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ANNUAL REPORT - 1928

Under authority of an ordinance approved January 31, 1928, the Bureau of Engineering and the Bureau of Surveys were consolidated under the title of "Bureau of Engineering and Surveys". The duties of these separate bureaus were so interlocked that it was considered public business would be accelerated by their combination. The position of Chief Engineer and Surveyor, heading the new bureau, was filled by the appointment of John H. Neeson, who formerly held the position of Chief of the Bureau of Highways.

The Bureau of Engineering and Surveys is now in charge of the city planning and the new construction work comprised in city bridges, the elimination of grade crossings, sewers and drainage structures, and the carrying out of the Sewage Treatment Project. In addition to these duties are the planning work required for special constructions and projects authorized by Council, the issuing of permits for connections to the drainage system, the investigation and control of manufacturing and trade wastes, and the checking of permits issued by the Board of Highway Supervisors, for utility structures within the city streets. The bureau also operates the City Laboratory, for the physical and chemical testing of materials entering into the City construction work, and supplies purchased for the maintenance and operation of the various City institutions. The activities of the bureau for the year 1928 are outlined herein.

BOARD OF SURVEYORS

The Board of Surveyors is composed of the Surveyors and Regulators of the sixteen Districts into which the city is divided, with the Chief Engineer and Surveyor as President of the Board, and the Assistant Chief Engineer and Surveyor as Vice-President. The stated meetings of this body are on the first and third Mondays of each month, but special meetings may be called at any time by the President of the Board.

All ordinances of Council affecting the City Plan are referred to the Board of Surveyors and reported upon prior to the passage of such legislation. The duties also include consideration and approval of extensions and modifications of street railway track systems, alignment, grades, and bridge construction of steam railroads, and plans of sewer and bridge constructions.

The Board of Surveyors possesses no legislative authority. Its functions are advisory, although the legal intent of an ordinance of Council pertaining to a change in the City Plan is not complete until the plan receives its final confirmation by the Board of Surveyors, and this final confirmation is not made until, in accordance with an advertisement, a public hearing is held to interested parties, and consideration given to their views by the Board. During the year 1928, the Board of Surveyors held twenty-five stated and special meetings and three Road Day hearings for the public, prior to confirming City Plans. These meetings comprised action on 134 plans. Consideration was given, and reports rendered, on 168 ordinances affecting

the City Plan, and 118 extensions or changes to the City Plan were confirmed. Approval was given to 32 plans comprising bridges, sewers, and street railways. Approval was also given to 23 plans of property sub-division, involving the placing of new streets therein.

The detail work of the Surveyors in their several Districts is, to regulate and determine party lines; to make surveys for conveyance purposes; the preparation of preliminary surveys and plans for construction work and for grading, paving and repaving of streets and alleys; the giving of lines and grades during the progress of the work; measuring and certifying the quantities of work completed under contracts, and the preparation of assessment bills against property abutting on improvement work. The necessary plans for the legal matters involved in openings, and changes of grade of streets, and damage claims, are made upon the request of the Department of Law, for use in determining damage awards.

Appropriations for construction work in 1928 were not made available as early in the year as usual, and this required the speeding up of work in order to complete in six months what would otherwise have been a twelve-months' program. From July 15 to December 31, 1,542 plans were ordered and 1,250 completed. Of the balance remaining, 202 plans are of record character and have no bearing on the output of construction work. Contracts entered into which required attention of the Survey forces numbered 1,623, of which 742 were completed and 881 still continuing. These contracts represented a money expenditure of over \$10,000,000, from which the cash return to the City Treasury on charges for the work of the District Surveyors, was \$378,536.00.

Among the important changes in the City Plan may be noted the following:

The lines of Race and Vine streets, from Sixth street to Franklin street are being revised to widen the cartways to 48', as a measure towards relieving the vehicular congestion at the Delaware River bridge approach. The additional ground required is being taken from the area comprised in Franklin Square. Henry avenue northward from Hunting Park avenue was confirmed preparatory to the construction of bridges over the Reading Railway and over Wissahickon Creek, to provide a new travel artery from the Roxborough section to the center of the city, and relieve the congestion along Ridge avenue.

An extensive revision has been made in the Southern boundary of the Frankford section, which removes the City Plan streets interfering with the Tacony Creek Golf Course, and establishes a wide traffic thoroughfare around the Southern part of Frankford, extending from Wyoming avenue to the Delaware River.

Development of the Roxborough section is provided in the extension of Henry avenue from Port Royal avenue to Ridge avenue, north of the proposed Chestnut Hill-Bryn Mawr road. This Chestnut Hill-Bryn Mawr road is proposed to extend from the intersection of Graver's lane and St. Martin's lane, in Chestnut Hill, to Bryn Mawr, crossing the Wissahickon Valley near Rex avenue, and crossing the Schuylkill River about 1200 feet south of the Montgomery County Line. This will provide another needed connection cross-town through Chestnut Hill and Roxborough.

In the Thirty-fifth Ward the rapid increase in values of farm lands, and the intensive development in this section, has necessitated planning work on a large scale. It is a difficult undertaking as the developments are so

scattered in this large territory that large areas must be planned to properly tie in the scattered developments.

The City is cooperating with the Regional Planning Federation of the Tri-State District in providing outlets and connecting links to the system of highways being mapped out for through traffic in the region contiguous to Philadelphia. Travel on most of the inter-county roads bordering Philadelphia has increased to an extent, within recent years, that serious congestion is occurring. City avenue westward from the Schuylkill River is an example of this condition, and widening and adjustment of grades has been planned preliminary to carrying out an authorization of City Council for the section between Schuylkill River and Monument road.

An ordinance approved December 29, 1928, authorized the widening of Cheltenham avenue between Broad street and Fifth street, and the authorities of Cheltenham Township, in cooperation, have authorized the widening of 40' from Cresheim avenue to Front street, thus insuring a future boundary street 85' in width from Cresheim avenue to Broad street, and 80' in width from Broad street east -- a total distance of approximately 4 miles.

Other connections to the County traffic arteries are the improvement of Cardington road between Lansdowne avenue and Cobbs Creek, which was designed with curves and easy grades through Cobbs Creek Park and Haverford road, which has been sewered and improved northwestwardly to Malvern avenue, leaving but one-half mile between this point and the City Line yet to be completed.

An ordinance approved July 11, 1928, authorized the improvement of Castor avenue between the Roosevelt Boulevard and Cottman avenue, and also Frankford avenue from Bridge street to Longshore street, and thus provide two main traffic arteries in the Northeast section. The physical work of these streets is now proceeding and comprises the placing of the trolley tracks in the center of the avenues, all of the necessary underdrainage work, and the paving of the street surface. Aramingo avenue is being planned to relieve congestion in the Northeast, and when completed and a bridge provided over Frankford Creek, will provide a main traffic artery from Bustleton avenue and Knorr street through Wissinoming, Bridesburg, Frankford, and Kensington, to Girard avenue.

In connection with the railway terminal improvements, extensive changes were involved in the City Plan. The Pennsylvania Terminal Improvement will almost completely revamp that section of the city lying south and west of the Parkway, north of Market street, and between Broad street and beyond 32nd street, including both banks of the Schuylkill River between Spring Garden street and Grays Ferry avenue. It will provide the Pennsylvania Boulevard, 90' wide, comprising the bed of the present Filbert street from 15th street westwardly, with a bridge over the Schuylkill River to the proposed new station, to be erected in the vicinity of 30th and Market streets, and the widening and opening of 20th street to 90' between Market street and the Parkway. It is planned to convert the east and west banks of the Schuylkill River from their present unsightly condition to driveways of utility and beauty.

BRIDGES

The extension and development of a city requires the opening up of new thoroughfares as arteries of transportation. In this connection there must be constructed the necessary bridge crossings of streams and railroads, to which must be added, under a general program of bridge construction, the rehabilitation of the older bridges in the already built-up sections of the city.

UNIVERSITY BRIDGE

One of the major projects undertaken in 1927 was a new connection between South and Southwest Philadelphia and the central section of the city, by way of a new structure over the Schuylkill River, known as the University bridge. In design this bridge consists of 5 spans, the central span being an electrically operated double leaf bascule of the quick-opening type. It will provide a clear channel between centers of 100', and when closed will have a clearance above mean high water of 30'. The total length between abutment faces is 536', and the bridge deck comprises a cartway 54' wide and two sidewalks each 9' wide. The foundations for this bridge were carried down to bed rock, which in some cases was 45' below mean high water. The south abutment and the south intermediate pier were constructed in open cofferdams, but the north abutment, north intermediate pier, and both bascule piers, were constructed by the use of pneumatic caissons. The large caissons for the main bascule piers were 28' wide and 123' long. The exposed surfaces of piers and abutments are faced with selected buff Indiana limestone. The limit of contract for the work is \$1,350,000, and at the close of the year 1928, the structure was 93% completed. Before placing this bridge in service it will be necessary to construct approaches on both river banks, including a bridge in connection with the Pennsylvania Railroad tracks on the west bank.

RHAWN STREET BRIDGES

In the Northeastern section of the city two timber structures which had been condemned as unsafe for traffic, on the line of Rhawn street over Pennypack Creek, are being replaced with two concrete ornamental arch bridges at a cost of \$370,000. The new bridges are of reinforced concrete and each bridge has one main arch of 100' clear span, and two side spans of 76' each, carrying a roadway divided into a 38' wide cartway and two sidewalks 8' wide. The clearance over Pennypack Creek is approximately 38', and at the end of the year the work was 91% completed. The necessary work on the approaches to these structures will be placed under contract early in 1929, and this important thoroughfare, which has been closed to traffic for a number of years, should again be in service before the end of the Summer of 1929.

GREEN LANE BRIDGE

Another important bridge crossing reopening traffic in 1928 was on the line of Green Lane over the Schuylkill River, connecting Philadelphia and Montgomery Counties, each of which participated equally in the cost of the construction. The former bridge was of an old type of steel truss which had become entirely inadequate for the demands of modern 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' over the Schuylkill Navigation Company Canal and the Reading Company tracks. The cartway is 36' wide and there are two 8' wide sidewalks for the total length of 630'. The cost of the structure was \$398,321.75, of which the City of Philadelphia paid \$199,406.63. In connection with this project it was necessary to rebuild about 400' of the retaining wall supporting Main street, along the Navigation Company canal, for the purpose of carrying the increased height of the east approach to the bridge. This wall is of concrete and conforms to the architecture of the bridge. The total cost was \$40,380, which was paid entirely by the City of Philadelphia. The contract for the east approach was 99% complete at the end of the year, and the contract limit is \$35,000.

HUNTING PARK AVENUE BRIDGE

The opening of Hunting Park avenue to the eastward of 5th street re-

quired the construction of a bridge over the North Penn Railroad. This is a steel girder bridge encased in concrete, with concrete abutments and concrete retaining walls. The bridge was completed in June 1928 at a total cost of \$7,416.55, all of which was paid by the City of Philadelphia.

GIRARD AVENUE BRIDGE

The replacement of the floor system of the Girard avenue bridge over the Schuylkill River, which was built originally for the Centennial Exposition of 1876, and had become unsafe due to corrosion of the steel work, was completed at a cost of \$165,371.18. The work was complicated by the necessity of maintaining the bridge open for traffic during the entire period of operations. The work of constructing a bridge path on the North side of the lower deck is proceeding, and at the end of the year was 91% completed. The limit of contract is \$55,000.

Contracts have been entered into, and work is progressing on the following bridge structures:

RYAN AVENUE OVER SANDY RUN

This is required for the opening of Ryan avenue through Pennypack Park. The structure will be a reinforced concrete arch, faced with stone, and having a clear span of 33'. It carries a cartway 52' wide, and two sidewalks 8' wide. The contract limit is \$40,000.

SIXTH STREET AND ALLEGHENY AVENUE OVER RICHMOND BRANCH OF THE READING COMPANY

The old bridge at this site had become dangerous due to corrosion of the steel work. Contract was entered into to replace the entire deck, but using the old masonry supporting walls. The new bridge will be of steel girder construction, encased in concrete, with a contract limit of \$130,000, the entire cost of which is borne by the City. Street railway traffic is being maintained during the work.

ABBOTSFORD AVENUE OVER GERMANTOWN AND CHESTNUT HILL BRANCH, CONNECTING RAILWAY

This bridge will provide access for the development of a large acreage west of the Connecting Railway. It will be a steel girder type, encased in concrete, and carried on concrete abutments. The cartway will be 52' wide and the sidewalks 12' wide. The limit of contract is \$50,000, of which 73.5% will be borne by the City and 26.5% by the Pennsylvania Railroad Company. The contract is 99% complete.

ASHDALE STREET UNDER P. N. & E. Y. RAILROAD

This bridge will furnish access to property ready for development to the east of the railroad line. The design is for a single track road, by way of a single span of 70'. The contract limit is \$55,000, entirely at the City expense, and the work is now 75% complete.

COTTMAN STREET UNDER THE P. N. & E. Y. RAILROAD

This work will eliminate a dangerous grade crossing by carrying Cottman street under the railroad. The contract limit for the City's share of the work

is \$40,000, and it is 84% completed.

SEVENTEENTH STREET OVER GREENWICH BRANCH,
PENNSYLVANIA RAILROAD

This construction is a timber foot bridge and was authorized to provide a safe crossing for school children who must use this point to reach the public school. It is only a temporary structure, as the intended removal of the Greenwich Branch tracks will permit the abandonment, and the development of the street system at this point. The limit of contract is \$5,000, and will be entirely a City expense.

RISING SUN AVENUE OVER TACONY CREEK

This replaces an old stone bridge which was becoming unsafe, and by reason of lack of width constituted a dangerous congestion point for the traffic which is now using Rising Sun Avenue. The new bridge provides a 44' wide cartway and two sidewalks of 10'8" width, supported on steel girders encased in concrete. The showing faces of the bridge will be in the form of concrete arches with stone facing and stone railings. The limit of contract is \$95,000, and the work is 75% completed.

LEVERINGTON AVENUE OVER MANAYUNK CANAL

The old steel truss bridge at this location was inadequate and unsafe for modern traffic, and a new structure of steel girders encased in concrete, and carried on concrete abutments, is being provided for a cartway 20' wide and two sidewalks 8' wide. Traffic is being maintained on both the highway and the canal. The limit of the contract is \$113,000, of which the City of Philadelphia will pay 44.2% and the Schuylkill Navigation Company 55.8%. The work is now 63% complete.

LINDEN AVENUE OVER THE PHILADELPHIA AND
TRENTON RAILROAD

This is to eliminate a dangerous grade crossing and will be a steel structure encased in concrete. The cartway will be 40' wide and the sidewalks 13' wide. The work is 87% complete and the cost is shared in equal portions by the City of Philadelphia and the Pennsylvania Railroad, of which the City obligation is \$70,000.

COBBS CREEK BRIDGE BETWEEN SIXTY-FIFTH
STREET AND FLORENCE AVENUE

This structure replaces an existing iron truss bridge which is unsafe for traffic. The new bridge will be a concrete arch, faced with stone, and having a clear span of 46'. The limit of contract is \$25,000.

LYCOMING STREET OVER THE RICHMOND BRANCH,
READING COMPANY

This is made necessary by the opening of Lycoming street westward from Broad street. The structure is of steel girders encased in concrete, with a clear span of 66' between concrete abutments. The cartway is 26' wide and the sidewalks 10' wide. The limit of contract is \$55,000 - entirely a City expense.

During the year plans were prepared for the following bridges, and the work is expected to be placed under contract early in 1929:

Welsh avenue over Pennypack Creek
Wyoming avenue over the North Penn Railroad
"B" street under the Connecting Railway
"B" street under the Philadelphia and Bustleton Branch
Hunting Park avenue over the Philadelphia and Bustleton Branch.

Plans have, also, been completed for grading the approaches to the Rhawn street bridges and for retaining walls along Hunting Park avenue between Clearfield street and Ridge avenue, required in the widening and improvement of Hunting Park avenue.

Planning work is proceeding on the following bridge projects:

Olney avenue over the Philadelphia, Newtown and New York Railroad
Mascher street over the Richmond Branch of the Reading Company
Cayuga street over the North Penn Railway
70th street over the Philadelphia, Baltimore and Washington Railroad
Rising Sun avenue and Bristol street over the Philadelphia, Newtown and New York Railroad
University avenue under the Philadelphia, Baltimore and Washington Railroad
Walnut Lane over Lincoln Drive.

ABOLITION OF GRADE CROSSINGS

Various improvements are being carried forward under the project for eliminating grade crossings, the main subdivisions of which are as follows:

South Philadelphia Improvement
Pennsylvania Terminal Improvement
Baltimore and Ohio Terminal Improvement
Manayunk Elevated
Delaware Avenue Improvement
Chester Branch Elevated
Elevation of the Philadelphia, Germantown and Norristown Branch and the Chestnut Hill Railroad, between a point south of Wister street and Bethlehem Pike.

SOUTH PHILADELPHIA IMPROVEMENT

In connection with the South Philadelphia Improvement the elevation of the railroad tracks on the line of 25th street was continued, and the concrete viaduct completed to Ritner street. The new tracks are now in use on this line from the Arsenal bridge to south of Passyunk avenue, and the change resulted in the abolition of eleven grade crossings, although the supporting structure from Ritner street southward is a temporary trestle. One temporary track remains on the surface for switching purposes, but will be removed shortly. This will leave 25th street 100' wide, and clear of all surface tracks, and will allow paving from Washington avenue to Passyunk avenue. Considerable filling has been done on the joint elevated line between Passyunk avenue and Broad street. Construction work proceeded on the relocation and elevation of the Baltimore and Ohio Railroad Company's tracks between the East Side Yard and 26th street and Oregon avenue, including the erection of bridges over 28th street, 26th street, and Passyunk avenue. Filling has been completed between 26th street and Passyunk avenue.

Dredging of the river channel and in front of the new Terminal Yard of the Pennsylvania Railroad, at Delaware River, has been almost completed, and a coal handling pier, dock, and sustaining yard to operate the pier, are now under

construction. Contract has been entered into for the widening and improvement of 28th street, from Jackson street to Passyunk avenue, and work is in progress.

Expenditures under the South Philadelphia Improvement Project during 1928 were \$1,658,000, and there remains an available balance to continue work of \$3,250,000.

PENNSYLVANIA TERMINAL IMPROVEMENT

Under the Pennsylvania Terminal Improvement the main activity in construction work, to which the City was a party, was carried on east of the Schuylkill River. This included the construction and reconstruction of the sewer system between 15th street and the Schuylkill River and between Market and Arch streets, necessary to provide a clear right of way for the Pennsylvania Subway to the 15th street station. The completion of this work is expected in 1929.

Plans and specifications have been prepared for the bulkhead walls along the Schuylkill River, between Spring Garden street and south of Walnut street, and the revised bulkhead lines have been approved by the Secretary of War. Property is being acquired for the carrying out of this work, which is expected to cost about \$500,000, and sewers to be constructed therewith will require \$400,000 additional. A portion of this work will be placed under contract early in 1929. Plans are being developed for the necessary highway work, including the bridge on the line of the Pennsylvania Boulevard over the Schuylkill River, and for the opening and improving of Pennsylvania Boulevard between 15th street and the West River Drive.

The Pennsylvania Railroad Company is proceeding with the construction of the Suburban Subway Line between 16th street and 22nd street. A large part of the excavation has been completed and concrete and steel have been placed between 19th street and 22nd street. Traffic on the line of 17th, 18th and 19th streets is being carried over the excavation on temporary bridges.

