4TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 2110.

NEWARK BAY, N. J.

# LETTER

FROM

# THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORTS ON PRELIMINARY EXAMINATION AND SURVEY OF NEWARK BAY, N. J.

MARCH 3, 1917.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with illustration.

WAR DEPARTMENT,
*Washington, March 3, 1917.*

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, dated the 1st instant, together with copies of reports from Lieut. Col. C. H. McKinstry, Corps of Engineers, dated November 24, 1915, and January 4, 1917, with map, on a preliminary examination and survey, respectively, of Newark Bay, N. J., made by him in compliance with the provisions of the river and harbor act approved March 4, 1915.

Very respectfully,

NEWTON D. BAKER,
*Secretary of War.*

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
*Washington, March 1, 1917.*

From: The Chief of Engineers, United States Army.
To: The Secretary of War.
Subject: Preliminary examination and survey of Newark Bay, N. J.

1. There are submitted herewith for transmission to Congress reports dated November 24, 1915, and January 4, 1917, with map, by Lieut. Col. C. H. McKinstry, Corps of Engineers, on preliminary

examination and survey, respectively, authorized by the river and harbor act approved March 4, 1915, of Newark Bay, N. J.

2. Newark Bay is an arm of New York Bay. It is connected with upper New York Bay by Kill van Kull, 3 miles long, and with lower New York Bay by Staten Island Sound and Raritan Bay, 24 miles long. The existing project for improvement of Newark Bay and Passaic River provides for a channel 300 feet wide and 20 feet deep from deep water in the bay to the Nairn Linoleum Works, with lesser dimensions above. On the west side of Newark Bay the city of Newark has under construction a terminal with a branch channel connecting with the through channel dredged by the United States. The further improvements now suggested by interested parties include the widening of the present channel in Newark Bay, the dredging of channels along the pierhead lines on either side of the bay, the dredging of the entire bay to a depth of 20 feet, and the maintenance by the United States of the channel dredged by the city of Newark. The commerce passing through Newark Bay now amounts to over 4,000,000 tons per annum, but with the exception of about 2,000,000 feet of lumber handled at the partially completed Newark terminal, this commerce all pertains to the Passaic and Hackensack Rivers. There is no development along the shores of Newark Bay which would warrant the deepening of the bay or the construction of the proposed channels along the pierhead lines. The district officer believes, however, that it is advisable for the United States to widen the existing channel from Kill van Kull to the upper limit of the bay to 500 feet at an estimated cost of $220,500, and to take over the maintenance to a depth of 20 feet and width of 400 feet of that part of the Newark terminal channel which lies between the pierhead line and the main channel in the bay, at an estimated first cost of $21,100 and an annual cost of $2,400. The Division Engineer concurs in the views of the district officer.

3. These reports have been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated February 13, 1917. The board concurs in general in the views of the district officer and division engineer, but it believes that an increase in the width of the through channel to 400 feet, at an estimated cost of $84,500 will be sufficient for the present and the immediate future. It concurs in recommending that the United States provide the side channel to connect with the Newark terminal channel, as proposed by the district officer.

4. After due consideration of the above-mentioned reports, I concur in the views of the Board of Engineers for Rivers and Harbors, and therefore report that the further improvement by the United States of Newark Bay, N. J., is deemed advisable to the extent of (*a*) widening the main channel to 400 feet from Kill Van Kull to the upper limit of the bay, approximately as shown on accompanying map, at an estimated cost of $84,500 for first construction and $17,700 annually for maintenance, provided that this work shall not be begun until the Secretary of War shall have been satisfied that the Central Railroad of New Jersey bridge will be reconstructed within a reasonable time; and (*b*) dredging a side channel 400 feet wide and 20 feet deep from the bay channel to the pierhead line to connect

with the Newark Terminal channel, at an estimated cost of $21,100 and $2,400 annually for maintenance. The entire cost of original work, $105,600, should be made available in one appropriation.

W. M. BLACK, *Brigadier General.*

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REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS ON SURVEY.

[Third indorsement.]

THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
*February 13, 1917.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY.

1. The following is in review of the district officer's reports authorized by the river and harbor act of March 4, 1915, on preliminary examination and survey of Newark Bay, N. J.

2. Newark Bay is an arm of New York Bay with which it is connected by a channel 25 feet deep through Kill Van Kull and by a channel 21 feet deep through Staten Island Sound and Raritan Bay. The length of the bay is 6 miles and its width about 1½ miles. The Passaic and the Hackensack Rivers enter the bay at its head.

3. The existing project for Newark Bay and Passaic River provides for a channel 20 feet deep and 300 feet wide through the bay and up the Passaic River to the Nairn Linoleum Works and for lesser dimensions above to the Gregory Avenue Bridge at Passaic. The total expenditures on this project to July 1, 1916, amounted to $1,494,259.78, and on all projects $2,143,513.68. The channel has been completed through the bay.

4. The commerce passing through Newark Bay bound principally to or from the Passaic River, is of a miscellaneous character, and has increased from about 2,500,000 tons in 1902 to over 4,000,000 tons in 1915. The latter amount, however, includes about 500,000 tons of ashes and sweepings of little commercial value. With the exception of about 2,000,000 feet of mahogany lumber handled at the partially completed Newark Terminal on the west side of the bay, this is all through commerce pertaining to the Passaic or the Hackensack Rivers.

5. Several improvements have been considered, including a channel on either side of the bay following the pierhead lines; deepening and widening the present channel through the bay; dredging the entire bay; and dredging a side channel from the United States channel to the pierhead line to connect with the Port Newark Terminal Channel. Estimates for each of these improvements have been prepared. There is no present need for deepening the entire bay, and this should not be undertaken by the United States. A channel along either pierhead line could be justified only by extensive local cooperation and a commerce of considerable magnitude resulting from local industries. Neither of these has materialized. The request for deepening the bay channel is in the interests of the Newark Terminal, and justification for such improvement must be found in prospective commerce, for as yet there is practically none existing. If the terminal and its accessories are completed and used to capacity additional depth may

be warranted, but under present conditions it would be premature for the United States to undertake this work.

6. The widening of the bay channel is desired for the benefit of the extensive commerce to and from Passaic River. This is mostly carried by tows and difficulty is experienced at the Central Railroad of New Jersey bridge and in the open channel. The first of these difficulties is to be overcome through the reconstruction of the bridge; the second can be removed by a suitable increase in width of channel. The district officer is of opinion that the proper width for this channel is 500 feet. The cost of widening to this extent is estimated at $220,500, and maintenance of the enlarged channel at $24,300 annually. He believes this improvement is justified, the time for doing the work to be governed by the time required for the reconstruction of the bride referred to above. The district office also favors connecting this channel with the channel of the Newark Terminal by a side channel 400 feet wide and 20 feet deep at an estimated cost of $21,100 for first construction and $2,400 annually for maintenance. The division engineer concurs in the views of the district officer.

7. It appears from the information now available that the present depth of 20 feet in the Passaic River and in the bay is adequate for the through commerce. There is no development on either side of the bay to justify the provision of a channel along the pierhead lines, and so far as shown there is none in prospect. Moreover, to justify such improvement there must be liberal local cooperation, and none has been offered. The deepening of the entire bay is not needed at this time, and it is not probable that it will be in the near future. While the city of Newark has expended large sums in connection with its terminal, there has as yet resulted no commerce of magnitude, and it is not at all clear that this lack of commerce is attributable to insufficient depth as evidenced by the extensive business of the Passaic River on the present depth of 20 feet. This depth is sufficient for a very substantial commerce at the terminal, and until this has been realized at least to a greater extent than at present it is believed to be inadvisable for the United States to provide a greater depth. The provision of the side channel to connect the present through channel in the bay with the terminal appears advisable on the part of the United States, as the work is outside the pierhead line and will afford access to the terminal for such vessels as can use the main channel. Difficulty has been experienced in handling the tows engaged in traffic through the bay, and it appears advisable to increase the width of the channel somewhat. It is believed, however, that an additional width of 100 feet, i. e., an increase to 400 feet, will be sufficient for the present and immediate future. It is estimated that this work will cost $84,500 and future maintenance of the channel $17,700. To sum up, the board is of opinion that it is advisable for the United States to undertake additional improvement in Newark Bay to the extent of (*a*) widening the bay channel to 400 feet from Kill Van Kull to the upper limit of the bay, approximately as shown on the map, at an estimated cost of $84,500 and $17,700 annually for maintenance, provided that this work shall not be begun until the Secretary of War is satisfied that the Central Railroad of New Jersey bridge will be reconstructed within a reason-

able time, and (*b*) a side channel 400 feet wide and 20 feet deep from the bay channel to the pierhead line to connect with the Newark terminal channel at an estimated cost of $21,100 and $2,400 annually for maintenance. The entire first cost of the work, $105,600, should be made available in one appropriation.

8. In compliance with law, the board reports that there are no questions of terminal facilities, water power, or other subjects so related to the project proposed that they may be coordinated therewith to lessen the cost and compensate the Government for expenditures made in the interests of navigation.

For the board:

FREDERIC V. ABBOT,
*Colonel, Corps of Engineers,*
*Senior Member of the Board.*

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## PRELIMINARY EXAMINATION OF NEWARK BAY, N. J.

UNITED STATES ENGINEER OFFICE,
THIRD DISTRICT,
*New York City, November 24, 1915.*

From: The District Engineer Officer.
To: The Chief of Engineers, United States Army
(Through the Division Engineer).
Subject: Preliminary examination of Newark Bay, N. J.

1. This is report on a preliminary examination of Newark Bay, N. J., called for by the river and harbor act of March 4, 1915, and by department letter of March 15, 1915.

2. The accompanying map[1] shows Newark Bay and the approved harbor lines therein, the waterways with which it is connected, and railroad lines leading to New York Harbor and connecting waters.

3. Newark Bay, an arm of New York Bay, is connected with the upper bay by Kill Van Kull, 3 miles long, and with the lower bay by Staten Island Sound and Raritan Bay, 24 miles long. The governing depth in Kill Van Kull is 25 feet, and in Staten Island Sound and Raritan Bay 21 feet. The length of the bay is 6 miles from the confluence of the Passaic and Hackensack Rivers to Staten Island; its width about 1½ miles. The Passaic has a navigable length of about 12 miles, the Hackensack of about 21 miles. In this report the northerly boundary of the bay will be assumed to be a line from Droyers Point to the junction of the dredged channels of the Passaic and Hackensack Rivers. (See map.) From Staten Island northerly for a distance of 2½ miles there is a natural central channel in the bay 20 or more feet deep and from 300 to 600 feet wide. Throughout about two-thirds of the width of the bay the natural depths outside of this channel are from 6 to 10 feet. The mean range of tides is about 5 feet. Near its lower end the bay is crossed by the trestle bridge of the Central Railroad of New Jersey, which has two rolling lift openings, each 85 feet wide, and near its upper end by the trestle

[1] Not printed.

bridge of the Lehigh Valley Railroad, which has a swing draw providing two openings, each 100 feet wide.

4. The established harbor lines are so placed that wharves can be built out 500 to 2,500 feet or more on either side of the bay, and the pierhead lines are about 4,500 feet apart. Except at Elizabethport and at a few places in front of Newark, the bay is bordered on the west by salt marshes some 2 or 3 miles wide. On the east the bay is bordered by the peninsula known as Bergen Neck or Bayonne, which separates it from Upper New York Bay. Bayonne adjoins Jersey City and is well built up with residences, stores, and manufacturing establishments. The shore on this side of the bay, except just at the mouth of the Hackensack River, is high ground, and the space between this high ground and the bulkhead line is comparatively narrow.

