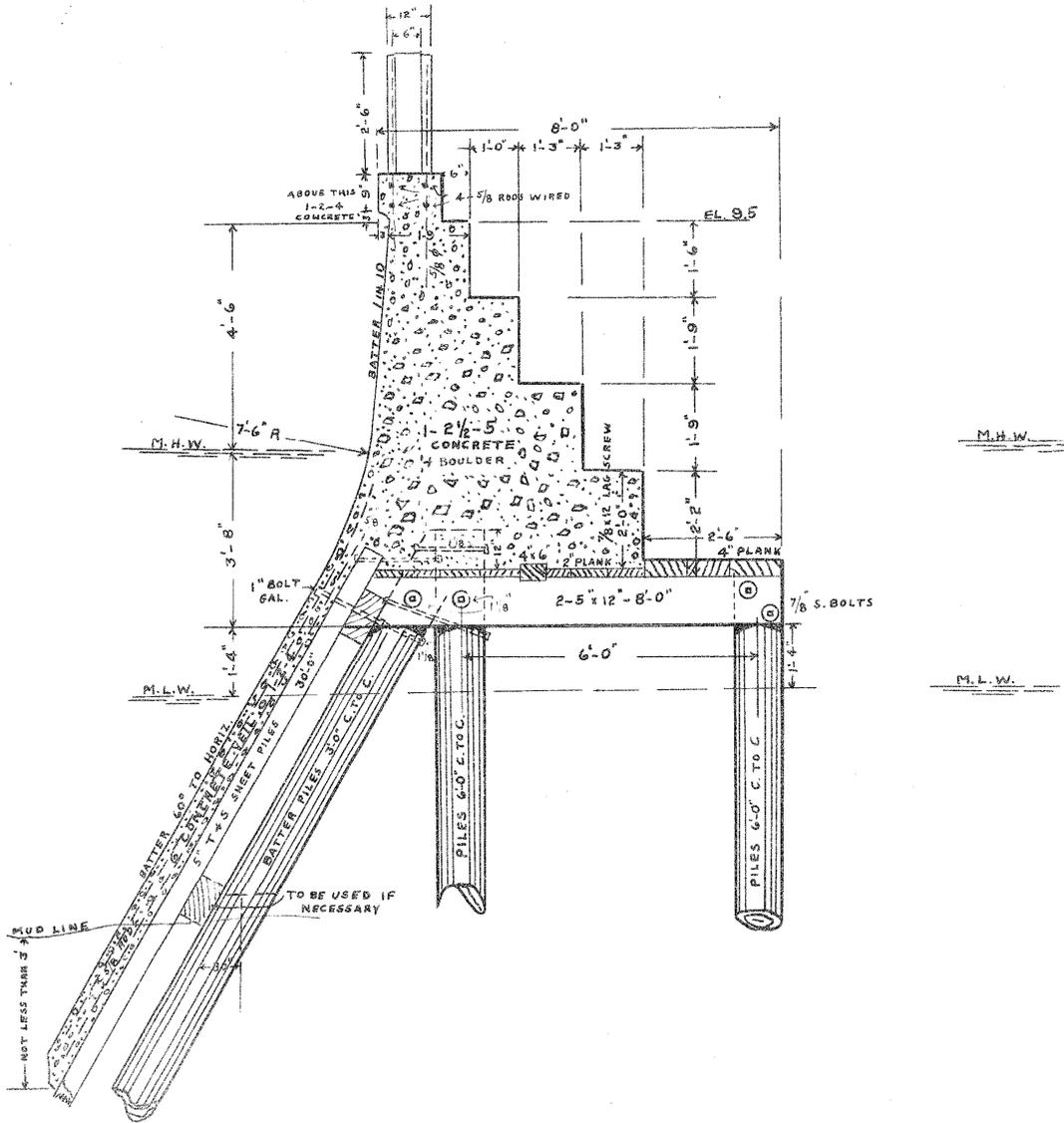


Appendix F

Low Battery Seawall

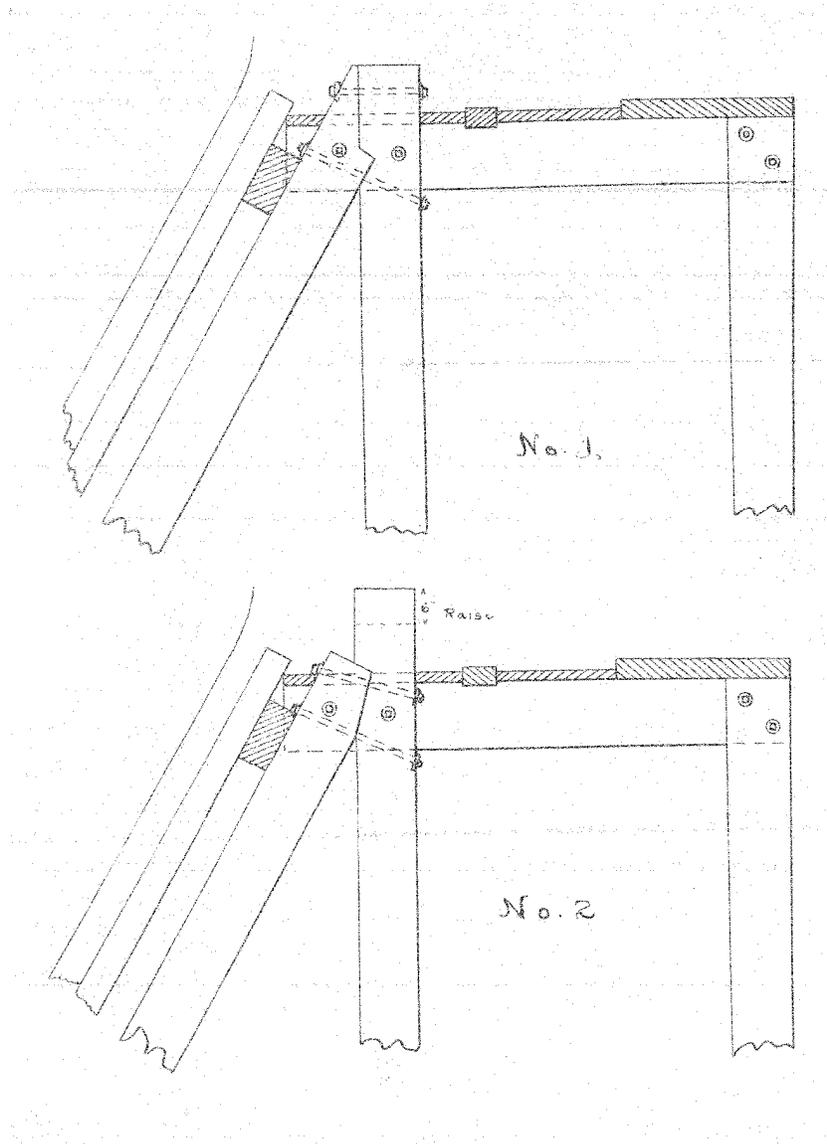
Archive Drawings and Excerpts from the City of Charleston Year Books