The expenditure under this improvement has been \$276,608.47, and there is available to carry on the work the sum of \$6,356,685.15.

BALTIMORE AND OHIO TERMINAL IMPROVEMENT

Under the proposed improvement of the Baltimore and Ohio Railroad, by the construction of a modern terminal station at 24th and Chestnut streets, studies and plans proceeded upon the changes in the street system and the river bank work in connection therewith. The first section to be dealt with will be between Market street and Walnut street, and an appropriation towards the City's share of the work of \$1,000,000 has been provided.

MANAYUNK ELEVATED

Work is proceeding under the agreement between the City and the Reading Company for eliminating the grade crossings on the Philadelphia, Germantown and Norristown Railroad, between Wissahickon Creek and Fountain street. The viaduct to carry Ridge avenue over the tracks of the Reading Company and the new station at Wissahickon have been completed, and this dangerous grade crossing has been abolished. Bids have been received for the work between Haines street and Fountain street, and an early start is expected on construction. This will eliminate all grade crossings on the Norristown Branch between Wissahickon Creek and Fountain street, and will open Cresson street as a public highway.

The expenditures under this improvement have totalled \$249,450.66 for the year 1928, and for carrying on the work there remains an available balance of \$1,959,653.93.

DELAWARE AVENUE IMPROVEMENT

Under the improvement on the extension of Delaware avenue it was not possible to make physical progress during the year 1928, as this extension is dependent upon the railroad construction work under the South Philadelphia Improvement, and work had not proceeded to a point permitting the final paving of Delaware avenue. There is available for carrying forward this work the sum of \$358,252.40.

CHESTER BRANCH ELEVATED

This project comprises the abolishment of grade crossings along the Chester Branch of the Reading Company, between 57th street and Bow Creek. The first step of this work is now proceeding in the construction of a bridge at 61st street, which is proceeding to a contract limit of \$200,000, of which one-half will be paid by the Reading Company.

CHESTNUT HILL IMPROVEMENT

This comprises the elevation of the Philadelphia, Germantown and Norristown Branch, and the Chestnut Hill Railroad, between a point south of Wister street and Bethlehem Pike. Although no appropriation has been made to this project, negotiations between the City and the Reading Company have been completed, and preliminary plans prepared. The estimated cost of this project is \$5,500,000.

DRAINAGE

For the year 1928, City Council appropriated \$900,000 for the construction of branch sewers. From this appropriation 151 branch sewers were placed under contract in various locations throughout the city. Of these, 111 contracts were completed and 40 are still proceeding. For main sewers the sum of \$2,500,000 was provided, from which 16 main sewers were placed under contract and about 7 miles of sewer were completed. Ten sewers which had been contracted for prior to 1928 were completed during the year, in addition to five which had been contracted for in 1928. Work is still proceeding under 11 unfinished contracts. The expenditure during 1928 for main and branch sewers was \$1,833,000.

The main sewers completed in 1928, which were placed under contract previously, follow:

Allegheny avenue, Sepviva street, and Butler street, between Frankford Creek and Frankford avenue, is a reinforced concrete rectangular sewer averaging 5' x 5', supported on a pile foundation, and was completed for a length of 5,266'.

Cranford avenue, Benner street, Whitaker avenue, Conly street, Tabor avenue, Benner street, and Lawndale street, from Oxford avenue to north of Robbins avenue, is a reinforced concrete rectangular section averaging 7' x 7', and was completed to a length of 3,578'.

Forrest avenue, Gowen avenue, and Williams avenue, from southeast of Mt. Airy avenue to Cresheim avenue, is a brick sewer averaging 6' diameter, and was completed to a length of 2,832'.

Greenwood avenue, from Cheltenham avenue to Vernon road, is a double system sewer comprising a 10" diameter sanitary sewer and a 30" diameter brick sewer, the completed length of which is 2,020'.

Hellerman street, from Tackawanna street to Battersby street, is a reinforced concrete sewer 8' x 10'6", and was completed to a length of 2,146'.

Large street, Magee avenue, Horrocks street and Unruh street, between Everett avenue and Eastwood avenue, is a brick sewer 4'6" in diameter, and was completed to a length of 2,807'.

Tabor avenue, from Sanger street to Cheltenham avenue, is 3'6" in diameter, of brick construction, and a length of 595'.

Tiegs street, Salmon street, Schiller street, and Gaul street, between Richmond street and Ontario street, is a reinforced concrete rectangular sewer on pile foundation, and an average size of 6' x 7'6"; the length completed was 2,287'.

Washington lane, from Boyer street northeastwardly, is a 3'6" diameter brick sewer, completed to a length of 1,299'.

Washington lane, from Chew street to Boyer street, is a brick construction, 5' diameter, and a length completed of 752'.

The sewers placed under contract in 1928; and completed, were the following:

Battersby street, Unruh street, Brous street and Tyson street, between Hellerman street and the Roosevelt Boulevard, is a reinforced concrete sewer, 10' x 8', and a total length of 4,219'.

Haverford avenue, from 69th street to Lebanon avenue, is a brick sewer 4'6" diameter, and a length of 1,008'.

Packer avenue, between Delaware River and east of Delaware avenue, was an outlet channel from the end of the Packer avenue sewer to the Delaware River. It was of open construction through property owned by the Pennsylvania Railroad.

Gaul street, from Schiller street to Ontario street, was a 6' x 7'6" reinforced concrete sewer of a length of 371'.

Extension of the Little Tacony Creek Sewer from Lewis street through private property towards Frankford Creek. This is a reinforced concrete sewer, 3'6" x 9'6" in size, and a length of 324'.

The following main sewers were placed under contract, and work is still proceeding:

Aramingo avenue, from Sepviva street to Wheatshaaf lane, is a reinforced concrete sewer, 5' x 6', and a completed length of 1,568'.

Bouvier street and Cheltenham avenue, between Elston street and Washington lane, is of various sizes, of which the largest is 7' x 8',

reinforced concrete, and constructed to a length of 2,723'.

Butler street, between Aramingo avenue and Frankford avenue, is a brick sewer, 4' in diameter, and a length of 1,222'.

Gorgas lane and Henry avenue, between Wissahickon Creek and Gates street, is a brick sewer, 3'6" diameter, and a length of 3,418'.

Haverford avenue, from Lebanon avenue to Malvern avenue, is a brick sewer, 3'6" x 2'4", and a length of 1,009'.

Lakeside avenue, 12th street and 69th avenue north, between Cheltenham avenue and Broad street, is a reinforced concrete sewer of various sizes, of which the largest is a 6' x 7' twin section. Part of this work is in tunnel and the length of sewer completed was 2,664'.

Mansfield avenue, between Upsal street and Mt. Airy avenue, is a reinforced concrete section, 7'6" x 7'6", and a length of 399'.

Robbins street, Palmetto street, Hellerman street, and Rising Sun avenue, between Lawndale street and Passmore street, is a brick sewer, 4'6" diameter, and a length of 980'.

Sheffield street and Crabtree street, from Pennypack Creek to Rowland avenue, is a brick sewer, 4'6" diameter, and a length of 1,305'.

Tabor avenue, Unruh street, and Bingham street, between Magee street and Longshore street, is a reinforced concrete sewer, 5'6" x 4'6", and a brick sewer 4' diameter, of a length of 698'.

Thirtieth street, from Morris street to Mifflin street, is a reinforced concrete sewer, 5' x 4'6", and a length of 980'.

During the year 1928, 70 branch sewers were constructed at private cost, to serve building developments, and these represent a value of \$562,000.

Under the general improvement authorized for Frankford avenue and Castor avenue, the expenditure was \$261,827.96. The drainage work during the year added to the sewer system, under all classes of construction, 42.83 miles of sewer.

SEWAGE TREATMENT

From the money appropriated since 1923, there have been constructed the Wingohocking Main Sewer from west of Palethorp street to Frankford Creek; the Tacony Creek Intercepting Sewer from the Wingohocking Sewer to the City Line at Cheltenham avenue, and a connection made with the drainage system of Cheltenham Township by which Tacony Creek is maintained in a clean condition throughout its entire length; the Intercepting Sewer connecting the Oak Lane section; the Upper Delaware Collecting Sewer from the Treatment Works at Wheatshaf Lane northward to the Pennypack Creek; a large sewage lifting station at the Treatment Works, and a Grit Chamber at the same location.

In the lowlands of the Fortieth Ward, at the southern end of West Phil-

Philadelphia, the 80th Street Collecting Sewer has been completed for about one-half of the total length towards Cobbs Creek, and the Southwest Sewage Pumping Station was completed and placed in service. A system of storm water channels was constructed at this location, and there is now proceeding a dike along the boundary line between Philadelphia and Delaware Counties, which will protect this lowland area from future flooding. The work in this part of the City during the past two years has required the expenditure of \$404,000. Land has also been acquired for the site of the Southeast Sewage Treatment Works, but no construction contracts have been entered into at this site.

On December 28, Mayor Mackey made application to the Sanitary Water Board of the State of Pennsylvania for an extension of time in which the City of Philadelphia would be permitted to discharge sewage into the Delaware and Schuylkill Rivers. This application is made at intervals of two years, and must be accompanied by a statement of the progress made by the City towards carrying out the work required to attain the removal of sewage pollution from the rivers, and an outline of the work which it is proposed to carry out during the two years following the application.

The Act of Assembly approved April 22, 1905, created the Department of Health of the State of Pennsylvania, and placed in the control of that body the task of restoring and maintaining the waters of the State in a clean condition. Following the organization of the Department of Health the City of Philadelphia was notified to prepare a comprehensive plan for the removal of sewage pollution discharged from the City of Philadelphia, and submit it to the Department of Health for approval. This was completed and submitted in 1914, and approved by the State in 1915. It set forth a program by which this extensive work was to be accomplished in regular and coordinated stages, and work has been proceeding thereunder since that time.

The first requirement of this program was the completion of work in the Northeastern section of Philadelphia, to remove the pollution within tidal range of the Torresdale Intake of the Philadelphia water supply. Since 1923, City Council has made available the sum of \$15,000,000. Previous to this time there have been constructed and placed in operation the Sewage Treatment Works at Wheatshaf Lane and Richmond Street, to a capacity of 60,000,000 gallons daily, and the work during recent years has been the construction of the conduit system to pick up the sewage flowing in the main sewers and convey it to the Treatment Works at Wheatshaf Lane.

The Sewage Treatment Project is being carried forward in accordance with the program approved by the State of Pennsylvania in 1915, and under an agreement that at least \$3,000,000 per annum shall be expended towards completion of this program. During the year 1928, there were completed the following contracts carried forward from 1927: The Wingoocking Main Sewer, the Tacony Creek Intercepting Sewer, and four sections of the Upper Delaware Collecting Sewer, at a total expenditure of \$3,900,000.

Work is still proceeding upon the following contracts carried forward from 1927: One section of the Upper Delaware Collecting Sewer, and five contracts covering the Northeast Sewage Pumping Station. These will require a total expenditure of \$2,300,000.

Contracts were entered into in 1928 for the Northeast Grit Chamber and the Pennypack Intercepting Sewer between State Road and Frankford Avenue, which will require an expenditure of \$743,000. A contract was also entered into for open storm water channels along the Philadelphia County Line between Darby Creek

and Church Creek, at a cost of approximately \$180,000.

During the coming year it is proposed to carry out the work necessary to place in service the Upper Delaware Collecting Sewer and the Northeast Grit Chamber and Pumping Stations, to construct the Upper and Lower Frankford Creek Intercepting Sewers, extend the Upper Delaware Collecting Sewer to Ashburner street, and provide additional capacity at the Northeast Treatment Works. This work in the Northeastern section will remove all sewage pollution entering the Delaware River within tidal influence of the Torresdale Intake of the water supply, and the estimated cost thereof is \$4,000,000.

In the Southwest district it is proposed to begin construction of the Outfall from the Southwest Sewage Treatment Works, the main collecting sewer, the Island Avenue collecting sewer, the 60th street cut-off sewer, and the first unit of treatment structures at the Southwest Works. These steps will require for completion an estimated expenditure of \$7,640,000. There is available the sum of \$2,700,000 for proceeding with contracts under the Sewage Treatment Project.

It will, also, be necessary to construct the intercepting sewers along the Schuylkill River, between Fairmount Dam and Grays Ferry, on both banks of the river, the estimated cost of which will be in excess of \$3,000,000.

In the maintenance operations incident to sewage treatment, the following main points are noted in relation to the various units included thereunder:

OAK LANE SEWAGE PUMPING STATION

This station, located at 69th Avenue North, between Broad Street and Old York Road, was placed in service in 1916, to allow sewer construction in the Oak Lane area until such time as the main sewer system could be constructed to this point. This main sewer is now under contract, and it is anticipated that operations at this pumping station can be abandoned in 1929.

The station is equipped with 2 - 4" centrifugal pumps, electrically operated by current purchased from the Philadelphia Electric Company. The total pumpage for the year 1928 was 115,000 gallons, and the power cost was \$2,236. The total expenditure for the maintenance and operation of this station was \$4,797.

During the year, screenings were collected and incinerated to a bulk of 1,177 cu. ft.

MINGO CREEK PUMPING STATION

This station, located on the west bank of the Schuylkill River, north of Penrose Ferry road, was constructed in 1896, to provide surface drainage for the lowlands of the Fortieth Ward. The station comprises two horizontal centrifugal pumps with a total capacity of 60,000,000 gallons per day, driven by steam engines which obtain their power from two oil-fired boilers of 150 H.P.. The amount of pumping at this station was greatly increased during the year by the numerous breaks in the dike system, which admitted flood waters from Darby Creek and seriously overtaxed the pumping station. During the year there was made necessary 3,554 pumping hours of operation, and the fuel oil consumption was 312,581 gallons. The total expenditure for equipment, maintenance and operation was \$22,002.

SOUTHWEST SEWAGE PUMPING STATION

This station is the first unit of the Southwest Treatment Works, and is

located in the vicinity of Penrose Ferry road and Island avenue. The station will have a pumping capacity of 160,000,000 gallons daily, but at the present time there is electrically driven equipment installed to a capacity of 50,000,000 gallons. The small quantity of sewage being received to the present time requires only about three and a half hours' pump operation daily, and the total cost for maintenance and operation of this station, for the year, was \$18,664.

FRANKFORD CREEK GRIT CHAMBER

This station, at Lycoming and "O" streets, was installed for the purpose of removing grit and street washings from the sewage before delivering to the treatment structures. During the year 1928, the station cared for a total sewage flow of 12,048 million gallons, from which 15,000 cu. ft. of solid material were intercepted on the screens, and 36,262 cu. ft. of grit were intercepted, washed and hauled to a disposal site. The extremely fine character of this grit has made necessary the reduction of velocity in flowing through the sedimentation channels to .7 feet per second. From these channels 3,908 cu. ft. of grease were intercepted and removed. Constant repair work is required on the mechanical and lighting systems due to corrosion from the sewage gases and humidity. The total expenditure for maintenance and operation during the year was \$13,157.49.

NORTHEAST SEWAGE TREATMENT WORKS

These Works, located at Wheatshaf lane between Richmond street and the Delaware River, have a capacity of 60,000,000 gallons daily, of which 35,000,000 is in use. Operation was begun in 1923, and the determination of settling solids by Imhoff glasses indicates a consistent removal of practically 100%, and there is a reduction of suspended solids of 86%. The total sewage flow of 12,048 million gallons produced 11,222 cu. yds. of wet, digested sludge. During the year there was withdrawn from the Imhoff tanks 13,600 cu. yds. of digested sludge. There were no offensive odors at any time.

At the Northeast Works Laboratory a total of 5,456 samples of sewage waters, sewage sludge, and trade wastes, were examined and reported upon.

PENNYPACK PUMPING STATION

This station is located at State road and Pennypack Creek, and forces the sewage from the Village of Holmesburg, and municipal institutions in the vicinity, to the treatment works at Ashburner street and State road. The station is equipped with electrically operated centrifugal pumps, and with a power cost of \$4,564.76 there was handled a sewage pumpage of 872,000,000 gallons. The total expenditure for operation and maintenance of this station was \$11,008.

PENNYPACK SEWAGE TREATMENT WORKS

These Works, at State road and Ashburner street, have been in operation since 1912, for the protection of a water supply intake at Torresdale. Complete treatment and disinfection is practiced at these Works. The sewage flow of 872,000,000 gallons produced 769 cu. yds. of wet sludge. The designed capacity of 2,000,000 gallons daily has been exceeded and results in a lesser detention period in the Imhoff tanks, but the secondary treatment processes are ample in capacity and the character of effluent has not deteriorated. The total expenditure for operation and maintenance of these Works amounted to \$9,048.

The year 1928 saw the completion of the Tacony Creek Intercepting Sewer to the County Line, and the connection with the sewer system of Cheltenham Township. A meter has been installed for measuring the sewerage entering the City of Philadel-

phia from Cheltenham Township, as provided for in the agreement entered into in 1923, by which the City of Philadelphia conveys and treats the sewage of Cheltenham Township at the cost provided for in the agreement. The completion of this intercepting sewer made possible the diversion of sewage from Tacony Creek, which was formerly delivered from the sewer systems at Ashdale street, Bingham street and Champlatt avenue. The completion of the main Wingohocking sewer removed the last section of Wingohocking Creek, formerly a landmark in that section of Philadelphia, which was the main drainage channel from the heart of Germantown over to Frankford Creek.

In connection with the operation under the sewage treatment process it has been necessary to establish a patrol system to maintain the sewage in a fit condition for treatment, by controlling the discharge of objectionable materials from manufacturing establishments. During the year, 450 industrial plants were visited in the section of the city connected to the treatment works, and 25% of these places were found to be delivering objectionable materials. Changes have been made in accordance with the City requirements, sometimes at considerable expense to the industry, but it is desired to make a matter of record the cooperation and assistance given to the City by these industries, when the importance of clarifying and neutralizing their discharges is explained. In no case has it been found necessary to invoke legal aid or to as much as refer to such action.

It will be necessary to extend this patrol work into each section of the city, as these various sections may be connected with the sewage treatment processes, following the construction of intercepting sewers and extensions to the treatment works.

DRAINAGE PERMIT DIVISION

The operation of the Division issuing permits for the connection of buildings to the drainage system required a total of 1,210 permits, which authorized 8,035 connections to the City sewer system. The office records were added to by the recording of 191 plans of sewers constructed during the year, and the inspection information relating thereto. The receipts of the office, from all sources, were \$69,921.18.

TESTING LABORATORY

This laboratory, operating under the direction of the Bureau of Engineering and Surveys, carries on the physical and chemical testing of materials submitted by the various City departments and bureaus, under their respective specifications. Inspection and collection service was performed where required or requested. Research was made into a number of new types of construction and materials employed therein. The number of tests made during the year reached a grand total of 11,394, which is an increase of about 7% over the year 1927.



DEPARTMENT OF PUBLIC WORKS

OFFICE OF THE DIRECTOR

CITY HALL, PHILADELPHIA

No. 16022	FILED SYMBOL		
REC. 1-8-29			
January 7, 1929			
BUREAU OF ENGINEERING & SURVEYS			
FOR YOUR ATTN.	C		
REPORT WRITTEN			
VERBAL			
REPLY DIRECT			
PREPARE			
REC'D	1/6		
FORW'D			
REC'D			
RET'D			
DATE	3/10	SENT TO FILES BY	SEA

From: The Director's Office.