5. The act of March 4, 1915, calls for a preliminary examination and survey of—

> New York and New Jersey Channels, with a view to securing a ship channel of increased width and depth necessary for the purposes of commerce from lower New York Bay, through Raritan Bay, Arthur Kill, Staten Island Sound, channel north of Shooters Island and Kill Van Kull, to upper New York Bay.

The report under that call will accordingly deal with the channel north of Shooters Island, and for the purposes of this present report the southerly boundary, the westerly half of Newark Bay will be assumed to be the northerly side of the present channel north of Shooters Island. It will be observed that convenient approach to a deep channel north of Shooters Island would require the removal of a considerable part of Bergen Point Shoal, including Bergen Point light. But it is also the case that this shoal renders difficult the approach to the channel in Newark Bay from Kill Van Kull and that its removal would be in the interest of the already large commerce of Newark Bay and the Passaic and Hackensack Rivers. To the east, therefore, of the west side of the westerly channel leading from the Kill Van Kull into Newark Bay, the bay will be considered to extend to the northerly side of Kill Van Kull.

6. Navigation in Newark Bay is sometimes obstructed by floating ice in the months of January and February. The entire bay has been known to freeze. Floating ice is held in the bay longer than would otherwise be the case by the Central Railroad of New Jersey bridge.

7. Previous preliminary examinations and surveys of Newark Bay:

TABLE I.—*Preliminary examinations and surveys of Newark Bay, N. J.*

| Date of act authorizing same. | Section covered. | Congressional documents. | | | Annual Reports of Chief of Engineers. | | | Nature of report. |
|---|---|---|---|---|---|---|---|---|
| | | House or Senate. | No. | Congress. | Year. | Page. | Part. | |
| Aug. 30, 1852... | Newark Bay..... | ..... | ..... | ..... | ..... | ..... | ..... | (1). |
| Authorized by Chief of Engineers, May 9, 1879. | Passaic River, mouth to Midland Railroad Bridge. | ..... | ..... | ..... | [2] 1880 | 537 | 1 | Favorable.[3] |
| Mar. 3, 1899.... | Staten Island Sound to Paterson. | House.. | [4] 401 | 56th, 1st sess. | [2] 1900 | 1530 | 2 | Do.[5] |
| Mar. 3, 1905.... | Staten Island Sound to Montclair & Greenwood Lake Railroad Bridge. | ...do... | [2] 441 | 59th, 2d sess. | ..... | ..... | ..... | Do.[6] |
| Mar. 3, 1909.... | Channel along east shore of Newark Bay. | ...do... | [2] 80 | 61st, 1st sess. | ..... | ..... | ..... | Unfavorable. |
| June 25, 1910... | Newark Bay, Passaic and Hackensack Rivers. | ...do... | [2] 707 | 62d, 2d sess.. | ..... | ..... | ..... | Favorable.[7] |
| Do..... | Canal from Newark to Kill Van Kull. | ...do... | [2] 1076 | 62d, 3d sess .. | ..... | ..... | ..... | Unfavorable. |

[1] Aug. 30, 1852, $10,000 was appropriated by Congress for improvement of Newark Bay and $2,000 was appropriated for survey of same. Survey was made and report rendered under date of Jan. 27, 1853. No record showing whether work of improvement was done or disposition made of funds.
[2] No map printed.
[3] This report includes upper part of Newark Bay. Basis of 10-foot project adopted June 14, 1880. Total estimated cost, $232,875.
[4] Contains map.
[5] This report formed basis of 12-foot project adopted June 13, 1902. Total estimated cost, $1,133,563.
[6] This report formed basis of 16-foot project adopted Mar. 2, 1907. Total estimated cost, $1,216,776.66, with $10,000 annually for maintenance.
[7] This report forms the basis of the 20-foot project adopted July 25, 1912. Total estimated cost, $1,064,800, with $20,000 annually for maintenance.

8. The history of the various previous projects for the improvement of Newark Bay and the Passaic and Hackensack Rivers will be found in the Appendix to the Report of the Chief of Engineers for 1915. The present project for the improvement of Newark Bay (and the Passaic River) calls for a channel 20 feet deep and 300 feet wide from the natural 20-foot contour in the bay up to the Nairn Linoleum Works at Kearny; thence 16 feet deep and 200 feet wide to the Montclair & Greenwood Lake Railroad bridge; thence 6 to 7½ feet deep and 50 to 200 feet wide to the highway bridge at Passaic. The depths mentioned refer to mean low water. The tidal range in the bay and river up to the Montclair & Greenwood Lake Railroad bridge is 5 feet; at the highway bridge in Passaic it is 4.6 feet. The 20-foot project was adopted by the river and harbor act of July 25, 1912, at an estimated cost of $1,064,800, with $20,000 annually for maintenance (see H. Doc. No. 707, 62d Cong., 2d sess.); the 16-foot project was adopted by the river and harobr act of March 2, 1907, as a part of the project for securing 16 feet in depth in the bay and river, 300 feet wide to the Nairn Linoleum works, and thence 200 feet wide to the Montclair & Greenwood Lake Railroad bridge, at a total estimated cost of $1,216,775, and $10,000 annually for maintenace (see H. Doc. No. 441, 59th Cong., 2d sess.); the 6-foot project was adopted by the river and harbor act of June 10, 1872, at an estimated cost of $123,924 (see Annual Report for 1872, p. 808). The 20-foot channel

has been completed to the Pennsylvania Railroad freight bridge at Point-no-Point, and an existing contract covers its prosecution as far as Jackson Street bridge, Newark. Funds in hand, not pledged under this contract, are to be expended in redredging for maintenance below the Pennsylvania Railroad freight bridge. The existing contract will carry the 16-foot channel nearly to the Montclair & Greenwood Lake Railroad bridge. The 6-foot channel has been completed.

9. The approved project for the Hackensack River was adopted by the river and harbor act of July 25, 1912, and provides for dredging a channel 12 feet deep at mean low water and 200 feet wide from the Passaic River at the head of Newark Bay to Little Ferry, and thence 150 feet wide to the New York, Susquehanna & Western Railroad bridge, at an estimated cost of $171,018.10 and $6,000 per annum for maintenance, in accordance with report printed in House Document No. 643, Sixty-first Congress, second session. The project has been completed. Dredging for maintenance is being done below the Central Railroad of New Jersey bridge.

10. The following tables contain information as to the commerce of Newark Bay:

TABLE II.—*Commerce of Newark Bay, N. J.*

| Calendar year. | Volume of commerce in short tons. | Value of commerce. | Principal items. |
|---|---|---|---|
| 1898 | [1] 1,509,772 | [2] | Building material, coal, general merchandise, oils, ashes, and sweepings; fertilizer, ores and metals. |
| 1899 | [1] 1,962,462 | [2] | |
| 1900 | [1] 2,037,363 | [2] | |
| 1901 | [1] 2,009,356 | [2] | |
| 1902 | [1] 2,494,312 | [3] $131,534,788 | |
| 1903 | [1] 2,456,511 | [3] 131,837,577 | |
| 1904 | [1] 2,567,942 | [3] 134,850,964 | |
| 1905 | [1] 2,567,000 | [3] 137,303,300 | |
| 1906 | [1] 2,577,188 | [3] 167,113,305 | |
| 1907 | [4] | [4] | |
| 1908 | 2,110,959 | [3] 171,612,700 | |
| 1909 | 2,650,809 | [3] 164,800,203 | |
| 1910 | 2,266,291 | 62,216,587 | |
| 1911 | [4] | [4] | |
| 1912 | [4] | [4] | |
| 1913 | 2,807,387 | 64,439,074 | |
| 1914 | [5] 4,260,541 | 81,489,426 | |

[1] Commerce prior to 1908 reported in long tons, since then reported in short tons.
[2] No value given.
[3] These figures were furnished by the Newark Board of Trade and appear to be too great.
[4] Estimates same as for 1906.
[5] Includes 1,391,524 tons of ashes and sweepings, garbage from New York City taken up the bay and deposited on the meadows above the Lehigh Valley Railroad Bridge. This material was reported as having no commercial value.

TABE III.—*Commercial statistics Newark Bay for calendar year 1914.*

| Articles. | Shipped out. | | Received. | |
|---|---|---|---|---|
| | Amount in short tons. | Valuation. | Amount in short tons. | Valuation. |
| Ale and beer | 17,167 | $1,400,463 | 3,880 | $430,677 |
| Ashes and sweepings | | | 1,391,524 | (1) |
| Asphalt | | | 3,200 | 64,000 |
| Brick and fire brick | | | 164,474 | 478,277 |
| Building tile | | | 375 | 6,750 |
| Candles and tallow | | | 3,000 | 300,000 |
| Cement and plaster | 15,400 | 149,000 | 61,690 | 261,698 |
| Chemicals and colors | 7,508 | 1,300,394 | 15,462 | 1,049,865 |
| Clay | | | 745 | 1,735 |
| Coal | 142,279 | 636,101 | 241,793 | 896,396 |
| Copra | | | 2,400 | 312,000 |
| Cordwood | | | 1,500 | 4,500 |
| Cotton waste | | | 500 | 125,000 |
| Fertilizers | 26,433 | 1,132,295 | 48,328 | 602,830 |
| Flax and jute | | | 470 | 45,000 |
| General merchandise | 68,084 | 5,156,830 | 156,968 | 12,736,090 |
| Glass | | | 772 | 1,737 |
| Grain | | | 2,300 | 65,000 |
| Ice | | | 25,000 | 75,000 |
| Lath | | | 4,634 | 55,959 |
| Lumber | 30,000 | 687,500 | 108,873 | 1,601,282 |
| Machinery and manufactures | | | 47 | 4,500 |
| Miscellaneous | 1,950 | 97,500 | 4,980 | 408,357 |
| Oils | 1,298 | 42,618 | 432,027 | 11,704,290 |
| Ores and metals | 36,838 | 18,000,000 | 51,008 | 18,010,000 |
| Paving blocks | | | 36,611 | 334,800 |
| Piles | | | 17,000 | 83,871 |
| Sand and stone | 6,080 | 79,089 | 651,251 | 532,714 |
| Structural steel | | | 950 | 109,000 |
| Tar bark | 5,800 | 1,500 | ..... | ..... |
| Tar | 9,639 | 61,558 | ..... | ..... |
| Total for Hackensack River | 49,028 | 845,050 | 411,275 | 1,598,213 |
| Total | 417,504 | 29,589,898 | 3,843,037 | 51,899,528 |

[1] No value.

11. The act directing the present preliminary examination does not describe the character or extent of the further improvement to be reported on. On July 23, 1915, the then district officer, Col. Frederic V. Abbot, Corps of Engineers, held a public hearing at Newark, N. J., to give interested parties an opportunity to explain the improvements which they thought desirable. Copy of the stenographic report of the proceedings is herewith,[1] also copies[2] of communications received from interested parties. The desires of interested parties as set forth at the hearing and in these communications are:

(*a*) That the present channel from the Kill Van Kull to the mouth of the Passaic and Hackensack Rivers be widened to 800 or 1,000 feet.

(*b*) That the channel dredged by the city of Newark from the Government channel in the bay to the municipal terminal now under construction be maintained by the United States.

(*c*) That channels 300 feet wide and 20 feet deep be dredged along the pierhead lines on either side of the bay.

(*d*) That the entire bay be dredged to the depth of 20 feet.

(*e*) That ultimately the entire bay be dredged to the depth of 35 feet.

[1] Not printed. [2] One communication printed.