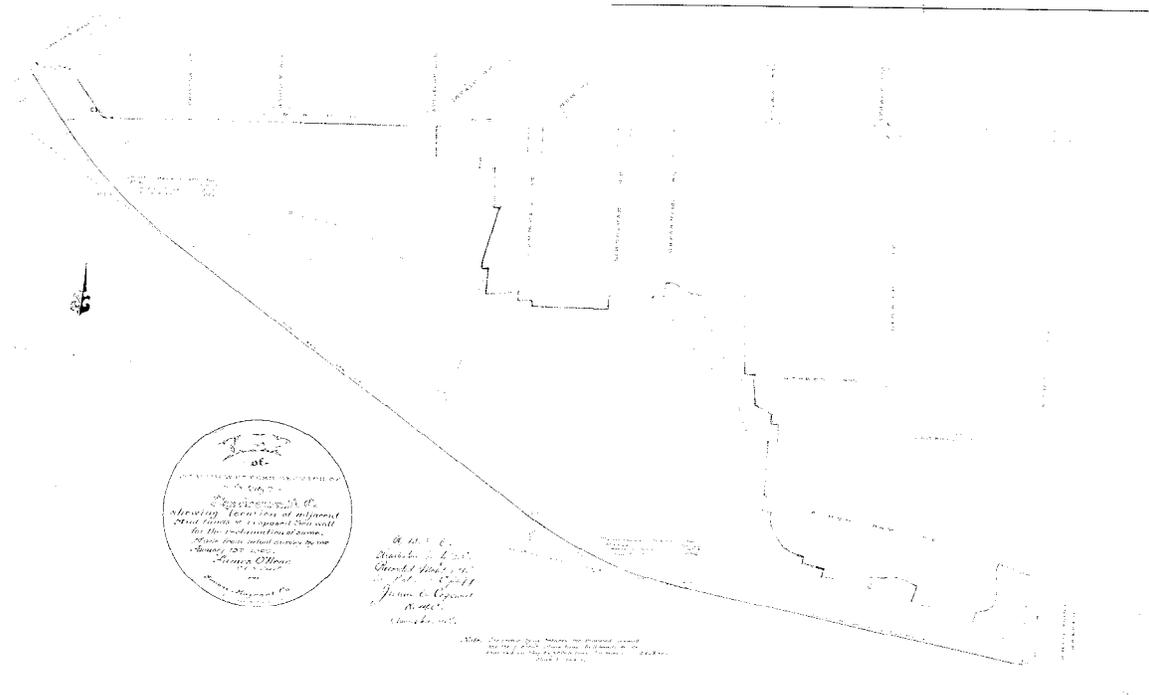
TENTATIVE SECTION PROPOSED SEA WALL
 WESTERN WATER FRONT CHARLESTON S.C.
 CITY ENGINEER'S OFFICE MAY 16, 1935
 SCALE $\frac{1}{2}'' = 1'$

(SUBJECT TO CHANGE AFTER PILE TESTS AND BORINGS SHALL HAVE BEEN MADE)

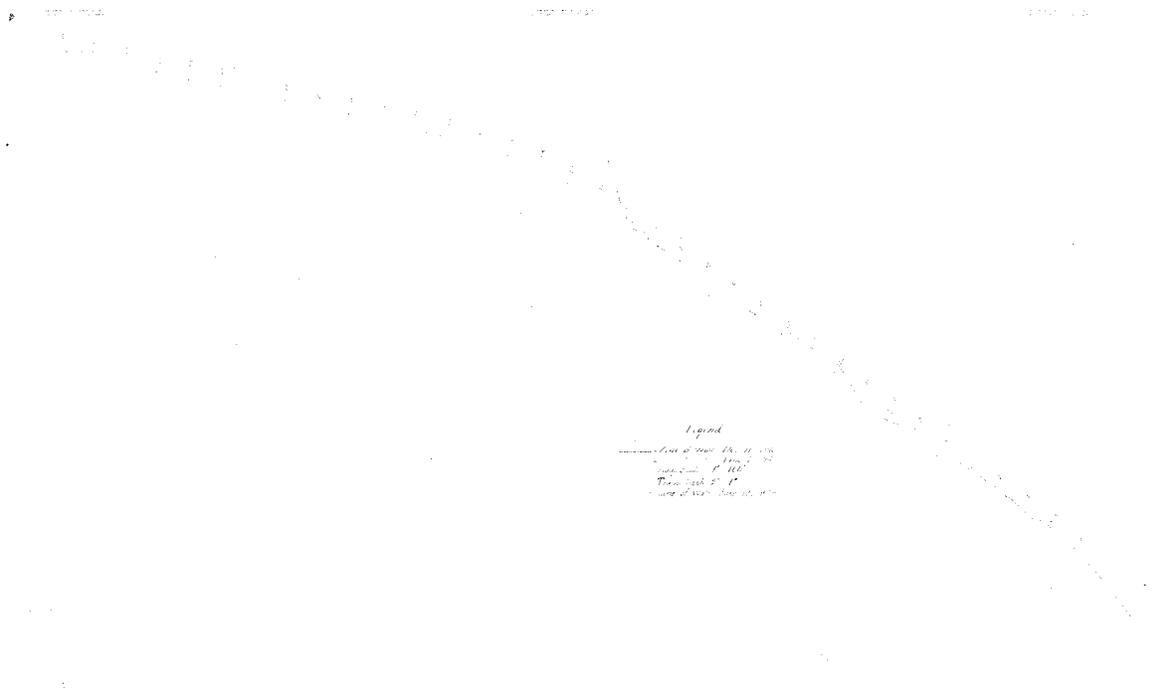
This drawing was obtained from the City of Charleston Archives. The drawing shows the cross-section design through the Low Battery and is dated 1935, nearly 16 years after the completion of "The Boulevard Extension". This cross-section design graphically correlates with great precision the dimensions and configurations as described in the City of Charleston Year Book 1911 and Year Book 1917.



