	" "	2,285.00	2,131.72		2,131.72	153.28
203 A105	" "	2,285.00	2,269.95		2,269.95	15.05
203 A106	" "	2,285.00	2,285.00		2,285.00	
203 A107	" "	2,290.00	2,289.76		2,289.76	.24
203 A108	" "	1,230.00	1,225.36		1,225.36	4.64
203 A109	" "	1,150.00	528.08		528.08	621.92
203 A110	" "	4,565.00	4,259.83		4,259.83	305.17
203 A111	" "	3,385.00	2,626.83		2,626.83	758.17
203 A112	" "	2,285.00	2,285.00		2,285.00	
203 A113	" "	3,805.00	3,803.42		3,803.42	1.58
203 A114	" "	3,040.00	3,040.00		3,040.00	
203 A115	" "	3,805.00	3,572.78		3,572.78	232.22
203 A116	" "	3,040.00	1,338.44		1,338.44	1,701.56
203 A117	" "	3,040.00	3,040.00		3,040.00	
203 A118	" "	5,335.00	4,563.05		4,563.05	771.95
203 A119	" "	5,335.00	5,335.00		5,335.00	
203 A120	" "	4,950.00	4,773.28		4,773.28	176.72
203 A121	" "	3,260.00	3,260.00		3,260.00	
203 A122	" "	3,420.00	3,420.00		3,420.00	
203 A123	" "	3 045.00	3,044.70		3,044.70	.30
203 A124	" "	3,045.00	1,890.82		1,890.82	1,154.18
203 A125	" "	1,910.00	1,909.85		1,909.85	.15
203 A126	" "	1,145.00	310.90		310.90	834.10
203 A127	" "	1,530.00	1,529.90		1,529.90	.10
203 A128	" "	3,040.00	3,040.90		3,040.00	
203 A129	" "	2,285.00	1,924.90		1,924.90	360.10
203 A130	" "	2,665.00	1,981.92		1,981.92	683.08
203 A131	" "	2,285.00	1,670.38		1,670.38	614.62
203 A232	" "	1,530.00	1,529.27		1,529.27	.73
203 A133	" "	1,905.00	1,905.00		1,905.00	
203 A134	" "	1,540.00	1,441.35		1,441.35	98.65
203 A135	" "	1,910.00	1,908.55		1,908.55	1.45
	Total	$ 102,510.00	$ 94,020.04		$ 94,020.04	$ 8,489.96

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF STREETS—Continued					
Removal and Disposal of Pure Garbage—By Wards:					
204 A 1 Wages—Laborers and Sub-Foremen	$ 3,170.00	$ 3,154.75		$ 3,154.75	$ 15.25
204 A 2 " "	3,225.00	3,051.91		3,051.91	173.09
204 A 3 " "	2,980.00	2,980.00		2,980.00	
204 A 4 " "	1,005.00	1,005.00		1,005.00	
204 A 5 " "	1,010.00	945.12		945.12	64.88
204 A 6 " "	2,680.00	2,227.04		2,227.04	452.96
204 A 7 " "	2,565.00	2,565.00		2,565.00	
204 A10 " "	2,085.00	2,077.20		2,077.20	7.80
204 A11 " "	2,105.00	2,060.20		2,060.20	44.80
204 A12 " "	2,205.00	2,205.00		2,205.00	
204 A13 " "	4,045.00	3,641.85		3,641.85	403.15
204 A14 " "	2,540.00	2,540.00		2,540.00	
204 A15 " "	3,395.00	3,395.00		3,395.00	
204 A16 " "	2,190.00	2,190.00		2,190.00	
204 A17 " "	2,735.00	2,735.00		2,735.00	
204 A18 " "	3,760.00	3,760.00		3,760.00	
204 A19 " "	2,700.00	2,689.55		2,689.55	10.45
204 A20 " "	2,250.00	2,250.00		2,250.00	
204 A21 " "	2,620.00	1,805.70		1,805.70	814.30
204 A22 " "	2,430.00	2,430.00		2,430.00	
204 A23 " "	2,155.00	2,124.87		2,124.87	30.13
204 A24 " "	3,110.00	3,050.64		3,050.64	59.36
204 A25 " "	2,340.00	2,338.95		2,338.95	1.05
204 A26 " "	3,060.00	3,060.00		3,060.00	
204 A27 " "	3,600.00	3,600.00		3,600.00	
204 A28 " "	2,880.00	2,880.00		2,880.00	
204 A29 " "	2,520.00	2,514.61		2,514.61	5.39
204 A30 " "	2,700.00	2,699.45		2,699.45	.55
204 A31 " "	3,420.00	3,420.00		3,420.00	
204 A32 " "	4,015.00	4,014.71		4,014.71	.29
204 A33 " "	3,600.00	3,600.00		3,600.00	
204 A34 " "	2,970.00	2,970.00		2,970.00	
204 A35 " "	3,705.00	3,705.00		3,705.00	
Totals	$ 91,770.00	$ 89,686.55		$ 89,686.55	$ 2,083.45

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BUREAU OF STREETS—Continued

Removal and Disposal of Pure Garbage—By Wards:

204 B 1	Hire of Teams, Horses and Carts	$ 6,490.00	$ 6,490.00	$ 6,490.00	
204 B 2	" "	10,435.00	10,435.00	10,435.00	
204 B 3	" "	11,610.00	11,610.00	11,610.00	
204 B 4	" "	7,200.00	7,200.00	7,200.00	
204 B 5	" "	6,410.00	6,410.00	6,410.00	
204 B 6	" "	10,015.00	9,477.00	9,477.00	$ 538.00
204 B 7	" "	9,180.00	9,180.00	9,180.00	
204 B10	" "	5,655.00	5,655.00	5,655.00	
204 B11	" "	5,740.00	5,740.00	5,740.00	
204 B12	" "	7,465.00	7,465.00	7,465.00	
204 B13	" "	13,055.00	13,053.00	13,053.00	2.00
204 B14	" "	8,985.00	8,985.00	8,985.00	
204 B15	" "	10,510.00	10,510.00	10,510.00	
204 B16	" "	6,750.00	6,750.00	6,750.00	
204 B17	" "	6,840.00	6,840.00	6,840.00	
204 B18	" "	9,995.00	9,642.00	9,642.00	353.00
204 B19	" "	5,175.00	5,175.00	5,175.00	
204 B20	" "	5,995.00	5,995.00	5,995.00	
204 B21	" "	8,450.00	8,450.00	8,450.00	
204 B22	" "	5,810.00	5,154.00	5,154.00	656.00
204 B23	" "	11,390.00	11,390.00	11,390.00	
204 B24	" "	8,315.00	8,202.00	8,202.00	113.00
204 B25	" "	13,050.00	13,050.00	13,050.00	
204 B26	" "	14,400.00	14,400.00	14,400.00	
204 B27	" "	11,700.00	11,700.00	11,700.00	
204 B28	" "	7,920.00	7,920.00	7,920.00	
204 B29	" "	6,955 60	6,882.00	6,882.00	73.00
204 B30	" "	9,325.00	9,324.00	9,324.00	1.00
204 B31	" "	13,475.00	13,475.00	13,475.00	
204 B32	" "	12,855.00	12,855.00	12,855.00	
204 B33	" "	14,245.00	14,245.00	14,245.00	
204 B34	" "	11,700.00	11,700.00	11,700.00	
204 B35	" "	15,480.00	15,480.00	15,480.00	
	Totals	$ 312,575.00	$ 310,839.00	$ 310,839.00	$ 1,736.00

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF STREETS—Continued					
Repairing of Unimproved Streets, Sidewalks and Miscellaneous Street Work—By Wards:					
205 A 1 Wages—Laborers and Sub-Foremen	$ 750.00	$ 374.62		$ 374.62	$ 375.38
205 A 2 " "	100.00	100.00		100.00	
205 A 3 " "	100.00	80.83		80.83	19.17
205 A 4 " "	100.00	35.05		35.05	64.95
205 A 5 " "	800.00	794.18		794.18	5.82
205 A 6 " "	100.00	100.00		100.00	
205 A 7 " "	100.00	100.00		100.00	
205 A 8 " "	2,000.00	1,968.35		1,968.35	31.65
205 A 9 " "	1,200.00	1,195.00		1,195.00	5.00
205 A10 " "	200.00				200.00
205 A11 " "	45.00	38.88		38.88	6.12
205 A12 " "	450.00	321.75		321.75	128.25
205 A13 " "	100.00	99.10		99.10	.90
205 A14 " "	100.00	100.00		100.00	
205 A15 " "	100.00	99.00		99.00	1.00
205 A16 " "	100.00	58.70		58.70	41.30
205 A17 " "	150.00	150.00		150.00	
205 A18 " "	100.00	77.58		77.58	22.42
205 A19 " "	100.00	89.13		89.13	10.87
205 A20 " "	100.00	5.88		5.88	94.12
205 A21 " "	100.00	100.00		100.00	
205 A22 " "	100.00	100.00		100.00	
205 A23 " "	50.00	36.70		36.70	13.30
205 A24 " "	100.00	98.93		98.93	1.07
205 A25 " "	300.00	298.13		298.13	1.87
205 A26 " "	300.00	300.00		300.00	
205 A27 " "	2,500.00	2,499.95		2,499.95	.05
205 A28 " "	50.00	49.50		49.50	.50
205 A29 " "	1,300.00	1,300.00		1,300.00	
205 A30 " "	100.00	98.97		98.97	1.03
205 A31 " "	150.00	146.25		146.25	3.75
205 A32 " "	750.00	745.88		745.88	4.12
205 A33 " "	300.00	300.00		300.00	
205 A34 " "	650.00	650.00		650.00	
205 A35 " "	900.00	899.68		899.68	.32
Totals	$ 14,445.00	$ 13,412.04		$ 13,412.04	$ 1,032.96

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BUREAU OF STREETS—Continued

Repairing of Unimproved Streets, Sidewalks and Miscellaneous Street Work—By Wards:

205 B 1	Hire of Teams, Horses and Carts	$ 400.00	$ 147.00	.....	$ 147.00	$ 253.00
205 B 2	" "	110.00	110.00	.....	110.00	.....
205 B 3	" "	110.00	110.00	.....	110.00	.....
205 B 4	" "	110.00	.....	.....	.....	110.00
205 B 5	" "	1,000.00	984.00	.....	984.00	16.00
205 B 6	" "	110.00	110.00	.....	110.00	.....
205 B 7	" "	125.00	125.00	.....	125.00	.....
205 B 8	" "	2,300.00	2,300.00	.....	2,300.00	.....
205 B 9	" "	1,500.00	1,372.50	.....	1,372.50	127.50
205 B10	" "	100.00	95.00	.....	95.00	5.00
205 B11	" "	200.00	200.00	.....	200.00	.....
205 B12	" "	1,500.00	1,149.00	.....	1,149.00	351.00
205 B13	" "	110.00	110.00	.....	110.00	.....
205 B14	" "	110.00	110.00	.....	110.00	.....
205 B15	" "	110.00	110.00	.....	110.00	.....
205 B16	" "	110.00	102.00	.....	102.00	8.00
205 B17	" "	110.00	110.00	.....	110.00	.....
205 B18	" "	110.00	33.00	.....	33.00	77.00
205 B19	" "	110.00	110.00	.....	110 00	.....
205 B20	" "	110.00	30.50	.....	30.50	79.50
205 B21	" "	110.00	110.00	.....	110.00	.....
205 B22	" "	110.00	110.00	.....	110.00	.....
205 B23	" "	150.00	150.00	.....	150.00	.....
205 B24	" "	150.00	150.00	.....	150.00	.....
205 B25	" "	300.00	300.00	.....	300.00	.....
205 B26	" "	300.00	300.00	.....	300.00	.....
205 B27	" "	2,500.00	2,500.00	.....	2,500.00	.....
205 B28	" "	150.00	150.00	.....	150.00	.....
205 B29	" "	1,600.00	1,600.00	.....	1,600.00	.....
205 B30	" "	110.00	108.00	.....	108.00	2.00
205 B31	" "	350.00	350.00	.....	350.00	.....
205 B32	" "	1,200.00	1,199.25	.....	1,199.25	.75
205 B33	" "	600.00	600.00	.....	600.00	.....
205 B34	" "	900.00	900.00	.....	900.00	.....
205 B35	" "	350.00	350.00	.....	350.00	.....
	Totals	$ 17,325.00	$ 16,295.25	.....	$ 16,295.25	$ 1,029.75

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Totals	
BUREAU OF STREETS—Continued					
Repairing Unimproved Streets, Sidewalks and Miscellaneous Street Work—By Wards:					
205 D 1 Material for Repairs and Replacements	$ 175.00	$ 149.70		$ 149.70	$ 25.30
205 D 2 " "	90.00	70.17		70.17	19.83
205 D 3 " "	90.00	19.35		19.35	70.65
205 D 4 " "	90.00	48.11		48.11	41.89
205 D 5 " "	500.00	28.63		28.63	471 37
205 D 6 " "	90.00	43.74		43.74	46.26
205 D 8 " "	200.00	7.62		7.62	192.38
205 D 9 " "	500.00	185.67		185.67	314.33
205 D10 " "	100.00				100.00
205 D11 " "	65.00	64.72		64.72	.28
205 D12 " "	150.00	9.75		9.75	140.25
205 D13 " "	100.00	25.06		25.06	74.94
205 D14 " "	100.00	10.52		10.52	89.48
205 D16 " "	100.00	1.00		1.00	99.00
205 D17 " "	100.00	40.32		40.32	59.68
205 D18 " "	100.00	3.98		3.98	96.02
205 D19 " "	100.00	66.39		66.39	33.61
205 D20 " "	100.00	36.31		36.31	63.69
205 D21 " "	100.00	91.04		91.04	8.96
205 D22 " "	100.00	99.46		99.46	.54
205 D23 " "	25.00	4.92		4.92	20.08
205 D24 " "	100.00				100.00
205 D25 " "	100.00	35.39		35.39	64.61
205 D26 " "	350.00	201.85		201.85	148.15
205 D27 " "	1,500.00	1,496.52		1,496.52	3.48
205 D28 " "	100.00	9.72		9.72	90.28
205 D29 " "	900.00	892.40		892.40	7.60
205 D30 " "	100.00	66.15		66.15	33.85
205 D31 " "	100.00				100.00
205 D32 " "	500.00	269.86		269.86	230.14
205 D33 " "	600.00	598.43		598.43	1.57
205 D34 " "	200.00				200.00
205 D35 " "	150.00	150.00		150.00	
Totals	$ 7,675.00	$ 4,726.78		$ 4,726.78	$ 2,948.22

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BUREAU OF STREETS—Continued

Special Snow Removal:

207 Y 1	Removal of Snow in 1st Ward	$ 75,000.00	$ 71,889.12		$ 71,889.12	$ 3,110.88
207 Y 2	" " " " 2nd "	5,000.00	4,977.61		4,977.61	22.39
207 Y 3	" " " " 3rd "	600.00	600.00		600.00	
207 Y 4	" " " " 4th "	2,000.00	2,000.00		2,000.00	
207 Y 5	" " " " 5th "	1,500.00	1,500.00		1,500.00	
207 Y 6	" " " " 6th "	500.00	499.82		499.82	.18
207 Y 7	" " " " 7th "	1,500.00	1,499.93		1,499.93	.07
207 Y10	" " " " 10th "	2,000.00	1,995.49		1,995.49	4.51
207 Y13	" " " " 13th "	500.00	499.03		499.03	.97
207 Y16	" " " " 16th "	500.00	499.58		499.58	.42
207 Y17	" " " " 17th "	2,700.00	2,700.00		2,700.00	
207 Y18	" " " " 18th "	16,400.00	16,400.00		16,400.00	
207 Y19	" " " " 19th "	3,000.00	3,000.00		3,000.00	
207 Y20	" " " " 20th "	5,000.00	4,548.87		4,548.87	451.13
207 Y21	" " " " 21st "	12,500.00	12,239.89		12,239.89	260.11
207 Y22	" " " " 22nd "	3,500.00	3,500.00		3,500.00	
207 Y23	" " " " 23rd "	500.00	500.00		500.00	
	Totals	$ 132,700.00	$ 128,849.34		$ 128,849.34	$ 3,850.66

Ditching in Various Wards:

209 Y 5	Ditching in 5th Ward	$ 2,000.00	$ 2,000.00		$ 2,000.00	
209 Y 8	" " 8th "	500.00	81.75		81.75	$ 418.25
209 Y 9	" " 9th "	800.00	800.00		800.00	
209 Y12	" " 12th "	500.00	198.38		198.38	301.62
209 Y25	" " 25th "	200.00	189.00		189.00	11.00
209 Y26	" " 26th "	750.00	75.70		75.70	674.30
209 Y27	" " 27th "	3,000.00	3,000.00		3,000.00	
209 Y29	" " 29th "	3,000.00	2,999.97		2,999.97	.03
209 Y32	" " 32nd "	1,500.00	1,024.20		1,024.20	475.80
209 Y33	" " 33rd "	975.00	974.05		974.05	.95
209 Y34	" " 34th "	1,000.00	1,000.00		1,000.00	
	Totals	$ 14,225.00	$ 12,343.05		$ 12,343.05	$ 1,881.95