12. Of the plans proposed, (*a*) and (*b*) refer to the improvement of existing channels. As pointed out at the public hearing, the difficulty of navigating the present bay channel arises from defects in the Central Railroad of New Jersey bridge and from the narrowness of the upper end of the channel. The trestle approach to the draw spans holds ice in the bay in the wintertime, and the draws are deficient in span and headroom. The channel in the northerly part of the bay is too narrow for convenient navigation in all conditions of tide and wind by the tows that now use this waterway, and especially by the longer tows that will use it when wider and higher draw spans are provided in the bridge. Again, Bergen Point Shoal and the middle ground at the junction of the bay channel and the Kill Van Kull unduly narrow and obstruct the entrance to the bay channel. In view of the large commerce using this waterway (par. 8 above), its improvement by widening is worthy of being undertaken by the United States, provided the cost involved is not too great. With respect to the channel of approach now being dredged by the city of Newark to the municipal terminal, the maintenance by the United States of this channel as far west as the pierhead line would not seem to be inequitable. (House Doc. 1076, 62d Cong., 3d sess., p. 2.) A survey is needed for the preparation of a project for improving the main channel and for maintaining the outer portion of the side channel referred to.

13. Plans (*c*), (*d*), and (*e*), paragraph 8, contemplates dredging along undeveloped frontage, and (*d*) and (*e*) contemplate the dredging of more extensive areas than are necessary for the movement of ships either in the main channel or to and from the pierhead lines. The proponents of these plans contemplate that all dredgings removed from the bay will be deposited back of the bulkhead lines, thus making land that will be available for use as factory sites. Moreover, the development expected to follow the dredging of channels along the pierhead lines and the filling of near-by lands is largely an industrial terminal development. It was recognized at the public hearing that this is eminently a project in which the local communities and especially riparian and other land owners will not only share in the public or general benefits resulting from the improvement, but will enjoy additional benefits and profits, and the equitableness of local cooperation was emphasized by several speakers. The only definite scheme of cooperation suggested was that of the Newark Board of Trade, namely: That the cities of Newark, Elizabeth, Bayonne, and Jersey City should secure from the State legislature legislation permitting them to enter into an agreement with the United States under which assessments for benefits could be levied against owners of lands susceptible of being raised by the deposit thereon of dredgings from the bay, whereby a percentage of the cost of dredging could be assessed against this land, payment of this assessment to be made in equal installments over a period of years, as the cost of putting water on arid land in the West is reimbursed to the United States under the reclamation act.

14. With respect to the proposal to dredge the entire bay to 35 feet it should be noted that a depth of 35 feet in Newark Bay would be useless unless there was same depth in Kill Van Kull, and to obtain a channel 35 feet deep and 500 feet wide in Kill Van Kull would

cost over $2,000,000 (H. Doc. No. 1124, 62d Cong., 3d sess., p. 16). As stated above (par. 5), a preliminary examination and survey is being made under the act of March 4, 1915, of Kill Van Kull and of the channels on the west and south sides of Staten Island. Whatever further improvement of the Staten Island channels may be made considerable time must elapse before a 35-foot channel in Kill Van Kull can be an accomplished fact, and it therefore seems premature to consider the deepening of Newark Bay to 35 feet at the present time. The improvement of Newark Bay under plans (*c*) and (*d*) is worthy of being undertaken by the United States, provided the cost is not out of proportion to the benefits to be obtained and provided adequate cooperation is offered. The cost of carrying out these plans can only be known as the result of a survey. The fact that the city of Newark after lengthy investigation has embarked upon an expensive terminal and industrial improvement (par. 21) supports the view that sooner or later adequate commercial and industrial results would follow an extensive filling of the flats about Newark Bay and the dredging of channels affording access to the pierhead line. The usual difficulty will be encountered in determining what proportion of the benefits are general or national and what local, and the extent to which the United States and local interests should share in the cost of the improvement. No binding scheme of cooperation has yet been proposed, and in view of the number of interests to be coordinated, the formulation of any scheme of cooperation will be difficult. The useful purpose which could be served by a State agency empowered in cases of this kind to cooperate with the United States and to assess charges according to benefits received is obvious. However, since the equitableness of cooperation seems to be generally admitted in this case, it is not impossible that a practicable scheme therefor may be worked out during the time necessarily involved in making the survey to determine cost.

15. Subject to the condition that the cost is not excessive, I am of the opinion that an improvement of the existing bay channels is worthy of being undertaken by the United States. Subject to the same condition and to the offer of adequate cooperation by local interests, it appears that extensive improvements of the bay by the United States might be advisable. Accordingly a survey of the entire bay is recommended and the preparation of estimates of cost of carrying out the plans mentioned in paragraph 11, except (*e*), and of any plan which, considering probable commercial benefits, cost, and cooperation offered, may seem advisable.

### TERMINAL FACILITIES AND OTHER SUBJECTS.

16. Neither the United States nor the State of New Jersey owns any frontage on Newark Bay.

17. The city of Elizabeth owns no frontage on Newark Bay. (It owns about 434 feet of frontage on Staten Island Sound.)

18. Of the 4,400 linear feet of frontage on the west side of the bay south of the Central Railroad of New Jersey bridge, the Singer Manufacturing Co. owns about 2,800 feet and the Central Railroad of New Jersey about 1,600 feet. A portion of the Singer frontage is bulkheaded and wharved; the depth along this front being from

13 to 17 feet. The Central Railroad of New Jersey frontage is wharved and is used by coal barges drawing from 5 to 20 feet.

19. The 11,400 feet next above the Central Railroad of New Jersey bridge is in private ownership and is unimproved. The next 1,000 feet is owned by Ross & Wetmore, who have built two wharves, at which a depth of about 9 feet has been provided. The property lies idle.

20. From this property to the area now being developed by the city of Newark there is an undeveloped frontage of 2,100 feet in private ownership.

21. The frontage owned by the city of Newark is about 4,060 feet. The development planned for this property is thus described in a report of the Newark Board of Trade dated October, 1915:

The Port Newark terminal project is a work undertaken by the city of Newark with the object of providing facilities for the location of industry, for the building up of commerce, and for making Newark a seaport in reality. The plan for this work has been advocated by the Newark board of trade and under special act of the legislature of the State the municipality has been authorized to expend upward of $2,000,000 in the construction of the first unit.

Comprehended in this work of construction, which is now approaching completion, is a system of dockage extending a total length of 4,500 feet, 2,500 of which extends inward from the shore line and borders full length on a water channel 400 feet in width at the bottom, with a depth of 20 feet at low water. Giant piers 1,200 feet in length, as at present planned, are to be of greater length than any in the East and are intended to accommodate the largest class of vessels afloat.

The system of docks, it is designed, are to be equipped with the most modern appliances for the handling and transfer of freights; each dock will carry double standard gauge railway tracks, on which electric traveling cranes will operate.

* * * * * * *

In addition to the water channel now completed, there has been reclaimed an area of 500 acres, and the work contemplates the reclaiming of 500 acres more, title of which has been secured by the city. This area is so plotted as to provide the very best in the way of advantages for all classes of business concerns, whether commercial, industrial, or maritime.

In the reclaiming of this area of land a fill of 6 feet above mean low water has been made. Streets and connecting highways are being constructed and facilities for sewerage, drainage, water supply, fire protection and transportation are being planned and carried out in connection with the completion of the work.

* * * * * * *

In connection with the work going on at the bay front, the work of construction of new arteries for travel from built-up sections is being rapidly pushed to completion, and a municipal railroad, part of which is already constructed, will be connected up with the Pennsylvania, the New Jersey Central, and the Lehigh Valley Railroad systems. This connection will undoubtedly be extended in the future to the Erie and Lackawanna Railways.

* * * * * * *

A plan for the transportation of labor is included, and before many days will be added as another link to the chain of progress. It is expected the Central Railroad of New Jersey will commence immediately to build a passenger station on the site, which will give service to the center of Newark, to Jersey City and New York City. Arrangements are under way with the Public Service Corporation of New Jersey for an extension of a trolley line to the development.

Arrangements for light and electric power will be made with the Public Service Electric Co. at rates applying for ordinary city service.

* * * * * * *

One of the big advantages that Newark has is its water supply, which comes from the mountains of North Jersey and is furnished through mains by

gravity system with 62.5 square miles of watersheds, with nine reservoirs storing nearly 10,000,000,000 gallons, giving a daily available supply of 50,000,000 gallons, and being used at the rate of 102 gallons per day per capita.

22. The 1,900 feet of frontage lying between the north line of the City of Newark property and the Lehigh Valley Railroad bridge is owned by the Pennsylvania Railroad Co. and is undeveloped, except for a small wharf used by Henry Steers (Inc.), a contracting firm. The depth at this wharf is about 10 feet.

23. For 1,250 feet south of the bridge this property is bordered by a dike constructed by the United States some years ago for the improvement of the adjacent channel. This dike extends above the bridge for a distance of about a mile. The distance from the bridge northerly to a point opposite the junction of the dredged channels of the Passaic and Hackensack Rivers is about 2,130 feet. The land in rear of this length of dike has been partially filled by dredgings taken from the two rivers and Newark Bay.

24. On the east shore of Newark Bay, at the junction with the Kill Van Kull (Bergen Point) is the plant of the Texas Co., having a frontage of about 1,400 feet on Newark Bay and a wharf about 580 feet in length, at which a depth of from 10 to 25½ feet has been provided by dredging.

25. The Precious Woods Co. (a branch of the Innovation Trunk Co.) occupies the water front for about 800 feet north from the Texas Co.'s line at West First Street, Bayonne, N. J. This frontage is partly bulkheaded and there is a dock basin carrying about 8.5 feet of water.

26. North of this property is located the Dodge & Olcutt Co., having a partly bulkhead water front about 500 feet in length with 7 to 8 feet depth.

27. North of the Dodge & Olcutt Co., the Nucoa Butter Co. occupies a water front of about 400 feet in length, with a wharf about 400 feet in length and a depth of about 8 feet.

28. The water front between the Nucoa Butter Co. and the Central Railroad of New Jersey bridge, about 600 feet, is occupied by Augustus Smith. There is a wharf about 350 feet long with an available depth of about 6 feet alongside.

29. North of the Central Railroad of New Jersey bridge for about 800 feet the water front is bulkheaded and a dock has been built. This property is occupied by the Electric Launch Co., and a depth of about 5 feet is available.

30. The next wharf in commercial use is that of James Brady & Sons Co., and is about 5,100 feet north of the Electric Launch plant. In the intervening space there are about 10 small pleasure wharves, with a depth of 2 feet or less.

31. The Brady company handles coal and building materials and has a developed water front of about 400 feet and an available depth of 4 to 5 feet.

32. For about 425 feet north from the Brady property is a marine ways and shipyard owned by Gus Nelson.

33. Adjacent to this property, at the foot of West Twenty-fifth Street, is the Bayonne City wharf, about 420 feet long, with a depth of about 4 feet. The frontage owned by the city at this point is 185 feet in length. (The city of Bayonne owns about 528 feet of frontage on Kill Van Kull.)

34. North of this to the Lehigh Valley Railroad bridge, a distance of about 9,830 feet, the water front is undeveloped.

35. In this stretch the Hudson County Park, occupying a water front of 3,000 feet or more south from Forty-ninth Street, Bayonne, is in course of development. It is understood that the construction of a concrete bulkhead on the bulkhead line is contemplated.

36. North of the Lehigh Valley Railroad bridge for about 2,460 feet, measured along the pierhead line, the frontage is in private ownership, and is undeveloped; the next 275 feet belongs to Jersey City and is undeveloped; the next 1,170 feet is in private ownership and undeveloped; the next 4,220 feet (Droyers Point) belongs to Jersey City and is undeveloped.