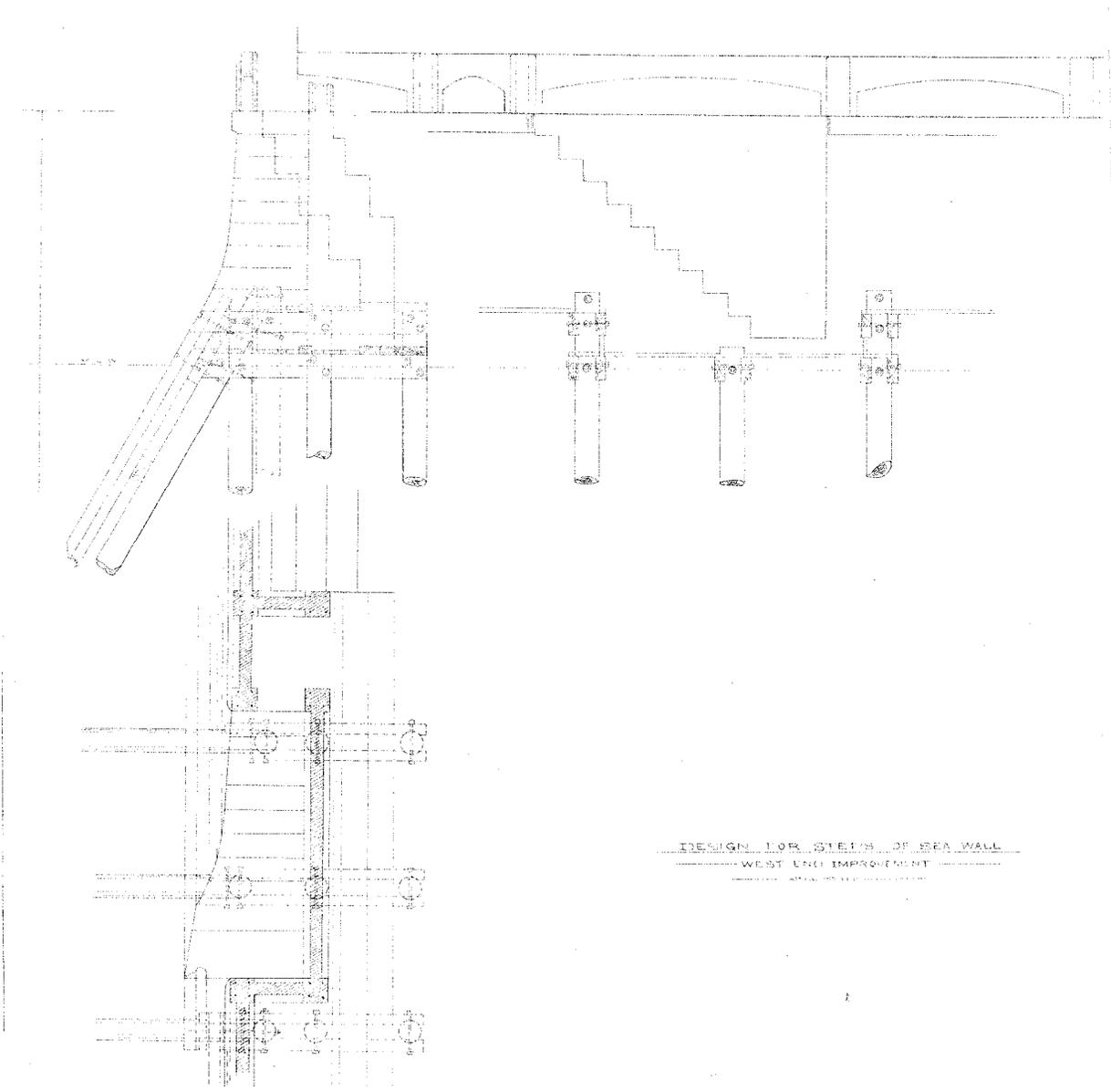
This drawing was obtained from the City of Charleston Archives. This is an undated drawing believed to be a design detail for the Low Battery seawall of two alternatives for the connection of the batter (sloped) pile to the adjacent vertical pile. The detail shows the cross-section of the timber platform that supports the main concrete structure of the seawall.



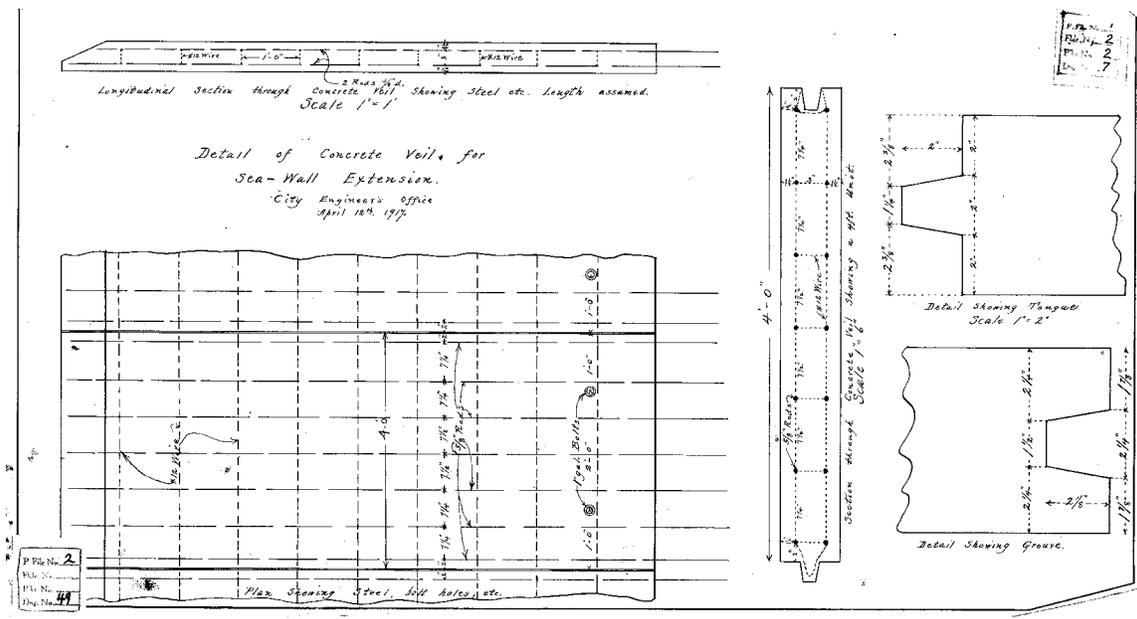
This drawing was obtained from the City of Charleston Archives. This drawing dated 1909 indicates the geometry for the layout of "The Boulevard" portion of the Low Battery seawall.



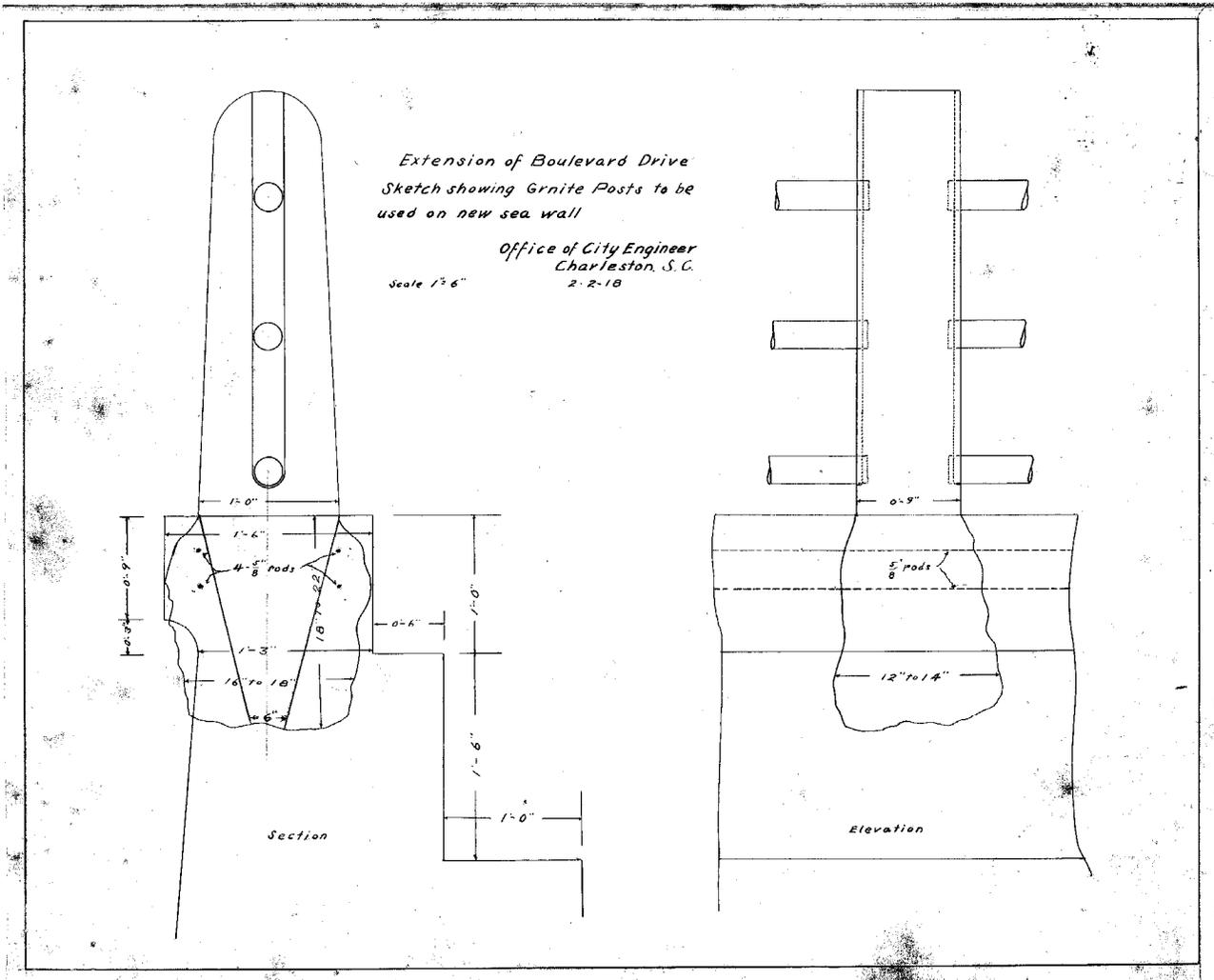
This drawing was obtained from the City of Charleston Archives. This is an undated drawing believed to be a survey of the horizontal position of "The Boulevard" portion of the Low Battery seawall. The "Line" of the seawall had been plotted on an exaggerated transverse scale in relation to the longitudinal scale. Surveys were taken on three separate occasions December 11, 1910, June 2, 1911, and June 12, 1911. Perhaps, the fill placed landward of the seawall had caused some portions of the seawall to move seaward.



