

continuing the securing of the public works of the harbor of Southport, Conn."

The records do not show how these sums were applied, but it is believed that a revetment of stone was built on the west or river side of the dike, timber beacons filled with stone erected at the outer end of the breakwater and on the bar, and the channel deepened by the use of teams and scrapers at low water.

Under date of September 26, 1838, Capt. W. H. Swift, United States Engineers, recommended the construction of a revetment wall on the east face of the dike of the same dimensions as that on the west face, as follows: 4 feet thick at base, 2 feet at top, and 8 feet high, laid upon a grillage about 6 feet in width, sufficiently below the surface to secure a good foundation. The grillage to be formed of 3-inch plank laid transversely of the wall and fastened together by plank of the same description laid longitudinally. The width of the dike at the top to be 8 feet.

The cost of this work was estimated at \$2,581.60. Under date of September 8, 1839, Captain Swift renewed his recommendation for the construction of the wall on the east side of the dike. The channel has a depth of about 2 feet at low water.

In August, 1870, the Chief of Engineers made an allotment of \$500 from the general appropriation for examinations or surveys for a survey of Southport Harbor. Under date of January 14, 1871, Bvt. Maj. Gen. G. K. Warren gave a condensed history of the work at this place.

In view of the limited means, a survey was not deemed necessary, but after a personal examination an estimate of all that was needed to be done was made as follows:

To restore the wall in good condition, uniformly to its present (1870) level, 100 cubic yards of stone, at \$6	\$600
To raise the wall 4 feet for a distance of 200 feet, using split granite blocks, doweled and clamped together, 200 cubic yards, at \$15	3,000
To raise 80 feet of wall 2 feet with large blocks of granite, clamped and doweled, 385 cubic yards, at \$15	5,77
To raise the revetment wall of dike 2 feet over whole length, 400 cubic yards of wall, at \$4	1,600
To fill the space between two walls, 750 cubic yards coarse gravel, small stones, or spalls from quarry, at \$1	750
For a stone ice-breaker at the north end of the dike	500
Total for breakwater and dike	12,225

No estimate for dredging was thought necessary.

It was recommended that an appropriation of \$12,225 be made to repair these works.

By act of Congress of March 3, 1875, \$5,000 was appropriated "for the repair of breakwater and piers at Southport, Conn."

With the money it was proposed to increase the height of the breakwater 2 feet by laying a granite coping 2 feet thick upon the top of the old wall. All the coping stones, each 5 feet long, to be laid as headers. Proposals were invited and bids opened June 22, 1875, and the contract awarded to Messrs. Beattie & Dresser, of Guilford, Conn., at \$5.90 per cubic yard. Work was commenced September 4, 1875, and completed January 8, 1876. For a length of 853 feet the new coping was laid on top of the old wall after bringing it to an even surface, and for 183 feet at the shore end of the work it was raised 0.5 foot higher; 387 cubic yards of coping were used, and in addition 184 cubic yards of rubblestone, at a cost of \$4 per cubic yard, were used in repairs. During the month of September, 1875, a survey of the harbor was made under the direction of Maj. J. W. Barlow, Corps of Engineers, by Mr. Wm. W. Starr, jr., assistant engineer. In a report to Colonel Barlow, dated

SOUTHPORT HARBOR, CONN.

June 30th 1879.

Scale of Feet.



The mean rise and fall of tide is 6.64 feet.

The shaded area has a depth of 4 feet.

The contours are as follows:

