NEW HAVEN HARBOR

CONNECTICUT

PRELIMINARY EXAMINATION (REVIEW OF REPORTS)

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION, BOSTON, MASS.

JULY 25, 1956

NOT FOR PUBLIC RELEASE

PRELIMINARY EXAMINATION
(REVIEW OF REPORTS)

on
NEW HAVEN HARBOR, CONNECTICUT

SYLLABUS

The Division Engineer has investigated the need for improvement of New Haven Harbor, and has carefully considered all specific proposals for such improvement.

In view of the inadequate economic justification, he recommends that no survey be made at this time with a view to deepening the existing 35-foot main harbor channel, or the 12-foot Mill River channel, nor extending the Quinnipiac River channel beyond its presently authorized limits. He further recommends, on the same basis, that no survey be made at this time with a view of constructing breakwaters at Morris Cove, City Point, or Prospect Beach for the purpose of providing protection for small craft. The Division Engineer finds, however, that probable economic benefits to recreational boating from the provision of moderate anchorage areas in the sheltered part of the harbor are sufficient to warrant a survey thereof to determine the extent and cost of small boat anchorages needed and the Federal interest therein.

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION
BOSTON, MASS.

NEDGW 25 July 1956

SUBJECT: Preliminary Examination (Review of Reports) on New Haven Harbor, Connecticut

TO: Chief of Engineers, Department of the Army, Washington 25, D. C.

AUTHORITY

1. This report is submitted in compliance with the following resolutions adopted by the Committee on Public Works of the House of Representatives, United States, and by the Committee on Public Works of the United States Senate, on December 14, 1950 and on April 23, 1954, respectively:

> "RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE HOUSE OF REPRESENTATIVES, UNITED STATES, that the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on New Haven Harbor, Connecticut, submitted in House Document No. 517, 79th Congress, 2nd Session, and prior reports, with a view to determining the advisability of modifying the existing project at this time, particularly with regard to providing a small boat anchorage."

> "RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, that the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report of the Chief of Engineers on New Haven Harbor, Connecticut, published as House Document Numbered 517, Seventy-Ninth Congress, Second Session, and prior reports, with a view to determining whether the existing project should be modified in any way at this time."

SCOPE OF EXAMINATION

2. A report of preliminary examination scope was authorized by the Chief of Engineers on January 8, 1951, and on June 11, 1954, based on the above House and Senate resolutions.

3. In the preparation of this report, consideration of the locality has been limited to field reconnaissance, and to office study of data obtained from existing records, local representatives, and as a result of a

public hearing. No detailed field work has been undertaken.

DESCRIPTION

4. New Haven Harbor is located on the north shore of Long Island Sound, about 67 miles east of New York Harbor, and about 44 miles west of New London Harbor. The nearest small boat harbors are Milford, about 7 miles to the west, and Branford, about 7 miles to the east.

5. New Haven Harbor is a large tidal bay from 1.0 to 4.0 miles wide, extending about 4.5 miles northward from breakwater protection at its entrance to a point just below Tomlinson Bridge, and including the navigable portions of the West, Mill, and Quinnipiac Rivers. The outer harbor is from 2.0 to 4.0 miles wide, and extends from the protecting breakwaters at the harbor entrance to Sandy Point on the west shore and into Morris Cove on the east shore. The main harbor extends about 2.0 miles from Sandy Point north to Tomlinson Bridge, and varies in width from 1.0 to 1.5 miles. Except for dredged areas, depths over about half of the outer harbor are from 15 to 25 feet, and in the inner harbor less than 6.0 feet for the most part. The major part of the harbor is subdivided into oyster grounds.

6. Of the three rivers the navigable portions of which are considered part of the harbor, West River is the southernmost, entering the west side of the inner harbor through a wide, shallow mouth north of Sandy Point. The approach to West River from the main harbor channel is via an entrance channel which extends from the vicinity of the anchorage area west of the main channel and leads westward past City Point, thence southward about halfway across the river mouth, thence westward and northward close inshore of West Haven to the head of navigation at an expressway bridge presently under construction about 650 feet north of Kimberly Avenue Bridge. The Quinnipiac and Mill Rivers join at the northeast end of the inner harbor. From their junction, the Mill River extends northerly about 0.5 mile, thence branches into two channels which extend about one-quarter mile further to Grand Avenue, above which the river is navigable for small craft for about 0.5 mile. The Quinnipiac River extends easterly and northerly about 1.1 miles to the Grand Avenue Bridge, and thence nearly 1.0 mile to Middletown Avenue and the railroad bridges immediately upstream.

7. The inner harbor is well protected, but the outer harbor is partially exposed to southerly storms and partially protected by breakwaters. The mean range of tide is 6.2 feet, although tides of 2.5 feet below and 8.0 feet above mean low water have occurred. Between the entrance breakwaters, the tidal current has an average velocity at strength of about 1.5 knots. Ice generally obstructs navigation to some extent for sailing vessels from December to March, but except in winters of record cold weather the harbor is always open for steamer traffic. Prevailing winds are south and southwesterly during the summer, and northerly during the remaining months of the year. The heaviest gales occur from the northeast and the southeast. During 1950, fog signals located at stations east and west of the harbor operated a total of 839

and 440 hours, respectively. During the period from May to October inclusive, the recreational boating season, signals east and west of the harbor operated 330 and 146 hours, or about 8 and 3 percent of the time, respectively. Morris Cove, used by yachts as an anchorage, is exposed and rough in westerly winds. The locality is shown on United States Coast and Geodetic Survey Charts, Numbered 218 and 1212, and on the map accompanying this report.