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF STREETS—Continued					
For Emergency Expenditures from ward activities after depletion of appropriations hereinbefore set forth:					
208 Y 1st Ward	$ 5,185.00	$ 4,092.88		$ 4,092.88	$ 1,092.12
208 Y 2nd "	5,510.00	4,122.27		4,122.27	1,387.73
208 Y 3rd "	4,925.00	3,863.40		3,863.40	1,061.60
208 Y 4th "	4,485.00	4,001.93		4,001.93	483.07
208 Y 5th "	3,900.00	3,631.95		3,631.95	268.05
208 Y 6th "	4,055.00	3,794.15		3,794.15	260.85
208 Y 7th "	5,775.00	5,738.95		5,738.95	36.05
208 Y 8th "	5,685.00	5,333.04		5,333.04	351.96
208 Y 9th "	2,910.00	2,700.18		2,700.18	209.82
208 Y10th "	3,340.00	3,277.71		3,277.71	62.29
208 Y11th "	6,530.00	5,893.05		5,893.05	636.95
208 Y12th "	3,310.00	2,887.52		2,887.52	422.48
208 Y13th "	8,690.00	6,489.38		6,489.38	2,200.62
208 Y14th "	6,698.00	6,404.80		6,404.80	293.20
208 Y15th "	7,372.00	6,670.82		6,670.82	701.18
208 Y16th "	3,310.00	2,013.72		2,013.72	1,296.28
208 Y17th "	6,157.00	5,991.12		5,991.12	165.88
208 Y18th "	7,635.00	6,865.31		6,865.31	769.69
208 Y19th "	4,050.00	3,911.71		3,911.71	138.29
208 Y20th "	3,995.00	2,067.18		2,067.18	1,927.82
208 Y21st "	6,290.00	6,254.76		6,254.76	35.24
208 Y22nd "	8,095.00	5,380.31		5,380.31	2,714.69
208 Y23rd "	8,180.00	6,793.52		6,793.52	1,386.48
208 Y24th "	4,260.00	1,671.52		1,671.52	2,588.48
208 Y25th "	5,920.00	5,917.85		5,917.85	2.15
208 Y26th "	6,355.00	6,007.67		6,007.67	347.33
208 Y27th "	5,395.00	5,395.00		5,395.00	
208 Y28th "	4,210.00	2,757.47		2,757.47	1,452.53
208 Y29th "	5,580.00	4,728.48		4,728.48	851.52
208 Y30th "	6,638.00	5,747.84		5,747.84	890.16
208 Y31st "	4,615.00	4,338.16		4,338.16	276.84
208 Y32nd "	5,745.00	5,729.01		5,729.01	15.99
208 Y33rd "	10,676.00	10,619.35		10,619.35	56.65
208 Y34th "	7,519.00	7,176.83		7,176.83	342.17
208 Y35th "	5,799.00	5,567.19		5,567.19	231.81
Totals	$ 198,794.00	$ 173,836.03		$ 173,836.03	$ 24,957.97

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BUREAU OF STREETS—Continued					
Street or Alley Improvement or Repairs (to be paid from receipts of vehicle tax licenses) General Administration:					
206 A 1 Salaries and wages	$ 30,620.00	$ 29,772.47	.....	$ 29,772.47	$ 847.53
206 Y1 to 35 Ward Service—For repairing permanent pavements, oiling, screening and repairing macadam pavements in different wards of the city	554,800.00	500,827.21	.....	500,827.21	53,972.79
206 Y40 Maintenance of equipment, purchase of supplies, printing and stationery, furniture, fittings, advertising, transportation, fuel, power, etc.	46,559.00	46,312.30	.....	46,312.30	246.70
206 Y41 For resurfacing and repairing 22nd street west of Crawford ave.	6,872.00	6,855.24	.....	6,855.24	16.76
206 Y42 For repairing and improving streets and alleys and such of the through routes as shall be determined upon by the City Council, amounts to be expended in the discretion of the Commissioner of Public Works and under his direction	132,399.00	131,740.14	.....	131,740.14	658.86
206 Y50 To be expended in wards where needed at the discretion of the Commissioner of Public Works	29,853.00	28,227.61	.....	28,227.61	1,625.39
Apparatus and Equipment Comprising Permanent Outfit for Repairing Streets and Alleys:					
206 FX40 For purchase of six 500-gallon tar tank wagons	2,397.00	.....	2,397.00	2,397.00	.....
206 FX41 For purchase of sprinklers for oiling, and necessary alterations to present oiling equipment	5,780.00	.....	5,780.00	5,780.00	.....
206 FX44 For purchase of one portable concrete paving mixer	1,120.00	.....	1,120.00	1,120.00	.....
206 FX45 For purchase of testing apparatus for laboratory	600.00	.....	333.66	333.66	276.34
Totals	$ 811,000.00	$ 743,734.97	$ 9,630.66	$ 753,355.63	$ 57,644.37
Totals Bureau of Streets	$ 4,628,657.69	$ 4,327,699.51	$ 63,911.53	$ 4,391,611.04	$ 237,046.65

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CORPORATE FUND—Continued

		Appropriation	EXPENDITURES			Unexpended Balance
			Ordinary	Extraordinary	Total	
BUREAU OF SEWERS:						
Superintendence:						
301 A	Salaries	$ 19,337.00	$ 19,231.83	.....	$ 19,231.83	$ 105.17
301 C	General supplies	50 00	49.89	.....	49.89	.11
301 E	Repairs and replacements by contract or open order	7.00	6.73	.....	6.73	.27
301 G	Furniture, fittings, fixtures and library	40.00	39.63	.....	39.63	.37
301 H	Printing, stationery and office supplies	1,050.00	1,003.03	.....	1,003.03	46.97
301 I	Advertising	100.00	79.28	.....	79.28	20.72
301 J	Street car and railroad transportation	2,700.00	2,699.30	.....	2,699.30	.70
301 S	Personal services other than by employes	100.00	99.91	.....	99.91	.09
	Totals	$ 23,384.00	$ 23,209.60	.....	$ 23,209.60	$ 174.40
House Drains:						
301 A10	Salaries	$ 39,724.00	$ 39,401.94	.....	$ 39,401.94	$ 322.06
	Totals	$ 39,724.00	$ 39,401.94	.....	$ 39,401.94	$ 322.06
Repairing Sewers:						
301 A30	Salaries and wages	$ 55,225.00	$ 55,224.27	.....	$ 55,224.27	$ 0.73
301 A31	Mason inspection	6,708.00	6 563.46	.....	6,563.46	144.54
301 A32	Inspection and other services to be reimbursed from deposits	4,000.00	3,998.42	.....	3,998.42	1.58
301 B30	Hire of teams, horses and carts	15,000.00	14,999.08	.....	14,999.08	.92
301 C30	General supplies	180.00	179.45	.....	179.45	.55
301 D30	Material for repairs and replacements	12,000.00	11,959 28	.....	11,959.28	40.72
301 L30	Fuel and power	170.00	162.25	.....	162.25	7.75
301 S30	Personal services other than by employes	25.00	.....	.....	.....	25.00
301 T30	Impersonal services and benefits	225.00	174.84	.....	174.84	50.16
301 W30	Tools and implements including their repairs	300.00	279.30	.....	279.30	20.70
	Totals	$ 93,833.00	$ 93,540.35	.....	$ 93,540.35	$ 292.65
Construction and Betterments:						
301 X50	Sewer construction including sewer outfalls, new catch basins and connecting sewers	$ 3,244.00	.....	$ 3,243.72	$ 3,243.72	$ 0.28
301 V51	To reimburse "Real Estate Capital Acct." for money expended for reversionary rights in pumping station property	3,450.00	.....	3,450.00	3,450.00	.....
301 X51	Betterment of sewer yards, such as road walks, fences, setting of trees, etc.	18.00	.....	17.14	17.14	.86
	Totals	$ 6,712.00	.....	$ 6,710.86	$ 6,710.86	$ 1.14

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BUREAU OF SEWERS—Continued					
Cleaning Sewers:					
301 A40 Salaries	$ 12,560.00	$ 12,555.62		$ 12,555.62	$ 4.38
301 A41 Salaries and wages—assistant foremen and laborers	200,784.60	200,764.79		200,764.79	19.81
301 B40 Hire of teams, horses and carts	82,151.00	82,121.80		82,121.80	29.20
301 C40 General supplies	863.00	860.85		860.85	2.15
301 D40 Material for repairs and replacements	590.00	571.77		571.77	18.23
301 E40 Repairs and replacements by contract or open order	250.00	227.70		227.70	22.30
301 F40 Apparatus, machinery, vehicles and harness	28.00	25.78		25.78	2.22
301 G40 Furniture, fittings, fixtures and library	35.00	34.29		34.29	.71
301 L40 Fuel and power	250.00	232.05		232.05	17.95
301 S40 Personal services other than by employes	50.00	50.00		50.00	
301 T40 Impersonal services, and benefits	600.00	573.88		573.88	26.12
301 W40 Tools and implements including their repairs	700.00	645.02		645.02	54.98
Totals	$ 298,861.60	$ 298,663.55		$ 298,663.55	$ 198.05
Restoration of Streets:					
301 E50 Repairs by contract or open order	$ 8,026.91	$ 8,025.14		$ 8,025.14	$ 1.77
301 S50 Personal services for testing	148.00	147.38		147.38	.62
Totals	$ 8,174.91	$ 8,172.52		$ 8,172.52	$ 2.39
Surveys and Bench Monuments:					
301 A51 Salaries	$ 4,260.00	$ 4,225.00		$ 4,225.00	$ 35.00
	$ 4,260.00	$ 4,225.00		$ 4,225.00	$ 35.00
301 Y51 Construction and betterments bench monuments	$ 12.00		$ 11.09	$ 11.09	$ 0.91
	$ 12.00		$ 11.09	$ 11.09	$ 0.91
Totals Bureau of Sewers	$ 474,961.51	$ 467,212.96	$ 6,721.95	$ 473,934.91	$ 1,026.60

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Total	
BUREAU OF ENGINEERING:					
Division of Bridges, Harbor and Viaducts—Superintendence:					
401 A 1 Salaries	$ 15,080.00	$ 12,979.97		$ 12,979.97	$ 2,100.03
401 A 2 Mechanical inspectors detailed for corporation inspection (reimbursed)	7,500.00	3,197.50		3,197.50	4,302.50
Totals	$ 22,580.00	$ 16,177.47		$ 16,177.47	$ 6,402.53
Bridges and Viaducts:					
401 A 3 Salaries	$ 7,000.00	$ 5,759.18		$ 5,759.18	$ 1,240.82
401 Y Preparation of plans for repairs and betterments of existing bridges	11,000.00	11,000.00		11,000.00	
401 A 4 Track elevation	684.19	684.19		684.19	
401 Y10 For raising Laramie Ave. Viaduct and constructing foot bridges	12,000.00				12,000.00
401 C General supplies	7,500.00	6,643.58		6,643.58	856.42
401 G Furniture, fittings, fixtures and library	175.00	157.00		157.00	18.00
401 H Printing, stationery and office supplies	750.00	691.54		691.54	58.46
401 I Advertising	275.00	197.87		197.87	77.13
401 J Street car and railroad transportation	2,300.00	1,786.00		1,786.00	514.00
401 S Personal services other than by employes	1,500.00	1,434.94		1,434.94	65.06
401 T Impersonal services and benefits	15,000.00	13,336.66		13,336.66	1,663.34
401 W Tools and implements including their repairs	2,200.00	2,117.64		2,117.64	82.36
Totals	$ 60,384.19	$ 43,808.60		$ 43,808.60	$ 16,575.59
Repairs and Replacements:					
401 A10 Salaries and wages	$ 32,450.00	$ 28,744.77		$ 28,744.77	$ 3,705.23
401 A11 Mechanics and pile driver crew	155,180.81	155,180.81		155,180.81	
401 A15 Pattern makers and painters	275.20	275.10		275.10	.10
401 A12 Laborers	14,819.19	14,818.15		14,818.15	1.04
401 B10 Hire of teams, horses and carts	3,400.00	3,396.76		3,396.76	3.24
401 D10 Material for repairs and replacements	100,000.00	80,382.14		80,382.14	19,617.86
401 E10 Repairs and replacements, by contract or open order	27,000.00	23,442.49		23,442.49	3,557.51
401 F10 Apparatus, machinery, vehicles and harness	17,284.50	11,000.39		11,000.39	6,284.11
401 Y11 Repairs of retaining wall at Loomis street bridge	1,000.00	508.81		508.81	491.19
401 E32 For repairing dock at Samson Slip	1,200.00	1,198.78		1,198.78	1.22
Totals	$ 352,609.70	$ 318,948.20		$ 318,948.20	$ 33,661.50

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BUREAU OF ENGINEERING—Continued					
Damage to Bridges (to be reimbursed):					
401 A13 Wages, mechanics and laborers	$ 5,000.00	$ 2,732.29		$ 2,732.29	$ 2,267.71
401 D11 Materials for repairs and replacements	4,000.00	3,449.68		3,449.68	550.32
401 A14 Expenditures made as the result of accidental damages	3,500.00	56.55		56.55	3,443.45
401 B11 Hire of teams, horses and carts	100.00	75.00		75.00	25.00
401 D12 Material for repairs and replacements	1,000.00				1,000.00
401 E12 Repairs and replacements by contract or open order	300.00				300.00
Totals	$ 13,900.00	$ 6,313.52		$ 6,313.52	$ 7,586.48
To be reimbursed by railroad companies:					
401 X40 Viaduct on East and West 12th St., from Canal St. to Wabash Ave.	$ 1,500,000.00		$ 19,177.82	$ 19,177.82	$ 1,480,822.18
Totals	$ 1,500,000.00		$ 19,177.82	$ 19,177.82	$ 1,480,822.18
Bridge Operation:					
401 A21 Salaries	$ 215,607.50	$ 204,840.84		$ 204,840.84	$ 10,766.66
401 A22 Laborer to operate ferry	912.50	893.75		893.75	18.75
401 G20 Furniture, fittings, fixtures and library	3,500.00	3,478.64		3,478.64	21.36
401 L20 Fuel and power	30,500.00	30,312.45		30,312.45	187 55
Totals	$ 250,520.00	$ 239,525.68		$ 239,525.68	$ 10,994.32
Rivers and Harbors:					
401 A31 Salaries	$ 7,100.75	$ 7,060.12		$ 7,060.12	$ 40.63
Totals	$ 7,100.75	$ 7,060.12		$ 7,060.12	$ 40.63
Harbor Master's Office:					
401 A32 Salaries	$ 14,040.00	$ 12,144.58		$ 12,144.58	$ 1,895.42
401 C30 General supplies	200.00	136.25		136.25	63.75
401 D30 Material for repairs and replacements	50.00	39.80		39.80	10.20
401 E30 Repairs and replacements, by contract or open order	4,450.00	1,502.48		1,502.48	2,947.52
401 F30 Apparatus, machinery, vehicles and harness	100.00	46.95		46.95	53.05
401 G30 Furniture, fittings, fixtures and library	250.00	223.66		223.66	26.34
401 H30 Printing, stationery and office supplies	250.00	248.97		248.97	1.03
401 I30 Advertising	50.00	38.03		38.03	11.97
401 J30 Street car and railroad transportation	750.00	749.00		749.00	1.00
401 L30 Fuel and power	350.00	246.74		246.74	103.26
401 T30 Impersonal services, and benefits	475.00	274.32		274.32	200.68
401 T300 Impersonal services and benefits (to be reimbursed by Sanitary Trustees)	5,000.00				5,000.00
401 S30 Personal services other than by employes	1,000.00	25.00		25.00	975 00
Totals	$ 26,965.00	$ 15,675.78		$ 15,675.78	$ 11,289.22

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CORPORATE FUND—Continued

	Appropriation	EXPENDITURES			Unexpended Balance
		Ordinary	Extraordinary	Totals	
BUREAU OF ENGINEERING—Continued					
Construction and Repair of Bridges:					
401 X37 Monroe street bridge (to be reimbursed by R. R. Co.)	$ 250,000.00		$ 14,961.16	$ 14,961.16	$ 235,038.84
401 E14 Repairs to 12th street bridge	30,000.00				30,000.00
401 E13 Building east approach to Monroe street bridge	11,750.00				11,750.00
401 Y12 Repairing Crawford avenue bridge	2,000.00	$ 1,810.67		1,810.67	189.33
Totals	$ 293,750.00	$ 1,810.67	$ 14,961.16	$ 16,771.83	$ 276,978.17
Construction of New Bridges. To be paid for out of the proceeds of Bridge Bonds:					
901 X 2 Belmont avenue bridge	$ 300,000.00		$ 137,446.77	$ 137,446.77	$ 162,553.23
901 X 6 West 12th street bridge	600,000.00		39,520.01	39,520.01	560,479.99
901 X 7 Lake street bridge	504,878.84		355,185.55	355,185.55	149,693.29
901 X 8 Indiana avenue bridge over Calumet river	17,500.00		17,403.78	17,403.78	96.22
901 X 9 Weed street bridge	1,000.00		126.22	126.22	873.78
901 X10 South California avenue bridge	25,000.00		22,156.48	22,156.48	2,843.52
901 X11 Fuller street bridge	10,000.00		126.22	126.22	9,873.78
901 X15 Madison street bridge	10,000.00		1,813.82	1,813 82	8,186.18
901 X16 Clark street bridge	10,000.00		4,125.02	4,125.02	5,874.98
901 X17 Webster avenue bridge	267,000.00		150,810.02	150,810.02	116,189.98
901 X18 One Hundred and Sixth street bridge	1,000.00		126.22	126.22	873.78
901 X25 Montrose boulevard bridge	70,000.00		37,239.47	37,239.47	32,760.53
901 X31 One Hundredth street bridge	1,000.00		126.22	126.22	873.78
901 X32 La Salle street bridge	250,000.00		25,506.59	25,506.59	224,493.41
901 X33 Lawrence avenue bridge	80,000.00		1,131.03	1,131.03	78,868.97
901 X34 North Spalding avenue bridge	5,000.00		126.22	126.22	4,873 78
901 X35 Blackhawk street bridge	1,000.00		161.22	161.22	838.78
901 X36 Franklin street bridge	297,500.00		2,625.90	2,625.90	294,874.10
Totals	$ 2,450,878.84		$ 795,756.76	$ 795,756.76	$ 1,655,122.08
Totals Bureau of Engineering	$ 4,978,688.48	$ 649,320.04	$ 829,895.74	$ 1,479,215.78	$ 3,499,472.70
Total Corporate	$10,515,047.45	$ 5,815,664.21	$ 906,864.88	$ 6,722,529.09	$ 3,792,518 36