Low water line

3 feet curve

6

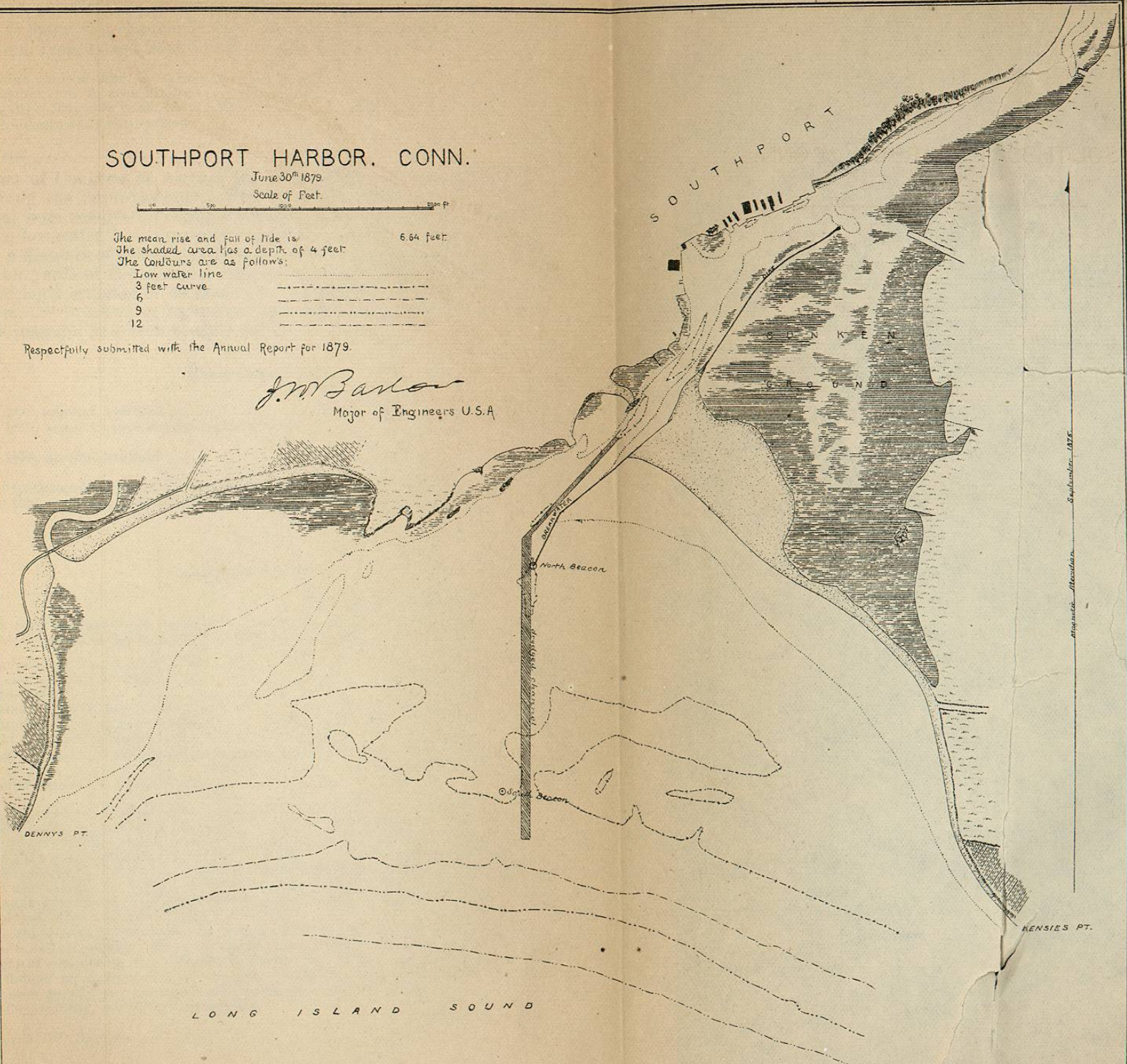
9

12

Respectfully submitted with the Annual Report for 1879.

J. M. Barber

Major of Engineers U.S.A.



March 15, 1876, Mr. Starr estimated the amount of material to be removed to make the channel 50 feet wide and 5 feet deep at mean low-water from Long Island Sound to the upper docks as—

40,200 cubic yards of sand, to cost about 25 cents per cubic yard.....	\$10,050
15 to 20 cubic yards of rock in place	200
Refilling dike, 500 cubic yards, at 30 cents.....	150
Superintendence and contingencies	1,005
Total	11,305

By act of Congress of August 14, 1876, \$5,000 was appropriated for continuing the improvements. With this sum 17,319 cubic yards of material were removed, making a channel 60 feet wide and 4 feet deep at mean low-water from the outer beacon to above the end of the breakwater, a distance of about 2,800 feet, at a cost of 17 cents per cubic yard; 631 cubic yards of the material removed were deposited in the dike at an additional expense of 20 cents per cubic yard. Repairs were also made on the breakwater by placing new stone below the coping where the old material had been washed out by the waves.

Money statement.

July 1, 1878, amount available.....	\$652 69
July 1, 1879, amount expended during fiscal year.....	631 09
July 1, 1879, amount available	21 60
Amount (estimated) required for completion of existing project.....	5,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881..	5,000 00

COMMERCIAL STATISTICS.

SOUTHPORT, CONN., July 9, 1879.

DEAR SIR: In response to your letter of July 2, permit me to submit the following statistics in regard to the Southport Harbor and shipping:

Total number of vessels of all classes entered and cleared during the fiscal year ending June 30, 1879.....	250
Total tonnage.....	3,000
Estimated value of cargoes received.....	\$700,000
Estimated value of cargoes exported.....	\$150,000
Draught of vessels (average).....	7 feet.
Number of vessels of all classes entering the harbor for refuge during the year	700
Number of vessels owned in the village	14

Ordinary market schooners cannot come into the wharves at low-tide.

Present width of channel so far as dug by government, 50 feet.