To: Mr. Dudley T. Corning, Chief,
Bureau of Highways.
Mr. A. M. Soby, Chief,
Bureau of Street Cleaning.
Mr. C. T. Hayes, Chief,
Bureau of Water.
Mr. John H. Neeson, Chief,
Bureau of Engineering & Surveys.
Mr. Charles W. Neeld, Chief,
Bureau of City Property.
Mr. Walter Carlin, Chief,
Bureau of Lighting.
Dr. Robinson, Chief,
Bureau of Gas.

Subject: ANNUAL REPORT OF PROCEEDINGS DURING PRECEDING YEAR

The following is copy of a letter dated January 4, 1929, received from the Office of the Mayor:

"The law provides that the several heads of city departments, the City Architect, the Zoning Commission, the City Planning Commission, and the Art Jury 'shall present to the Mayor, annually on or before the first Monday of February, a report of their proceedings during the preceding year, and he shall transmit the same to the Council, with any recommendations he may think proper to make'.

Accordingly, I am directed by Mayor Mackey to advise you to send to this office, before January 25th, a report covering the activities of your Department during the year 1928, so that all departmental reports may be compiled in time to present them to City Council, as provided by law."

Kindly forward these reports in duplicate on 8 $\frac{1}{2}$ x 11" paper.

W. J. Logan
WILLIAM J. LOGAN,
Chief Clerk.

16-1928

ANNUAL REPORT
1928
GRADE CROSSING DIVISION

January 21, 1929.

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 (Reading Company)
Elevation of the Philadelphia, Germantown & Norristown
Branch and the Chestnut Hill Railroad between a
point south of Wister Street and Bethlehem Pike

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

SOUTH PHILADELPHIA TRACK ELEVATION

In connection with the South Philadelphia track elevation the concrete viaduct on Twenty-fifth street was completed to Ritner street during the year and the main running tracks thereon are now in use from the Arsenal bridge to south of Passyunk avenue, using from Ritner street south a temporary trestle. This change resulted in the abolition of eleven grade crossings over tracks for through operation of trains.

Only one temporary track remains at grade for switching purposes and this will be removed the coming year. This will leave Twenty-fifth street, 100 feet wide, clear of all surface tracks so that it can be improved and paved from Washington avenue to Passyunk avenue.

Considerable filling has been done on the joint elevated line between Passyunk avenue and Broad street. Construction work on the relocation and elevation of the Baltimore and Ohio Railroad Company's tracks between East Side yard and Twenty-sixth & Oregon avenue included the erection of bridges over Twenty-eighth street, Twenty-sixth street and Passyunk avenue, which are complete. Filling has been completed between Twenty-eighth street and Passyunk avenue.

Dredging of the channel and the necessary dredging in front of the new terminal yard of the Pennsylvania Railroad has been nearly completed and a new coal handling pier and dock and a sustaining yard to operate the pier are now under construction.

A contract was let in the latter part of 1928 for the widening and improvement of Twenty-eighth street from Jackson street to Passyunk avenue and the work is now in progress.

PENNSYLVANIA TERMINAL IMPROVEMENT

Actual construction work on this project during 1928 included construction and reconstruction of the sewer system between Fifteenth street and the Schuylkill river and between Market and Arch streets. This work is progressing and will be completed during the coming year.

Approval by the Secretary of War of the revised bulkhead lines between Spring Garden street and a point south of Walnut street will permit construction of the bulkhead wall along the west side of the Schuylkill river from Spring Garden street to Market street. Plans and specifications for the first section of this wall have been prepared and it is hoped to start construction early in 1929.

Estimated cost of sewers \$400,000.
" " " bulkhead wall 500,000.

Property belonging to the Reading Company required for the development of the West River drive from Spring Garden southward is in course of acquisition.

The work of constructing the drive will proceed immediately after construction of the bulkhead wall and acquisition of necessary property, other than that owned by the Pennsylvania Railroad Company.

The City is developing its plans for all street work, including the bridge on the line of the Pennsylvania boulevard over the Schuylkill river and the opening and improving of Pennsylvania boulevard between Fifteenth street and the West River drive.

During the past year the Pennsylvania Railroad has prosecuted the construction of its suburban subway line between Sixteenth street and Twenty-second street. A large part of the excavation has been completed, considerable concrete and steel have been placed between Nineteenth street and Twenty-second street and temporary bridges built to carry Seventeenth, Eighteenth and Nineteenth streets over the excavation.

BALTIMORE AND OHIO TERMINAL IMPROVEMENT

The City has provided \$1,000,000. in funds for the first section of this work between Walnut street and Market street and the Baltimore and Ohio Railroad Company is preparing plans, in conjunction with the City, to permit putting this section of the work under construction at an early date. The estimated cost of the first section is \$1,000,000.

MANAYUNK ELEVATED

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, actual construction work has been confined to the elimination of the Ridge avenue crossing at Wissahickon station and the construction of a bridge to carry Ridge avenue, in its new location, over the railroad. This work was completed during the year and a dangerous grade crossing abolished.

Near the close of the year bids were received for the embankment and masonry, bridges and steel viaduct between Haines street and Fountain street, comprising nearly all the work necessary to elevate the tracks between those points. These contracts will be let and actual construction will start shortly after the first of the year. This will eliminate all grade crossings between Wissahickon creek and Fountain street, notably those along Cresson street, and will open Cresson street as a public highway.

Considerable of the additional real estate needed has been acquired and the demolition of existing buildings to clear the ground for construction is under way.

IMPROVEMENT OF DELAWARE AVENUE

Delaware avenue has been opened, graded and paved as far south as Bigler street. No construction work took place during 1928.

CHESTER BRANCH ELEVATED (READING COMPANY)

A bridge to carry Sixty-first street over the Chester Branch of the Reading Company has been completed, with the exception of the paving on the deck, which has been deferred until favorable weather. The total cost of this bridge will be \$200,000., one-half to be paid by the Reading Company.

No other work was in progress in connection with the abolishment of grade crossings along the Chester Branch between Fifty-seventh street and Bow creek.

ELEVATION OF THE P. G. & N. AND CHESTNUT HILL RAILROADS

from south of Wister street to Bethlehem pike. Negotiations have been completed and preliminary plans prepared for this project and, upon passage by City Council of the necessary ordinance, the agreement between the City and Railroad Company for carrying out this work will be entered into.

This project when completed will eliminate all grade crossings on these branches of the Reading Company's lines.

The estimated cost is \$5,500,000.

GRADE CROSSING DIVISION

	Spent 1928	Available 1929
South Philadelphia Improvement	\$1,658,131.67	\$3,248,569.30
Delaware Avenue Improvement	----	358,252.40
Manayunk Elevated	249,450.66	1,939,653.93
Pennsylvania Terminal	276,608.47	6,356,585.14
61st Street Bridge	107,459.97	6,501.58
B. & O. Improvement	----	1,000,000.00
	<hr/>	<hr/>
	\$2,291,650.77	\$12,909,562.35

January 1, 1929

SEWER CONSTRUCTION

\$2,500,000.00 was appropriated by Council for the Construction of Main Sewers.

\$900,000.00 was appropriated by Council for the Construction of Branch Sewers.

MAIN AND BRANCH SEWERS.

151 branch sewer contracts were started in 1928. 111 branch sewer contracts were completed during the year 1928 and 40 are now in the course of construction.

6.91 miles of main sewers were completed. Sixteen new main sewers were started during the year 1928.

MAIN SEWERS PLACED UNDER CONTRACT PREVIOUS TO 1928
AND COMPLETED IN 1928.

Aramingo Avenue from Frankford Creek to Sepviva Street and in Sepviva Street from Aramingo Avenue to Butler Street and in Butler Street between Sepviva Street and Frankford Avenue. Size 5' x 5'6" reinforced concrete sewer on piles and 5' x 4'6" reinforced concrete and various smaller sized. Total length of sewer completed 5266.20 lin. ft.

Cranford Avenue from Oxford Avenue to Benner Street, in Benner Street from Cranford Avenue to Whitaker Avenue, in Whitaker Avenue from Benner Street to Comly Street, in Comly Street from Whitaker Avenue to Tabor Avenue, in Tabor Avenue from Comly Street to Benner Street, in Benner Street from Tabor Avenue to Lawndale Street and in Lawndale Street from Benner Street to north of Robbins Avenue. Sizes 7'6" x 8' reinforced concrete in open cut, 7'6" x 8' reinforced concrete in tunnel, 7' x 7' reinforced concrete, 6'6" x 6'6" reinforced concrete and various smaller sizes. Total length of sewer completed 3578.02 lin. ft.

Forrest Avenue from southeast of Mt. Airy Avenue to Gowen Avenue, in Gowen Avenue from Forrest Avenue to Williams Avenue and in Williams Avenue between Gowen Avenue and Cresheim Avenue. Sizes 6'6" reduced cradle with stone block invert, 5'0" reduced cradle with stone block invert and various smaller sizes. Total length of sewer completed 2832.46 lin. ft.

Greenwood Avenue from Cheltenham Avenue to Vernon Road. Size 2'6" diameter brick sewer with 10" diameter vitrified pipe and various other sizes of pipe sewers. Total length of sewer completed 2020 lin. ft.

Hellerman Street from Tackawanna Street to Battersby Street. Size 10'6" x 8' reinforced concrete sewer with stone block invert and various smaller sizes. Total length of sewer completed 2145.87 lin. ft.

Large Street from Everett Avenue to Magee Avenue, in Magee Ave. from Large Street to Horrocks Street, in Horrocks Street from Magee Avenue to Unruh Street and in Unruh Street from Horrocks Street to Eastwood Street. Size 4'6" diameter brick sewer in full cradle 4'6" diameter brick sewer in reduced cradle with vitrified shale brick invert and various smaller sizes. Total length of sewer completed 2807.44 lin. ft.

Tabor Avenue from Sanger Street to Cheltenham Avenue. Size 3'6" diameter brick sewer and various smaller sizes. Total length of sewer completed 595 lin. ft.

Tioga Street from present terminus near Richmond Street to Salmon Street, in Salmon Street from Tioga Street to Schiller Street, in Schiller Street from Salmon Street to Gaul Street and in Gaul Street from Schiller Street to Ontario Street. Size 6' x 7'6" reinforced concrete on earth and 6' x 7'6" reinforced concrete sewer on piles. Total length of sewer completed 2287 lin. ft.

Washington Lane from present terminus near Boyer Street north-eastwardly. Size 3'6" diameter brick sewer with stone block invert and 3'2" diameter brick sewer with vitrified shale brick invert. Total length of sewer completed 1299 lin. ft.

Washington Lane from Chew Street to Boyer Street. Size 5'0" diameter brick sewer with vitrified shale brick invert, 4'6" diameter brick sewer with stone block invert and various smaller sizes. Total length of sewer completed 752 lin. ft.

MAIN SEWERS STARTED IN 1928 AND COMPLETED IN 1928.

Battersby Street from Hellerman Street to Unruh Street, in Unruh Street from Battersby Street to Brous Street, in Brous Street from Unruh Street to Tyson Street and in Tyson Street between Brous Street and Roosevelt Bld. Size 10' x 8' reinforced concrete sewer with stone block invert, 8' x 7'6" reinforced concrete sewer with stone block invert and various smaller sizes. Total length of sewer completed 4218.8 lin. ft.

Haverford Avenue from 69th Street to Lebanon Avenue. Size 4'6" diameter brick sewer in reduced cradle with stone block invert, 4'6" diameter brick sewer in reduced cradle with 15" diameter vitrified pipe and various smaller sizes. Total length of sewer completed 1008 lin. ft.

Packer Avenue between Delaware River and a point 650' east of Delaware Avenue. This was an outlet channel from end of the Packer Avenue sewer to the Delaware River

Salmon Street from Tioga Street to Schiller Street, in Schiller Street from Salmon Street to Gaul Street and in Gaul Street from Schiller St. to Ontario Street. Size 6' x 7'6" reinforced concrete sewer. Total length of sewer completed 370.89 lin. ft.

Extension of Little Tacony Creek Sewer from present terminus at Lewis Street southwestwardly. Size 8'6" x 9'6" reinforced concrete sewer with vitrified shale invert lining. Total length of sewer completed 324.06 lin. ft.

MAIN SEWERS STARTED IN 1928 BUT NOT COMPLETED.

Aramingo Avenue from Sepviva Street to Wheatsheaf Lane. Size 5' x 6' reinforced concrete, 4'6" x 4'6" reinforced concrete and various other sizes. Length of sewer completed 1568 lin. ft.

Bouvier Street from Elston Street to Cheltenham Avenue and in Cheltenham Avenue between Bouvier Street and Washington Lane. Sizes 7' x 8' reinforced concrete sewer with vitrified plate lining and various other sizes. Length of sewer completed 2723 lin. ft.

Butler Street between Aramingo Avenue and Frankford Avenue. Size 4'0" diameter brick sewer in reduced cradle with vitrified shale brick invert, 3'6" diameter brick sewer in reduced cradle with vitrified shale brick invert and various other sizes. Length of sewer completed 1222 lin. ft.

Gorgas Lane from Wissahickon Low Level Intercepting Sewer to Henry Avenue and in Henry Avenue between Gorgas Lane and Gates Street. Size 3'6" diameter brick sewer in reduced cradle 3'6" diameter brick sewer in hard rock and various other sizes. Length of sewer completed 3418.06 lin. ft.

Haverford Avenue from Lebanon Avenue to a point northwest of Malvern Avenue. Size 3'6" x 2'4" brick sewer with vitrified shale brick invert, 3'6" x 2'4" brick sewer in hard rock with vitrified shale brick invert. Length of sewer completed 1009 lin. ft.

Lakeside Avenue between Cheltenham Avenue and 12th Street, in 12th Street from Lakeside Avenue to 69th Avenue North and in 69th Avenue N. between 12th Street and Broad Street. Size 6' x 7' twin section reinforced concrete sewer with 24" diameter and 12" diameter vitrified pipe in concrete, 7'6" x 9'6" reinforced concrete sewer with 24" and 12" diameter vitrified pipe and various smaller sizes. Length of sewer completed 2664.22 lin. ft.

Mansfield Avenue between Upsal Street and Mt. Airy Avenue. Size 7'6" x 7'6" reinforced concrete sewer with stone block invert, 7'6" x 6'0" reinforced concrete sewer with stone block invert and various sizes. Length of sewer completed 399 lin. ft.

Robbins Street from Lawndale Street to Palmetto Street, in Palmetto Street from Robbins Street to Hellerman Street, in Hellerman St. from Palmetto Street to Rising Sun Avenue and in Rising Sun Avenue between Hellerman Street and Passmore Street. Sizes 4'6" diameter brick sewer in reduced cradle with vitrified shale brick invert, 4'6" diameter brick sewer in hard rock and other sizes. Length of sewer completed 980 lin. ft.

Sheffield Street from Rowland Avenue to Crabtree Street and in Crabtree Street and Pennypack Park from Sheffield Street to Pennypack Creek. Size 4'6" diameter brick sewer in reduced cradle with stone block invert and various sizes. Length of sewer completed 1304.9 lin. ft.

Tabor Avenue from Magee Street to Unruh Street and in Unruh Street from Tabor Avenue to Bingham Street and in Bingham Street between Unruh Street and Longshore Street. Size 5'6" x 4'6" reinforced concrete sewer with vitrified plate invert, 4'0" diameter brick sewer in full cradle with stone block invert and various sizes. Length of sewer completed 698 lin. ft.

30th Street from Morris Street to Mifflin Street. Size 5' x 4'6" reinforced concrete sewer. Length of sewer completed 980 lin. ft.

SEWERS STARTED PREVIOUS TO 1928 BUT NOT COMPLETED
IN 1928

Tabor Avenue from the present terminus north of Comly Street to Benner Street, in Benner Street from Tabor Avenue to Lawndale Street and in Lawndale Street from Benner Street to north of Robbins Street. Size 6'6" x 6'6" reinforced concrete sewer, 5'6" x 6'6" reinforced concrete sewer, 6' x 6' reinforced concrete sewer and various sizes. Length of sewer completed 1939 lin. ft.

INLETS, LATERALS, etc.

One inlet contract was carried over from 1927 and completed in 1928.

BOARD OF SURVEYORS

The Board of Surveyors is composed of the Chief Engineer and Surveyor as President, the Assistant Chief Engineer and Surveyor as Vice-President, and the sixteen District Surveyors and Regulators.

Regular meetings are held on the first and third Mondays of each month and such special meetings as the public business may require.

Sub-committees report to the general body on all ordinances received from City Council pertaining to subjects to be acted upon by the Board, and the Board recommends or disapproves the proposed ordinances in reports forwarded to Council prior to the passage of legislation.

The duties of the Board also include consideration and approval of the following matters:-

Plans submitted by street railway companies for the extension of new track systems,

Modifications of existing tracks,

Plans of steam railroad companies showing alignment, grades and bridge construction,

Plans of main sewers and bridges to be constructed.

Existing laws place the responsibility of the development of the City Plan upon the Board of Surveyors. Ordinances authorizing the original planning of large outlying sections of the City, or the revision of existing City Plans, are seldom specific in detail except as to boundaries of the sections under consideration.

The Board possesses no legislative authority. Its

functions are ministerial or advisory, although the legal intent of an Ordinance of Council pertaining to ^athe City Plan is not complete until the plan receives its final confirmation by the Board of Surveyors. Upon the confirmation of ^athe City Plan, it becomes a legal document, and can not be changed without additional authority granted by legislation of City Council. Before a City Plan is finally confirmed, advertisement is made and a public hearing before the Board of Surveyors granted to interested parties.

The Board of Surveyors, being a City Planning body, feels that it should be ~~more~~ closely associated with all movements of a City Planning nature. In past years, it has been represented at the majority of the Annual National Conferences on City Planning by two members of the Board delegated to attend and prepare a report on the proceedings.

The members of the Board should not only have the privilege, but they should be delegated to visit other cities; and to attend Engineering Conventions where it would be possible to get in close touch with the most advanced ideas on modern municipal growth.

A summary of the activities of the Board of Surveyors during the year is expressed in the following table:-

Number of stated and special meetings held.....	25
Number of Road Day meetings held.....	3
Number of plans advertised for public hearing.....	134
Number of ordinances reported on:	
For revision of City Plan.....	34
To place streets on City Plan.....	93

127
33
8
168

26-
1928

To strike streets from City Plan.....	33
To change street names.....	8
Number of street railway plans acted on.....	15
Number of deeds of dedication and releases acted on..	172
Number of City plans finally confirmed.....	118
Number of plans of property subdivision involving new streets approved.....	23
Number of bridge plans approved.....	10
Number of main sewer plans approved.....	7

DISTRICT OFFICES

The City of Philadelphia is divided into sixteen districts each of which is in charge of a Surveyor and Regulator. The work in these District Offices can be summarized under two lines of activity.

By the authority of the Legislature of the State of Pennsylvania, dating back as early as 1721, the Surveyors and Regulators are empowered to regulate and determine party lines for the erection of new buildings, and ^{for} alterations and additions to existing buildings; and to make surveys and resurveys for conveyance purposes. These powers have not been granted to any similar set of officers by any other State. The decisions of the Surveyors and Regulators are directed or reviewed only by the Courts. The wisdom of empowering a competent set of officers with this duty is shown by the lack of frequency of Court cases in this City involving disputes on the question of ^{property} party lines.

Tilte Insurance Companies usually make "an exception" of "accuracy of description" in a property title insurance, unless a plan of a Survey made by the ^{District} Surveyor and Regulator accompanies the application.

The other line of work in the District Offices includes that which is done for the different Bureaus and Departments of the City, and involves the making of preliminary estimates for Ordinances of Council for all classes of construction work; making the preliminary plans and estimates for the different Bureaus of the City preparatory to the making of contracts for the construction of sewers and bridges, and for such improvements as grading, paving and repaving of streets and alleys; the giving of lines and grades during the progress of the work, and measuring and certifying the quantities of the completed work. These offices also prepare all assessment bills against properties for all classes of construction work where the same is legally assessable.

