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ANNUAL REPORT FOR YEAR 1927

BRIDGE DIVISION - BUREAU OF ENGINEERING

During the year 1927 the following bridges were completed:-

2ND & LUZERNE STREET. The construction of this bridge was necessitated by the grading of Luzerne Street. It carries a single track of the Philadelphia, Newtown & New York Railroad, in addition to carrying 2nd Street over Luzerne Street. Access from Luzerne Street to 2nd Street is provided by a concrete stairway at the northeast corner. The bridge is constructed of steel girders encased in concrete with an open concrete balustrade. It was put under contract September 24, 1925, and was opened to traffic September 4, 1926, although not fully completed. Final payment was made June 14, 1927, to the contractors, Brown-King Construction Company. The total cost was \$77,913.75 and was paid for entirely by the City of Philadelphia.

RISING SUN AVENUE BRIDGE UNDER RICHMOND BRANCH, READING COMPANY. The construction of this bridge was necessitated by the widening of Rising Sun Avenue to 70 ft. The old arch bridge at this site accomodated a road only 28 ft. wide and carried 3 railway tracks. The new bridge is of steel encased in concrete, supported on concrete abutments and columns at the sidewalk curbs and carries 4 tracks. Railroad traffic was maintained continuously during construction and highway traffic was permitted on Rising Sun Avenue beginning February 10, 1927. Final payment was made March 29, 1927, to the contractor, George F. Dobbin. The total cost was \$62,161.21, which was shared 32 $\frac{1}{2}$ % by the Reading Company and 67 $\frac{1}{2}$ % by the City within the railroad right-of-way.

"I" STREET BRIDGE UNDER CONNECTING RAILWAY COMPANY. Construction of this bridge permits the opening of "I" Street to the north of Erie

Avenue and the development of a considerable territory. The bridge is a through plate girder with concrete floor and carries 6 railway tracks over "I" Street. The abutments are of concrete. The contract included also a retaining wall extending south of the bridge for a distance of 204 feet along the west house line of "I" Street. Railroad traffic was maintained continuously during construction. This work was put under contract January 28, 1927, and the contractors, Kaufman Construction Company, received final payment on December 13, 1927. The total cost of the contract was \$92,346. which was the City's proportion of the cost of the bridge. The railroad contributed toward the construction by doing all the work of maintaining traffic during construction, excavation under its right-of-way, timber and pile supports for the tracks, alterations to tracks and signals, the erecting of the steel, the furnishing and placing of the concrete floor, the building of the back-walls above the bridge seat, and the back-fill on its right-of-way.

65TH STREET BRIDGE OVER COBBS CREEK PARKWAY. This bridge replaced an old timber structure which provided only 25 feet for roadway and sidewalk and was unsafe for present day traffic. The new bridge is of steel girders encased in concrete. It has two 12 ft. sidewalks and a 36 ft. cartway. It crosses Cobbs Creek Parkway with two 50 ft. spans supported on stone faced concrete abutments and one center pier. The total length is 200 feet. A stairway from 65th Street to the Parkway was included in the contract. During construction traffic of all kinds was maintained on the Parkway and pedestrian and street car traffic was maintained on 65th Street. The work was begun on October 7, 1925, and the bridge was opened to traffic on June 16, 1926, although not entirely completed at that time. The contractor, M. & J. B. McHugh, received final payment May 3, 1927. The total cost was \$72,935.58 and was paid entirely by the City of Philadelphia.

The following bridges were put under contract and not completed during the year 1927:-

GREEN LANE BRIDGE OVER SCHUYLKILL RIVER. This bridge will replace the existing iron truss bridge which has become entirely inadequate for present day traffic. The new structure consists of four concrete arches of 92'9" clear span over the river and a concrete encased steel girder span of 75 feet over the Schuylkill Navigation Company Canal and the Reading Company's track. The new bridge will provide two 8 ft. sidewalks and a 36 ft. cartway. Its total length will be 630 feet. This work was put under contract December 4, 1926, and at the close of 1927 was 64% complete. The limit of contract is \$430,000. to be paid jointly by the City of Philadelphia and Montgomery County. The contractors are Seeds & Derham.

In connection with this project it was found necessary to rebuild about 400 feet of retaining wall along Main Street for the east approach to the bridge. This wall is of concrete and conforms to the architecture of Green Lane Bridge. It was put under contract on October 28, 1927, and the limit of contract is \$47,000. The contractor is C. A. MacDonald. The contract for grading the east approach of Green Lane Bridge was awarded to the Union Paving Company on December 29, 1927. The limit of this contract was set at \$35,000.

GIRARD AVENUE BRIDGE OVER SCHUYLKILL RIVER. The old deck of Girard Avenue Bridge had deteriorated from corrosion to such an extent as to be very dangerous and it was necessary that a new floor be provided which would not overload the old trusses and would provide sufficient strength for present day traffic. The cartway slab, made up of special welded steel trusses encased in a concrete slab of a total depth of only 5", was decided upon, after actual tests, to be the most

suitable design. On July 19, 1927, the contract was awarded to M. & J. B. McHugh, to remove the old deck and rebuild the bridge floor, including the 5" slab and the steel stringers supporting it, new sidewalk slabs and various other general repairs to the old bridge. Traffic has been maintained without interruption on the river and the river drives. Pedestrian and electric car traffic has been maintained in both directions on the bridge. Vehicular traffic has, however, been permitted only in a westerly direction, as it was necessary to restrict the cartway to half of the bridge while the other half was being worked on. The limit of this contract was set at \$170,000. and at the end of the year it was about 45% completed.

HUNTING PARK AVENUE BRIDGE OVER NORTH PENN RAILROAD. This bridge was constructed in order to open Hunting Park Avenue to the east of the bridge. The structure is a concrete encased steel girder bridge with concrete abutments and a concrete retaining wall along the south side of Hunting Park Avenue from the bridge to 5th Street. Railway traffic was maintained continuously during construction. The contract for this work was awarded March 4, 1927, to the Robbins Contracting Co., Inc., and at the close of the year was about 87% completed. The limit of contract is \$100,000. and the entire cost is to be borne by the City of Philadelphia.

UNIVERSITY BRIDGE OVER SCHUYLKILL RIVER. This bridge will provide a much needed connection between south and west Philadelphia and will be the southern terminus of the proposed plan to beautify the banks of the Schuylkill River. The structure consists of five spans, the central span being an electrically operated double leaf bascule bridge. It will provide a clear channel between fenders of 100 feet and when closed will

have a clearance above mean high water of 30 feet. The plans provide for 2 sidewalks 9 feet wide and a cartway 54 feet wide. The total length between abutment faces will be 536 feet. The piers and abutments will be surfaced with select buff Indiana limestone. The foundations for this bridge have been taken down to firm bed rock which was found in some cases to be 44 feet below mean high water. The foundations for the south abutment and the south intermediate pier were constructed by the open coffer dam method - while the north abutment, north intermediate pier and both bascule piers were constructed by the pneumatic caisson method. The large caissons for the main bascule piers are 123 feet long by 28 feet wide. The contract was awarded to the Dravo Contracting Company of Pittsburgh, on June 9, 1927. The limit of contract has been set at \$1,330,000. At the close of 1927 all of the caissons had been sunk to bed rock, excepting the south bascule pier caisson.

LINDEN AVENUE BRIDGE OVER PHILADELPHIA AND TRENTON RAILROAD. A contract was entered into with the Robbins Contracting Company for the construction of a bridge at this site on October 21, 1927. The price bid for the construction of this bridge was \$126,811 and was to be paid for, in equal portions, by the City of Philadelphia and the Pennsylvania Railroad. The structure is of concrete encased steel girder construction and spans the existing 4 tracks with provision for 2 future tracks in side spans. The sidewalks will be 13'0" wide and the cartway will be 40'0" wide.

RHAWN STREET BRIDGES OVER PENNYPACK CREEK. These bridges will replace two old timber structures which were condemned as unsafe some years ago. The first design prepared by the Bridge Division provided for one straight bridge and one curved bridge to conform with the

existing line of Rhawn Street at that time. However, at the request of the Art Jury the lines of Rhawn Street were changed and the bridges, as redesigned, provided for two straight bridges with a curve at the eastern end of the east crossing of Pennypack Creek. Each bridge consists of three arches, a central span of 100 feet and 2 side spans of 76 feet each. The roadway provides for a cartway 38 feet wide and sidewalks 8 ft. wide. The clearance over Pennypack Creek is approximately 40 feet at the west bridge and 35 feet at the east bridge. The contract for these bridges was awarded to the Vare Construction Company on December 29, 1927, and the limit of contract has been set at \$370,000.

During the year plans have been prepared for the following bridges:-

Cottman Street under Philadelphia, Newtown & N. Y. Railroad.

Leverington Avenue over Manayunk Canal.

"B" St. under Connecting Railway and Philadelphia & Bustleton Railroad.

Abbotsford Avenue over Connecting Railway.

Ryan Avenue over Sandy Run.

6th & Allegheny Avenue over Richmond Branch of the Reading Co.

Lycoming Street over Richmond Branch of the Reading Company.

Hunting Park Avenue over Phila. & Bustleton Railroad.

In addition the Bridge Division has checked 39 sets of plans of vaults, marquises, private bridges, etc. at the request of the Board of Highway Supervisors. Preliminary studies and calculations were also made on the following bridges:-

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Penrose Avenue over Schuylkill River.

Welsh Avenue over Pennypack Creek.

Cobbs Creek between 65th Street and Florence Avenue.

Rising Sun Avenue over Tacony Creek.

BRIDGES UNDER CONTRACT 1927.