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TABLE No. 11

STATEMENT OF EXPENDITURES OF BUREAU OF STREETS FOR THE YEAR 1915

GENERAL SUPERINTENDENCE:		
Office salaries and supplies	$ 66,923.32	
Ward Superintendents, Clerks, Yardmen and maintenance of personally owned vehicles	117,437.10	$ 184,360.42
CARE AND OPERATION OF OFFICES IN WARD YARDS:		
Wages	$ 998.17	
General supplies	999.02	
Material and repairs	1,356.72	
Furniture and fittings	474.32	
Fuel and power	2,000.00	
Services, benefits, etc	4,690.57	10,518.80
OPERATION AND MAINTENANCE OF AUTO FLUSHERS:		
Salaries and supplies		11,190.85
STREET OPENINGS AND OBSTRUCTIONS:		
Public Utility Inspection—Salaries and expenses,		62,550.65
CLEANING STREETS AND ALLEYS AND FLUSHING SAME:		
Wages	$1,156,560.52	
Hire of teams, horses and carts	259,930.12	
Tools and implements	17,494.70	
By Citizens Street Cleaning Bureau	51,000.00	
Cleaning Haymarket Square	4,999.92	
By railway and traction companies' transportation of sweepings and refuse	30,837.50	
By Car Service and Repairs due Chicago Railways Co. for 1914	6,976.22	1,527,798.98
SNOW REMOVAL AND MAINTENANCE OF SNOW DUMPS		129,391.89
REMOVAL AND DISPOSAL OF ASHES AND REFUSE:		
Wages	$ 68,626.60	
Hire of teams, horses and carts	798,751.00	
Maintenance and operation of dumps	78,151.76	945,529.36
CONSTRUCTION OF LOADING STATION AT LOOMIS STREET AND 15TH PLACE:		1,265.59
REMOVAL OF PURE GARBAGE:		
Wages	$ 89,686.55	
Hire of teams, horses and carts	310,839.00	
Docks and loading stations	67,615.16	468,140.71

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TABLE No. II—Continued

REPAIRING UNIMPROVED STREETS, SIDEWALKS, AND EMERGENCY STREET WORK			$ 34,434.07
FOR EMERGENCY EXPENDITURES FROM WARD ACTIVITIES AFTER DEPLETION OF APPROPRIATION			173,836.03
DITCHING IN VARIOUS WARDS			12,343.05
MAINTENANCE AND EXTENSION OF STREET SIGNS:			3,964.66
STREET CLEANING PERMANENT EQUIPMENT:			13,771.85
REMOVAL OF DEAD TREES:			1,309.20
REPAIRS OF APPROACHES TO BRIDGES			4,535.87
CITY'S SHARE OF MORGAN PARK'S OBLIGATION TO CITY OF BLUE ISLAND FOR IMPROVING 119TH ST. FROM WESTERN TO VINCENNES AVENUES:			288.15
CONSTRUCTION AND BETTERMENTS:			
Ward offices and storage sheds	$ 13,307.96		
Concrete sidewalk intersections	3,851.30		
Curbs	4,449.65		
Subways	31,416.37		53,025.28
STREET REPAIRS—FROM VEHICLE TAX LICENSES:			
Salaries and wages	$ 29,772.47		
Repairing in different wards	507,682.45		
To be expended at the discretion of the Commissioner of Public Works	159,967.75		
Maintenance of equipment	46,312.30		
Apparatus and equipment	9,620.66		753,355.63
Total			$1,391,611.04

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Bench monuments	11.09	6,721.95
Total		$ 473,934.91

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TABLE No. II—Continued

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TABLE No. IV

STATEMENT OF EXPENDITURES OF BUREAU OF SEWERS FOR THE YEAR 1915

GENERAL SUPERINTENDENCE:		
Salaries and expenses		$ 23,209.60
HOUSE DRAINS:		
Salaries		39,401.94
REPAIRING SEWERS:		
Salaries and wages	$ 55,224.27	
Mason inspection	6,563.46	
Inspection and other services (to be reimbursed)	3,998.42	
Hire of teams, horses and carts	14,999.08	
Materials, supplies, repairs, etc	12,755.12	93,540.35
CLEANING SEWERS:		
Salaries and wages	$ 213,320.41	
Hire of teams, horses and carts	82,121.80	
Materials, supplies, tools, etc	3,221.34	298,663.55
RESTORATION OF STREETS BY DEPOSITS		8,172.52
SURVEYS AND BENCH MONUMENTS:		4,225.00
CONSTRUCTION AND BETTERMENTS:		
Outfalls, new catch basins and connecting sewers	$ 3,243.72	
Reimbursing "Real Estate Capital Acct." for money expended for reversionary rights in pumping station property	3,450.00	
Walks, fences, etc	17.14	
Bench monuments	11.09	6,721.95
Total		$ 473,934.91

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TABLE No. V

STATEMENT OF EXPENDITURES OF DIVISION OF BRIDGES, HARBORS AND VIADUCTS FOR THE YEAR 1915

GENERAL SUPERINTENDENCE:		
Salaries	$ 18,739.15	
Inspection (to be reimbursed)	3,197.50	
Preparation of plans for betterment of existing bridges	11,000.00	
General supplies, services, benefits, tools, etc	13,028.57	
Track elevation	684.19	
Impersonal services and benefits	5,036.66	$ 51,686.07
BRIDGES AND VIADUCTS—REPAIRS AND REPLACEMENTS:		
Salaries and wages	$199,018.83	
Hire of teams, horses and carts	3,396.76	
Material and repairs	103,824.63	
Apparatus, machinery, etc	11,000.39	
Repairs of retaining walls, Loomis street bridge	508.81	
Repairs to dock at Samson slip	1,198.78	
Repairing damaged bridges (to be reimbursed)	6,313.52	325,261.72
BRIDGE OPERATION:		
Salaries	$204,840.84	
Operation of ferries	893.75	
General supplies	3,478.64	
Fuel	7,662.45	
Current for operating and lighting	30,950.00	247,825.68
RIVERS AND HARBORS:		
Salaries		7,060.12
HARBOR MASTER'S OFFICE:		
Salaries	$ 12,144.58	
Supplies	1,988.92	
Material and Repairs	1,542.28	15,675.78
CONSTRUCTION AND BETTERMENTS:		
Viaduct on East and West 12th street, from Canal street to Wabash avenue	$ 19,177.82	
Monroe street bridge	14,961.16	
Repairing Crawford avenue bridge	1,810.67	35,949.65
CONSTRUCTION FROM PROCEEDS OF BRIDGE BONDS:		
Belmont avenue bridge	$137,446.77	
West 12th street bridge	39,520.01	
Lake street bridge	355,185.55	
Indiana avenue bridge over Calumet river	17,403.78	
Weed street bridge	126.22	
South California avenue bridge	22,156.48	
Fuller street bridge	126.22	
Madison street bridge	1,813.82	
Clark street bridge	4,125.02	
Webster avenue bridge	150,810.02	
106th street bridge	126.22	
Montrose boulevard bridge	37,239.47	
100th street bridge	126.22	
La Salle street bridge	25,506.59	
Lawrence avenue bridge	1,131.03	
North Spaulding avenue bridge	126.22	
Blackhawk street bridge	161.22	
Franklin street bridge	2,625.90	795,756.76
Total		$ 1,479,215.78

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TABLE No. VI

STATEMENT OF CORPORATE FUND REVENUE OF DEPARTMENT OF PUBLIC WORKS, FOR THE YEAR 1915

ORDINARY ACCOUNTS:		
Commissioner's Office—		
House-drain layers' licenses	$ 2,425.00	
City Hall telephone pay stations	22.50	
Miscellaneous	8.40	
Bureau of Maps and Plats—		
Fees for legal descriptions	1,005.75	
Bureau of Engineering—		
Docking, dredging and towing permits	3,990.06	
Bridges and viaducts	28,957.38	
Inspection	3,197.50	
Bureau of Streets—		
House moving permits	2,204.00	
Cleaning rights of way of traction company	285,569.07	
Public utility inspection	56,670.75	
Use of streets from special deposits	15,852.76	
Cement walk permits	4,675.00	
Sale of old material	6.55	
Miscellaneous	1,500.00	
Bureau of Sewers—		
House-drain permits	44,252.50	
Mason and junction setters' permits	2,970.00	
Sale of old material	109.97	
Miscellaneous	4,772.42	
Bureau of Compensation—		
Space permits	35,583.47	
Sub-sidewalk permits	7,220.00	
Switch tracks	7,482.25	
Canopies	1,030.75	
Scales	171.38	
Use of streets, alleys and docks	6,810.51	
Sub-sidewalk and alley space	898.59	
Vacation of streets and alleys	201,260.91	
Bridges over streets and alleys	201.50	
Bulkheads, platforms, etc	627.16	
Miscellaneous	772.50	
Total		$720,248.63

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TABLE No. VII

STATEMENT OF APPROPRIATIONS AND EXPENDITURES FOR THE YEAR 1915—WATER FUND ACCOUNTS

	Appropriations	EXPENDITURES			Unexpended Balances
		Ordinary Accounts	Extraordinary Accounts	Totals	
DEPARTMENT OF FINANCE—INTEREST:					
W21 P2 Interest on judgments	$ 3,000.00	$ 90.57	.....	$ 90.57	$ 2,909.43
W21 P4 Interest on water pipe extension certificates	15,000.00	8,618.12	.....	8,618.12	6,381.88
Total interest—water	$ 18,000.00	$ 8,708.69	.....	$ 8,708.69	$ 9,291.31
DEPARTMENT OF FINANCE—MISCELLANEOUS:					
W22 U1 For payment of claims on account of moneys deposited in the water fund from unclaimed wages account, suspense account and refunding duplicate payments and payments made in error.	$ 1,000.00	$ 20.40	.....	$ 20.40	$ 979.60
W22 Q For payment of judgments	50,000.00	4,087.35	.....	4,078.35	45,912.65
W22 Q1 For payment of water pipe extension certificates and the redemption of such other water certificates as shall be ordered paid by the City Council	140,000.00	125,585.06	.....	125,585.06	14,414.94
W22 Q3 For payment of 90 per cent refunds of special assessments paid for water supply pipes and water service pipes	60,000.00	.....	$ 59,316.36	59,316.36	683.64
W22 U3 For payment of services in adjusting claims for damages when approved by Corporation Council and Finance Committee	10,000.00	.....	.....	.....	10,000.00
W22 K Rents of real estate and buildings (Bureau of Engineering)	6,215.00	1,455.00	4,715.00	6,170.00	45.00
W22 U4 Workmen's compensation	15,500.00	15,486.08	.....	15,486.08	13.92
W22 Y To reimburse corporate fund for expenditures in various departments having an expense common to both Corporate and Water Funds	275,993.46	262,383.65	.....	262,383.65	13,609.81
CITY REAL ESTATE AND BUILDINGS:					
W20 E1 For repairs to buildings at 3901 Lake avenue	200.00	10.00	.....	10.00	190.00
Total, Miscellaneous	$ 558,908.46	$ 409,027.54	$ 64,031.36	$ 473,058.90	$ 85,849.56
DEPARTMENT OF HEALTH:					
W37 A80 Salaries and wages	$ 5,580.00	$ 5,481.69	.....	$ 5,481.69	$ 98.31
Totals	$ 5,580.00	$ 5,481.69	.....	$ 5,481.69	$ 98.31

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BOARD OF LOCAL IMPROVEMENTS:						
W50 A	Salary of junior clerk to handle refund vouchers for laying water service pipes	$ 1,200.00	$ 1,200.00		$ 1,200.00	
W50 R	Public benefits—water supply pipes	27,310.72		$ 27,193.75	27,193.75	$ 116.97
W50 U	To the Ryan Company for damages in connection with their contract for sewer in 55th street, between Kedzie and Western avenues, special assessment warrant No. 40214. Damages caused by leakage of water mains	870.23	870.23		870.23	
	Totals	$ 29,380.95	$ 2,070.23	$ 27,193.75	$ 29,263.98	$ 116.97
SPECIAL PARK COMMISION:						
W60 A22	Maintenance and operation of bathing beaches at night during summer months	$ 1,200.00	$ 480.00		$ 480.00	$ 720.00
W60 C	Supplies	3,500.00	2,387.57		2,387.57	1,112.43
W60 F	Apparatus, machinery, vehicles and harness	400.00				400.00
W60 G	Furniture, fittings, fixtures and library	100.00	32.34		32.34	67.66
	Totals	$ 52,000.00	$ 2,899.91		$ 2,899.91	$ 2,300.09
SPECIAL PARK COMMISSION—For Construction:						
	Swimming pool at Springfield Avenue pumping station			$ 22,994.37	$ 22,994.37	
	" " " Central Park Avenue pumping station			22,542.24	22,542.24	
	" " " Roseland pumping station			26,497.15	26,497.15	
	" " " Harrison street pumping station					
	" " " Washington Heights pumping station			495.45	495.45	
W60 X	Totals	$ 146,000.00		$ 72,529.21	$ 72,529.21	$ 73,470.79
W60 Y	Capital account for Special Park Commission, to be utilized for the purpose of doing such work for the various departments of the City government as may be reimbursable from appropriations from the water fund	$ 2,000.00		$ 2,000.00	$ 2,000.00	
	Totals	$ 2,000.00		$ 2,000.00	$ 2,000.00	
BUREAU OF ENGINEERING—City Engineer's General Office:						
501 A1	Salaries and wages	$ 30,340.00	$ 28,597.62		$ 28,597.62	$ 1,742.38
501 A2	Overtime	1,141.00	1,139.63		1,139.63	1.37
501 C1	Supplies	200.00	22.66		22.66	177.34
501 E1	Repairs by contract or open order	50.00				50.00
501 G1	Furniture, fittings, fixtures and library	400.00	331.01		331.01	68.99
501 H1	Printing, stationery and office supplies	1,500.00	1,460.80		1,460.80	39.20
501 J1	Street car transportation	100.00	86.75		86.75	13.25
501 S1	Personal service, other than by employes	175.00	31.76		31.76	143.24
501 T1	Impersonal services and benefits	25.00	23.81		23.81	1.19
501 T2	Reimbursing employes for use of personal automobiles	5,000.00	3,181.45		3,181.45	1,818.55
	Totals	$ 38,931.00	$ 34,875.49		$ 34,875.49	$ 4,055.51

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WATER FUND ACCOUNTS—Continued

		Appropriations	EXPENDITURES			Unexpended Balances
			Ordinary Accounts	Extraordinary Accounts	Totals	
BUREAU OF ENGINEERING—Continued						
Testing Division:						
501 Y24	For amount to be withdrawn from the Water Fund and placed in a special fund entitled "Testing Division Capital Account" for expenditures to be made under the direction of the Commissioner of Public Works for which this account is to be reimbursed out of the appropriations of departments or bureaus for which services are performed	$ 15,000.00	.....	$ 15,000.00	$ 15,000.00	.....
501 F	Apparatus, machinery, vehicles and harness	3,150.00	.....	.....	.....	$ 3,150.00
	Totals	$ 18,150.00	.....	$ 15,000.00	$ 15,000.00	$ 3,150.00
Fullerton Avenue Pumping Station:						
501 C11	Supplies	$ 130.00	$ 12.05	.....	$ 12.05	$ 117.95
501 D11	Material for repairs	210.00	.....	.....	.....	210.00
501 E11	Repairs by contract or open order	400.00	15.95	.....	15.95	384.05
501 G11	Furniture, fittings, fixtures and library	25.00	.....	.....	.....	25.00
501 H11	Printing, stationery and office supplies	10 00	.....	.....	.....	10.00
501 L11	Fuel and power	1,000.00	836.06	.....	836.06	163.94
501 S11	Personal service, other than employes	960.00	960.00	.....	960.00	.....
501 T11	Impersonal services and benefits	20.00	.....	.....	.....	20.00
501 W11	Tools and implements, including their repair	25.00	.....	.....	.....	25.00
	Totals	$ 2,780.00	$ 1,824.06	.....	$ 1,824.06	$ 955.94
Sewerage Pumping Stations—						
Salaries and wages:						
501 A 12	Ninety-fifth street	$ 15,777.50	$ 15,760.76	.....	$ 15,760.76	$ 16.74
501 A 13	Stony Island avenue	15,777.50	15,754.32	.....	15,754.32	23.18
501 A 14	Kensington	8,721.67	8,697.61	.....	8,697.61	24.06
501 A 15	Pullman	8,721.67	8,688.05	.....	8,688.05	33.62
501 A 16	Hegewisch	5,043.33	4,895.34	.....	4,895.34	147.99
501 A 17	Rogers Park	975.00	903.00	.....	903.00	72.00
501 A171	Mechanics and laborers, for repair work at pumping stations	1,000.00	575.33	.....	575.33	424.67
	Totals	$ 56,016.67	$ 55,274.41	.....	$ 55,274.41	$ 742.26

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BUREAU OF ENGINERING—Continued						
Sewerage Pumping Stations—General:						
501 B10	Hire of teams, horses and carts	$ 100.00	$ 18.00	.....	$ 18.00	$ 82.00
501 C10	Supplies	1,200.00	1,190.60	.....	1,190.60	9.40
501 D10	Material for repairs	1,500.00	1,134.60	.....	1,134.60	365.40
501 E10	Repairs by contract or open order	3,700.00	2,643.61	.....	2,643.61	1,056.39
501 F10	Apparatus, machinery, vehicles and harness	250.00	88.19	.....	88.19	161.81
501 G10	Furniture, fittings, fixtures and library	150.00	37.54	.....	37.54	112.46
501 H10	Printing, stationery and office supplies	100.00	10.90	.....	10.90	89.10
501 I 10	Advertising	25.00	12.12	.....	12.12	12.88
501 J 10	Street car transportation	25.00	24.15	.....	24.15	.85
501 L10	Fuel and power (including reserve)	15,535.00	14,943.59	.....	14,943.59	591.41
501 S10	Personal services, other than by employes	550.00	447.29	.....	447.29	102.71
501 T10	Impersonal services and benefits	900.00	743.35	.....	743.35	156.65
501 W10	Tools and implements, including their repair	200.00	98.12	.....	98.12	101 88
501 X10	Installation of new boilers, including stoker equipment, at Stony Island avenue pumping station	7,600.00	.....	$ 4,778.74	4,778.74	2,821 26
501 X 9	For construction of sidewalk along city property at Lawrence and No. Washtenaw ave.	600.00	.....	.....	.....	600.00
501 X10	Betterments	6,000.00	.....	4,310.67	4,310.67	1,689.33
501 E15	Overhauling engines at Pullman pumping station	100.00	.....	.....	.....	100.00
501 X17	Rogers Park pumping station: For designs and installation of sewerage pumps and machinery and work in connection with such installation	15,000.00	.....	213.64	213.64	14,786.36
	Totals	$ 53,535.00	$ 21,392.06	$ 9,303.05	$ 30,695.11	$ 22,839.89
General Office—Miscellaneous:						
501 Y20	Maintenance of tunnels, plants and shafts	$ 37,100.00	$ 23,297.06	.....	$ 23,297.06	$ 13,802.94
501 Y21	For payment of unpaid bills	10,500.00	2,177.73	$ 7,163.87	9,341.60	1,158.40
501 Y22	For the purpose of reimbursing the Civil Service Commission Capital Account for the cost of establishing a unit cost system in Bureau of Engineering, and maintenance of same	2,000.00	769.53	.....	769.53	1,230.47
501 Y23	Operation and maintenance of unit cost system	4,000.00	3,177.34	.....	3,177.34	822.66
	Totals	$ 53,600.00	$ 29,421.66	$ 7,163.87	$ 36,585.53	$ 17,014.47
Rivers and Harbors:						
501 A30	Salaries and wages	$ 19,600.00	$ 19,415.10	.....	$ 19,415.10	$ 184.90
	Totals	$ 19,600.00	$ 19,415.10	.....	$ 19,415.10	$ 184.90
Superintendence of Pumping Stations and Cribs:						
502 A1	Salaries and wages	$ 17,220.00	$ 16,923.79	.....	$ 16,923.79	$ 296.21
502 A2	For payment of claims for time lost at pumping stations	1,000.00	291.14	.....	291.14	708.86
	Totals	$ 18,220.00	$ 17,214.93	.....	$ 17,214.93	$ 1,005.07