Our greatest trouble at present is the incomplete condition of the new channel. It is only half the contemplated or requisite width, and dug for only part of the way in.

In the present condition, the vessel-owners inform me, it is worse than no channel at all, for not being wide enough to permit a vessel to be worked in it they strike and get caught upon its sides, and when the tide goes out get very severely wrenched. Two have already been seriously injured in this way.

Our crying need at present is the completion of this channel so begun and left incomplete and dangerous. Please represent in your report, as far as you are able, the necessity of completing this unfinished work. Our vessels are really in more than usual danger on account of it as now left. With our channel completed our harbor would soon greatly increase its already, to us, important business.

Respectfully, your obedient servant,

JNO. H. PERRY.

Major J. W. BARLOW.

C 8.

IMPROVEMENT OF PORT JEFFERSON HARBOR, LONG ISLAND, NEW YORK

By act of Congress of June 18, 1878, \$8,000 was appropriated for continuing the improvement.

Advertisements were issued for the delivery of riprap granite to be applied to extending the two jetties.

Abstract of proposals received August 6, 1878, for improving the harbor at Port Jefferson, N. Y.

Names.	Address.	Price per ton.	To commence—	To complete—	Remarks.
Charles F. Stoll.....	New London, Conn.	\$1 12	Aug. 10, 1878	Dec. 1, 1878	Signature to proposals not witnessed.
Francis H. Smith.....	New York, N. Y.	1 08	At once.....	Dec. 1, 1878	
John Beattie.....	Guilford, Conn.	1 05	Aug. 10, 1878	Dec. 1, 1878	
Asa C. Palmer.....	Fayetteville, N. Y.	1 22	Aug. 20, 1878	Dec. 1, 1878	
Luce & Haskins.....	East Lyme, Conn.	1 05	Aug. 10, 1878	Dec. 1, 1878	
Ingerson & Molthrop.	New London, Conn.	1 08	Aug. 15, 1878	Nov. 30, 1878	

The contract was awarded to John Beattie. Work was begun on the 17th of August and continued until December 1, during which time 5,703 tons of riprap were delivered and placed as follows: 990 tons upon the east jetty, and 4,713 in lengthening the west jetty 450 feet. The latter extension has been raised but 2 feet above low water, except the outer end and an intermediate point, where the height was made equal to the old work for the purpose of marking the position of the line for passing vessels.

This extension has had the important effect of so modifying the direction of the ebb current, that the shoal which recently formed near the end of the east jetty has nearly disappeared. In April, 1879, the work was resumed by the contractor under an extension of his contract, and an additional amount of 1,437 tons of riprap delivered. This stone was placed on the outer end of the east jetty, extending that structure seaward 70 feet. It is believed the jetties are now sufficiently advanced to protect from filling a dredged channel suitable for the use of vessels seeking this harbor. This opinion is based upon the fact that the experimental cut made through the bar in 1877 remains nearly unchanged, having slightly enlarged from its original dimensions. The plank fence built at the head of the east jetty to arrest the passage of sand over the beach has been almost entirely demolished, proving the inadequacy of this method in so exposed a position. It is therefore proposed to replace this fence by a dike made of two parallel fences, strongly built and tied together, the space between filled with sand.

Such a structure would be inexpensive, durable, and, it is believed, sufficiently strong for the purpose. Its cost would be about \$1 per running foot; the length required is about 600 feet. As large quantities of sand are carried over the beach into the channel on occasions of severe easterly storms, the construction of this dike is urgently recommended.

During the season the inspector in charge, Mr. F. N. Owen, determined the direction of the currents at the mouth of the harbor. The results of this work are given on the accompanying charts and are explained in the following report.

The current mentioned as passing through the old mouth of the harbor will always be a disturbing element in the permanent improvement of this harbor. It was hoped that this old channel would fill up by natural causes, but as little change has been observed in a number of years, it is deemed advisable at some future time to place in it artificial obstructions. Preliminary to this the heavy dredged material taken from the bar will be deposited in this channel, which will have the effect of lessening the current; after this, some cheap form of dike may be built if thought necessary. A substantial improvement of this harbor having been so nearly attained, it is the more urgently recommended that the dredging which is necessary to open this beautiful bay as a refuge to vessels in need of shelter be at once undertaken with the funds appropriated by the last Congress, and that an additional sum adequate to complete the improvements as recommended in previous reports be appropriated next year.

The plans adopted in 1875 provide for the extension of the jetties to the 9-foot curve at an estimated cost of..... \$22,500
Dredging and contingencies..... 11,500

Total..... \$34,000

In prosecution of this project \$14,000 have been expended and \$5,000 additional appropriated; \$15,000 should be appropriated to complete the improvements. The whole sum could be profitably expended during the next fiscal year.