LOCATION	DATE OF ORDINANCE	BIDS RECEIVED	DATE OF CONTRACT	CONTRACTOR	% COMPLETE - ED AT LAST ESTIMATE	DATE LAST ESTI- MATE
2nd St. over Lu- zerne St. carrying P.N.& N. Y. Railroad	7-23-24	9-9-25	9-24-25	Brown-King Constr. Co.	100	6-14-27 (Final)
65th St. over Cobbs Creek Pk.	2-3-25	9-30-25	10-7-25	M. & J. B. McHugh	100	5-3-27 (Final)
Rising Sun Ave. under Rich.Br.	2-3-25	2-10-26	3-11-26	George F. Dobbins	100	3-29-27 (Final)
"I" St. under Conn. Rwy.	5-27-25	1-19-27	1-28-27	Kaufman Constr. Co.	100	12-13-27 (Final)
Green Lane over Schuylkill	2-15-26	11-30-26	1-21-27	Seeds & Derham	63-55/100	12-20-27
Main St. Retain- ing Wall adja- cent to Green Lane Bridge	2-15-26	10-5-27	10-28-27	C. A. MacDonald	- -	none
Hunting Pk. Ave. over N. Penn RR	12-3-25	2-16-27	5-4-27	Robbins Contr. Co.	85-90/100	12-6-27
University Br. over Schuylkill	12-12-24 11-24-25	5-25-27	6-9-27	Dravo Contr. Co.	23-32/100	12-6-27
Girard Ave. over Schuyl. - Re- placement of deck	10-2-25	7-6-27	7-19-27	M. & J. B. McHugh	48-01/100	12-23-27
Linden Ave. over Phil & Tr RR	12-3-25	8-24-27	10-21-27	Robbins Contr. Co.	- -	none

LOCATION	SOURCE OF FUNDS	AMOUNT OF APPROPRIATION FOR CITY'S SHARE	LIMIT OF PAYMENT BY CITY	LIMIT OF PAYMENT BY JOINT CONTRACTOR	AMOUNT PAID BY CITY TO DEC. 31, 1927
2nd St. over Luzerne St. carrying P. N. & N. Y. Railroad	Item 304F	\$ 90,000.	\$ 85,000.	- -	\$ 77,913.73
65th St. over Cobbs Creek Pk.	Item 322	125,000.	80,000.	- -	72,935.58
Rising Sun under Richmond Br. - Reading Company	Item 322B	150,000.	70,000.	Reading Company \$ 30,000.	62,161.21
"I" St. under Conn. Railway	Item 322E	150,000.	100,000.	- -	92,346.
Green Lane over Schuylkill Riv.	Item 322J		199,578.50	Montgomery County 50% total cost 112,643.65	112,643.65
East Appn. Green Lane Bridge	Item 322J	300,000.	25,000.	- -	none
Main St. Retaining Wall adjacent to Green Lane	Item 322J		47,000.	- -	none
Hunting Pk. Ave. over N. Penn RR	Item 363C	150,000.	100,000.	- -	67,094.25
University Br. over Schuylkill	Item 325L Item 363A	1,330,000.	1,330,000.	- -	273,402.61
Girard Ave. over Schuylkill - Renewal of Deck	Item 370L	250,000.	170,000.	- -	68,858.12
Line P. & R. R.	Item 363	120,000.	70	50% total cost	none

FINANCIAL STATEMENT

Appropriation 1927 General funds		\$291,150.00
Additional Appropriation 1927 General funds		718.42
Balance General Funds 1926		1,951.82
Balance Loan Funds 1926		32,897,995.87
Additional Loan Funds 1927		369,342.48
Transfer from General funds 1927	\$26,700.00	
Expenditures 1927	9,336,996.22	
Balance Merged 1927	11,367.90	
Balance Available 1928	24,186,094.47	
	\$33,561,158.59	\$33,561,158.59
Receipts 1927:		
Sewer Registrar		\$85,994.78

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ANNUAL REPORT
1927
GRADE CROSSING DIVISION

January 16, 1928.

The improvements carried on under the Grade Crossing Division are
South Philadelphia Improvement
Pennsylvania Terminal Improvement
Baltimore and Ohio Terminal Improvement
Manayunk Elevated
Delaware Avenue Improvement
Chester Branch Elevated

There was considerable activity on the projects carried on under the charge of the Grade Crossing Division of the Bureau during the past year.

An agreement was executed between the City and the Baltimore and Ohio Railroad Company and the Schuylkill River East Side Railroad Company which involves the work of constructing a new passenger station by the Railroad Companies at Twenty-fourth and Chestnut streets, whereby the City has the right to construct, maintain and operate a drive along and over the tracks of the Railroad Companies between the Parkway and the University Bridge and Thirty-fourth street and Grays Ferry avenue, for a distance of about 3.3 miles.

An agreement was entered into between the City and the Pennsylvania Railroad Company amending the agreement of July 13, 1925 so that the Pennsylvania Railroad can construct their subway between Twentieth street and Fifteenth street mostly on railroad property and permit of a better development of the lines and grades of the Pennsylvania Boulevard between Broad street and the West River Drive and the proposed new terminal station to be constructed by the Pennsylvania Railroad just west of the river.

Negotiations are about consummated between the Reading Company and the City looking towards the elimination of grade crossings on the Philadelphia, Germantown and Norristown Branch and the Chestnut Hill Railroad between Wister street and the Bethlehem pike.

In connection with the South Philadelphia track elevation, actual construction was confined to Twenty-fifth street between the Arsenal Bridge and Passyunk avenue and considerable progress was made in the construction of the concrete viaduct on the line of Twenty-fifth street between Washington avenue and Passyunk avenue looking towards the final elimination of the surface tracks of the Delaware Extension of the Pennsylvania Railroad between the above points. This will leave Twenty-fifth street, 100 feet in width, clear of all surface tracks so that it can be improved and paved its entire length and give a wide north and south thoroughfare between Washington avenue and Passyunk avenue.

There is under construction the relocation and elevation of the Baltimore and Ohio Railroad Company's tracks between its East Side Yard at Jackson street and the Schuylkill river and Twenty-sixth street and Oregon avenue.

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All the real estate has been acquired for the right-of-way and the railroad yards for the relocation and elevation of the tracks of the Pennsylvania Railroad Company, the Baltimore and Ohio Railroad Company and the Philadelphia Belt Line Railroad Company, generally known as the 6-track joint line between Passyunk avenue and League Island park.

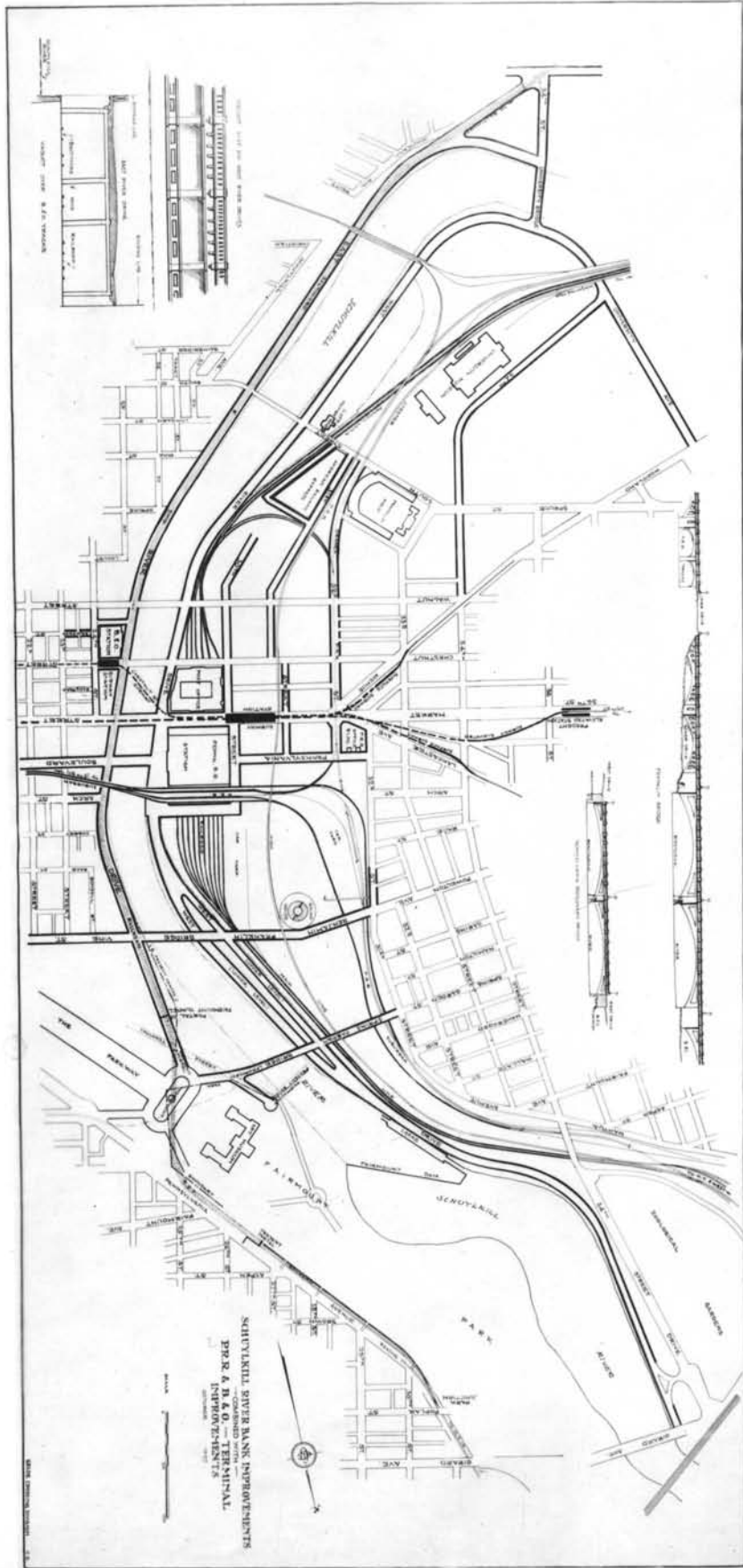
The dredging of the channel and the necessary dredging in front of the new terminal yard of the Pennsylvania Railroad is now being done and during the year 1928 a new coal handling pier and dock will be constructed also sufficient area of the new yard constructed to serve the pier.

Under the agreement between the City and the Reading Company for the elimination of grade crossings on the Philadelphia, Germantown and Norristown Railroad between Wissahickon creek and Fountain street through Manayunk, construction work has been confined to the elimination of Ridge avenue crossing at Wissahickon station and the work of both the reconstruction of the station and the construction of a bridge to carry Ridge avenue on its new line over the railroad is advanced and it will be only a few months before the crossing will be eliminated. When this is done the other portion of the elevation will be taken up.

In connection with the work of the South Philadelphia track elevation, in order to meet the City's share of its obligation under the agreement it will be necessary to provide additional funds and an amount should be included in the electoral loan sufficient to meet the City's obligation. The Bureau has requested the officials of the Pennsylvania Railroad Company to proceed with the work of elimination of grade crossings from Thirtieth street and Grays Ferry avenue to Washington avenue and on Washington avenue from Twenty-fifth street to Fifth street, which is the next important step in the South Philadelphia work.

In connection with the South Philadelphia track elevation and Delaware avenue improvement, Delaware avenue has been opened, graded and paved as far south as Bigler street and legally opened between Bigler and Hoyt streets, damages paid and is now being brought to grade.

There is now under contract a bridge to carry Sixty-first street over the Chester Branch of the Reading Company, which is the first step in connection with the abolishment of grade crossings along the Chester Branch between Fifty-seventh street and Bow creek.