This drawing was obtained from the City of Charleston Archives. This drawing dated 1910 is the design for the stairs along the seaward face of "The Boulevard" portion of the Low Battery seawall. It also shows the different levels for the timber platform supporting the main concrete structure of the seawall.



This drawing was obtained from the City of Charleston Archives. This drawing dated 1917 is the design for the protective concrete slabs that are located along the seaward face of the timber sheet piles.



This drawing was obtained from the City of Charleston Archives. This drawing dated 1918 is a design for the installation of the granite railing pedestals on the "Boulevard Extension" portion of the Low Battery seawall.

REPORT OF CITY ENGINEER.

Charleston, S. C., January, 1, 1910.

*To the Honorable the Mayor and City Council,
Charleston, S. C.*

Gentlemen:

The following Annual Report of the City Engineer's Department for the year 1909, I have the honor to submit for your consideration, in accordance with Section 782, Revised Ordinances.

In connection with this report, your attention is directed to the reports on "Sewerage" and "Sewerage Extension" made to the Sewer Board, and on "Street Cleaning," "Scavenging" and "Highways" made to the Board of Public Works. These latter reports include a considerable portion of the work of the Engineer's Department, but it is not considered necessary to duplicate them here since they can be seen elsewhere.

The construction of the Sea Wall, from South Battery, at the foot of King Street, to Chisolm's Mill, at the west end of Tradd Street, has had our close attention, both in the preparation of plans and specifications and in the inspection of the work now in progress.

The street signs have been inspected from time to time and necessary repairs and renewals made. Acetylene gas generators, of which we have knowledge, have also been inspected as required by ordinance. The Union Station has been inspected at various times, as has also the Cooper River water front; reports on the latter having been made to the Dock Commission. Building plans and specifications have been examined, permits issued and construction inspected as required by the building code. Tests of paving, brick and cement, have been made for all public work.

The following tabulated statement shows the work done in preparation of data, profiles, estimates, etc., for curbs, sidewalks, roadways, drains, etc.:

Yearbook 1910

Mayor Rhett's Annual Report

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Mayor Rhett's Annual Report

The growth of the City and its suburbs in the past three years has added considerably to the task of this department, and the public does not realize the strain it too often has to undergo with its limited numbers.

SALARIES AND WAGES

Inasmuch as property has advanced about 50% in the past seven or eight years, and the true tax rate has been reduced lower than ever before, it is only proper that the salaries and pay of the men in the departments, whose cost of rent and living has of course increased, should be raised. Thus only can they share in that prosperity, which has come to the tax payer. From time to time, this has been done, and this administration can feel it has acted fairly by both the tax payer and the employee.

In no city in the World, can there be found a more careful, and economical expenditure of public money and a more scrupulous regard for the public interests by its officials and employees. In no place in the World will there be found such a sense of public duty actuating men of the highest ability and attainments to a service for the public which no money can buy and for no other consideration than a patriotic love of their city.

Respectfully submitted,
R. G. RHETT,
Mayor.

Mayor Rhett's Annual Report

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soon as its pit and pumps are installed and all will be in operation before the Summer is over.

BOULEVARD

This work is not yet complete. It is hardly probably it will be finished before May 1st. The saving to the City in the cost of engineering and inspection by the Engineer and his office has been over \$25,000. Mr. Dingle has certainly earned his salary and the public owe him much more than they have any idea of.

HEALTH

The reorganization of the Health Department in 1906 by the revision of all ordinances in existence in reference thereto; the addition of many safeguards and some means of enforcing them, and the persistent efforts of the Health Officer, Dr. J. M. Green, in bringing the public to a realization of the necessity of observing rules of sanitation, has brought about most admirable results. As soon as the sewerage system is in operation over the entire City, there will be no reason why our rate of mortality, both white and colored, should not compare favorably with the best urban rate in the Country.

FIRE DEPARTMENT

This Department has put its new motor engine in use during the past year and has found it fully up to expectations. The City is spreading and the calls on the Department are growing greater and greater. The necessity for its being made a fully paid department has become apparent and a beginning has been made in that direction during the present year. In a short time "call-men" will be a thing of memory only.

POLICE DEPARTMENT

There has been a marked improvement in the police force of the City in the past few years. The physique of the men is better, their attendance is better and the esprit-de-corps is better, although there is still much to be desired in the latter.

Excerpt from the City of Charleston Year Book 1910
Relating to the Engineering History of the Low Battery Seawall

City Engineer's Report.

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EXPENDITURES.

| | | | |
|---|----------|------------|------------|
| City Engineer..... | | \$2,916.67 | |
| Two Asst. Engineers..... | | 2,050.00 | |
| Office Assistants..... | | 960.00 | |
| Drawing Instruments..... | \$ 33.88 | | |
| Engineering Instruments..... | 106.17 | | |
| Drawing Materials..... | 33.96 | | |
| Record Books, Printing, Stationery etc..... | 111.02 | \$ 285.03 | |
| Miscellaneous: | | | |
| Car tickets..... | \$ 50.00 | | |
| Stamps..... | 25.00 | | |
| Express and Drayage..... | 13.75 | | |
| Typewriter..... | 40.00 | | |
| Telephone..... | 25.20 | | |
| Filing cases..... | 130.49 | | |
| Map..... | 75.00 | | |
| Draughting..... | 15.00 | | |
| Incidentals..... | 2.50 | \$ 376.94 | |
| Total..... | | | \$6,588.64 |

TOTAL EXPENDITURES WEST END IMPROVEMENT.