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WATER FUND ACCOUNTS—Continued

		Appropriations	EXPENDITURES			Unexpended Balances
			Ordinary Accounts	Extraordinary Accounts	Totals	
BUREAU OF ENGINEERING—Continued						
Water Supply Investigation:						
502 A6	Salaries and wages	$ 4,200.00	$ 647.40		$ 647.40	$ 3,552.60
502 C6	Supplies	300.00				300.00
502 F6	Apparatus, machinery, vehicles and harness	500.00				500.00
502 G6	Furniture, fittings, fixtures and library	100.00				100.00
502 H6	Printing, stationery and office supplies	50.00				50.00
502 S6	Personal services, other than employes	500.00	433.09		433.09	66.91
502 T6	Impersonal services and benefits	500.00	9.16		9.16	490.84
	Totals	$ 6,150.00	$ 1,089.65		$ 1,089.65	$ 5,060.35
Pumping Stations—Salaries and wages:						
502 A11	Chicago avenue	$ 55,040.00	$ 52,426.62		$ 52,426.62	$ 2,613.38
502 A12	Fourteenth street	47,306.35	45,742.38		45,742.38	1,563.97
502 A14	Harrison street	27,569.92	27,305.88		27,305.88	264.04
502 A15	Twenty-second street	50,336.82	47,857.16		47,857.16	2,479.66
502 A16	Sixty-eighth street	60,493.00	60,146.30		60,146.30	346.70
502 A17	Lake View	49,702.90	48,916.95		48,916.95	785.95
502 A18	Central Park avenue	58,283.34	57,678.81		57,678.81	604.53
502 A19	Springfield avenue	60,075.72	58,168.27		58,168.27	1,907.45
502 A21	Jefferson Park	7,791.78	6,284.64		6,284.64	1,507.14
502 A22	Rogers Park	9,238 49	8,581.28		8,581.28	657.21
502 A23	Roseland	39,931.48	34,234.80		34,234.80	5,696.68
502 A24	Norwood and Edison Park	1,920.00	772.50		772.50	1,147.50
	Totals	$ 467,689.80	$ 448,115.59		$ 448,115.59	$ 19,574.21
Pumping Stations—General:						
502 B10	Hire of teams, horses and carts	$ 4,588.00	$ 2,279.25		$ 2,279.25	$ 2,308.75
502 C10	Supplies	48,250.00	33,337.57		33,337.57	14,912.43
502 D10	Material for repairs	41,750.00	38,047.68		38,047.68	3,702.32
502 E10	Repairs by contract or open order	168,800.00	122,876.31		122,876.31	45,923.69
502 F10	Apparatus, machinery, vehicles and harness	8,000.00	3,170.33		3,170.33	4,829.67
502 G10	Furniture, fittings, fixtures and library	3,000.00	1,087.20		1,087.20	1,912.80
502 H10	Printing, stationery and office supplies	996.60	979.43		979.43	17.17
502 I 10	Advertising	500.00	349.42		349.42	150.58
502 J 10	Street car transportation	310.20	284.15		284.15	26.05
502 L10	Fuel and power	522,100.00	490,155.11		490,155.11	31,944.89
502 R10	Taxes and special assessments	13,100.00	6,370.64	$ 41.44	6,412.08	6,687.92
502 S10	Personal services, other than employes	8,585.00	6,819.76	21.08	6,840.84	1,744.16
502 T10	Impersonal services and benefits	15,000.00	13,327.94	33.75	13,361.69	1,638.31
502 U10	Damages, refunds and other claims	940.00	183.00		183.00	757.00
502 W10	Tools and implements including their repair	4,904.00	2,070.21		2,070.21	2,833.79
	Totals	$ 840,823.80	$ 721,838.00	$ 96.27	$ 721,434.27	$ 119,389.53

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BUREAU OF ENGINEERING—Continued					
Lake Cribs and Tunnels:					
502 A30 Salaries and wages	$ 30,557.50	$ 29,033.26	.....	$ 29,033.26	$ 1,524.24
502 C30 Supplies	8,750.00	2,436.28	.....	2,436.28	6,313.72
502 D30 Material for repairs	3,500.00	2,122.98	.....	2,122.98	1,377.02
502 E30 Repairs by contract or open order	18,973.00	5,489.49	.....	5,489.49	13,483.51
502 F30 Apparatus, machinery, vehicles and harness	1,977.00	210.21	.....	210.21	1,766.79
502 G30 Furniture, fittings, fixtures and library	600.00	357.85	.....	357.85	242.15
502 H30 Printing, stationery and office supplies	50.00	32.47	.....	32.47	17.53
502 I30 Advertising	50.00	47.91	.....	47.91	2.09
502 J30 Street car transportation	36.00	26.50	.....	26.50	9.50
502 L30 Fuel and power	1,872.00	1,071.85	.....	1,071.85	800.15
502 S30 Personal services, other than by employes	125.00	28.70	.....	28.70	96.30
502 T30 Impersonal services and benefits, including meals	25,000.00	21,867.56	.....	21,867.56	3,132.44
502 W30 Tools and implements, including their repair	386.00	75.92	.....	75.92	310.08
502 X30 Purchase of tug	35,000.00	.....	$ 4,500.00	4,500.00	30,500.00
502 E31 Two-mile crib—addition to second floor of crib structure to provide for sanitary quarters for men employed during the winter months	3,500.00	.....	.....	.....	3,500.00
Totals	$ 130,376.50	$ 62,800.98	$ 4,500.00	$ 67,300.98	$ 63,075.52
Chlorinating Plants:					
502 X300 For construction of chlorinating plants	$ 35,000.00	.....	$ 3,658.62	$ 3,658.62	$ 31,341.38
502 Y 30 Maintenance and operation	25,000.00	$ 2,725.55	.....	2,725.55	22,274.45
Totals	$ 60,000.00	$ 2,725.55	$ 3,658.62	$ 6,384.17	$ 53,615.83
Construction Division—Capital Account:					
502 Y40 For amount to be withdrawn from the water fund and placed in special fund entitled "Construction, Division Capital Account" for expenditures under direction of the Commissioner of Public Works for which this account is to be reimbursed out of the appropriations of departments or bureaus for whom services are rendered	$ 100,000.00	.....	$ 100,000.00	$ 100,000.00	.....
Totals	$ 100,000.00	.....	$ 100,000.00	$ 100,000.00	.....
Construction:					
502 X23 Roseland pumping station—two engines and appurtenances, including engineering, inspection and incidentals	$ 155,000.00	.....	$ 122,371.71	$ 122,371.71	$ 32,628.29
502 X231 Roseland pumping station—new boilers, complete, with coal bunkers, piping, etc., including engineering, inspection and incidentals	25,700.00	.....	10,139.18	10,139.18	15,560.82
502 X232 Roseland pumping station—booster pumps and appurtenances complete, installed in Roseland pumping station for replacing Washington Heights pumping station, including engineering, inspection and incidentals	5,361.40	.....	5,249.80	5,249.80	111.60
Carried forward	$ 186,061.40	.....	$ 137,760.69	$ 137,760.69	$ 48,300.71

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WATER FUND ACCOUNTS—Continued

	Appropriations	EXPENDITURES			Unexpended Balances
		Ordinary Accounts	Extraordinary Accounts	Totals	
BUREAU OF ENGINEERING—Continued					
Construction—Continued:					
Brought forward	$ 186,061.40		$ 137,760.69	$ 137,760.69	$ 48,300.71
502 X 17 Lake View pumping station—rehabilitation of station, including three new engines and new boiler plant, including engineering, inspection and incidentals	320,000.00		251,252.77	251,252.77	68,747.23
502 X171 Lake View pumping station—construction of new breakwater for protection of shore, including inspection, engineering and incidentals	25,000.00		742.74	742.74	24,257.26
502 X233 For payment of contract liabilities to Allis-Chalmers Co. for Roseland pumping station	26,118.06		26,118.06	26,118.06	
502 X234 Installation of water tank and tower at the Chicago and Cook County School for boys	5,000.00		3,027.89	3,027.89	1,972.11
502 X37 Wilson ave. tunnel system—including cribs, engineering, inspection and incidentals	1,200,000.00		1,197,743.95	1,197,743.95	2,256.05
502 X13 Mayfair pumping station, complete, including engineering, inspection and incidentals	150,000.00		95,337.82	95,337.82	54,662.18
502 X18 Central Park ave. pumping station—one turbine-driven centrifugal pump, piping, etc., complete, including engineering, inspection and incidentals	4,145.63		4,145.60	4,145.60	.03
502 Y19 Springfield ave. pumping station—lining pump pits, including engineering, inspection and incidentals	8,000.00				8,000.00
502 X191 Springfield ave. pumping station—one turbine-driven centrifugal pump, piping, etc., including engineering, inspection and incidentals	4,145.62		3,809.75	3,809.75	335.87
502 Y41 For preliminary studies and preparation of general plans and estimates for extensions of the water systems, under direction of city engineer, including high pressure water purposes	15,000.00	$ 6,081.81		6,081.81	8,918.19
501 X25 Marshall Boulevard Municipal Plant—for construction of buildings for pattern storage warehouse, carpenter shop, machine shop, blacksmith shop and foundry and appurtenances, complete, including engineering, inspection and incidentals	1,150,000.00		692,360.23	692,360.23	457,639.77
502 Y18 Central Park ave. pumping station—lining pump pits, including engineering, inspection and incidentals	8,000.00				8,000.00
502 X15 Twenty-second street pumping station—removal of old boilers, foundations for new boilers, installation of two new boilers, breeching, piping, etc., including engineering, inspection and incidentals	20,000.00		5,413.18	5,413.18	14,586.82
Carried forward	$2,919,900.05	$ 1,500,000.00	$1,035,930.12	$1,035,930.12	$1,883,969.93

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BUREAU OF ENGINEERING—Continued						
Construction—Continued:						
	Brought forward	$ 2,919,900.05	$ 1,509,000.00	$ 1,035,930.12	$ 1,035,930.12	$ 1,883,969.93
502 V10	Pumping stations—purchase of real estate	40,000.00	.....	10,090.75	10,090.75	29,909.25
502 X16	Sixty-eighth street pumping station—two 25,000,000 gallon steam turbine-driven centrifugal pumps, foundations and appurtenances, including engineering, inspection and incidentals	81,704.40	.....	9,604.94	9,604.94	72,099.46
502 X12	Fourteenth st. pumping station—one turbine-driven centrifugal pump, piping, etc., including engineering, inspection and incidentals	4,145.63	.....	4,117.61	4,117.61	28.02
502 X14	Harrison st. pumping station—one turbine-driven centrifugal pump, piping, changes in building, boiler, piping, and interior wiring, etc., including engineering, inspection and incidentals.	7,002.33	.....	6,584.32	6,584 32	418.01
502 X21	Jefferson Park pumping station—two centrifugal pumps and appurtenances, including engineering, inspection and incidentals	6,000.00	.....	5,762.25	5,762.25	237.75
501 X24	Municipal plant—improvement of grounds, including roads and tracks and temporary bridge	1,191.42	.....	37.92	37 92	1,153.50
502 X151	Twenty-second street pumping station—wiring station, and miscellaneous betterments, including engineering, inspection and incidentals	918.50	.....	905.89	905.89	12.61
502 X 39	Sixty-eighth street connecting tunnel—from Seventy-third street to Sixty-eighth street pumping station, including engineering, inspection and incidentals	172,000.00	.....	57,623.56	57,623.56	114,376.44
502 X181	Central Park avenue pumping station—new boiler plant and appurtenances, including coal conveyor, etc., also engineering, inspection and incidentals	175,000.00	.....	11,816.23	11,816.23	163,183.77
	Totals	$ 3,609,432.99	$ 6,081.81	$ 2,524,256.15	$ 2,530,337.96	$ 1,079,095.03
Repairs to dock on city property adjoining slip "A"						
502 E42	Repairs by contract or open order	$ 19,000.00	.....	.....	.....	$ 19,000.00
502 I 42	Advertising	50.00	.....	.....	.....	50.00
502 S42	Personal services, other than city employes	950.00	$ 112.17	.....	$ 112.17	837.83
	Totals	$ 20,000.00	$ 112.17	.....	$ 112.17	$ 19,887.83
Water Pipe Extension– Superintendent's Office:						
503 A	Salaries and wages	$ 45,780.00	$ 43,889.67	.....	$ 43,889.67	$ 1,890.33
503 A1	Overtime	446.43	446.43	.....	446.43	.....
503 G	Furniture, fittings, fixtures and library	300.00	293.61	.....	293.61	6.39
503 H	Printing, stationery and office supplies	3,900.00	3,765.85	.....	3,765.85	134.15
503 I	Advertising	300.00	292.35	.....	292.35	7.65
503 J	Street car transportation	750.00	747.80	.....	747.80	2.20
503 S	Personal services, other than city employes	4,300.00	4,185.88	.....	4,185.88	114.12
503 T	Impersonal services and benefits	6,000.00	5,890.46	.....	2,581.75	109.54
503 U	Damages, refunds and other claims	4,800.00	2,581.75	.....	62,093.80	2,218.25
	Totals	$ 66,576.43	$ 62,093.80	.....		$ 4,482.63

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WATER FUND ACCOUNTS—Continued

		Appropriations	EXPENDITURES			Unexpended Balances
			Ordinary Accounts	Extraordinary Accounts	Totals	
BUREAU OF ENGINEERING—Continued						
Pipe Yards:						
503 A10	Salaries and wages	$ 13,020.00	$ 12,955.38	.....	$ 12,9553.8	$ 64.62
503 A11	Salaries and wages—watchmen and laborers	31,500.00	31,494.84	.....	31,4948.4	5.16
503 A12	Salaries and wages—carpenters	3,000.00	3,000.00	.....	3,000.00	.....
503 B10	Hire of teams, horses and carts	300.00	.....	.....	.....	300.00
503 C10	Supplies	500.00	476.61	.....	476.61	23.39
503 J10	Street car transportation	150.00	149.55	.....	149.55	.45
503 T10	Impersonal services and benefits	500.00	493.47	.....	493.47	6.53
503 Y10	Repairs to buildings and grounds of the various pipe yards	1,600.00	502.73	.....	502.73	1,097.27
	Totals	$ 50,570.00	$ 49,072.58	.....	$ 49,072.58	$ 1,497.42
Repairs and Maintenance—Mains, Hydrants, Valves and Services:						
503 A20	Superintendence—salaries and wages	$ 76,680.00	$ 51,981.75	.....	$ 51,981.75	$ 24,698.25
503 A201	Salaries and wages—watchmen, mechanics and laborers	464,852.00	464,579.31	.....	464,579.31	272.69
503 B20	Hire of teams, horses and carts	54,000.00	53,981.00	.....	53,981.00	19.00
503 Y20	Maintenance of drinking fountains	10,000.00	9,060.31	.....	9,060.31	939.69
503 Y21	Changes in water mains on account of sewer connections	10,000.00	9,921.45	.....	9,921.45	78.55
503 C20	Supplies	17,000.00	14,558.20	.....	14,558.20	2,441.80
503 D20	Material for repairs	32,000.00	30,787.49	.....	30,787.49	1,212.51
503 E20	Repairs by contract or open order	112,966.89	110,794.05	.....	110,794.05	2,172.84
503 F20	Apparatus, machinery, vehicles and harness	2,500.00	2,007.08	.....	2,007.08	492.92
503 J20	Street car transportation	3,700.00	3,675.10	.....	3,675.10	24.90
503 L20	Fuel and power	1,500.00	982.66	.....	982.66	517.34
503 M20	Purchase of horses	500.00	430.00	.....	430.00	70.00
503 N20	Forage, shoeing, boarding and care of horses	4,000.00	3,954.46	.....	3,954.46	45.54
503 T20	Maintenance of automobiles—not to exceed $35.00 per month for each automobile	3,780.00	3,778.37	.....	3,778.37	1.63
	Totals	$ 793,478.89	$ 760,491.23	.....	$ 760,491.23	$ 32,987.66
Tapping Section:						
503 A30	Salaries and wages	$ 22,240.00	$ 22,130.70	.....	$ 22,130.70	$ 109.30
503 B30	Hire of teams, horses and carts	21,500.00	19,851.35	.....	19,851.35	1,648.65
503 C30	Supplies	120.00	8.39	.....	8.39	111.61
503 D30	Material for repairs	13,000.00	12,772.30	.....	12,772.30	227.70
503 E30	Repairs by contract or open order	300.00	3.00	.....	3.00	297.00
503 W30	Tools and implements, including their repair	6,000.00	5,689.60	.....	5,689.60	310.40
	Totals	$ 63,160.00	$ 60,455.34	.....	$ 60,455.34	$ 2,704.66