TRIBUTARY AREA

8. The area tributary to New Haven Harbor includes approximately 40 percent of the State of Connecticut and has a total population of over 1,000,000. In 1950, the City of New Haven had a population of about 165,000, and the combined population of the cities and towns within a 15-mile radius totaled about 425,000. The principal industries of the area are the manufacture of steel and iron products, firearms, brass, copper, and silverware, and rubber goods. New Haven is on the main line of the New York, New Haven, and Hartford railroad, between Boston and New York. Modern highways, including United States Route No. 1, and the Merritt and Wilbur Cross Parkways, radiate from New Haven to all parts of New England and to New York.

BRIDGES

9. No bridges cross New Haven Harbor proper, but West. Mill, and Quinnipiac Rivers are crossed by a series of bridges. The West River is crossed by two bridges: (1) by the Kimberly Avenue Bridge, a bascule type highway bridge with a horizontal clearance of 45 feet and a closed vertical clearance of 7.2 feet at mean high water; and (2), about 650 feet upstream, at the head of navigation established by Congress, by the Connecticut expressway over a fixed bridge now under construction. The new bridge will have a horizontal clearance of 100 feet and a vertical clearance of 23 feet at mean high water. The Mill River is crossed by two bridges: (1) by the Chapel Street Bridge, a swing type highway bridge with horizontal clearances of 71 and 72 feet, and a closed vertical clearance of 7.1 feet at mean high water, located about 0.3 mile above the entrance of the river; and (2) at the head of navigation, about 0.6 mile upstream from the Chapel Street Bridge, the east and west branches of Mill River are both spanned by Grand Avenue over fixed bridges with horizontal and vertical clearances on the east branch of 39.5 and 6.0 feet, respectively, and on the west branch of 20.0 and 4.5 feet, respectively. The Quinnipiac River is crossed by four bridges: (1) by the Tomlinson Bridge, located at its entrance, a bascule type highway bridge which forms the upper limit of New Haven Harbor proper and has a horizontal clearance of 125.4 feet, and a closed vertical clearance of 12.1 feet at mean high water; (2) by the Ferry Street Bridge, located about 0.6 mile above the Tomlinson Bridge, a bascule type highway bridge with a horizontal clearance of 101 feet and a closed vertical clearance of 25.5 feet at mean high water; (3) by Grand Avenue, about 0.5 mile upstream from the Ferry Street Bridge, over a swing type bridge having a horizontal clearance of 70 feet and a closed vertical clearance of 9.5 feet at mean high water; and (4) by the Middletown Avenue Bridge, about 1.0 mile further upstream, a fixed highway bridge with horizontal and vertical

clearances of 40.0 feet and 7.0 feet, respectively.

10. The Connecticut expressway, presently under construction and referred to above, will span the West River with a fixed bridge 650 feet upstream from the Kimberly Avenue Bridge. Public Law 289, 84th Congress, 1st Session, declared that portion of the West River upstream from this new bridge non-navigable; the act was approved August 9, 1955. The same expressway will span the Quinnipiac River about 300 feet upstream of the Tomlinson Bridge as a fixed bridge with horizontal and vertical clearances of 283 and 60 feet, respectively.

PRIOR REPORTS

11. The main harbor of New Haven and its tributary rivers have been the subject of numerous reports since 1852, and improvement of the harbor under previous projects includes the removal of rocks from the entrance to the harbor and from Morris Cove, and the dredging of channels through the harbor and in West River. Data on other prior reports are given in House Document No. 106, 76th Congress, 1st Session. The report printed in House Document No. 517, 79th Congress, 2nd Session, the report under review, is the basis of the major portion of the existing project, providing for the 35-foot main harbor channel, elimination of the 30-foot anchorage, the present location and extent of the 16-foot anchorage, and for the 22-foot channel and turning basin in Quinnipiac River. This report is the latest of the reports under review.

EXISTING CORPS OF ENGINEERS PROJECT

12. The natural depth across the bar at Fort Hale, before the commencement of Federal improvement was about 13 feet, while the controlling depth within the inner part of the harbor was about 9.0 feet. The first work done by the Federal government consisted of the removal of obstructing rocks at the entrance to the harbor. In 1871, dredging was commenced to secure a channel 14 feet deep and 200 feet wide through the harbor to the adjacent wharves. Subsequent acts and appropriations have secured the present channel and anchorage dimensions and depths. At the present time there are two existing projects for New Haven Harbor, the first providing for the breakwaters at the harbor entrance, and the second providing for the various improvements within the harbor and its tributary rivers.

13. The existing breakwater project for New Haven Harbor, adopted in 1879, extended in 1890, and modified in 1900 provides for the construction of three riprap breakwaters as follows: (1) an east breakwater, located about 2,500 feet southwest of Morgan Point and extending southwesterly for 3,450 feet; (2) a middle breakwater, located about 3,200 feet west southwest of the east breakwater, and extending 4,450 feet southwesterly; and (3) a west breakwater, located about 4,000 feet southeast of Oyster River Point, (Ames Point) and extending southeasterly 4,200 feet. The main harbor channel passes between the east and middle breakwaters. This project was completed in 1915.

14. The existing project for New Haven Harbor, adopted in 1882, and modified in 1899, 1910, 1912, 1930, 1935, 1946, and 1955, provides for: (1) a main harbor channel and three lesser channels; (2) a turning basin; (3) three anchorage basins; (4) a pile and riprap dike; and (5) the removal of certain obstructions. Channels provided are as follows: (1) a main harbor channel 35 feet deep, 400 to 800 feet wide, extending from Long Island Sound to Tomlinson Bridge at the head of the main harbor; (2) a channel 12 feet deep, 100 to 150 feet wide, extending from the 16-foot anchorage to the Kimberly Avenue Bridge at the entrance to the West River, thence 12 feet deep and 75 feet wide up the West River to the new expressway bridge, for a total distance of about 1.5 miles; (3) a channel 22 feet deep, 250 to 400 feet wide from the head of the main harbor up Quinnipiac River to a point 1,000 feet above Ferry Street, thence 16 feet deep, 200 feet wide to Grand Avenue, a total distance of about 1.25 miles; and (4) a channel 12 feet deep, 200 feet wide up Mill River to the junction of the two branches, a distance of about 2,000 feet, thence 12 feet deep in each branch to Grand Avenue Bridge, the east branch 100 feet wide and extending about 1,200 feet, and the west branch 125 feet wide and extending about 1,600 feet. The turning basin provided is located on the Quinnipiac River at the mouth of the Mill River, and is 22 feet deep, 200 to 800 feet wide, and 700 feet long. Anchorage basins provided are located one at the mouth of the West River, this being 2 acres in area and 6 feet deep; and two below the Tomlinson Bridge in the main harbor, with areas of 30 and 145 acres and depths of 15 and 16 feet, respectively. The project is about 80 percent complete, the Quinnipiac River 22-foot turning basin and channel not yet having been dredged.