The District Offices also prepare all plans for the openings and changes of grade of streets, as requested by the Department of Law for the use of the Board of View in determining damage awards. During the past year, the District Surveyors and Regulators have co-operated with the City Solicitor's office in these proceedings, and in many cases this co-operation has resulted in successfully reducing excessive damage claims.

The work of the District Offices during the past year, in connection with the sewerage, grading, paving and repaving of streets, was intensified by reason of the late start of the 1928 improvement program. Ordinances were passed by City Council early in July with the result that a large percentage of work, which is ordinarily spread over a twelve month period, had to be performed during the last six months of the year.

The speeding up of the program in various Survey Districts

resulted in probably the largest number of plans turned out in a given period in the history of the Bureau. From July 15th to the end of the year 1542 plans were ordered, and 1250 were turned in completed; 292 plans remain to be returned, but of this number 202 are of constructed sewers and have no bearing on proposed work. Ninety-four per cent, in the net, of plans ordered for improvement work were returned by the various District Survey Offices, which establishes a high record of performance.

In addition to this, the Surveyors are in possession of 1623 contracts sent to them since the beginning of the year for sewers, grading, paving and repaving, of which they have returned completed 742, leaving 881 still unfinished.

The amount of money involved in completed contracts for which lines and grades, measurements, bills and certificates were furnished was \$10,285,046. The amount of District cash receipts for the year 1928 was \$378,536. These amounts represent the great volume of work handled by the District Offices, and show a tremendous increase when compared with the year 1920 with \$4,824,495. for contracts and \$115,277. in voucher receipts.

A statistical report showing the activities of the Survey Districts during 1928 is appended herewith.

REVISION OF CITY PLANS

City Plan No. 9-S.

In the Southern section of the City, Plan No. 9-S, bounded by Carpenter Street, 20th Street, South Street and Broad Street, was confirmed. The section covered by this City Plan

was part of a former plan confirmed by the Court on December 12, 1840, while this portion of the City was still a part of the Townships of Moyamensing and Passyunk. There have been no revisions of this plan in the intervening period, and the new plan furnishes an accurate working basis for surveys.

Delaware River Bridge Approaches.

✓ On November 1, 1928, an ordinance was approved authorizing certain revisions in the central section of the City. This ordinance provides for the revision of the lines of Race Street and Vine Street, from Sixth Street to Franklin Street, and the plan will be heard on next Road Day, February 18, 1929. Under authority of this ordinance the cartway of Race Street will be widened twenty-two feet on the North side, and the cartway of Vine Street twenty-two feet on the South side, thus making a total width of forty-eight feet in the cartway of each street. These widenings will help to relieve the vehicular congestion to and from the Delaware River Bridge approach.

Henry Avenue.

✓ The revision of the lines and grades of Henry Avenue, from Markle Street to School House Lane, and streets adjacent and connecting therewith, was confirmed by the Board of Surveyors on May 8, 1928, preparatory to construction of the Henry Avenue Bridge over the Wissahickon Creek.

City Plan No. 345.

The confirmation of City Plan No. 345, bounded by Wyoming Avenue, Adams Avenue, Cayuga Street, "I" Street and

Ramona Avenue, including the revision of the lines and grades of boundary streets, strikes from this City Plan all streets through the Tacony Creek Golf Course with the exception of Castor Avenue. This avenue is an eighty feet wide traffic street connecting Kensington Avenue with The Roosevelt Boulevard, and extending beyond to Bustleton Avenue. The plan also provides for the widening of Adams Avenue, between Church Street and Wyoming Avenue, from fifty feet to eighty-eight feet. This revision is in connection with the planning of a wide thoroughfare around the Southern part of Frankford, extending from Wyoming Avenue and Castor Avenue to the Delaware River, which will divert the larger part of traffic now passing through Frankford from The Boulevard. Plans are in the course of preparation for placing Adams Avenue on the City Plan between Torresdale Avenue and the Delaware River. Ordinances have been introduced for the final step for this revision between Church Street and Torresdale Avenue.

EXTENSION OF THE CITY PLAN

Henry Avenue, Chestnut Hill - Bryn Mawr Road, and Widening of
← Ridge Avenue.

✓ Henry Avenue is now on the confirmed City Plan, one hundred and one hundred eight feet wide, from Hunting Park Avenue to South of Port Royal Avenue, and the extension of this street is provided for on City Plan No. 295, which has been authorized and will be advertised and probably confirmed in 1929. The above extension of Henry Avenue will terminate at

a point on Ridge Avenue about three hundred feet North of the proposed Chestnut Hill - Bryn Mawr Road.

✓ The Chestnut Hill - Bryn Mawr Road, of the width of one hundred feet, is proposed to extend from the intersection of Gravers Lane and St. Martins Lane, Chestnut Hill, to Bryn Mawr, crossing the Wissahickon Creek in Fairmount Park near Rex Avenue, and the Schuylkill River about twelve hundred feet South of the Montgomery County Line. The portion of this road between Hagy's Mill Road and Wissahickon Avenue is included on City Plan No. 295.

The widening and improving to full width of Ridge Avenue, from Leverington Avenue to the Montgomery County Line, is badly needed as a continuation of Henry Avenue. This street is on the City Plan eighty feet wide from Leverington Avenue to the proposed Chestnut Hill - Bryn Mawr Road, and North of that point is plotted one hundred twenty feet wide on City Plan No. 295. Ridge Avenue is legally and physically open to the width of fifty feet.

Sectional City Plans for the Unplanned Portion of the Thirty-fifth Ward.

✓ The number of new Sectional Plans in the unplanned section of the Thirty-fifth Ward has steadily increased during the past few years. A large portion of this Ward has not as yet been developed, and the rapid increase in values of farm lands has necessitated the planning of this section. It is with difficulty that the demands of interested parties in land developments can be met, as the developments are scattered in many section of this vast territory. During the past year, two Sectional City Plans, covering approximately one hundred sixty acres, were confirmed.

REGIONAL PLANNING

County Line Roads.

cont
The Regional Planning Federation of the Tri-State District is making extensive studies and surveys, and is mapping the region contiguous to Philadelphia for the better future development of Civic centers, the linking up of creek valleys for permanent parks and the projection of highways that will ultimately serve the best interests of the several communities. Travel on some of the inter-county roads bordering Philadelphia and adjoining counties has increased tremendously, while the improvement of ^{these} ~~the~~ roads has been slow due to the lack of co-operation where two counties are involved.

City Avenue is the main marginal highway for all kinds of traffic between Philadelphia, Montgomery and Delaware Counties, and affords transportation into the surrounding country without taxing the already overburdened central City highways. Small sections of this road have been widened and improved from time to time. One of the most difficult and particularly dangerous portions of roadway ^{for travel} is that section between the Schuylkill River and Monument Road, as it contains gradients exceeding eleven per cent. During the past year, an appropriating ordinance was passed by City Council to widen and improve this roadway between Schuylkill River and Monument Road, dependent upon action by authorities of Lower Merion Township and Montgomery County. The grades have been adjusted so that in no case will they exceed eight per cent. The City of Philadelphia, by an opening ordinance, widened City Avenue on the Southeast side to the eighty feet line. On the Northwest side of City Avenue, the owners have dedicated their

holdings required for the widening without expense to the County or Township. Conferences are now taking place between the respective authorities, and before the close of the present year there is very little doubt but that this most needed highway, widened to eighty feet, will be in use.

On December 29, 1928, an ordinance was passed to widen Cheltenham Avenue on the South side an additional fifteen feet between Broad Street and Fifth Street, thus widening the City's side to forty feet. The authorities of Cheltenham Township in Montgomery County have co-operated in this proposed widening and have passed a setback ordinance of forty feet on the North side from Cresheim Avenue to Front Street, thus assuring in the future a boundary street eighty feet wide East of Broad Street and eighty-five feet in width from Broad Street to Cresheim Avenue, a total distance of approximately four miles. This is a step forward in co-operation in securing County Line roads of adequate width for future requirements.

STREET IMPROVEMENTS

Broad St

During the past year, the Survey Districts have given the lines and grades for the restoration of the paving on the unpaved sections of Broad Street, from City Hall Northward to Nedro Avenue. Broad Street is now paved with improved pavement from City Hall Northward to 72nd Avenue^{North}, and a contract has been executed to pave the unpaved portion between 72nd Avenue^{North} and City Line, which will complete the improvement of this main traffic artery. *from City Hall to the Montgomery County Line.*

Cardington Road

The improvement of Cardington Road, between Lansdowne Avenue and Cobbs Creek, is now under construction. This is a somewhat different country road improvement inasmuch as there are special features connected with the drainage and the surrounding landscape of Cobbs Creek Park. This road has been specially designed with graceful curves and easy grades particularly suited for park embellishment. The road, when completed, will connect Philadelphia and Delaware Counties through a beautiful, rolling section, and afford a convenient method of transportation between Philadelphia and the 69th Street trolley terminal. This improvement will be looked upon more in the nature of a satisfaction to public convenience than as a mere road construction.

Haverford Road.

The main highway artery into Western Montgomery County and Southern Delaware County is Haverford Road. During the ¹⁹²⁸ ~~present~~ year, this highway ^{was} ~~has been~~ sewered and improved as far Northwest as Malvern Avenue, and the remaining one-half mile between this point and the municipal boundary at City Line awaits future drainage before it can be linked up with the County highways.

Note: - follow with Castor Avenue, Frankford Ave

Castor Avenue - Frankford Avenue.

A special ordinance was approved July 11, 1928, appropriating to the Bureau of Engineering and Surveys \$500,000 for the improvement of Castor Avenue, a hundred feet wide traffic artery from The Roosevelt Boulevard to Cottman Avenue; and for Frankford Avenue, another main traffic artery seventy and one hundred feet wide, from Bridge Street to Longshore Street. The City is thus endeavoring to keep abreast of the demands for improvements in the Northeast District by projecting two wide thoroughfares on the East and West sides.

The City owned trolley line beginning at Frankford Avenue and Oxford Avenue and extending to Bustleton, under lease by the Philadelphia Rapid Transit Company, is laid for part of its distance as a single track line along the East side of Castor Avenue between the points named, a distance of 8,500 feet. A contract has been executed, and is almost completed, for laying a double track trolley line with seven-inch girder rail on steel ties, imbedded in concrete, and the paving of the track area, nineteen feet two inches wide, with asphalt. Sewers have been designed to complete the drainage and their construction will be started in a short time. Upon the completion of the sewers a contract will be executed for the paving of the shoulders. The general effect of this improvement will be to open up territory that is now locked in because of poor transportation facilities; and in addition a new traffic route will be established between The Roosevelt Boulevard and the Northern outlet at Cottman Avenue. As this City owned trolley line will be continued in service to Bustleton, the same character of improvement

must eventually be carried through Northward to Bustleton Avenue and thence to Bustleton.

Frankford Avenue during 1927, was improved of the width of one hundred feet from Welsh Road to Longshore Street. The present ordinances authorize the continuation of this improvement from Longshore Street Southwardly to Bridge Street. The necessary sewers are now under construction and will be completed shortly. A contract for the grading and paving of the shoulders has been executed, and work will be started in the early spring. The completion of this contract will provide a main traffic artery nearly four miles in length, Northwardly from the present terminus of the Frankford Elevated Railway.

ARAMINGO AVENUE

Ordinances were approved during 1928, authorizing the opening of several sections of Aramingo Avenue, to its full width of one hundred feet, between Ontario Street and Bustleton Avenue. Ordinances have been introduced in City Council to open other sections of this avenue, and it is hoped they will be passed and approved during the coming year. The opening and improving of Aramingo Avenue is rapidly advancing to the stage which will necessitate a bridge over Frankford Creek, and when this street is fully opened and improved it will provide a main traffic artery from Bustleton Avenue and Knorr Street, through The Boulevard section, Wissinoming, Bridesburg, Frankford, and Kensington to Girard Avenue.

IMPROVEMENT OF BENSLEM AVENUE*from Grant Avenue to the City Line,*

The West driveway of Bensalem Avenue, which has been closed to traffic for a year, was repaved. This contract, nearly four miles in length, ~~extending from Grant Avenue to the City Line~~, was of such character as to require a field office on the line of the work. The establishment of this office facilitated the preparation of the preliminary plans and estimates, the giving of lines and grades, and the making of final measurements and certificates. The completion of this contract restores the two lanes of traffic on the Lincoln Highway between Pennypack Circle and the City Line.

*Note: follow with Railway Terminal Improvements
Sheet 15.*

15

RAILWAY TERMINAL IMPROVEMENTS

The City of Philadelphia is committed to a vast amount of improvements in connection with the proposed railway terminal changes. There are two major improvements planned and now in progress by the railroads entering this City. The Pennsylvania Terminal Improvement will almost completely revamp that section of the City lying south and west of the Parkway to Market Street, west of the Schuylkill River to a point beyond 32nd Street, and include both banks of the Schuylkill River between Spring Garden Street and Grays Ferry Avenue. This will involve the development by the City of the Pennsylvania Boulevard, ninety feet wide, superimposed upon the bed of the present Filbert Street from 15th Street westwardly, with a bridge over the Schuylkill River, to the proposed new station to be erected in the vicinity of 30th and Market Streets, and the widening and opening of 20th Street, ninety feet wide, between Market Street and the Parkway. The revision of the southwest line of the Parkway was authorized by Ordinance of City Council approved December 31, 1928. Under this ordinance, quite a large section, from 20th Street to 22nd Street, and from 23rd Street to the Schuylkill River, will be included in the area of the Parkway as part of a plan to convert the East and West banks of the Schuylkill River from their present unsightly condition to driveways of utility and beauty. On the west side of the Schuylkill River special surveys have been made determining and defining the right-of-way of the Schuylkill Navigation Company, Fairmount Park, and the proposed new right-of-way of The Pennsylvania Railroad. It is between these boundaries that the new West River Drive will be located. During the past year the roadway of Market Street, which is very much congested and obstructed by the columns of the elevated railway, has been widened eleven feet on the north side by moving back the curb in the vicinity of the proposed new Pennsylvania Railroad Station near 30th Street.

The general location plan of the improvement on the east bank of the River, involving the Baltimore and Ohio Railroad Company, has been finally approved by the Com-

39-1978

missioners of Fairmount Park. Application is being made for a certificate of public convenience to enable the Railroad Company to proceed early in the year with the building of its new station at 24th and Chestnut Streets, and for the widening and improving of the area now occupied by tracks between Walnut Street and Market Street over which it is proposed to construct a viaduct carrying the East River Drive.

ABOLISHMENT OF GRADE CROSSINGS.

In connection with the abolition of grade crossings along 25th Street in South Philadelphia, ^{over} on which a concrete viaduct has been constructed, stakes were given for street and property lines, and fourteen plans checked for the acquisition of property for right-of-way purposes, by the Survey District Office.

In Manayunk considerable progress has been made with the abolition of grade crossings. A bridge has been constructed and the street improved on the new line of Ridge avenue at Wissahickon Station. The widening and improving of Main Street and Leverington Avenue, and the construction of a new bridge on the line of the Philadelphia, Germantown and Norristown Railroad over Leverington Avenue, which work will shortly be started, will make the widening and improving of Umbria Street to full City Plan width of one hundred fifty feet, north of Leverington Avenue, highly desirable. Umbria Street is practically an extension of Main Street which now comes to a dead end at Leverington Avenue.

ANNUAL REPORT OF THE OFFICIAL PHOTOGRAPHER

Department of Public Works

NEGATIVES

PRINTS

MISS.

BLUE PRINTING (SQ. FT.)

YEAR	8 X 10	5 X 7	KODAK	8 X 10	5 X 7	KODAK	BRO. ENG.	LAN. SLIDES	BLUE PRINT	LINAURA	VANDYKE
Engineering & Survey	420	23	60	1746	69	148	3	18	124856	5055	2624
Highway	76			214		108			51566	250	160
Street Cleaning	6			15					16304	150	156
Water	114			451	56	136		11	53163	40	139
Health	4	6		19	16				2838		111
City Property	886			4305					3266		91
Architect				6					9776		48
Public Works	12			118							
Art Jury	13			48							
Electrical									5812	27	196
Welfare	6			18					275		
Law	3/6			1281							
Civil Service	2			24					850		
Total	1855	29	60	8245	141	392	3	29	268706	5522	3525

Roberts E. Leonard
 OFFICIAL PHOTOGRAPHER

41-1928

ANNUAL REPORT

FOR 1928

TESTING LABORATORY

BUREAU OF ENGINEERING & SURVEYS

DEPARTMENT OF PUBLIC WORKS.

JANUARY 16, 1929.

42-1928

BUREAU OF ENGINEERING AND SURVEYS

DEPARTMENT OF PUBLIC WORKS

CITY OF PHILADELPHIA

CITY HALL



January 14, 1928.

REPLY AND REFER TO: **TL-AFB**

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

Report of Testing Laboratory Division, Bureau of Engineering and Surveys, activities for the calendar year 1928 is hereby submitted.

The work consisted of physical and chemical testing of materials submitted by the various city departments and bureaus, in accordance with their respective specification. Inspection and collection service was performed where required or requested.

Investigation covering several new types of hydraulic cements and concrete admixtures was conducted in the endeavor to determine the value of same for use on city work. Research investigations were made on several materials which failed after being placed in the work.

High quality of laboratory standards and methods have been maintained and was substantiated by cooperative tests with several outside laboratories.

Total number of specimens tested show an increase of approximately seven (7) percent over the preceding year.

The appended tables show the total, variety, distribution and percentage of the specimens submitted by city departments and bureaus.