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BUREAU OF ENGINEERING—Continued						
Work done for Board of Local Improvements:						
503 A31X	Salaries and wages	$ 13,860.00	.....	$ 13,696.02	$ 13,696.02	$ 163.98
503 J31X	Street car transportation	150.00	.....	149.35	149.35	.65
	Totals	$ 14,010.00	.....	$ 13,845.37	$ 13,845.37	$ 164.63
Extraordinary:						
503 X80	Private work, laying water pipe, making special taps, etc., for which special deposit has been made	$ 105,000.00	.....	$ 104,025.51	$ 104,025.51	$ 974.49
503 X81	Extensions of mains on revenue, including engineering, inspection and supervision	250,000.00	.....	236,537.60	236,537.60	13,462.40
503 X82	Replacing mains of inadequate size prior to street paving, including engineering, inspection and supervision	160,000.00	.....	159,261.61	159,261.61	738.39
	Totals	$ 515,000.00	.....	$ 499,824.72	$ 499,824.72	$ 15,175.28
Surveys for Electrolysis:						
503 A40	Salaries and wages	$ 2,500.00	$ 2,430.13	.....	$ 2,430.13	$ 69.87
503 C40	Supplies	14.00	5.35	.....	5.35	8.65
503 D40	Material for repairs	50.00	46.81	.....	46.81	3.19
503 E40	Repairs by contract or open order	75.00	3.40	.....	3.40	71.60
503 F40	Apparatus, machinery, vehicles and harness	200.00	131.93	.....	131.93	68.07
503 J40	Street car transportation	100.00	98.05	.....	98.05	1.95
503 W40	Forage, shoeing, boarding and care of horses	300.00	.....	.....	.....	300.00
503 S40	Personal services, other than employes	100.00	44.85	.....	44.85	55.15
503 W40	Tools and implements, including their repair	10.00	.....	.....	.....	10.00
	Totals	$ 3,349.00	$ 2,760.52	.....	$ 2,760.52	$ 588.48
Plumbing Inspection:						
503 A50	Salaries and wages	$ 58,320.00	$ 56,836.06	.....	$ 56,836.06	$ 1,483.94
503 J50	Street car transportation	1,250.00	1,248.15	.....	1,248.15	1.85
	Totals	$ 59,570.00	$ 58,084.21	.....	$ 58,084.21	$ 1,485.79
Rehabilitation—Mains, hydrants, on account of street paving work:						
503 A21	Salaries and wages	$ 155,000.00	$ 150,393.58	.....	$ 150,393.58	$ 4,606.42
503 B21	Hire of teams, horses and carts	10,000.00	9,897.85	.....	9,897.85	102.15
503 C21	Supplies	1,000.00	516.18	.....	516.18	483.82
503 D21	Material for repairs	9,500.00	9,470.95	.....	9,470.95	29.05
503 E21	Repairs by contract or open order	1,000.00	735.25	.....	735.25	264.75
503 F21	Apparatus, machinery, vehicles and harness	1,500.00	315.01	.....	315.01	1,184.99
	Totals	$ 178,000.00	$ 171,328.82	.....	$ 171,328.82	$ 6,671.18

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WATER FUND ACCOUNTS—Continued

		Appropriations	EXPENDITURES			Unexpended Balances
			Ordinary Accounts	Extraordinary Accounts	Totals	
BUREAU OF ENGINEERING—Continued						
Special Construction Work:						
503 X10	Improvements in pipe and district yards	$ 15,000.00	.....	$ 3,442.24	$ 3,442.24	$ 11,557.76
503 X60	Installing drinking fountains throughout the city	10,000.00	.....	8,614.96	8,614.96	1,385.04
503FX61	Apparatus, machinery, vehicles and harness	20,000.00	.....	10,602.90	10,602.90	9,397.10
503 X83	Laying mains for circulation, including engineering, inspection and incidentals	407,265.00	.....	406,258.61	406,258.61	1,006.39
503 X84	Laying mains and installing hydrants for fire protection, including engineering, inspection and incidentals	120,000.00	.....	119,804.07	119,804.07	195.93
503 X85	Laying water supply pipe in Addison street between Harlem and Oak Park avenues	7,500.00	.....	6,588.90	6,588.90	911.10
503 X86	Extending water mains in Twenty-second street and laying supply and distribution pipe to grounds of the Chicago and Cook County School for Boys, including the necessary hydrants, valves, etc	10,861.00	.....	9,439.68	9,439.68	1,421.32
503 X87	Utility galleries on Canal street between Madison and Monroe st.	17,000.00	.....	11,162.73	11,162.73	5,837.27
503 X88	Purchase of cast iron water pipe	500,000.00	.....	.....	.....	500,000.00
503 X89	Laying 24 in. water main in Argyle street from No. Kostner to No. Central Park avenues	7,000.00	.....	6,799.49	6,799.49	200.51
	Feeder mains, including engineering and inspection. Locations are approximate and subject to modification to meet paving and underground conditions:					
503 X73	Addison st., 48th ave. to Central Park ave.; Avondale ave., Central Park ave. to California ave.; Avondale ave. to Diversey boulevard; Diversey boulevard, California ave. to Western ave.	185,280.00	.....	185,182.70	185,182.70	97.30
503 X74	Torrence ave., from 95th to 109th st	55,500.00	.....	50,345.37	50,345.37	5,154.63
503 X75	Stony Island ave., from 66th st. to 57th st.; 57th st., from Stony Island ave. to Washington ave.; Washington ave., from 57th to 51st st.; 51st st., from Washington ave. to Ellis ave.; Ellis ave., from 51st st. to 43rd st	195,900.00	.....	195,520.14	195,520.14	379.86
503 X76	51st st., from Ellis ave. to Wabash ave	45,147.00	.....	43,474.14	43,474.14	1,672.86
503 X77	103rd st., Vincennes road to Leavitt st.; 95th st., Beverly ave. to Leavitt st.; Leavitt st., 95th st. to 107th st.; 107th st., Leavitt st. to Armeda st.; Armeda st., 107th st. to 119th st	98,600.00	.....	90,989.58	90,989.58	7,610.42
503 X78	67th st., Justine st. to 48th ave.	204,114.00	.....	197,777.28	197,777.28	6,336.72
503 X79	Avenue N, from 110th st. to 134th st (24 inch main)	100,000.00	.....	99,949.60	99,949.60	50.40
503 X44	Mains in Addison st. and Irving Park bouleward	2,500.00	.....	.....	.....	2,500.00
503 X46	Mains in 67th st	10,000.00	.....	2,152.84	2,152.84	7,847.16
	Totals	$2,016,667.00	.....	$ 1,448,105.23	$ 1,448,105.23	$ 563,561.77

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BUREAU OF ENGINEERING—Concluded						
Water Works Shops and Repairs:						
504 E	Repairs by contract or open order	$ 2,000.00	.....	$ 430.15	$ 430.15	$ 1,569.85
	Totals	$ 2,000.00	.....	$ 430.15	$ 430.15	$ 1,569.85
Water Meter Shops—Repairs, Purchase and Installation of Meters:						
505 A	Salaries and wages	$ 13,650.00	$ 11,065.89	$ 1,555.23	$ 12,621.12	$ 1,028.88
505 A 1	Wages—mechanics	38,908.00	28,511.90	3,260.47	31,772.37	7,135.63
505 A 2	Wages—laborers	9,750.00	8,464.89	721.62	9,186.51	563.49
505 B	Hire of teams, horses and carts	7,000.00	6,042.97	660.03	6,703.00	297.00
505 C	Supplies	1,200.00	574.48	.....	574.48	625.52
505 D	Material for repairs	10,000.00	5,460.50	3,209.27	8,669.77	1,330.23
505 E	Repairs by contract or open order	1,000.00	93.83	.....	93.83	906.17
505 F	Apparatus, machinery, vehicles and harness	207,219.00	1,166.48	111,828.90	112,995.38	94,223.62
505 G	Furniture, fittings, fixtures and library	150.00	73.00	.....	73.00	77.00
505 H	Printing, stationery and office supplies	300.00	299.80	.....	299.80	.20
505 I	Advertising	150.00	149.78	.....	149.78	.22
505 J	Street car transportation	200.00	143.35	.....	143.35	56.65
505 L	Fuel and power	800.00	174.97	.....	174.97	625.03
505 S	Personal services, other than by employes	750 00	321.16	.....	321.16	428.84
505 T	Impersonal services and benefits	750.00	323.59	.....	323.59	426.41
505 W	Tools and implements, including their repair	500.00	229.99	.....	229.99	270.01
505 X	Installation of meter connections	30,000.00	.....	15,662.30	15,662.30	14,337.70
	Totals	$ 322,327.00	$ 63,096.58	$ 136,897.82	$ 199,994.40	$ 122,332.60
	Totals, Bureau of Engineering	$ 9,575,014.08	$ 2,649,494.69	$ 4,762,651.10	$ 7,412,145.79	$ 2,162,868.29
BUREAU OF WATER:						
Superintendent's Office:						
600 A	Salaries and wages	$ 7,260.00	$ 7,039.93	.....	$ 7,039.93	$ 220.07
	Totals	$ 7,260.00	$ 7,039.93	.....	$ 7,039.93	$ 220.07
Collection Division—General:						
600 A1	Salaries and wages	$ 22,600.00	$ 20,052.32	.....	$ 20,052.32	$ 2,547.68
Assessed Rates Section:						
600 A2	Salaries and wages	43,140.00	41,422.88	.....	41,422.88	1,717.12
Meter Rates Section:						
600 A3	Salaries and wages	55,384.00	53,770.73	.....	53,770.73	1,613.27
	Totals	$ 121,124.00	$ 115,245.93	.....	$ 115,245.93	$ 5,878.07

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WATER FUND ACCOUNTS—Concluded

	Appropriations	EXPENDITURES			Unexpended Balances
		Ordinary Accounts	Extraordinary Accounts	Totals	
BUREAU OF WATER—Continued					
Assessments Division—General:					
600 A4 Salaries and wages	$ 98,928.00	$ 97,377.09	.....	$ 97,377.09	$ 1,550.91
Shut-off Section:					
600 A5 Salaries and wages	20,280.00	19,840.79	.....	19,840.79	439.21
Permit and Map Section:					
600 A6 Salaries and wages	12,900.00	12,672.29	.....	12,672.29	227.71
Totals	$ 132,108.00	$ 129,890.17	.....	$ 129,890.17	$ 2,217.83
Auditing Division:					
600 A7 Salaries and wages	$ 13,680.00	$ 13,261.84	.....	$ 13,261.84	$ 418.16
Totals	$ 13,680.00	$ 13,261.84	.....	$ 13,261.84	$ 418.16
Miscellaneous:					
600 A8 Overtime	$ 2,404.38	$ 2,397.00	.....	$ 2,397.00	$ 7.38
600 A9 Extra clerk hire for assisting on regular work and on transcribing of assessed meter rates ledgers and meter mechanical books	8,200.00	6,728.28	.....	6,728.28	1,471.72
600 B3 Hire of teams, horses and carts (meter rates section)	26,077.50	25,629.75	.....	25,629.75	447.75
600 B5 Hire of teams, horses and carts (shut-off section)	10,980.00	9,443.25	.....	9,443.25	1,536.75
600 C Supplies	400.00	186.89	.....	186.89	213.11
600 D Material for repairs	150.00	72.28	.....	72.28	77.72
600 G Furniture, fittings, fixtures and library	1,320.00	1,285.78	.....	1,285.78	34.22
600 H Printing, stationery and office supplies	26,500.00	26,167.70	.....	26,167.70	332.30
600 I Advertising	30.00	10.80	.....	10.80	19.20
600 J Street car transportation	1,200.00	1,082.90	.....	1,082.90	117.10
600 S Personal services, other than employes	700.00	660.36	.....	660.36	39.64
600 T Impersonal services and benefits	350.00	273.55	.....	273.55	76.45
600 U Damages, refunds and miscellaneous claims	25,000.00	24,999.44	.....	24,999.44	.56
600 W Tools and implements, including their repair	100.00	97.88	.....	97.88	2.12
Totals	$ 103,411.88	$ 99,035.86	.....	$ 99,035.86	$ 4,376.02
Totals, Bureau of Water	$ 377,583.88	$ 364,473.73	.....	$ 364,473.73	$ 13,110.15
Totals, Water Fund	$11,717,667.37	$ 3,442,156.48	$ 4,928,405.42	$ 8,370,561.90	$ 2,347,105.47

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TABLE No. VIII

STATEMENT OF WATER FUND REVENUE OF DEPARTMENT OF PUBLIC WORKS FOR THE YEAR 1915

ORDINARY ACCOUNTS:		
Assessed rates	$ 3,376,350.57	
Meter rates	2,761,367.60	
Meter mechanical receipts	1,462.12	
Permits	37,524.00	
Assessor's miscellaneous	23,926.98	
Use of water by special deposits	4,968.32	
Advances for laying water mains	60,548.65	
Rent of Rookery site	35,000.04	
Rent of real estate and buildings	3,360.00	
Sale of old material	3,603.21	
Interest on deposits of City funds	55,150.71	
Interest on bonds held by Water Fund	21,430.57	
Interest on anticipation tax warrants held by Water Fund	30,731.62	
Rent of space in water pipe tunnels	1,852.91	
Miscellaneous	30,969.74	
Total		$6,448,247.04

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TABLE No. IX

COMPARATIVE STATEMENT OF ORDINARY REVENUE AND ORDINARY EXPENSE OF WATER SYSTEM FOR THE YEARS 1902 TO 1915, INCLUSIVE

YEAR	Ordinary Revenue	Increase over Preceding Year	Per Cent. Increase over Preceding Year	Ordinary Expense	Increase over Preceding Year	Per Cent. Increase over Preceding Year	Excess of Ordinary Revenue over Ordinary Expense	Per Cent. Increase of Excess of Ordinary Revenue over Ordinary Expense over Preceding Year	Per Cent. of Ordinary Expense to Ordinary Revenue
1902	$ 3,505,473.16			$ 1,787,925.13			$ 1,717,548.03		51.00
1903	3,818,884.11	$ 313,410.95	8.94	1,796,143.34	$ 10,218.21	.57	2,020,740.77	17.65	47.09
1904	4,086,936.35	268,052.24	7.02	1,946,187.54	148,044.20	8.23	2,140,748.81	5.94	47.62
1905	4,209,391.55	122,455.20	3.00	2,048,664.75	102,477.21	5.27	2,160,726.80	.93	48.67
1906	4,420,367.27	210,975.72	5.01	2,060,249.12	11,584.37	.57	2,360,118.15	9.23	46.61
1907	4,726,205.63	305,838.36	6.92	2,442,122.97	381,873.85	15.64	2,284,082.66	*3.22	51.67
1908	4,953,640.30	227,434 67	4.81	2,703,811.40	260,688.43	10.67	2,250,828.90	*1.45	54.56
1909	5,241,635.77	287,995.47	5.81	2,775,938.72	73,127.32	2.70	2,465,697.05	9.54	52.95
1910	5,685,006.60	443,370.83	7.80	2,815,497.06	39,558.34	1.40	2,869,509.54	16.37	49.52
1911	5,993,771.32	308,764.72	5.43	3,174,097.04	358,599.98	12.74	2,819,674.28	*1.74	52.95
1912	6,527,925.73	534,154.41	8.91	3,588,640.40	414,543.36	13.06	2,939,285.33	4.24	54.97
1913	6,813,973.83	286,048.10	4.38	3,318,681.72	*269,958.68	* 7.52	3,495,292.11	18.92	48.69
1914	6,741,210.24	* 72,763.59	* 1.07	3,193,881.75	*124,799.97	* 3.76	3,547,328.49	1.47	47.38
1915	6,448,247.04	* 292,963.20	* 4.34	3,287,548.18	93,666.43	2.93	3,160,698.86	*10.89	50 98

*Decrease.

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TABLE No. X

STATEMENT OF FREE WATER SERVICE RENDERED BY THE CHICAGO WATER WORKS DURING THE YEAR 1915

	CLASSIFICATION	AMOUNT
(A)	Fire hydrants (28,278 at $40.00 each, based on hydrant rentals)	$1,131,120.00
(A)	Public parks	100,000.00
(A)	Street cleaning and sprinkling	60,000.00
(A)	Flushing sewers	11,270.00
(A)	Track elevation and street improvements	5,000.00
(B)	Public schools	104,754.10
(B)	Police department	3,951.95
(B)	Fire department	3,256.88
(B)	Public baths	1,637.00
(B)	Municipal Tuberculosis Hospital	2,544.67
(B)	Small parks and playgrounds	1,607.51
(B)	Pumping stations	22,675.25
(B)	Miscellaneous City property	11,496.31
(B)	State institutions	43,844.68
(B)	Churches and parsonages	34,444.54
(B)	Parochial and private schools and colleges	46,327.53
(B)	Hospitals	17,877.44
(B)	Homes	13,990.96
(B)	Miscellaneous religious, educational and charitable institutions	6,929.07
	Total	$1,622,727.89

(*A*) Estimated by City Engineer.

(*B*) Recorded as decreased upon the Records of the Bureau of Water—Assessed rates, $284,583.78; meter rates, $30,754.11.

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TABLE No. XI

STATEMENT OF WATER FUND COLLECTIONS DURING THE YEAR 1915

COLLECTIONS BY CASHIER OF BUREAU OF WATER:		
Assessed rates	$3,376,350.57	
Meter rates	2,761,367.60	
Assessor's miscellaneous	23,926.98	
Permits	37,524.00	
Meter Mechanical	1,462.12	
Suspense No. 1	168.40	
Suspense No. 2	639.60	
Total		$6,201,439.27
COLLECTIONS BY THE CITY COLLECTOR ON WARRANTS FOR COLLECTION:		
Use of water in construction of cement walks	$ 5,178.37	
Sale of old material of Water Works	3,861.83	
Services and material to private parties	115,308.69	
Rent of Rookery property	35,000.04	
Other rents	3,360.00	
Use of water from Fullerton avenue conduit	4,000.00	
Compensation for running pipes and cables through water pipe tunnels under the Chicago river	1,965.95	
Furnishing steam and hot water to No. 7229 Sheridan road and No. 1225 Chase avenue	308.00	
Profit sharing rebate on four Ford automobiles	200.00	
Use of office building, 3rd district water pipe extension, as polling place	7.00	
Total		169,189.88
COLLECTIONS BY CITY COMPTROLLER:		
Interest on funds in hands of various City depositaries	$ 55,150.71	
Interest on bonds held by the Water Fund	21,430.57	
Interest on anticipation tax warrants held by the Water Fund	36,187.11	
Miscellaneous items	135.06	
Total		112,903.45
Grand total		$6,483,532.60

In addition to the above, special deposits amounting to $118,140.31 were collected by Cashier of Water Office.

In addition to the above earnings, warrants for collection for labor performed and material furnished, were collected by the City Collector and credited as follows: Water Works Repair Shops Capital Account, $421,876.59; Water Pipe Extension Suspense Stock Account, $1,115,538.95; City Engineer's Designing Division Capital Account, $73,388.47; Water Pipe Extension Division Capital Account, $61,423.54; Construction Division Capital Account, $2,315,168.09; Testing Division Capital Account, $35,455.52.