15. The most recently reported controlling depths of the existing project at mean low water are as follows: in the 35-foot main harbor channel, 29 to 31 feet to about 500 feet downstream of the Tomlinson Bridge, thence 18 feet to the bridge (1952); in the West River, 8.0 feet generally to Kimberly Avenue Bridge (1956), thence 9.0 feet to the new expressway bridge (1952); in the Mill River channel, 10 feet to the junction of the East and West Branches, thence generally 5.0 feet in the East Branch, and 7.0 feet in the West Branch (1953). Maintenance dredging in the Quinnipiac River to a depth of 18 feet in the channel from 500 feet below the Tomlinson Bridge to Ferry Street Bridge, and thence 16 feet to Grand Avenue Bridge was accomplished in 1955. In the West Haven 6-foot anchorage, the most recently reported controlling depth was 0 to 8 feet (1956); in the 16-foot anchorage, over 16 feet in the easterly two-thirds, including a section of about 30 acres with depths in excess of 35 feet; and generally less than 15 feet in the westerly third (1953).

16. The total cost of the existing project through June, 1955, has been $5,510,115, of which $3,873,620 has been for new work, and $1,636,495 has been for maintenance.

17. The estimated additional appropriation needed for completion of the existing project is $600,000, resulting in a total estimated improvement cost (1956) of $4,473,000 exclusive of amounts expended on the previous project. The latest (1955) approved estimate for annual maintenance is $89,300.

LOCAL COOPERATION ON EXISTING PROJECT

18. The 35-foot main channel and the 22-foot channel and turning basin in the Quinnipiac River were authorized subject to the provision that local interests furnish free of cost to the United States all lands, easements, and rights-of-way and suitable spoil disposal areas for the initial work and for subsequent maintenance, when and as required, and hold and save the United States free from damages resulting from the improvement. These requirements as applied to the 35-foot channel have been met, and assurances have been furnished that the requirements for the 22-foot channel and turning basin in the Quinnipiac River will be met. These assurances were approved by the Chief of Engineers on June 2, 1947.

OTHER IMPROVEMENTS

19. All improvements for the benefit of general navigation in New Haven Harbor have been undertaken by the United States, except for dredging and maintenance of private approach channels to the wharves.

TERMINAL AND TRANSFER FACILITIES

20. The port of New Haven is served by 53 waterfront facilities with combined berthage space of about 18,000 feet, of which 48 terminals with combined berthage space of about 17,200 feet are located within the New Haven city limits, and 5, with combined berthage space of about 800 feet are located on the west side of the West River in West Haven. The improved waterways within the port area, along which these facilities are located, include the Main Harbor, the West River, the West and East Branches of the Mill River, and the Quinnipiac River. All terminal facilities within the harbor except the City Wharf, owned and operated by the City of New Haven, are privately owned, although 6 of these privately owned wharves are open to the public upon agreement with the owner.

21. Depths alongside the piers and wharves range from 0 to 35 feet. Over 5,000 feet of berthage with depths generally in excess of 28 feet is available in the main harbor. Depths in the greater part of the remaining berthage space range from 6 to 12 feet at mean low water. Length of berthage at individual wharves varies from one 60-foot terminal and several 100-foot terminals, to a few terminals which have in excess of 1,000 feet.

22. Twenty-six of the terminal facilities have rail connections which connect with the New York, New Haven, and Hartford railroad. Practically all are accessible by paved roads. Nineteen have mechanical handling facilities. The City Wharf has ten acres available for the open storage of bulk commodities. A total of 5 terminals, including the City Wharf, are used for the mooring of small craft. Several other wharves are used in the oyster business.

23. Petroleum commerce accounts for the greater part of the annual tonnage within the port, and the importance of the petroleum industry has

influenced the construction, improvement, and expansion of the terminal facilities of the port. There are 22 petroleum handling facilities in the various sections of the harbor, with a combined storage capacity of about 5,170,000 barrels. The largest single petroleum terminal is that of the Esso Company, with 19 tanks having a combined capacity of 1,730,000 barrels. Bunker oil can be obtained in standard grades at two of the facilities which provide sufficient depth of water alongside to accommodate deep-draft vessels. Small craft can obtain diesel oil and gasoline at 3 of the facilities.

24. There are 3 marine repair plants at the port of New Haven. The West Haven Shipyard, on the west side of the harbor at West Haven is provided with 2 marine railways, the larger having a hauling capacity of 450 tons; the Shipyard is equipped to make all types of repairs. City Point Boat Yard at City Point has a 50-ton marine railway. On the west side of the Quinnipiac River, J. C. Wyman operates a wharf, a marine repair plant, and 3 marine railways with capacities of 64, 30 and 15 tons.

25. There is a limited amount of unused frontage on the east side of the harbor, and considerable saleable industrial land along the harbor front for the development of new terminals or other port facilities.