A. F. Burbidge

A. F. Burbidge,
Assistant Engineer.

43-1928

TOTAL NUMBER OF SAMPLES FOR 1928

BRICK

Concrete	29
Paving	30
Sewer	124
Building	3
TOTAL	- 186

186

COAL

Anthracite	405
Bituminous	583
TOTAL	- 988

988

CONCRETE

Cores	111
Cylinders	3798
Fine Aggregate (Sand)	80
Coarse Aggregate (Gravel, Slag, Pebbles, etc.)	89
Cubes	49
Building Block	19
Sewer Block	11
TOTAL	- 4157

4157

CEMENT

Domestic Portland Cement Samples	1991
Foreign " " "	318
Special Investigations	26
TOTAL	- 2335

2335

CONDUIT (Electric)

TOTAL - 1

1

CAST IRON (Arbitration Bars)

TOTAL - 45

45

FABRICS

TOTAL - 7

7

FIRE HOSE

TOTAL - 10

10

FOODS

TOTAL - 17

17

METALS

Ferrous	21
Non-Ferrous	23
TOTAL	- 44

44

MISCELLANEOUS

TOTAL - 116

116

OIL

Fuel	214
Headlight & Gasoline	20
Lubricating & Lubricants	66
TOTAL	- 300

300

PAINT AND PAINT MATERIALS

Mixed Paints	142
Pigments	82
Pastes	20
Drier	32
Linseed Oil & China Wood Oil	78
Putty	1
Turpentine	26
Shellac	5

44-1928

Carried Forward		385	8200
Carried Forward			
PAINT AND PAINT MATERIALS (Continued)			
Varnish		5	
		<u>389</u>	389

ROAD MATERIALS

Asphalt Waterproofing	24	
" Compounds (misc.)	27	
" Cement (Bituminous)	5	
" " (Penetration)	1216	
" Sand	41	
Tar	10	
Wearing Surface	1172	
TOTAL -	<u>2495</u>	2495

ROPE	4
ROOFING MATERIALS	8
SLUDGE	79
SOAP AND SOAP MATERIALS	28
STEEL	76
TILE	106
WATERPROOFING	<u>3</u>

GRAND TOTAL - 11394

45-1928

DISTRIBUTION OF SAMPLES FOR 1928

	No. of Samples	%	No. of Samples	%
Dept. of City Transit			2221	19.5
Dept. of Public Safety				
Bureau of Boiler Inspection	19	0.2		
" " Building Inspection	61	0.5		
" " Automobiles	2	-		
Electrical Bureau	1	-		
	<u>TOTAL</u>	<u>0.7</u>	83	0.7
Department of Public Health				
Bureau of Health			39	0.3
Department of Public Works				
Bureau of Engineering & Surveys	4411	38.8		
" " Highways	3235	28.4		
" " Water	363	3.2		
" " Street Cleaning	3	-		
" " City Property	3	-		
	<u>TOTAL - 8015</u>	<u>70.4</u>	8015	70.4
Dept. of Supplies			1023	9.0
pt. of Wharves, Docks & Ferries			13	0.1
			<u>TOTAL - 11,394</u>	<u>100.0%</u>

HYDRAULIC CEMENT SAMPLES FOR 1928

Domestic Portland Cement Samples	1991
Foreign Portland Cement Samples	318
Special Investigations	26
TOTAL	<u>2335</u>

DISTRIBUTION OF HYDRAULIC CEMENT FOR 1928

Dept. of Public Works

Bureau of Engineering

Sewer Division	911
Sewage Disposal (Construction)	340
Bridge Division	218
Grade Crossing Division	71
Testing Laboratory	40
Bins	29

TOTAL - 1609

1609

Bureau of Highways

" " "	14
" " " (Piers)	202
" " Water	4

TOTAL - 220

220

Dept. of City Transit

" " " "	261
" " " " (Bins)	186
" " " " (Piers)	89

TOTAL - 536

GRAND TOTAL - 2335

CHEMICAL SAMPLES FOR 1928

COAL

Anthracite 405
Bituminous 583
TOTAL - 988

988

FABRICS

7

FIRE HOSE

10

FOODS

17

METALS

Ferrous 21
Non-Ferrous 23
TOTAL - 44

44

MISCELLANEOUS MATERIALS

100

OIL

Fuel 214
Headlight-Gasoline 20
Lubricating-Lubricants 66
TOTAL - 300

300

PAINT AND PAINT MATERIALS

Mixed Paints 142
Pigments 82
Pastes 20
Drier 32
Linseed Oil 71
China Wood Oil 7
Putty 1
Turpentine 26
Shellac 3
Varnish 5
389

389

ROAD MATERIALS

Asphalt Sands 2
Asphalt (Waterproofing) 24
Asphalt Comps. (Misc.) 27
Asphalt Cement (Bituminous) 5
Asphalt Cement (Penetration) 1216
Tar 10
Wearing Surface 1172
TOTAL 2456

2456

Carried Forward	4311
ROPE	4
ROOFING MATERIALS	8
SOAP AND SOAP MATERIALS	28
SLUDGE	79
WATERPROOFING MATERIALS	3
GRAND TOTAL -	<u>4433</u>

DISTRIBUTION OF CHEMICAL SAMPLES FOR 1928

Dept. of City Transit		255
Dept. of Public Health		
Bureau of Health		39
Department of Public Safety		
Bureau of Automobiles	2	
Bureau of Boiler Inspection	19	
Bureau of Building Inspection	1	
Electrical Bureau	1	
	TOTAL	<u>23</u>
Department of Public Works		
Bureau of City Property	3	
Bureau of Engineering & Surveys	213	
Bureau of Highways	2505	
Bureau of Water	356	
Bureau of St. Cleaning	3	
	TOTAL	<u>3080</u>
Department of Supplies		1023
Department of Wharves, Docks and Ferries		13
	GRAND TOTAL	- <u>4433</u>

SAMPLES FOR PHYSICAL ANALYSIS FOR 1928

BRICK

Paving 30
Concrete 29
Sewer 124
Building 3

TOTAL - 186

186

CONCRETE

Cores 111
Cylinders 3798
Fine Aggregate (Sand) 60
Course Aggregate (Gravel, Slag, Grit, Pebbles) 89
Cubes 49
Building Block 19
Sewer Block 11

CONDUIT (Electric)

1

CAST IRON (Arbitration Bars)

45

MISCELLANEOUS

16

SAND (Asphalt)

39

STEEL

76

TILE

106

GRAND TOTAL - 4826

DISTRIBUTION OF PHYSICAL SAMPLES FOR 1928

Department of City Transit		1460
Department of Public Safety (Bureau of Building Insp.)		60
Department of Public Works		
Bureau of Engr. & Sur.	2589	
" " Highways	514	
" " Water	3	
	TOTAL -	<u>3106</u>
		TOTAL - <u>4626</u>



BUREAU OF ENGINEERING AND SURVEYS
DEPARTMENT OF PUBLIC WORKS
CITY OF PHILADELPHIA
CITY HALL

January 17, 1929

REPLY AND REFER TO: BES - FV

From: Sewer Registrar.
To: Mr. John E. Allen, Principal Assistant Engineer.
Subject: REPORT FOR 1928.

There has been a slight decrease in the number of permits issued and connections made to sewers during the year in this Division. The permits numbered 1210 and comprised 8035 connections to sewers.

The routine work of the office required the recording and filing of 191 record plans of sewers constructed during the year, together with the inspectors' diaries relating thereto.

During the year 1928, the receipts of this office from all sources were \$69,921.18.

A daily return of all permits issued was made to the Bureau of Health.

Permits issued	1210
Connections made to sewers	8035
Plans and diaries of sewers	191

Sewer permits	\$16,838.00
Sewer Assessment Bills	<u>53,083.13</u>

Total	\$69,921.13
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FRANK W. VAUGHN
Sewer Registrar,
Room 318 City Hall.

53-1928

ANNUAL REPORT - 1928.

DRAINAGE DIVISION

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 now under construction in Lakeside and Cheltenham Avenues to Broad Street and 69th Avenue North is completed. It is anticipated that this sewer will be completed and the Pumping Station abandoned early in 1929.

About 500 buildings are connected to the sewer system and the contributing population is estimated as 3000 persons.

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 1928 amounted to 115 million gallons, at a power cost of \$2,235.

The total expenditures for equipment, repairs, maintenance and operation amounted to \$4,797.

During the year, 1177 cubic feet of wet solids were intercepted on the rack screens and burned in the incinerator. At times when the capacity of the incinerator was exceeded, screenings were hauled to the Northeast Sewage Treatment Works and burned.

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 dikes 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 horsepower 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.

During the year, repairs were made to the slate roof and gutters, at a total cost of \$200.

Both boiler smoke stacks were painted, at a cost of \$48.

Leaking butt straps of boiler #2 were welded, and a slight blister which occurred in the rear header of boiler #2 was repaired by arc weld heating, the total cost of the work amounting to \$120.

The action of the flame from the oil burners upon the boiler brickwork has been severe, particularly in the front half of the furnace. Several years study of the air register in use at this Station and the newer type in use on the boilers at the Northeast Sewage Works Heating Plant indicated the later type to be more satisfactory in every way, and less severe in effect upon the life of the boiler brickwork. Accordingly, the old type air registers in boiler #1 were replaced with the newer type, and the results so encouraging and satisfactory that the new type was also placed in the front of boiler #2. The total cost for labor and material employed in making these changes amounted to \$307.

Frequent breaks in the dikes along Darby Creek beyond the City limits and the filling in of City property with river deposits by City dredges, were in a great measure responsible for an estimated increase in yearly pumpage of nearly 1200 million gallons, and an increase in fuel oil consumption of nearly 67,000 gallons over that of 1927.

In spite of the increased oil consumption, the more favorable price of 3.82¢ per gallon as against 5-1/8¢ paid during 1927, resulted in a lower net cost for fuel oil than that of 1927.

A contract entered into during 1928 for open stormwater channels along the County Line between Darby Creek and Church Creek, to the amount of \$150,000. is 70% completed. The excavation from these channels is being used to form a dike along this line for the further protection of the 40th Ward Lowlands from the drainage originating in Delaware County.

The pumping hours for one unit during the year totalled 3554 hours, and the fuel oil consumption amounted to 312,581 gallons, at a cost of \$11,940.66 for fuel oil. The total expenditure for equipment, maintenance, repairs and operation during the year amounted to \$22,002.

Sewage Disposal Div.

SOUTHWEST SEWAGE PUMPING STATION.

This Station is located on a 1000 acre tract near Penrose Ferry Road and Island Avenue, the proposed site of the Southwest Sewage Treatment Works.

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

This Station was placed in operation August 24, 1927.

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 requires about $3\frac{1}{2}$ hours daily pump operation, and will continue to be discharged into Eagle Creek pending the design and construction of the Sewage Treatment Works to be located adjacent to this Station.

The total cost of maintenance, operation and equipment of this Station for 1928 amounted to \$18,664, of which \$10,837 was for salary and wages, \$4289 for power and light, and \$3538 for maintenance and supplies.

FRANKFORD CREEK HIGH LEVEL SEWER.

The completion of the Wingohocking Sewer in Ramona Avenue from Cayuga Street to I Street, at a cost of \$578,787.88, early in 1928, wipes out the Wingohocking Creek, long a landmark of Philadelphia.

This sewer is of reinforced concrete construction with granite block invert, the vertical sides of which support a semi-circular arch roof. The inside height of the sewer is 21 feet and the width 24 feet.

Connection is made to the Frankford Creek High Level Collector near I Street through two sluice gates, each 5 feet wide x 3 feet high. A dam 2'9 $\frac{1}{2}$ " wide has been placed across the sewer just beyond this point to comply with the requirements of the Pennsylvania State Department of Health, which provide that a storm flow up to 200% of the average dry weather flow in this sewer shall be passed into the Frankford Creek High Level Sewer, while storm flows in excess of this amount may be discharged into Frankford Creek without treatment.

On the night of January 25, 1928, just before the completion of the sewer and during a heavy rainstorm, the gates leading to the Frankford Creek High Level Collector were fully opened for the protection of a newly poured concrete apron at the outlet end of the sewer, and a flow considerably in excess of 200% was passed through the Collector to the Grit Chamber, causing an overflow from the distributing tank of the sedimentation units at the Northeast Sewage Treatment Works.

To permit 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 from November 20, 1927 to January 20, 1928, during which time operation of the Frankford Creek Grit Chamber and the Northeast Sewage Treatment Works was suspended.

During this period, laborers from the Grit Chamber and Treatment Works were employed in removal from the High Level Collecting Sewer between I and Ramona

Streets and the Grit Chamber, a distance of approximately 5000 feet, accumulations of rubbish and debris originating from the ash dumps along the Wingohocking Creek before the completion of the sewer.

About 400 cubic yards of rubbish, which consisted of timber, boxes, automobile tires, etc., and about 200 cubic yards of sand and stone, were removed from the sewer by City laborers.

The Tacony Creek Intercepting Sewer ^{from} ~~at~~ Adams Avenue ^{to} ~~and~~ Cheltenham Avenue, was completed during the year, at a cost of \$53,896.34. At Cheltenham Avenue, connection has been made to the sewer of Cheltenham Township, and a meter installed for measuring the sewage entering Tacony Creek Intercepting Sewer from the Township Sewer, in accordance with an agreement entered into November 20, 1923 between that Township and the City of Philadelphia, providing for the conveyance ^{to} and the treatment of the Cheltenham sewage at the Northeast Sewage Treatment Works.

Upon the completion of Tacony Creek Intercepting Sewer, sewage from the sewers formerly discharging into Tacony Creek was diverted to this sewer for conveyance to the Northeast Sewage Treatment Works, as follows:

February 27, 1928	Ashdale Street sewer
March 9, 1928	Cheltenham Township sewer
April 26, 1928	Bingham Street sewer
May 15, 1928	Champlost Avenue sewer

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 coarse material and sand from the sewage before it enters the pressure conduit constructed in Wheatsheaf Lane, and leading to the Northeast Sewage Treatment Works.

The Frankford Creek High Level Collector leading to the Grit Chamber is designed for a flow as high as 200% of the average dry weather flow, to afford additional protection to that portion of Frankford Creek flowing through Juniata park.

The permit issued by the Pennsylvania State Department of Health provides, and the Grit Chamber and Treatment Works have been designed for the treatment of sewage flows as high as 141% of the average dry weather flow. Accordingly, a stormwater overflow weir has been constructed at a point in the sewer where it connects with the Grit Chamber, and the excess of stormwater is conveyed directly to Frankford Creek below the park property.

During the period January 1 to December 31, from a total sewage flow of 12,048 million gallons, 15,002 cubic feet of wet screenings were ^{intercepted} ~~incinerated~~, which equalled 1.2 cubic feet per million gallons of sewage. The practice of draining the screenings and burning in the incinerator installed at this Station was continued until warm weather. Occupants of the rather high grade residences surrounding the block complained that smoke from the burning screenings at times was annoying and offensive, particularly during the humid weather of August. It was not practical to extend the smoke stack to such a height as to insure freedom from complaints, and the screenings since then have been carted to the site of the Northeast Sewage Works and buried.

36,262 cubic feet of wet grit, equal to 3.0 cubic feet per million gallons of sewage, were intercepted, washed and hauled to the Northeast Sewage Treatment Works for disposal on low ground.

Analysis of the grit removed indicated a volatile matter content of 6.2%.

Formerly, a sewage velocity ranging between .8 and .9 feet per second appeared to be most satisfactory for depositing a maximum volume of mineral matter and a minimum volume of organic matter in the flow channels of the Grit Chamber, and at the same time resulting in a minimum deposit of grit in the effluent channels of the Imhoff Tanks at the Treatment Works.

Since the completion of the Wingohocking Sewer and the Tacony Creek Intercepting Sewer, these velocities result in the deposit of a considerable volume of a very fine sand in the influent channels, indicating that a greater volume of mineral matter than is desirable passes through the Grit Chamber and settles out in the Imhoff tanks. This fine sand contains many flakes of mica, and is kept in suspension by a relatively low sewage velocity. The presence of mica flakes is also noticeable in the sludge withdrawn from the Imhoff tanks. The sewage flow to the Grit Chamber has therefore been reduced to a velocity ranging from .7 to .8 feet per second, resulting in a greater deposit of the mineral matter in the Grit Chamber channels.

The exterior woodwork of the building was painted at a cost of \$110.

Copper roof gutters were repaired at a cost of \$48.

23 Oriental Plane trees, purchased at a cost of \$97.75, were planted by Bureau employees inside the fence line along O Street and Lycoming Street.

Grate bars in the incinerator were replaced early in the year, at a cost of \$94.

A liquid level recorder was purchased for \$96.50 and placed in the influent sewer, where it connects with the Grit Chamber. This gauge serves the purpose of recording the depth of sewage in the sewer and furnishes more accurate data as to the extent and duration of storm flows discharging over the weir in the storm overflow sewer.

The bell type of control gate placed in the outlet end of the center flow channel, and which proved unsatisfactory in operation, was replaced by one of the vein type, similar to those used in the other two channels, with entirely satisfactory results. The gate was built by Bureau employees, and the cost of material amounted to \$125.

Due to excessive humidity and sewage gases, the lighting system over the channels became defective and the fixtures badly corroded. Three flood lights were purchased at a cost of \$94.51, and placed by Bureau employees, one at the inlet end of each flow channel. A much better lighting arrangement resulted, and a considerable reduction in current consumption was effected.

3908 cubic feet of grease were intercepted and disposed of with the screenings.

The total expenditure for maintenance, operation, repairs and equipment during 1928 amounted to \$13,157.49, or \$1.09 per million gallons of sewage treated.

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 reverse flow Imhoff tanks and 80 sludge drying beds, is designed for a sewage flow of 60 million gallons per day, at a detention period of 3 hours. These Works were placed in operation October 29, 1923, and the average daily flow of 35 million gallons is cared for by 24 of the Imhoff tanks.

The character of the sewage varies from a rather heavy concentrated day flow containing much trade waste highly colored with dyes, to a more dilute night flow. The volume of dry weather flow fluctuates between a minimum rate of flow of 25 MGD occurring about 5 A.M, and a maximum rate of about 50 MGD occurring about 5 P.M.

Determination of settling solids by Imhoff settling glasses indicates a consistent removal of 100% throughout the year.

Samples for suspended solids collected at 3 hour intervals and made into a weekly composite sample for Gooch crucible determination indicate the following average total suspended solid content:

Works influent	142 PPM
Works effluent	21 PPM

or a reduction of 86% total suspended solids.

While oxidation processes are not employed at these Works, there is an improvement noted in the effluent, as indicated in the biochemical oxygen demand tests which are reported as follows:

Works influent	223 PPM
Works effluent	159 PPM

The total sewage flow for the period January 21 to December 31 amounted to 12048 million gallons and produced 11222 cubic yards of wet digested sludge, or .9 cubic yards per million gallons of sewage treated.

The total quantity of sludge withdrawn from the Imhoff tanks during the year amounted to 13,600 cubic yards. This sludge was dark in color, well digested,

and flowed freely. Offensive odors were not noticed at any time in the vicinity of the lagoon into which the sludge was discharged.

Laboratory analysis of the sludge withdrawn is reported as follows:

Specific gravity	1.023
Moisture	91.5%
Dry residue, volatile	50.9%
fats	20.3%
Alkalinity (Methol orange)	1333 PPM

Temperatures of sludge taken near the bottom of the Imhoff tanks indicated a range from 50°F. to 70°F. *between winter and summer*

Gas ebullition has been very active in nearly all gas vents of the tanks during the entire year. As early as March, every sudden rise in air temperature was accompanied by excessive ebullition of gas from the vents, and this was taken as a warning that foaming would appear at the advent of warm weather.

Where pH readings of the supernatant liquor collected over the sludge digestion compartment were reported as less than 7.0, hydrated lime in an amount equal to 100 lbs. per million gallons of sewage treated was deposited daily in the gas vents until a reading of 7.0 or higher was obtained. The volume of sludge in the tanks was reduced by withdrawal.

In spite of the addition of lime, there was a decrease in the pH values of the supernatant liquor early in May, and active foaming was in evidence generally throughout the tanks on May 15th. This foaming persisted until about July 1st.

An entire battery of tanks was given over to experimental work for the purpose of determining what corrective measures would be most satisfactory in the abatement of this condition. Studies were made as to the effect of resting the tanks, the application of air and rinsing water to the sludge in the bottom of the hoppers, the addition of lime in varying amounts, the mixing of well digested sludge with the foam and scum, and spraying and paddling the scum. A report of these studies was made, and the conclusion reached indicated that where corrective measures were employed, the period of foaming was reduced and the activity of the foam made less violent.

The interior walls and ceilings of the Locker Building were painted at a cost of \$80.

The walls and ceilings of the first and second floors of the Administration Building were painted at a cost of \$396.

The exterior of the Administration Building was painted one coat at a cost of \$98.

Bureau employees painted the exterior of the Locker Building, Transformer Building, Heating Plant Building, Outfall Pier Pumping Station and Office Building, Outfall Pier Wharf Logs and metal work, and air and water piping in the Imhoff tanks.

Metal window screens were furnished and erected at the Outfall Pier Pumping Station and Office Building, at a cost of \$154.

The sludge drying beds of Battery B were resanded at a cost of \$240. for sand.

