

1955

# Rockland Harbor, Maine: Letter from the Secretary of the Army Transmitting a Letter from the Chief of Engineers, Department of the Army, Dated June 22, 1955

United States Senate, Committee on Public Works

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ROCKLAND HARBOR, MAINE

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LETTER

FROM THE

SECRETARY OF THE ARMY

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY, DATED JUNE 22, 1955, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS, ON A REVIEW OF REPORTS ON ROCKLAND HARBOR, MAINE, REQUESTED BY A RESOLUTION OF THE COMMITTEE ON PUBLIC WORKS, UNITED STATES SENATE, ADOPTED ON SEPTEMBER 14, 1954



PRESENTED BY MR. NEUBERGER FOR MR. CHAVEZ

JULY 26, 1955.—Referred to the Committee on Public Works  
and ordered to be printed with two illustrations

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UNITED STATES  
GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1955



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(Only pls. 1 and 3 printed)

1. Plan of improvements.
2. Survey map.
3. Desired improvements.
4. Aerial photograph, 1952.

## APPENDIX MADE IN CONNECTION WITH THE REPORT OF THE DIVISION ENGINEER

(Not printed)

Digest of public hearing.

## LETTER OF TRANSMITTAL

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DEPARTMENT OF THE ARMY,  
Washington 25, D. C., July 25, 1955.

HON. DENNIS CHAVEZ,  
*Chairman, Committee on Public Works,  
United States Senate, Washington, D. C.*

DEAR MR. CHAIRMAN: I am transmitting herewith a report dated June 22, 1955, from the Chief of Engineers, Department of the Army, together with accompanying papers and illustrations, on a review of reports on Rockland Harbor, Maine, requested by a resolution of the Committee on Public Works, United States Senate, adopted on September 14, 1954.

In accordance with section 1 of Public Law 14, 79th Congress, the views of the Governor of Maine are set forth in the enclosed communication, together with the reply of the Chief of Engineers thereto. The comments of the Department of the Interior in accordance with Public Law 732, 79th Congress, are also enclosed.

Although the Bureau of the Budget advises that there is no objection to the submission of the report to the Congress, it states that no commitment can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation. The complete views of the Bureau of the Budget are contained in the attached copy of its letter.

Sincerely yours,

WILBER M. BRUCKER,  
*Secretary of the Army.*

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## COMMENTS OF THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT,  
BUREAU OF THE BUDGET,  
Washington, D. C., July 20, 1955.

The honorable the SECRETARY OF THE ARMY.

MY DEAR MR. SECRETARY: This is in reply to Assistant Secretary Roderick's letter of June 24, 1955, submitting a copy of the report of the Chief of Engineers on Rockland Harbor, Maine, prepared in response to a resolution of the Senate Committee on Public Works, adopted September 14, 1954.

The Chief of Engineers recommends, subject to certain conditions of local cooperation, abandonment of a portion of the existing project for Rockland Harbor, Maine, and in lieu thereof dredging of (1) channels in the central section of the harbor to a depth of 18 feet in the outer



portions and 14 feet in the inner portions, and (2) a channel 18 feet deep to the vicinity of the General Foods Corp. base in the southern part of the harbor. The Federal cost of the recommended improvements, based on 1954 price levels, is estimated at \$710,000 for construction and \$5,500 for navigation aids. Non-Federal cost of meeting the stipulated conditions of local cooperation is estimated at \$235,000, including a cash contribution of \$10,000 toward the dredging of the channel in the southern part of the harbor. Annual carrying charges are estimated at \$41,600 for the work in the central section of the harbor and \$3,650 for the southern channel. The annual benefits are estimated at \$90,800 for the work in the central section and \$11,500 for the southern channel. Benefit-cost ratios are stated to be 2.2 and 3.1 respectively.

I am authorized by the Director of the Bureau of the Budget to advise you that there would be no objection to the submission of the report to the Congress. No commitment, however, can be made at this time as to when any estimate of appropriation would be submitted for construction of the improvement, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation.

Sincerely yours,

CARL H. SCHWARTZ, Jr.,  
*Chief, Resources and Civil Works Division.*

#### COMMENTS OF THE GOVERNOR OF MAINE

STATE OF MAINE,  
 OFFICE OF THE GOVERNOR,  
*Augusta, June 7, 1955.*

Maj. Gen. S. D. STURGIS, Jr.,  
*Office of the Chief of Engineers,  
 Department of the Army, Washington 25, D. C.*

DEAR GENERAL STURGIS: This is with reference to your letter of April 27, 1955, addressed to Mr. Miner R. Stackpole of our Water Resources Division in connection with the proposed project at Rockland Harbor, Maine.

I have reviewed the accompanying report with Mr. Stackpole and a representative of the local interests in Rockland. As a result I am in a position to heartily support the recommendations of the Board of Engineers for Rivers and Harbors, subject only to one qualification in connection with the proposed channel to the vicinity of the General Foods Corp. marine base. I take it that this is a reference to the Birdseye frozen food base.

With reference to the latter, I note that the estimated cost is \$20,000, of which 50 percent must be borne by the Birdseye people. I fully understand that existing policy or regulations dictate this requirement. However, I would deeply appreciate any consideration that might be given to relieving this company of this burden.

It would be appropriate to indicate the interest of the State of Maine in this project. The 95th Maine Legislature, in 1951, created the Rockland Port District for the purpose of constructing public terminal facilities at Rockland. The district was authorized to borrow up to \$100,000 for this purpose. In addition the legislature

appropriated \$50,000 to subsidize such construction, and authorized the State highway commission to construct the necessary highway entrance to the terminal. The 97th legislature, this past winter, appropriated an additional \$50,000 to support the terminal project. Thus, \$200,000 will be available to construct the terminal facilities if and when the harbor project is approved.

This action on the part of the legislature is consistent with an awakening interest in the development of Maine seaports. This is reflected, for the first time, in a legislative appropriation to the Maine Port Authority to promote the economic development of our ports.

In connection with the Board of Engineers report, I note that certain assurances are required of responsible local interests. I am advised that these have been considered by local interests in Rockland and that no difficulty is anticipated in connection with them.

It is well to point out, I think, that there have been no changes in depth and no improvements in Rockland Harbor since the turn of the century. The enthusiastic local interest and the potential commerce of the port warrant support of the project. I am most happy to add my endorsement and to urge every possible consideration to the end that approval be given as quickly as possible.

Sincerely yours,

EDMUND S. MUSKIE.

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LETTER TO THE GOVERNOR OF MAINE

DEPARTMENT OF THE ARMY,  
OFFICE OF THE CHIEF OF ENGINEERS,  
Washington, D. C., June 23, 1955.

Hon. EDMUND S. MUSKIE,  
*Governor of Maine,  
Augusta, Maine*

DEAR GOVERNOR MUSKIE: Reference is made to your letter of June 7, 1955, submitting your comments on the proposed project for Rockland Harbor, Maine.

The Corps of Engineers appreciates receiving your comments on this project. I note that you concur generally in the recommendations for improvement of the harbor subject to further consideration of the recommended cash contribution toward the cost of the channel to the General Food Corp. marine base. As stated in your letter, current policies require substantial local participation in navigation improvements where benefits are expected to accrue mainly to a single organization. You may be assured that your views on this matter will accompany the report to Congress for its consideration.

I shall be pleased to notify you when the report is transmitted to Congress by the Secretary of the Army and furnish you a copy of the letter of transmittal for your information.

Sincerely yours,

S. D. STURGIS, Jr.,  
*Major General, USA,  
Chief of Engineers.*



## COMMENTS OF THE DEPARTMENT OF THE INTERIOR

DEPARTMENT OF THE INTERIOR,  
OFFICE OF THE SECRETARY,  
Washington, D. C., June 20, 1955.

Maj. Gen. S. D. STURGIS, Jr.

*Chief of Engineers, Department of the Army,  
Washington, D. C.*

DEAR GENERAL STURGIS: This is in reply to your letter of April 27, transmitting for our comments copy of your proposed report, together with the reports of the Board of Engineers for Rivers and Harbors, and of the division engineer, on a review of reports on Rockland Harbor, Maine.

Your report recommends construction of navigation improvements for Rockland Harbor, Maine, at an estimated cost to the United States of \$710,000 for construction and \$2,900 annually for maintenance in addition to that now required for the existing breakwater.

The Fish and Wildlife Service advises that the proposed construction would have no adverse effects on fish and wildlife in Rockland Harbor, and that no project modifications are necessary for the protection of fish and wildlife. The contemplated improvements would aid the fishing industry in one of New England's major fishing ports.

The Bureau of Mines reports that there are no known mineral deposits that would be adversely affected by the proposed construction. The Bureau further advises that there are large deposits of limestone in the area which may be of value in the exploitation of the low-grade manganese ores of Aroostook County, Maine, at some time in the future. In such event, any improvement in navigation facilities would be helpful.

The interests of this Department would not be adversely affected by the proposed construction.

We appreciate the opportunity of commenting on this report.

Sincerely yours,

FRED G. AANDAHL,  
*Assistant Secretary of the Interior.*



## ROCKLAND HARBOR, MAINE

### REPORT OF THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY

DEPARTMENT OF THE ARMY,  
OFFICE OF THE CHIEF OF ENGINEERS,  
*Washington 25, D. C., June 22, 1955.*

Subject: Rockland Harbor, Maine.

To: The Secretary of the Army.

1. I submit herewith for transmission to Congress the report of the Board of Engineers for Rivers and Harbors in response to resolution of the Committee on Public Works of the United States Senate, adopted September 14, 1954, requesting the Board to review the reports of the Chief of Engineers on Rockland Harbor, Maine, submitted to Congress on June 21, 1937, and prior reports, with a view to determining whether the recommendations therein should be modified in any way at this time, with particular reference to the improvement of Lermond's Cove.

2. After full consideration of the report secured from the division engineer, the Board recommends abandonment of that portion of the existing project for Rockland Harbor, Maine, authorized by the River and Harbor Act approved June 3, 1896, providing for dredging in the vicinity of the wharves and for removal of the ledges, and in lieu thereof recommends the construction of (a) a short approach channel, and 3 branch channels each with a turning basin, extending from deep water along about 1.5 miles of the central and northern waterfront to depths of 18 feet below mean low water in the outer portion and 14 feet below mean low water in the inner portion and to widths of 150 feet and 100 feet, and (b) a channel 18 feet deep at mean low water and 100 feet wide from deep water to the vicinity of the General Foods Corp. marine base in the southern part of the harbor, all generally in accordance with plans of the division engineer with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, at an estimated cost to the United States of \$710,000 for construction and \$2,900 annually for maintenance in addition to that now required for the existing breakwater; provided that responsible local interests give assurances satisfactory to the Secretary of the Army that they will provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the project and for subsequent maintenance, when and as required; hold and save the United States free from damages due to the construction and maintenance of the project; provide and maintain at local expense adequate public terminal and transfer facilities open to all on equal terms; and contribute in cash 50 percent of the cost of construction work for which the Corps of Engineers is responsible under (b) above, the cost of such work being currently estimated at

\$20,000; and provided further, that either separable part of the improvement may be constructed independently of the other when funds therefor are available and the requirements of local cooperation applicable thereto have been met.

3. After due consideration of this report, I concur in the views and recommendations of the Board.

S. D. STURGIS, Jr.,  
Major General, USA,  
Chief of Engineers.

## REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

CORPS OF ENGINEERS, U. S. ARMY,  
BOARD OF ENGINEERS FOR RIVERS AND HARBORS,  
Washington, D. C., March 23, 1955.

Subject: Rockland Harbor, Maine.

To: The Chief of Engineers, Department of the Army.

1. This report is submitted in response to the following resolution adopted September 14, 1954:

*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 reports of the Chief of Engineers on Rockland Harbor, Maine, submitted to Congress on June 21, 1937, and prior reports, with a view to determining whether the recommendations therein should be modified in any way at this time, with particular reference to the improvement of Lermond's Cove.*

2. Rockland Harbor, Maine, is located just inside the southwestern entrance to Penobscot Bay and about 75 miles northeast of Portland. It is formed by a broad high peninsula to the southeast and Jameson Point to the northeast. From Jameson Point a breakwater extends about 4,350 feet to the south toward the peninsula. The harbor entrance between the end of the breakwater and the peninsula is 5,000 feet wide with 3,000 feet having depths in excess of 50 feet. Within the breakwater the harbor length is about 7,000 feet opposite the entrance, and the width about 10,000 feet. Depths in the harbor area range from 50 feet in the outer portion to less than 2 feet in considerable areas of shoal water along the north and south shores. Opposite the entrance and along the westerly shore 2 projecting points of land form 3 coves, the most northerly of which is Lermond Cove. The most intensively developed section of the waterfront is along this western shore. The heaviest gales are from the east and northeast. The high peninsula protects the harbor from the south and southeast; while Jameson Point and the breakwater affords full protection from the north and partial protection from the east. Thus the intensively developed waterfront opposite the entrance is partly exposed to easterly storms. Ice sometimes forms in the harbor during winter months. Tidal currents are negligible. There are no bridges crossing any part of the harbor. The mean range of tide is 9.7 feet and the spring range is 11.2 feet.

3. The existing project for Rockland Harbor provides for a riprap breakwater extending 4,346 feet southerly from Jameson Point, authorized by the River and Harbor Act of June 14, 1880, and completed in 1904; dredging the inner harbor in the vicinity of the wharves



to depths ranging from 4 to 13 feet at mean low tide, and removing 2 groups of ledges, one to 22 feet and the other to 14 feet at mean low tide, authorized by the River and Harbor Act of June 3, 1896, and completed in 1901. Costs to the United States to June 30, 1954, were \$915,863 for new work and \$78,453 for maintenance. The estimated annual cost of maintenance is \$1,500, of which \$1,000 is for maintenance of the breakwater. The breakwater was last repaired in 1925 and is now in good condition. The last maintenance was dredging in Lermond Cove to a depth of 4 feet in 1949. The existing project required no local cooperation. Local interests have dredged approach channels to various wharves. Over 20 wharves are in active use at the present time, extending along about 15,000 feet of developed water frontage. Depths at wharves range from nothing at low tide to 15 feet with depths at 7 wharves ranging from 10 to 15 feet.