IMPROVEMENT DESIRED

26. A public hearing was held at New Haven on November 21, 1955, to determine the nature and extent of the improvements desired by local interests, and to give interested parties an opportunity to be heard. The hearing was attended by a United States Congressman, a State Legislator and other state officials; by representatives of the City of New Haven, the New Haven Chamber of Commerce, and the New Haven Citizens Action Commission; by representatives of navigation, petroleum, and other business interests; and by representatives of recreational boating interests. Attendance at the hearing totaled about 60 persons, of whom about half participated in the discussion of a series of improvements. Twelve exhibits presented at the hearing included both relatively brief letters and sizeable studies detailing plans of improvement.

27. Local interests generally favored improvement of the harbor in any way which would enhance its use for navigation. A number of the discussions and exhibits, however, were limited mainly to proposals for flood protection, reflecting local concern for damages resulting from recent hurricane tidal floods. Local interests expressed a strong desire for adequate maintenance of the existing improvements to project depths, and completion of the existing authorized navigation project.

28. A representative of the Connecticut State Board of Fisheries and Game urged careful consideration of the problem of spoil disposal. Expressing no opposition to any improvement, he emphasized the need to select spoil disposal areas in such a manner as to prevent the loss of too much marsh land.

29. A representative of the Harbor Development Committee of the Chamber of Commerce presented a brief setting forth desired improvements for each section of the harbor, the primary proposal being that for deepening the main harbor channel to 40 feet.

30. A representative of the New Haven Chamber of Commerce presented a brief advocating the development of suitable facilities for recreational boating by constructing breakwater protection for Morris Cove and by providing a small boat anchorage at the approach to West River.

31. A spokesman for the Mayor of New Haven urged development of the harbor by maintenance dredging in the main harbor, and by deepening the Quinnipiac River to its authorized 22-foot depth. The Chairman of the Citizens Action Commission, an appointed municipal advisory commission, expressed the opinion that a 35-foot channel properly maintained was sufficient for present and foreseeable future needs of the harbor, and cited numerous firms and shipping officials in support of this opinion. In general, this representative expressed the belief that the dredging of the main channel to any depth greater than 35 feet would constitute an uneconomical expenditure of public funds.

32. A spokesman for the Planning Consultants of the City of New Haven presented a brief with extensive plans for future development of the harbor and its tributaries. This brief recommended dredging of the Mill River as follows: (1) 200 feet wide and 22 feet deep in the entrance channel from the project turning basin to Chapel Street Bridge; (2) 125 feet wide and 22 feet deep in the West Branch from Chapel Street Bridge to Grand Avenue Bridge; and (3) maintenance of the East Branch to project dimensions of 100 feet wide and 12 feet deep. This same brief recommended that the Quinnipiac River channel be dredged to the authorized project depth of 22 feet, and that the east bank of the upper Quinnipiac River, where a 1,500 acre space is available, be used as the spoil area for this project. The brief finally recommended two small boat anchorages, one at City Point and the other at Morris Cove, it being claimed that the demand for small boat anchorage greatly exceeded the available space.

33. Local interests expressed a desire for the widening of the West River channel at the bend in the existing channel near West Haven. It was proposed to effect this widening by moving the channel to the east for a length of approximately 1,400 feet, over an area varying in width from 0 at each end of the change to about 170 feet at the sharpest part of the bend. Local interests stated that this sharp bend in the existing channel causes considerable difficulty to towboats and tankers which are unable to negotiate the bend and avoid colliding with boats alongside the docks at West Haven. It is claimed that many times boat owners have had to move their boats at the West Haven docks before other boats could pass.

34. Two businesses located on the Quinnipiac River above Grand Avenue expressed a desire for the dredging of a channel to their docks.

The first of these is a barge terminal located on the west bank of the Quinnipiac about 700 feet above Grand Avenue Bridge; this business desires a 12-foot channel 200 feet wide to its docks, and a turning basin sufficiently large to accommodate a vessel 214 feet long, with 32-foot beam. The second is a marine repair shop for industrial, fishing and recreational boats, located about 1,500 feet above the Grand Avenue Bridge on the west bank of the river; this business desires a 6-foot channel with no specified width to their dock. It was noted that a proposed industrial development east of the river above Grand Avenue Bridge is in the planning stage.

35. Various local interests expressed desires for improved small boat facilities within the harbor. Proposals of the New Haven Chamber of Commerce for the development of improved small boat facilities by providing breakwater protection for Morris Cove, and by dredging small boat anchorages on the West Haven side of the harbor were supported. An oyster fisherman based at City Point requested consideration of breakwater construction to protect piers and boats along that waterfront. Small boating interests in the Prospect Beach area of West Haven expressed a desire for construction of a breakwater to protect small boats in that area.

COMMERCE

36. New Haven Harbor is the largest port in Connecticut. Commerce in the harbor, including its tributary rivers, averaged 5,833,000 tons annually from 1950 through 1954 inclusive, ranging from a minimum of 5,297,000 tons in 1950 to a maximum of 6,297,000 tons in 1954. Commodities carried in 1954 consisted of 4,698,000 tons of petroleum products, 1,249,000 tons of coal and coke, 129,000 tons of iron and steel products, 123,000 tons of chemicals, 46,000 tons of lumber and shingles, 21,000 tons of coal-tar products, 12,000 tons of shellfish products, and a total of 20,000 tons of other items. In 1954 the receipt and shipment of coal, coke, and petroleum products constituted 94 percent of the total commerce of the harbor. Passenger traffic in the harbor is very limited.

37. Local interests report a total fishing fleet of about 25 boats, most of which are oyster boats. The West Haven Yacht Club is reported to have a membership of 150, and 4 other yacht clubs in New Haven are estimated to have approximately 50 boats each. There are adequate boat building and repair facilities available in the harbor.