Refunds amounting to $24,999.44 were disbursed by the Cashier of Bureau of Water on account of wrong property, over-payments and erroneous assessments paid.

Refunds amounting to $30.40 were disbursed by the City Comptroller on account of duplicate payments, etc.

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TABLE No. XII

STATEMENT OF EXPENDITURES FOR OPERATION OF WATER SYSTEM, INCLUDING INTEREST, DURING THE YEAR 1915

CLASSIFICATION		AMOUNT	PER CENT.
GENERAL SUPERINTENDENCE:			
Salaries	$ 20,408.11		
Expenses	8,972.44	$ 29,380.55	1.6
ENGINEERING DIVISION:			
Salaries	$ 32,326.20		
Expenses	6,553.15	38,879.35	2.1
TESTING DIVISION:			
Expenses		50.92	
CRIBS:			
Two-Mile	$ 12,563.43		
Four-Mile	6,868.88		
Lake View	7,801.11		
Hyde Park	10,861.80		
Carter H. Harrison	7,613.68		
Ed. F. Dunne	403.09	46,111.09	2.5
Tug Service		9,635.42	.5
WATER PUMPING STATIONS:			
14th Street	$113,136.17		
68th Street	136,837.78		
92nd Street	140,255.10		
Chicago Avenue	102,596.96		
Springfield Avenue	118,404.06		
Central Park Avenue	124,336.75		
Harrison Street	59,553.20		
Lake View	113,613.64		
Washington Heights	141.95		
Norwood Park	1,015.47		
Roseland	62,116.10		
Rogers Park	12,813.52		
Jefferson Park (Booster)	10,650.67		
Edison Park	.16	995,471.53	54.0
SEWER PUMPING STATIONS:			
Stony Island Avenue	20,379.98		
95th Street	20,175.94		
Hegewisch	5,906.98		
Pullman	12,161.35		
Kensington	11,858.20		
Rogers Park	1,628.75	72,111.20	3.9
ASSESSMENT AND COLLECTION OF WATER RATES:			
Salaries	$309,636.15		
Expenses	29,838.14	339,474.29	18.4
Water Supply Investigation		1,089.65	.1
Services of City Departments		278,356.11	15.0
Municipal Plant (Ground rent)		1,200.00	.1
Superintendence of Pumping Stations and Cribs		16,923.79	.9
Fullerton Avenue Sewerage Pumping Station		1,808.11	.1
Electrolysis Surveys		2,760.52	.1
Interest on Certificates and Judgments		8,708.69	.7
Costs on Judgments		83.95	.....
Total		$1,842,046.07	100.0

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TABLE No. XIII

STATEMENT OF EXPENDITURES FOR REPAIRS AND RENEWALS OF WATER WORKS PROPERTY AND EQUIPMENT DURING THE YEAR 1915

CLASSIFICATION		AMOUNT	PER CENT
CRIBS:			
Two-mile	$ 1,140.66		
Four-mile	1,464.96		
Lake View	188.33		
Hyde Park	3,659.52		
Carter H. Harrison	783.18		
Edward F. Dunne	1,367.02		
		$ 8,583.67	.6
TUNNELS		23,297.06	1.6
WATER PUMPING STATIONS:			
14th Street	$ 26,007.36		
68th Street	29,239.16		
22nd Street	15,778.15		
Chicago Avenue	19,723.96		
Springfield Avenue	21,595.97		
Central Park Avenue	25,055.73		
Harrison Street	9,032.74		
Lake View	15,687.51		
Washington Heights	24.50		
Norwood Park	29.48		
Roseland	10,475.41		
Rogers Park	1,910.25		
Jefferson Park	106.52		
Edison Park	75.00		
Mayfair	254.78		
Englewood (proposed pump)	6.10		
		175,002.62	12.1
SEWER PUMPING STATIONS:			
Stony Island Avenue	$ 1,348.69		
95th Street	1,929.96		
Kensington	655.18		
Pullman	327.70		
Hegewisch	396.76		
Rogers Park	.88		
		4,659.17	.3
WATER PIPE EXTENSION:			
Mains, Hydrants and Valves	$1,107,173.97		
Tapping and Retapping	60,455.34		
Pipe Yards	502.73		
		1,168,132.04	80.8
WATER WORKS PROPERTY RENTED TO PRIVATE PARTIES		10.00	
WATER WORKS REPAIR SHOPS		430.15	
FULLERTON AVENUE SEWAGE PUMPING STATION		15.95	
INTERCEPTING SEWER SYSTEM		1,363.30	.1
METERS		64,006.15	4.5
Total		$1,445,502.11	100.00

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TABLE No. XIV

STATEMENT OF EXPENDITURES FOR ADDITIONS, EXTENSIONS AND BETTERMENTS OF WATER WORKS PROPERTY AND EQUIPMENT DURING THE YEAR 1915

CLASSIFICATION		AMOUNT	PER CENT.
LAND TUNNELS:			
Wilson Avenue Tunnel and Crib (Including Purchase of Real Estate amounting to $8,395.70)	1,202,477.20		
Sixty-eighth Street Connecting Tunnel	57,623.56		
		$ 1,260,100.76	26.2
CRIBS:			
C. H. Harrison		14.41	
WATER PUMPING STATIONS:			
14th Street	$ 4,117.61		
68th Street	9,604.94		
92nd Street	6,383.96		
Chicago Avenue	3,579.32		
Springfield Avenue	3,809.75		
Central Park Avenue	15,961.83		
Harrison Street	7,374.53		
Lake View	251,995.51		
Roseland	174,029.18		
Jefferson Park (Booster)	5,702.25		
Mayfair	95,337.82		
		577,956.70	12.0
SEWER PUMPING STATIONS;			
Stony Island Avenue	4,974.12		
Pullman	4,115.29		
Rogers Park	213.64		
		9,303.05	.2
WATER PIPE EXTENSION:			
Mains, Hydrants and Valves	$2,052,469.58		
Service Pipes, Taps, etc.	65.50		
Pipe Yards	3,442.24		
		2,055,977.32	42.8
PUMPING STATION SWIMMING POOLS:			
Springfield Avenue	$ 22,994.37		
Central Park Avenue	22,542.24		
Washington Heights	495.45		
Roseland	26,497.15		
		72,529.21	1.5
Marshall Boulevard Municipal Plant		692,416.49	14.4
Gas Power Boat Illinois		4,500.00	.1
Intercepting Sewers, Section "N"		1,709.66	
Meters		136,897.82	2.8
Total		$ 4,811,405.42	100.0

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TABLE No. XV

COMPARATIVE STATEMENT OF EXPENDITURES FOR OPERATION OF WATER SYSTEM INCLUDING INTEREST FOR THE YEARS 1908 TO 1915 INCLUSIVE

CLASSIFICATION	1908	1909	1910	1911	1912	1913	1914	1915
General Superintendence	$ 31,069.91	$ 20,853.42	$ 29,988.67	$ 39,078.16	$ 38,915.18	$ 45,330.64	$ 27,645.89	$ 29,380.55
Engineering Division	38,256.69	51,097.46	54,502.36	46,572.52	34,795.53	29,748.28	35,889.54	38 879.35
Testing Division	.....	.....	.....	23,103.67	24,098.14	22.414.87	33,357.27	50.92
Electrolysis Surveys	.....	.....	.....	4,109.27	3,933.68	1,747.98	2,301.42	2,760.52
Water Supply Investigation	.....	.....	.....	3,394.08	2,735.90	5,337.16	437.90	1,089.65
Water Waste Surveys	34,947.27	47,758.88	55,893.46	121,044.56	122,860.00	39,237.43	.....	.....
Cribs	39,630.31	39,899.99	40,564.70	39,081.09	43,739.20	42,427.98	45,661.31	46,111.99
Tug Service	12,540.08	12,395.29	12,614 93	10,795.65	11,736.26	11,115.56	11,187.11	9,635.42
Pumping Stations	792,965.12	753,310 92	836,854.69	868,396.04	941,360.48	902,832.57	921,255.53	995,471.53
Assessment and Collection of Water Rates	292,204.01	319,184,83	282,832.97	307,729.18	339,724.88	299 900.84	320,773.43	339,474.29
Services of City Departments	250,346.26	240,940.03	248,695.28	259,756.37	421,420.03	452,860.14	249,327.29	278,356.11
Interest on Bonds, Certificates and Judgments	264,438.09	274,855.72	259,428.23	237,420 76	194,352.00	89,469.24	14,978.16	8,708.69
Costs on Judgments	123.05	109.30	33.70	188.75	154.81	59.71	132.57	83.95
Damage to Property	6,585.00	16,466.78	16,945.48	.....	.....	.....	.....	.....
Fullerton Avenue Sewage Pumping Station	16,796.60	18,759.29	17,983.25	14,071.36	8,063.45	2,419.04	1,998.75	1,806.11
Other Sewage Pumping Stations	.....	.....	.....	.....	.....	.....	.....	72,111.20
Intercepting Sewer Pumping Stations	79,314.91	81,026.59	56,566.44	227.68	5.44	2,421.20	153.47	.....
Water Works Shops. General Salaries and Expenses	.....	21,118.53	20,856.43	25,994.28	24,490.65	28,623.09	13.00	.....
Pumping out Section "N" Lawrence Avenue Conduit	.....	.....	4,918.01	.....	.....	.....	.....	.....
Superintendence of Pumping Stations, Repair Shops and Cribs	.....	.....	.....	.....	22,237.05	17,638.10	14,019.89	16,923.79
Miscellaneous	.....	.....	2,750.00	.....	.....	.....	1,200.00	1,200.00
Total	$ 1,559,217.30	$ 1,907,777.08	$ 1,942,427.60	$ 1,940,993.42	$ 2,224,602.68	$ 1,993,577.82	$ 1,750,332.53	$ 1,842,046.07

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TABLE No. XVI

COMPARATIVE STATEMENT OF EXPENDITURES FOR REPAIRS AND RENEWALS OF WATER WORKS PROPERTY AND EQUIPMENT FOR THE YEARS 1908 TO 1915 INCLUSIVE

CLASSIFICATION	1908	1909	1910	1911	1912	1913	1914	1915
Testing Division	.....	.....	.....	$ 71.76	.....	.....	.....	.....
Water Waste Surveys	.....	.....	$ 32.15	27.20	.....	.....	.....	.....
Water Supply Investigation	.....	.....	.....	143.23	.....	.....	.....	.....
Cribs	$ 7,365.56	$ 7,501.14	6,417.41	4,517.70	$ 13,409.78	$ 12,360.31	$ 14,734.61	$ 8,583.67
Tunnels	.....	7,258.73	4,439.89	2,488.86	3,380 44	9,697.10	5,301 24	23,297.06
Pumping Stations	153,400.77	123,547.49	111,704.66	202,431.20	260,985.20	224,770.47	228,664.67	175,002.62
Mains, Hydrants and Valves	511,594.58	535,181.99	571,831 58	808,269.79	843,933.03	854,630.87	1,067,160.51	1 107,173.97
Tapping and Retapping	.....	.....	.....	77,860.06	79,995.47	80,354 50	57,625.73	60,455.34
Service Pipes, Taps, Shut-off Boxes, etc	69,373.13	75,281.01	76,822.94	40,607.11	72,188.29	60,685.00	.....	.....
Pipe and District Yards	192.06	522.62	.....	.....	.....	.....	989.96	502.73
Meters	79,016 66	89,654.79	79,219.60	79,800.75	72,168.53	63,105.20	67,924.30	64,008.15
Meter Repair Shops, Testing Plants and Equipment	849.14	95.23	.....	.....	.....	.....	.....	.....
Intercepting Sewer Pumping Stations	2,154.66	4,552.72	1,641.02	392.09	119.46	.....	.....	.....
Fullerton Avenue Sewage Pumping Station	3,923.95	1,811.29	1,799.06	1,919.00	470.48	492.45	219.51	15.95
Other Sewage Pumping Stations	.....	.....	.....	.....	.....	.....	.....	4,659.17
Protection of Street Ends	.....	4,362.49	.....	.....	.....	.....	.....	.....
Maintenance of Intercepting Sewers	.....	.....	568.88	100.56	305.30	355.99	.....	1,363.30
Water Works Shop and Repair Division	.....	.....	14,927.55	14,579.31	16,707.81	13,652.01	52.00	430.15
Dredging North Branch of Chicago River	.....	.....	.....	.....	367.13	.....	.....	.....
Electrolysis Surveys	.....	.....	.....	.....	6.80	.....	.....	.....
Water Works Property Rented to Private Parties	.....	.....	.....	.....	.....	.....	876.69	10.00
Totals	$ 827,870.53	$849,769.49	$869,404.74	$1,233,208.62	$1,364,037.72	$1,325,103.90	$1,443,549.22	$1,445,502.11

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TABLE No. XVII

COMPARATIVE STATEMENT OF EXPENDITURES FOR ADDITIONS, EXTENSIONS AND BETTERMENTS OF WATER WORKS PROPERTY AND EQUIPMENT FOR THE YEARS 1908 TO 1915 INCLUSIVE

CLASSIFICATION	1908	1909	1910	1911	1912	1913	1914	1915
Cribs						$ 4,493.70	$ 63.30	$ 14.41
Lake Tunnels	$ 487,471.86	$ 502,995.45	$ 226,855.20	$ 165,802.58	$ 36,533.07	165,188.04		
Land Tunnels	1,193,921.15	265,964.43	7,707.95	32,889.65	55,729.10	95,887.32	274,658.56	1,260,100.76
Water Pipe Tunnels	11,000.00							
Pumping Stations	375,716.66	206,864.52	470,244.64	363,316.76	506,072.91	483,050.81	629,921.74	577,956.70
Mains, Hydrants and Valves	636,136.10	573,759.04	478,403.83	1,160,189.16	1,719,222.50	1,173,945.00	1,467,383.25	2,052,469.58
Service Pipes, Taps, Shut-off Boxes, etc	961.77	92.11	1,020.62	911.61	526.07	194.28	158.28	65.50
Pipe and District Yards	8,416.01	1,527.31			1,512.44	2,836.68	4,743.14	3,442.24
Meters	47,511.90	62,385.38	61,965.69	33,391.59	53,258.89	42,103.01	56,937.67	136,897.82
Meter Repair Shops and Testing Plants	12,453.54							
General Repair Shops	6,640.32	6,795.12		3,402.08		8,903.59	4,038.52	
Fullerton Avenue Sewage Pumping Station	1,775.61			860.83	6,557.31	11,538.19	2,740.38	
Other Sewage Pumping Stations								9,303.05
Rogers Park Water System (Purchase Price)	59,579.45	60,500.00	57,500.00	55,000.00	52,897.25			
Intercepting Sewer System	606,816.50	133,018.38	41,901.05	1,312.34	2,000.00	2,270.00	65.00	1,709.66
Marshall Boulevard Municipal Plant					12,667.03	30,582.81	275,013.45	692,416.29
Fullerton Avenue Intake Crib					115.00	2,760.00		
Swimming Pools					9,750.00		4,703.78	73,539.21
Purchase of Real Estate						188,107.48	6,682.94	
Gas Power Boat Illinois								4,500.00
Totals	$3,448,400.67	$1,812,921.79	$1,345,598.98	$1,816,976.55	$ 2,456,841.57	$ 2,210,860.91	$ 2,727,106.86	$4,811,405.42

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TABLE No. XVIII

SEWAGE PUMPING STATIONS

DETAILED STATEMENT OF EXPENDITURES FOR OPERATION DURING THE YEAR 1915

PUMPING STATIONS	Salaries	Fuel and Power	Oil	Waste	Grease	Packing	Tools	Miscellaneous	Total	Per Cen
Stony Island Avenue	$15,713.99	$3,966.37	$ 62.44	$67.28	$28.85	$15.29	$48.72	$477.04	$20,379.98	28.1
95th Street	15,470.89	3,973.23	206.36	85.22	18.40	20.69	49.44	351.71	20,175.94	28.0
Hegewisch	4,893.56	668.30	65.68	17.45	.....	22.20	.....	239.79	5,906.98	08.3
Pullman	8,688.05	3,035.64	64.56	33.07	.....	33.22	2.55	304.26	12,161.35	17.0
Kensington	8,690.42	2,671.84	131.67	28.29	1.80	10.95	12.16	311.07	11,858.20	16.4
Rogers Park	1,074.00	552.41	2.34	.....	.....	.....	.....	.....	1,628.75	02.2
Totals	$54,530.91	$14,867.79	$535.05	$231.31	$49.05	$102.35	$112.87	$1,683.87	$72,111.20	100.0

DETAILED STATEMENT OF EXPENDITURES FOR REPAIRS AND RENEWALS DURING THE YEAR 1915

	Buildings and Grounds	Engines and Pumps	Boilers and Furnaces	Piping and Steamfitting	Coal and Ash Handling Plant	Electric Lighting System	Miscellaneous	Total	Per Cent
Stony Island Avenue	$369.60	$407.80	$ 70.55	$495.01	.....	$5.73	.....	$1,348.69	29.
95th Street	850.29	241.01	394.57	279.73	.....	9.04	$155.32	1,929.96	41.
Hegewisch	110.06	282.06	.....	4.64	.....	.....	.....	396.76	09.
Pullman	81.01	220.10	4.28	18.13	.....	.....	4.18	327.70	07.
Kensington	110.59	360.92	183.67	.....	.....	.....	.....	655.18	14.
Rogers Park	.88	.....	.....	.....	.....	.....	.....	.88	
Totals	$1,522.43	$1,511.89	$653.07	$797.51	.....	$14.77	$159.50	$4,659.17	100.

DETAILED STATEMENT OF EXPENDITURES FOR ADDITIONS, EXTENSIONS AND BETTERMENTS, DURING THE YEAR 1915

	Buildings and Grounds	Engines and Pumps	Boilers and Furnaces	Piping and Steamfitting	Coal and Ash Handling Plant	Electric Lighting System	Miscellaneous	Total	Per Cent
Stony Island Avenue	$247.42	.....	$4,676.68	.....	$50.02	.....	.....	$4,974.12	54.
Pullman	28.93	$4,086.36	.....	.....	.....	.....	.....	4,115.29	44.
Rogers Park	.....	213.64	.....	.....	.....	.....	.....	213.64	02.
Totals	$276.35	$4,300.00	$4,676.68	.....	$50.02	.....	.....	$9,303.05	100.