37. To sum up: Neither the United States nor the State of New Jersey nor Union County owns any frontage on Newark Bay. The 3,000 feet of frontage on the east side of the bay owned by Hudson County is undeveloped for commercial or industrial purposes. The city of Newark owns 4,500 feet on the west side of the bay and is constructing a modern industrial and commercial terminal at which the depth of water provided is the same as that in the United States channel in the bay, namely, 20 feet. This improvement contemplates the development of 2,500 linear feet of frontage on a canal excavated inside the shore line of the bay. Jersey City owns 4,495 feet of undeveloped frontage on the east side of the bay. (This does not include frontage on the Hackensack River above the extremity of Droyer's Point.) The city of Elizabeth owns no frontage on Newark Bay. The city of Bayonne owns 185 feet of improved frontage on the east side of the bay. Of the remaining 43,375 feet of frontage, all in private ownership, about 10,025 feet is developed and 33,350 feet undeveloped. Of the developed frontage only about 1,100 feet is provided with wharves having a depth alongside equal to that in nearby channels. Apart from the dredging done and contemplated by the city of Newark only an inconsiderable quantity of dredging has been done by riparian owners to connect with natural channels or to supplement dredging done by the United States. The dredging in question has been done by the Singer Manufacturing Co. and the Central Railroad of New Jersey at Elizabeth; by Ross & Wetmore, at their property on the west side of the bay; and by the Texas Co. and James Brady & Sons Co., at Bayonne.

38. The Texas Co. has a steam crane operating upon standard-gauge railroad track running out upon their dock.

39. The Electric Launch Co. has a small derrick, marine ways, and dock equipment suitable for shipping their manufactured product, i. e., launches and yachts of from 2 to 75 tons.

40. The James Brady & Sons Co. have two steam derricks equipped with orange-peel buckets and hoisting cables, hooks, etc.

41. The city of Bayonne has a small hand-power derrick with boom on their dock at the foot of Twenty-fifth Street.

42. The freight-handling facilities contemplated at the Newark Terminal have been referred to above.

43. Direct connections between water and rail is contemplated for the Newark Terminal. At the following wharves such connection exists: The wharves of the Central Railroad of New Jersey and the

Singer Manufacturing Co., at Elizabeth, and of the Texas Co., the Electric Launch Co., and the Dodge & Olcutt Co., at Bayonne. The Newark Terminal is to be open to all carriers on equal terms. None of the existing wharves is open to all carriers; they are used exclusively for the business of their owners, respectively.

44. It was stated at the public hearing that the channel improved by the United States in Newark Bay nowhere touches the pierhead line and that accordingly "the Federal Government has not thus far provided any facilities by which the riparian owners on the bay may utilize their riparian lands by the construction of piers out to the pierhead line, unless they supplement that work by dredging from the pierhead lines to this channel." The facts may otherwise be stated thus: Very few riparian owners have taken advantage of the Government channel in the bay by dredging out to it from their properties. Taken in connection with the Newark terminal now under construction, the development of a portion of the frontage owned by Jersey City and Hudson County would enable an adequate use to be made of the United States channel in the bay. No offer to undertake such development has been made. With respect to dredging channels along the pierhead lines or deepening the entire bay, it would appear that riparian owners ought not only to construct terminals, but should pay a part of the cost of the dredging and all of the cost of disposing of dredgings on marginal lands.

45. A resemblance between the case of Newark Bay and that of Jamaica Bay having been pointed out at the public hearing, it may be well to recall that in the case of Jamaica Bay the agreement between the United States and the city of New York is that the United States shall dredge and maintain the entrance channel and the main interior channel, and that the city shall dredge the subsidiary channels and bulkhead and fill submerged and other low-lying lands to the extent possible with the material dredged from the interior channels. The actual dredging of the main interior channel is to be done under the city, the United States reimbursing the city for the cost of the dredging up to 8 cents per cubic yard. The depth in the entrance to Jamaica Bay has been increased to 14 feet and some 1,700,000 cubic yards have been dredged from the main interior channel, both at the expense of the United States. This is all that has been accomplished. The expenditure of the city appropriation of $1,000,000 made in 1912, has been held up by legal contests over the ownership of submerged lands. In the case of Newark Bay the entrance channel (Kill Van Kull) has been provided by nature. The "main interior channel" has been dredged by the United States, but as pointed out above it may need to be widened. This channel differs from the main interior channel in Jamaica Bay in that it runs through the middle of the bay instead of along the pierhead line.

46. There is no possibility of the development or utilization of water power for industrial or commercial purposes through any improvement of this waterway.

47. Except as pointed out above in respect to land reclamation there are no matters related to the proposed projects of improvement that might be coordinated therewith to lessen the cost and compensate the United States for expenditures made in the interests of navigation.

48. As stated in paragraph 15, I believe the further improvement of Newark Bay to be worthy of being undertaken by the United States, provided the cost is not excessive and adequate cooperation is offered in the case of improvements more extensive than the proposed widening and maintenance of the existing channels. Accordingly the making of the survey and estimates of cost outlined in that paragraph is recommended.

C. H. McKINSTRY,
*Lieutenant Colonel, Corps of Engineers.*

[First indorsement.]

OFFICE OF DIVISION ENGINEER,
EASTERN DIVISION,
*New York City, November 29, 1915.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

Concurring in the views and recommendation of the district engineer officer.

W. M. BLACK,
*Colonel, Corps of Engineers.*

[Third indorsement.]

THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
*December 7, 1915.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

For reasons stated herein, the board concurs with the district officer and the division engineer in recommending a survey in order to determine the extent and advisability of the improvement, and the amount of local cooperation that can be secured.

For the board:

W. M. BLACK,
*Colonel, Corps of Engineers,*
*Senior Member of the Board.*

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## LETTER OF THE BOARD OF TRADE.

NEWARK, N. J., *July 23, 1915.*

SIR: In the name of the Board of Trade of the City of Newark and on behalf of the industrial, commercial, and other interests of the city, this brief relating to the future of Newark Bay as a seaport and a part of the port of New York is offered for the consideration of the War Department and the Rivers and Harbors Committee of Congress.

The importance of Newark Bay as a seaport has been recognized by the Congress of the United States at various periods in the granting of appropriations for the improvement of channel facilities and in the act of Congress passed March 4, 1915, which provided that preliminary examinations and surveys be made to ascertain facts to determine the advisability of the Government providing appropriations for the widening of the present channel, and ultimately to dredge the entire area of the bay to permit of the utilization of this waterway to its maximum capacity of wharfage and terminal uses.

It has been represented in previous statements filed with the War Department, that the location of Newark Bay offers natural advantages which should be availed of in the interest of transcontinental commerce.

It has been represented that this waterway properly developed would afford anchorage and wharf facilities for vessels engaged in the ocean carrying

trade and facilities for railroads carrying transcontinental freights, whereby freight could be loaded direct from vessels onto cars for delivery to interior points, or for the transfer of commodities from rail carriers direct to vessels for export to all points.

The enormous tonnage of bulk freights now carried by rail to the shores of the Hudson River to be transferred at that point to floats or lighters involves a service which adds additional costs, aggregating, it is estimated, upward of $100,000,000 annually, a great part of which sum would be conserved to the country at large if the project for the deepening of Newark Bay were consummated.

Within the zone of this waterway, the tracks of the Pennsylvania, the Baltimore & Ohio, the Philadelphia & Reading, the New Jersey Central, and the Lehigh Valley Railroads can be coordinated and connected up with wharves and terminals, and with the construction of a short connecting road it is also feasible and practicable to connect the tracks of the Lackawanna and Erie, the Susquehanna & Western, and the West Shore Railroads, thereby connecting this wharf frontage with rail carriers serving practically all points in the United States.

It is important in its relation to this proposed improvement to submit that land fronting on adjacent waterways, having rail facilities, viz, Kill Van Kull, Arthur Kill, and the Passaic and Hackensac Rivers, is practically taken up with manufacturing and commercial enterprises. Undoubtedly, the frontage on this waterway, if water facilities are afforded, will respond to a rapid development.

Realizing and anticipating the demand for land suitable for manufacturing and commercial expansion, the city of Newark, by a vote of its citizens, approved of the purchase of a large area of overflowed marshlands fronting on Newark Bay, and authorized an expenditure of $2,000,000 for the carrying out of plans prepared by its board of works, under which a series of wharves and docks are under construction and now near completion.

In connection therewith a channel has been dredged 20 feet deep from the main channel in Newar Bay into and along the line of this development work, thereby attesting in the most practical manner the belief of its citizens that the time is now here for active work to provide facilities which are being sought by many industrial interests seeking a location on tidewater.

It is important also to represent in connection with this question that the city of Newark has joined in with other communities in the Passaic Valley in the construction of a trunk sewer to remove all forms of pollution from the waters of the Passaic River and Newark Bay, and that this great sewer system will involve an expenditure of approximately $15,000,000, testifying to the fact that the communities located on these waterways not only realize their value in the building up of the communities, but also the vast importance of conserving their usefulness by removing the present cause of pollution and contamination of the waters and preventing the deposit of solid matter in the channels that have been, and are being, dredged at Federal expense.

The committee on rivers and harbors representing the board of trade can attest the fact that if deep water facilities were available on Newark Bay frontage many large industrial plants would have acquired property suitable for their purposes and would have located within recent years industrial establishments on this waterway.

It can also be attested that this whole section, including the frontage within the city of Newark, also the frontage within the city of Elizabeth, the city of Bayonne and the city of Jersey City, has labored under marked disadvantages because of insufficient depth of water in Newark Bay and insufficient accommodation for vessels engaged in the ocean carrying trade. This condition coupled with the fact that this section has been denied equal privileges with the Brooklyn water front on New York Bay, and the water front on the East River and the Hudson River by reason of the action of the various rail carriers establishing free lighterage privileges to such points has militated against the commercial and industrial development of Newark Bay.

Through this discrimination and by reason of the water facilities afforded with Government aid South Brooklyn water front has been developed with immense industrial and warehousing establishments, notably so, what is known as the Bush Terminal.

There is promise that the discrimination in freight rates will be corrected through the filing of an informal protest with the Interstate Commerce Com-

mission, in the name of the Board of Trade of the city of Newark and other commercial bodies, as we have reason to feel satisfied that the Interstate Commerce Commission has recognized the injustice of permitting rail carriers to continue to perform a service involving heavy cost of operation which favors one district or interest against another, and that henceforth under a recent order issued it will be compulsory for the carriers to include a charge for lighterage service. With this change in methods, it may be anticipated a great demand for water front facilities on Newark Bay will become evident and the natural importance of this location will be recognized.

It is interesting to note the fact that as early as 1834 it was conceived that Newark was destined to become one of the important seaports of the country, because at that time the value of goods exported in foreign and American vessels amounted to $59,806; and that exports were shipped to France, Spain, the Mediterranean, West Indies, South America, and Nova Scotia.

At stated periods since that date there has been much written and spoken with reference to making Newark a seaport. The people of Newark to-day are determined to advance with every means within their power the development of Newark Bay for shipping purposes, and to carry out on its shore frontage and adjacent lands, plans which will lead to the making of this area a shipping center, capable of handling a great share of the transcontinental shipment of merchandise freights.

It has been represented to the Committee on Rivers and Harbors of this board that because of existing conditions in the channel, more particularly because of the obstruction to navigation offered by the bridge of the New Jersey Central Railroad across Newark Bay, the interests of Newark and other communities served by the Passaic and Hackensack Rivers are compelled to pay excessive charges for delivery of freights. To cite an instance: It is possible for coal to be delivered in barges from Perth Amboy to any point on New York Harbor at the rate of $10 per hundred tons, while to secure the same delivery to Newark the cost would be $25; the reason assigned being that in towing to New York points the size of the tow is limited only to the power of the tug, while delivery to Newark is restricted to the width of the opening in drawbridges and to the hazard of navigating in a narrow channel.