VESSEL TRAFFIC

38. In 1954, the latest year for which complete vessel trip statistics are available, there were in New Haven Harbor 86 trips by vessels with drafts over 30 feet; 200 trips by vessels with drafts of 26 through 30 feet, inclusive; and 5,956 trips by vessels with drafts of 25 feet or under. The maximum draft of vessels using the harbor was 34 feet, one trip of this draft being recorded. In addition to this vessel traffic, there were a total of 2,884 recorded trips by local commercial vessels, all of 18-foot draft or less. These statistics do not include movement

of from 300 to 400 local recreational power and sail boats which make numerous trips in and out of the harbor during the recreational boating season. Vessel traffic for the 5 year period 1950 through 1954 is tabulated below:

Draft	1950	1951	1952	1953	1954
34					1
33				1	
32	2	4	6	4	7
31	53	61	56	74	78
30	63	44	84	79	90
29	65	103	89	82	79
28	22	12	9	12	13
27	4	2	6	4	8
26	6	11	5	5	10
Total over 25-foot draft	215	237	255	261	286
Total under 25-foot draft	10,175	4,127	4,301	5,431	5,956
Total non-local traffic	10,390	4,414	4,556	5,692	6,242
Local commercial vessel trips	(1)	4,920	4,389	4,307	2,884
Grand totals	10,390	9,334	8,945	9,999	9,126

(1) Included in figures for trips 25 feet and under.

DIFFICULTIES ATTENDING NAVIGATION

39. The 35-foot main harbor channel was completed to project depth in 1949. Since that time there has been some silting in the channel. Maintenance dredging is scheduled for the fiscal year 1957. In the West River area and the approach channel thereto from the 16-foot anchorage past City Point and the West Haven docks and up West River, there has been considerable silting in the channel within recent years. Maintenance dredging of this channel is also scheduled for fiscal year 1957.

40. Tankers and towboats with barges are also reported to have considerable difficulty making the bend adjacent to the docks at West Haven, and it is reported that owners of boats at the docks frequently have to move them before navigation can proceed. At City Point, navigation interests claim that their boats and docks are exposed to severe storms from the southeast as a result of the dredging in recent years of a natural barrier bar of sand and gravel off Sandy Point, for highway fill.

41. Local interests above Grand Avenue Bridge on the Quinnipiac River report numerous groundings of both commercial and recreational craft in the shallow river bed and dangerous navigation conditions for tankers passing through Grand Avenue Bridge. These interests report that the necessity of navigating only during periods of high tide results in considerable tidal delay on both incoming and outgoing trips. There is no Federal navigation project above Grand Avenue Bridge.

WATER POWER AND OTHER SPECIAL SUBJECTS

42. The proposed improvements of New Haven Harbor lie in tidal waters. Matters of water power and flood control are not pertinent to this report. A proposal was made by the representative of the State Board of Fish and Game to utilize the available spoil to build up more shoal areas as resting ground for waterfowl and other birds. Local officials of oyster companies opposed in general any dredging or filling that would destroy oyster beds or interfere with the natural currents or tidal movement of water over existing oyster grounds. Oyster company representatives specifically opposed a suggestion by the State Board of Fish and Game that additional tidal flats be created south of Sandy Point by deposition of dredged material.

SHORE LINE CHANGES

43. The improvements requested by local interests involve the deepening of the existing main harbor and Mill River channels, the relocation of the approach channel to West River, the extension of a navigable channel up the Quinnipiac River above Grand Avenue Bridge, the construction of breakwaters, and the dredging of additional anchorage areas for small craft. These proposed improvements would have no adverse effect on the configuration of the adjacent shore line, except for the proposal to deepen Mill River channel. Dredging the existing 12-foot channel to a depth of 22 feet for the desired width of 125 feet would probably undermine the bulkheads and structures along the river bank, which are now separated by widths varying from 125 to 300 feet.

DISCUSSION

44. New Haven Harbor is located on the north shore of Long Island Sound, about 67 miles east of New York Harbor. The nearest commercial ports are Bridgeport Harbor, 18 miles to the west, and New London Harbor, 44 miles to the east, and the nearest small boat harbors are Milford and Branford, 7 miles to the west and east. One of the major ports in New England, New Haven's favorable geographical location, its network of highways, and its ample railroad facilities make it a logical distribution center for the thickly populated and highly industrialized area that surrounds it.

45. At a public hearing held in New Haven on November 21, 1955, to determine the desires of local interests with respect to improvement of New Haven Harbor, a number of improvements were proposed. Local interests expressed desires for further deepening of the existing 35-foot main harbor

channel; for improvement of the approach channel to the West River; for deepening the Quinnipiac River channel, and extending it beyond the Grand Avenue Bridge; for the provision of deeper and wider channels in the Mill River area; and for the provision of protected anchorage areas for recreational craft. A number of requests were also made for maintenance dredging and for the provision of flood control structures.

46. Considerable local interest centered upon proposals to provide a deeper main harbor channel, suggestions varying from a depth of 37 feet to one of 45 feet, with conflicting opinions being expressed as to the present or foreseeable need for any deepening of the channel in excess of the existing 35-foot depth. Since the completion of the existing 35-foot main channel project in 1949, there has been substantial increase in deep draft vessel traffic in the harbor. Supertankers are reported to be operating in the existing main harbor channel, and to be proceeding up the channel without regard to tide. Proponents of a 40-foot channel depth at mean low water expressed the opinion that such a channel depth would provide benefits from increased tonnages of petroleum. Several oil companies in the area estimated such increased tonnages to average 35 percent in the next 5 years and 62 percent in the next 10 years. Opponents of the proposal expressed the opinion that estimated increased tonnages would be a natural result of the present authorized channel, and that therefore any money expended on providing a depth greater than the existing 35-foot depth would not produce a public benefit.

47. Questionnaires distributed to interested oil companies and other shipping companies by the Chamber of Commerce Harbor Committee to determine their reaction to proposals for a deeper channel were inconclusive, partly as a result of the phrasing of the questionnaire. Some shippers observed that they were presently receiving petroleum products in supertankers drawing 32 feet, and indicated the possibility of receiving petroleum in supertankers of the 30,000 ton class, which have a maximum draft of 34 feet 2 inches fully laden. The only shipping company definitely favoring a project depth greater than 35 feet was the Gulf Oil Corporation, which advocated a depth of 37 feet. Their desire for greater depth, however, was based on the probability of a sustained northerly wind for several days, which would blow enough water out of the harbor to make it unsafe for 34-foot supertankers. The mean range of tide is 6.2 feet, and although tides of 2.5 feet below the mean have occurred in the harbor, such occurrence is so infrequent as to make it untenable as a basis of channel depth design.