To JANUARY 1ST, 1911.

| | | | |
|-----------------------------|------------|-------------|-----------|
| Consulting Engineer..... | | \$ 1,100.00 | |
| Preliminary Investigations: | | | |
| Surveys..... | \$1,749.31 | | |
| Test piles..... | 65.50 | | |
| | | | 1,814.81 |
| Instruments..... | 427.86 | | |
| Drawing Material..... | 32.12 | 459.98 | |
| Office Supplies, etc.: | | | |
| Printing..... | \$ 42.75 | | |
| Stationery..... | 6.80 | | |
| Advertising..... | 47.22 | | |
| Stamps..... | 10.00 | | |
| Telegram..... | .50 | | |
| | | | \$ 107.27 |
| Office Maintenance: | | | |
| Rent..... | \$ 87.50 | | |
| Stove..... | 6.15 | | |
| Fire Wood..... | 1.35 | | |
| | | | \$ 95.00 |

Excerpt from the City of Charleston Year Book 1910
 Relating to the Engineering History of the Low Battery Seawall

| | | |
|--|-------------|--------------|
| Deposited with U. S. Government..... | \$ 1,000.00 | |
| Options..... | \$1,500.00 | |
| Quit Claims..... | 2,475.00 | |
| Legal Services..... | 106.05 | |
| Recording Deeds..... | 87.00 | |
| | | \$ 4,168.05 |
| Inspection..... | | 4,255.20 |
| Launch for Inspectors..... | \$ 300.00 | |
| Launch, repairs and supplies..... | 143.70 | |
| | | \$ 443.70 |
| Barricade—Tradd St..... | \$2,674.95 | |
| “ King St..... | 794.56 | |
| | | 3,469.51 |
| Drains— Rutledge Ave..... | \$5,323.22 | |
| “ Limehouse St..... | 9,156.59 | |
| “ King St..... | 652.04 | |
| | | 15,131.85 |
| Main Wall..... | | 120,433.50 |
| Transportation of shells..... | \$1,218.53 | |
| Transportation of cobble..... | 616.23 | |
| Transportation of cobble from City Streets to wharf..... | 211.75 | |
| | | 2,046.51 |
| Shell, Young's Island..... | 932.66 | |
| Shell, Charleston Canning Co..... | 107.36 | |
| | | 1,040.02 |
| Granite rip-rap material and transportation..... | | 837.50 |
| Drain castings..... | | 75.60 |
| Labor on drains cutting for connections..... | | 12.00 |
| Constructing Transit Stations in river..... | | 106.05 |
| Filling..... | | 35,572.50 |
| Improving approaches, B. P. W..... | | 1,162.10 |
| | | |
| Total..... | | \$193,331.15 |
| McLean Con. Co.—Less portion of above paid 1911..... | \$1,490.60 | |
| Inspection..... | — | 50.00 |
| Office Rent..... | — | 10.00 |
| | | 1,550.60 |
| | | \$191,780.55 |

Respectfully submitted,

J. H. DINGLE,
City Engineer.

The following is given as information:

| | Sq. miles. |
|------------------------------|------------|
| Area of high land..... | .376 |
| Area of marsh and flats..... | 1.36 |
| Total area of City..... | 5.12 |

Excerpt from the City of Charleston Year Book 1910
Relating to the Engineering History of the Low Battery Seawall

WEST END IMPROVEMENT.

This work accomplished the reclamation of forty-seven acres of river front in the Southwestern portion of the City along Ashley River. The area reclaimed varied in elevation from about 6 feet below mean low water to about 6 feet above the same datum, and was filled to elevation not less than 8.5 feet above mean low water, with material dredged from the river, requiring 667,000 cubic yards of material, exclusive of shrinkage and settlement. To retain this filling, a concrete wall 3,885 feet long, on pile foundation was constructed, having been so designed as to admit of future extension. With this in view, a temporary timber barricade was constructed at each end of the wall with a total length of 262 feet extending from wall to high land to retain the filling, instead of the more expensive permanent concrete work, which would be valueless should the wall be extended. The toe of the wall was protected with oyster shells, cobble stones, and granite rip-rap. Across the fill three main drains were extended each on pile foundations, with a total length of 939.1 feet 30-inch terra cotta pipe, and 921.5 feet, 4 feet by 4 feet reinforced concrete drain with a total of nine manholes. The wall exclusive of rail and reinforced concrete sheath piles, consists of about 29 cubic feet concrete per lineal foot, the coping being reinforced with 4 longitudinal rods 5-8-inch diameter. The rail which surmounts the wall rises 2 feet 6 inches above coping and consists of reinforced concrete pillars 12 inches by 12 inches, set 10 feet apart, center to center, and connected by reinforced concrete arches with spring lines 12 inches above coping and rise of 6 inches, the rail being 12 inches deep at center, 6 inches thick and reinforced with 4 longitudinal 5-8-inch rods and vertical rods of same diameter, spaced about 8 inches center to center.

The foundation consists of vertical piles 6 feet, center to center, both ways braced by one row of batter piles along the front, 3 feet center to center. Outside of the batter piles, parallel with and supported by same, a

line of 5-inch grooved and splined sheath piles 30 feet long was driven and on this was set the reinforced concrete veil consisting of tongued and grooved slabs 3 feet wide and 6 inches thick, cast on shore and set in place after having thoroughly set. The slabs were reinforced with 5-8-inch rods, about 8 inches center to center, wired together and the length of slabs varied with depth of water in which they were placed.

The finished elevation of the coping is 10.5 feet above mean low water.

Bids for the above work were invited March 24, 1909, to be opened May 3, 1909.

The contract was awarded to McLean Contracting Company of Baltimore, Md., and was signed June 21, 1909, with date of completion January 21, 1911.

Owing to delays of various kinds, some unavoidable, the work was not accepted until June 5, 1911, and even then the acceptance was conditioned upon the performance of certain work, deemed necessary within the 60 days which under the contract intervened between acceptance and final payment.

Upon the date of final payment, viz: August 5, 1911, the portion of the area last filled, which being at the spillway and therefore containing the lightest material, had settled and \$500,000 was withheld until this was raised again to the contract elevation, which was accomplished December 8, 1911, when final payment was made. Under the agreement made by the City with the lot owners whose interests were affected by this improvement, the plans were to be examined and reported upon by a consulting engineer, and for this work, the City was fortunate in securing the services of Mr. F. R. Harris, C. E., U. S. N., who had the esteem and confidence of all connected with the work and whose services were much appreciated.

The expenditures for the entire work were as follows:

| | |
|---|-------------|
| TOTAL EXPENDITURES, WEST END IMPROVEMENT. | |
| Consulting Engineer..... | \$ 1,254.00 |
| Inspection..... | 1,567.84 |
| Equipment, instruments, etc..... | 439.98 |
| Office expenses (printing, stationery, advertising, postage, etc.)..... | 534.46 |
| Office maintenance (rent, stove, firewood, etc.)..... | 153.50 |
| Options, quit claims, etc..... | 10,208.05 |
| Inspection..... | 8,461.05 |
| Additional work (transit stations and repairs to wharf)..... | 343.38 |
| Improving approaches..... | 5,164.37 |
| Contract: | |
| Sea wall..... | \$18,975.00 |
| Tradd Street barricade..... | 3,430.00 |
| King Street barricade..... | 1,135.00 |
| Rutledge Avenue drain and appurtenances..... | 6,013.06 |
| Limehouse Street drain and appurtenances..... | 8,833.81 |
| King Street drain and appurtenances..... | 791.70 |
| Drain deposited..... | 1,591.00 |
| Cobbles deposited..... | 789.96 |
| Filling..... | \$18,312.44 |
| | 62,037.00 |
| | \$20,779.44 |
| Less demurrage..... | 1,900.00 |
| | \$18,879.44 |
| Extra work on drain..... | 2,689.27 |
| Rip-rap material—shell, cobble and rock..... | 3,439.57 |
| Grading streets, curbing, spreading shell..... | 385.33 |
| Concrete curb, King Street extended..... | 21.00 |
| Photographs of work..... | 331.78 |
| Lumber, pegs, tools, etc..... | 5,357.58 |
| Rip-rap (McCabe)..... | \$ 692.37 |
| Shell for roadway (McCabe)..... | 1,192.12 |
| Shell for roadway (Gibbes Preserving Co.)..... | |
| Total..... | 1,834.49 |
| | \$20,713.16 |

From the above it will be noted that the engineering and inspection (including consulting engineer, preliminary investigations, instruments, printing, stationery, advertising, office rent and maintenance, launch and operation of same and salaries) amounts to 5.02 per cent of total cost of work to January 1, 1912. The salaries and launch expense amounted to 3.28 per cent of cost of work, excluding preliminary engineering work and engineering equipment.