4. Rockland, with a population of 9,234 in 1950, is the principal port and commercial center serving a district containing over 34,000 persons in Knox County and portions of Waldo and Lincoln Counties, Maine. At Rockland, the third largest fishing port in New England, the principal industrial activity is the handling of fish, shellfish, and fish products. It is also a center for fish packing, processing, and canning for adjacent ports. Inedible portions of the fish catch are processed into fish meal, fertilizer, pet food, pharmaceutical products, and oils. Other important industries are shipbuilding and the manufacture of wearing apparel, portland cement, and agricultural lime. Rockland is the mainland terminus for ship lines serving the Penobscot Bay island communities of Criehaven, Matinicus, Vinalhaven, and North Haven, having a permanent population of 2,250 and a summer population of 4,250. Municipally owned ships operating between these islands and Rockland carry freight, passengers, and mail. The total waterborne commerce for Rockland Harbor during the 5-year period 1949 to 1953, inclusive, averaged over 100,000 tons annually, ranging from 102,000 tons in 1950 to 113,000 tons in 1951. The principal commodities are fish, petroleum products, coal, gypsum, and general freight. Vessel traffic using the harbor varies from shallow-draft lobster boats to large fishing craft, steamers, motor vessels, and barges drawing up to 20 feet. The Northwest harbor area is used by coal barges drawing up to 20 feet loaded and a considerable number of fishing vessels drawing up to 12 feet. The central harbor area is used by fishing vessels drawing up to 16 feet loaded; and by passenger vessels, general freight carriers, petroleum vessels and other craft drawing up to 12 feet. Fishing vessels now using the southern harbor area are not loaded and have a light draft of 14 feet.

5. At a hearing held by the division engineer, local interests requested dredging of the entire harbor area in the vicinity of Lermond Cove to a depth of 13 feet at mean low water; a channel to the northwest harbor front at least 17 feet deep; a channel along the northwest harbor front 14 feet deep; a channel 14 feet deep to serve the south central waterfront area; a channel 18 feet deep in the southern part of the harbor; and a stone breakwater about 1,200 feet long to protect the central portion of the harbor. Subsequently, request was made for consideration of a channel to the northwest harbor front adequate to accommodate coastal ships of 30-foot draft. Local interests state that the needs of the port have changed since 1896 when the existing



project for dredging and removal of ledges was authorized. The former smaller, shallow-draft vessels have been replaced by larger deeper-draft vessels. Some of these vessels cannot use the harbor at all due to shallow depths while many others are delayed waiting for favorable tide. Wharves along the central waterfront on Crockett Point have been damaged at various times due to their exposure to easterly storms. Local interests state that the only wharf suitable for handling general cargo was purchased by the United States during the last war and is now used exclusively by the United States Coast Guard. Temporary arrangements by the city for lease of wharf space for use of the island boats are now unsatisfactory due to insufficient wharf space, inadequate safe load capacity of the wharf, and its exposure to easterly storms. The Rockland Port District has obtained an option to purchase an area on Lermond Cove which is close to the city's business district, has adequate water frontage for sheltered berthing of vessels and extensive land area for construction of necessary buildings and parking. The port district plans to construct modern facilities in Lermond Cove for use of general freight and passenger commerce, and fishing vessels. Local interests, although initially proposing the deepening of general harbor areas to serve present-day shipping, recognize the advisability of providing at a lesser cost dredged channels which would accomplish in major measure the desired purposes of the initial proposal. Local interests have indicated that requirements of local cooperation will be met.

6. The division engineer finds that the practice of navigating the harbor only at high tide, enforced by necessity, is a severe economic handicap to the fishing and commercial activities of the port. The State and local governments and the representatives of fishing and business interests have concluded that harbor improvement is imperative and are planning expenditures of over \$350,000 to that end. The division engineer finds that provision of channels of 17 feet or 26 feet in depth to the northwest harbor front would not be economically feasible at this time; that channels in lieu of the area dredging initially requested by local interests would be less costly and would accomplish the major portion of the desired results; and that storm damage was insufficient to justify the high cost of a breakwater to protect the central waterfront. He finds, however, that the most favorable harbor development would be a short approach channel, and three branch channels each with a turning basin, extending from deepwater along about 1.5 miles of the central and northern waterfront, 18 and 14 feet deep at mean low water with widths of 150 and 100 feet (plan 1); and a channel 18 feet deep at mean low water and 100 feet wide from deepwater to the vicinity of the marine base of the Birdseye Division, General Foods Corp., in the southern part of the harbor (plan 2). He estimates the costs, annual charges, average annual benefits, and the benefit-cost ratios as follows:

	Plan 1	Plan 2	Total
<b>Costs:</b>			
<b>Federal:</b>			
Corps of Engineers.....	\$700,000	\$10,000	\$710,000
Navigation aids <sup>1</sup> .....	5,000	500	5,500
Subtotal.....	705,000	10,500	715,500
<b>Non-Federal:</b> .....	185,000	<sup>2</sup> 50,000	235,000
<b>Total</b> .....	890,000	60,500	950,500
<b>Annual charges:</b>			
<b>Federal:</b>			
Interest and amortization.....	24,800	350	25,150
Maintenance:			
Channels.....	2,500	400	2,900
Navigation aids <sup>1</sup> .....	1,500	100	1,600
Subtotal.....	28,800	850	29,650
<b>Non-Federal:</b>			
Interest and amortization.....	7,800	2,300	10,100
Maintenance.....	5,000	500	5,500
Subtotal.....	12,800	2,800	15,600
<b>Total</b> .....	41,600	3,650	45,250
Average annual benefits.....	90,800	11,500	
Benefit-cost ratio.....	2.2	3.1	

<sup>1</sup> To be provided by U. S. Coast Guard.

<sup>2</sup> Includes \$10,000 cash contribution toward the portion of the plan for which the United States would be responsible.

<sup>3</sup> To be maintained by U. S. Coast Guard.

The reporting officer considers the benefits for plan 1 to be general in character; while those for plan 2 he considers to be half local and half general because operations in the area which would be served by this plan are controlled by a single company. The division engineer recommends that the portion of the existing project which provides for area dredging and the removal of ledges be abandoned, and that in lieu thereof the United States adopt a project for Rockland Harbor, as described above under plans 1 and 2, provided local interests agree to certain requirements of local cooperation including the contribution of 50 percent of the estimated first cost to the United States of the construction of plan 2.

7. Local interests were notified of the nature of the report of the division engineer and given an opportunity to present their views to the Board. Careful consideration has been given to the communications received.

#### VIEWES AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

8. The Board of Engineers for Rivers and Harbors concurs generally in the views and recommendations of the reporting officer. The improvement of Rockland Harbor, Maine, is needed for the accommodation of present-day vessel traffic. The Board believes that the division engineer's plan is adequate, the most practicable and suitable which can be developed at this time, and fully justified by the prospective benefits.

9. Therefore, the Board recommends abandonment of that portion of the existing project for Rockland Harbor, Maine, authorized by the River and Harbor Act approved June 3, 1896, providing for dredging in the vicinity of the wharves and for removal of the ledges, and in



lieu thereof recommends the construction of (a) a short approach channel, and 3 branch channels each with a turning basin, extending from deep water along about 1.5 miles of the central and northern waterfront to depths of 18 feet below mean low water in the outer portion and 14 feet below mean low water in the inner portion and to widths of 150 feet and 100 feet, and (b) a channel 18 feet deep at mean low water and 100 feet wide from deep water to the vicinity of the General Foods Corp. marine base in the southern part of the harbor, all generally in accordance with plans of the division engineer with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, at an estimated cost to the United States of \$710,000 for construction and \$2,900 annually for maintenance in addition to that now required for the existing breakwater; provided that responsible local interests give assurances satisfactory to the Secretary of the Army that they will provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the project and for subsequent maintenance, when and as required; hold and save the United States free from damages due to the construction and maintenance of the project; provide and maintain at local expense, adequate public terminal and transfer facilities open to all on equal terms; and contribute in cash 50 percent of the cost of construction work for which the Corps of Engineers is responsible under (b) above, the cost of such work being currently estimated at \$20,000; and provided further, that either separable part of the improvement may be constructed independently of the other when funds therefor are available and the requirements of local cooperation applicable thereto have been met.

For the Board:

B. L. ROBINSON,  
Major General, USA, Chairman.

## REPORT OF THE DIVISION ENGINEER

### SYLLABUS

The division engineer finds that the existing project for Rockland Harbor, completed in 1904, is no longer adequate for present-day commerce and shipping. The division engineer has considered four principal plans for improvement of various sections of Rockland Harbor, and alternatives and variations of these plans. The principal plans are as follows:

*Plan 1.*—A channel extending along about 1.5 miles of the northern and central waterfront, generally 14 feet deep, except for the entrance and the central quarter mile adjacent to the entrance, which are to be 18 feet deep, the channel varying in width from 100 to 150 feet, with a basin approximately 2.5 acres in area in Lermont Cove, and appropriate turning basins at each end of the channel. The estimated cost is \$700,000, with \$2,500 for annual maintenance all to be borne by the United States.

*Plan 2.*—A channel 18 feet deep 100 feet wide leading to the vicinity of the General Foods marine base in the southern part of the harbor. The estimated cost is \$20,000, of which 50 percent shall be contributed by local interests. The annual cost of maintenance is \$400.

*Plans 3A and 3B.*—In lieu of that part of the 14-foot channel in plan 1 serving the northwest harbor waterfront, a channel 17 (or 26) feet deep to that harbor area. The estimate of cost for plan 3A, a channel 17 feet deep, is \$150,000 and for plan 3B, a channel 26 feet deep, is \$700,000. The annual maintenance would be \$1,000 and \$2,000, respectively.

*Plan 4.*—A breakwater 1,200 feet long protecting the central waterfront. The estimated cost of the breakwater is \$750,000 and its annual maintenance is estimated at \$1,200.

The division engineer finds that sufficient benefits would result from plans 1 and 2 to justify their construction, but that benefits from plans 3A and 4 would not be sufficient to warrant the expenditures required. He finds that the proposed industrial development which plan 3B, the 26-foot channel, is designed to serve, has not reached a stage at which the expected benefits could be conclusively accepted. The division engineer therefore does not recommend adoption of a project for a 26-foot channel at this time pending more definite determination that the industrial development will materialize. The division engineer further finds that the benefits from plan 1 are general in character, and that therefore the costs should be borne entirely by the United States; but that the benefits from plan 2 are equally of local as well as general in nature, and that therefore the costs of plan 2 should be borne equally by the United States and by local interests. The division engineer notes that local interests propose to expend in the aggregate over \$350,000 on improvements related to and dependent upon the channel improvements comprising plans 1 and 2, this local participation amounting to about 35 percent of the total Federal and local harbor investments herein contemplated.

The division engineer therefore recommends that the existing project for Rockland Harbor be abandoned except for the existing breakwater, and in lieu thereof, a new project be adopted providing for (1) a waterfront channel described under plan 1 above, at an estimated cost to the United States of \$700,000 for new work with \$2,500 annually for maintenance, and (2) a channel to the marine base in the southern part of the harbor, described under plan 2 above, at an estimated cost to the United States of \$10,000 for new work with \$400 annually for maintenance.

The total estimated cost of the two project features recommended above is \$720,000, with \$2,900 annually for maintenance. The estimated cost to the United States for the recommended project is \$710,000 with \$2,400 for annual maintenance in addition to that now required. The recommendations of the division engineer are contingent upon certain conditions of local cooperation, the recommendation for plan 2 being specifically contingent upon a local contribution of 50 percent of the cost of new work, said contribution being presently estimated at \$10,000.

CORPS OF ENGINEERS, UNITED STATES ARMY,  
OFFICE OF THE DIVISION ENGINEER,  
NEW ENGLAND DIVISION,  
*Boston, Mass., February 4, 1955.*

Subject: Survey (Review of Reports) of Rockland Harbor, Maine.  
To: Chief of Engineers, Department of the Army, Washington, D. C.

#### AUTHORITY

1. This report is submitted in compliance with the following resolution adopted September 14, 1954, by the Committee on Public Works of the United States Senate:

*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 reports of the Chief of Engineers on Rockland Harbor, Maine, submitted to Congress on June 21, 1937, and prior reports, with a view to determining whether the recommendations therein should be modified in any way at this time, with particular reference to the improvement of Lermond's Cove.*

2. Pursuant to a similar resolution adopted April 25, 1951, by the Committee on Public Works of the House of Representatives, a preliminary examination (review of reports) recommending a survey, submitted by the division engineer on December 4, 1953, was reviewed by the Board of Engineers for Rivers and Harbors, and referred to the Committee on Public Works of the House of Representatives, United States Congress.



## SCOPE OF SURVEY

3. A review report of survey scope was assigned to the New England Division September 21, 1954, by the Chief of Engineers.

4. In the preparation of this report, a detailed hydrographic survey consisting of soundings and probings was made, from which the character of the harbor bottom and estimated quantities to be dredged were determined. Available maps, commercial statistics, and other data pertaining to the harbor have been studied. A public hearing was held at Rockland, Maine, on October 20, 1953, and information obtained therefrom is described in paragraphs 27-41 of this report. The information obtained from the public hearing is further supplemented by recent contacts with local interests and correspondence submitted by them, and all additions or changes in improvements, requested subsequent to the public hearing, are incorporated and considered in this report.

## DESCRIPTION

5. Rockland Harbor is located in Knox County, Maine, just inside the southwestern entrance to Penobscot Bay. The harbor is about 75 miles northeast of Portland.

6. A broad, high peninsula, Owls Head, protects the harbor from the southeast, Jameson Point and a breakwater which extends about 4,350 feet southerly from the point afford full protection from the north and partial protection from the east. Lermond Cove, on the west side of the harbor fronting the city's central business section, provides excellent shelter from all storms.

7. The harbor entrance at the breakwater has a width of open water of 5,000 feet, of which 3,000 feet has depths in excess of 50 feet. Within the breakwater the harbor has a width of about 10,000 feet and a length of about 7,000 feet. Depths in this area range from 40 feet in the outer portion to less than 2 feet in considerable areas of shoal water along the north and south shores. The most intensively developed section of the waterfront lies nearly opposite the entrance and is partly exposed to easterly storms. The wharves are principally located on 3 coves formed by 2 projecting points of land on the westerly side of the harbor, the more northerly known as Crockett Point and the more southerly known as Atlantic Point. Portions of this section of the harbor have been improved by the United States to depths of 13, 6, and 4 feet. Lermond Cove, the most northerly of the 3 developed coves, was last maintained to a depth of 4 feet in 1949. In addition, rock areas at Jameson Point and South Ledge were removed by the United States to depths of 14 feet and 22 feet at mean low water. The mean range of tide is 9.7 feet and the spring range is 11.2 feet. Tidal currents in the harbor are negligible. Prevailing winds are southwesterly during summer and northerly in winter, but at all seasons the heaviest gales are from the east and northeast. Ice sometimes forms in the harbor during the winter months. There are no bridges crossing any portion of Rockland Harbor. The locality is shown on United States Coast and Geodetic Survey Charts Nos. 209, 310, and 1203 and on the plan accompanying this report.

## TRIBUTARY AREA

8. Rockland is the principal port and commercial center for Knox County and portions of Waldo and Lincoln Counties. It is the shopping center of a district comprising over 34,000 people. In 1950, the population of the city was 9,234 and the assessed property valuation in 1954 was \$14,224,840.