48. The Citizens Action Commission, which is appointed by the Mayor, presented substantial arguments with authoritative references in support of the opinion that the existing 35-foot project depth in the main harbor channel is adequate for shipping needs now and in the foreseeable future. It is apparent that with a mean range of tide of 6.2 feet, a channel maintained at 35-foot depth could accommodate any existing supertankers on the tide. Preliminary estimates of the benefits that would accrue from further deepening of the main harbor channel indicate

that resulting benefits would be far outweighed by costs incurred. In view of this fact, and in view of the lack of any substantial concurrence among shippers as to the need or justification for a channel of greater depth than the presently authorized 35 feet, it is considered that no further investigation of the proposal is necessary at this time.

49. A number of firms and individuals doing business in West Haven expressed a desire for improvement of the approach channel to West River. Improvement desired consists of a relocation or widening of the approach channel at the sharpest part of the bend opposite the main docks at West Haven. The existing channel is reported to be badly silted at the present time, creating an urgent need for maintenance dredging. Shipping interests report considerable difficulty in navigating the bend, and it is claimed that there are numerous collisions with boats at the docks of West Haven, causing considerable damage and delay to shipping. It is considered that the desired improvement would benefit navigation by reducing damages and delays. However, the slight required modification of the existing project, by dredging on the east of the bend for an additional width of approximately 170 feet at the sharpest part of the bend and tapering out to zero extra width at each end of a reach of approximately 1,400 feet is considered to be within the authority of the Chief of Engineers to approve easing of channel bends under existing project authorizations.

50. Local interests expressed a desire for channel improvement on the Quinnipiac River above Grand Avenue Bridge. City planning officials propose to use a several hundred acre area east of the river as spoil area for any dredging of the Quinnipiac River to provide for the eventual development of an industrial area. Several commercial developments on the west bank of the river are now dependent on the navigable river for their continued existence, and additional desirable business locations are available for development. Specific requests were made for channel improvements above Grand Avenue Bridge by dredging a channel 12 feet deep and 200 feet wide for a distance of approximately 700 feet, with a turning basin sufficient to accommodate a vessel 214 feet long with a beam of 32 feet; and for a channel of 6-foot depth for an additional 800 feet. Although no width was specified for the desired 6-foot channel, it is considered that a 75-foot width would accommodate pleasure and fishing craft desiring to use the area. It is claimed that desired improvements would benefit firms located beyond the limit of the existing projects, these firms being reported to have lost up to 75 percent of their business in recent years as a result of channel silting, consequent tidal delays, and inability to use larger vessels in place of smaller craft which are becoming obsolete. Although the desired improvement would result in an increase in the value of adjoining property on both sides of the river, no substantial data were submitted in support of general benefits to navigation.

51. In the Mill River area, where the existing project provides for a 12-foot channel from the turning basin at the river mouth up both branches of the river to the Grand Avenue Bridge, local interests expressed a desire for a 22-foot channel depth in the West Branch to the

Grand Avenue Bridge. A local company official, however, requested that this be modified to an 18-foot depth, in view of the fact that the Harbor Commission had stated that conditions at the Chapel Street drawbridge would prevent dredging of the Mill River to a depth greater than 18 feet. Estimates by two local companies of annual savings of $210,000 accruing from the proposed deepening of the Mill River channel in the West Branch are considered optimistic, although some savings would undoubtedly accrue to these and other companies if deeper draft vessels were used as a result of the improvement. It is claimed that other companies which presently receive most of their commerce by rail would be materially benefitted if they were made accessible to waterborne commerce. No specific data were presented, however, to indicate definitely the degree to which such deep draft traffic would in fact ensue as a result of the proposed improvement.

52. The Quinnipiac River below Grand Avenue Bridge has an authorized channel depth of 22 feet, the dredging of which is dependent upon the appropriation of necessary funds. No desires have been expressed by local interests for a channel depth greater than 22 feet, and the improvement as authorized is considered adequate to serve the present and foreseeable needs of shipping in that area. Data presented at the public hearing to show the need for a deeper channel than presently exists, and the increased tonnages and benefits which it was stated would be derived therefrom, are believed to support desires for accomplishment of the presently authorized channel deepening. In view of this, it is not considered that further modification of the existing project at this time is desired or warranted. It is noted that the proposed Connecticut expressway which will cross the river about 300 feet above the Tomlinson Bridge will provide ample clearances for navigation under the bridge.

53. Local interests claimed that the New Haven area is in need of additional sheltered mooring area for recreational craft. It was stated that facilities are needed by those who now use the Milford, Branford, and Essex Yacht Clubs because suitable nearby areas are not available. Considerable interest was evinced at the public hearing for some harbor improvement for recreational craft, several specific proposals being advanced by various local interests.

54. Local interests proposed the construction of a breakwater 400 to 500 yards long extending northwesterly from the south shore of Morris Cove to provide more adequate protection for craft moored in the cove. Morris Cove has adequate depth for all types of pleasure craft, and the construction of the proposed breakwater would undoubtedly provide desirable protected anchorage. The convenience of the location to New Haven and to the summer resort area to the east would be conducive to its full use. Though there are other more sheltered areas located further up the harbor, they appear to be considerably less attractive to pleasure boat owners because of their distance from the summer shore development, and because of the commercial nature of the upper harbor development. These advantages, however, appear to be more than offset by the extremely costly nature of a breakwater of the necessary length to provide adequate protection in existing depths. It is considered that even a very substantial expansion of the pleasure fleet which might accrue from the desired

breakwater construction, and the reduction of damages to craft now using the anchorage, would be inadequate to offset the high cost of the construction.