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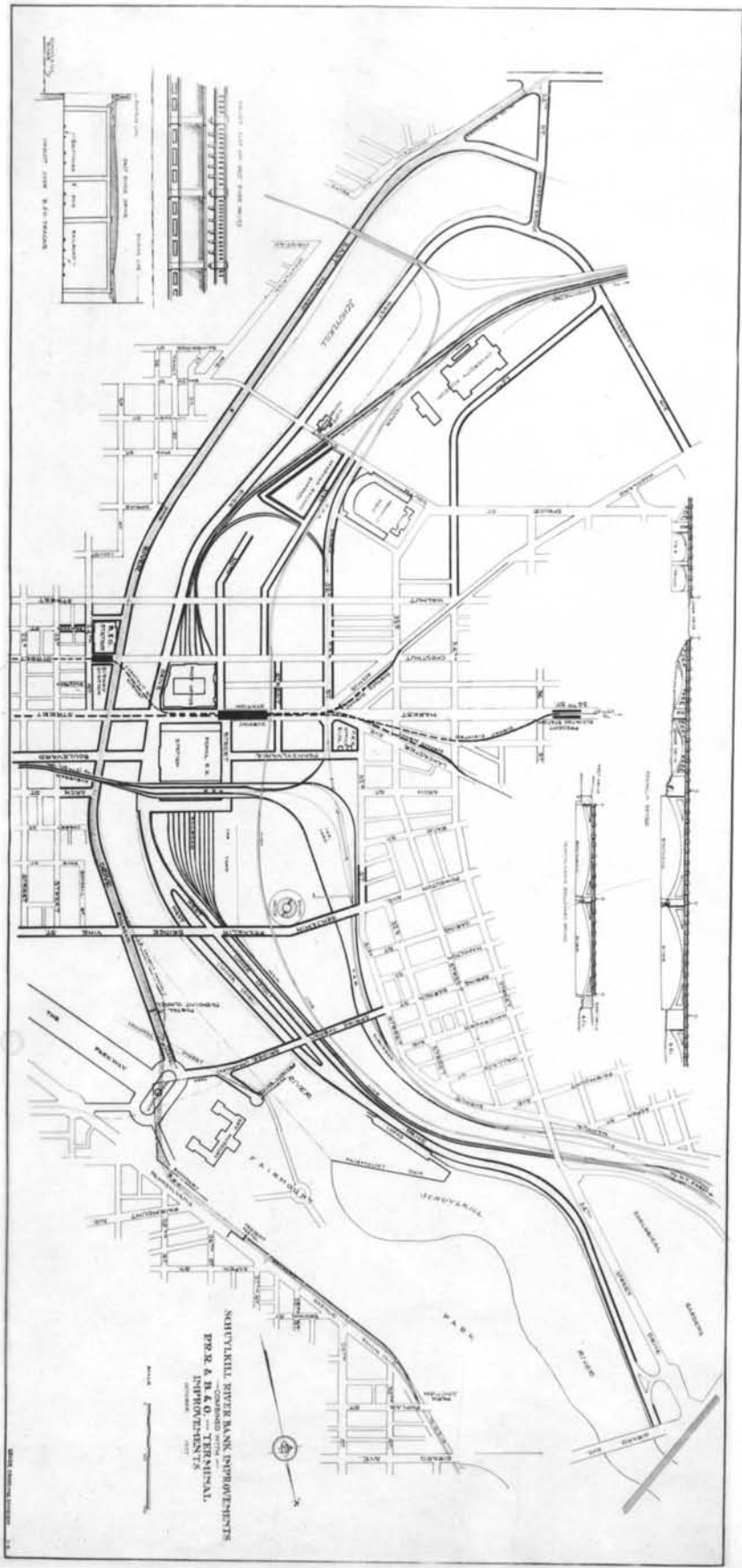
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ANNUAL REPORT - 1927.

DRAINAGE

OAK LANE PUMPING STATION.

This station is located at 69th Avenue North between Broad Street and Old York Road, and provides drainage for an area of approximately 80 acres. It was placed in service in 1916 and serves as a temporary measure until such time as the main sewer system will be extended to this locality.

About 481 buildings are connected, comprising a population estimated at 2500. The station is equipped with two 4" vertical centrifugal pumps automatically operated by current purchased from the Philadelphia Electric Company. The total pumpage for the year 1927 amounted to 76 million gallons, at a power cost of \$1575. The total expenditures for equipment, repairs, maintenance and operation amounted to \$3518.

During the year 495 cubic feet of wet solids were intercepted on the rack screens and burned in the incinerator.

Both pumps were overhauled, a new impeller and pump shaft was placed in pump No. 1, and a new pump shaft in pump No. 2.

MINGO CREEK PUMPING STATION.

This station is located on the west bank of the Schuylkill River north of Penrose Ferry Road, and was constructed in 1896 to provide surface drainage for the lowlands of the 40th Ward. The surface elevations throughout the lowlands are generally below the high tide level in the surrounding rivers, and this area is therefore protected from flooding by a system of dykes along the water front. The natural creeks traversing this area have been converted into a system of drainage ditches and discharge into the main channel of Mingo Creek, which terminates at the site of the pumping station.

Two 150 horse power oil fired boilers provide steam for driving 2 horizontal

centrifugal pumps, of a combined capacity to lift 60 million gallons per day and discharge the water into the Schuylkill River against a head of 13 feet.

The center and rear wall of boiler #2 was rebuilt. Boiler #1 furnace was relined, rear wall rebuilt and boiler seams electric welded.

The pumping hours for one unit during the year totalled 2754 hours, and the fuel oil consumption amounted to 245,723 gallons, at a cost of \$12,593. The total expenditure for maintenance, repairs and operation during the year amounted to \$23,685.

SOUTHWEST SEWAGE DISPOSAL PROJECT.

In carrying out the sewage disposal project in the southwest section, the work has progressed to a point which permitted the beginning of operation of the Southwest Sewage Pumping Station on August 24, 1927.

This pumping station was completed at a cost of approximately \$270,000., and is located in the City-owned 1000-acre tract near Penrose Ferry Road and Island Road.

A portion of the collecting sewer has been constructed from the Pumping Station to a point near 82nd Street and Bartram Avenue.

The small quantity of sewage now collected will continue to be discharged into Eagle Creek pending the design and construction of the sewage treatment works to be located within this section.

The motor driven pumping equipment now installed consists of 4 vertical volute pumps designed for a total daily flow of 50 million gallons against a 40-foot head. Future installation will increase the pumping capacity to a total of 160 million gallons daily.

FRANKFORD CREEK GRIT CHAMBER.

This station is located on a tract of land bounded by N Street, Hunting Park Avenue, O Street and Lycoming Street, and provides coarse screening and preliminary

sedimentation for sewage collected by the Wingohocking and Tacony Creek Intercepting Sewers, so as to remove debris and sand from the sewage before it passes through the pressure conduit leading to the Northeast Sewage Treatment Works.

To enable the contractor to construct the connection between the Wingohocking Sewer and the Frankford Creek High Level Collector, it was necessary to by-pass the flow of the Wingohocking Sewer into Frankford Creek in the vicinity of I and Ramona Streets, and the operation of the Grit Chamber and Treatment Works was therefore suspended from November 20th to the end of the year.

During the period January 1st to November 20th, 1927, a total of 5403 cubic feet of wet screenings, equal to .7 cubic feet per million gallons of sewage, have been intercepted, and after draining, were burned.

20,710 cubic feet of wet grit, equal to 2.7 cubic feet per million gallons of sewage have been intercepted, washed and hauled to the Northeast Sewage Treatment Works.

Analysis of the grit removed indicated the presence of 6.3% volatile matter.

660 cubic feet of grease have been intercepted and burned with the screenings in the incinerator.

The total sewage flow for the year amounted to 7400 million gallons.

The total expenditure for operation, repairs to plant, maintenance and equipment, amounted to \$13,504, or \$1.75 per million gallons of sewage.

NORTHEAST SEWAGE TREATMENT WORKS.

These works are located along Wheatsheaf Lane between Richmond Street and the Delaware River. The first section of these works, comprising 32 Imhoff tanks and 80 sludge drying beds, was placed in operation October 29, 1923.

An average flow of 27 million gallons per day is cared for by 24 of the Imhoff tanks.

The quality of sewage varies from a rather heavy concentrated day flow to a

more dilute night flow. During the time of day flow, the sewage contains much trade waste, and is highly colored by dyes.

A slight foaming action occurred in the gas vents over the Imhoff tanks during the days of the early summer, and following sudden rises in temperature. During this period, the foaming was kept in check by paddling and beating down by water from a hose nozzle.

Settling solids as determined by Imhoff settling glasses show a consistent removal of 100% throughout the year.

Samples for suspended solids have been collected at 3-hour intervals and made into a composite sample for weekly analysis. As measured by Gooch crucible, the average total suspended solid content is reported as follows:

Tank influent	190 parts per million
Tank effluent	21 " " "

or a reduction of 89% total suspended solids.

The total sewage flow for the period January 1st to November 20th amounted to 7400 million gallons and produced 9579 cubic yards of wet digested sludge, or about 1-1/4 cubic yards of sludge per million gallons of sewage treated.

The total quantity of sludge withdrawn from the Imhoff tanks was 12,190 cubic yards. This sludge was well digested and free from offensive odors.

Laboratory analysis of the sludge withdrawn is reported as follows:

Specific gravity	1.041
Moisture	89.0%
Dry residue, volatile	41.9%
fats	14.7%

NORTHEAST SEWAGE WORKS LABORATORY.

A total of 5514 samples of sewage waters, sewage sludge and trade wastes have been examined and reported upon during the year by the laboratory. The origin of these samples is as follows: Northeast Sewage Treatment Works, Frankford Creek Grit Chamber, Pennypack Sewage Treatment Works, Byberry Sewage Treatment Works and the Industrial Waste Surveys.

PENNYPACK PUMPING STATION.

This station is located on Pennypack Creek near State Road.

Sewage from the Municipal Institutions in the vicinity and from the village of Holmesburg is collected in the intercepting sewer along the creek and conveyed to the Pumping Station, where it is forced by electrically driven centrifugal pumps to the Treatment Works at Ashburner Street and State Road.

The total pumpage for the year amounted to 798 million gallons, at a power cost of \$4493.

The total expenditure for operation, maintenance and repairs to plant and equipment amounted to \$11,888.

PENNYPACK SEWAGE TREATMENT WORKS.

These works have been in operation since 1912 and have consistently produced an effluent that is clear, non-putrescible and nearly sterile. The treatment processes employed are as follows: Clarification in Imhoff tanks, oxidation in trickling filters, disinfection by calcium hypochlorite, and sedimentation in secondary settling tanks.

Prior to 1925, the character of sewage delivered to these works was industrial and residential. Manufacturing industries having moved into this section, trade wastes from a wool scouring and dyeing establishment, and from a cotton goods bleachery, have resulted in a more concentrated sewage, highly alkaline and of increased fat content.