9. The handling of fish, shellfish, and fish products has made Rockland the third largest fishing port in New England. It is the center of fish packing, processing, and canning for adjacent ports. All inedible portions of the fish catch are processed into fish meal fertilizers, pet food, pharmaceutical chemicals, and oils.

10. Although Rockland's principal industrial activity is the servicing and processing of the products of the sea, the city also has nearly a score of important industries, ranging from shipbuilding to the manufacture of wearing apparel. The proximity of limestone quarries make the manufacture of portland cement and agricultural lime important activities within the area. Considerable amounts of coal and gypsum are received by water for use in these industries.

11. Rockland is the mainland terminus for ship lines serving the Penobscot Bay island communities of Criehaven, Matinicus, Vinalhaven, and North Haven, which have a total permanent population of about 2,250 and a summer population of about 4,250. Municipally owned ships operate between these islands and Rockland for the accommodation of freight, passengers, and mail. Rockland is the logical trading center for these communities and serves as the hub of the island transportation and commerce. A branch line of the Central Maine Railroad extends from Rockland to the main line at Brunswick, and the city and surrounding area is served by a good highway system. There is year-round air freight and airline passenger traffic service to Rockland.

## PRIOR REPORTS

12. Rockland Harbor has been the subject of several previous reports. The earliest reports, which form the basis for the existing project, were made over a half century ago. Pertinent data with reference to more recent unpublished reports are contained in the following tabulations:

Scope and date of report	Work considered	Recommendation
Preliminary examination submitted to Congress Apr. 13, 1921.	Channels to Rockland Lime Co. and East Coast Fisheries wharves, anchorage 10 to 12 feet deep in the shelter of Crockett Point.	Unfavorable.
Survey report submitted to Congress June 21, 1937.	Approach channel 13 feet deep to municipal pier. Approach channel 16 feet deep to Eastern Steamship Lines, Inc., wharf.	Do.
Preliminary examination submitted to Congress Mar. 11, 1954.	Channels and anchorages in Lermond Cove and other parts of the harbor for the purpose of facilitating commercial navigation.	Favorable to a survey.

## EXISTING CORPS OF ENGINEERS PROJECT

13. There had been no Federal improvement of the harbor prior to the existing project. This project provides for a riprap breakwater extending 4,346 feet southerly from Jameson Point on the north side



of the entrance to the harbor; dredging of 4 acres in the inner harbor in the vicinity of the wharves to depths ranging from 4 to 13 feet at mean low water; and removing 2 groups of ledges, one to 22 feet and the other to 14 feet at mean low water.

14. The existing project was authorized by the River and Harbor Act of June 14, 1880, which provided for the breakwater, and by the act of June 3, 1896, which provided for dredging and removal of ledges.

15. The dredging and ledge removal were completed in 1901 and the breakwater was completed in 1904. The total cost for new work was \$915,862.73 and the cost for maintenance to date has been \$78,452.93. The annual cost of maintenance of the authorized project in 1950 was estimated at \$1,500, of which \$1,000 is maintenance of the breakwater, and \$500 is maintenance of the dredged harbor areas. This has proved adequate since the only maintenance dredging required has been in the 4-foot area. The breakwater was last repaired in 1925 and recent examinations reveal it to be in good condition.

#### LOCAL COOPERATION ON EXISTING PROJECT

16. There were no conditions of local cooperation prescribed for the existing project.

#### OTHER IMPROVEMENTS

17. The city of Rockland provides and maintains a public landing with necessary appurtenances. Considerable dredging of approach channels to the various wharves has been accomplished by local interests. Most of this work has been done on the harbor side of the Federal harbor lines. Pier space for freight and passenger service to the islands in Penobscot Bay is presently leased by the city.

18. In 1951 the State legislature passed an act creating the Rockland Port District for the purpose of providing and operating suitable wharfage facilities in the harbor. The trustees of this port district are empowered to issue bonds up to \$100,000 for necessary facilities. In addition the State has allocated \$50,000 to be made available to the port district. Also the State legislature is presently considering allocation of a second \$50,000 to the port district, making a total of \$200,000 in all for that purpose. After a survey of the entire waterfront in search of a sheltered, adequate terminal area, a site on Lermond Cove, known as Perry's wharf, has been tentatively chosen for improvement by the Rockland Port District and is intended to be used by the Penobscot Bay island boats, fishing vessels, and small freighters. The city of Rockland owns a large area of open land immediately behind this wharf. This availability of land space, and the degree of shelter provided in Lermond Cove, were the predominant factors resulting in selection of that site for the port district terminal.

19. The city of Rockland has under consideration a plan to bulkhead off and fill the upper end of Lermond Cove for a municipal parking area. Although the plan has not been definitely adopted, the financing has been arranged, and indications are that the development will be undertaken. The city recognizes that the layout will require a change in the United States harbor line in that area. Although the improvement is not directly associated with any specific harbor activity, nor tied in with the proposed harbor project, it is intended to provide much needed parking area close to the center of



the city and close to the waterfront, as an asset to present and further growth in that area.

#### TERMINAL AND TRANSFER FACILITIES

20. About 15,000 feet of the total water frontage of the harbor has been developed, and over 20 wharves are in active use at the present time. Wharf construction varies from timber cribs filled with stones or earth, to granite faced fills. Seven of the wharves have depths ranging from 10 to 15 feet; 8 have depths ranging from 5 to 9 feet; 4 have depths ranging from 1 to 4 feet; and the remainder are dry at low water. Gantry cranes or derricks are available at some of the wharves for unloading and handling cargo, and many of the wharves at the fish companies are equipped with salt water suction pumps used in handling fish from the boats.

21. Located at the north end of the waterfront, there is at present one lime terminal in active use for waterborne commerce. This terminal is operated by the Rockland & Rockport Lime Co. which manufactures agricultural lime and uses its dock facilities for receiving coal for its own use and for sale to industrial and domestic consumers. This wharf is also used for the receipt of gypsum rock which is transported by truck to the Dragon Cement Co. at Thomaston, 5 miles distant.

22. The wharves located in the Lermond Cove area, on Crockett Point, and in the cove south of this point are used mainly for the receipt of fish and shellfish, and marine products.

23. A Coast Guard wharf is located at the east end of Crockett Point. The Rockland public landing is located in the cove to the south about midway between Crockett and Atlantic Points. The city of Rockland also leases wharf space as a public terminal at McLoons wharf, a short distance south of the Coast Guard wharf.

24. The Socony-Vacuum Oil Co. wharf is situated at the east end of Atlantic Point, about 1 mile south of Crockett Point. On the south side of Atlantic Point at the south end of the developed waterfront is the Shipyard Division of the General Foods Corp. The shipyard makes services and ordinary repairs to fishing vessels. The marine railway at this shipyard has a capacity of 2,600 tons and can handle vessels up to 200 feet in length.

25. None of the wharves presently have rail service, but adequate highway connections are available at each pier. Except in the Lermond Cove area, very little suitable, unused frontage is available within the present limits of developed waterfront for the construction of new terminals. Several wharves now fallen in disrepair are available for reconstruction, but they have only limited adjacent land area. Extensive shore frontage is available for development along the north and the more exposed south shores of the harbor.

26. The Rockland Port District proposes to construct modern facilities in Lermond Cove for the use of general freight and passenger boats, and fishing vessels. The Birdseye Division of the General Foods Corp. proposes a large long-range program for development of their extensive holdings along the southern waterfront into a completely integrated fishing fleet base and fish processing plant. Other wharf owners propose to undertake wharf and berth improvements if the harbor is dredged.

## IMPROVEMENT DESIRED

27. In order to obtain the views of interested parties with respect to improvement of the harbor, a public hearing was held at Rockland, Maine, on October 20, 1953. The hearing was attended by representatives of the Federal, State, and local governments, the fishing industry and other business interests.

28. The Rockland Port District, the city, the chamber of commerce, the Snow Marine Basin, Inc., General Foods Corp., and the United States Coast Guard requested dredging to a depth of 13 feet at mean low water in the northwestern portion of the harbor inshore of the 13-foot contour, from Lermond Cove and Crockett Point northward. Representatives of the Vinalhaven and North Haven Port Districts requested dredging in Lermond Cove. A representative for the captains operating the freight and passenger boats between Rockland and the Penobscot Bay islands stated that a channel at least 150 feet wide and 13 feet deep leading into Lermond Cove is needed for the operation of their boats.

29. Proponents for the improvement of the Lermond Cove area in the northwest section of the harbor state that the needs of the port have changed since 1896 when the existing project was authorized. The smaller, shallow-draft vessels that were used at that time have been replaced by larger and deeper-draft vessels. They state that the only suitable wharf for handling general cargo [Tillsons wharf] was purchased during the war by the United States and is now used exclusively by the United States Coast Guard. The temporary arrangements made by the city of Rockland in leasing wharf space at McLoon's wharf for the Penobscot Bay island boats are now unsatisfactory due to the great increase in freight and passenger traffic. There is not sufficient room for trucks to load and unload on the wharf and the slip where the cars are driven aboard boats is in poor shape. Trucks with loads of 5 to 10 tons are beyond the safe load capacity of the wharf. The wharf is exposed to easterly storms. It is said to be impossible to tie up at this wharf in rough weather and that a 2-inch cable is quickly snapped by the surge. The State of Maine has created a Rockland Port District for the purpose of purchasing or constructing suitable shore facilities and operating them for the general benefit of waterborne commerce. The port district, after a careful study of all possible sites, has selected a suitable site on Lermond Cove, close to the city's business section, which provides adequate water frontage for sheltered berthing and extensive land area for construction of necessary buildings and parking. The port district proposes to expend up to \$200,000 in providing wharfage and berthing space, service buildings, warehousing, parking area, and general cargo-handling facilities to meet the needs of general freight and passenger commerce in Rockland Harbor, and requests the cooperation of the Federal Government in the improvement of the Federal waterway. The proponents stated that the area in Lermond Cove would be used year around by the freight and passenger boats serving the needs of the many inhabitants of the Penobscot Bay islands of Vinalhaven, North Haven, Matineus, and Criehaven. In the sheltered cove, there would be much more safety in loading and unloading passengers and freight. The improvement of the waterway would also induce an expansion of business in the Lermond Cove area, and



serve as a much needed protected harbor of refuge. The city manager of Rockland stated that the city desired to arrange for new wharf facilities prior to expiration of the present lease in 1955.

30. In addition, a representative of the Snow Marine Basin, Inc., stated that because of inadequate depth of water in the Lermond Cove area, many of the larger boats have to be taken to other repair yards outside of Rockland. Some of the yards to which the boats are taken are at Camden, Stonington, Boothbay, and Southwest Harbors; their distances ranging from 10 to 50 miles from Rockland. Improvement by dredging the area to a greater depth would enable this yard to expand its facilities and service these vessels which at the present time cannot get into this yard. In the spring of 1953, this company made a random survey of the fishing fleet and other commercial vessels using Rockland Harbor. Of 26 boatowners contacted with vessels ranging from 50 to 400 tons, it was found that their expenditures totaled \$114,000 for general repair, painting, and hauling-out costs in 1952. It was also revealed that it was necessary for at least 50 percent of the owners contacted to take their boats elsewhere for repair because of insufficient depth of water in the Lermond Cove area. It is the opinion of this shipbuilding and repair concern that with the proper depth of water so that boats may reach their yard, these repairs would be made at Rockland instead of at a distant harbor.

31. The Algin Corporation of America, located east of Lermond Cove, along the approach to the cove from the harbor, stated in a letter forming part of the record of the hearing that they need a harbor channel depth of at least 12 feet at mean low water in order to be able to receive boats at their wharf. The Whitmoyer Laboratories, Inc., located in the same area, likewise stated in a letter forming part of the record of the hearing that their requirements call for a 9- or 10-foot channel.

32. The Algin Corporation of America on Crockett Point receive 99 percent of their raw materials by boat, the total annual tonnage running over 500 tons. They operate 4 boats under charter, each having a 10-foot draft, 3 of 61 net tons capacity and 1 of 32 net tons. One of these boats docks at their wharf for discharging during the higher stages of tide. The other 3 boats dock at a neighboring wharf and the raw material is hauled overland to their plant, a distance of about 1 mile per round trip. It is claimed that in the event the harbor is dredged these boats would dock at their own wharf resulting in a saving of at least \$1,500 per year. The company stated that they were in process of expanding, which means that lack of adequate channel depth will be reflected in a greater loss to them.

33. The Whitmoyer Laboratories, Inc., claim that they have to wait for tide before the vessels bringing trash fish and other material can land at their wharf. The boats bringing trash fish usually arrive in the evening to get their catches unloaded and return to the grounds for the next day's fishing. When the boats arrive on the lower stages of tide at night, it becomes necessary for them to wait until the next day. The tidal delays result in lost time to the boatmen as well as a loss to the company in having the boatmen get discouraged because of inadequate depths of water, and discontinue bringing in the trash fish. The company has no fishing boats of their own. They receive their fish from various fishermen. There are 10 to 12 boats varying in length from 30 to 100 feet and in gross weight from 25 to



75 tons that bring in between 3 million and 3,500,000 pounds of fish per year. The company also reported that they have 6 to 8 larger vessels varying in length from 80 to 200 feet bringing in material from Newfoundland and unless these boats can be docked and unloaded at the higher stages of tide, it becomes necessary to hire dockage elsewhere for these vessels.

34. The Rockland-Rockport Lime Co. and the Dragon Cement Co. requested dredging a channel at least 17 feet deep at mean low water in the northwest part of the harbor. The Maine Sea Products Corp. reported favorable to dredging in the Lermond Cove area and in addition requested dredging a channel at least 14 feet deep at mean low water in the northwest part of the harbor.

35. The representative of the Rockland-Rockport Lime Co. and the Dragon Cement Co. which uses the lime company's wharf, in support of the desired 17-foot northwest harbor front channel, claimed it would be possible for larger modern vessels to be used in transporting coal to Rockland, resulting in a saving of 30 to 50 cents per ton. The Dragon cement plant located at Thomaston is using oil for fuel at present but is equipped to burn coal, depending upon which can be procured the cheapest. The annual consumption of coal at this plant would be 85,000 tons. It was further stated that with the proposed channel improvement, the expected commerce would increase and bulk cargo receipts would consist of 100,000 tons of coal, 18,000 tons of gypsum, and a possibility that there might be 10,000 tons of sand.

36. The Maine Sea Products Corp., in support of the desired 14-foot channel along the northwest harbor waterfront, claim they have had to turn down a considerable amount of business because of insufficient depth of water in the harbor channel in that area. At the present time the company owns and operates 4 boats ranging from 8 to 12 feet in draft. There is a probability that this fleet may be enlarged with boats of greater draft.