Within the recent three years there has located on frontage available to the use of the present channel several very important industrial establishments, while others are now in course of erection. At the mouth of the Passaic River an extensive plant is being constructed for the manufacture of dyestuffs; alongside the Plank Road Bridge is located one of the largest leather plants in the country, directly above other concerns have recently erected buildings, and Public Service is engaged in erecting at Point-no-Point a power plant that will have greater capacity than any other plant operated by the corporation. On the east bank of the Passaic River, north of the Lincoln Highway Bridge, there are several other manufacturing plants in operation, all constructed within the period referred to, and also the immense lumber distributing plant of the Trexler Lumber Co.

Since the commencement of the present year the services of our board of trade have been requested by no less than 10 important manufacturing concerns, whose demands require for factory purposes areas of land of from 1 acre to 15 acres, each of which concerns are desirous of finding a location affording rail and water facilities; one of these requiring deep water to permit them to receive direct Swedish iron ore. This concern has an invested capital of $12,000,000 and are about to equip a plant in this country to take care of business which they have developed here, and which has been jeopardized owing to war conditions in Europe.

With the exception of the year 1914, the tonnage movement of freights to and from points on the Passaic and Hackensack Rivers and Newark Bay, shows a steady increase in tonnage, indicating the increasing importance of these waterways.

| Year. | Short tons. | Valuation. |
|---|---|---|
| 1889 | 1,854,084 | $47,267,827 |
| 1890 | 1,975,282 | 52,395,019 |
| 1891 | 2,072,869 | 53,361,145 |
| 1892 | 1,526,165 | 42,053,308 |
| 1893 | 1,369,309 | 38,529,708 |
| 1894 | 1,369,309 | 38,529,708 |
| 1895 | 1,410,042 | 25,658,850 |
| 1896 | 1,392,847 | 22,478,963 |
| 1902 | 2,793,629 | 131,534,788 |
| 1903 | 2,751,292 | 131,837,577 |
| 1904 | 2,876,095 | 134,850,964 |
| 1905 | 2,875,040 | 137,303,300 |
| 1906 | 2,886,450 | 167,113,305 |
| 1907 | 2,886,450 | 167,113,305 |
| 1908 | 2,110,959 | 171,612,700 |
| 1909 | 2,650,809 | 164,800,203 |
| 1912 | 3,125,319 | 133,150,000 |
| 1913 | 3,365,890 | 165,450,000 |
| 1914 | 2,631,861 | 128,421,000 |

The record for the year 1913 shows a total tonnage movement of 3,365,890 short tons, having an estimated valuation of $165,450,000. This tonnage statement is based upon reports received from individual concerns and from the various transportation lines operating on these waters and may be accepted as fairly accurate.

The tonnage movement of freights is attested in the table of statistics kept by the officials of the New Jersey Central Railroad, which shows for the year 1914 that 15,518 trips were made by steamers, 11,799 trips by barges, 283 trips by schooners, and that 850 sloops and 10,466 launches had passed through the Newark Bay Drawbridge; a total of 38,916 trips by vessels of one class or other during the year.

It is important to note in connection with the proposed improvement of Newark Bay, that the population of the Passaic and Hackensack Valleys is increasing enormously; that the increase during the decade between 1900 and 1910 was over 300,000, and that it is reasonably certain that the per cent of increase during the decade from 1910 to 1920 will number 500,000. There can be added to this also the increase in population in Elizabeth, Bayonne, and Jersey City, which communities will also benefit from any improvement of Newark Bay.

To indicate the steady growth of commerce and industry in the city of Newark, we submit a table compiled from reports received from the various railroads showing the total number of cars of freight and the total tonnage delivered and shipped for the years 1906 to 1914, viz:

| Year. | Total cars. | Total tons. |
|---|---|---|
| 1906 | 263,292 | 4,382,979 |
| 1907 | 267,600 | 4,383,700 |
| 1908 | 285,610 | 4,718,227 |
| 1909 | 278,265 | 4,224,163 |
| 1910 | 279,724 | 4,404,038 |
| 1911 | 344,391 | 4,324,521 |
| 1912 | 339,393 | 4,809,864 |
| 1914 | 311,045 | 4,025,764 |

No greater indication of growth can be offered in connection with the municipal work undertaken by the city of Newark, on the bay front, than that furnished in the table of municipal valuations, which shows that the total valuation of real and personal property in Newark in 1880 amounted to $82,000,000; in 1890, $110,806,000; in 1900, $148,834,000; in 1910, $344,812,000; and for the year 1914 the total valuations had reached the sum of $403,199,000. Values in the adjacent communities will show a proportionate, if not a greater, per cent of increase.

The aggregate totals of deposits in the national banks, trust companies, savings banks, and building and loan association in the city of Newark is also an

index of its commercial and industrial growth. A like growth can be attributed to the communities interested in the improvement of Newark Bay.

As an exhibit we would include a table showing the resources and assets of these institutions in the city of Newark covering a period of years from 1907 to 1914. This table shows that the deposits in the national banks have increased from $33,149,000 in 1907 to $51,000,000 in 1914; deposits in trust companies from $23,000,000 in 1907 to $38,000,000 in 1914; deposits in the savings banks from $30,708,000 in 1907 to $44,847,000 in 1914, and that the total yearly payments in building and loan associations within the city have increased from $11,000,000 in 1907 to over $36,000,000 in 1914.

The most important development from which all others have prospered has been in the rapid expansion of industries. Including the communities fronting on Newark Bay, we have industrial plants employing a capital of $350,000,000, having a combined total of production amounting to $575,000,000, exceeded only by New York, Chicago, and Philadelphia, a production which represents, if it represents anything, a tonnage movement of raw materials of such vast importance and value as to command the aid of the Government in affording facilities for water navigation which will facilitate the shipment and delivery of freights.

The commerce of the port of New York, it is represented, is overtaxing present facilities; and it is represented that when a real commencement of tonnage movement takes place on the Barge Canal, connecting the Lakes with the Hudson, that a serious congestion is bound to create; also that this congestion will become more acute each year as the increase of commerce resulting from the operation of the Panama Canal becomes manifest; and that it will become imperative to provide additional wharf facilities.

Why should such facilities be provided at points inaccessible to rail carriers, or at points requiring lighterage service, involving increased cost for handling and transportation, when through the improvement and development of Newark Bay time can be saved and the handling of commodities be facilitated by connecting rail carriers direct with piers and wharves, where cargoes can be transferred direct from vessels to cars and vice versa.

The marshlands fronting on and lying west of Newark Bay in the cities of Newark and Elizabeth are subject to a wonderful development, a work which can be safely left with the two communities. It has been commenced by the city of Newark and can be continued and water frontage developed by means of cutting additional water channels on these lands, which will increase the importance of this waterway as a seaport and permit of a development which will afford water and rail facilities for thousands of industrial and commercial establishments; but before this great undertaking can be successfully carried out by the cities interested there must be some definite plan agreed upon for the ultimate development of the bay, and such a development can only be undertaken and carried out by Government.

It is for this reason that a petition has been presented to the Congress of the United States in the hope that the possibilities of this waterway can be demonstrated and that Federal aid can be secured in promoting its improvement for the benefit of all sections of the country.

Therefore we would advocate a recommendation being made by the Corps of Engineers in favor of the cutting of another channel at least 300 feet wide and 20 feet deep at low water along the western pierhead line to permit owners of property fronting thereon to commence a development which would invite the location of industrial or commercial establishments thereon.

We would also urge and advocate a favorable report being made by the Corps of Engineers recommending the widening of the present channel from Kill Van Kull up to the line of the channel established by the city of Newark into the wharves and piers now being completed by the city, and that the channel be widened between these points to at least 1,000 feet so as to permit vessels such as would be expected to find dockage at these wharves to turn at this point.

We would also urge that a favorable report be presented to the War Department by the Corps of Engineers, contemplating the adoption of a plan under which provision would be made for the ultimate dredging of the entire area of Newark Bay, to permit of a maximum use of this waterway for all manner of shipping, anchorage, and other uses, believing that in the course of a very few years such a work will be useful and necessary to accommodate the demand of water-borne commerce.

It may be suggested that the Corps of Engineers consider the possibility of securing municipal cooperation on the part of Newark, Elizabeth, Bayonne, and Jersey City, whereby these cities could secure from the Legislature of the State of New Jersey such legislation as may be necessary to permit of their entering into an agreement with the Government under which assessments for benefits could be levied against owners of marsh lands or other lands subject to improvement, whereby a percentage of the cost for dredging could be assessed against all land improved by deposit of dredged material thereon, under a plan which would provide for the payment of such assessments in yearly installments spread over a period of years in order to permit owners to develop their properties or on a plan similar to that under which payments are made to Government by owners of lands improved through the irrigation service.

Respectfully submitted on behalf of the Board of Trade of the City of Newark by the Committee on Rivers and Harbors.

GEORGE F. REEVES, *Chairman.*

Col. F. V. ABBOT,
*Corps of Engineers.*

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SURVEY OF NEWARK BAY, N. J.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
THIRD DISTRICT,
*New York City, January 4, 1917.*

From: The District Engineer Officer.
To: The Chief of Engineers, United States Army
(Through the Division Engineer).
Subject: Survey of Newark Bay, N. J.

1. Following is a report on a survey of Newark Bay, N. J., made pursuant to the river and harbor act approved March 4, 1915, and department letter of December 20, 1915.

2. To obtain the data for the estimates of cost directed, it was necessary to make some 203 probings (wash borings). There were already available the results of the probings and rock borings made by the Central Railroad of New Jersey and the Pennsylvania Railroad along the lines of their Newark Bay bridges, respectively, and by the Passaic Valley Sewerage Commission on a line across the bay north of the Lehigh Valley crossing. The location of all these borings is indicated on the accompanying map, which also shows the limiting lines of certain proposed channels or enlargements of existing channels for which estimates were authorized. Between pierhead lines no rock was encountered above a plane of 36 feet below mean low water anywhere to the north of the Central Railroad of New Jersey bridge nor in the westerly half of the bay below that bridge. There is rock close to the water surface on the Bergen Point Shoal and at varying depths below 25 feet at points at the west of the channel opposite Bergen Point. In general all material down to a depth of about 22 feet (except rock at Bergen Point) can be removed with a suction dredge. At varying depths below 22 feet hard clay is met with, for the removal of which a dipper dredge would have to be used. A powerful dipper dredge might be able to remove the loose shale rock met with south of the Central bridge. The rock at Bergen Point is believed to be trap and would have to be drilled. The rock encountered on the line explored by the Passaic Valley Sewerage Commission was sandstone; by the Pennsylvania Railroad, red sandstone; and by the Central Railroad of New Jersey, red and gray sandstone.

ESTIMATES.

3. (*a*) Estimated cost of a channel 21 feet deep and 400 feet wide from the United States channel in Newark Bay to the pierhead line crossing the Port Newark Terminal Channel, $21,100; estimated annual cost of maintenance, $2,400.

(*b*) Estimated cost of a channel 26 feet deep and 400 feet wide in Newark Bay from Kill Van Kull to United States pierhead line crossing the Port Newark Terminal Channel, $301,800. This estimate covers a channel having a sharp turn at the Bergen Point Light. To ease this turn, $296,700 should be added for rock excavation. Maintenance would cost annually about $17,500.

(*c*) Estimated cost of a channel 26 feet deep and 500 feet wide in Newark Bay from Kill Van Kull to United States pierhead line crossing the Port Newark Terminal Channel, $388,500. This estimate covers a channel having a sharp turn at the Bergen Point Light. To ease this turn, $296,700 should be added for rock excavation. Maintenance would cost annually about $21,900.