55. Local interests requested the construction of a breakwater to provide protection for small craft moored at Prospect Beach. Such a breakwater, however, is considered not economically justified inasmuch as craft now moored in this area can obtain adequate shelter along West Haven shore north of Sandy Point. Local desires for a breakwater to protect City Point from rough waters apparently resulting from the removal of a gravel bar a short distance south of the docks by the State of Connecticut does not appear to be justified by benefits which would accrue therefrom.

56. Local interests further proposed sites for small boat anchorages on the west side of City Point, and on the west side of the harbor above Sandy Point. These locations are apparently well sheltered from all directions. The area north of Sandy Point would be convenient to residents of West Haven, and it is believed that it might be possible to incorporate a small boat anchorage in this area with the existing 6-foot anchorage area. It is noted, however, that these areas would probably have high maintenance costs due to fairly rapid silting.

57. Although no estimate was made by local interests of the increased number of pleasure craft which might be expected to result from improvement, it is believed that the percentage increase in the number of recreational craft based in the harbor if improved facilities were provided would be high. The area has considerable recreational boating activity. The West Haven Yacht Club is reported to have a membership of 150, and 4 other yacht clubs are estimated to have 50 boats each. Boat building and repair facilities are presently available in the harbor for approximately 400 craft. In view of these facts, it is considered that further investigation to determine the most beneficial plans for recreational improvement is warranted at this time.

58. Benefits accruing from improvement of the harbor for recreational craft will be partly general and partly local, requiring substantial local cooperation. Although the extent of probable local cooperation has not been stated, the strong desire of officials of the City of New Haven and other local interests for improvement of the harbor indicates that fulfillment of the requirements of local cooperation, including cash contribution, furnishing of spoil-disposal areas, and the release of the United States from any claims for damages due to the work may reasonably be expected.

CONCLUSIONS

59. In view of the lack of evidence supporting the need for a deepening of the main harbor channel beyond the existing 35-foot project depth, and in view of the lack of any general concurrence among shippers as to the need for a deeper channel, the Division Engineer concludes that further study of proposals for improvement of the main harbor channel is not warranted at this time. He further concludes that in view of the lack of data indicating

that substantial benefits to waterborne commerce would actually accrue from the proposed deepening of existing channels in the Mill River below Grand Avenue Bridge, and the proposed extension of the existing channel in the Quinnipiac River above Grand Avenue Bridge, further study of these improvements is not warranted at this time.

60. The Division Engineer concludes that local desires for improvement of the Quinnipiac River below Grand Avenue Bridge will be met by the accomplishment of the existing authorized project, which is currently dependent upon the appropriation of necessary funds. He concludes that evidence adduced by local interests as to benefits accruing from such improvement are in support of the authorized project depth of 22 feet in the Quinnipiac channel.

61. The Division Engineer further concludes that the minor relocation of the West River channel to ease the turn and afford more adequate clearance from boats moored at the docks would be within the authority of the Chief of Engineers under existing project authorizations. It is concluded that upon the next maintenance of this channel, provided the proposed relocation is determined upon investigation to provide sufficient justification therefor, the relocation should be undertaken at that time.

62. It is further concluded that recreational boating in the New Haven region requires additional mooring area. In view of the relatively high cost of constructing breakwaters at Morris Cove, Prospect Beach, or City Point, as proposed by local interests, it is considered improbable that resulting benefits would equal annual charges. In addition, the benefits would be preponderantly local in character, requiring a very substantial cash contribution by local interests. It is considered unlikely that the requisite major cash contribution by local interests would be forthcoming for this purpose. It is therefore concluded that further studies of these breakwaters are not warranted at this time. It is the opinion of the Division Engineer, however, that the northwesterly part of New Haven Harbor affords a relatively high degree of protection and an area where additional anchorage space might economically be provided. It is therefore concluded that a survey should be made to determine the extent of improvement required and the degree of Federal participation therein which may be warranted.