37. Representatives of the United States Coast Guard, an agency having as one of its chief responsibilities the safe navigation of vessels, felt that dredging to greater depths in the harbor should be accomplished for the safety and benefit of established and future navigation and requested removal of several isolated shoal areas in the central part of the harbor, located in the vicinity of the wharves of the United States Coast Guard and the A. C. McLoon Co., and in the southern part of the harbor near the wharf of the Standard Oil Company of New Jersey.

38. The Birdseye Division of the General Foods Corp. requested removal to a depth of 18 feet at mean low water shoal areas in the southern part of the harbor near their marine base, and in the central part of the harbor. These shoal areas affect navigation to their wharf at their fillet plant, and to O'Hara's wharf where all Rockland fishing vessels obtain ice and fuel. The Birdseye Division of the General Foods Corp. claim that lack of sufficient water depths approaching O'Hara's wharf, the General Foods fish pier, and the General Foods marine base, restricts the movements of all larger vessels to and from these wharves to the period outside of 2 hours before until 2 hours after low water. It is claimed that as the result, conservatively, 1 trip per year for each large fishing vessel is lost through delays in movements and sailings, totaling not less than \$100,000 loss per year for the entire fleet under present conditions,

and with immediate and future plans this figure could easily become a \$300,000 per year loss to the port of Rockland.

39. A representative of the Independent Lobster Co. discussed the exposed nature of the wharves along the central waterfront on Crockett Point and requested consideration of the feasibility of constructing a stone breakwater 1,200 feet in length running in a southwesterly direction from a point about 500 feet south of the present Coast Guard wharf. The request for the construction of a stone breakwater was based on the belief that the breakwater would protect a portion of the waterfront lying between Crockett and Atlantic Points during easterly storms and induce improvements of shore facilities within the area with consequent increase in commerce. The requested breakwater received the support of only one other local interest present at the hearing.

40. The A. C. McLoon Co. located in the central waterfront area requested dredging to a depth of 13 to 15 feet below mean low water in an area lying westerly of the existing 13-foot project. This company also supported the recommendation for the breakwater mentioned in the previous paragraph. The A. C. McLoon Co. based its claim for greater depths on the fact that the portion of its pier now leased to the city for use by the island boats will be vacant when the new terminal in Lermond Cove is made available. In all probability it is expected that the space now used by the island boats will be leased to a fish firm who will require depths of 13 to 15 feet at mean low water. This company in its support for the breakwater mentioned in the previous paragraph, claims that their wharf and others in the vicinity have been damaged at different times because of lack of protection during easterly storms.

41. The Holmes Packing Corp. located along the south central waterfront submitted a letter at the hearing in their support for harbor improvements, citing losses due to tidal delays.

#### COMMERCE

42. The total waterborne commerce in Rockland Harbor for the 5-year period 1949-53 as reported in the annual reports of the Chief of Engineers on waterborne commerce of the United States, adjusted to reflect statistical data obtained in detailed investigations at the harbor, has averaged over 100,000 tons annually, ranging from about 100,000 tons to about 113,000 tons. The principal commodities are fish, petroleum products, coal, gypsum, and general freights. Several large fish processors and packers operate filleting, packing, and canning plants at Rockland and the port has become the center of the fishing industry for the area. From data furnished by the United States Fish and Wildlife Service the amount of edible fish landed at Rockland in 1953, exclusive of shellfish and sardines or herrings, is estimated at 16,000 tons and valued at about \$1,250,000. At the present rate of fish catch, this figure would be increased to about 30,000 in 1955, the increase principally due to the establishment and rapid expansion of the General Foods fishing base at Rockland.

43. In 1953 the General Foods Corp. transferred 3 large trawlers and 1 smaller trawler to Rockland. In 1954 the size of the fleet increased until it reached its present total of nine large trawlers late in the year. Therefore neither the 1953 nor 1954 fish catch totals are representative of the present annual rate of fish catch. In addition to the above landings of edible fish in 1953, there were over 4,500 tons



of fish waste and trash fish landed and processed into fish meal, fertilizer, animal food, chemicals, and oils, and over 8,000 tons of sardines or herring were landed at the Rockland canneries. There were also about 4,000 tons of lobsters landed by boat in Rockland. The total of all fish landings in 1953 was approximately 31,500 tons, and at the present rate of fish catch would be about 50,000 tons in 1955.

44. Waterborne commerce handled at Rockland during the period 1949 to 1953 and passenger traffic for the same period are shown in the following table:

*Receipts and shipments, Rockland, Maine*

[In short tons]

Commodity	1949	1950	1951	1952	1953
Fish and shellfish.....	43,697	29,359	40,972	30,000	31,500
Animal products, inedible.....	670	5,992	2,023	3,385	2,421
Coal and lignite.....	9,570	16,867	15,766	20,576	9,921
Petroleum products.....	30,692	31,575	34,537	33,111	39,437
Gypsum.....	8,339	9,477	9,100	12,337	17,382
Stone, sand, and gravel.....	3,200	1,750			
General commodities.....	10,554	6,888	8,396	6,858	7,301
Miscellaneous.....	1,401	374	2,115	1,034	748
Total.....	108,123	102,282	112,909	107,301	108,710
Passengers.....	29,110	28,461	28,734	27,988	29,465

1 Present rate of fish catch is about 50,000 tons a year based on the rate attained in 1954.

VESSEL TRAFFIC

45. Rockland Harbor is used by vessels varying from shallow draft lobster boats to large fishing craft and steamers, motor vessels, and barges drawing up to 20 feet. The following table gives the present annual commercial vessel traffic in and out of the harbor:

*Average annual commercial vessel traffic*

[Number of vessel trips]

NORTHWEST HARBOR AREA

Draft (feet)	Coal and gypsum	Fish	Total	Draft (feet)	Coal and gypsum	Fish	Total
20.....	5		5	7.....	6	39	45
13.....	6		6	6.....		50	50
12.....		119	119	5.....		39	39
11.....		46	46	4.....		5	5
10.....		229	229	Total..	22	820	842
9.....	5	139	144				
8.....		154	154				

CENTRAL HARBOR AREA

Draft (feet)	Passenger, general freight, petroleum, and other	Fish	Total	Draft (feet)	Passenger, general freight, petroleum, and other	Fish	Total
16.....		207	207	8.....	1,600	238	1,838
14.....		207	207	7.....	1,154	142	1,296
12.....	4	50	54	6.....		114	114
11.....		390	390	5.....		98	98
10.....	28	146	174	Total..	2,970	1,998	4,968
9.....	184	406	590				

APPROACH CHANNEL, SOUTH HARBOR

Draft, 14 feet (fish)..... 414

## DIFFICULTIES ATTENDING NAVIGATION

46. The main difficulties attending navigation in Rockland Harbor are those associated with the operation of vessels with drafts in excess of the low-water depths in the harbor. Groundings are not uncommon, but the major loss is that of operating time, waiting tidal stages at which the harbor could be navigated without danger of vessel groundings. There are also passenger and freight-vessel delays due to exposure to storms at present wharf location, and delay in loading and unloading due to cramped space.

## WATERPOWER AND OTHER SPECIAL SUBJECTS

47. The waterway is tidal. There are no problems involved in this investigation pertaining to waterpower, flood control, pollution, or related subjects. The work contemplated would have no adverse effect on wildlife or shellfish.

## PLANS OF IMPROVEMENT

48. At the public hearing held in Rockland, October 20, 1953, local interests requested the following dredging: (1) the entire harbor area in the vicinity of Lermond Cove, 13 feet deep; (2) areas off the central waterfront, 18 feet and 15 feet deep; (3) a channel to the northwest harbor front, 17 feet deep; (4) a channel along the northwest harbor front, 14 feet deep; (5) a channel 14 feet deep serving the south-central waterfront area in the vicinity of the Holmes Packing Co.; and (6) a channel 18 feet deep in the southern part of the harbor, in the vicinity of the General Foods marine base. A request was also made for construction of a breakwater 1,200 feet long to protect the central waterfront area. Also during the progress of the study, a local interest requested consideration of a channel to the northwest harbor front capable of serving coastal ships of 30-foot draft, which would require a minimum channel depth of 26 feet. As the study developed, it became apparent that the major proportion of the desired results and benefits could be obtained by dredging a channel or channels, at considerably less cost than would be incurred by dredging the general areas. The plans of improvement finally determined as most nearly accomplishing the desired purpose in the most practicable manner are as follows:

*Plan 1.*—A channel extending along about 1.5 miles of the northern and central waterfront, generally 14 feet deep, except for the entrance and the central quarter mile adjacent to the entrance, which are to be 18 feet deep, the channel varying in width from 100 to 150 feet, with a basin approximately 2.5 acres in area in Lermond Cove, and appropriate turning basins at each end of the channel.

*Plan 2.*—A channel 18 feet deep 100 feet wide leading to the vicinity of the General Foods marine base in the southern part of the harbor.

*Plans 3A and 3B.*—In lieu of that part of the 14-foot channel in plan 1 serving the northwest harbor waterfront a channel 17 (or 26) feet deep to that harbor area.

*Plan 4.*—A breakwater 1,200 feet long protecting the central waterfront.

49. Plan 1, the waterfront channel generally 14 feet deep, but 18 feet deep along its central 1,700 feet of length, and the approach



channel of 18-foot depth in that location, will by one improvement serve the entire developed harbor area except in the southern part of the harbor. Certain harbor shoals that were requested to be removed will remain outside the improved channel, imposing some restriction on harbor navigation. The sheltered basin in Lermond Cove will be of much less area than originally contemplated. However, all present and future harbor development within these limits would be benefited by this improved general harbor channel. This plan would entail two changes in existing United States harbor lines, the affected lines having been established or last modified in 1895. One change would be to shift landward the line now projecting sharply out into the harbor east of Crockett Point. The other change would be to shift channelward the line along the west bank of Lermond Cove, this line having for all practical purposes been rendered obsolete by the reconstruction of Perry wharf, 1930-37. The plan of the city of Rockland for bulkheading and filling upper Lermond Cove will also entail a revision in that harbor line. Although this latter plan has no direct connection with the harbor improvements considered herein, it will result in additional area for development in close proximity to the harbor improvements. It is believed that there will be no opposition to any of these harbor line changes.

50. Under plans 3A and 3B, the most economical channel to the northwest harbor front of 17-foot or 26-foot depth as requested for shipping in that part of the harbor would approach that area directly from the deeper outer harbor area. Provision of these greater depths along the alinement of the proposed waterfront channel would be more costly. As there is no demand or need for the greater channel depths for commerce destined to intermediate terminals along the waterfront, there would be no benefit to compensate for the added cost of deepening the waterfront channel.

#### ESTIMATES OF FIRST COST

51. Estimates of first costs have been prepared for the various plans of harbor improvement considered in this report, and for the alternative plans also studied. An unusual number [432] of probings were made in the hydrographic survey of the harbor to determine the relative hardness of the material to be dredged, and the existence and extent of submerged ledge rock areas. Except for one area of ledge rock of limited extent in the Lermond Cove channel, all proposed plans are expected to include only dredging of ordinary material, consisting of mud, sand, and gravel. Dredging quantities are in terms of place measurement and provide for dredging to the proposed project depth in ordinary material and to 1 foot below project depth in ledge, plus an allowance of 1 foot for overdepth in each case, except that for the 26-foot channel to the northwest harbor front an allowance of 2 feet of overdepth was estimated. Side slopes of 1 vertical on 3 horizontal in ordinary material and 1 vertical on 1 horizontal in ledge were estimated. The unit prices are based on prices prevailing in the 1954 construction season, and on removal of material by contract dredging, using a bucket dredge, with disposal of dredged material in deep water about a mile outside the harbor. The base unit cost for dredging at Rockland Harbor is estimated at \$1.25 per cubic yard. However, as the dredging under plan 2 might be undertaken separately, the

unit cost for the relatively small volume involved in that plan is \$1.75. Also under plan 3B, the volumes involved are so large that the unit cost would be \$1. The estimated costs of the various considered improvements include allowances for contingencies and engineering, inspection, and overhead. These estimated costs are set forth below:

*Plan 1.*—Waterfront channel 1.5 miles long, generally 14 feet deep, except for central 1,700 feet of its length, and for entrance channel 500 feet long, 18 feet deep.

A. Federal:

(1) Corps of Engineers:

(a) Dredging 400,000 cubic yards of ordinary material at \$1.25..... \$500, 000

(b) Removal of 5,000 cubic yards of ledge rock at \$40..... 200, 000

(2) U. S. Coast Guard: Aids to navigation..... 5, 000

Total Federal cost..... 705, 000

B. Non-Federal: (1) Local interests: Wharf and approach channel and berth improvements:

(a) Port district terminal..... 1 75, 000

(b) Private terminals..... 110, 000

Total non-Federal..... 185, 000

C. Total:

(1) Federal..... 705, 000

(2) Non-Federal..... 185, 000

Grand total..... 890, 000

<sup>1</sup> Exclusive of estimated \$75,000 self-liquidating costs, and \$50,000 development costs not dependent upon the harbor improvement.

*Plan 2.*—Approach channel 100 feet wide, 1,000 feet long, 18 feet deep in southern part of harbor.

A. Federal:

(1) Corps of Engineers: 50 percent of cost of dredging 12,000 cubic yards of ordinary material at about \$1.75..... \$10, 000

(2) U. S. Coast Guard: Aids to navigation..... 500

Total Federal cost..... 10, 500

B. Non-Federal:

(1) Local interests:

(a) 50 percent allocation to local interests of cost of Federal project dredging of 12,000 cubic yards of ordinary material at about \$1.75..... 10, 000

(b) Dock and approach channel and berth improvements..... 40, 000

Total local cost..... 50, 000

Total cost..... 60, 500

*Plan 3A.*—Channel 150 feet wide, about 0.5 mile long, 17 feet deep, to the northwest harbor front.

A. Federal:

(1) Corps of Engineers: Dredging 120,000 cubic yards at \$1.25..... \$150, 000

(2) U. S. Coast Guard: Aids to navigation<sup>1</sup>..... 500

Total..... 150, 500

B. Non-Federal: (1) Local interests: Dredging and wharf construction..... 135, 000

Total..... 285, 500

<sup>1</sup> In addition to existing aids.



*Plan 3B.*—Channel 200 feet wide, about 0.75 mile long, 26 feet deep, to the northwest harbor front:

A. Federal:

(1) Corps of Engineers: Dredging 700,000 cubic yards at \$1... <sup>2</sup>	\$700, 000
(2) U. S. Coast Guard: Aids to navigation <sup>1</sup> -----	1, 500

Total----- 701, 500

B. Non-Federal: (1) Local interests: Dredging and wharf construction-----	210, 000
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Total----- 911, 500

*Plan 4.*—Breakwater 1,200 feet long protecting central waterfront:

(1) Corps of Engineers: Furnishing and placing 100,000 tons of stone at \$7.50-----	\$750, 000
(2) U. S. Coast Guard: Aids to navigation-----	20, 000

Total----- 770, 000

<sup>1</sup> In addition to existing aids.