7568 linear feet of 16" wide wooden walks over the sludge troughs of the Imhoff tanks were hot creosoted at a cost of \$79. for creosote and \$30. for dipping tank.

A tractor type lawn mower, designed to make an 84" wide cut, was purchased for \$420.50.

CONSTRUCTION.

Relative to the contracts entered into in 1927 for the Northeast Low Level Sewage Pumping Station and equipment, the amount of contracts and progress made is reported as follows:

Sub- and Super-structure	\$375,000.	98% completed
Mechanical Equipment	193,000.	46% "
Electrical Equipment	82,000.	64% "
Plumbing Equipment	4,500.	52% "
Heating Equipment	6,000.	65% "

A contract was entered into in 1928 for the construction of the Northeast Low Level Grit Chamber and equipment; the amount of the contracts and progress made is reported as follows:

Sub- and Super-structure	\$210,000.	52% completed
Mechanical Equipment	125,000.	-
Heating Equipment	2,000.	-
Electrical Equipment	20,000.	-

64-1928

UPPER DELAWARE LOW LEVEL COLLECTING SEWER.

The Upper Delaware Low Level Collecting Sewer, beginning at the Northeast Sewage Treatment Works and extending along the Delaware River to a point south of Holmesburg Avenue, work on which was started in 1927, has been completed except for the crossing under the large water mains in Robbins Street.

Section #1 - total cost	\$965,350.80	complete
#2 " "	721,240.93	"
#3 " "	800,000.00	"
#4 " "	809,773.24	"
#5 - amount of contract	1,675,000.00	98% complete

During 1928 contracts were awarded for extensions of this sewer as follows:

From a point 312 feet southwest of State Road to State Road, amount of contract \$45,000.
5% complete

In State Road southeast of Holmesburg Avenue to Holmesburg Avenue and in
Holmesburg Avenue to a point 182 feet southeast of Frankford Avenue,
amount of contract \$340,000.
35% completed.

Upon completion of this work, a collecting sewer will have been provided for the interception of sewage discharged from that portion of the City draining to the Delaware River between Wheatshaf Lane and Pennypack Creek, and into Pennypack Creek from the Delaware River to Bensalem Avenue. This work is in line with the recommendation of the 1914 report of the Bureau of Surveys for the Collection and Treatment of the sewage of the City, and has for its object the protection of the water supply of the City taken from the Delaware River at the Torresdale Water Purification Plant, which furnishes about two-thirds of the total water consumption of the City.

NORTHEAST SEWAGE WORKS LABORATORY.

A total of 5456 samples of sewage waters, sewage sludge and trade wastes have been examined and reported upon during the year. The origin of these samples is as follows: Northeast Sewage Treatment Works, Frankford Creek Grit Chamber, Pennypack Sewage Treatment Works, Byberry Sewage Treatment Works, Industrial Waste Survey and Schuylkill River Sanitary Survey.

While the total number of samples examined during the year was 58 less than 1927, the volume of work was greatly increased, as the samples submitted by the Schuylkill River Sanitary Survey required on an average of 15 determinations each.

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 872 million gallons, at a power cost of \$4564.76.

The total expenditures for operation, maintenance and repairs of plant and equipment amounted to \$11,008.

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

A total sewage flow of 872 million gallons produced 769 cubic yards

of wet Imhoff tank sludge, or .9 cubic yards per million gallons of sewage treated.

Laboratory analysis of the sludge withdrawn was reported as follows:

Specific gravity	1.050
Moisture	87%
Dry residue, volatile	59%
fats	20%

Considerable trouble was encountered at times in the withdrawal of sludge from the Imhoff tanks, due to accumulations of stone of about $1\frac{1}{2}$ " diameter, which probably washed into the sewer before improvement of the streets in the drainage area.

The high rate of flow reported in 1927 continued during 1928.

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 for the greater flow.

The final effluent of these works during the year, however, was at all times satisfactory. Laboratory analysis was reported as follows:

Suspended solids	10 PPM
Fats	4 PPM
Dissolved oxygen saturation	61%
Total bacteria	2 per CC on litmus lactose agar at 37° in 24 hours.

The exterior woodwork of the Operating House and Disinfection House was painted, at a cost of \$97.

A chemical feed orifice for regulating the dosage of hypochlorite solution was purchased at a cost of \$80, to replace one which had become defective after several years service.

For resanding the sludge drying beds, sand was purchased at a cost of \$87.68.

A 4" portable gasoline driven diaphragm pump for removing sludge from the final settling basin was purchased at a cost of \$290, to replace a 3" pump which was worn out after 15 years service.

Bureau employees rebuilt several sections of the dry stone wall along the east side of the trickling filters, where failure had occurred.

The total expenditures for operation, maintenance and repairs to plant and equipment amounted to \$9048.

FIELD CORPS.

Upon consolidation of the Bureau of Engineering and Bureau of Surveys early in 1928, the field work of surveys and construction of sewers was returned to the direction of the district survey offices, and the employees assigned to the district survey offices in the Northeast section of the City, where the magnitude of the work appeared to be greatest. One corp was retained for sewage disposal construction and surveys. The work of surveys, lines, grades and estimates returned by them during the year covered the following construction work:

Concrete sewers 5'x5'6" to 12'3" diameter	24,855 lin.ft.
Brick sewers 2'3" x 1'6" to 5' diameter	9,890 " "
Separate system sewers	942 " "
Pipe sewers	5,399 " "
Construction of Northeast Low Level Sewage Pumping Station	
Construction of Northeast Low Level Grit Chamber	
Surveys, lines and grades for the Aviation Field, 40th Ward.	
Surveys for the Frankford Creek Low Level Collecting Sewer.	

ANNUAL REPORT

FOR 1928

TESTING LABORATORY

BUREAU OF ENGINEERING & SURVEYS

DEPARTMENT OF PUBLIC WORKS.

JANUARY 16, 1929.

69-1928

BUREAU OF ENGINEERING AND SURVEYS

DEPARTMENT OF PUBLIC WORKS

CITY OF PHILADELPHIA

CITY HALL



January 14, 1928.

REPLY AND REFER TO: TL-AFB

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

Report of Testing Laboratory Division, Bureau of Engineering and Surveys, activities for the calendar year 1928 is hereby submitted.

The work consisted of physical and chemical testing of materials submitted by the various city departments and bureaus, in accordance with their respective specification. Inspection and collection service was performed where required or requested.

Investigation covering several new types of hydraulic cements and concrete admixtures was conducted in the endeavor to determine the value of same for use on city work. Research investigations were made on several materials which failed after being placed in the work.

High quality of laboratory standards and methods have been maintained and was substantiated by cooperative tests with several outside laboratories.

Total number of specimens tested show an increase of approximately seven (7) percent over the preceding year.

The appended tables show the total, variety, distribution and percentage of the specimens submitted by city departments and bureaus.

A.F. Burbidge,
Assistant Engineer.

70-1928

TOTAL NUMBER OF SAMPLES FOR 1928

BRICK			
Concrete	29		
Paving	30		
Sewer	124		
Building	3		
TOTAL	-	186	186
COAL			
Anthracite	405		
Bituminous	583		
TOTAL	-	988	988
CONCRETE			
Cores	111		
Cylinders	3798		
Fine Aggregate (Sand)	80		
Coarse Aggregate (Gravel, Slag, Pebbles, etc.)	89		
Cubes	49		
Building Block	19		
Sewer Block	11		
TOTAL	-	4157	4157
CEMENT			
Domestic Portland Cement Samples	1991		
Foreign " " "	318		
Special Investigations	26		
TOTAL	-	2335	2335
CONDUIT (Electric)	TOTAL -	1	1
CAST IRON (Arbitration Bars)	TOTAL -	45	45
FABRICS	TOTAL -	7	7
FIRE HOSE	TOTAL -	10	10
FOODS	TOTAL -	17	17
METALS			
Ferrous	21		
Non-Ferrous	23		
TOTAL	-	44	44
MISCELLANEOUS	TOTAL -	116	116
OIL			
Fuel	214		
Headlight & Gasoline	20		
Lubricating & Lubricants	66		
TOTAL	-	300	300
PAINT AND PAINT MATERIALS			
Mixed Paints	142		
Pigments	82		
Pastes	20		
Drier	32		
Linseed Oil & China Wood Oil	78		
Putty	1		
Turpentine	26		
Shellac	5		

Carried Forward		8206
Carried Forward	385	
PAINT AND PAINT MATERIALS (Continued)		
Varnish	5	
	<u>389</u>	389

ROAD MATERIALS

Asphalt Waterproofing	24	
" Compounds (misc.)	27	
" Cement (Bituminous)	5	
" " (Penetration)	1216	
" Sand	41	
Tar	10	
Wearing Surface	1172	
	<u>2495</u>	2495
	TOTAL -	

ROPE	4
ROOFING MATERIALS	8
SLUDGE	79
SOAP AND SOAP MATERIALS	28
STEEL	76
TILE	106
WATERPROOFING	<u>3</u>

GRAND TOTAL - 11394

DISTRIBUTION OF SAMPLES FOR 1928

	No. of Samples	%	No. of Samples	%
Dept. of City Transit			2221	19.5
Dept. of Public Safety				
Bureau of Boiler Inspection	19	0.2		
" " Building Inspection	61	0.5		
" " Automobiles	2	-		
Electrical Bureau	1	-		
TOTAL	<u>83</u>	<u>0.7</u>	83	0.7
Department of Public Health				
Bureau of Health			39	0.3
Department of Public Works				
Bureau of Engineering & Surveys	4411	38.8		
" " Highways	3235	28.4		
" " Water	363	3.2		
" " Street Cleaning	3	-		
" " City Property	3	-		
TOTAL-	<u>8015</u>	<u>70.4</u>	8015	70.4
Dept. of Supplies			1023	9.0
Dept. of Wharves, Docks & Ferries			13	0.1
			TOTAL - <u>11,394</u>	<u>100.0%</u>

HYDRAULIC CEMENT SAMPLES FOR 1928

Domestic Portland Cement Samples	1991
Foreign Portland Cement Samples	318
Special Investigations	26
TOTAL	<u>2335</u>

DISTRIBUTION OF HYDRAULIC CEMENT FOR 1928

Dept. of Public Works	
Bureau of Engineering	
Sewer Division	911
Sewage Disposal (Construction)	340
Bridge Division	218
Grade Crossing Division	71
Testing Laboratory	40
Bins	29
TOTAL	<u>1609</u>
Bureau of Highways	
" " " (Piers)	14
" " Water	202
" " "	4
TOTAL	<u>220</u>
Dept. of City Transit	
" " " (Bins)	261
" " " (Piers)	186
" " "	89
TOTAL	<u>506</u>
GRAND TOTAL	<u>2335</u>

CHEMICAL SAMPLES FOR 1928

COAL

Anthracite 405
Bituminous 583
TOTAL - 988

988

FABRICS

7

FIRE HOSE

10

FOODS

17

METALS

Ferrous 21
Non-Ferrous 23
TOTAL - 44

44

MISCELLANEOUS MATERIALS

100

OIL

Fuel 214
Headlight-Gasoline 20
Lubricating-Lubricants 66
TOTAL - 300

300

PAINT AND PAINT MATERIALS

Mixed Paints 142
Pigments 82
Pastes 20
Drier 32
Linseed Oil 71
China Wood Oil 7
Putty 1
Turpentine 26
Shellac 3
Varnish 5
389

389

ROAD MATERIALS

Asphalt Sands 2
Asphalt (Waterproofing) 24
Asphalt Compds. (Misc.) 27
Asphalt Cement (Bituminous) 5
Asphalt Cement (Penetration) 1216
Tar 10
Wearing Surface 1172
TOTAL 2456

2456

Carried Forward	4311
ROPE	4
ROOFING MATERIALS	8
SOAP AND SOAP MATERIALS	28
SLUDGE	79
WATERPROOFING MATERIALS	3
GRAND TOTAL -	<u>4433</u>

✓

DISTRIBUTION OF CHEMICAL SAMPLES FOR 1928

Dept. of City Transit		255
Dept. of Public Health		
Bureau of Health		39
Department of Public Safety		
Bureau of Automobiles	2	
Bureau of Boiler Inspection	19	
Bureau of Building Inspection	1	
Electrical Bureau	1	
	TOTAL	<u>23</u>
		23
Department of Public Works		
Bureau of City Property	3	
Bureau of Engineering & Surveys	213	
Bureau of Highways	2505	
Bureau of Water	356	
Bureau of St. Cleaning	3	
	TOTAL	<u>3080</u>
		3080
Department of Supplies		1023
Department of Wharves, Docks and Ferries		13
	GRAND TOTAL -	<u>4433</u>

✓

SAMPLES FOR PHYSICAL ANALYSIS FOR 1928

BRICK

Paving	30
Concrete	29
Sewer	124
Building	3
TOTAL -	<u>186</u>

186

CONCRETE

Cores	111
Cylinders	3798
Fine Aggregate (Sand)	80
Course Aggregate (Gravel, Slag, Grit, Pebbles)	89
Cubes	49
Building Block	19
Sewer Block	11

CONDUIT (Electric)

1

CAST IRON (Arbitration Bars)

45

MISCELLANEOUS

16

SAND (Asphalt)

39

STEEL

76

TILE

106

GRAND TOTAL - 4626

DISTRIBUTION OF PHYSICAL SAMPLES FOR 1928

Department of City Transit		1460
Department of Public Safety (Bureau of Building Insp.)		60
Department of Public Works		
Bureau of Engr. & Sur.	2589	
" " Highways	514	
" " Water	3	
	TOTAL -	<u>3106</u>
		TOTAL - <u>4626</u>

ANNUAL REPORT FOR THE YEAR 1928.

BRIDGE DIVISION, BUREAU OF ENGINEERING & SURVEYS

During the year the following contracts were completed:-

GIRARD AVENUE BRIDGE OVER THE SCHUYLKILL RIVER - Due to corrosion the upper deck of Girard Avenue Bridge has been in a dangerous condition for several years and on July 19, 1927, as noted in the previous annual report, a contract was awarded to M. & J. B. McHugh for the renewal of this floor. During construction traffic was maintained on the bridge and on the river drives. Street railway traffic was maintained in both directions but it was necessary to restrict vehicular traffic to west bound travel only. The final payment was made August 28, 1928. The total cost was \$165,371.18.

On August 7, 1928 a contract was entered into with the Mundy Paving and Construction Company to construct a bridle path on the north side of the lower Deck of Girard Avenue Bridge. At the close of the year the work was 91% completed. The limit of contract is \$55,000.00.

HUNTING PARK AVENUE BRIDGE OVER NORTH PENN RAILROAD - This bridge was constructed in order to open Hunting Park Avenue to the east of Fifth Street. The structure is a concrete encased steel girder bridge with concrete abutments and concrete retaining walls. The retaining walls west of the bridge extend to Fifth Street. Railway traffic was maintained continuously during construction. The contract for this work was awarded, March 4, 1927, to the Robbins Contracting Company, Inc., and final payment was made June 12, 1928. The total cost of the bridge was \$87,416.55, all of which was paid by the City of Philadelphia.

GREEN LANE BRIDGE OVER SCHUYLKILL RIVER - The Green Lane Bridge replaced an old iron truss bridge which had become unsafe 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 provides a 36 ft. cartway and two 8 ft. sidewalks and its total length is 630 feet. The contract was awarded to Seeds & Derham on Dec. 4, 1926, and final payment was made Dec. 4, 1928. The total cost was \$398,321.75, of which the City of Philadelphia paid \$199,406.63 and Montgomery County paid \$198,915.12.

In connection with this project it was found necessary to rebuild about 400 ft. 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. The contract was awarded Oct. 28, 1927, and final payment was made June 6, 1928. The total cost was \$40,380.00 which was paid entirely by the City of Philadelphia. The contractor was C. A. MacDonald.

The contract for grading the east approach of Green Lane Bridge was awarded to the Union Paving Company on Dec. 29, 1927, and at the close of 1928 was 99% completed. The entire cost of this contract will be paid by the City of Philadelphia. The limit of contract is \$35,000.00.

The following bridges were under contract but not completed at the end of the year 1928:-

RHAWN STREET BRIDGES OVER PENNYPACK CREEK - The construction of the two Rhawn Street Bridges will make possible the reopening of Rhawn Street through Pennypack Park. This street has been closed for several years since the condemnation of two old timber spans which had become unsafe. The new bridges are reinforced concrete arches and are similar in appearance. Each bridge has one main arch of 100 feet clear span and two side

spans of 76 feet each. The roadway provides for a 38 feet wide cartway and 2 sidewalks 8 feet wide. The clearance over Pennypack Creek is approximately 40 feet at the west bridge and 35 feet at the east bridge. The contract was awarded to the Vore Construction Company on December 29, 1927, and at the close of 1928 was 91% completed. The limit of contract is \$370,000.00.

RYAN AVENUE BRIDGE OVER SANIXY RUN - This bridge, when completed, will open Ryan Avenue through Pennypack Park. The structure is a stone faced reinforced concrete arch having a clear span of 33 feet. It provides for a cartway 52 feet wide and two sidewalks 8 feet wide. The contract was awarded to Walsh Brothers and O'Vary on Aug. 3, 1928, and at the close of 1928 was 68% complete. The limit of contract is \$40,000.00.

6TH STREET AND ALLEGHENY AVENUE BRIDGE OVER RICHMOND BRANCH OF THE READING COMPANY - The old bridge at this site has for several years been in a dangerous condition due to corrosion. Plans were prepared for reconstructing the entire deck. The old masonry walls are in good condition and except for minor repairs will not be altered. The contract to build a new floor was awarded to Horridge, Elcock & Hall on August 18, 1928, and work was begun on Dec. 11, 1928. The new bridge will be constructed of steel girders encased in concrete. Street railway traffic is being maintained during the course of the work. The limit of contract is \$130,000.00 and the entire cost is to be borne by the City of Philadelphia.

ABBOTSFORD AVENUE BRIDGE OVER GERMANTOWN AND CHESTNUT HILL BRANCH OF THE CONNECTING RAILWAY - The Abbotsford Avenue Bridge, when completed, will open a large undeveloped territory west of the railroad. On May

23, 1928, the contract for this bridge was awarded to Jafolla and Mark. The plans call for a steel girder bridge encased in concrete and concrete abutments. The cartway will be 52 feet wide and each sidewalk 12 feet wide. The limit of contract is \$50,000.00 and the cost is shared 73.5% by the City of Philadelphia and 26.5% by the Pennsylvania Railroad Company. At the close of 1928 the contract was 99% complete.

ASHDALE STREET BRIDGE UNDER P. N. & N. Y. RAILROAD (READING COMPANY). - The construction of the Ashdale Street Bridge will aid in the development of considerable territory to the east of the railroad. The contract for this work was awarded to Horridge, Elcock & Hall on August 2, 1928, The limit of contract is \$55,000.00 and the entire cost will be borne by the City of Philadelphia. The bridge as designed carries a single track over Ashdale Street on one span of 70 feet. At the close of 1928 the contract was 75% complete.

COTTMAN STREET BRIDGE UNDER P. N. AND N. Y. RAILROAD - The construction of the Cottman Street Bridge will eliminate a dangerous grade crossing by carrying Cottman Street under the Philadelphia, Newtown and New York Railroad. The contract for the bridge was awarded to Horridge, Elcock and Hall on May 23, 1928. The approach work will be paid for entirely by the City. The work within the right-of-way lines will be paid for in the proportions of 71.4% for the City and 28.6% for the railroad. The limit of contract for the city's share is \$40,000.00. At the close of the year the work was 84% completed.