Beginning June 15th, the flow was further increased by admission of sewage from the Baptist Home and Shriners Hospital, located along the Roosevelt Boulevard near Pennypack Creek.

A total sewage flow of 798 million gallons of sewage produced 612 cubic yards of wet Imhoff tank sludge, or .8 cubic yards per million gallons of sewage treated. Laboratory analysis of the sludge withdrawn was reported as follows:

Specific gravity	.068
Moisture	83%
Dry residue, volatile	46%, fats 15%

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1927

During the year, a marked increase in the sewage flow occurred, and the designed capacity of 2 million gallons daily has generally been exceeded, resulting in a lesser detention period during the preliminary treatment and a greater deposit of solid material in the Imhoff tanks. This has resulted generally in incomplete sludge digestion.

The secondary processes, such as the trickling filters, disinfecting plant and final settling basin, appear to be ample to provide satisfactory treatment for the increased flow.

The final effluent of these works during this year, however, was at all times satisfactory, and laboratory analysis is reported as follows:

Suspended solids	9 parts per million
Fats	3 " " "
Dissolved oxygen	63% saturation
Total bacteria	27 per CC on litmus lactose agar at 30 degrees in 24 hours.

The total expenditure for operation, maintenance, repairs to plant and equipment amounted to \$6674.

INDUSTRIAL WASTE SURVEYS AND SEPARATION OF STORMWATER AND SEWAGE DRAINS.

The value and variety of the yearly output of manufacturing plants of Philadelphia probably exceeds that of any other city of the world.

Where processes of sewage treatment involving biological decomposition are employed, the effect of large volumes of industrial wastes upon the operation of sewage treatment works is of great moment.

Legislation has been provided to prevent the discharge into the sewers of such materials as may cause stoppage, or may have a harmful effect upon the sewer structures.

Manufacturing is to be encouraged, and cooperative studies therefore have been inaugurated by representatives of the industries affected and the City, to the end that these trade wastes shall not prejudicially affect the operation of the sewage treatment works.

23-
1927

About 300 plants have been visited and a report made of the character of trade wastes discharged into the sewer system from these industries. This survey will be continued until the entire City is covered.

Appropriate measures have already been taken in the matter of trade wastes discharged from wool scouring and bleaching plants in the Pennypack Creek Drainage area.

Investigations have been made of the character of anticipated trade wastes to be discharged from the industrial plants when application has been made for sewer connection.

Investigations have also been made as to certain trade wastes and gasoline discharged into the water courses.

In common with the experience of other cities using separate sewers for house sewage and for stormwater, it frequently happens that error is made in the house connections, whereby stormwater enters the sewage sewer and sewage enters the stormwater drain.

During the year, investigation of sewer connections from more than 350 houses was made, principally in the Oak Lane district, for the purpose of correcting stormwater and sewage drains where found improperly connected.

In the matter of undesirable discharges from industrial plants, in 37 cases correction was made without additional cost to the City or owner.

FIELD CORPS.

The Field Corps in charge of surveys, lines, grades, estimates and return plans has, during the year, covered the following construction work:

Concrete sewers 3'6" x 4' to 21' x 24' - 43,301 lin.ft. completed 1927.
24,290 lin.ft. under construction but not completed.

Brick sewers 2' to 13' diameter - 35,373 lin.ft. completed 1927.
9,385 lin.ft. under construction but not completed.

Pipe sewers 6" to 48" diameter - 19,343 lin.ft. completed 1927.
3,804 lin.ft. under construction but not completed.

Separate system sewers - 5020 lin.ft. completed 1927
577 lin.ft. under construction but not completed.

Preliminary surveys for sewers - 55,787 lin.ft.

Inlets staked out - 16.

Curbs staked out - 173 lin.ft.

Miscellaneous: Grading, paving and Pumping Station, Northeast Sewage Works.

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ANNUAL REPORT - 1927.

DRAINAGE

OAK LANE PUMPING STATION.

This station is located at 69th Avenue North between Broad Street and Old York Road, and provides drainage for an area of approximately 80 acres. It was placed in service in 1916 and serves as a temporary measure until such time as the main sewer system will be extended to this locality.

About 481 buildings are connected, comprising a population estimated at 2500. The station is equipped with two 4" vertical centrifugal pumps automatically operated by current purchased from the Philadelphia Electric Company. The total pumpage for the year 1927 amounted to 76 million gallons, at a power cost of \$1575. The total expenditures for equipment, repairs, maintenance and operation amounted to \$3518.

During the year 495 cubic feet of wet solids were intercepted on the rack screens and burned in the incinerator.

Both pumps were overhauled, a new impeller and pump shaft was placed in pump No. 1, and a new pump shaft in pump No. 2.

MINGO CREEK PUMPING STATION.

This station is located on the west bank of the Schuylkill River north of Penrose Ferry Road, and was constructed in 1896 to provide surface drainage for the lowlands of the 40th Ward. The surface elevations throughout the lowlands are generally below the high tide level in the surrounding rivers, and this area is therefore protected from flooding by a system of dykes along the water front. The natural creeks traversing this area have been converted into a system of drainage ditches and discharge into the main channel of Mingo Creek, which terminates at the site of the pumping station.

Two 150 horse power oil fired boilers provide steam for driving 2 horizontal

centrifugal pumps, of a combined capacity to lift 60 million gallons per day and discharge the water into the Schoeykill River against a head of 13 feet.

The center and rear wall of boiler #2 was rebuilt. Boiler #1 furnace was relined, rear wall rebuilt and boiler seams electric welded.

The pumping hours for one unit during the year totalled 2754 hours, and the fuel oil consumption amounted to 245,723 gallons, at a cost of \$12,593. The total expenditure for maintenance, repairs and operation during the year amounted to \$23,685.

SOUTHWEST SEWAGE DISPOSAL PROJECT.

In carrying out the sewage disposal project in the southwest section, the work has progressed to a point which permitted the beginning of operation of the Southwest Sewage Pumping Station on August 24, 1927.

This pumping station was completed at a cost of approximately \$270,000., and is located in the City-owned 1000-acre tract near Penrose Ferry Road and Island Road.

A portion of the collecting sewer has been constructed from the Pumping Station to a point near 82nd Street and Bartram Avenue.

The small quantity of sewage now collected will continue to be discharged into Eagle Creek pending the design and construction of the sewage treatment works to be located within this section.

The motor driven pumping equipment now installed consists of 4 vertical volute pumps designed for a total daily flow of 50 million gallons against a 40-foot head. Future installation will increase the pumping capacity to a total of 160 million gallons daily.

FRANKFORD CREEK GRIT CHAMBER.

This station is located on a tract of land bounded by N Street, Hunting Park Avenue, O Street and Lycoming Street, and provides coarse screening and preliminary

sedimentation for sewage collected by the Wingoocking and Tacony Creek Intercepting Sewers, so as to remove debris and sand from the sewage before it passes through the pressure conduit leading to the Northeast Sewage Treatment Works.

To enable the contractor to construct the connection between the Wingoocking Sewer and the Frankford Creek High Level Collector, it was necessary to by-pass the flow of the Wingoocking Sewer into Frankford Creek in the vicinity of I and Ramona Streets, and the operation of the Grit Chamber and Treatment Works was therefore suspended from November 20th to the end of the year.

During the period January 1st to November 20th, 1927, a total of 5403 cubic feet of wet screenings, equal to .7 cubic feet per million gallons of sewage, have been intercepted, and after draining, were burned.

20,710 cubic feet of wet grit, equal to 2.7 cubic feet per million gallons of sewage have been intercepted, washed and hauled to the Northeast Sewage Treatment Works.

Analysis of the grit removed indicated the presence of 6.3% volatile matter.

660 cubic feet of grease have been intercepted and burned with the screenings in the incinerator.

The total sewage flow for the year amounted to 7400 million gallons.

The total expenditure for operation, repairs to plant, maintenance and equipment, amounted to \$13,504, or \$1.75 per million gallons of sewage.

NORTHEAST SEWAGE TREATMENT WORKS.

These works are located along Wheatsheaf Lane between Richmond Street and the Delaware River. The first section of these works, comprising 32 Imhoff tanks and 80 sludge drying beds, was placed in operation October 29, 1923.

An average flow of 27 million gallons per day is cared for by 24 of the Imhoff tanks.

The quality of sewage varies from a rather heavy concentrated day flow to a

more dilute night flow. During the time of day flow, the sewage contains much trade waste, and is highly colored by dyes.

A slight foaming action occurred in the gas vents over the Imhoff tanks during the days of the early summer, and following sudden rises in temperature. During this period, the foaming was kept in check by paddling and beating down by water from a hose nozzle.

Settling solids as determined by Imhoff settling glasses show a consistent removal of 100% throughout the year.

Samples for suspended solids have been collected at 3-hour intervals and made into a composite sample for weekly analysis. As measured by Gooch crucible, the average total suspended solid content is reported as follows:

Tank influent	190 parts per million
Tank effluent	21 " " "

or a reduction of 89% total suspended solids.

The total sewage flow for the period January 1st to November 20th amounted to 7400 million gallons and produced 9579 cubic yards of wet digested sludge, or about 1-1/4 cubic yards of sludge per million gallons of sewage treated.

The total quantity of sludge withdrawn from the Imhoff tanks was 12,190 cubic yards. This sludge was well digested and free from offensive odors.

Laboratory analysis of the sludge withdrawn is reported as follows:

Specific gravity	1.041
Moisture	89.0%
Dry residue, volatile	41.9%
fats	14.7%

NORTHEAST SEWAGE WORKS LABORATORY.

A total of 5514 samples of sewage waters, sewage sludge and trade wastes have been examined and reported upon during the year by the laboratory. The origin of these samples is as follows: Northeast Sewage Treatment Works, Frankford Creek Grit Chamber, Pennypack Sewage Treatment Works, Byberry Sewage Treatment Works and the Industrial Waste Surveys.

PENNYPACK PUMPING STATION.

This station is located on Pennypack Creek near State Road.

Sewage from the Municipal Institutions in the vicinity and from the village of Holmesburg is collected in the intercepting sewer along the creek and conveyed to the Pumping Station, where it is forced by electrically driven centrifugal pumps to the Treatment Works at Ashburner Street and State Road.

The total pumpage for the year amounted to 798 million gallons, at a power cost of \$4493.

The total expenditure for operation, maintenance and repairs to plant and equipment amounted to \$11,888.

PENNYPACK SEWAGE TREATMENT WORKS.

These works have been in operation since 1912 and have consistently produced an effluent that is clear, non-putrescible and nearly sterile. The treatment processes employed are as follows: Clarification in Imhoff tanks, oxidation in trickling filters, disinfection by calcium hypochlorite, and sedimentation in secondary settling tanks.