<sup>2</sup> Allocation of construction cost would be dependent on extent of developments to be served. That part of the project cost due to commerce of a single industrial unit would be required to be borne equally by local interests and the United States. Apparently 97 percent of the cost would be for channel depths in excess of those required for existing shipping.

#### ESTIMATES OF ANNUAL CHARGES

52. The estimated annual carrying charges have been computed on an assumed life of 50 years and at an interest rate of 2.5 percent on Federal investment and non-Federal public investment, and 4 percent on private investment. The annual charges on all plans except plan 2 have been computed on the basis that the cost of the channel improvements will be entirely borne by the United States, and the dock and berth improvements entirely by local interests. The annual charges on plan 2 are based on allocation of investment costs on a 50–50 basis between the Federal Government and local interests. The estimated annual charges are indicated on the following tabulations:

*Plan 1.*—Waterfront channel 1.5 miles long, generally 14 feet deep, except for 1,700 feet of its length, and for entrance channel 500 feet long, 18 feet deep.

1. Federal investment:

(a) Construction (Corps of Engineers)-----	\$700, 000
(b) Aids to navigation (Coast Guard)-----	5, 000
(c) Total-----	705, 000

2. Federal annual carrying charge:

(a) Interest-----	17, 600
(b) Amortization-----	7, 200
(c) Estimated cost of annual channel maintenance-----	2, 500
(d) Maintenance of aids to navigation-----	1, 500
(e) Total-----	28, 800

3. Non-Federal investment:

(a) Wharf and berth construction (port district)-----	75, 000
(b) Wharf and berth construction (private terminals)-----	110, 000
(c) Total-----	185, 000

## 4. Non-Federal annual carrying charge:

(a) Interest on port district investment.....	\$1, 900
(b) Interest on private investment.....	4, 400
(c) Amortization of port district investment.....	800
(d) Amortization of private investment.....	700
(e) Maintenance.....	5, 000

(f) Total non-Federal annual carrying charge.....	12, 800
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## 5. Total annual carrying charge:

(a) Federal annual carrying charge.....	28, 800
(b) Non-Federal annual carrying charge.....	12, 800

(c) Total annual carrying charge.....	41, 600
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*Plan 2.*—Approach channel 100 feet wide, 1,000 feet long, 18 feet deep, in southern part of harbor.

## 1. Federal investment:

(a) Construction (Corps of Engineers).....	\$10, 000
(b) Aids to navigation (Coast Guard).....	500

(c) Total Federal investment.....	10, 500
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## 2. Federal annual carrying charge:

(a) Interest.....	250
(b) Amortization.....	100
(c) Estimated cost of annual channel maintenance.....	400
(d) Maintenance of aids to navigation.....	100

(e) Total Federal annual carrying charge.....	850
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## 3. Non-Federal investment:

(a) 50 percent participation in Federal project.....	10, 000
(b) Local wharf and berth improvements.....	40, 000

(c) Total non-Federal.....	50, 000
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## 4. Non-Federal carrying charge:

(a) Interest.....	2, 000
(b) Amortization.....	300
(c) Wharf and berth maintenance.....	500

(d) Total non-Federal annual carrying charge.....	2, 800
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## 5. Total annual carrying charge:

(a) Federal annual carrying charge.....	850
(b) Non-Federal annual carrying charge.....	2, 800

(c) Total annual carrying charge.....	3, 650
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*Plan 3A.*—Channel 150 feet wide, about 0.5 mile long, 17 feet deep, to the northwest harbor front.

## 1. Federal investment:

(a) Construction (Corps of Engineers).....	\$150, 000
(b) Aids to navigation (Coast Guard).....	500

(c) Total.....	150, 500
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## 2. Federal annual carrying charge:

(a) Interest.....	3, 800
(b) Amortization.....	1, 500
(c) Estimated cost of annual channel maintenance.....	1, 000
(d) Maintenance of aids to navigation.....	100

(e) Total.....	6, 400
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3. Non-Federal investment: (a) Wharf and berth improvements.....	135, 000
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4. Non-Federal annual carrying charge:	
(a) Interest.....	\$5, 400
(b) Amortization.....	900
(c) Maintenance.....	1, 000
(d) Total.....	7, 300

5. Total annual carrying charge:	
(a) Federal.....	6, 400
(b) Non-Federal.....	7, 300
(c) Total.....	13, 700

*Plan 3B.*—Channel 200 feet wide, about 0.75 mile long, 26 feet deep, to the northwest harbor front.

1. Federal investment:	
(a) Construction (Corps of Engineers).....	\$700, 000
(b) Aids to navigation (Coast Guard).....	1, 500
(c) Total.....	701, 500

2. Federal annual carrying charge:	
(a) Interest.....	17, 500
(b) Amortization.....	7, 200
(c) Estimated cost of annual channel maintenance.....	2, 000
(d) Maintenance of aids to navigation.....	300
(e) Total.....	27, 000

3. Non-Federal investment: (a) Local interests, wharf and berth construction.....	210, 000
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4. Non-Federal annual carrying charge:	
(a) Interest.....	8, 400
(b) Amortization.....	1, 400
(c) Maintenance.....	1, 200
(d) Total non-Federal annual carrying charge.....	11, 000

5. Total annual carrying charge:	
(a) Federal annual carrying charge.....	27, 000
(b) Non-Federal annual carrying charge.....	11, 000
(c) Total annual carrying charge.....	38, 000

*Plan 4.*—A breakwater 1,200 feet long, off the central waterfront:

1. Investment:	
(a) Construction (Corps of Engineers).....	\$750, 000
(b) Aids to navigation (Coast Guard).....	20, 000
(c) Total.....	770, 000

2. Annual carrying charge (all Federal):	
(a) Interest.....	19, 200
(b) Amortization.....	7, 900
(c) Estimated cost of annual maintenance.....	1, 200
(d) Maintenance of aids to navigation.....	700
(e) Total.....	29, 000

#### ESTIMATES OF ANNUAL BENEFITS

53. *Plan 1—Waterfront channel.*—The harbor area that would be served by the proposed waterfront channel includes a multiplicity of terminals, handling waterborne commerce in a wide range of commodities, the cargoes being carried in a variety of vessel types. There

are within this harbor area terminals handling coal, gypsum, edible fish, waste fish, and fish products [fertilizer, livestock meal, chemicals], fish processing plants and canneries, an ice and fuel supplier to fishing craft, a boat repair and supply concern, a marine products plant [Irish sea moss], an oil terminal and a public terminal with regularly scheduled passenger and general cargo boat trips to the island communities. All of this commerce is now hampered to greater or less degree by inadequate depths for navigation. The passenger and general cargo traffic to the islands, particularly sensitive to exposure to storm wave action, is seriously affected because of the unprotected location of the Rockland public terminal. The tangible benefits that will accrue due to provision of a channel of adequate depth would be (1) enabling use of larger ships, resulting in savings in transportation costs, and (2) reduction of navigation costs by reducing delays waiting for tide because of inadequate channel depths.

54. *Coal commerce.*—Coal is received at the Rockland-Rockport Lime Co. terminal located at the northern extremity of the proposed waterfront channel. The coal barges now in use have a capacity of about 3,300 tons, and are 250 feet long and have a loaded draft of 20 feet. These barges take maximum benefit of the 9.7-foot tidal range, and limit their navigation in the harbor to within 1 hour before or after slack high water, at which period there is 9 feet of additional channel depth. At this stage of tide there is 1 foot of navigation depth in excess of ship draft, hardly adequate to allow for the various factors affecting ship navigation, such as uneven loading, squat underway, clearance under the keel for maneuverability, minus tides or tides lower than average, and lack of full project depth pending channel maintenance at infrequent intervals. The net minimum channel project depth required at mean low water to effect a channel safely adequate for fully loaded barges is as follows:

	<i>Feet</i>
Ship draft.....	20
Excess depth allowance.....	+3
Depth afforded by limiting navigation to high tide.....	-9
Channel depth required at mean low water.....	14

The channel presently used has shoaled to a controlling depth of 12 feet, and narrowed to a width of 75 feet. The barge traffic is now operating with less than adequate or safe channel dimensions, a condition which will be intensified by further deterioration of the channel.

55. The waterborne coal commerce has averaged 15,000 tons annually over the past 5 years, remaining at a uniform level except for fluctuations in the annual totals occasioned by receipt of a barge load just before or after the close of the year. It is estimated that future coal commerce will at least maintain this level, and will probably increase. Estimates of benefits are based on the average tonnage of recent years.

56. Provision of a channel 14 feet deep instead of the present channel 12 feet deep will reduce tidal delays an average of 1.4 hours per trip. At an hourly operating cost of \$60 for the barge and towboat, this saving would represent an average annual benefit of about \$400.

57. The ship charterer scheduling the coal movement to Rockland has stated that barge rates using 3,300-ton barges would be reduced \$0.50 per ton of coal if the channel were dredged sufficiently to permit the use of larger barges 330 feet long, 23-foot draft, carrying



about 5,600 tons of coal. Barges of this size would require a channel 17 feet deep and 150 feet wide, even taking maximum benefit of the tidal range and limiting navigation to high tide. Such a channel was considered under plan 3A. The additional annual benefit that would result from providing a channel 17 feet deep, permitting the use of 5,600-ton barges, is 15,000 tons times \$0.50, or \$7,500, thus yielding a total annual benefit to the coal commerce resulting from a 17-foot channel of \$7,900. An estimate was also made of the transportation cost if the 5,600-ton barges were underloaded, reducing the barge draft and channel depth requirement 1 foot, but it was found that such underloading just about eliminated any saving in cost as compared to using 3,300-ton barges fully loaded.

58. Representations were made at the public hearing indicating the possibility of a future increase in coal commerce by 85,000 tons a year to a total future annual coal commerce of 100,000 tons. This possibility was based on future use by the Dragon Cement Co. of coal as a fuel rather than oil. The plant is equipped to burn either fuel. However, no firm indication could be obtained as to the extent of variation from the present relative price levels of these two fuels that would result in such a shift from oil to coal. It is understood that oil has certain superior qualities that make the determination of the fuel to be used more than solely a matter of relative cost. Lacking data sufficient to verify an actual future increase in coal traffic, the benefit determinations have been restricted to present volumes of coal commerce.

59. *Gypsum*.—There is an annual traffic in gypsum received by ship at the lime company dock which has been averaging 16,000 tons for the past few years. This traffic is expected to be maintained in view of the extreme demand for cement production in the foreseeable future. This annual tonnage is received in 6 vessel trips, each of approximately 2,600 tons, the vessel having a 13-foot loaded draft. These vessels would suffer an average tidal delay of 12 hours if the channel is unimproved, but only 0.5 hours if a 14-foot channel is provided. This reduction in tidal delay of 0.7 hour per trip would have an annual value of about \$200.

60. Provision of a channel depth of 17 feet would yield an additional benefit to the gypsum traffic due to entire elimination of delays now incurred waiting for tide. This additional reduction in delays would average about 0.5 hour per trip inbound, or 3 hours per year. It is estimated that elimination of this delay would result in an added annual benefit of \$150.

61. *Fish and fish products*.—The waterfront channel will serve the entire fishing fleet of Rockland. The fish piers are all within the waterfront area along the proposed channel. Within this area there are based about 65 fishing boats, ranging in length from 20 to 150 feet, and in loaded draft from 5 to 16 feet. All of these craft suffer delays in varying degree, due to inadequate harbor depths. Controlling depths of 14 feet affect the central waterfront area, and depths of 6 and 7 feet control navigation to the remaining waterfront area, except for the most northerly fishing terminal where the controlling depth is 10 feet. Although differing widely, the average annual number of trips per vessel is 22, for a total traffic of approximately 2,800 fishing vessel movements, 1,400 inbound and 1,400 outbound. The drafts outbound average 1 to 2 feet less than inbound. Also the

boats based in the central waterfront area, within the limits of the proposed 18-foot channel, are principally the larger ships, ranging in loaded draft from 12 to 16 feet, while those based in the less central areas principally range in draft from 8 to 12 feet, although some have lesser drafts. The delays encountered by these fishing boats are as follows:

*Central waterfront area*

[14-foot controlling depth]

Draft (feet)	Annual number of vessel trips	Average tidal delay per trip (in hours)	Total annual tidal delay (in hours)
16.....	207	1.6	331
14.....	207	.8	166
12.....	50	.3	15
10.....	50	0	0
Total.....			512
Say.....			500

The hourly costs for operating these boats are \$35 for the 14- to 16-foot draft boats and \$25 for the 10- to 12-foot draft boats. If, then, we multiply 485 hours' delay by \$35 per hour, and 15 hours' delay by \$25 per hour, the total annual benefit to the nearest hundred dollars is \$17,400.

*Waterfront channel other than central area*

Draft (feet)	Annual number of vessel trips		Average tidal delay per trip (in hours)		Total annual tidal delay (in hours)
	6 to 7 feet controlling depth	10 feet controlling depth	6 to 7 feet controlling depth	10 feet controlling depth	
12.....	110	9	4.1	1.6	465
11.....	409	27	2.7	1.2	1,136
10.....	262	63	2.7	.8	758
9.....	455	90	2.1	.5	1,000
8.....	329	63	1.2	.3	414
7.....	163	18	.8	0	130
6.....	149	15	.5	0	74
5.....	122	15	.3	0	37
4.....	5		.3		2
Total.....					4,016
Say.....					4,000

The hourly cost of operating these boats averages \$15 so the total annual benefit is 4,000 hours times \$15 per hour, or \$60,000. The total annual benefit to the Rockland fishing fleet due to elimination of tidal delays by provision of the waterfront channel would be the sum of the above estimates or \$77,400. The time saved by elimination of these tidal delays would be used for productive fishing.

62. In addition to elimination of tidal delays, local interests submitted figures indicating that the channel improvement would eliminate annual trucking costs estimated at \$1,500 and \$1,200, respectively, to the Algin Corp. wharf and Feylers wharf from other docks in deeper parts of the harbor. The volumes and commodities trucked, consisting of 500 tons of sea products such as Irish sea moss to Algins, and 1,200 tons of fish to Feylers. These estimates appear reasonable



and the realization of these benefits is considered to be reliably assured by the proposed channel improvements.

63. *Miscellaneous commerce.*—The Maine State highway construction and maintenance program on the island highways is entirely dependent on shipping of equipment and materials out of Rockland. The Maine State Highway Department claims that due to unsatisfactory shipping facilities at Rockland increased costs are incurred in their construction and maintenance of highways on Vinalhaven, North Haven, and the other islands. Materials and equipment must now be handled in small and uneconomical movements. The State highway department claims that the proposed new port district terminal, with spacious loading areas, in a sheltered location in the harbor served by a channel capable of accommodating larger ships, will result in more efficient operations, at an annual saving estimated at \$2,000.