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TABLE No. XIX

PUMPING STATIONS

DETAILED STATEMENT OF EXPENDITURES FOR OPERATION DURING THE YEAR 1915

PUMPING STATIONS	SALARIES	FUEL AND POWER	OIL	WASTE	GREASE	PACKING	TOOLS	MISCELLANEOUS	TOTAL	PER CENT
Fourteenth Street	$ 44,717.42	$ 59,869.40	$ 1,511.42	$ 256.70	$ 19.55	$1,021.86	$ 264.50	$ 5,475.32	$113,136.17	11.3
Sixty-eighth Street	59,206.96	68,981.56	1,661.22	614.96	131.23	1,207.57	128.48	4,905.80	136,837.78	14.0
Twenty-second Street	46,476.00	87,154.14	660.80	315.32	119.05	1,042.42	302.77	4,184.60	140,255.10	14.0
Chicago Avenue	51,950.35	43,753.50	1,336.45	500.13	211.16	95.60	315.59	4,434.18	102,596.96	10.3
Springfield Avenue	57,782.19	54,796.52	1,140.75	709.20	43.96	299.16	267.44	3,364.82	118,404.06	12.0
Central Park Avenue	57,767.03	58,864.96	1,052.68	634.93	92.19	1,229.98	451.86	4,243.12	124,336.75	12.5
Harrison Street	27,256.91	27,210.29	362.23	156.08	29.47	471.48	114.50	3,952.25	59,553.20	06.0
Lake View	48,349.32	57,660.72	2,969.12	753.12	49.13	.....	176.00	3,656.23	113,613.64	11.3
Washington Heights	.....	106.35	15.97	2.63	.....	.....	.....	17.00	141.95	.....
Norwood Park	772.50	124.44	.41	9.95	.....	.....	2.00	106.17	1,015.47	00.1
Roseland	34,234.80	24,108.47	1,778.33	359.94	40.82	16.25	36.24	1,541.25	62,116.10	06.2
Rogers Park	8,700.25	3,201.96	94.49	42.78	5.97	.....	27.94	740.16	12,813.52	01.3
Jefferson Park (Booster)	6,294.64	3,797.33	11.47	15.90	7.50	.....	5.71	528.13	10,650.67	01.0
Edison Park	.....	.....	.....	.....	.....	.....	.....	.16	.16	.....
Totals	$443,498.37	$ 469,639.60	$ 13,595.33	$ 4,371.64	$ 750.05	$ 5,384.33	$ 2,093.03	$ 37,149.19	$ 995,471.53	100.0

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TABLE No. XX

WATER PUMPING STATIONS

DETAILED STATEMENT OF EXPENDITURES FOR REPAIRS AND RENEWALS DURING THE YEAR 1915

Pumping Stations	Buildings and Grounds	Engines and Pumps	Boilers and Furnaces	Piping and Steamfitting	Coal and Ash Handling Plant	Electric Lighting System	Miscellaneous	Total	Per Cent.
Fourteenth Street	$ 3,914.37	$ 6,368.56	$2,650.24	$5,578.40	$1,269.73	$ 699.39	$ 526.67	$26,007.36	15.0
Sixty-eighth Street	6,245.00	4,157.95	10,121.63	3,202.63	3,461.47	662.51	1,153.31	29,239.16	17.0
Twenty-second Street	3,032.23	8,542.12	2,316.55	1,680.91	.....	71.33	134.96	15,778.15	09.0
Chicago Avenue	4,231.57	7,808.41	3,710.35	2,173.04	1,509.62	20.91	120.56	19,723.96	11.0
Springfield Avenue	4,251.96	7,969 11	4,951.53	2,155.04	1,350.06	236.95	681.30	21,595.97	12.0
Central Park Avenue	3,734.23	9,265.69	6,738.50	1,939.80	666.52	469.36	251.63	25,055.73	15.0
Harrison Street	729.43	2,263.35	4,525.42	1,087.87	269.19	65 03	72.45	9,032.74	05.0
Lake View	2,580.60	3,925.52	7,067.32	1,367.37	318.36	48.34	379.70	15,687.51	09.0
Washington Heights	24.50	.....	.....	.....	.....	.....	.....	24.50	.....
Norwood Park	29.48	.....	.....	.....	.....	.....	.....	29.48	.....
Roseland	2,649.08	1,674.00	3,009.31	1,454.68	826.13	731.07	95.29	10,475.41	06.0
Rogers Park	1,481.84	298.67	45.94	28.61	.....	.....	55.19	1,910.25	01.0
Jefferson Park (Booster)	8.84	86.73	.....	7.06	.....	.....	3.89	106.52	.....
Edison Park	75.00	.....	.....	.....	.....	.....	.....	75.00	.....
Englewood (proposed pump)	6.10	.....	.....	.....	.....	.....	.....	6.10	.....
Mayfair	254.78	.....	.....	.....	.....	.....	.....	254.78	.....
Totals	$38,389.01	$52,360.41	$47,137.19	$20,674.41	$9,727.10	$3,004.89	$3,474.95	$175,002.62	100.0

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TABLE No. XXI

PUMPING STATIONS

DETAILED STATEMENT OF EXPENDITURES FOR ADDITIONS, EXTENSIONS AND BETTERMENTS DURING THE YEAR 1915

PUMPING STATIONS	Buildings and Grounds	Engines and Pumps	Boilers and Furnaces	Piping and Steamfitting	Coal and Ash Handling Plant	Electric Lighting System	Break-water	Miscellaneous	TOTAL	Per Cent.
Fourteenth Street		$ 3,839.03		$ 278.58					$ 4,117.61	00.7
Sixty-eighth Street	$ 463.11	8,008.08	$ 150.72	983.03				$ 234.66	9,604.94	02.0
Twenty-second Street	368.26		4,939.28	159.83		$ 851.70		64.89	6,383.96	01.1
Chicago Avenue								3,579.32	3,579.32	00.6
Springfield Avenue		3,809.75							3,809.75	00.6
Central Park Avenue	3,081.76	4,289.09	5,896.49	1,412.66	$ 1,281.83				15,961.83	03.0
Harrison Street		4,034.45	3,340.08						7,374.53	01.2
Lake View	82,676.65	43,706.43	23,435.91	55,830.36	39,644.92	5,485.10	$ 742.74	473.40	251,995.51	43.6
Roseland	10,157.79	150,925.86	7,734.59	3,447.23	1,710.98	53.73			174,029 18	30.2
Jefferson Park		5,763.25							5,763.25	01.0
Mayfair	87,441.94	3,956.92	1,138.38	1,180.63	666.92	398.87		562.16	95,337.82	16.0
Totals	$ 184,189.51	$ 228,331.86	$ 46,635.45	$ 63,392.33	$ 43,304.65	$ 6,780.40	$ 742.74	$ 4,914.43	$577,956.70	100.0

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TABLE No. XXII

WATER PUMPING STATIONS

COMPARATIVE STATEMENT OF EXPENDITURES FOR OPERATION DURING THE YEARS 1906 TO 1915 INCLUSIVE

PUMPING STATIONS	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915
Chicago Avenue	$103,320.83	$101,861.42	$101,577.08	$104,632.95	$102,787.21	$ 99,400.11	$108,716.67	$ 96,023.82	$102,072.32	$102,596.96
Fourteenth Street	89,961.44	100,385.55	102,919.49	92,534.72	100,264.94	99,028.56	106,957.73	100,822.16	108,945.20	113,136.17
Harrison Street	50,972.11	51,308.58	48,503.57	47,782.87	50,806.98	47,106.51	53,638.93	48,008 36	54,801.26	59,553 20
Lake View	69,172.86	73,471.57	80,610.57	74,419.12	90,525 67	86,481.85	94,444.42	95,621.27	123,534.16	113,613.64
Twenty-second Street	91,581.06	98,781.53	98,983.25	94,595.86	108,552.56	89,980.75	141,068.24	136,581.64	138,720.55	140,255.10
Sixty-eighth Street	131,094.40	126,178.27	131,399.62	121,705.72	140,057.98	139,365.70	129,867.92	112,315.52	120,006.82	136,837.78
Central Park Avenue	76,973.29	97,563.86	97,317.29	90,173.12	105,217.99	103,781.38	105,154.79	105,156.47	123,845.96	124,336.75
Springfield Avenue	69,815.93	88,256.87	96,929.88	94,120.28	102,505.53	98,573.51	112,136.06	106,387.00	124,364.83	118,404.06
Norwood Park	5,444.44	5,306.28	5,662.12	5,394.74	6,314.43	7,318.11	7,286.24	1,079.00	3,501.69	1,015.47
Washington Heights	13,746.65	15,011.45	13,766.15	13,743.90	14,737.58	12,674.51	12,710.72	12,365.78	10,149.59	141.95
Rogers Park	.....	8,688.33	15,276.10	14,207.64	15,083.82	15,299.26	16,224.48	16,040.56	15,606.54	12,813.53
Roseland	.....	.....	.....	.....	.....	6,100.82	48,999.10	52,773.21	54,435.79	62,116.10
Edison Park	.....	.....	.....	.....	.....	592.22	851.76	348.87	22.53	.16
Morgan Park	.....	.....	.....	.....	.....	2,623.75	2,368.48	.....	.....	.....
Jefferson Park	.....	.....	.....	.....	.....	.....	934.94	19,308.91	11,248.29	10,650.67
Totals	$702,683.01	$766,813.70	$792,965.12	$753,310.92	$836,854.69	$808,326.04	$941,360.48	$902,833.57	$991,255.53	$995,471.53
Percentage of increase of expenditures over preceding year	2.2	9.1	3.4	*5.2	11.1	*3.5	16.5	*4.1	9.8	.4
Millions of gals. of water pumped.	160,184	166,979	172,506	175,939	188,747	185,176	201,785	210,919	223,863	222,413
Expenditures for operation of pumping stations per thousand gallons	$ .00438	$ .00459	$ .00459	$ .00428	$ .00443	$ .00436	$ .00466	.00428	$ .00443	$ .00447

*Decrease.

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TABLE No. XXIII

WATER PUMPING STATIONS

COMPARATIVE STATEMENT OF EXPENDITURES FOR REPAIRS AND RENEWALS DURING THE YEARS 1906 TO 1915 INCLUSIVE

PUMPING STATIONS	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915
Chicago Avenue	$ 24,591.26	$ 19,002.90	$ 18,248.42	$ 19,546.01	$ 18,032.43	$ 42,534.00	$ 36,047.79	$ 43,325.62	$ 25,559.44	$ 19,723.96
Fourteenth Street	29,750.19	14,297.73	21,980.29	18,005.67	12,855.47	26,831.38	38,919.94	28,832.08	33,329.88	26,007.36
Harrison Street	5,044.77	7,940.52	10,698.17	6,606.89	6,515.87	13,757.83	8,397.99	9,684.04	15,394.29	9,032.74
Lake View	10,853.50	9,473.77	9,394.42	10,351.39	8,115.87	12,909.92	8,596.21	10,311.96	14,421.14	15,687.51
Twenty-second Street	11,256.15	25,278.01	21,363.19	11,229.72	9,945.59	19,498.66	13,999.07	13,545.84	21,662.00	15,778.15
Sixty-eighth Street	17,184.83	22,852.53	23,954.19	18,721.56	21,210.49	30,178.12	49,578.33	24,936.34	28,042.94	29,239.16
Central Park Avenue	15,608.86	16,784.98	23,423.85	17,574.43	14,886.80	21,227.94	38,769.78	35,624.09	42,945.05	25,055.73
Springfield Avenue	22,558.99	13,608.72	16,511.36	15,438.87	14,287.33	26,299.37	53,785.59	40,610.67	33,516.87	21,595.97
Norwood Park	186.41	1,721.24	2,165.31	619.40	1,390.56	3,815.89	3,019.19	179.12	178.37	29.48
Washington Heights	1,911.52	382.42	1,901.65	1,510.38	2,424.79	1,868.98	686.80	2,063.95	282.35	24.50
Rogers Park	.....	853.72	3,759.92	3,943.17	1,989.39	2,482.99	1,532.82	5,581.42	1,837.56	1,910.25
Roseland	.....	.....	.....	.....	.....	342.75	7,560.60	9,239.72	9,644.27	10,475.41
Edison Park	.....	.....	.....	.....	.....	220.29	21.77	117.85	40.50	75.00
Morgan Park	.....	.....	.....	.....	.....	752.97	67.32	.....	163.12	.....
Englewood (proposed pump)	.....	.....	.....	.....	50.05	10.11	.....	6.61	.....	6.10
Jefferson Park	.....	.....	.....	.....	.....	.....	.....	711.14	983.52	106.52
Mayfair	.....	.....	.....	.....	.....	.....	.....	.....	214.37	254.78
Totals	$ 138,946.48	$ 122,191.54	$ 153,400.77	$ 123,547.49	$111,704.66	$ 202,431.20	$ 260,985.20	$ 224,770.47	$ 226,664.67	$ 175,008.62
Percentage of increase of expenditures over preceding year	*4.8	*4.8	16.	*19.4	*10.6	81.2	28.9	*13.8	1.7	*22.5
Millions of gallons of water pumped	160,184	166,979	172,506	175,089	168,747	185,176	201,785	210,919	223,863	223,413
Expenditures for repairs and renewals of pumping stations per thousand gallons	$ .000867	$ .000791	$ .000889	$ .000706	$ .000661	$ .001093	$ .001293	.001065	$ .001061	$ .000785

*Decrease.

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TABLE No. XXIV

WATER PUMPING STATIONS

COMPARATIVE STATEMENT OF TOTAL EXPENDITURES FOR OPERATION AND REPAIRS AND RENEWALS DURING THE YEARS 1906 TO 1915, INCLUSIVE

PUMPING STATIONS	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915
Chicago Avenue	$ 127,912.09	$ 120,864.32	$ 119,835.50	$ 124,178.96	$ 120,819.64	$ 141,934.11	$ 144,764.46	$ 139,349.44	$ 127,631.76	$ 123,320.92
Fourteenth Street	119,711.63	114,683.28	124,899.78	110,540.39	113,120.41	125,559.94	145,877.67	129,654.24	142,775.06	129,143.53
Harrison Street	56,016.88	59,249.10	59,201.74	54,389.76	57,823.85	60,864.34	62,036.92	57,692.40	70,196.55	68,585.94
Lake View	80,026.36	82,945.34	90,004.99	84,770.51	98,641.54	99,391.77	103,042.63	105,933.25	137,955.30	129,301.15
Twenty-second Street	102,837.21	124,059.53	120,346.44	105,825.58	118,496.15	109,479.41	155,067.31	150,127.48	160,383.55	156,033.25
Sixty-eighth Street	148,879.23	149,080.80	155,353.81	140,427.28	161,268.47	169,543.82	179,446.25	137,251.86	148,049.76	166,076.94
Central Park Avenue	92,562.15	114,348.84	120,741.14	107,747.55	120,104.79	125,009.32	143,924.57	140,780.56	166,791.01	149,392.48
Springfield Avenue	92,374.92	101,860.59	113,441.24	109,559.15	116,792.86	124,872.88	165,921.65	146,997.67	157,881.70	140,000.03
Norwood Park	5,630.85	7,027.52	7,847.43	6,014.14	7,705.01	11,134.00	10,305.43	1,258.12	3,660.06	1,044.95
Washington Heights	15,658.17	15,398.87	15,667.80	15,254.28	17,162.37	14,543.49	13,397.52	14,429.73	10,431.94	166.45
Rogers Park	.....	9,542.05	19,086.02	18,150.81	17,073.21	17,782.25	17,757.30	21,621.96	17,444.10	14,723.77
Roseland	.....	.....	.....	.....	.....	6,443.57	56,559.70	62,012.93	64,080.06	72,591.51
Edison Park	.....	.....	.....	.....	.....	812.51	873.53	466.72	63.03	75.16
Morgan Park	.....	.....	.....	.....	.....	3,375.72	2,435.80	.....	162.12	.....
Englewood (proposed pump)	.....	.....	.....	.....	50.05	10.11	.....	6.61	.....	6.10
Jefferson Park	.....	.....	.....	.....	.....	.....	934.94	20,020.05	12,181.81	10,757.19
Mayfair	.....	.....	.....	.....	.....	.....	.....	.....	214.37	254.78
Totals	$ 841,689.49	$ 899,005.24	$ 946,365.89	$ 876,858.41	$ 948,559.35	$1,010,757.24	$1,202,345.68	$1,127,603.04	$1,219,920.20	$ 1,170,474.15
Percentage of increase of expenditures over preceding year	1.0	6.8	5.2	*7.9	8.2	6.4	18.9	*6.2	8.2	*4.1
Millions of gallons of water pumped	160,184	166,979	172,506	175,939	188,747	185,176	201,785	210,919	223,863	223,412
Percentage of increase of pumpage over preceding year	6.6	4.2	3.3	1.9	7.3	*1.9	8.9	4.5	6.1	*.6
Expenditures for operation and repairs and renewals of pumping stations per thousand gallons	$ .00525	$ .00538	$ .00548	$ .00498	$ .00502	$ .00546	$ .00595	$ .00534	$ .00544	$ .00526

*Decrease.