Respectfully submitted,
J. H. DINGLE, City Engineer.

REPORT OF CITY ELECTRICIAN.

To the Mayor and Aldermen of the City of Charleston, S. C.

Gentlemen:

I beg leave to submit for your consideration my sixteenth Annual Report, for the year 1911.

Nineteen permits were issued to, and one hundred and twenty-nine poles set by the Charleston Consolidated Railway and Lighting Company during the year, 1911.

The Postal Telegraph Company have finished rebuilding their pole lines throughout the City.

I would again call to your attention my recommendation of the last couple of years, in regard to some steps being taken to have the electric light and power wires placed underground, as same are very dangerous, and especially in case of high winds and storms.

The Charleston Consolidated Railway and Lighting Company have extended their tracks through Columbus Street between Meeting and King Streets.

The certificate for the electrical work was issued on December 28, 1911, and cars were run on said tracks on December 31, 1911.

COMMENCING THE THIRTEENTH YEAR OF MUNICIPAL INSPECTION.

During the year there were issued 1,081 permits to do electrical construction, made 2,605 inspections, including old and new installations, issued 774 certificates covering 9,095 incandescent lights, 8 alternating arc lights, 230 fans, 57 motors, (equivalent to 272 1-horse power), 2 picture machines, 4 spot lights, 15 electric pianos, 2 meter loops, 33 rewiring, 10 outlets, 2 electric heaters, 1 X-ray machine, and 2 stage pockets.

Issued 47 special certificates, covering, 1,144 incandescent lights, 12 fans, 2 motors (equivalent to 11 horse power), 2 picture machines, 1 X-ray machine, 1 spot light, 2 electric pianos, 3 alternating arc lights.

said property above mentioned such mud as may be necessary for filling in said property.

Section 3.—That Holston Corporation, its successors or assigns, are hereby authorized in carrying out the project provided for herein, to make any reasonable alterations or modifications in the plans herewith filed that may be approved by the Board of Harbor Commissioners of the port of Charleston.

Section 4.—That this Act shall take effect upon its approval by the Governor.

Approved the 13th day of February, A. D. 1911.

AN ACT

To incorporate Ashley River Water Front Corporation.

Whereas, The General Assembly has, by a two-thirds vote of each House on a Concurrent Resolution, allowed the introduction of this Bill; Section 1.—Be it enacted by the General Assembly of the State of South Carolina, That R. C. Rhett, the mayor of the city of Charleston; T. J. McCarty, the chairman of the committee on pleasure grounds of the city of Charleston; Samuel Lapham, the chairman of the park board of the city of Charleston; James R. Johnson, the president of the board of public commissioners of the city of Charleston; Wilson G. Harvey, the chairman of the colonial common and Ashley River embankment of the city of Charleston; and H. W. H. Buck, Julius H. Jahnz, P. H. Gadsden and T. R. Waring; and their successors, be, and they are hereby, made and created a body corporate, under the name and style of "Ashley River Water Front Corporation," for the purpose of reclaiming, developing and improving all that portion of the city of Charleston lying upon or adjacent to the Ashley River.

Section 2.—That the incumbents of the public offices above named shall, except as hereinafter provided, cease to be members of said corporation so soon as they shall cease to fill said offices, and their successors in said offices, by virtue thereof, shall immediately become members of said corporation. In the event that any one of said public officers shall for any cause cease to exist, so that there shall be no public officer answering any one of the descriptions above named, the incumbent of said office at the time it shall go out of existence shall continue to be a member of said corporation for a period of four years from the date when said office shall be discontinued, and the city council shall determine how and for what term the vacancy shall be filled at the expiration of said period of four years, or within that time if the office shall in the meantime become vacant by death, resignation or otherwise. That the said H. W. H. Buck and P. H. Gadsden shall each serve until the 15th of January, 1912, and until their successors are elected and qualified; and the said J. H. Jahnz and T. R.

Waring until the 15th of January, 1915, and until their successors are elected and qualified. That the successors of the said H. W. H. Buck and Julius H. Jahnz shall be elected by City Council of Charleston some time within thirty (30) days prior to the expiration of their terms of office, and shall hold office for a period of four years, and in the event of the death, resignation or removal from office of either of the said P. H. Gadsden and T. R. Waring, or their successors, the vacancy shall be filled by the said chamber of commerce.

Section 3.—That the said "Ashley River Water Front Corporation," hereby incorporated, may have and use a common seal, may sue and be sued, contract and be contracted with, and may adopt such rules and by-laws determining the number and nature of the officers of the said corporation and the mode and manner of its operation as may be agreed to by a majority of the members of the corporation; said corporation shall have and may exercise the following powers, viz: It may acquire land within the limits of the city of Charleston, by purchase, gift, donation, or otherwise, and hold the same upon such terms, trusts, or conditions, not inconsistent with the provisions of this Act or the laws of the State, as shall be expressed in the deeds or grants conveying said land, and it may develop or improve any land so acquired in accordance with plans and regulations which shall first be approved by the City Council of Charleston. It may, with the consent and approval of the City Council of Charleston, dedicate, appropriate and lay out any part or parts of said land as streets, highways, public parks, or for other public purposes; and it may sell or dispose of any part or parts of said land not appropriated to any public use; and for the purpose of acquiring land, or of reclaiming, improving or developing lands held by said corporation, it may contract debts, and in evidence thereof, give its notes, bonds, or other obligations, and secure the same by mortgage or deed of trust of any of its lands not appropriated to a public purpose, or by pledge of its securities; and such debts shall be the debts of the said corporation only, and in no case whatsoever shall they be held or taken to be the debts of the City Council of Charleston or the State of South Carolina. No moneys received by the said corporation from any source shall be applied to any purpose other than the expenses of maintaining the said corporation, the payment of its debts, the acquisition of land and the development and improvement of the same.

Section 4.—Said corporation shall have the right and power to condemn any and all lands, property, water, riparian, or other rights or easements, or any interest therein necessary for the extension, improvement or protection of any property devoted to a public use, upon the same terms and

conditions and in the same manner as now provided by law for the condemnations by railways, canal and turnpike companies. Provided, That just compensation shall first be paid for any property owned by individuals or corporations before the same are taken by said corporation in the construction of said sea wall and filling up said area, and just compensation shall also be first paid individuals or corporations owning lands butting or bounding on any navigable streams within or running through said area before the same are immedied, stopped or their use interfered with, all of which compensation shall include not only the value of the property taken, but also the damages inflicted upon such business as may be conducted on said property or said lands butting or bounding on said navigable streams, by either the taking of the property or the impeding or stoppage of such stream or interference with the use thereof.