64. The Snow Marine Basin, presently handling annually some 90 ships of 3- to 6-foot draft, is hampered in bringing these ships to and from its yard, due to channel controlling depths of 4 feet. These ships are delayed an average of at least 1 hour each, both in entering and leaving the yard. A representative of the concern stated that the shipyard working area would be dredged if the channel were improved. It is estimated that the annual value of elimination of the delays due to channel conditions would be at least \$1,800 at the rate of \$10 an hour. In addition, it is claimed that some ships needing repairs must go to repair yards in other harbors not limited to the same extent by shoal channel conditions. However, these ships could undoubtedly be brought to the Snow Marine Basin at high tide, with less cost for tidal delay than is now incurred in transporting the boats to repair yards in other harbors. It is considered therefore that the cost to the boatowners for transporting their boats to other harbors for repairs is not due to necessity because of channel conditions, but to preference. Therefore no benefit is estimated for elimination of this practice.

65. The McLoon wharf is a depot for fuel oil and gasoline shipped by small tanker to the islands and small coastal ports of Maine. The tanker has a loaded draft of 9 feet, and will be unaffected by the proposed channel deepening. There are no present plans for use of a deeper draft tanker.

66. The Rockland Port District at the time of the hearing in 1953 requested provision of a channel 13 feet deep to the terminal to be established at the Perry wharf, so called. It was claimed that existing leased accommodations were cramped and inadequate, and that 40,000 passengers and \$2,500,000 worth of commerce to the islands required better facilities. The port district has a bonding authority of \$100,000 and the State of Maine allocated an additional \$50,000 for the port district improvement. In addition, the Maine State Legislature is considering appropriation of a second \$50,000, thus making a total of \$200,000 available for this purpose. With these funds, the port district expects to construct a wharf and warehouse and all other necessary facilities. The present 3 ships running mail, freight, and passengers to the islands have drafts of 7 and 8 feet. It is expected that a larger ship will replace these craft. Vessels at other localities similar to that now proposed have a draft of about 11 feet. In December 1954, with their plans more definitely determined, the

port district revised its estimate of required channel depth to 14 feet. In view of the nature of the proposed port district service, with regularly scheduled runs and a large passenger business, the channel must be adequate so that no tidal delays will be encountered. To insure such reliability of operation and to make proper allowance for lower than average tides, channel shoaling to less than project depth, and minimum clearance under the keel for safe navigation of a passenger boat, a channel of 14-foot depth would be required. It is impracticable to attempt to make a fully monetary evaluation of the benefits that would accrue due to establishment of a more spacious and better equipped public port terminal and the provision of an adequate channel to that terminal, but there is clearly considerable intangible public benefit. It has been verified that about 1,000 round trips, or a total of 2,000 vessel trips, were made in 1953, carrying 10,000 tons of freight and 30,000 passengers. Island winter and summer populations of over 2,000 and 4,000 persons, respectively, are entirely dependent on continuity of this boat service.

66A. The freight and passenger vessels using the present public terminal at McLoon's wharf are subject to operating delays and vessel damage due to the relatively exposed location of the wharf. The passenger and freight traffic is particularly vulnerable in this respect. The ship operations are further delayed due to the inadequate space available at the present terminal, resulting in slow and inefficient loading and unloading procedures. The proposed relocation at the new port district terminal at Lermond Cove will eliminate these delays from both causes (exposure to wave action and delays due to cramped loading space), and will also eliminate the excessive damages caused to the ship in lying at the more exposed pier. Information from the operators of these vessels indicate that there are at least 10 days a year when the weather is such that the boats do not land at Rockland solely because they cannot lie at the dock. They would land in Lermond Cove under the same weather conditions. Losses in freight, mail, and passenger movements total \$3,900. Operating costs in these periods for which there is no return amount to \$1,350. Ship damages suffered during bad weather landings that would be eliminated by transferring the terminal to Lermond Cove amount to \$1,000 annually. The total of these delays, damages, and losses amount to \$6,250 a year.

67. The United States Coast Guard maintains a base at Tillson's wharf in Rockland Harbor, at which the Coast Guard boats *Snohomish* and *Laurel* are moored. The *Snohomish* is 110 feet long, with a draft of 12 feet, and the *Laurel* is 180 feet long, with a draft of 13.5 feet. The Coast Guard is seriously hampered in its operations by lack of channel depth, limiting navigation in shoal areas to times of higher tidal stages. The benefit to the Coast Guard in the performance of its functions that would be realized by removal of the obstructing harbor shoals cannot be readily evaluated on a monetary basis, but is nevertheless of importance.

68. The total evaluated annual benefits accruing to the waterfront channel is tabulated below:



	Plan 1, 14-foot waterfront channel	Plan 3A, 17-foot channel
Coal:		
Tidal delays.....	\$400	\$400
Larger barges.....		7,500
Gypsum: Tidal delays.....	200	350
Fish:		
Tidal delays.....	77,400	<sup>1</sup> 13,500
Elimination of trucking cost.....	2,700	<sup>1</sup> 1,200
State highway.....	2,000	
Passenger and freight traffic:		
Losses due to weather-exposure delays and loading delays.....	5,300	
Elimination of vessel damages.....	1,000	
Boat repairs.....	1,800	
Total.....	90,800	22,950

<sup>1</sup> That part of benefits derived equally either from the 14-foot or 17-foot channel to the northwest harbor area. Incremental benefits due to provision of 17-foot channel instead of 14-foot channel are \$7,650.

In addition, the intangible benefit accruing to the establishment of a modern and spacious port district terminal and area, and an adequate channel serving the same, although not readily susceptible of monetary evaluation, is considered to be real and extensive.

69. The dredging to a depth of 13 feet of the entire harbor area between Lermond Cove and the lime company would cost \$700,000, in addition to the cost of a waterfront channel. The benefits that would be derived from this expenditure would consist principally of provision of a more extensive area of refuge, a benefit not readily susceptible of monetary evaluation. Although it is considered that real benefits would accrue to such a refuge, it is considered doubtful that such an extensive area would afford sufficient benefits, beyond those provided by the smaller basin in Lermond Cove under plan 1, to justify the additional cost.

70. *Plan 2—Approach channel, South Harbor.*—The General Seafoods division, which is the marine branch of the Birdseye division of General Foods Corp., is based in Rockland. This corporation at the time of the public hearing in October 1953 operated four deep-sea trawlers from Rockland. They now operate 9 from this harbor, and a fillet plant located along the central waterfront, employing 150 people, processing fish caught by their own ships and by independently operated ships. The corporation also operates a marine base in the southern part of the harbor for servicing and repairing the fishing fleet, this marine base employing 100 people. The corporation is the largest property owner on the waterfront. The 9 trawlers are approximately sister ships, all of steel construction, 146 feet long, with drafts of 14 feet light and 16 feet loaded, cargo capacity 150 tons. These ships make 2 trips a month to the fishing grounds, their trips being of 12-day duration. The annual scheduled traffic therefore is 216 round trips. However, the company claims that these ships lose 1 full trip a year, or about 4 percent of their operating time, because of harbor delays due to inadequate channel depths and necessity of waiting for tide. Therefore the fleet actually makes about 207 trips. The present controlling harbor depth approaching their marine base is 14 feet. These depths result in tidal delays averaging 1.6 hours per round trip or 330 hours per year for their entire fleet. The estimated

annual cost of this tidal delay is about \$11,500. The ships undoubtedly incur further tidal delay however, due to lesser depths in the berths or harbor areas around the piers, shoreward of the harbor line. Representatives of the company state that the planned development of the base at Rockland will include elimination of these conditions, as well as all other improvements necessary to eliminate losses in time and to increase efficiency of operation.

71. *Plan 3A.*—Plan 3A provides for a channel 17 feet deep, 150 feet wide, to the coal and gypsum terminal and the fish piers in the northwest part of the harbor, in lieu of the northern branch of the 14-foot waterfront channel. A channel of that depth directly approaching the terminal would be somewhat more economical than the additional cost of deepening of the northern branch of the proposed 14-foot waterfront channel to 17 feet. The added benefits that would accrue to a 17-foot channel as stated in paragraph 68 above, are \$7,500 for larger coal barges, and \$150 for reduction of tidal delays incurred by coal and gypsum boats.

72. *Plan 3B.*—Plan 3B provides for a channel 26 feet deep, 200 feet wide, to the northwest part of that harbor, in lieu of the northern branch of the 14-foot waterfront channel. A channel of 26-foot depth directly approaching that part of the shore from the outer harbor would be more economical than the added cost of deepening the northern branch of the proposed 14-foot waterfront channel. The purpose of a channel 26 feet deep would be to afford navigation at high water by ships of 30-foot draft. An industrial developer requested that consideration be given to such a channel in connection with proposed establishment of a new cement plant in Rockland and proposed shipment of the bulk product by water to the major east coast ports. The scale of the operation described would involve a relatively large volume of waterborne commerce, probably equivalent to one or more trips a month of large bulk carriers of 30-foot draft. An economic survey of industrial potentialities of New England, made for the Federal Reserve Bank of Boston, mentions establishment of such a plant in New England as having a very favorable aspect. However the proposed development has not yet reached a stage where this future commerce can be considered assured. Pending more positive determination that the development will materialize at the scale described, no firm assessment of benefits can be made.

73. *Plan 4—Breakwater.*—Construction of an offshore breakwater to protect the central waterfront has been requested and considered. However, no specific data have been furnished as to damages to navigation that such a breakwater would reduce or eliminate. In common with all coastal harbors, there is desire for more shelter from the exceptional storms that cause varying amounts of damage and upset normal harbor operations. Lack of readily apparent information as to such damages indicates that the damage caused was not unusual nor sufficiently great to justify the heavy expenditure required for the protective breakwater. In addition, the provision of the proposed waterfront channel and the development of port facilities in Lermond Cove will provide a small, well sheltered harbor for general freight and passenger traffic and for emergency refuge thus further reducing the necessity for increased protection to the central waterfront.



## COMPARISON OF BENEFITS AND COSTS

74. A comparison of annual benefits and annual charges pertaining to each of the plans under consideration is given in the following tabulation:

Plan	Description	Annual benefits	Annual charges	Ratio of benefits to costs
1	14- to 18-foot waterfront channel.....	\$90, 800	\$41, 600	2. 2
2	18-foot south harbor channel.....	11, 500	3, 650	3. 1
3A	17-foot north harbor channel.....	22, 950	13, 700	1. 7
3B	26-foot north harbor channel.....	(1)	38, 000	(1)
4	1,200-foot breakwater.....	(1)	29, 000	(1)

<sup>1</sup> Not evaluated.

In addition to the evaluated annual benefits tabulated above, there are extensive intangible benefits pertaining to the channels proposed to serve the central waterfront area and the Lermond Cove area. The principal benefits comprise those of betterment of the lifesaving services of the United States Coast Guard and those deriving from improvement of port and terminal services available to the neighboring island and coastal communities. These additional benefits, although not susceptible of monetary evaluation for comparison with project costs, are nevertheless real and of great significance to the future development of the port.

## PROPOSED LOCAL COOPERATION

75. The benefits to be derived from the proposed waterfront channel are all general in nature, pertaining to reduction of costs of the fishing fleet and general waterborne commerce. Therefore, no local cash contribution to the cost of this project should be required. However, it should be recognized that local expenditures of over \$300,000 are contemplated and proposed in connection with this harbor improvement, of which the major expenditure [\$200,000] will be for the public terminal development under the auspices of the Rockland Port District, created by the Maine State Legislature.

76. The benefits to be derived from the proposed south harbor channel, serving a single concern, are considered to be local as well as general in character. It is considered therefore that local interests should contribute half the cost of the improvement. Although no formal assurance has been obtained from local interests, indications have been given that this requirement will be readily met.

77. Local interest should, in addition, be required (1) to provide without cost to the United States all lands, easements, rights-of-way necessary for the construction of the projects and for subsequent maintenance, when and as required; (2) to hold and save the United States free from damages due to the construction and maintenance of the project; and (3) to provide and maintain at local expense adequate public terminal and transfer facilities open to all on equal terms.

## ALLOCATION OF COSTS

78. As stated in paragraph 76, above, 50 percent of the cost of the south harbor channel should be borne by local interests. All other project costs of improvement and maintenance and operation, exclu-

sive of costs of aids to navigation, will be costs to be borne by the Corps of Engineers.

#### COORDINATION WITH OTHER AGENCIES

79. All Federal, State, and local agencies having interest in the improvement of Rockland Harbor were notified of the public hearing held at Rockland, October 20, 1953. Representatives of the Rockland Port District, the city of Rockland, other local interests, the United States Fish and Wildlife Service, and the United States Coast Guard have all been consulted throughout the study concerning the proposed harbor improvements affecting their activities. The port district and city officials and others have expressed approval of the proposed improvements. The United States Fish and Wildlife concur that the plan will have no adverse effect on the fish or wildlife.

#### DISCUSSION

80. Rockland Harbor is located on Penobscot Bay, about the midpoint of the Maine coast, and except for the deep-sea ports which are primarily fuel depots for their tributary areas, is the principal port of the State. Rockland is the third largest fishing port of New England, as well as a terminus of the Maine Central Railroad, and is the mainland port serving the bay and offshore islands, including Vinalhaven, North Haven, Crielhaven, and Matinicus, and the smaller coastal ports to the east and west. The annual commerce of the port is over 100,000 tons, and is more diversified than is generally true of New England ports, the major components of commerce being fish, petroleum products, general cargo, gypsum, and coal.

81. The harbor has been improved by the Federal Government by construction of a breakwater, dredging of certain areas near the wharves, and removal of certain limited rock shoals. These improvements were completed in 1904 at a cost approaching \$1 million. The nature of the port commerce and characteristics of its shipping have changed materially in the half century since the Federal project was completed. The majority of present-day fishing trawlers, barges, and cargo ships are larger and of deeper draft and consequently are operating only at the extreme upper stages of the 9.7-foot tide. This method of operation has become increasingly uneconomical, with increasing hourly costs of these larger ships. In addition, in some instances the safe limit of ship draft that can be accommodated by channel depths even at the higher tidal stages has been exceeded. Unless the port channels are modified to accommodate these larger ships, the port will lose its commerce and decline. In recognition of this fact, and with characteristic New England practicability and independence, the State, city, and local business and industrial representatives have formulated a definite plan of self-help and harbor improvement. Over \$350,000 of local expenditure is proposed for necessary terminal and waterfront development, \$200,000 of which is for establishment of an adequate and modern public terminal under the administration of the Rockland Port District. However, these local interests realize that these improvements will serve no purpose unless the harbor channels are concurrently and equally improved by the Federal Government. Although initially proposing improvement of general harbor areas to depths necessary to serve present-day



shipping, local interests readily recognized the economic prudence of less extensive development by dredging channels at more moderate cost, accomplishing in major measure the desired purposes of the initial proposal.