Prior to 1925, the character of sewage delivered to these works was industrial and residential. Manufacturing industries having moved into this section, trade wastes from a wool scouring and dyeing establishment, and from a cotton goods bleachery, have resulted in a more concentrated sewage, highly alkaline and of increased fat content.

Beginning June 15th, the flow was further increased by admission of sewage from the Baptist Home and Shriners Hospital, located along the Roosevelt Boulevard near Pennypack Creek.

A total sewage flow of 798 million gallons of sewage produced 612 cubic yards of wet Imhoff tank sludge, or .8 cubic yards per million gallons of sewage treated. Laboratory analysis of the sludge withdrawn was reported as follows:

Specific gravity	.068
Moisture	83%
Dry residue, volatile	46%, fats 15%

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Suspended solids	9 parts per million
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BUREAU OF ENGINEERING

DEPARTMENT OF PUBLIC WORKS

CITY OF PHILADELPHIA

CITY HALL

REPLY AND REFER TO: B.E. - HJS

January 18, 1928

From: Assistant Engineer, Sewer Construction

To: Mr. J. A. Vogleson, Chief Engineer

Subject: ANNUAL REPORT

Complying with your request of January 10, 1928

you will find herewith attached in duplicate the annual report
of this division for the year 1927.

H. J. Sowden, Asst. Engineer,
Sewer Construction.

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January 1, 1928

SEWER CONSTRUCTION

\$100,000. was appropriated by Council for the Construction of Main Sewers

\$250,000. was appropriated by Council for the Construction of Branch Sewers.

MAIN AND BRANCH SEWERS

Contracts for 193 branch sewers were entered into to the amount of \$1,253,800.00. 177 branch sewer contracts were completed during the year of 1927 and 45 are now in course of construction.

11.65 miles of main sewers were completed at a cost of \$2,357,588.18. 23 new main sewers were started during the year of 1927 in the amount of \$1,559,500.00.

MAIN SEWERS PLACED UNDER CONTRACT PREVIOUS TO 1927 AND COMPLETED IN 1927.

Champlost Avenue from Tacony Creek to Front Street. Size 5' diameter, reduced cradle stone block invert and 4'6" diameter reduced cradle stone block invert. Total length of sewer completed 1543.43 lin.ft.

Cranford Avenue from present terminus near Robbins to Robbins Ave. and in Robbins Ave. from Cranford Ave. to Cranford Ave., and in Cranford Avenue between Robbins Avenue and Oxford Avenue. Size 10'6" concrete sewer and 8'0" concrete sewer. Total length of sewer completed 1588.34 lin. ft.

Erie Avenue between present terminus southeast of Casper Street and Edgemont Street. Size 7' by 10'6" reinforced concrete on piles and 7' by 10'6" reinforced concrete sewer. Total length of sewer completed 2211 lin. ft.

Eighteenth Street between Wagner Avenue and Rockland St. Size 3'6" diameter in reduced cradle and 3'6" diameter in hard rock. Total length of sewer completed 585.54 lin. ft.

Fairmount Park from the Wissahickon High Level Collector near Lincoln Drive to Walnut Lane and a connection to the intersection of Daniel and Hermit Street. Size 10" pipe in concrete and 10" cast iron pipe. Total length of sewer completed 2533 lin. ft.

Forty-ninth Street from Schuylkill River to Chester Branch of Pennsylvania Railroad. Size 3'6" diameter in full cradle on piles and 3'0" diameter in full cradle on piles. Total length of sewer completed 975.9 lin. ft.

Germantown Avenue from Cresheim Creek to Allen's Lane. Size 12" pipe with 3'6" vitrified shale brick invert and 3'6" reduced

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cradle vitrified shale brick invert. Total length of sewer completed 2279 lin. ft.

Gillespie Street from Robbins Avenue to Levick Street, in Levick Street from Gillespie to Cottage Street, in Cottage St. from Levick to Hellerman Street and in Hellerman Street between Cottage and Walker Street. Size 12' by 8' reinforced concrete. Total length of sewer completed 1863.20 lin. ft.

Green Lane from Henry Avenue to Lawnton Street. Size 4' with 10" pipe, 4' reduced cradle, 3'6" reduced cradle with 10" pipe, 2'6" reduced cradle with 10" pipe. Total length of sewer completed 2749 lin. ft.

Greenwood Street from Vernon Road to Williams Avenue, in Williams Avenue from Greenwood Street to Sedgwick Street, in Sedgwick Street from Williams Avenue to Forrest Avenue and in Forrest Avenue from Sedgwick Street to 29.28' southeast of Mt. Airy Avenue. Size 6' concrete stone block invert. Total length of sewer completed 4674 lin. ft.

Hellerman Street from present terminus between Cottage and Walker Street to Tackawanna Street, in Tackawanna Street from Hellerman Street to Levick Street, in Levick Street from Tackawanna Street to Frankford Avenue, in Frankford Avenue from Levick Street southwestwardly to stream. Size 12' by 8' reinforced concrete, 5'0" reduced cradle and 4'6" reduced cradle. Total length of sewer completed 1940.56 lin. ft.

Langdon Street from Robbins Street to Levick Street, in Levick Street from Langdon Street to Enola Street and in Enola Street between Levick and Magee Streets. Size 8' by 8' reinforced concrete. Total length of sewer completed 2686.56 lin. ft.

Mansfield Avenue between Haines Street and Washington Lane. Size 8' by 7'6" reinforced concrete. Total length of sewer completed 1610 lin. ft.

Magee Street from Enola Street to Tabor Avenue. Size 5'6" diameter vitrified shale brick lining and 5'6" diameter in reduced cradle. Total length of sewer completed 1289.85 lin. ft.

Mifflin Street from 32nd to 29th Streets. Size 7'6" by 5' reinforced concrete. Total length of sewer completed 1387.03 lin. ft.

Oak Lane Collecting Sewer in Tenth Street from about 41' south of Oak Lane Avenue to Oak Lane, in Oak Lane from Tenth Street to Verbena Street, in Verbena Street from Oak Lane to Cheltenham Ave., in Cheltenham Avenue from Verbena to Lakeside Avenue. Size 6' brick sewer, 5'6" in reduced cradle and 5'6" brick sewer. Total length of sewer completed 1933 lin. ft.

Packer Avenue between present terminus west of Delaware Avenue and Second Street. Twin 6' by 10' reinforced concrete on piles. Total length of sewer completed 2498.5 lin. ft.

Rising Sun Avenue between Olney to Clarkson Avenue. Size 3' by 2' in hard rock. Total length of sewer completed 666 lin. ft.

Extension of Sandy Run Main Sewer from its present terminus in the intersection of Lexington Avenue and Brous Street to a point in Pennypack Park about 15' south of Lexington Avenue. Size 13' in diameter. Total length of sewer completed 73 lin. ft.

State Road between Cottman and Rhawn Streets. Sizes from 2'6" by 1'8" diameter to 4'0" diameter brick sewer. Total length of sewer completed 3122 lin. ft.

Tioga Street from present terminus near Balfour Street to Edgemont Street. Size 4'0" diameter in reduced cradle, 4'0" diameter in hard rock. Total length of sewer completed 1396 lin. ft.

Whitaker Avenue from Magee to Tyson Street and in Tyson Street from Whitaker Avenue to Montour Street. Size 6' by 6' of 6" reinforced concrete with vitrified shale block invert, 6' by 6' reinforced concrete with vitrified stone block invert, 5' by 6' reinforced concrete and 5' by 6' dia. in reduced cradle and 5'0" dia. on piles. Total length of sewer completed 2831.55 lin. ft.

Wissahickon Low Level Collecting Sewer from its present terminus northwest of Shawmont Avenue northwestwardly. Size 36" vitrified pipe and 24" vitrified pipe in concrete. Total length of sewer completed 4799.19 lin. ft.

MAIN SEWERS STARTED IN 1927 AND COMPLETED IN 1927

Cobbs Creek Park from present terminus near Beaumont Street sewer to Cobbs Creek. Size 12' by 11'6" rectangular reinforced concrete sewer. Total length of sewer completed 179.25 lin. ft.

Erie Avenue, Edgemont to Aramingo Avenue. Size 7' by 8' reinforced concrete sewer. Total length of sewer completed 1935 lin. ft.

"G" Street, present terminus north of Luzerne Street to Luzerne Street and in Luzerne Street from "G" to "F" Streets. Size 4'0" dia. brick sewer in reduced cradle with vitrified shale brick invert. Total length of sewer completed 671 lin. ft.

Garland Street, Bingham to Tabor Avenue. Size 3'0" dia. brick sewer in reduced cradle with vitrified shale brick invert, 3'0" dia. brick sewer in reduced cradle with stone block invert, 3'0" dia. brick sewer in hard rock, 3'0" diameter brick sewer in full cradle on piles and 3'0" dia. brick sewer in reduced cradle. Total length of sewer completed 1188.53 lin. ft.

Mansfield Avenue, present terminus Tulpehocken St. to Upsal St. Size 8' by 7'6" reinforced concrete sewer, 7'6" by 7'6" reinforced concrete sewer, 3'6" diameter brick sewer in reduced cradle and 3'0" dia. brick sewer in reduced cradle and all appurtenances. Total length of sewer completed 3030 lin. ft.

Mifflin Street, 28th to 26th Street. Size 4'0" diameter brick sewer in reduced cradle, 3'0" diameter brick sewer on piles, 3'0" diameter brick sewer in reduced cradle, 2'6" by 1'8" brick sewer in reduced cradle. Total length of sewer completed 903.6 lin. ft.

Monastery Avenue, Jannette to Jamette and in Jannette Street, Monastery Ave. to Gerhard Street. Size 2'6" diameter brick sewer, in full cradle with vitrified shale brick invert with 10" diameter vitrified pipe, 2'6" diameter brick sewer in reduced cradle with vitrified shale brick invert with 10" diameter vitrified pipe and all appurtenances. Total length of sewer completed 817 lin. ft.

Packer Avenue from near Second Street to Fourth Street and in Fourth Street from Packer Avenue to Pollock Street and in Pollock Street from Fourth Street to Broad Street. Size Twin 6' by 10' reinforced concrete sewer on piles and

Semicircular 6' by 10' reinforced concrete sewer on piles					
6' by 7'6"	"	"	"	"	"
6' by 7'0"	"	"	"	"	"
6' by 6'	"	"	"	"	"
6' by 6'	"	"	"	"	earth
5' by 6'	"	"	"	"	piles
5' by 6'	"	"	"	"	earth
5' by 5'	"	"	"	"	piles
5' by 5'	"	"	"	"	earth

Railroad crossing structure including end chamber complete and all appurtenant work. Total length of sewer completed 5281.87 lin. ft.