(*d*) Estimated cost of a channel 31 feet deep and 750 feet wide in Newark Bay from Kill Van Kull to United States pierhead line crossing the Port Newark Terminal Channel, $3,451,600. This includes about $2,176,400 for removal of rock at Bergen Point to ease the turn. Maintenance would cost annually about $33,400, decreasing.

(*e*) Estimated cost of a channel 21 feet deep and 300 feet wide along easterly pierhead line from Kill Van Kull to Droyers Point, $1,041,300. Maintenance would cost annually about $21,500.

(*f*) Estimated cost of a channel 21 feet deep and 300 feet wide along the westerly pierhead line from Arthur Kill to the mouth of the Passaic River, upper end of Newark Bay, $784,700. Maintenance would cost annually about $16,900, decreasing.

(*g*) To dredge the entire Newark Bay to 21 feet, $10,865,000; maintenance would cost annually about $33,400, decreasing.

(*h*) To widen the present 20-foot channel 100 feet; i. e., to 400 feet from Kill Van Kull to "upper limit of bay" (see map), $84,500. This does not include easing the turn at Bergen Point, which would cost about $102,900 extra for rock removal. Maintenance would cost annually about $17,700.

(*i*) To widen present channel to 500 feet from Kill Van Kull to "upper limit of bay" (see map), $220,500. This does not include easing the turn at Bergen Point, which would cost about $102,900 extra for rock removal. Maintenance would cost annually about $24,300, decreasing.

(*j*) To widen present channel to 900 feet from Kill Van Kull to "upper limit of bay" (see map), $890,400. This does not include easing the turn at Bergen Point, which would cost about $102,900 extra for rock removal. Maintenance would cost annually about $30,000, decreasing.

Details of these estimates are found in the accompanying paper.

CHANNELS ALONG PIERHEAD LINES ON EITHER SIDE OF BAY.

4. It was stated in the preliminary examination report:

With respect to dredging channels along the pierhead lines * * * it would appear that riparian owners ought not only to construct terminals but

should pay a part of the cost of the dredging and all of the cost of disposing of dredgings on marginal lands. * * * It was recognized at the public hearing that this is eminently a project in which the local communities and especially riparian and other land owners will not only share in the public or general benefits resulting from the improvement, but will enjoy additional benefits and profits, and the equitableness of local cooperation was emphasized by several speakers.

No plan of cooperation has yet been proposed by local interests. The Legislature of New Jersey has lately passed an act (ch. 83, Laws, session of 1916, approved Mar. 16, 1916) entitled:

An act providing for the reclamation and improvement of salt marsh and meadow lands and lands under water and other lands within municipalities bordering on tidal waters in this State resulting from the construction of channels and the making of harbor improvements in the waters adjacent thereto, and authorizing the board of commerce and navigation, on behalf of such municipalities, to arrange for and contract with the Federal Government for such improvements, and authorizing the levying by such municipalities of assessments for benefits to such lands resulting from the reclamation and improvement thereof by or from the construction of channels and harbor improvements in the waters adjacent thereto.

A copy of this act is herewith. No advantage has so far been taken of this act to arrange for cooperation in the dredging of the proposed channels along the pierhead lines (nor in any other proposed work) in Newark Bay. Under the circumstances I report that in my opinion it is not advisable at the present time for the United States to undertake the dredging of either of these channels along the pierhead lines. However, it is thought that the public benefit that would follow the dredging of either of these channels would warrant the United States in sharing in the expense to the extent of, say, 8 cents per cubic yard of material removed, the interests making the improvement to be reimbursed to this extent by the United States. This is the approved plan in the case of the inner channel in Jamaica Bay. (H. Doc. No. 1488, 60th Cong. 2d sess.)

### DEEPENING THE ENTIRE BAY TO 20 FEET.

5. There is no present need for deepening the entire bay to 20 feet, and it is obviously undesirable for the United States to undertake this work at this time.

### DEEPENING AND WIDENING PRESENT CHANNEL IN NEWARK BAY.

6. It remains to consider the proposition to deepen and widen the present channel in Newark Bay, including the side channel to Port Newark Terminal. The request to deepen the bay channel is made in the interest of the Newark Terminal and not in the interest of the Passaic and Hackensack Rivers. The greatest governing depth in either of these rivers is found in the lower course of the Passaic and is the same as that of the bay channel, 20 feet. No increase in the depth of the Passaic River is advisable and none has been requested. The commerce to and from the Passaic and Hackensack Rivers is extensive, amounting in 1915 to 4,240,297 tons, valued at over $97,000,000. It is mostly carried by tows and the complaint of the towing companies is that the number of barges they can handle in one fleet is limited (1) by the narrowness of the openings in the

Central Railroad of New Jersey Bridge, and (2) by the narrowness of the channel between the Central Railroad bridge and the Lehigh-Pennsylvania bridge. The Central Railroad has applied for a permit to rebuild its bridge and the details of the new structure have been the subject of a public hearing and of numerous conferences between the New York Harbor Line board and officials of the company. A revised application has just been received for a bridge in which the bascule openings, two in number, will have a horizontal clearance of 125 feet each and a vertical clearance above high water of 25 feet, and the piers supporting the hinges (or rollers) of the bascules will be so designed and built as to be capable of supporting bascules giving horizontal clearances of 200 feet. When the new bridge is completed one of the above mentioned handicaps on the navigation of the bay will have been removed. It is believed that the proper width for a 20-foot channel in this bay, considering the size of the bay and the force of wind and waves to which tows are exposed, is 500 feet. As above stated the cost of widening the present channel to 500 feet (Par. 3, item (i)) would be $220,500 (or $323,400, if the end of Bergen Point Shoal is cut off), with about $73,000 every three years (or the rate of $24,300 annually) for maintenance. The maintenance charge would probably decrease with time. I am of opinion that it is desirable to modify the present project for Newark Bay to the extent of calling for a channel 20 feet deep and 500 feet wide at a first cost of $220,500, and an annual maintenance cost of $24,300. The first cost should be appropriated in one sum, but since the widened channel is not essential until the openings in the bridge have been enlarged, the expenditure of the appropriation should be so governed that the widened channel may become available at about the same time as the new draw openings.

7. For any deepening of the bay channel the justification must be found, if at all, in the prospective commerce of the Newark Terminal (or of other similar terminals that may be established). The proposed Port Newark Terminal is described in the preliminary examination report. The work done to date is briefly as follows: A channel has been dredged 400 feet wide, 20 feet deep, and about 7,000 feet long from the west side of the United States channel in Newark Bay; a timber wharf about 4,500 feet long has been built fronting on this channel; some 8,000 linear feet of bulkhead has been built; about 250 acres of land have been filled in; streets have been paved and water mains and sewers laid; and about 15 miles of railroad track have been laid in a terminal system with a connection to the Pennsylvania and the Central Railroads. No pier sheds or warehouses have yet been built. Since the channel was dredged it has shoaled somewhat, the present governing depth being about 14½ feet on a shoal near the crossing of the United States bulkhead line. The Newark Terminal, if completed and used to capacity, would supply a commerce sufficient in volume to warrant an enlargement of the bay channel, but for some reason not immediately manifest the use so far made of it has fallen far below expectation. Apart from construction materials the only commerce which has passed over the wharf is some 2,000,000 feet of mahogany lumber. One reason suggested to explain the lack of business is that until the passage of the recent State act (chap. 249, Laws, sess. of 1916) it has only been possible to lease,

not sell, lands in the terminal, and that doing away with this restriction will be followed by the sale of lands and the establishment of industrial plants, and that there will be considerable commerce incidental to the operation of such plants (fuel, raw materials, etc., in and products out). It is claimed that there would be adequate commerce if a 25 or 30 or 35 foot channel were provided. However, it should be recalled that eminent harbor engineers in reporting on the matter at the request of the city recommended that the terminal be developed not as a deep-sea transfer point, but as an industrial, proposition, fuel and raw materials to be received by lighters. The Board of Engineers in reviewing the preliminary examination report on a "ship canal with depths of 30 and 35 feet extending from a point in the city of Newark, below the junction of the Pennsylvania and Lehigh Valley Railroads through the Newark Meadows and Newark Bay to deep water of the Kill Van Kull," called for by the river and harbor act approved June 25, 1910, used these words (H. Doc. No. 1076, 62d Cong., 3d sess.):

* * * The district officer believes the connecting channel between the basin and deep water in Kill Van Kull should be provided by the United States when the city project has been carried out and it has become more evident that commerce and navigation require this connecting link.

The commerce that would develop as a result of the project under consideration is entirely prospective and the amount conjectural. If the plan proposed is carried into effect, it seems probable that it would be a potent factor in the movement of the commerce of the city of New York and vicinity. The whole project is as yet in an incipient stage and it would be premature for the General Government to participate in the work at this time. It is believed, however, that the proposition has potential merit and that if the work within the harbor line is carried out by local authorities it will be advisable for the United States to provide a connecting channel between the harbor line and Kill Van Kull, provided the cost is reasonable.

In view of the above the board reports that the proposed work is not worthy of being undertaken by the Government at the present time.

In line with this I report that provided the cost is not excessive it would be advisable, in my opinion, for the United States to provide and maintain from the pierhead line at the entrance to the port Newark terminal to Kill Van Kull and the Upper Bay a channel of any depth required by the business of the terminal when utilized to anything like capacity. But the fact that the Newark terminal contributes practically nothing to the commerce using the present bay channel discourages the idea that adequate use would immediately follow the provisions of a deeper channel. So far, then, as the present and immediately prospective commerce of the Newark terminal or of Newark Bay is concerned, the deepening of the bay channel is not worthy of being undertaken by the United States at the present time. With respect to the request made by the terminal authorities that the side channel to the terminal be maintained by the United States, I recommend that the project for Newark Bay be modified to provide for the maintenance to the depth of 20 feet and width of 400 feet of that part of the Newark terminal channel which lies between the pierhead line and the United States channel in the bay at an estimated initial expense of $21,100 and an annual cost of $2,400. The sum of $21,100 should be appropriated in one sum.

8. The favorable recommendations in this report are: That the present channel in Newark Bay be made 500 feet wide (par. 6) and that the United States maintain that part of the channel leading to

the Newark terminal which lies between the United States channel in Newark Bay and the pierhead line (par. 7).

C. H. McKINSTRY,
*Lieutenant Colonel, Corps of Engineers.*

[First Indorsement.]

THE DIVISION ENGINEER, NORTHEAST DIVISION,
*New York City, January 16, 1917.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY.

1. Forwarded.

2. I concur in the views and recommendations of the district officer. At present serious consideration is being given by the city of Bayonne and the State of New Jersey through its board of commerce and navigation to the creation on the eastern shore of Bayonne of a very extensive ocean and railway terminal suited to accommodate the deepest draft ocean steamers. If this is actually built, the Newark terminal on Newark Bay will not be needed for ocean commerce, and will develop along the lines of an industrial center, for which 20 feet will suffice. The terminal is well situated and planned for such an industrial development. For this reason I believe that at this time the improvement suggested by the district officer is sufficient, and is well justified.

FREDERIC V. ABBOT,
*Colonel, Corps of Engineers.*

[For report of the Board of Engineers for Rivers and Harbors on survey, see p. 3.]