82. At the time of analysis of the port needs, requests were also made for additional storm protection to the shipping in the harbor and the shore installations serving the port commerce. These requests primarily emphasized the advantages of improvement of the Lermond Cove area, the most sheltered part of the harbor, and the relocation to that site of the public passenger and freight terminal serving the island trade. The dependence of the offshore communities, with populations totaling over 4,000 persons, upon regular and reliable service from Rockland, the hub mainland port, adds emphasis to the need for such a sheltered terminal area. Requests were also made for provision of breakwater protection to the central harbor waterfront, along which is concentrated a large number of piers and wharves, and to other developed shore areas. The desire for increased protection from easterly and southeasterly storms is readily appreciated, but although exposure is sufficient to make these sections of the waterfront undesirable as a location for major port facilities, data concerning boat and shore structure damages that would be prevented by a breakwater is lacking to justify the heavy cost of such a structure.

83. The establishment and rapid growth of the General Foods base in Rockland Harbor is already having a marked effect on the fish catch of the port. The large modern trawlers and integrated fish processing and packing facilities, and ship-repair base, create an organization equipped to insure large-scale fishing operations on a modern businesslike and efficient basis, a prime necessity in the present-day fishing industry.

84. The plans of harbor improvement proposed generally have relatively high ratios of benefits to costs, a measure of the highly uneconomic shipping operation methods that have perforce been increasingly adopted during the past 50 years of transition in waterborne commerce from the early part of the century, when the harbor was last improved. The annual benefits, based on current volumes of commerce and fishing, are expected to increase over the life of the project, with population and market increases, and such further increases as might reasonably be expected to accrue from the provision of a port more conducive to commerce. The plans of improvement considered are four in number, and in addition an alternative to one of these. Of these proposals, that considered under plan 1 is for a channel 18 and 14 feet deep to, and along, the major part of the waterfront of the harbor, serving coal, gypsum, passenger traffic and general cargo commerce, fishing and fish products, marine chemicals, and ship repairing. Secondly, a channel to provide access to the fishing-ship marine base located in the southern part of the harbor has been considered under plan 2. Thirdly, a channel 17 feet deep to the coal and gypsum terminal in the northwest part of the harbor has been considered under plan 3A, and an alternative similar channel 26 feet deep under plan 3B. And finally, breakwater protection to the central waterfront area has been weighed under plan 4.

85. Of these plans, the first two would provide benefits substantially exceeding the costs. The benefits for the waterfront channel



stem largely from benefits to the present waterborne commerce in coal and gypsum, and benefits to the fishing industry based at the northwest and central parts of the harbor. These latter benefits are based on reduction of fishing costs, resulting from reduction or elimination of presently suffered tidal delays, and enabling the continued economic use of the large deep-draft fishing trawler with its high unit hourly costs of operation. Also of great importance to the port are benefits to the passenger and general cargo traffic to the islands and surrounding coastal communities, based on the dependence of this traffic on a more protected and adequate terminal, served by a channel of sufficient depth to insure safe maintenance of regularly scheduled service. As all of these benefits are general in nature, all project costs for the waterfront channel are assumed to be borne by the United States, with no local cash contribution to be required. The estimated first cost of the waterfront channel is \$700,000, exclusive of \$5,000 for additional aids to navigation. The total estimated annual charges are \$41,600, including \$12,800 of annual charges to be borne by local interests in connection with related terminal improvements. The total estimated annual benefits are \$90,800 for a benefit-cost ratio of 2.2.

86. The improvement for the Lermond Cove area initially proposed was the dredging of that entire area of the harbor to a depth of 13 feet. The project first cost would be \$1,400,000, exclusive of a \$4,000 cost for additional aids to navigation. No greater monetary benefit would result from this improvement than from the waterfront channel. The unevaluated benefits accruing to the new port district terminal would result, and in addition possibly greater unevaluated benefits due to provision of a larger sheltered mooring would be realized.

87. *Plan 2—Marine base channel.*—A channel leading to the General Foods marine base was requested, 18 feet deep, 200 feet wide. In view of the short channel length and straight alinement, a channel width of 100 feet is considered to be sufficient, even for the large 150-foot trawlers using the base. The provision of a channel in the southern part of the harbor in the vicinity of the General Foods marine base will benefit the fishing operations of that part of the Rockland fishing fleet producing an estimated two-thirds of the entire edible fish catch at the harbor, and about 50 percent of the total commerce in all types of fish and fish products. However, since the operations in this area are controlled by the single company, it is considered that the benefits derived from this channel will redound equally to local as well as to general commerce. Therefore, it is considered equitable that the costs of this improvement similarly be borne equally by local interests and the Federal Government. The estimated first cost of this channel is \$20,000, of which \$10,000 would be contributed by local interests. Although no formal assurances of fulfillment of this requirement of local cooperation have been made indications have been received that it will be readily met. In addition there would be an initial cost of \$500 for additional aids to navigation. The total estimated annual charges would be \$3,650, including \$2,800 to be borne by local interests, representing annual costs of the required contribution to the Federal project and annual costs for related wharf and berth improvements. The total estimated annual benefits are \$11,500 for a benefit-cost ratio of 3.1.



88. *Plan 3A.*—Provision of channel 17 feet deep to the coal and gypsum terminal in the northwest part of the harbor, with a 14-foot extension to the fish wharves in that section, in lieu of the north branch of the proposed 14-foot channel under plan 1, was considered. Such a channel would involve project first cost of \$150,000 exclusive of \$500 for additional aids to navigation and would also necessitate an estimated \$135,000 expenditure by local interests for dock and berth modifications. The annual carrying charges would be \$13,700 including \$7,300 of local carrying charges. The annual benefits would total \$22,950 for a benefit-cost ratio of 1.7.

89. Since plan 3A obviates the necessity for the 14-foot northwest channel extension in plan 1, it becomes apparent that a project consolidating the waterfront channel and Lermond Cove area of plan 1 and the 17-foot channel of plan 3A must be considered. The adoption of plan 3A would reduce the first cost of plan 1 by \$80,000 to \$620,000, giving a total project cost for modified plan 1 and plan 3A, therefore, \$620,000 plus \$150,000, or \$770,000 plus \$5,000 for additional aids to navigation. The local expenditures for wharf and berth improvements of \$135,000 under plan 3A would reduce local expenditures under plan 1 by \$21,000, to \$164,000. The annual carrying charges of such a combination of plans would be \$49,600 including \$18,200 of local carrying charges. The annual benefits would total \$98,450 for a benefit-cost ratio of 2.0. A plan providing additional depth for this section of the harbor has the additional attraction of providing potential benefits from possible increases in deep water coal or other commerce. However, analysis shows that the incremental annual benefits and costs due to the incremental channel depth from 14 to 17 feet would be \$8,150 and \$7,650 for a benefit-cost ratio of just under unity. Furthermore, the wharf owner does not consider the heavy expenditure he would be called upon to make to adapt his wharf to this deeper channel to be justified by the present volumes of commerce.

90. *Plan 3B.*—A local interest proposed a plan for a deep-draft channel in the northwest part of the harbor to permit coastwise bulk shipments in 30-foot draft ships. The cost of such an improvement has been estimated, but the proponent has not furnished conclusive data to enable firm determination that sufficient benefits would be realized to justify the large expenditure involved at this time. Similarly to plan 3A discussed in paragraphs 88–89, provision of a 26-foot channel to the coal and gypsum terminal in the northwest part of the harbor, with a 14-foot extension to the fish wharves in that area, would be in lieu of the north branch of the proposed 14-foot waterfront channel under plan 1. The 26-foot channel with 14-foot extension, would involve a project first cost of \$700,000, exclusive of \$1,500 for additional aids to navigation, and would also necessitate an estimated \$210,000 expenditure by local interests for dock and berth modifications. The annual carrying charges would be \$38,000, including \$11,000 of local carrying charges. The annual benefits to be realized by provision of a deep-draft channel have not been evaluated, due to lack of conclusive determination of the scale of plant operations and waterborne commerce that will result.

91. Since plan 3B would, in similar fashion to plan 3A, obviate the necessity for the 14-foot northwest channel extension in plan 1, it becomes apparent that a project consolidating the waterfront channel

and Lermond Cove area of plan 1 and the 26-foot channel of plan 3B should be considered. The adoption of plan 3B would reduce the first cost of plan 1 by \$80,000 to \$620,000, giving a total project cost for modified plan 1 and plan 3B of \$620,000 plus \$700,000, or \$1,320,000, plus \$6,000 for additional aids to navigation. The annual carrying charges for such a combination of plans would be \$73,900 including \$21,900 of local carrying charges.

92. *Plan 4—Breakwater.*—A breakwater 1,200 feet in length was requested to protect the central waterfront. The first cost of such a breakwater is estimated at \$750,000, exclusive of \$20,000 for additional aids to navigation, and the total annual charges are estimated at \$29,000. Data relative to damages to ships and shore structures are lacking, indicating an apparent lack of extreme damages.

#### CONCLUSIONS

93. Rockland has reached a point where the harbor must be improved to meet present needs of commerce and characteristics of shipping, or decline and slowly lose its waterborne commerce. The enforced practice of navigating the harbor only at high tide is a severe economic handicap to the fishing and commercial activities of the port. Loss of the asset of a useful harbor would be a major setback to the community and region, geared over its history to reliance upon the harbor and its associated industries. The State and local governments and the representatives of fishing and business interests have concluded that harbor improvement is imperative, and are planning expenditures of over \$350,000 to that end.

94. It is concluded that the Federal Government, in recognition of this local effort, and of the necessity for improvement of the harbor for general navigation if the local efforts are to be effective, should develop those harbor channels to the extent found most warranted. It is further concluded that two separate channels serving the centers of harbor activity would obtain most of the benefits that would result from improvement of entire areas of the harbor as originally proposed, and at a greatly reduced cost. It is concluded that the most favorable plans of harbor development would provide the following improvements:

(a) *Plan 1.*—A channel extending along about 1.5 miles of the northern and central waterfront, generally 14 feet deep, except for the central quarter mile and the entrance in that location, which are to be 18 feet deep; the channel varying in width from 100 to 150 feet, with a basin of approximately 2.5 acres in area in Lermond Cove, and appropriate turning basin at each end of the channel. Estimated project first cost, \$700,000.

(b) *Plan 2.*—A channel 18 feet deep, 100 feet wide leading to the vicinity of the General Foods marine base in the southern part of the harbor. Estimated first cost, \$20,000. Required local contribution 50 percent, estimated at \$10,000. These plans are shown on the map accompanying this report. The total project first cost of these 2 plans is \$720,000, of which \$710,000 would be borne by the United States. In accordance with the character of the benefits, it is concluded that a cash contribution of 50 percent of the cost of plan 2 should be required.



## RECOMMENDATIONS

95. It is recommended that the existing project for Rockland Harbor be abandoned, except for the harbor breakwater, and in lieu thereof, that the United States adopt a project for Rockland Harbor to provide for—

(a) A channel extending along about 1.5 miles of the northern and central waterfront, generally 14 feet deep except for the central quarter mile and the entrance in that location, which are to be 18 feet deep, the channel varying in width from 100 to 150 feet, with a basin of approximately 2.5 acres in area in Lermond Cove, and appropriate turning basins at each end of the channel. The estimated cost is \$700,000, with \$2,500 for annual maintenance all to be borne by the United States.

(b) A channel 18 feet deep 100 feet wide leading to the vicinity of the General Foods marine base in the southern part of the harbor. The estimated cost is \$20,000, of which 50 percent shall be contributed by local interests. The annual cost of maintenance is \$400.

The total estimated cost of new work for the 2 project features recommended above is \$720,000, with \$2,400 annually for maintenance in addition to that now required. The estimated cost to the United States for the 2 improvements is \$710,000. It is recommended that construction of the project be contingent upon assumption of the following requirements of cooperation by local interests:

(a) Agree to hold and save the United States free from damages due to construction and maintenance of the project.

(b) Provide without cost to the United States all lands, easements and rights-of-way necessary for the construction of the project and for subsequent maintenance, when and as required.

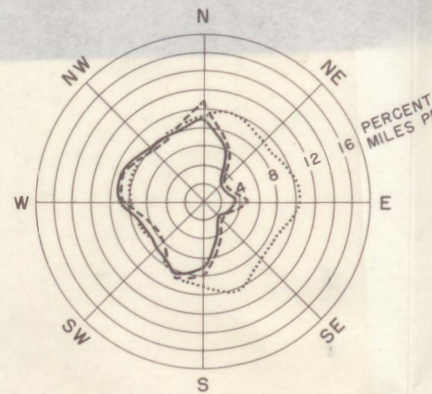
(c) Provide and maintain at local expense adequate public terminal and transfer facilities open to all on equal terms.

(d) Construction of plan 2, the channel to the marine base in the southern part of the harbor, be contingent upon contribution by local interests of 50 percent of the estimated first cost.

ROBERT J. FLEMING, Jr.,  
Colonel, Corps of Engineers,  
Division Engineer.



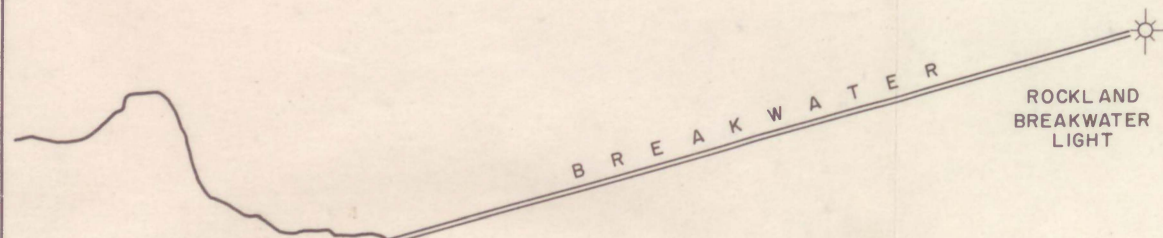




WIND DIAGRAM FOR PORTLAND, ME.

LEGEND

- % DURATION
- - - % MOVEMENT
- ..... AV. SPEED (M.P.H.)



JAMESON POINT

R O C K L A N D

SOUTH LEDGE

Rock removed to 22 ft. at M.L.W.

JAMESON POINT LEDGE

Rock removed to 14 ft. at M.L.W.