Richmond Street, Erie Avenue to Butler Street and in Butler Street, Richmond to Aramingo Avenue. Size 5'6" by 5' rectangular reinforced concrete sewer and 5' by 5' rectangular reinforced concrete sewer. Total length of sewer completed 3271 lin. ft.

Sandy Run Main Sewer westward from Roosevelt Boulevard. Size 12' concrete with two 30" diameter vitrified pipes, 3'0" reduced cradle stone block invert with 10" pipe. Total length of sewer completed 557.35 lin. ft.

St. Vincent Street, Rowland to Sackett Street. Size 4'0" diameter brick sewer in reduced cradle with vitrified shale brick invert, 4'0" diameter brick sewer in hard rock with vitrified shale brick invert. Total length of sewer completed 555.67 lin. ft.

Wingchocking Sewer in Howard Street from 65' southeast of Front Street to 161.67' southeast of Front Street. Size 19' by 22' reinforced concrete sewer and all appurtenances. Total length of sewer completed 97 lin. ft.

SEWERS STARTED IN 1927 BUT NOT COMPLETED IN 1927

Cranford Avenue, Oxford Avenue to Benner Street, in Benner St., Cranford Avenue to Whitaker Avenue, in Whitaker Avenue, Benner to Comly St., in Comly Street, Whitaker Avenue to Tabor Ave., in Tabor Avenue, Comly to Benner Street, in Benner Street, Tabor Avenue to Lawndale Avenue and in Lawndale Avenue, Benner to north of Robbins Avenue. Size 7'6" x 8' reinforced concrete sewer in open cut; 7'6" x 8' reinforced concrete sewer in tunnel and 6'6" x 6'6" reinforced concrete sewer. Length of sewer completed 2045 lin. ft.

Forrest Avenue from 29.28' southeast of Mt. Airy Avenue to Gowen Avenue, in Gowen Avenue, Forrest to Williams Avenue and in Williams Avenue, Gowen to Cresheim Road. Size 5'6" diameter brick sewer in reduced concrete with stone block invert; 5'6" diameter brick sewer in hard rock with stone block invert; 5'0" diameter brick sewer in full cradle with stone brick invert on piles; 5'0" diameter brick sewer in reduced cradle with stone block invert and 5'0" diameter brick sewer in hard rock. Length of sewer completed 743.49 lin. ft.

Greenwood Avenue, Cheltenham Avenue to Vernon Road. Size 18" dia. vitrified pipe in reinforced concrete. Length of sewer completed 2010 lin. ft.

Hellerman Street, Tackawanna to Battersby Street. Size 10'6" by 8' reinforced concrete sewer with stone block invert. Contract just started.

Large Street, Everett to Magee Avenue and in Magee Avenue, Large to Horrocks Street and in Horrocks Street, Magee to Unruh Ave., and in Unruh Horrocks to Eastwood Street. Size 4'6" diameter brick sewer in reduced cradle with stone block invert and 4'0" diameter brick sewer in reduced cradle with vitrified shale brick invert. This contract has just started.

Tabor Avenue, near Comly to Benner Street, in Benner Street, Tabor Avenue to Lawndale Street and in Lawndale Street, Benner St. to north of Robbins St. Size 6'6" by 6'6" reinforced concrete sewer; 5'6" by 6'6" reinforced concrete sewer and 6' by 6' reinforced concrete sewer. This contract has just started.

Tabor Avenue, Sanger to Cheltenham Avenue. Size 3'6" diameter brick sewer. This contract has just started.

Tioga Street, present terminus near Richmond to Salmon St., in Salmon Street, Tioga to Schiller Street, in Schiller Street from Salmon to Gaul Street and in Gaul Street from Schiller to Ontario St. Size 6' by 7'6" reinforced concrete sewer on earth and 6' by 7'6" reinforced concrete sewer on piles. Length of sewer completed 2187 lin. ft.

Washington Lane, Boyer Street northeastwardly. Size 3'6" dia. brick sewer with stone block invert and 3' by 2' diameter brick sewer with vitrified shale brick invert. Length of sewer completed 921 lin. ft.

Washington Lane, Chew to Boyer Street. Size 5'0" diameter brick sewer with vitrified shale brick invert and 4'6" dia. brick sewer with stone block invert. Length of sewer completed 705 lin. ft.

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SEWERS STARTED PREVIOUS TO 1927 BUT NOT COMPLETED IN 1927

Aramingo Avenue from Frankford Creek to Sepviva Street, in Sepviva Street from Aramingo Avenue to Butler Street and in Butler Street between Sepviva Street and Frankford Avenue. Size 5' by 5'6" reinforced concrete on piles, 5' by 4'6" reinforced concrete on piles and 4'6" diameter with 12" pipe. Total length of sewer completed to date 3295 lin. ft.

RECONSTRUCTION OF SEWERS STARTED PREVIOUS TO 1927 AND COMPLETED IN 1927.

Reconstruction of sewer in Eleventh Street between Girard Avenue and Susquehanna Avenue. Size 4' by 2'8" reduced cradle with vitrified shale brick invert and 3'6" by 2'4" reduced cradle. Total length of sewer completed 2580.71 lin. ft.

Reconstruction of sewer in Spruce Street between Woodland Avenue and 34th Street. Size 4'0" in reduced cradle, 4'0" in reduced cradle vitrified shale lining. Total length of sewer completed 1311.18 lin. ft.

INLETS.

One inlet contract was carried over from 1926 and completed in 1927. One inlet contract was started in 1927 but is not completed.

Total expenditure for construction of inlets in 1927 was \$45,892.18.

January 1, 1928

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MAIN AND BRANCH SEWERS

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11.65 miles of main sewers were completed at a cost of \$2,357,588.18. 23 new main sewers were started during the year of 1927 in the amount of \$1,559,500.00.

MAIN SEWERS PLACED UNDER CONTRACT PREVIOUS TO 1927 AND COMPLETED IN 1927.

Champlott Avenue from Tacony Creek to Front Street, Size 5' diameter, reduced cradle stone block invert and 4'6" diameter reduced cradle stone block invert. Total length of sewer completed 1543.43 lin.ft.

Cranford Avenue from present terminus near Robbins to Robbins Ave. and in Robbins Ave. from Cranford Ave. to Cranford Ave., and in Cranford Avenue between Robbins Avenue and Oxford Avenue. Size 10'6" concrete sewer and 8'0" concrete sewer. Total length of sewer completed 1588.34 lin. ft.

Erie Avenue between present terminus southeast of Casper Street and Edgemont Street. Size 7' by 10'6" reinforced concrete on piles and 7' by 10'6" reinforced concrete sewer. Total length of sewer completed 2211 lin. ft.

Eighteenth Street between Wagner Avenue and Rockland St. Size 3'6" diameter in reduced cradle and 3'6" diameter in hard rock. Total length of sewer completed 585.54 lin. ft.

Fairmount Park from the Wissahickon High Level Collector near Lincoln Drive to Walnut Lane and a connection to the intersection of Daniel and Hermit Street. Size 10" pipe in concrete and 10" cast iron pipe. Total length of sewer completed 2533 lin. ft.

Forty-ninth Street from Schuylkill River to Chester Branch of Pennsylvania Railroad. Size 3'6" diameter in full cradle on piles and 3'0" diameter in full cradle on piles. Total length of sewer completed 975.9 lin. ft.

Germantown Avenue from Cresheim Creek to Allen's Lane. Size 12" pipe with 3'6" vitrified shale brick invert and 3'6" reduced 41-1927

cradle vitrified shale brick invert. Total length of sewer completed 2279 lin. ft.

Gillespie Street from Robbins Avenue to Levick Street, in Levick Street from Gillespie to Cottage Street, in Cottage St. from Levick to Hellerman Street and in Hellerman Street between Cottage and Walker Street. Size 12' by 8' reinforced concrete. Total length of sewer completed 1863.20 lin. ft.

Green Lane from Henry Avenue to Lawnton Street. Size 4' with 10" pipe, 4' reduced cradle, 3'6" reduced cradle with 10" pipe, 2'6" reduced cradle with 10" pipe. Total length of sewer completed 2749 lin. ft.

Greenwood Street from Vernon Road to Williams Avenue, in Williams Avenue from Greenwood Street to Sedgwick Street, in Sedgwick Street from Williams Avenue to Forrest Avenue and in Forrest Avenue from Sedgwick Street to 29.28' southeast of Mt. Airy Avenue. Size 6' concrete stone block invert. Total length of sewer completed 4674 lin. ft.

Hellerman Street from present terminus between Cottage and Walker Street to Tackawanna Street, in Tackawanna Street from Hellerman Street to Levick Street, in Levick Street from Tackawanna Street to Frankford Avenue, in Frankford Avenue from Levick Street southwestwardly to stream. Size 12' by 8' reinforced concrete, 5'0" reduced cradle and 4'6" reduced cradle. Total length of sewer completed 1940.56 lin. ft.

Langdon Street from Robbins Street to Levick Street, in Levick Street from Langdon Street to Enola Street and in Enola Street between Levick and Magee Streets. Size 8' by 8' reinforced concrete. Total length of sewer completed 2686.56 lin. ft.

Mansfield Avenue between Haines Street and Washington Lane. Size 8' by 7'6" reinforced concrete. Total length of sewer completed 1610 lin. ft.

Magee Street from Enola Street to Tabor Avenue. Size 5'6" diameter vitrified shale brick lining and 5'6" diameter in reduced cradle. Total length of sewer completed 1289.85 lin. ft.

Mifflin Street from 32nd to 29th Streets. Size 7'6" by 5' reinforced concrete. Total length of sewer completed 1387.03 lin. ft.

Oak Lane Collecting Sewer in Tenth Street from about 41' south of Oak Lane Avenue to Oak Lane, in Oak Lane from Tenth Street to Verbena Street, in Verbena Street from Oak Lane to Cheltenham Ave., in Cheltenham Avenue from Verbena to Lakeside Avenue. Size 6' brick sewer, 5'6" in reduced cradle and 5'6" brick sewer. Total length of sewer completed 1933 lin. ft.

Packer Avenue between present terminus west of Delaware Avenue and Second Street. Twin 6' by 10' reinforced concrete on piles. Total length of sewer completed 2498.5 lin. ft.

42-1927

Rising Sun Avenue between Olney to Clarkson Avenue. Size 3' by 2' in hard rock. Total length of sewer completed 666 lin. ft.

Extension of Sandy Run Main Sewer from its present terminus in the intersection of Lexington Avenue and Brous Street to a point in Pennypack Park about 15' south of Lexington Avenue. Size 13' in diameter. Total length of sewer completed 73 lin. ft.

State Road between Cottman and Rhawn Streets. Sizes from 2'6" by 1'8" diameter to 4'0" diameter brick sewer. Total length of sewer completed 3122 lin. ft.