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DETAILED ESTIMATES OF COST OF CERTAIN PROPOSED IMPROVEMENTS IN NEWARK BAY.

| | |
|---|---|
| (*a*) To obtain a channel 21 feet deep and 400 feet wide from the United States channel in Newark Bay to the pierhead line crossing the Port Newark Terminal Channel. | |
| First cost: | |
| Excavating 137,224 cubic yards of mud, sand, and gravel, at 14 cents | $19,211.36 |
| 10 per cent for engineering and contingencies | 1,921.14 |
| Total | 21,132.50 |
| Annual maintenance: Excavating 17,010 cubic yards, at 14 cents | 2,381.40 |
| (*b*) To obtain a channel 26 feet deep and 400 feet wide in Newark Bay from Kill Van Kull to United States pierhead line crossing the Port Newark Terminal Channel. | |
| First cost: | |
| Excavating 2,257,955 cubic yards of mud, sand, and gravel, at 12 cents | 270,954.60 |
| Excavating 11,334 cubic yards of clay, at 30 cents | 3,400.20 |
| | 274,354.80 |
| 10 per cent for engineering and contingencies | 27,435.48 |
| Total | 301,790.28 |
| To ease turn at Bergen Point Light— | |
| Excavating 119,869 cubic yards of rock, at $2.25 | 269,705.25 |
| 10 per cent for engineering and contingencies | 26,970.53 |
| Total | 296,675.78 |

| | |
|---|---|
| Annual maintenance: Excavating 124,985 cubic yards, at 14 cents | $17,497.90 |

(*c*) To obtain a channel 26 feet deep and 500 feet wide in Newark Bay from Kill Van Kull to United States pierhead line crossing the Port Newark Terminal Channel.

| | |
|---|---|
| First cost: | |
| Excavating 2,811,320 cubic yards of mud, sand, and gravel, at 12 cents | 337,358.40 |
| Excavating 52,680 cubic yards of clay, at 30 cents | 15,804.00 |
| | 353,162.40 |
| 10 per cent for engineering and contingencies | 35,316.24 |
| Total | 388,478.64 |
| To ease turn at Bergen Point Light— | |
| Excavating 119,869 cubic yards of rock, at $2.25 | 269,705.25 |
| 10 per cent for engineering and contingencies | 26,970.53 |
| Total | 296,675.78 |
| Annual maintenance: Excavating 156,230 cubic yards, at 14 cents | 21,872.20 |

(*d*) To obtain a channel 31 feet deep and 750 feet wide in Newark Bay from Kill Van Kull to United States pierhead line crossing the Port Newark Terminal Channel.

| | |
|---|---|
| First cost: | |
| Excavating 5,538,960 cubic yards of mud, sand and gravel, at 11 cents | 609,285.60 |
| Excavating 1,833,284 cubic yards of clay, at 30 cents | 549,985.20 |
| | 1,159,270.80 |
| 10 per cent for engineering and contingencies | 115,927.08 |
| Total | 1,275,197.88 |
| To ease turn at Bergen Point Light— | |
| Excavating 879,335 cubic yards of rock, at $2.25 | 1,978,503.75 |
| 10 per cent for engineering and contingencies | 197,850.38 |
| Total | 2,176,354.13 |
| Annual maintenance: Excavating 238,485 cubic yards, at 14 cents | 33,387.90 |

(*e*) To obtain a channel 21 feet deep and 300 feet wide along easterly pierhead line from Kill van Kull to Droyers Point.

| | |
|---|---|
| First cost: | |
| Excavating 6,153,982 cubic yards of mud, sand, and gravel, at 15 cents | 923,097.30 |
| Excavating 78,432 cubic yards of clay, at 30 cents | 23,529.60 |
| | 946,626.90 |
| 10 per cent for engineering and contingencies | 94,662.69 |
| Total | 1,041,289.59 |
| Annual maintenance: Excavating 134,238 cubic yards, at 16 cents | 21,478,08 |

(*f*) To obtain a channel 21 feet deep and 300 feet wide along the westerly pierhead line from Arthur Kill to the mouth of the Passaic River, upper end of Newark Bay.

| | |
|---|---|
| First cost: | |
| Excavating 7,133,951 cubic yards of sand, mud, and gravel, at 10 cents | 713,395.10 |
| 10 per cent for engineering and contingencies | 71,339.51 |
| Total | 784,734.61 |
| Annual maintenance: Excavating 140,868 cubic yards, at 12 cents | 16,904.16 |

(*g*) To dredge the entire Newark Bay to 21 feet.

| | |
|---|---|
| First cost: | |
| Excavating 65,541,062 cubic yards of mud, sand, and gravel, at 12 cents | $7,864,927.44 |
| Excavating 1,163,450 cubic yards of clay, at 30 cents | 349,035.00 |
| Excavating 739,230 cubic yards of rock, at $2.25 | 1,663,267.50 |
| | 9,877,229.94 |
| 10 per cent for engineering and contingencies | 987,722.99 |
| Total | 10,864,952.93 |
| Annual maintenance: Excavating 238,485 cubic yards, at 14 cents | 33,387.90 |

(*h*) To widen the present 20-foot channel 100 feet, i. e., to 400 feet from Kill van Kull to "upper limit of bay" (see map).

| | |
|---|---|
| First cost: | |
| Excavating 568,767 cubic yards of mud, sand, and gravel, at 13½ cents | 76,783.54 |
| 10 per cent for engineering and contingencies | 7,678.35 |
| Total | 84,461.89 |
| To ease turn at Bergen Point Light— | |
| Excavating 41,568 cubic yards of rock, at $2.25 | 93,528.00 |
| 10 per cent for engineering and contingencies | 9,352.80 |
| Total | 102,880.80 |
| Annual maintenance: Excavating 126,700 cubic yards, at 14 cents | 17,738.00 |

(*i*) To widen present channel to 500 feet from Kill Van Kull to "upper limit of bay" (see map).

| | |
|---|---|
| First cost: | |
| Excavating 1,542,165 cubic yards of mud, sand, and gravel, at 13 cents | 200,481.45 |
| 10 per cent for engineering and contingencies | 20,048.14 |
| Total | 220,529.59 |
| To ease turn at Bergen Point Light— | |
| Excavating 41,568 cubic yards of rock, at $2.25 | 93,528.00 |
| 10 per cent for engineering and contingencies | 9,352.80 |
| Total | 102,880.80 |
| Annual maintenance: Excavating 173,970 cubic yards, at 14 cents | 24,355.80 |

(*j*) To widen present channel to 900 feet from Kill Van Kull to "upper limit of bay" (see map).

| | |
|---|---|
| First cost: | |
| Excavating 6,745,094 cubic yards of mud, sand, and gravel, at 12 cents | 809,411.28 |
| 10 per cent for engineering and contingencies | 80,941.12 |
| Total | 890,352.40 |
| To ease turn at Bergen Point Light— | |
| Excavating 41,568 cubic yards of rock, at $2.25 | 93,528.00 |
| 10 per cent for engineering and contingencies | 9,352.80 |
| Total | 102,880.80 |
| Annual maintenance: Probably | 30,000.00 |

NOTE.—The unit prices for mud, sand, and gravel are per yard scow measurement, and the quantities include side slopes of 1 on 3. Quantities in place are multiplied by 100/85 to obtain scow measurement. For rock excavation the unit is the cubic yard place measurement; side slopes of 1 on 1 are used.

In the case of each channel, the excavation is assumed to be carried to 1 foot below the project depth, and an overdepth allowance of 1 foot is also included.

## ACT OF THE NEW JERSEY STATE LEGISLATURE.

[State of New Jersey. Chap. 83, Laws of 1916.]

An act providing for the reclamation and improvement of salt marsh and meadow lands and lands under water and other lands within municipalities bordering on tidal waters in this State resulting from the construction of channels and the making of harbor improvements in the waters adjacent thereto and authorizing the board of commerce and navigation, on behalf of such municipalities, to arrange for and contract with the Federal Government for such improvements, and authorizing the levying by such municipalities of assessments for benefits to such lands resulting from the reclamation and improvement thereof by or from the construction of channels and harbor improvements in the waters adjacent thereto.

*Be it enacted by the Senate and General Assembly of the State of New Jersey:*

1. Upon the request of the board or body having charge of docks in any municipality bordering on tidewater in this State, or upon the request of the board or body having charge of streets in any such municipality where there is no board or body having charge of docks, the board of commerce and navigation shall have power, and it shall be the duty of such board, to establish a district or districts embracing the municipality or municipalities which in its judgment should be included, wherein are lands which can feasibly be improved by being filled with material to be obtained from any proposed improvement of the navigable water or waters adjacent thereto, or which lands would be benefited by an improvement recommended to be made by the Federal Government upon a proposed basis of cooperation between the Federal Government and any such municipality or municipalities.

2. The board of commerce and navigation shall, upon the receipt of such request and after conference with the Federal authorities having charge of any district port in which the improvements are proposed to be made, make an allotment or apportionment of the cost of making any such improvement which in its judgment should be paid by the respective municipalities as hereinafter provided and embraced within any district created by any such board for any one improvement: *Provided*, That said total payments to be made by the municipalities within said district shall not exceed 50 per cent of the cost of the total amount of work to be done in any one such project or improvement, and said board of commerce and navigation shall prepare a report showing the district or districts established by it wherein such improvement or improvements are proposed to be made, the allotment of cost of any such improvement to be paid by the municipalities within the district or districts so established, and the terms and conditions under which the Federal Government authorities will arrange with said board of commerce and navigation for the making of any such improvement, accompanied by a map showing the lands within each municipality in such district which can feasibly be improved or benefited by any such proposed work, and said board of commerce and navigation shall thereupon submit such report and map to the municipalities embraced within the district as established.

3. If there be lands under water, or salt marsh or meadow lands within any such municipality and shown on said map, which, in the judgment of the said municipal board or body, public necessity or interest demands should be reclaimed or filled, or if in its judgment public necessity or interest demands the construction of channels or harbor improvements which, or either of which, would specially benefit said lands or lands adjacent to said channels or harbor improvements, and if in its judgment it is advisable to arrange for such work to be done, upon the receipt by any such municipality of the report and map from the Board of Commerce and Navigation hereinbefore provided for, the said municipal board or body shall pass a resolution signifying that it is proposed to enter into arrangements with the Federal Government for participating in the cost of doing certain work in connection with harbor improvements by the construction of channels or the deepening of tidal waters adjacent to certain lands within said municipality which are shown on the map [1] submitted by the Board of Commerce and Navigation and approved by said municipal board or body. Such notice of intention shall be duly advertised in at least two newspapers published in the county in which the municipality

1 Not printed.

is situated (and if a paper is published in any such municipality such paper shall be one of those so selected) for at least once a week for two weeks, and said resolution shall fix a time and a place not earlier than two weeks after the publication of the first advertisement for a hearing on said proposed action; and prior to said hearing such municipal board or body shall prepare a tentative assessment showing the probable amount of assessments to be made against the property benefited, which proposed tentative assessments shall be presented at such hearing and shall be open to inspection, and any person desiring to he heard in regard thereto shall be given a hearing. After said hearing, if such municipal board or body shall decide to carry out the suggested cooperation with the Federal Government, it shall pass a resolution declaring such determination and setting forth that it will pay in the manner hereinafter provided its apportionment or contribution as made up by the Board of Commerce and Navigation, and said municipal board or body shall thereupon notify said Board of Commerce and Navigation of such action, and if all of the municipalities which have been included in any district for the carrying out of the proposed project shall signify that they will make the payments as so determined to be their respective portions of cost, then the Board of Commerce and Navigation shall transmit such information to the Federal district engineer in charge of any port district in which said municipalities lie and shall be authorized to enter into a definite understanding with the Federal Government authorities for the making of such improvement upon the terms and conditions assented to by such municipalities.