RECOMMENDATION

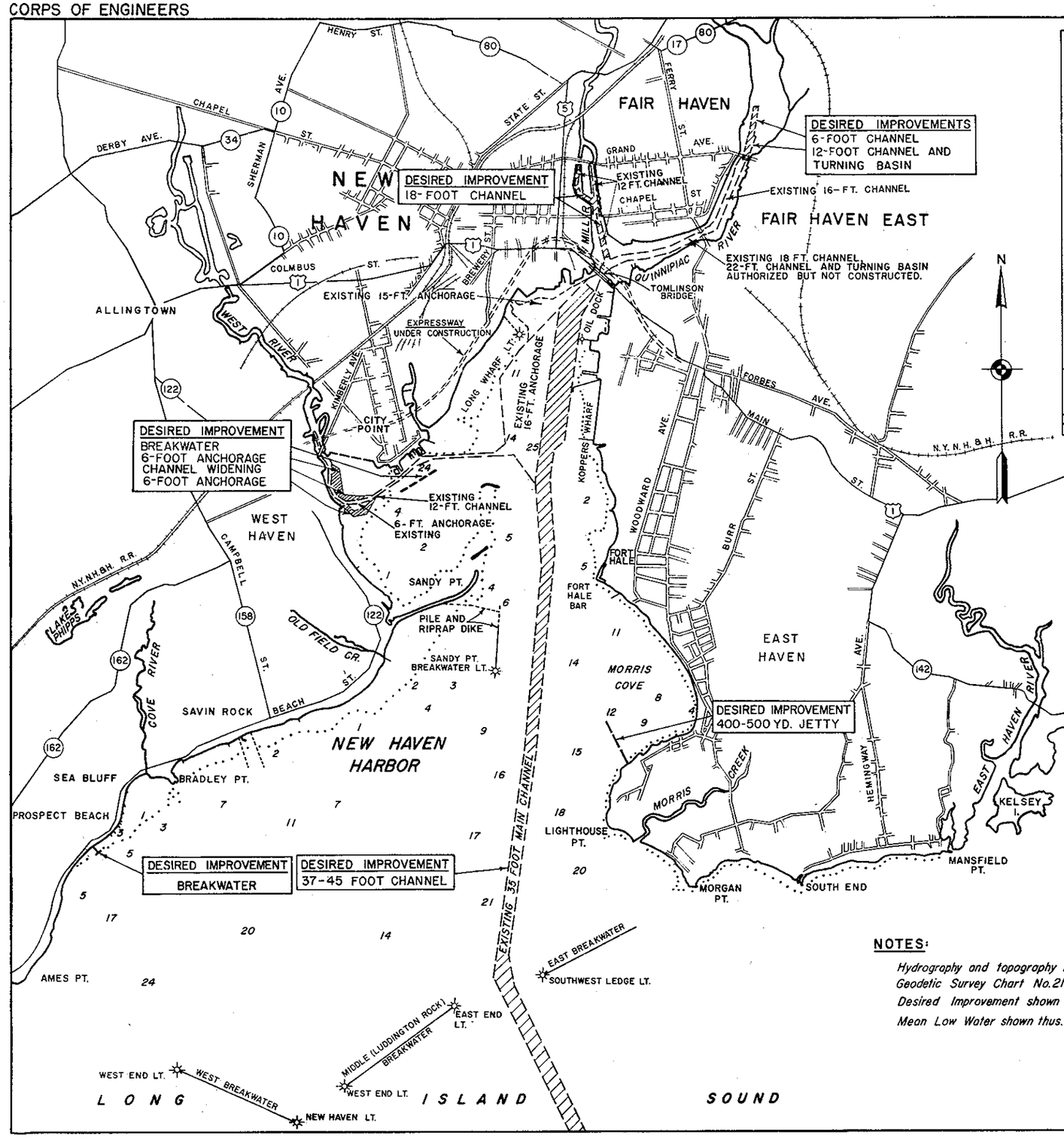
63. In view of the foregoing, the Division Engineer recommends that no survey be made at this time of the proposed deepening of the main harbor channel in New Haven Harbor, nor of the proposed deepening of the Mill River channels below Grand Avenue Bridge, or the proposed extension of the Quinnipiac River channel above Grand Avenue Bridge. He further recommends that no survey be made at this time of the proposed breakwaters at Morris Cove, Prospect Beach, or City Point.

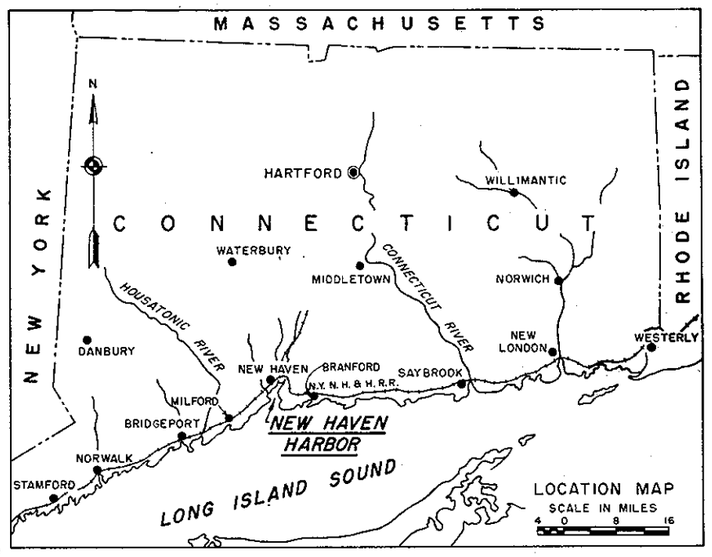
64. The Division Engineer also recommends that the desired minor relocation of the West River be undertaken under existing authority of the Chief of Engineers, provided upon investigation it is determined that there is sufficient justification therefor.

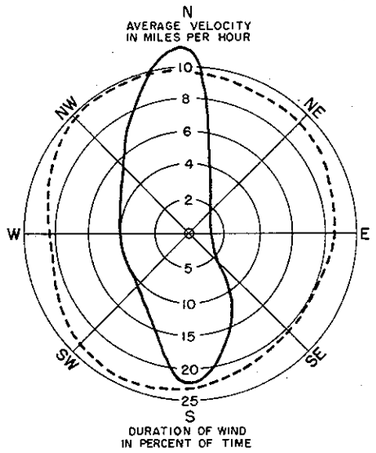
65. The Division Engineer further recommends that a survey be made to determine the extent and cost of small boat anchorages needed in New Haven Harbor, and the Federal interest therein.

GEORGE N. KIBLER
Colonel, Corps of Engineers
Acting Division Engineer

Incl:
Map of New Haven Harbor







WIND DIAGRAM FOR NEW HAVEN, CONN.

LEGEND

- - - - - AVERAGE VELOCITY IN M.P.H.
——— DURATION IN PERCENT OF TIME

NOTES:

Hydrography and topography from U.S. Coast and Geodetic Survey Chart No. 218.

Desired Improvement shown thus.

Mean Low Water shown thus.

NEW HAVEN HARBOR
CONNECTICUT

IN 1 SHEET — SCALE IN FEET 2000 0 2000 4000 6000

NEW ENGLAND DIVISION, BOSTON, MASS. JULY 1956

APPROVED: CHIEF, ENGINEERING DIVISION

APPROVED: LT. COL. C.E. ASST. DIVISION ENGINEER

SUBMITTED: CHIEF, PLANNING AND REPORTS BRANCH

CHIEF, RIVER AND HARBOR SECT.

DR. BY: R.M. TR. BY: R.M. CH. BY: AAC

TO ACCOMPANY PRELIMINARY EXAMINATION REPORT DATED: JULY 25, 1956

FILE NO. N.H. 776