Tioga Street from present terminus near Balfour Street to Edgemont Street. Size 4'0" diameter in reduced cradle, 4'0" diameter in hard rock. Total length of sewer completed 1396 lin. ft.

Whitaker Avenue from Magee to Tyson Street and in Tyson Street from Whitaker Avenue to Montour Street. Size 6' by 6' of 6" reinforced concrete with vitrified shale block invert, 6' by 6' reinforced concrete with vitrified stone block invert, 5' by 6' reinforced concrete and 5' by 6' dia. in reduced cradle and 5'0" dia. on piles. Total length of sewer completed 2831.55 lin. ft.

Wissahickon Low Level Collecting Sewer from its present terminus northwest of Shawmont Avenue northwestwardly. Size 36" vitrified pipe and 24" vitrified pipe in concrete. Total length of sewer completed 4799.19 lin. ft.

MAIN SEWERS STARTED IN 1927 AND COMPLETED IN 1927

Cobbs Creek Park from present terminus near Beaumont Street sewer to Cobbs Creek. Size 12' by 11'6" rectangular reinforced concrete sewer. Total length of sewer completed 179.25 lin. ft.

Erie Avenue, Edgemont to Aramingo Avenue. Size 7' by 8' reinforced concrete sewer. Total length of sewer completed 1935 lin. ft.

"G" Street, present terminus north of Luzerne Street to Luzerne Street and in Luzerne Street from "G" to "F" Streets. Size 4'0" dia. brick sewer in reduced cradle with vitrified shale brick invert. Total length of sewer completed 671 lin. ft.

Garland Street, Bingham to Tabor Avenue. Size 3'0" dia. brick sewer in reduced cradle with vitrified shale brick invert, 3'0" dia. brick sewer in reduced cradle with stone block invert, 3'0" dia. brick sewer in hard rock, 3'0" diameter brick sewer in full cradle on piles and 3'0" dia. brick sewer in reduced cradle. Total length of sewer completed 1188.53 lin. ft.

Mansfield Avenue, present terminus Tulpehocken St. to Upsal St. Size 8' by 7'6" reinforced concrete sewer, 7'6" by 7'6" reinforced concrete sewer, 3'6" diameter brick sewer in reduced cradle and 3'0" dia. brick sewer in reduced cradle and all appurtenances. Total length of sewer completed 3030 lin. ft.

Mifflin Street, 28th to 26th Street. Size 4'0" diameter brick sewer in reduced cradle, 3'0" diameter brick sewer on piles, 3'0" diameter brick sewer in reduced cradle, 2'6" by 1'8" brick sewer in reduced cradle. Total length of sewer completed 903.6 lin. ft.

Monastery Avenue, Jannette to Jannette and in Jannette Street, Monastery Ave. to Gerhard Street. Size 2'6" diameter brick sewer, in full cradle with vitrified shale brick invert with 10" diameter vitrified pipe, 2'6" diameter brick sewer in reduced cradle with vitrified shale brick invert with 10" diameter vitrified pipe and all appurtenances. Total length of sewer completed 817 lin. ft.

Packer Avenue from near Second Street to Fourth Street and in Fourth Street from Packer Avenue to Pollock Street and in Pollock Street from Fourth Street to Broad Street. Size Twin 6' by 10' reinforced concrete sewer on piles and

Semicircular 6' by 10' reinforced concrete sewer on piles	"	"	"	"	"
6' by 7'6"	"	"	"	"	"
6' by 7'0"	"	"	"	"	"
6' by 6'	"	"	"	"	"
6' by 6'	"	"	"	"	earth
5' by 6'	"	"	"	"	piles
5' by 6'	"	"	"	"	earth
5' by 5'	"	"	"	"	piles
5' by 5'	"	"	"	"	earth

Railroad crossing structure including end chamber complete and all appurtenant work. Total length of sewer completed 5281.87 lin. ft.

Richmond Street, Erie Avenue to Butler Street and in Butler Street, Richmond to Aramingo Avenue. Size 5'6" by 5' rectangular reinforced concrete sewer and 5' by 5' rectangular reinforced concrete sewer. Total length of sewer completed 3271 lin. ft.

Sandy Run Main Sewer westward from Roosevelt Boulevard. Size 12' concrete with two 30" diameter vitrified pipes, 3'0" reduced cradle stone block invert with 10" pipe. Total length of sewer completed 557.35 lin. ft.

St. Vincent Street, Rowland to Sackett Street. Size 4'0" diameter brick sewer in reduced cradle with vitrified shale brick invert, 4'0" diameter brick sewer in hard rock with vitrified shale brick invert. Total length of sewer completed 555.67 lin. ft.

Wingohocking Sewer in Howard Street from 65' southeast of Front Street to 161.67' southeast of Front Street. Size 19' by 22' reinforced concrete sewer and all appurtenances. Total length of sewer completed 97 lin. ft.

44-1927

SEWERS STARTED IN 1927 BUT NOT COMPLETED IN 1927

Cranford Avenue, Oxford Avenue to Benner Street, in Benner St., Cranford Avenue to Whitaker Avenue, in Whitaker Avenue, Benner to Comly St., in Comly Street, Whitaker Avenue to Tabor Ave., in Tabor Avenue, Comly to Benner Street, in Benner Street, Tabor Avenue to Lawndale Avenue and in Lawndale Avenue, Benner to north of Robbins Avenue. Size 7'6" x 8' reinforced concrete sewer in open cut; 7'6" x 8' reinforced concrete sewer in tunnel and 6'6" x 6'6" reinforced concrete sewer. Length of sewer completed 2045 lin. ft.

Forrest Avenue from 29.28' southeast of Mt. Airy Avenue to Gowen Avenue, in Gowen Avenue, Forrest to Williams Avenue and in Williams Avenue, Gowen to Cresheim Road. Size 5'6" diameter brick sewer in reduced concrete with stone block invert; 5'6" diameter brick sewer in hard rock with stone block invert; 5'0" diameter brick sewer in full cradle with stone brick invert on piles; 5'0" diameter brick sewer in reduced cradle with stone block invert and 5'0" diameter brick sewer in hard rock. Length of sewer completed 743.49 lin. ft.

Greenwood Avenue, Cheltenham Avenue to Vernon Road. Size 18" dia. vitrified pipe in reinforced concrete. Length of sewer completed 2010 lin. ft.

Hellerman Street, Tackawanna to Battersby Street. Size 10'6" by 8' reinforced concrete sewer with stone block invert. Contract just started.

Large Street, Everett to Magee Avenue and in Magee Avenue, Large to Horrocks Street and in Horrocks Street, Magee to Unruh Ave., and in Unruh Horrocks to Eastwood Street. Size 4'6" diameter brick sewer in reduced cradle with stone block invert and 4'0" diameter brick sewer in reduced cradle with vitrified shale brick invert. This contract has just started.

Tabor Avenue, near Comly to Benner Street, in Benner Street, Tabor Avenue to Lawndale Street and in Lawndale Street, Benner St. to north of Robbins St. Size 6'6" by 6'6" reinforced concrete sewer; 5'6" by 6'6" reinforced concrete sewer and 6' by 6' reinforced concrete sewer. This contract has just started.

Tabor Avenue, Sanger to Cheltenham Avenue. Size 3'6" diameter brick sewer. This contract has just started.

Tioga Street, present terminus near Richmond to Salmon St., in Salmon Street, Tioga to Schiller Street, in Schiller Street from Salmon to Gaul Street and in Gaul Street from Schiller to Ontario St. Size 6' by 7'6" reinforced concrete sewer on earth and 6' by 7'6" reinforced concrete sewer on piles. Length of sewer completed 2187 lin. ft.

Washington Lane, Boyer Street northeastwardly. Size 3'6" dia. brick sewer with stone block invert and 3' by 2' diameter brick sewer with vitrified shale brick invert. Length of sewer completed 921 lin. ft.

Washington Lane, Chew to Boyer Street. Size 5'0" diameter brick sewer with vitrified shale brick invert and 4'6" dia. brick sewer with stone block invert. Length of sewer completed 705 lin. ft.

45-1927

SEWERS STARTED PREVIOUS TO 1927 BUT NOT COMPLETED IN 1927

Aramingo Avenue from Frankford Creek to Sepviva Street, in Sepviva Street from Aramingo Avenue to Butler Street and in Butler Street between Sepviva Street and Frankford Avenue. Size 5' by 5'6" reinforced concrete on piles, 5' by 4'6" reinforced concrete on piles and 4'6" diameter with 12" pipe. Total length of sewer completed to date 3295 lin. ft.

RECONSTRUCTION OF SEWERS STARTED PREVIOUS TO 1927 AND COMPLETED IN 1927.

Reconstruction of sewer in Eleventh Street between Girard Avenue and Susquehanna Avenue. Size 4' by 2'8" reduced cradle with vitrified shale brick invert and 3'6" by 2'4" reduced cradle. Total length of sewer completed 2580.71 lin. ft.

Reconstruction of sewer in Spruce Street between Woodland Avenue and 34th Street. Size 4'0" in reduced cradle, 4'0" in reduced cradle vitrified shale lining. Total length of sewer completed 1311.18 lin. ft.

INLETS.

One inlet contract was carried over from 1926 and completed in 1927. One inlet contract was started in 1927 but is not completed.

Total expenditure for construction of inlets in 1927 was \$45,892.18.

46-1927

40TH WARD LOWLAND DRAINAGE.

The 40th Ward Lowlands work proceeded on contract for the Intercepting Sewer, Pumping Station and Miscellaneous Equipment, carried over from 1926, to the amount of \$89,787.97, which work was completed.

Contracts were entered into and completed for the completion of the section of the 80th Street Intercepting Sewer between Penrose Avenue and Erwig Avenue, and the Building and Installation of the Outdoor Electric Sub-Station at the Southwest Pumping Station, at a total cost of \$72,221.14.

SEWAGE TREATMENT PROJECT.

At the Northeast Sewage Treatment Works, the contract carried over from 1926 for Underground Wiring was completed at a cost of \$8638.00.

Contracts were entered into during 1927 for the Grading, Paving and Improvement of a portion of the Northeast Sewage Treatment Works; Construction and Erection of the Substructure and Superstructure of the Pumping Station; for Furnishing, Installing and Testing Mechanical Equipment, Electrical Equipment, Plumbing Equipment and Heating Equipment of the Pumping Station, totalling \$678,901.00, of which \$141,401 has been completed.

Contracts were entered into during 1927 for construction of the Upper Delaware Collecting Sewer from 485 feet southwest of Lewis Street to State Road. This work was awarded in five sections, two in tunnel under air, and three in open cut, totalling \$4,960,000, of which \$1,909,263.00 has been completed.

47-1927

40TH WARD LOWLAND DRAINAGE.