Section 5.—That whenever such extension, improvement or protection shall make necessary the filling up of low lands, owned by private parties, to a level established by the said City Council of Charleston, and such filling up is proposed to be accomplished by excavations from the bed of the Ashley River, bordering the water front so to be extended, improved or protected, under a general plan established by said City Council of Charleston, said low lands may be filled up by the said corporation at the expense of the said private owners, and the cost thereof shall be all in upon the land so filled up; the said cost to each private owner shall be determined by the proportion which the cubic contents of the filling in each lot or parcel of land, separately owned, shall be to the cubic contents of the whole area filled. Provided, however, That if the corporation and the owner cannot agree as to the cost of filling, aforesaid to be borne by such private owner then the same shall be determined by a proceeding in the nature of an action against such party, to be instituted by the corporation, in the Court of Common Pleas, to recover the amount claimed to be due, and the reasonable cost to be paid by such lot owner shall be determined by the jury, as in the case of similar actions. The corporation shall first notify each private owner interested of the plan proposed, and of the level up to which said lots are to be filled, and such private owners may, if they see fit, arrange to fill up their lands at their own expense, such filling up to be done either prior to or contemporaneously with the filling done by the corporation, such filling to be in accord with the general plan adopted. In the event that any lot owner objects to the cost of filling of his lot or lots, then, in that event, such owner may require the corporation to purchase said lot at a price agreed upon between the said corporation and the owner, and in case of failure to agree upon the price, then, and in that event, the said corporation is hereby authorized to condemn the said lot or lots; and upon paying to the owner or owners the price that may be fixed therefor, as hereinafter provided, the title thereof shall vest in said corporation, who shall proceed to fill said lot or lots, and may sell the same to reimburse itself for all expenses and charges. That for the purpose of such condemnation the said corporation shall file, in the Court of Common Pleas, a petition

setting forth the necessity of filling of such lots, and that the owner or owners have refused or failed to fill the same, upon being notified, and that said owner objects to the estimated cost of said filling, a copy of which petition shall be served upon the owner or owners of said lots as summons are now served in cases of law. That the Judge of said Court of Common Pleas shall thereupon cause a jury to proceed to fix the value to the said lot or lots to be paid by the said corporation.

Approved the 18th day of February, A. D. 1911.

yearbook 1917

Report on West End Improvement 235

Charleston, S. C., March 26, 1918.

*To the Mayor and Aldermen,
the City Council of Charleston.*

I beg to submit herewith the Annual Report of the City Engineer on West End Improvements, Boulevard Lots and Sea Wall.

LAWRENCE M. PINCKNEY,
Chairman Committee on Ways and Means.

REPORT OF CITY ENGINEER, WEST END IMPROVEMENT—BOULEVARD LOTS.

Charleston, S. C., January 2, 1918.

*Alderman L. M. Finckney,
Chairman Committee Ways and Means,
Charleston, S. C.*

Dear Sir:

I beg to report as follows concerning the construction of Drains, Sidewalks (including curb) and Roadways, in the Boulevard Area, West of Council Street and South of Tradd Street:

After due advertisement, bids for drain construction were opened in November 1916, and award made to Simons-Mayrant Company, Charleston, S. C., the contract being signed in January, 1917. As this area had been filled five or six years previously, with material dredged from the

river, it was necessary to provide pile foundations for the drains and appurtenances.

Where sewers were constructed contemporaneously with the drains, each two-pile bent supported both drain and sewer, the pipes being laid five feet apart.

The piles varied in length from twenty feet to thirty feet below cut-off, very few being less than thirty feet long.

In the double pipe trench, round piles were driven and capped with six inch by twelve inch caps, the bents being eight feet center to center, and the piles in each bent five feet, center to center. In single pipe trench, both round and square piles, six inches by six inches were used, the bents being five feet, center to center, and the piles in each bent two feet, center to center. The caps support longitudinal plank four inches by eight inches, doubled, for the large pipe and four inches by twelve inches for the smaller pipe.

Main drains were laid in the following streets:

| LOCATION | TERRA COTTA PIPE | | | | Inlets | |
|--|------------------|---------|---------|---------|-----------|---|
| | 14-inch | 15-inch | 12-inch | 14-inch | Man Holes | 2 |
| Ashley Avenue from Tradd St. to Boulevard | | | 562.7 | | | |
| Boulevard from Council Street to Tradd Street | 1,552.0 | | | | 5 | 2 |
| Council Street from Gibbes St. Street to Boulevard | | 42.5 | 556.0 | | | |
| Gibbes Street from Council St. to Rutledge Avenue | | 418.7 | | | 1 | |
| South Bay from Council Street to Rutledge Avenue | | 397.2 | | | 1 | |
| South Bay from Ashley Ave. to Chisolm Street | | | | 212.9 | 1 | |
| Tradd Street from Chisolm Street to West End | | | 322.2 | | 1 | |
| Total | 1,552.0 | 858.4 | 1,440.9 | 212.9 | 9 | 2 |

Although the drains are in use, the work has not been completed, there being several items to be corrected before acceptance.

Upon completion and acceptance, there will be due the contractor, \$1,738.96.

CURB.

Granite curbing was purchased under the Street Department contract and a considerable portion of the contemplated curbing has been laid by Mr. James Begley, the Street Department Contractor for Curb-Setting. For Curb, Labor and Material, there is due the Street Department \$4,226.04.

SIDEWALKS.

Filling for sidewalks is being purchased from Mr. W. A. Hutchinson, who, after due advertisement, was awarded the contract at eighty cents per cubic yard, f. o. b. cars Charleston Terminal Company. For hauling the filling from Charleston Terminal Company to the Boulevard, Mr. H. W. Bischoff, was awarded the contract at 58 cents per cubic yard.

In places along the sidewalks which are to be improved, the lots are much lower than the walks, necessitating the construction of curbing on the property line to retain the sidewalk fill. It is intended to use two inch plank for this purpose in the expectation that the lots, at least along the street lines, will be filled before the plank decays.

The inner curb will cost about seventeen cents per lineal foot, which would be unnecessary if the lots were filled for a width of two or three feet from the street line, in advance of sidewalk construction.

ROADWAYS.

Oyster shell for surfacing the roadways is being delivered at the Boulevard, by Mr. J. A. F. Meyer, who was awarded the contract at \$1.00 per cubic yard f. o. b. lighter. The expenditures to December 31, 1917, are as follows:

| | |
|----------------------------------|------------|
| Advertisements | \$ 1.00 |
| Contract-Drains, Boulevard | 6,725.00 |
| Oyster Shells | 1,277.50 |
| Filling | 872.72 |
| Hauling Filling | 194.07 |
| Lumber | 5.52 |
| Labor Spreading Filling | 105.70 |
| Total | \$9,181.60 |

Respectfully submitted,

J. H. DINGLE
City Engineer.

REPORT OF CITY ENGINEER, WEST END IMPROVEMENT—SEA WALL.

Charleston, S. C., January 2, 1918.

Alderman L. M. Pinckney,
Charleston, S. C.

Dear Sir:

I have the honor to report as follows, concerning the construction of the sea wall, South of and parallel with the present South Battery wall.

The "Boulevard" wall extending from the West end of Tradd Street to the South end of King Street, was completed in 1911. The wall now under construction will extend this wall Eastward to connect with an extension of the East Battery wall. The design of the extension is the same as that of the "Boulevard" wall except at the East end where the wall is raised several feet to meet the elevated promenade of East Battery.