Following are the several amounts which have been appropriated for the improvement of this harbor.

March 3, 1871..... \$15,000
June 10, 1872..... 15,000
March 3, 1875..... 15,000
August 14, 1876..... 6,000
June 18, 1878..... 8,000
March 3, 1879..... 5,000

The original estimates amounted to \$150,000, but have since been modified as above stated.

Port Jefferson is in the New York collection-district. The nearest light-house is on "Old Field Point," immediately west of the harbor entrance. Fort Hale, New Haven Harbor, 23 miles distant, is the nearest work of defense.

HISTORY OF THE IMPROVEMENT TO 1879.

Port Jefferson is situated on the north shore of Long Island, about 60 miles east of New York. It is the terminus of the Port Jefferson branch of the Long Island Railroad, and has a population of about 2,000 inhabitants. The principal business of the place is ship-building and fruit-raising; about 170 vessels are owned here either wholly or in part. The harbor is 1½ miles long and 1 mile wide, surrounded on three sides by high hills; it is nearly closed by a sand-spit, the entrance being a narrow opening about 400 feet wide, through which the tide at certain stages runs with a velocity of 5 knots per hour. The mean rise and fall of the tide is: Inside, 6.22 feet; outside, 7 feet. By act of Congress approved August 2, 1852, \$12,000 was appropriated "for a survey of Port Jefferson, N. Y., with reference to the improvement thereof."

In the summer of 1853 Lieut. M. Harrison, United States Engineers, made a survey, and reported that "Port Jefferson is a beautiful harbor in itself, and would doubtless be extremely valuable as a harbor of refuge to the multitudes of coasting vessels that pass it. I know of no

other claims it has to special consideration." By the second section of the act of Congress approved July 2, 1870, an examination or survey was ordered at the entrance to Port Jefferson Harbor, on the south side of Long Island Sound.

A personal examination was made by Maj. G. K. Warren, in whose charge the work was placed, and in January, 1871, he submitted a report, in which the improvement of the entrance to the harbor was strongly urged. Estimates were submitted as follows:

For building breakwater on east beach.....	\$150,125
For dredging channel 200 feet wide, 7 feet deep.....	15,000
	165,125

By an act of Congress of March 3, 1871, \$15,000 was appropriated for the improvement of the harbor. Proposals were invited for building a riprap sea-wall on the east side of the entrance to the harbor and for dredging.

Bids were opened June 7, 1871, and the contract for stone awarded to Mr. C. C. Campbell, at \$2.83 per ton, and for dredging to Mr. W. H. Beard, at 45 cents per cubic yard. Under these contracts 3,075 tons of stone were delivered in the breakwater, making it 600 feet long and 6½ feet high above mean low-water plane. No dredging was done. During the summer of 1871 a survey was made of the harbor, under the direction of Major Warren, by Capt. W. S. Edwards, assistant engineer. By act of Congress approved June 10, 1872, \$15,000 was appropriated for continuing the improvement of the harbor. A contract for granite to be used in the extension of the breakwater was made with Mr. John Beattie, at the rate of \$2.67 per ton. Under this contract 4,470 tons of stone were delivered and the work extended 1,052 feet.

During the spring of 1873 another map of the entrance to the harbor was made, under the direction of Major Warren, by Mr. J. H. Dager, assistant engineer.

In June, 1874, another survey was made of the entrance to the harbor by Mr. H. N. Babcock, assistant engineer, to ascertain the changes that had taken place during the previous winter. In July, 1874, the charge of this work was transferred from Major Warren to Maj. J. W. Barlow, Corps of Engineers.

By act of Congress of March 3, 1875, \$15,000 was appropriated for continuing the improvement. A contract was entered into with Mr. F. H. Smith for granite to build a jetty from the west shore. The price paid was \$1.44 per ton. Under this contract 3,933 tons of stone were used in the construction of a jetty from the west shore, 475 feet long and 11 feet high above mean low-water. A contract was also made with Mr. S. F. Shelburne for dredging, but the latter, after removing 165 cubic yards of sand and gravel, abandoned the work.

By act of Congress of August 14, 1876, \$6,000 was appropriated for continuing the improvement, but authority to spend the same was not granted until the spring of 1877. May 24, 1877, bids were opened and a contract awarded to Messrs. Ingerson & Molthrop, of New London, Conn., to deliver riprap granite on the east breakwater at the rate of \$1.33 per ton. Work was commenced June 17, 1877, and completed August 8, 1877, during which time 4,504 tons of riprap were used in increasing the height of the east breakwater to 5 feet above mean high-water plane and in extending it seaward a distance of 50 feet.

In July, 1877, a dredge of the Osgood pattern was hired of Mr. Morris F. Brainard, of Albany, N. Y., at the rate of \$6.50 per hour, working