The 40th Ward Lowlands work proceeded on contract for the Intercepting Sewer, Pumping Station and Miscellaneous Equipment, carried over from 1926, to the amount of \$89,787.97, which work was completed.

Contracts were entered into and completed for the completion of the section of the 80th Street Intercepting Sewer between Penrose Avenue and Erwig Avenue, and the Building and Installation of the Outdoor Electric Sub-Station at the Southwest Pumping Station, at a total cost of \$72,221.14.

SEWAGE TREATMENT PROJECT.

At the Northeast Sewage Treatment Works, the contract carried over from 1926 for Underground Wiring was completed at a cost of \$8638.00.

Contracts were entered into during 1927 for the Grading, Paving and Improvement of a portion of the Northeast Sewage Treatment Works; Construction and Erection of the Substructure and Superstructure of the Pumping Station; for Furnishing, Installing and Testing Mechanical Equipment, Electrical Equipment, Plumbing Equipment and Heating Equipment of the Pumping Station, totalling \$678,901.00, of which \$141,401 has been completed.

Contracts were entered into during 1927 for construction of the Upper Delaware Collecting Sewer from 485 feet southwest of Lewis Street to State Road. This work was awarded in five sections, two in tunnel under air, and three in open cut, totalling \$4,960,000, of which \$1,909,263.00 has been completed.

48-1927

40TH WARD LOWLAND DRAINAGE.

The 40th Ward Lowlands work proceeded on contract for the Intercepting Sewer, Pumping Station and Miscellaneous Equipment, carried over from 1926, to the amount of \$89,787.97, which work was completed.

Contracts were entered into and completed for the completion of the section of the 80th Street Intercepting Sewer between Penrose Avenue and Erwig Avenue, and the Building and Installation of the Outdoor Electric Sub-Station at the Southwest Pumping Station, at a total cost of \$72,221.14.

SEWAGE TREATMENT PROJECT.

At the Northeast Sewage Treatment Works, the contract carried over from 1926 for Underground Wiring was completed at a cost of \$8638.00.

Contracts were entered into during 1927 for the Grading, Paving and Improvement of a portion of the Northeast Sewage Treatment Works; Construction and Erection of the Substructure and Superstructure of the Pumping Station; for Furnishing, Installing and Testing Mechanical Equipment, Electrical Equipment, Plumbing Equipment and Heating Equipment of the Pumping Station, totalling \$678,901.00, of which \$141,401 has been completed.

Contracts were entered into during 1927 for construction of the Upper Delaware Collecting Sewer from 485 feet southwest of Lewis Street to State Road. This work was awarded in five sections, two in tunnel under air, and three in open cut, totalling \$4,960,000, of which \$1,909,263.00 has been completed.

49-1927

ANNUAL REPORT

FOR 1927

TESTING LABORATORY

BUREAU OF ENGINEERING

DEPARTMENT OF PUBLIC WORKS

January 17, 1928

CHIEFTAIN BOND

50-1927



BUREAU OF ENGINEERING

DEPARTMENT OF PUBLIC WORKS

CITY OF PHILADELPHIA

CITY HALL

January 16, 1928.

REPLY AND REFER TO: TL-AFB

From: Assistant Engineer, Testing Laboratory,
To: Chief Engineer, Bureau of Engineering
Subject: ANNUAL REPORT

Report of Testing Laboratory Division, Bureau of Engineering, activities for the calendar year 1927 is herewith submitted.

The work consisted of the Physical and Chemical testing of materials submitted by the various Departments and Bureaus: inspection and collection service was performed in some cases. Investigation of several comparatively new brands of Portland Cement has been conducted in order to prove their value for use on city contracts.

An extensive cooperative program, in connection with the American Society for Testing Materials, was conducted on practically all brands of Portland Cement in the attempt to simplify and improve method of test for same.

Total number of specimens tested show an increase of approximately five and one-half percent ($5\frac{1}{2}\%$) over the preceding year.

It is the endeavor of the laboratory to extend such assistance to the various City Departments and Bureaus as may be required in so far as the testing of materials and the writing of specifications for same is concerned.

The appended tables show the total, variety, distribution, and percentage of the specimens submitted by the City Departments and Bureaus.

A. F. Burbidge

A. F. Burbidge,
Assistant Engineer.

51-1927

TOTAL NUMBER OF SAMPLES FOR 1927

Brick		
Concrete	3	
Paving	14	
Sand Lime	29	
Sewer	69	
Fire	13	
	<u>TOTAL</u>	<u>128</u>
Coal		
Ash	3	
Anthracite	601	
Bituminous	633	
	<u>TOTAL</u>	<u>1237</u>
Concrete		
Cylinders	2397	
Fine Aggregate (Sand)	167	
Coarse " (Gravel, Slag, Grit)	177	
Cubes (Sawed Specimens)	44	
Building Block	29	
	<u>TOTAL</u>	<u>2814</u>
Cements		
Domestic Portland	2364	
Foreign Portland	644	
Specials	5	
A.S.T.M. Investigation	32	
	<u>TOTAL</u>	<u>3045</u>
Conduit (Electric)		9
Cast Iron (Arbitration Bars)		75
Fabrics		11
Fire Hose		8
Foods		14
Metals		
Ferrous	290	
Non-Ferrous	22	
	<u>TOTAL</u>	<u>312</u>
Miscellaneous Materials		82
Oil		
Fuel	200	
Headlight & Gasoline	13	
Lubrication & Lubricants	80	
	<u>TOTAL</u>	<u>293</u>

Continued

52-1927

Carried Forward 8028

Paint and Paint Materials

Drier	1
Linseed Oil	9
Paint	137
Putty	6
Turpentine	10
Shellac	2
Varnish	4

TOTAL 169

169

Road Materials

Asphalt	25
Asphalt Cement (Bit.)	20
Asphalt Cement Penetrations	949
Asphalt Compounds (Miscellaneous)	66
Road Oil	11
Tar	17
Wearing Surfaces	962

TOTAL 2050

2050

Rope 8

Roofing Materials 15

Sand (Hot Asphalt) 9

Soap and Soap Materials 17

Sludge 104

Steel 110

Tile 121

Waterproofing Materials 2

GRAND TOTAL

10,635

53-1927

DISTRIBUTION OF SAMPLES FOR 1927

	No. of Samples	%	No. of Samples	%
Department of City Transit			2196	20.6
Department of Public Safety				
Bureau of Boiler Inspection	20	0.2		
Bureau of Building Inspection	<u>50</u>	<u>0.4</u>		
TOTAL	70	0.6	70	0.6
Department of Public Health				
Bureau of Health			2	0.1
Department of Public Works				
Bureau of Engineering	4035	37.9		
Bureau of Highways	2670	25.1		
Bureau of St. Cleaning	52	0.5		
Bureau of Water	<u>611</u>	<u>5.8</u>		
TOTAL	<u>7368</u>	<u>69.3</u>	7368	69.3
Department of Supplies			997	9.4
			<u>10633</u>	<u>100.0%</u>
		GRAND TOTAL		

HYDRAULIC CEMENT SAMPLES FOR 1927

Domestic Portland Cement Samples	2364	
Foreign Portland Cement Samples	644	
Atlas Lumnite	2	
Natural Cement (Hyttest)	3	
A.S.T.M. Cooperative Investigation	32	
		<u>3045</u>
TOTAL	3045	

DISTRIBUTION OF SAMPLES OF HYDRAULIC CEMENT FOR 1927

Department of Public Works		
Bureau of Engineering		
Sewer Division	1418	
Sewage Disposal (Construction)	256	
Piers & Bins (Storage)	146	
Bridge Division	128	
Grade Crossing	74	
City Hall Annex	33	
Testing Laboratory	33	
	<u>2088</u>	2088
	TOTAL	
Bureau of Highways		
Bureau of Water	314	
Bureau of Street Cleaning	22	
	22	
	<u>2446</u>	2446
	TOTAL	
Department of City Transit		
		<u>599</u>
	GRAND TOTAL	3045

CHEMICAL SAMPLES FOR 1927

Coal			
Ash	3		
Anthracite	601		
Bituminous	633		
TOTAL	<u>1237</u>		1237
Fabrics			11
Fire Hose			8
Foods			14
Metals			
Ferrous	290		
Non-Ferrous	22		
TOTAL	<u>312</u>		312
Miscellaneous Materials			62
Oil			
Fuel	200		
Headlight & Gasoline	13		
Lubricating & Lubricants	80		
TOTAL	<u>293</u>		293
Paint and Paint Materials			
Drier	1		
Linseed Oil	9		
Paint	137		
Putty	6		
Turpentine	10		
Shellac	2		
Varnish	4		
TOTAL	<u>169</u>		169
Road Materials			
Asphalt	25		
Asphalt Cement (Bituminous)	20		
Asphalt Cement (Penetration)	949		
Asphalt Comp- ounds (Misc.)	66		
Road Oil	11		
Tar	17		
Wearing Sur- face	962		
TOTAL	<u>2050</u>		2050
Rope			8
Roofing Materials			15
Sand & Pebbles			68

56-1927

Continued

Carried Forward	4247
Soap and Soap Materials	17
Sludge	104
Waterproofing Materials	<u>2</u>
GRAND TOTAL	4370

DISTRIBUTION OF CHEMICAL SAMPLES FOR 1927

Department of City Transit		417
Department of Public Safety		
Bureau of Building Inspection	1	
Bureau of Boiler Inspection	20	
TOTAL	<u>21</u>	21
Department of Public Health		
Bureau of Health		2
Department of Public Works		
Bureau of Engineering	204	
Bureau of Highways	2140	
Bureau of Water	587	
Bureau of St. Cleaning	2	
TOTAL	- <u>2933</u>	2933
Department of Supplies		
		<u>997</u>
	TOTAL -	<u>4370</u>

SAMPLES FOR PHYSICAL ANALYSIS FOR 1927

Brick	
Concrete	3
Paving	14
Sand Lime	29
Sewer	69
Fire	13
Concrete	
Cylinders	2397
Fine Aggregate (Sand)	167
Course Aggregate (Gravel, Slag, Grit)	109
Cubes (Sawed Specimens)	44
Building Block	29
Conduit (Electric)	9
Cast Iron (Arbitration Bars)	75
Miscellaneous	20
Sand (Hot Asphalt)	9
Steel	110
Tile	<u>121</u>
	<u>TOTAL</u> 3218

DISTRIBUTION OF PHYSICAL SAMPLES FOR 1927

Department of City Transit		1180
Department of Public Safety		
Building Inspection		49
Department of Public Works		
Engineering Bureau	1743	
Highway Bureau	216	
Water Bureau	2	
St.Cleaning Bureau	28	
	TOTAL	<u>1989</u>
		TOTAL 3218