The wall is supported by pile bents carrying a flooring of two inch and four inch plank, the difference in thickness of the plank forming a shoulder to resist, in a measure, any transverse movement of wall over platform. The pile bents six feet, center to center, consist each of two vertical piles, six feet, center to center, and one batter pile on the water side. These three piles are held together by two five inch by twelve inch clamps, eight feet long, bolted to each pile. In addition, the batter piles are bolted to the outer vertical piles. Intermediate batter piles are located between bents, so that batter piles are three feet, center to center. A waling strip six inches by twelve inches, is placed at about platform level and securely bolted to all batter piles. Outside of this waling strip are driven, at an angle of thirty

degrees with the vertical, grooved and spined sheath piles, five inches thick and thirty feet long, bolted and spiked to the waling strip. Reinforced concrete grooved, and tongued slabs, 1-2-4 proportions, cast on shore, are driven on the outer face of the wood sheath piles to three feet below mud line, forming a concrete veil for the protection of the wood against marine borers.

The steel reinforcement of the concrete slabs projects several feet above the upper end of the slabs and is later bent over and incorporated in the concrete of the wall proper. The outer face of the wall proper, has a batter of one in ten, from the coping to mean high water, below which a circular arc, seven feet six inches radius, extends to the concrete slabs.

The thickness of concrete at platform level is six feet six inches from outer slope to inner face; the platform extends two feet six inches beyond the inner face of the concrete. The rear face of the wall at platform level is five feet six inches back of the front face of the coping, which latter is one foot six inches thick. The wall is stepped off at rear from platform to coping, the height of coping above platform being eight feet. The level of platform is two feet six inches above mean low water, the top of coping being ten feet six inches above same datum.

The coping is of reinforced concrete 1-2-4 mixture, the rest of the wall is of plain concrete 1-2½-5. An expansion joint in the wall is provided every ninety-six feet. The piles driven to date are sixty feet and seventy feet long, about ninety per cent being of the latter length. The total length of wall will be about 950 feet.

After due advertisement, the contract for construction of wall, for filling in back of same and for extension of existing drains through the wall by reinforced concrete additions to same, supported on pile foundations, was awarded to Bryan

& Co., of Jacksonville, Fla., who signed contract on Thursday, March 29, 1917, with a time limit of 200 working days, for completion.

At this date, the following work has been done:

Plumb Piles driven 284, equivalent to 850 lin. ft. of Wall.
Batter Piles driven 64, equivalent to 190 lin. ft. of Wall.
Wood Sheath Piles driven 181, equivalent to 145 lin. ft. of Wall.
Bents framed 32, equivalent to 190 lin. ft. of Wall.
Decking laid 6,200 ft. B. M., equivalent to 150 lin. ft. of Wall.
Concrete slabs-placed 5, equivalent to 19 lin. ft. of Wall.
Piles driven and cut off for drain, 35.
Drain completed, 85 lineal feet.

The following material is estimated on hand:

Concrete slabs 230
Decking 3,800 ft. B. M.
Wood Sheath piles 390
Foundation piles 20
Cement 400 Bbls.
Broken stone 750 Cu. yds.
Sand 250 Cu. yds.
Bolts and reinforcement 90% of amount necessary

The following are the expenditures from date of contract to December 31, 1917:

| | |
|-----------------------------------|------------|
| Type writing specifications | \$ 15.75 |
| Blue printing plans | 11.81 |
| Advertising proposals | 23.47 |
| Miscellaneous: | |
| Telegrams | \$1.09 |
| Counter | 5.10 |
| 6.19 | |
| On account contract | 5,000.00 |
| Inspection | 956.78 |
| Total | \$6,014.00 |

Very respectfully submitted,
J. H. DINGLE
City Engineer.

yearbook 1919

WEST END IMPROVEMENT—SEA WALL

Alderman D. L. Sinkler, Chairman,
Committee Ways and Means,
Charleston, S. C.

Dear Sir:

The work of constructing a sea wall and filling in behind same at South Battery was completed December 1, 1919.

The work included the construction of approximately 1,000 feet of sea wall, including removal of old rail from existing wall to new wall, the extension of the Meeting Street and the Church Street drains, the extension of the High Battery walk and filling in the reclaimed area behind the new wall.

The contract with Bryan & Co., of Jacksonville, Fla., was dated March 29, 1917, and provided the following prices:

| | |
|--|-----------|
| High section of wall, per lineal foot..... | \$ 56.00 |
| Low section of wall (with reinforced concrete rail), per lineal foot..... | 35.30 |
| Low section of wall (with granite posts and galvanized rail, provided by City, per lineal foot..... | 35.00 |
| Reinforced concrete drain on pile foundation, per lineal foot..... | 15.00 |
| Rip-rap, if ordered, per ton (2,000 lbs.)..... | 2.00 |
| Filling, per cubic yard..... | .14 |
| Lump sum bid for entire work exclusive of rip-rap, using reinforced concrete railing..... | 41,840.00 |
| Lump sum bid for entire work, exclusive of rip-rap, using existing granite posts and pipe railing..... | 41,585.00 |

The work was done under the last mentioned item, viz.: \$41,585.00 for entire work exclusive of rip-rap.

As the City was accumulating a considerable amount of old cobble stones from repaving operations, arrangements

were made to use this stone for rip-rap and bids were asked for moving and placing this material resulting as follows:

Moving and placing cobble stones which had been dumped on shell walk along line of old wall approximately 80 feet from line of new wall, per ton.....\$0.75
 Moving and placing cobble stones which had been dumped on City lot at foot of King street approximately 500 feet from the center of the work, per ton..... 1.00

Upon removal of the granite posts which had been imbedded in the old shell-concrete wall, the bases were found to be unusually massive and it was considered desirable to trim these bases before setting the posts in the new wall. A call for bids brought an offer to trim 88 posts, more or less, for \$370.00. This offer was accepted.

The expenditures for the year were as follows:

Contract, sea wall and filling.....\$16,426.50
 Contract, rip-rap..... 1,487.05
 Adjusting old wall southeast corner of Battery..... 58.85
 Contract, cutting granite posts..... 370.00
 Inspection..... 775.00
 Advertising..... .80
 Total.....\$19,118.20

The contract provides that ten per centum of the contract for sea wall and filling shall be withheld by the City until 60 days after completion and acceptance and then paid to the contractor, provided that no defects shall have become evident during the aforesaid sixty days. In accordance with this provision, should no defects develop in the work, the contractor will be due, on February 1st, his final payment, viz.: \$4,158.50.

The total expenditures for this work from commencement to December 31, 1919, were as follows:

| | 1917 | 1918 | 1919 | Total |
|---|------------|-------------|-------------|-------------|
| Typewritten specifications..... | \$ 15.75 | \$..... | \$..... | \$ 15.75 |
| Blue-printing plans..... | 11.81 | ..... | ..... | 11.81 |
| Advertising proposals..... | 5.27 | ..... | .80 | 6.07 |
| Miscellaneous..... | 6.19 | ..... | ..... | 6.19 |
| Inspection..... | 956.78 | 1,169.98 | 775.00 | 2,901.76 |
| Contract, sea wall and filling..... | 5,000.00 | 16,000.00 | 16,426.50 | 37,426.50 |
| Contract, placing rip-rap..... | ..... | ..... | 1,487.05 | 1,487.05 |
| Adjusting old wall at southeast corner Battery..... | ..... | ..... | 58.85 | 58.85 |
| Trimming granite posts..... | ..... | ..... | 370.00 | 370.00 |
| | \$6,014.00 | \$17,169.98 | \$19,118.20 | \$42,302.18 |

Respectfully submitted,
 J. H. DINGLE,
 City Engineer.