Should one or more of the municipalities which have been considered by the board of commerce and navigation to be included in the district so established decline or fail to signify a determination to join in the proposed undertaking within a period of 60 days after the receipt of the report and map from said board of commerce and navigation, said board shall reconsider the original proposition of apportioning the cost made by it; and if in its judgment it is practicable to work out a plan of cooperation with the Federal Government by which the benefits of the contemplated improvement may be more directly confined as far as practicable to that municipality which has, or to those municipalities which have, signified their willingness to pay its or their allotment of cost, said board shall make up a new apportionment of cost in connection with a new district in which benefits from such a cooperative plan of improvement may be given and shall then again submit a revised report and map, as hereinbefore provided, to the municipality or municipalities still remaining within said district; and if the part of said new district in any municipality where the said municipal board or body has passed a resolution of intention as herein provided shall differ from or include other lands than those included in such municipality in the original district, then a second proceeding based on notice of intention and hearing shall be had by such municipal board or body; and if said board or body shall determine to participate on the basis of any new apportionment so made, it shall notify the board of commerce and navigation, and said board of commerce and navigation shall communicate such determination to the Federal district engineer in charge of the port district in which said municipalities are situated, and said board of commerce and navigation shall be authorized to enter into a definite understanding with the Federal Government authorities for the making of such improvement upon the terms and conditions assented to by such municipality or municipalities.

The same process of elimination shall be continued until the board of commerce and navigation has come to an agreement with one or more municipalities providing for the cooperation with the Federal Government herein authorized.

4. The board of commerce and navigation shall be authorized to arrange with the Federal authorities having charge of the port district in which the municipalities included in any district created by said board lie; that in the execution of any such improvement herein authorized, the material resulting from dredging operations, etc., shall be used to fill and improve the lands as shown on the map as herein provided to be filed by it with the municipalities interested; and it shall be lawful to enter upon, use, and occupy the lands as shown on said map for the purpose of filling, bulkheading, and improving the same.

5. Any municipality embraced within a district created as provided by this act is hereby authorized to issue its bonds, temporary loans, or other form of obligation in the form now provided by law for temporary loans in anticipation of assessments for the amount of its allotment, as ascertained by the method herein provided; and such money shall be raised by the board or body having

charge of the finances of any such municipality upon the request of the board or body having charge of docks or upon the request of the board or body having charge of streets in any such municipality where there is no board or body having charge of docks.

Upon notice to the municipality from the Federal district engineer in charge of the port district in which such municipality is located that he has available for the execution of any proposed improvement for which the board of commerce and navigation has made an allotment of cost as herein provided, an appropriation of moneys from the Federal Government or an authorization to arrange for said work in an amount at least equal to 50 per cent of the total cost of any such proposed improvement, the funds to be contributed by such municipality shall be paid by it into the Treasury of the Federal Government and become available for the carrying out of such proposed improvement by the Federal authorities in accordance with the definite understanding made between said board of commerce and navigation and the Federal authorities in charge of the port district in which the municipality lies. If the Federal authorization herein referred to shall provide for part of the work to be done by local or State agencies, any municipality taking advantage of this act, or the board of commerce and navigation, is hereby empowered to carry out such part of the work in addition to or in lieu of depositing any or all of the money to be contributed by the municipality or municipalities; said work to be done and paid for as may be provided for in any agreement, contract, or understanding reached between any of the parties thereto.

Such sums as may be received by any municipality from assessments made in accordance with this act shall be applied to the payment of the temporary loans herein authorized to be issued, and any balance of the amount of the cost of the work done by the municipality, or by the board of commerce and navigation on behalf of such municipality, and the contribution made by any such municipality to the Federal Government in excess of the amount assessed as benefits shall either be placed in the tax levy of such municipality or bonds similar to those now authorized for deficiency of assessments may be issued therefor, and the interest and sinking-fund charges on such bonds shall be provided for in the tax levy until such bonds are paid.

6. Upon the completion of any such improvement, the board or body having charge of docks in said municipality, or the board or body having charge of streets in any such municipality where there is no board or body having charge of docks, is hereby authorized to make an assessment upon so much of the lands within the said municipality included in the report and map submitted by the board of commerce and navigation upon which the notice of intention hereinbefore provided was based as, in the judgment of said municipal board or body, are especially benefited, for benefits in a total amount not exceeding the cost of work done by the municipality, or by the board of commerce and navigation on behalf of such municipality, and any contribution made by any such municipality to the Federal Government for such improvement; but before the assessments so made for benefits are confirmed by any such municipal board or body in any such municipality so agreeing to contribute, it shall be the duty of said board or body to advertise in the manner now required by law for advertisements for hearings on matters of assessments, that it proposes to consider the confirmation of the assessments for benefits upon all or part of the lands included within such report and map prepared as herein provided by the board of commerce and navigation, and said advertisement shall designate a time and place at which any person interested may be heard in regard to such proposed assessments. After such hearing said municipal board or body shall by resolution confirm such assessment after making such modification as it shall deem proper, and any such assessment when so confirmed shall become due and payable as is now provided by law in any such municipality for assessments for street pavements, and where in any municipality such assessments may be made payable in five annual installments such methods of paying these assessments may be pursued, and all such assessments when filed with the proper municipal officer shall become liens upon the property against which such assessments are levied, in the same manner in which taxes become liens on property.

7. In the event that any portion of the lands included within lands benefited or improved by any work done in connection with the dredging of channels, etc., shall be riparian lands or lands under water, for which the riparian grant has not theretofore been made by the State, the municipal board or body which is authorized to make an assessment for improvements in accordance with this

act shall be, and is hereby, authorized to include in any such assessment a prospective assessment against such riparian lands, and a copy of such prospective assessment shall be filed with the board of commerce and navigation, and the same shall be a part of the records of said board. Upon the sale or grant by the State of the riparian rights to any such lands for which a prospective assessment has been filed with said board, the amount of such prospective assessment, together with interest at the rate of 5 per cent per annum from the time of the confirmation of the assessment for said improvement, shall by the board of commerce and navigation be included in the purchase price fixed for such lands and made a part of the payment for the grant, and the amount of such assessment, with interest as aforesaid, when paid, shall be turned over by such board of commerce and navigation to the municipality which has contributed to the Federal Government for the cost of the improvement by which said lands are benefited.

Such a prospective assessment shall also be made and included in the general assessment for and against any such riparian lands or lands under water for which an annual rental or fee is being charged or collected by the board of commerce and navigation under any agreement by which the fee of any such riparian lands is to pass, and when such fee does so pass by grant from the State such prospective assessment shall become immediately due and payable, together with interest thereon at the rate of 5 per cent per annum from the time of the confirmation of the assessment for such improvement, and said assessment shall become a lien upon such lands until paid, and shall be collectible as other liens for public improvements are now collectible in any such municipality.

8. If for any reason any section, clause, or provision of this act shall be questioned in any court and shall be held to be unconstitutional or invalid, no other section, clause, or provision of this act shall be affected thereby.

9. All acts or parts of acts inconsistent herewith are herewith repealed, and this act shall take effect immediately.

Approved March 16, 1916.

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WAR DEPARTMENT.

CORPS OF ENGINEERS U.S. ARMY.

INDEX MAP
SHOWING NEWARK BAY AND APPROACHES
Scale: in feet.
0 10,000 20,000 30,000

NOTES.

Probings are indicated by the symbol 0. The number above the symbol is the serial number of the probing; the number below is the depth of water at the site of the probing. Soundings are referred to the plane of Mean Low Water.

Probings along the bridges of the Lehigh Valley R.R., the Pennsylvania R.R. and the Central Railroad of New Jersey were taken by the railroad companies respectively. Those along the line "A-B" by the Passaic Valley Sewage Commission.

All probings were carried to the depth of 36 feet below M.L.W. without encountering rock except those in the following table which are indicated on the map by large circles, thus: 173 / 9.2

| No. | Depth of Water at M.L.W. | MATERIALS. Order of Penetration. | Bottom of Probing | Total Penetration below Mean Low Water |
|---|---|---|---|---|
| 173 | 9.2 ft. | 3.7 S. & Shells - 2.4 S. & G. - 4.3 S. - 3.0 S. & Br. Sh. - 1.8 C. & Sh. - 3.1 Stiff C. | Shale Rk. | 27.5 ft. |
| 174 | 4.5 " | 14.8 M. - 7.7 S., Sh. & C. - 2.0 S. - 5.9 C. & Sh | Rock | 34.9 " |
| 176 | 14.3 " | 6.0 M. - 0.6 S. - 4.4 C. & Sh. | Shale Rk. | 25.3 " |
| 177 | 12.4 " | 2.6 M. - 1.7 S. - 15.7 Stiff C. | Rock | 32.4 " |
| 180 | 4.3 " | 16.0 S. & Shells - 2.6 G. - 11.1 C. & Br. Sh. | Rock | 34.0 " |
| 181 | 7.4 " | 9.0 S. & Shells - 10.1 C. & Sh. | Shale Rk. | 26.5 " |
| 185 | 2.0 " | 4.7 S. & G. | Rock | 6.7 " |
| 186 | 30.1 " | 0.6 S. | Rock | 30.7 " |
| 188 | 6.6 " | 5.2 M. & S. - 13.3 C. & Sh. - 0.4 C. & S. | Shale Rk. | 25.5 " |
| 194 | 7.1 " | 2.1 M. - 2.8 S. - 8.2 C. & S. - 4.2 C. & Sh. | Hd. Pan or Rock | 24.4 " |
| 195 | 6.6 " | 1.0 S. | Rock | 7.6 " |
| 196 | 8.8 " | 1.7 S. & Shells - 2.1 S. & G. - 7.3 C. - 5.0 C., Sh. & Hd. S. | Rock | 24.9 " |
| 197 | 7.1 " | 3.1 S. - 1.4 C., S. & Sh. | Rock | 11.6 " |
| 198 | 7.9 " | 5.5 S. | Rock | 13.4 " |
| 199 | 4.5 " | 4.3 S. - 3.0 C. - 1.3 C. & Sh. | Shale Rk. | 13.1 " |
| 200 | 10.1 " | 4.2 S. - 9.6 C. - 0.4 Sh. Rk. | Shale Rk. | 24.3 " |
| 201 | 5.6 " | 1.4 S. | Rock | 7.0 " |
| 202 | 15.2 " | | Rock | 15.2 " |
| 203 | 17.9 " | 3.4 G. - 0.1 Hd. Pan or Rk. | Hd. Pan or Rock | 21.4 " |

M. = Mud.
S. = Sand.
C. = Clay (Soft unless marked hard).
G = Gravel.
Sh. = Shale.
Rk. = Rock.
Br. = Broken.
Hd. = Hard.

BENCH MARK.
The Bench Mark is on old Passaic Light, cut in stone on outer edge of upper surface of masonry. Elevation is 10.20 above the plane of Mean Low Water.

SOUNDINGS.
Soundings are expressed in feet and tenths and are referred to the plane of Mean Low Water.
The 21 ft. curve is shown thus: — · — · —
" 25 ft. " " " " — — — —
" 30 ft. " " " " — · · — · · —

The mean range of tide is 5.0 ft.

# NEWARK BAY, N.J.

IN 1 SHEET. SCALE: IN FEET. 100 0 500 1000 1500 3000

U.S. ENGINEER OFFICE, N.Y. DIST. NO. 3. JANUARY, 1917.

SUBMITTED: H. B. Gotham, Assistant Engineer.
APPROVED: C. W. McClintock, Lieut. Col., Corps of Engineers.

DRAWN BY C.L.A. FILE NO. 206. TRANSMITTED WITH REPORT DATED: JANUARY 4, 1917.

TO ACCOMPANY REPORT CALLED FOR IN RIVER & HARBOR ACT OF MARCH 4, 1915.
House Doc. No. 2110 ; 64th Cong., 2d Sess.