17TH STREET FOOTBRIDGE OVER GREENWICH BRANCH, PENNSYLVANIA RAILROAD - In order to provide a safe crossing for school children, a wooden footbridge was authorized for the above site. The contract was awarded to Kaufman Construction Company on November 23, 1928. As the removal of this railroad is contemplated in the near future this bridge

is being built entirely of timber. The limit of contract is \$5,000.00. The cost will be borne entirely by the City of Philadelphia.

RISING SUN AVENUE BRIDGE OVER TACONY CREEK - The Rising Sun Avenue Bridge will replace an old stone bridge which was falling to pieces and which had been dangerous for several years. The contract was awarded to J. and R. Lombardi on June 1, 1928. The new bridge provides for a 44 foot wide cartway supported on steel girders encased in concrete and two sidewalks of about 10'8" width supported on reinforced concrete arches. The bridge will have stone facing and stone railings. Street railway traffic is being maintained without interruption during construction. The limit of contract is \$95,000.00. At the close of the year this contract was 75% completed.

LEVERINGTON AVENUE BRIDGE OVER MANAYUNK CANAL - The old bridge at this site was inadequate and unsafe for the volume and weight of modern traffic. The contract for the new bridge was entered into with Seeds and Derham on July 28, 1928. The deck is of steel girders encased in concrete and the abutments are of concrete. The plans provide for a cartway 20 feet wide and two sidewalks 8 feet wide. Highway traffic will be maintained and Canal traffic will not be interrupted during construction. The Schuylkill Navigation Company will pay 55.8% of the cost of this bridge and the City of Philadelphia will pay 44.2%. The limit of the contract is \$113,000.00. At the close of the year the contract was 63% complete.

UNIVERSITY BRIDGE OVER SCHUYLKILL RIVER - This bridge will provide a connection between south and west Philadelphia, and is planned to be the southern terminus of the 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 each 9 feet wide and a cartway 54 feet wide. The total length between abutment faces is 536 feet. The piers and abutments are faced with select buff Indiana limestone. The foundations for this bridge were taken down to firm bed rock, which was found in some cases to be 45 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 pier 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 is \$1,530,000.00. At the close of 1928 the bridge was 93% completed.

LINDEN AVENUE BRIDGE OVER PHILADELPHIA AND TRENTON RAILROAD -

The Linden Avenue Bridge will eliminate a dangerous grade crossing over the Philadelphia and Trenton Railroad (Pennsylvania Railroad). The contract was entered into with the Robbins Contracting Company, Inc., on October 21, 1927. The plans call for a steel structure encased in concrete. The cartway will be 40'0" wide and the sidewalks will each be 13'0" wide. At the close of the year 1928 this bridge was 87% complete. The cost is shared in equal portions by the City of Philadelphia and the Pennsylvania Railroad. The limit of the City's share is \$70,000.00.

Plans were prepared and bids received on the following bridges:-

COBBS CREEK BRIDGE BETWEEN 65TH STREET AND FLORENCE AVENUE - The old iron truss bridge at this site is unsatisfactory both as to appearance and strength and will be replaced by a stone faced concrete arch having a clear span of 46 feet. The bids were received December 19, 1928, and the Kaufman Construction Company was awarded the work on December 21, 1928. The limit of contract has been fixed at \$25,000.00.

LYCOMING STREET BRIDGE OVER THE RICHMOND BRANCH OF THE READING COMPANY - This bridge will open Lycoming Street to the west of Broad Street. The plans call for concrete abutments supporting a concrete encased steel girder deck. The clear span is 66 ft. The cartway is 26 feet wide and the sidewalks are each 10 feet wide. Bids were received December 19, 1928, and George F. Dobbin was awarded the work. The limit of contract has been fixed at \$55,000.00 and the entire cost will be borne by the City.

During the year of 1928 plans have been prepared for the following projects which are awaiting approvals before being advertised for bids:-

Welsh Avenue over Pennypack Creek.

Wyoming Avenue over North Penn Railroad.

"B" Street under the Connecting Railway.

"B" Street under the Philadelphia and Bustleton Branch.

Hunting Park Avenue over the Philadelphia and Bustleton Branch.

Rhawn Street Grading Plans - Lexington Avenue to Rowland Avenue.

Retaining Walls along Hunting Park Avenue between Clearfield Street and Ridge Avenue.

Surveys have been completed and plans are in progress on the following projects:-

Olney Avenue over the Philadelphia, Newtown and New York Railroad.

Mascher Street over the Richmond Branch, Reading Company.

Cayuga Street over the North Penn Railway.

70th Street over Philadelphia, Baltimore and Washington Railroad.

Rising Sun Avenue and Bristol Street over Philadelphia, Newtown & New York Railroad.

University Avenue under Philadelphia, Baltimore and Washington Railroad.

Walnut Lane over Lincoln Drive.

Grading and paving of Rising Sun Avenue - Olney Avenue to Adams Avenue.

JOINT CONTRACTORS

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 JOINT CONTRACTOR TO 12-31-28	AMOUNT PAID BY CITY TO 12-31-28
ABBOTSFORD AVE. OVER CHEST. HILL BRANCH P. R. R.	Item 322-F	\$ 80000.	\$ 50000.	PER Co. 26.5% total cost	\$ 12451.90	\$ 34536.41
ASHDALE ST. UNDER P. N. & N. Y. RR	Item 363-B	70000.	55000.	- -	- -	31212.32
COTTMAN ST. UNDER P. N. & N. Y. RR	Item 322-D	40000.	40000.	Reading Co. 28.6% of work within r/w	5701.99	21554.12
GIRARD AVE. OVER SCHUYLKILL RIVER	Item 370-L	250000.	170000.	- -	- -	165371.18
GIRARD AVE. OVER SCHUYLKILL RIVER LOWER DECK	Item 370-L	250000.	55000.	- -	- -	38263.17
GREEN LANE OVER SCHUYLKILL RIVER	Item 322-J	300000.	199578.50	Montgomery County 50% total cost	198915.12	199406.63
EAST APPROACH GREEN LANE BRIDGE	Item 322-J	300000.	35000.	- -	- -	24992.56
LEVERINGTON AVE. OVER MANAYUNK CANAL	Item 385-K	60000.	49946.	Schuylkill Nav. Co. 55.8% total cost	25223.36	19979.79
LINDEN AVE. OVER P. & T. RAILROAD	Item 363-G	85000.	70000.	Penna. R. R. Co. 50% total cost	44827.21	44827.22
RHAWN ST. OVER PENNYPACK CREEK	Item 385-B	535000.	370000.	- -	- -	291251.30
RISING SUN OVER TACONY CREEK	Item 322-G	100000.	95000.	- -	- -	56597.81
RYAN AVE. OVER SANITARY RUN	Item 322-K	40000.	40000.	- -	- -	23614.52
67 ALLEGHENY AVE. OVER RICHMOND BRANCH	Item 385-M	130000.	125000.	- -	- -	none

JOINT CONTRACTORS

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 JOINT CONTRACTOR TO 12-31-28	AMOUNT PAID BY CITY TO 12-31-28
17TH ST. OVER GREENWICH BRANCH P. R. R	Item 98 Budget	\$ 10000.	\$ 5000.	- -	- -	none
UNIVERSITY BRIDGE OVER SCHUYLKILL RIVER	Items 323 363-A	1330000.	1330000.	- -	- -	\$1074972.35
HUNTING PARK AVE. OVER NORTH PENN RAILROAD	Item 363-C	150000.	100000.	- -	- -	87416.55
MAIN STREET RETAINING WALL AT GREEN LANE	Item 322-J	300000.	47000.	- -	- -	40380.

LOCATION	DATE OF ORDINANCE	BIDS RECEIVED	DATE OF CONTRACT	CONTRACTOR	% COMPLETED LAST EST.	DATE OF LAST ESTIMATE
ABBOTSFORD AVE. OVER CHEST. HILL BRANCH P. R. R.	5-27-25	5-16-28	6-7-28	Jafolla & Mark	98%	12-11-28
ASHDALE ST. UNDER P. N. & N. Y. RAILROAD	12-3-25	7-25-28	8-15-28	Horridge, Elcock & Hall	73.32%	12-18-28
COTTMAN ST. UNDER P. N. & N. Y. RAILROAD	5-22-25	5-16-28	6-6-28	Horridge, Elcock & Hall	76.72%	12-21-28
GIRARD AVE. OVER SCHUYLKILL RIVER	10-2-25	7-6-27	7-19-27	M.&J.B. McHugh	100%	8-28-28
GIRARD AVE. OVER SCHUYLKILL RIVER LOWER DECK	10-2-25	7-25-28	8-16-28	Mundy Paving & Construction Company	91.51%	12-21-28
GREEN LANE OVER SCHUYLKILL RIVER	2-15-26	11-30-26	1-21-27	Seeds & Derham	100%	12-4-28
EAST APPROACH - GREEN LANE BRIDGE	2-15-26	12-28-27	1-16-28	Union Paving Co.	99%	11-5-28
LEVERINGTON AVE. OVER MANAYUNK CANAL	6-28-28	7-25-28	8-2-28	Seeds & Derham	57.98%	12-4-28
LINDEN AVE. OVER P. & T. RAILROAD	12-3-25	8-24-27	10-21-27	Robbins Contr. Co.	78.08%	12-4-28
RHAWN ST. OVER PENNYPACK CREEK	8-6-28 & 4-5-28	12-28-27	1-3-28	Vare Construction	89.9%	12-11-28
RISING SUN AVE. OVER TACONY CREEK	6-17-25	5-23-28	6-9-28	J.&R. Lombardi	64.9%	12-21-28
RYAN AVE. OVER SANDY RUN	7-8-27	7-25-28	8-14-28	Walsh Bros. & O'Vary	67.83%	12-21-28
6TH & ALLEGHENY AVE OVER RICHMOND BR.	6-28-28	7-25-28	9-10-28	Horridge, Elcock & Hall	none	none
17TH ST. OVER GREENWICH BR. PRR	2-8-28 & 3-24-28	11-21-28	11-28-28	Kaufman Constr.Co.	none	none
UNION CITY BRIDGE OVER SCHUYLK. RIVER	12-12-24 & 11-24-25	5-25-27	6-9-27	Dravo Contr. Co. Pittsburgh	94.25%	1-8-29

LOCATION	DATE OF ORDI- NANCE	BIDS RECEIVED	DATE OF CONTRACT	CONTRACTOR	% COM- PLETED LAST EST.	DATE OF LAST ESTIMATE
HUNTING PARK AVE. OVER NORTH PENN R.R.	12-3-25	2-16-27	5-4-27	Robbins Contr. Co.	100%	6-12-28
MAIN ST. RETAINING WALL AT GREEN LANE	2-15-26	10-5-27	10-28-27	C. A. Mac Donald	100%	6-6-28

ANNUAL REPORT FOR THE YEAR 1928.

BRIDGE DIVISION, BUREAU OF ENGINEERING & SURVEYS

During the year the following contracts were completed:-

GIRARD AVENUE BRIDGE OVER THE SCHUYLKILL RIVER - Due to corrosion the upper deck of Girard Avenue Bridge has been in a dangerous condition for several years and on July 19, 1927, as noted in the previous annual report, a contract was awarded to M. & J. B. McHugh for the renewal of this floor. During construction traffic was maintained on the bridge and on the river drives. Street railway traffic was maintained in both directions but it was necessary to restrict vehicular traffic to west bound travel only. The final payment was made August 28, 1928. The total cost was \$165,371.18.

On August 7, 1928 a contract was entered into with the Mundy Paving and Construction Company to construct a bridle path on the north side of the Lower Deck of Girard Avenue Bridge. At the close of the year the work was 91% completed. The limit of contract is \$55,000.00.

HUNTING PARK AVENUE BRIDGE OVER NORTH PENN RAILROAD - This bridge was constructed in order to open Hunting Park Avenue to the east of Fifth Street. The structure is a concrete encased steel girder bridge with concrete abutments and concrete retaining walls. The retaining walls west of the bridge extend to Fifth Street. Railway traffic was maintained continuously during construction. The contract for this work was awarded, March 4, 1927, to the Robbins Contracting Company, Inc., and final payment was made June 12, 1928. The total cost of the bridge was \$87,416.55, all of which was paid by the City of Philadelphia.

GREEN LANE BRIDGE OVER SCHUYLKILL RIVER - The Green Lane Bridge replaced an old iron truss bridge which had become unsafe 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 provides a 36 ft. cartway and two 8 ft. sidewalks and its total length is 630 feet. The contract was awarded to Seeds & Derham on Dec. 4, 1926, and final payment was made Dec. 4, 1928. The total cost was \$398,321.75, of which the City of Philadelphia paid \$199,406.63 and Montgomery County paid \$198,915.12.

In connection with this project it was found necessary to rebuild about 400 ft. 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. The contract was awarded Oct. 28, 1927, and final payment was made June 6, 1928. The total cost was \$40,380.00 which was paid entirely by the City of Philadelphia. The contractor was C. A. MacDonald.

The contract for grading the east approach of Green Lane Bridge was awarded to the Union Paving Company on Dec. 29, 1927, and at the close of 1928 was 99% completed. The entire cost of this contract will be paid by the City of Philadelphia. The limit of contract is \$35,000.00.

The following bridges were under contract but not completed at the end of the year 1928:-

RHAWN STREET BRIDGES OVER PENNYPACK CREEK - The construction of the two Rhawn Street Bridges will make possible the reopening of Rhawn Street through Pennypack Park. This street has been closed for several years since the condemnation of two old timber spans which had become unsafe. The new bridges are reinforced concrete arches and are similar in appearance. Each bridge has one main arch of 100 feet clear span and two side

spans of 76 feet each. The roadway provides for a 38 feet wide cartway and 2 sidewalks 8 feet wide. The clearance over Pennypack Creek is approximately 40 feet at the west bridge and 35 feet at the east bridge. The contract was awarded to the Vare Construction Company on December 29, 1927, and at the close of 1928 was 91% completed. The limit of contract is \$370,000.00.

RYAN AVENUE BRIDGE OVER SANDY RUN - This bridge, when completed, will open Ryan Avenue through Pennypack Park. The structure is a stone faced reinforced concrete arch having a clear span of 33 feet. It provides for a cartway 52 feet wide and two sidewalks 8 feet wide. The contract was awarded to Walsh Brothers and O'Vary on Aug. 3, 1928, and at the close of 1928 was 68% complete. The limit of contract is \$40,000.00.

6TH STREET AND ALLEGHENY AVENUE BRIDGE OVER RICHMOND BRANCH OF THE READING COMPANY - The old bridge at this site has for several years been in a dangerous condition due to corrosion. Plans were prepared for reconstructing the entire deck. The old masonry walls are in good condition and except for minor repairs will not be altered. The contract to build a new floor was awarded to Horridge, Eleock & Hall on August 18, 1928, and work was begun on Dec. 11, 1928. The new bridge will be constructed of steel girders encased in concrete. Street railway traffic is being maintained during the course of the work. The limit of contract is \$130,000.00 and the entire cost is to be borne by the City of Philadelphia.

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23, 1928, the contract for this bridge was awarded to Jafolla and Mark. The plans call for a steel girder bridge encased in concrete and concrete abutments. The cartway will be 52 feet wide and each sidewalk 12 feet wide. The limit of contract is \$50,000.00 and the cost is shared 73.5% by the City of Philadelphia and 26.5% by the Pennsylvania Railroad Company. At the close of 1928 the contract was 99% complete.

ASHDALE STREET BRIDGE UNDER P. N. & N. Y. RAILROAD (READING COMPANY). - The construction of the Ashdale Street Bridge will aid in the development of considerable territory to the east of the railroad. The contract for this work was awarded to Horridge, Elcock & Hall on August 2, 1928, The limit of contract is \$55,000.00 and the entire cost will be borne by the City of Philadelphia. The bridge as designed carries a single track over Ashdale Street on one span of 70 feet. At the close of 1928 the contract was 75% complete.

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is being built entirely of timber. The limit of contract is \$5,000.00. The cost will be borne entirely by the City of Philadelphia.

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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 each 9 feet wide and a cartway 54 feet wide. The total length between abutment faces is 536 feet. The piers and abutments are faced with select buff Indiana limestone. The foundations for this bridge were taken down to firm bed rock, which was found in some cases to be 45 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 pier 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 is \$1,330,000.00. At the close of 1928 the bridge was 93% completed.

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The Linden Avenue Bridge will eliminate a dangerous grade crossing over the Philadelphia and Trenton Railroad (Pennsylvania Railroad). The contract was entered into with the Robbins Contracting Company, Inc., on October 21, 1927. The plans call for a steel structure encased in concrete. The cartway will be 40'0" wide and the sidewalks will each be 13'0" wide. At the close of the year 1928 this bridge was 87% complete. The cost is shared in equal portions by the City of Philadelphia and the Pennsylvania Railroad. The limit of the City's share is \$70,000.00.

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JOINT CONTRACTORS

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 JOINT CONTRACTOR TO 12-31-28	AMOUNT PAID BY CITY TO 12-31-28
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ASHDALE ST. UNDER P. N. & N. Y. RR	Item 363-B	70000.	55000.	- -	- -	31212.32
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GIRARD AVE. OVER SCHUYLKILL RIVER	Item 370-L	250000.	170000.	- -	- -	165371.18
GIRARD AVE. OVER SCHUYLKILL RIVER LOWER DECK	Item 370-L	250000.	55000.	- -	- -	38263.17
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RYAN AVE. OVER SANTON RUN	Item 322-K	40000.	40000.	- -	- -	23614.52
61 ALLEGHENY AVE. OVER RICH- MOND BRANCH	Item 385-M	130000.	125000.	- -	- -	none

JOINT CONTRACTORS

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 JOINT CONTRACTOR TO 12-31-28	AMOUNT PAID BY CITY TO 12-31-28
17TH ST. OVER GREENWICH BRANCH P. R. R	Item 98 Budget	\$ 10000.	\$ 5000.	- -	- -	none
UNIVERSITY BRIDGE OVER SCHUYLKILL RIVER	Items 323 363-A	1330000.	1330000.	- -	- -	\$1074972.35
HUNTING PARK AVE. OVER NORTH PENN RAILROAD	Item 363-C	150000.	100000.	- -	- -	87416.55
MAIN STREET RETAINING WALL AT GREEN LANE	Item 322-J	300000.	47000.	- -	- -	40380.