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TABLE No. XXVIII

WATER WORKS

TRIAL BALANCE GENERAL LEDGER

JANUARY 1, 1916

ACCOUNT	DR.	CR.
Water Fund (departmental)	$ 1,132,349.80	
Warrants for Collection	96,776.27	
Warrants for Collection (delinquent)	9,191.44	
Water Works Income		$ 134,875,225.42
Cashier's Petty Cash Fund	2,200.00	
Water Pipe Extension Petty Cash Fund	100.00	
Department of Supplies, Stock Account	15,000.00	
General Assessment	1,804,991.31	
General Assessment Suspense	10,996.92	
Water Works General Assessment		1,815,988.23
Water Loan Refunding Bonds, July 1, 1915 (due serially)		1,340,400.00
General Corporate Bonds		929,600.00
Water Pipe Extension Certificates		334,525.75
Interest on Bonds and Certificates	11,486,840.55	
Accrued Interest on Anticipation Tax Warrants	13,376.66	
Water Loan Sinking Fund	20.41	
Water Works Property and Equipment	66,487,440.56	
Water Works Expense	57,675,282.47	
Special Deposit Fund	65,733.14	
Sundry Deposits		65,733.14
Depreciation	13,427,074.03	
Appreciation		3,952,042.99
Water Works Depreciation		9,475,031.04
Investments in Special Funds	561,173.01	
Water Works Repair Shops, Capital		76,199.01
Water Works Repair Shops, Cash Available	30,710.68	
Water Works Repair Shops Warrants for Collection	68,985.67	
Water Works Repair Shops Revenue and Expense		23,497.34
Water Pipe Extension Capital Account		20,000.00
Water Pipe Extension Cash Available		7,355.32
Water Pipe Extension Warrants for Collection	67,685.05	
Water Pipe Extension Revenue and Expense		40,329.73
City Engineer's Designing Division Capital Account		32,974.00
City Engineer's Designing Division Cash Available	15,971.90	
City Engineer's Designing Division Warrants for Collection	16,112.77	
City Engineer's Designing Division Revenue and Expense	889.33	
Water Pipe Extension Suspense Stock Account Capital		200,000.00
Water Pipe Extension Suspense Stock Cash Available	1,911.52	
Water Pipe Extension Suspense Stock Warrants for Collection	240,191.88	
Water Pipe Extension Suspense Stock Revenue and Expense		42,103.40
Construction Division Capital Account		200,000.00
Construction Division Cash Available		124,322.21
Construction Division Warrants for Collection	381,362.69	
Construction Division Revenue and Expense		57,040.48
Testing Division Capital Account		15,000.00
Testing Division Cash Available	2,649.27	
Testing Division Warrants for Collection	16,133.86	
Testing Division Revenue and Expense		3,783.13
Totals	$153,631,151.19	$153,631,151.19

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TABLE No. XXVII

WATER WORKS

TRIAL BALANCE GENERAL LEDGER

DECEMBER 31, 1915

Accounts	Dr.	Cr.
Water fund (departmental)	$ 9,513,557.79	$ 8,381,207.99
Assessed rates receipts	.....	3,376,350.57
Meter rates receipts	.....	2,761,367.60
Miscellaneous water sale receipts	.....	24,734.98
Miscellaneous receipts	.....	38,986.12
Refunds	25,019.84	.....
Warrants for collection	351,514.24	254,737.97
Warrants for collection (delinquent)	9,191.44	.....
Judgment expense	3,400.40	.....
Judgments	27,803.40	27,803.40
Costs on judgments	83.95	.....
Water works income	91,157.95	128,789,963.94
Cashier's petty cash fund	2,200.00	.....
Water pipe extension petty cash fund	100.00	.....
Department of supplies—stock account	15,000.00	.....
General assessment	6,141,975.26	4,336,983.95
General assessment (suspense)	12,394.77	1,397.85
Water works general assessment	4,329,120.86	6,145,109.09
Water loan bonds, 4 per cent., 1915	1,415,000.00	1,415,000.00
Water loan bonds, July 1, 1915	.....	1,340,400.00
General corporate bonds	78,400.00	1,008,000.00
Water pipe extension certificates	126,015.18	460,540.93
Interest on bonds and certificates	11,486,840.55	.....
Accrued interest on anticipation tax warrants	53,594.50	40,217.84
Water loan sinking fund	1,415,020.41	1,415,000.00
Special assessments (mains)	59,514.04	59,514.04
Special assessments (service pipes)	65.50	65.50
Water works property and equipment	66,494,467.42	7,026.86
Operation	1,833,263.33	10.00
Repairs and renewals	1,445,572.11	145.00
Water works expense	54,416,917.68	23,800.00
Special deposit fund	155,513.92	89,780.78
Sundry deposits	89,780.78	155,513.92
Free taxes	1,094,828.30	.....
Free water service	.....	1,622,727.89
Free public service	1,622,727.89	1,094,828.30
Depreciation	13,427,074.03	.....
Appreciation	.....	3,952,042.99
Water works depreciation	.....	9,475,031.04
Investments in special fund	561,173.01	.....
Water works repair shops capital account	.....	76,199.01
Water works repair shops, cash available	474,290.22	443,579.54
Water works repair shops warrants for collection	491,935.73	422,950.06
Water works repair shops revenue and expense	444,653.01	468,150.35
Water pipe extension capital account	.....	20,000.00
Water pipe extension cash available	61,423.54	68,778.86
Water pipe extension warrants for collection	131,690.22	64,005.17
Water pipe extension revenue and expense	61,883.18	102,212.91
City Engineer's designing division capital account	.....	32,974.00
City Engineer's designing division cash available	79,034.83	63,062.93
City Engineer's designing division warrants for collection	90,044.56	73,931.79
City Engineer's designing division revenue and expense	68,054.52	67,165.19
Water pipe extension suspense stock account	.....	200,000.00
Water pipe extension suspense stock cash available	1,115,538.95	1,113,627.43
Water pipe extension suspense stock warrants for collection	1,355,730.83	1,115,538.95
Water pipe extension suspense stock revenue and expense	1,029,900.85	1,072,004.25
Construction division capital account	.....	200,000.00
Construction division cash available	2,415,178.09	2,539,500.30
Construction division warrants for collection	2,706,102.10	2,324,739.41
Construction division revenue and expense	2,460,179.19	2,517,219.67
Testing division capital account	.....	15,000.00
Testing division cash available	50,455.52	47,806.25
Testing division warrants for collection	52,742.85	36,608.99
Testing division revenue and expense	48,959.72	52,742.85
Totals	$ 189,436,086.46	$ 189,436,086.46

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TABLE No. XXIX

BONDS ISSUED FOR BENEFIT OF WATER WORKS OUTSTANDING JANUARY 1, 1916

Water Loan Refunding Bonds, due serially, bearing 4 per cent interest		$1,340,400.00
General Corporate Bonds, due serially, bearing 4½ per cent interest	$ 664,000.00	
General Corporate Bonds, due serially, bearing 4 per cent interest	265,600.00	
		929,600.00
Total		$2,270,000.00

NOTE:—In addition to the above, water pipe extension certificates amounting to $334,525.75 were outstanding December 31, 1915.

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TABLE No. XXX

STATEMENT OF ESTIMATED COST OF AND REVENUE FROM SUPPLYING WATER TO CONSUMERS DURING THE YEAR 1915

COST:		
Expenditures for operation (see Table No. XIV)	$1,833,337.38	
Expenditures for interest on certificates and judgments (see Table No. XIV)	8,708.69	
Expenditures for repairs (see Table No. XV.)	1,445,502.11	
Expenditures for refunds	25,019.84	
Total ordinary expenditures during the year 1915		$ 3,312,568.02
Sinking fund for bonds issued for benefit of water works, provided by annual corporate tax levy for 1915	$ 148,400.00	
Interest on bonds issued for benefit of water works paid from corporate fund	99,028.00	
Net depreciation of water works property and equipment during the year 1915 over amount expended for repairs	356,479.68	
Interest on invested capital less net depreciation and bonds outstanding assumed at rate of 3 per cent.	1,642,272.29	$2,246,179.97
Total estimated cost of supplying water to consumers during the year 1915, including allowances for sinking fund, depreciation and interest		$ 5,558,747.99
Total number of gallons of water pumped during the year 1915		222,411,830,000
Cost per 1,000 gallons of water pumped, based on total ordinary expenditures		$ .01489
Assuming 50 per cent of total pumpage for free water service*, leakage and wastage, the cost rate to paying consumers per 1,000 gallons actually delivered to paying consumers, based on total ordinary expenditures, would be twice the cost per 1,000 gallons of water pumped based on total ordinary expenditures and would amount to		$ .02978
Estimated cost per 1,000 gallons of water pumped including allowances for sinking fund, depreciation and interest on net invested capital assumed at rate of 3 per cent		$ .02499
Assuming 50 per cent of total pumpage for free water service*, leakage and wastage, the estimated cost rate to paying consumers per 1000 gallons actually delivered to paying consumers, including allowances for sinking fund, depreciation and interest on net invested capital at assumed rate of 3 per cent, would be twice the estimated cost per 1,000 gallons of water pumped, including allowances for sinking fund, depreciation and interest on net invested capital assumed at rate of 3 per cent and would amount to		$ .04998

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TABLE No. XXX—Continued

REVENUE:		
Revenue from assessed rates (see Table No. VIII).....	$3,376,350.57	
Revenue from meter rates (see Table No. VIII)... ..	2,761,367.60	
Revenue—Miscellaneous (see Table No. VIII).....	310,528.87	
Total ordinary revenue during the year 1915....		$ 6,448,247.04
Revenue per 1,000 gallons of water pumped.		$ .02899
Assuming 50 per cent of total pumpage for free water service,* leakage and wastage, the revenue from paying consumers per 1,000 gallons actually delivered to paying consumers, would be twice the revenue from 1,000 gallons pumped and would amount to.....		$ .05798

*NOTE:—See Table No. X for estimated total amount of free water service during the year 1915.

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INDEX

COMMISSIONER'S OFFICE

REPORT OF COMMISSIONER OF PUBLIC WORKS:

	Page
Total Expenditures	9
Contracts entered into	9
Comparison of Ordinary Revenue and Expense of Water Works System	10
Wilson Avenue Tunnel System	10
68th Street Connecting Tunnel	11
Marshall Boulevard Municipal Plant	11
Pumping Stations	12
Water Pipe Extension	12
Water Works Shops and Repairs	14
Water Meters	14
Assessment and Collection of Water Rates	14
Chicago Union Station	15
Utility Gallery	15
Bridges and Viaducts	15
Rivers and Harbors	17
Streets	17
Sewers	19
Maps and Plats	19
Compensation	20
Architecture	20

BUREAU OF ENGINEERING

REPORT OF CITY ENGINEER:

Statistics of Organization	25
Water Works Operation	26
Water Waste	26
Improvements in Efficiency	28
Municipal Foundry	28
New Shops	29
Wilson Avenue Water Tunnel	29
Fire Hydrants	29
Valves	30
Chicago Union Station Work	30
Public Utility Gallery	30
New Bridges	30
Bridge Plans	31
Bridge Maintenance	31
Diagram showing mileage and tonnage of water pipe in service, rated capacity of pumping system, nominal capacity of tunnel system, population and average daily pumpage in June, July and August	32-A
Summary of statistics of water works in form recommended by the New England Water Works Association	33

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DIVISION OF OPERATION AND MAINTENANCE OF PUMPING STATIONS, CRIBS AND WATER SUPPLY TUNNELS.

PUMPING STATIONS:

Page

Operation and Maintenance 35
Table "A"—Monthly Pumpage in Millions of Gallons..... 42-A
Table "B"—Operation of Pumping Stations..... 42-B
Table "C"—Coal Account..... 43
Table "D"—Statement of Operation of Electric Driven Pumps—22nd Street Pumping Station 46
Table "E"—Comparative Analysis of Pumping Costs..... 46-A
Table "F"—Statistics Showing Growth of Water Works System..... 46-B
Table "G"—Pumping Engines in Operation—December 31, 1915..... 46-C
Table "H"—Boiler Room Equipment—December 31, 1915..... 46-D
Diagrams of Pumpage and Head..... 47
Distribution of Cost of Operation and Maintenance of Pumping Stations 58-A
Table "AA"—Monthly Pumpage in Millions of Gallons—Sewer Pumping Stations 58
Table "BB"—Operation of Sewage Stations..... 58-B
Table "GG"—Pumping Engines—Sewer Pumping Stations..... 58-C
Table "HH"—Boiler Plants of Sewer Pumping Stations..... 58-D
Table "CC"—Coal Account—Sewer Pumping Stations..... 59

LAKE CRIBS AND TUNNELS:

General 60

WATER WORKS SHOPS AND REPAIRS DIVISION:

General 60
Statement of Work Performed and Billed..... 62
Statement of Hydrants and Valves Manufactured and Repaired..... 65
Municipal Iron Foundry..... 66

WATER METER SHOPS:

General 66
Statistical Tables 67

TESTING DIVISION:

General 72
Oil, Cement, Cast Iron Water Pipe, Etc..... 73
Average Analyses and Prices paid for tested coal..... 75

WATER PIPE EXTENSION DIVISION:

Present size of system..... 78
Feeder Mains 78
Mains Laid on Deposit and Revenue..... 85
Mains Laid by Special Assessment..... 85
Fire Protection Work..... 85
Work Done on Account of Paving..... 85
Construction Gang 85

Digitized by Google

WATER PIPE EXTENSION DIVISION—Continued:

Page
Maintenance Work 86
Engineering Work 86
Pipe Yards 88
Service Pipes and Taps Installed..... 88
Plumbing Inspection 89
Drinking Fountains 89
Meter Connections Installed..... 90
Electrolysis 90
Recapitulation of Maintenance Expenditures..... 91
Pipe Laid by Special Assessment..... 93
Pipe Laid by Districts..... 95
Corporation Ferrules and Large Connections.....112
Water Service Pipes Installed.....112
Complaints Received 112
Valves 113
Hydrants 114
Recapitulation of Mains in Service Showing Amounts by Size.....114-A
Recapitulation of Pipe Laid Including Hydrant Branches.....115
Table Showing Amount of Water Pipe at Close of Year.....116

DESIGNING DIVISION:

Pumping Stations 117
Marshall Boulevard Municipal Plant.....118
Tunnels and Cribs 120
Miscellaneous 120
Design and Test of Hydrants.....120
Utility Gallery in Canal Street.....121

CONSTRUCTION DIVISION:

Wilson Avenue Tunnel 122
Mayfair Pumping Station.....144
68th Street Connecting Tunnel.....145
Marshall Boulevard Municipal Plant.....149
Lake View Pumping Station.....157
Roseland Pumping Station.....160
Central Park Avenue Pumping Station.....165
68th Street Pumping Station.....166
Stony Island Avenue Sewage Pumping Station.....166
Pullman Sewage Pumping Station.....168
95th Street Incinerator Plant.....168
Chicago and Cook County School for Boys.....169
Miscellaneous Tests, Inspections, Etc.....171
Municipal Reduction Plant 172
Four-Mile Tunnel 177
Filling Cross Town Tunnel and Building Bulkheads.....178
Statement of Construction Division—Capital Account.....181

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DIVISION OF BRIDGES:

Page
General 182
Bridge Designing 182
Expenditures for Repairs and Operation....182-A
Bridge Construction by Contract....187
Summary of Bridge Construction Contracts....188
Bridge Construction by Day Labor....197
Repairs and Betterments Section....199
Viaduct Section 203
List of City Bridges 204-A
List of Viaducts 204-B

BUREAU OF RIVERS AND HARBORS

Harbor Master's Report....207
Permits Issued 209
Material Dumped in Lake Michigan, Sources and Where Deposited..211
Lake Commerce 212
Statistical Diagram 214-A
Statistical Data 215
Work Done by U. S. Government in Chicago Harbor....217
Chicago River 218
Calumet Harbor 218
Calumet River 219
Work Done by Sanitary District in Chicago River....219
Expenditures for Improvement of Harbor....220
Work Done by City 220
Dock Line Ordinances Passed by City Council....221
Vacation of Portion of South Fork, South Branch, Chicago River....221
Harbor Board Ordinance 222
Eastland Disaster 222
Bridge Operation 224

BUREAU OF SEWERS

Expenditures 227
Sewers and Catch-Basins Cleaned by Districts....227-A
Statement of Repair and Construction Work....228
Summary of Sewers Constructed by Special Assessment....229
Summary of Sewers Constructed by Private Contract....230
Miscellaneous Sewer Construction Work....232
Recapitulation of All Sewers, Manholes and Catch-Basins Built....233
Sewers Acquired by Annexation....234
Summaries of Drains Constructed....235
Cost of Sewer Construction and Maintenance Since Establishment of Sewerage System in 1855....236
Benches and Street Grades....237

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BUREAU OF WATER

Page
General Review of Work....241
Detailed Statement of Gross Collections....244
Detailed Statement of Net Collections....245
Comparative Statement of Collections and Operation Expenses....246
Comparative Statement of Gross Collections....247
Detail of General Assessment....247-A
Analysis of General Ledger—Assessed Rates....247-B
Comparative Statement of Debit Balances....248
Analysis of General Ledger—Meter Rates....249
Miscellaneous Statistics....250
Distribution of Water Meters in Service....250
Types and Sizes of Water Meters in Service....251
Statement of Assessors' Increase and Decrease Checks....252
Statement of Free Water Service Accounts....253
Permits Issued....254
Field Assessing—Buildings Examined....255
Work of Shut-off Section....256
Income Account....257
Balance Sheet....259

BUREAU OF STREETS

Garbage....263
Ashes and Miscellaneous Waste....263
Street Cleaning....264
Flushing....265
Snow Removal....267
Emergency Work....268
Dead Animals....268
Vehicle Tax and Work Done....269
Statement of Cost of Street Repairs....272-A
Repair Work Done and Unit Costs....273
Statement of Output of Asphalt Plants and Costs....274
Report of House Moving....275
Permits....276
Track Elevation....284

BUREAU OF COMPENSATION

Switch Tracks....296
Canopies....297
Scales....297
Use of Streets, Alleys and Docks....297
Sub-Sidewalk and Alley Spaces....298
Vacations of Streets and Alleys....299
Bridges Over Streets and Alleys....299
Bulkheads....300
Miscellaneous....300
General Report....302

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BUREAU OF MAPS AND PLATS

Page
General Report 307
New Construction Work 309
Plats Made 310
Maps, Charts and Certificates 310
Petitions and Ordinances Verified 310
Plats Approved for Record 311
Area of Land Sub-divided 311
Miscellaneous Work 311
Mileage of Streets and Alleys 311
Street Names Changed by Ordinance 312
Area of City 314

BUREAU OF ARCHITECTURE AND CITY HALL

General Report of City Architect, of the Work of the Bureau of Architecture and the Operation and Maintenance of the City Hall Building 317

OFFICE OF COMMISSIONER OF PUBLIC WORKS

ACCOUNTING DIVISION:
Accounting Statements 323

PHOTOGRAPHS

Wilson Avenue Tunnel. Drift Under the Lake, Looking East, Showing Ventilating Pipe, Track and High Pressure Air Line 122
Wilson Avenue Tunnel. Drift Under the Lake, Showing Concreted Tunnel, Gasoline Locomotive, and Train of Cars 124
View of Site of Mayfair Pumping Station, Looking South, Showing Rock Excavated from Tunnel, Trestle and Head-House and Excavation for Foundation of Pumping Station 138
View of Carpenter Shop and Warehouse, Looking South 150
Lake Street Bridge—Looking East 188
Belmont Avenue Bridge—East Abutment 192

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