LOCATION	DATE OF ORDINANCE	BIDS RECEIVED	DATE OF CONTRACT	CONTRACTOR	% COMPLETED LAST EST.	DATE OF LAST ESTIMATE
ABBOTSFORD AVE. OVER CHEST. HILL BRANCH P. R. R.	5-27-25	5-16-28	6-7-28	Jafolla & Mark	98%	12-11-28
ASHDALE ST. UNDER P. N. & N. Y. RAILROAD	12-3-25	7-25-28	8-15-28	Horridge, Elcock & Hall	73.32%	12-18-28
COTTMAN ST. UNDER P. N. & N. Y. RAILROAD	5-22-25	5-16-28	6-6-28	Horridge, Elcock & Hall	76.72%	12-21-28
GIRARD AVE. OVER SCHUYLKILL RIVER	10-2-25	7-6-27	7-19-27	M.&J.B. McHugh	100%	8-28-28
GIRARD AVE. OVER SCHUYLKILL RIVER LOWER DECK	10-2-25	7-25-28	8-16-28	Mundy Paving & Construction Company	91.51%	12-21-28
GREEN LANE OVER SCHUYLKILL RIVER	2-15-26	11-30-26	1-21-27	Seeds & Derham	100%	12-4-28
EAST APPROACH - GREEN LANE BRIDGE	2-15-26	12-28-27	1-16-28	Union Paving Co.	99%	11-5-28
LEVERINGTON AVE. OVER MANAYUNK CANAL	6-28-28	7-25-28	8-2-28	Seeds & Derham	57.98%	12-4-28
LINDEN AVE. OVER P. & T. RAILROAD	12-3-25	8-24-27	10-21-27	Robbins Contr. Co.	78.08%	12-4-28
RHAWN ST. OVER PENNYPACK CREEK	8-6-28 & 4-5-28	12-28-27	1-3-28	Vare Construction	89.9%	12-11-28
RISING SUN AVE. OVER TACONY CREEK	6-17-25	5-23-28	6-9-28	J.&R. Lombardi	64.9%	12-21-28
RYAN AVE. OVER SANDY RUN	7-8-27	7-25-28	8-14-28	Walsh Bros. & O'Vary	67.83%	12-21-28
6TH & ALLEGHENY AVE OVER RICHMOND BR.	6-28-28	7-25-28	9-10-28	Horridge, Elcock & Hall	none	none
17TH ST. OVER WYOMING BR. PRR	2-8-28 & 3-24-28	11-21-28	11-28-28	Kaufman Constr. Co.	none	none
UNIVERSITY BRIDGE OVER SCHUYLK. RIVER	12-12-24 & 11-24-25	5-25-27	6-9-27	Dravo Contr. Co. Pittsburgh	94.25%	1-8-29

LOCATION	DATE OF ORDI- NANCE	BIDS RECEIVED	DATE OF CONTRACT	CONTRACTOR	% COM- PLETED LAST EST.	DATE OF LAST ESTIMATE
HUNTING PARK AVE. OVER NORTH PENN R.R.	12-3-25	2-16-27	5-4-27	Robbins Contr. Co.	100%	6-12-28
MAIN ST. RETAINING WALL AT GREEN LANE	2-15-26	10-5-27	10-28-27	C. A. Mac Donald	100%	6-6-28

The extension and development of a city requires the opening up of new thoroughfares as arteries of transportation. In this connection there must be constructed the necessary bridge crossings of streams and railroads, to which must be added, under a general program of bridge construction, the rehabilitation of the older bridges in the already built up sections of the city.

One of the major projects undertaken by the Bureau in 1926 was a new connection between South and Southwest Philadelphia and the central section of the city, by way of a new structure over the Schuylkill River known as the University bridge. This is a steel bridge of the quick-opening or bascule type, for which the contract limit was \$1,330,000; the expenditure to date being \$1,074,972.35, indicating that the main portion of the structure is virtually completed. The final development that will place this bridge in service will be the construction of the approaches on both river banks -- an action which is anticipated to be taken at an early date.

In the northeast section of the city two dilapidated timber structures which had been condemned as unsafe for traffic, on the line of Rhawn street over Pennypack Creek, are being replaced with two concrete ornamental arch bridges at a cost of \$370,000, and upon which payments have been made to date of \$278,089.70, indicating an early date for completion. The approaches to these structures will be placed under contract in January and this important thoroughfare, which has been closed to traffic for a number of years, should again be in service before the end of the Summer, 1929.

Another important bridge crossing reopening traffic in 1928 was Green Lane over the Schuylkill River, connecting Philadelphia and Montgomery Counties, each of whom participated equally in the cost of the reconstruction. The former bridge was of the old type of truss construction, adequate enough for vehicular traffic when it was built, but entirely unsuited for that of today. Concrete arches have replaced the dilapidated and dangerous iron bridge at a total cost to Montgomery County and the City of Philadelphia of \$398,321.75.

A new bridge on the line of Hunting Park avenue over the North Pennsylvania Railroad has been completed during the year at a total cost of \$87,416.55.

The replacement of the floor system of the Girard avenue bridge over the Schuylkill River, which was built originally in anticipation of the opening of the Centennial in 1876, was finally completed during the year at a cost of \$165,371.18. The work was tedious because of the necessity of maintaining the bridge open for traffic during the entire period of the operation.

Contracts have been entered into and work is progressing on bridges at:

Linden avenue over the Philadelphia and Trenton Railroad
Rising Sun avenue over Tacony Creek
Cottman street under the Philadelphia, Newtown and New York Railroad
Abbottsford avenue over the Chestnut Hill Branch of the Pennsylvania Railroad
Ryan avenue over Sandy Run
Ashdale street under the Philadelphia, Newtown and New York Railroad
Leverington avenue over the Schuylkill Navigation Company Canal, and at 17th street, for foot traffic only, over

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the tracks of the Pennsylvania and Baltimore and Ohio
Railroads.

These structures have all been found to be necessary either for the development of new territory or to eliminate hazardous and dangerous railroad grade crossings. The projects enumerated represent a contract value of \$ a portion of which will be participated cost by the Railroad Companies.

An important reconstruction is under way on the line of Sixth street and Allegheny avenue, over the Richmond Branch of the Reading Railroad, which has become necessary through the dangerous condition of a structure built 35 years ago, which will cost the City \$125,000. One of the lower deck walks of Girard avenue bridge over the Schuylkill River is being strengthened and converted so as to be available as a bridle path for equestrians between the east and west river drives along the Schuylkill River to Fairmount Park.

There has been and will be expended for bridge construction completed or now under contract, a total of \$2,638,806.38, including all incidental outlay, from which \$ has actually been paid to date.

Plans are completed, or within such stage of completion that bids will be received and contracts entered into between this date and May 1, 1929, for the following bridges:

Lycoming street over the Philadelphia and Reading Railroad
"B" street under the Pennsylvania Railroad
Hunting Park avenue over the Philadelphia and Bustleton
Railroad
Mascher street over the Philadelphia and Reading Railroad
Cayuga street over the North Pennsylvania Railroad
70th street over the Philadelphia, Baltimore and Washing-
ton Railroad
Welsh road over Pennypack Creek
Henry avenue over Wissahickon Creek
Henry avenue over Philadelphia and Reading Railroad

to which may be added the construction of the approaches to the Rhawn street and Rising Sun avenue bridges, and a small bridge over Cobbs Creek near Florence avenue. These projects involve an outlay on the part of the City of \$3,386,000.

The Bureau is further engaged on the planning work for bridges to carry:

Olney avenue over the Philadelphia, Newtown and New York
Railroad
Rising Sun avenue and Bristol street over the Philadelphia,
Newtown and New York Railroad
Walnut Lane over Lincoln Drive and Fairmount Park
Wycing avenue extension over the North Pennsylvania Railroad
University bridge approach over the Schuylkill River

which will absorb the balance of \$ available for bridge construction to be placed under contract during the year 1929.

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Ryan avenue over Sandy Run
Ashdale street under the Philadelphia, Newtown and New York Railroad
Leverington avenue over the Schuylkill Navigation Company Canal, and at 17th street, for foot traffic only, over

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University bridge approach over the Schuylkill River

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To Director:

Subject: SUMMARY OF ACTIVITIES, BUREAU OF ENGINEERING AND SURVEYS

In answer to your request for a summary of the work of the Bureau of Engineering and Surveys, for the year 1928, and a forecast of the activities for 1929, I submit the following data:

BRIDGES

During the year 1928 the following work was completed:

Green Lane bridge over the Schuylkill River: A concrete arch structure replacing an old truss bridge which had become unsafe for modern traffic. The construction proceeded jointly under the City of Philadelphia and the County of Montgomery, with a participation in cost as follows:

✓

Montgomery County	\$198,915.12
City of Philadelphia	199,406.63
Total	<u>398,321.75</u>

X Retaining wall along the Schuylkill River for the approaches to Green Lane bridge on the Philadelphia side - total cost \$40,380.00

✓ Bridge on the line of Hunting Park avenue over the North Pennsylvania Railroad - cost, \$87,416.55

✓ New floor system on the Girard avenue bridge over the Schuylkill River: This was made necessary to place the bridge in a condition fit to carry modern traffic loads and the work was carried on while maintaining the bridge open for traffic. The cost was \$165,371.18. Funds expended in obtaining test boring information for bridge construction purposes amounted to \$1,618.64.

The employment of expert services in connection with the University bridge over the Schuylkill River entailed an expenditure of \$2,942.50. The total expenditure during 1928 on completed bridge projects was \$696,050.62, of which \$198,915.12 was paid by Montgomery County and \$497,135.50 by the City of Philadelphia.

Contracts entered into on which work is now proceeding are as follows:

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Philadelphia approach to the Green Lane bridge, comprising the grading, paving, sewers and street improvements under a contract total of \$35,000, of which \$24,992.56 has been expended.

University bridge over the Schuylkill River: This is a steel bridge, bascule type, on the line of University avenue. The contract limit is \$1,330,000 and the expenditure to date is \$1,074,972.35. The completion of this structure is anticipated at an early date, but it will be necessary to construct approaches on both river banks before the bridge can be placed in service.

Linden avenue bridge over the Philadelphia & Trenton Railroad, constructed of steel encased in concrete and upon completion will eliminate a dangerous grade crossing. The contract limit was \$140,000 and the expenditure to date is \$89,654.43, of which \$44,827.21 has been paid by the Philadelphia, Newtown and New York Railroad.

Rhawn street bridges over Pennypack Creek, consisting of two concrete arch bridges within the limits of Pennypack Park and replacing old timber structures which had been condemned as unsafe for traffic. The contract limit is \$370,000 and expenditures to date are \$278,089.70

Bridge on line of Rising Sun avenue over Tacony Creek is of concrete faced with stone and replaces an old stone arch which had become inadequate for traffic conditions. The contract limit was \$95,000 and the expenditure to date is \$36,662.53.

Bridge over Cottman avenue under the Philadelphia, Newtown and New York Railroad is a steel bridge constructed to eliminate a dangerous crossing. Contract limit is \$46,000 and the expenditure to date is \$24,053.25, of which \$4,785.27 has been paid by the Philadelphia, Newtown and New York Railroad, as a participation in costs between the City and the Railroad.

Abbottsford avenue bridge over the Chestnut Hill Branch, Penna. R.R., is a steel structure encased in concrete, and the contract limit is \$68,000

The expenditure to date is \$41,795.73, of which \$11,075.87 has been paid by the Pennsylvania Railroad.

✓ Linden avenue bridge over Sandy Run, constructed of concrete with stone facing and will provide for the opening of Ryan avenue over Sandy Run Creek. The contract limit is \$40,000 and the expenditure to date is \$17,266.05.

✓ Ashdale street under the Philadelphia, Newtown and New York Railroad is a steel structure, the completion of which will permit the physical use of Ashdale street under the railroad. The contract limit is \$55,000 and the expenditure to date is \$20,003.64, entirely on the part of the City.

✓ Girard Avenue bridge - lower deck-consists of the replacing of the lower deck footway and the construction of a bridle path. The contract limit is \$55,000, of which there has been expended to date \$9,387.04.

✓ Bridge on the line of Leverington avenue over the canal of the Schuylkill Navigation Company. This structure replaces an old steel truss which had become unsafe for modern traffic. The contract limit is \$113,000 and the expenditure to date is \$45,203.15, of which \$25,223.36 has been paid by the Schuylkill Navigation Company.

✓ Bridge carrying 6th St. and Allegheny Ave. over the Richmond Branch, Reading Company, will replace the existing structure which is in a dangerous condition. The contract limit is \$125,000, but no expenditures have been made to date.

✓ 17th St. north of Packer Ave. bridge, is a footway structure spanning the tracks of the Pennsylvania and Baltimore & Ohio Railroads, and is intended to remove a dangerous grade crossing which must be used to obtain access to a public school. The contract limit is \$5,000, and no expenditures have been made to date.

A contract has been entered into and work is proceeding for test pits on the line of Henry avenue over the Wissahickon Creek, to a limit of \$5,000, but no expenditures have yet been made. Contracts for the preparation of plans, specifications, and supervision of work for the bridges on the line of Henry avenue over

Wissahickon Creek, and the several lines of the Reading Company, have been entered into to the limit of \$129,000, under which the expenditures to date have been \$42,220.

✓ The contract work now proceeding is to the value of \$2,638,806.38, of which \$1,704,300.43 has been paid.

During the year 1929 work will proceed on the following projects:

✓ Lycoming street over the Richmond Branch, Reading Company, for which bids will be received on December 19.

Cobbs Creek, near Florence Avenue, for which bids will be received December 19.

✓ "B" Street bridges under the Connecting Railway, and the Philadelphia & Bustleton Railroad, for which bids will be received about March 1929.

✓ Hunting Park Avenue over the Philadelphia & Bustleton Railroad, for which bids are expected in February.

✓ Approaches to the Rhawn street bridge, which will be advertised in January.

New railings for the Girard avenue bridge over the Schuylkill River - advertisement in April.

✓ Mascher street over the Richmond Branch will probably be advertised in April.

✓ Cayuga street over the North Pennsylvania Railroad will be advertised about May.

✓ 70th Street over the Philadelphia, Baltimore and Washington Railroad will be advertised in May.

✓ Welsh avenue over Pennypack Creek will be ready for advertisement in January.

Approaches to the RisingSun avenue bridge over Tacony Creek can be advertised in January.

✓ The above projects, on which plan ^{making} has proceeded to the extent where the receipt of bids can be forecast, represent an expenditure of \$1,220,000.

✓ Planning work is proceeding on the bridge to carry Olney avenue over the Philadelphia, Newtown and New York Railroad; on the bridge for Rising Sun avenue and Bristol street over the Philadelphia, Newtown and New York Railroad; Walnut lane over Lincoln Drive and Fairmount Park; the west approach to the University bridge, and the bridges

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Financial Statement

Respiration 1978		918,700.00
Additional General Funds 1978		89,737.92
Balance carried from former years - From funds		74,186.094.47
Additional from funds 1978		14,553.070.78
Expenditures 1978	10,519,370.56	
Balance carried to 1979 from funds	79,135,059.75	
" " " 1979 General funds	45,049.17	
Balance merged 1978	7,679.69	
	39,687,059.17	39,687,059.18

DRAINAGE

The continual growth of the city makes necessary continuous work on extensions to the system of sewers which insure sanitary living conditions. For 1928 there was appropriated \$2,500,000 for main sewers and \$900,000 for branch sewers. From these appropriations main sewer contracts were entered into to the number of 17, at a cost of \$1,044,630. Of the work authorized over one million dollars' worth could not be placed under contract, due to various obstacles, such as unopened streets or other unfinished contracts upon which the new work was dependent. These obstacles are being cleared away and additional contracts will be entered into during the present year.

Of the branch sewers authorized practically the entire appropriation was made use of. In addition to placing work under contract which was authorized in previous years the expenditure during 1928 for branch sewers was \$1,075,828, comprised in 159 contracts. Under the Sewage Disposal Project additional sewers were constructed to the value of \$1,018,790, and it is estimated that drainage work at private cost was to the value of \$562,000. This was comprised in 70 contracts. The length of sewers constructed under these various items was as follows:

Main Sewers	6.91	miles
Branch "	19.76	"
Private Cost	13.22	"
Sewage Disposal	2.94	"

a total increase to the length of the drainage system of 42.83 miles.

The drainage projects listed for the coming year are mainly in the Sewage Disposal group and will include the collecting sewers along Frankford Creek; the extension of the Upper Delaware Collector northeast from Pennypack Creek; the interceptor on the line of Sandy Run, and the beginning of work on the collecting sewers which will remove sewage from the Schuylkill River.

TESTING LABORATORY

A subdivision of the Bureau of Engineering and Surveys is the Testing Laboratory, which is maintained for the purpose of determining the fitness of materials and supplies purchased by the City of Philadelphia. Materials delivered on construction work, comprising cement, sand, gravel, stone, bricks, timber, paints, and practically all substances, are sampled upon delivery at the work and tested for their compliance with specifications, and suitability for the work. In addition to this class of material, supplies purchased - coal, oil, foodstuffs - are also investigated.

During the year tests were made and materials reported upon to the number of 11,341 samples, of which 70% were contributed by the various Bureaus of the Department of Public Works, and 20% by the Department of City Transit. The remaining 10% were distributed over the various Bureaus in the Departments of Public Safety, Public Health, Supplies, and Wharves, Docks and Ferries.

The Testing Laboratory also conducted investigations of new types of cements and concrete mixtures, concrete brick, and various other new materials, to determine the value for use on City work. A number of investigations were, also, made following charges of faulty materials in construction work. It has always been the aim to maintain the standards of this Laboratory at the highest possible point, and in a number of cases where cooperative tests were conducted with Laboratories of high standing it was proven that the City Laboratory was second to none.

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INDUSTRIAL WASTE CONTROL

An activity of the Bureau of Engineering and Surveys which is little known but exceedingly important is the investigation and control of industrial wastes discharged into the sewer system. This work is necessary both to insure the maintenance of the drainage structures free from damage by acids or other corrosive material, and to prevent interference with sewage treatment processes by substances which would destroy the bacteria employed in sewage treatment methods.

During the year investigations were made of 450 industrial plants, mostly in the Northern portion of the city. About 25% of these industries were found by Laboratory analysis to be depositing objectionable matter in the sewers. The question of the most economical and efficient methods of correcting the condition was gone into with the operators of the various industries, and corrective measures were worked out. A number of conditions were found whereby establishments in the same locality were discharging substances which, when combined, produced a neutral condition in the sewers, and this condition is acceptable as long as both industries remain in operation at their present locations. Should one remove, the remaining industry would be compelled to install corrective measures. At the present time search is being made for establishments which are discharging slaughter house refuse into the sewer system in direct violation of a specific ordinance of Council.

OFFICIAL PHOTOGRAPHER

The Department of Public Works maintains an organization for the making of photographs and blueprints required by City operations. The various construction projects of the City are recorded in photographic records throughout the stages of progress; conditions surrounding accidents are also recorded for possible legal proceedings; sites for improvements, and conditions preliminary to improvements are recorded.

During the year 1928 there were photographs made of 1,920 views, from which 8,778 prints were made. The making of blueprints for contract work of the City required the use of 278,000 square feet of blueprint paper.

DRAINAGE PERMITS

The Sewer Registrar of the Bureau of Engineering and Surveys controls the issuing of permits for the connection of buildings to the City drainage system, and he is, also, in charge of the Inspection Force which is necessary to insure that the connections are properly made.

During the year 1928 there were 8,035 new connections made to the sewer system from buildings constructed during the year. These connections were covered in 1,210 permits and a record was made of the condition and location of each one of these connections.

In this office is also maintained the location, depth and size of all slants and laterals provided for the connection of future buildings when the sewers are built. This service is for the use of registered plumbers who desire to make drainage connections and can locate the exact spot for street openings from the records of this office. The data maintained is exceedingly valuable to the future conditions in the City streets, and every effort is made to maintain it in a most efficient and safe condition.

January 17, 1929

BES - FV

From: Sewer Registrar.
 To: Mr. John E. Allen, Principal Assistant Engineer.
 Subject: REPORT FOR 1928.

There has been a slight decrease in the number of permits issued and connections made to sewers during the year in this Division. The permits numbered 1210 and comprised 8035 connections to sewers.

The routine work of the office required the recording and filing of 191 record plans of sewers constructed during the year, together with the inspectors' diaries relating thereto.

During the year 1928, the receipts of this office from all sources were \$69,921.18.

A daily return of all permits issued was made to the Bureau of Health.

Permits issued	1210
Connections made to sewers	8035
Plans and diaries of sewers	191
Sewer permits	\$16,838.00
Sewer Assessment Bills	<u>53,083.13</u>

Total	\$69,921.13
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FRANK W. VAUGHN
 Sewer Registrar,
 Room 318 City Hall.

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