PLAN I

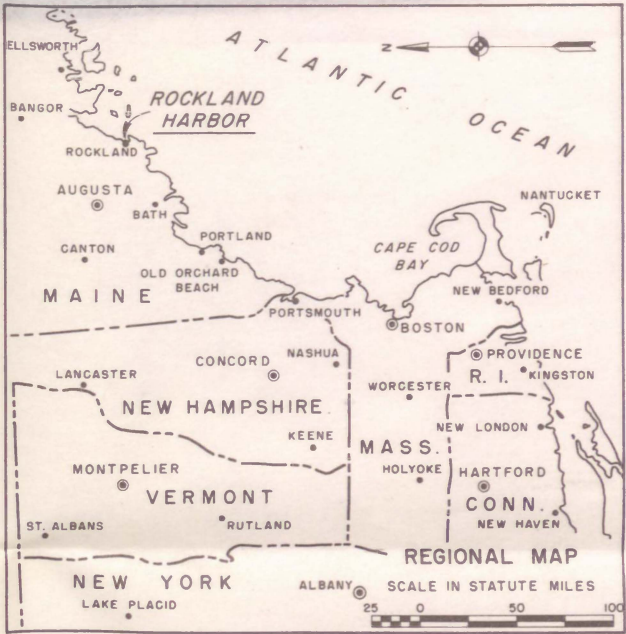
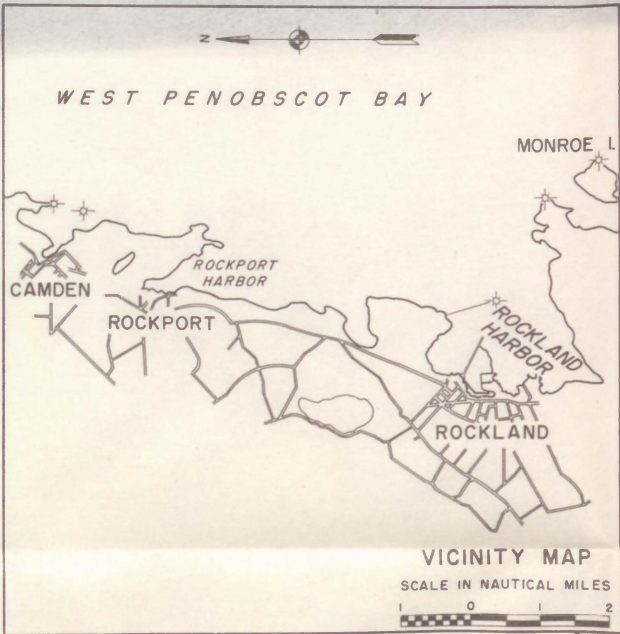
IMPROVEMENT RECOMMENDED

WATERFRONT CHANNEL

18 ft. & 14 ft. deep at M.L.W.  
150 ft. wide to Lermond Cove  
100 ft. wide in branches to Northwest and Southwest harbor areas



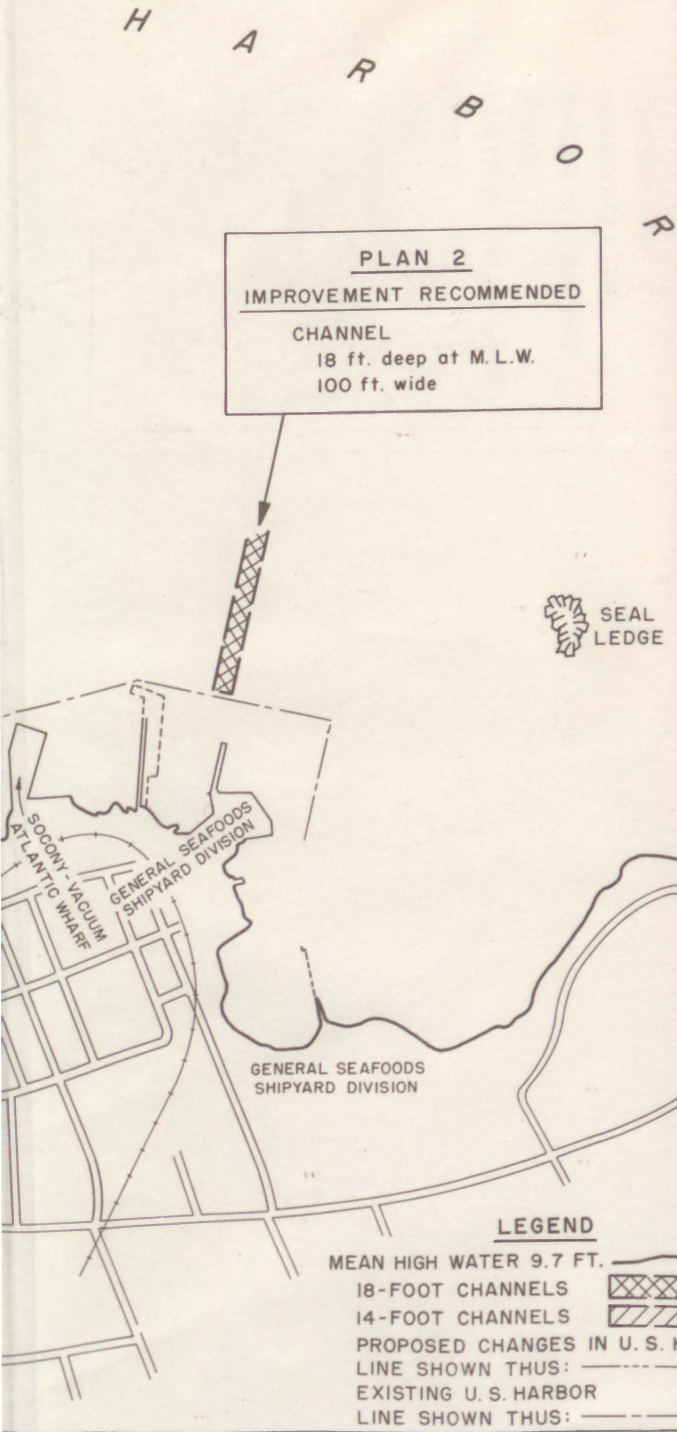




NOTES

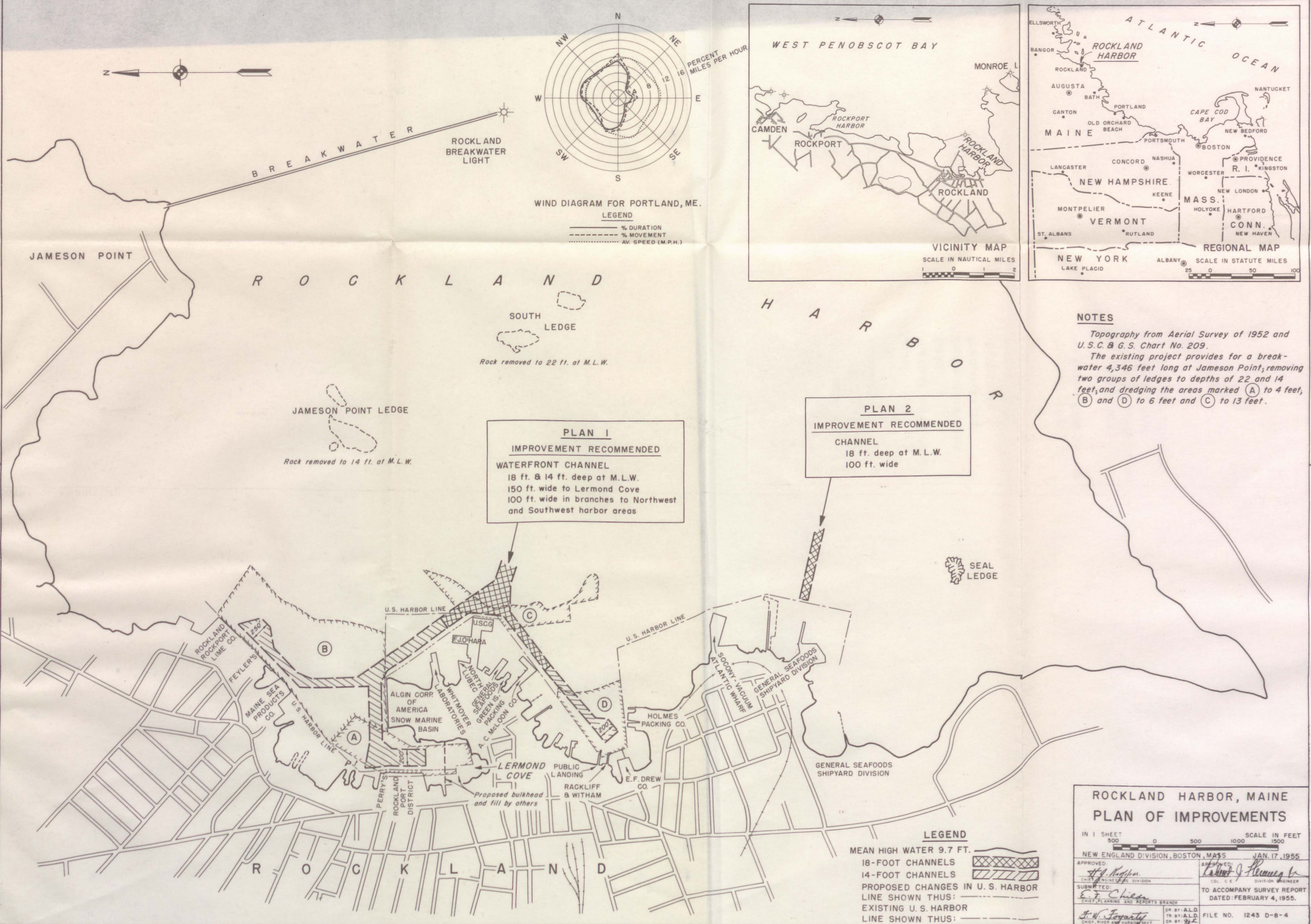
Topography from Aerial Survey of 1952 and U.S.C. & G.S. Chart No. 209.

The existing project provides for a break-water 4,346 feet long at Jameson Point, removing two groups of ledges to depths of 22 and 14 feet, and dredging the areas marked (A) to 4 feet, (B) and (D) to 6 feet and (C) to 13 feet.



ROCKLAND HARBOR, MAINE	
PLAN OF IMPROVEMENTS	
IN 1 SHEET	SCALE IN FEET
500 0 500 1000 1500	
NEW ENGLAND DIVISION, BOSTON, MASS. JAN. 17, 1955	
APPROVED:	APPROVED:
<i>H. A. Kupper</i>	<i>Robert J. Fleming Jr.</i>
CHIEF ENGINEERING DIVISION	COL. C. E. DIVISION ENGINEER
SUBMITTED:	TO ACCOMPANY SURVEY REPORT
<i>E. F. Chien</i>	DATED: FEBRUARY 4, 1955.
CHIEF, PLANNING AND REPORTS BRANCH	
<i>J. W. Fogarty</i>	DR BY: A.L.D.
CHIEF, RIVER AND HARBOR SECT	TR. BY: A.L.D.
	CH. BY: <i>J. L.</i>
	FILE NO. 1243 D-8-4





**ROCKLAND HARBOR, MAINE**  
**PLAN OF IMPROVEMENTS**

IN 1 SHEET  
500 0 500 1000 1500  
SCALE IN FEET

NEW ENGLAND DIVISION, BOSTON, MASS  
JAN. 17, 1955

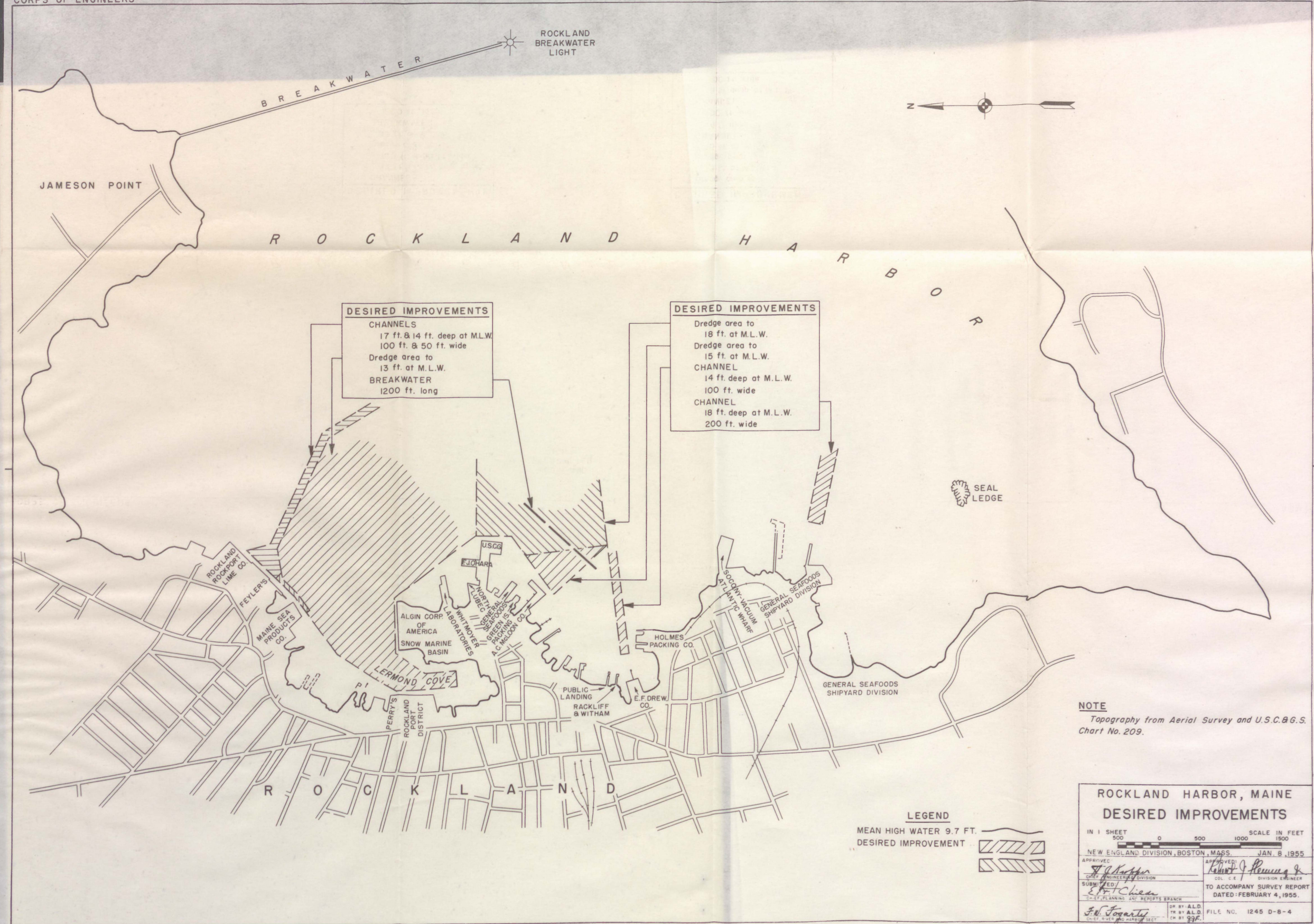
APPROVED:   
CHIEF ENGINEERING DIVISION

SUBMITTED:   
CHIEF PLANNING AND REPORTS BRANCH

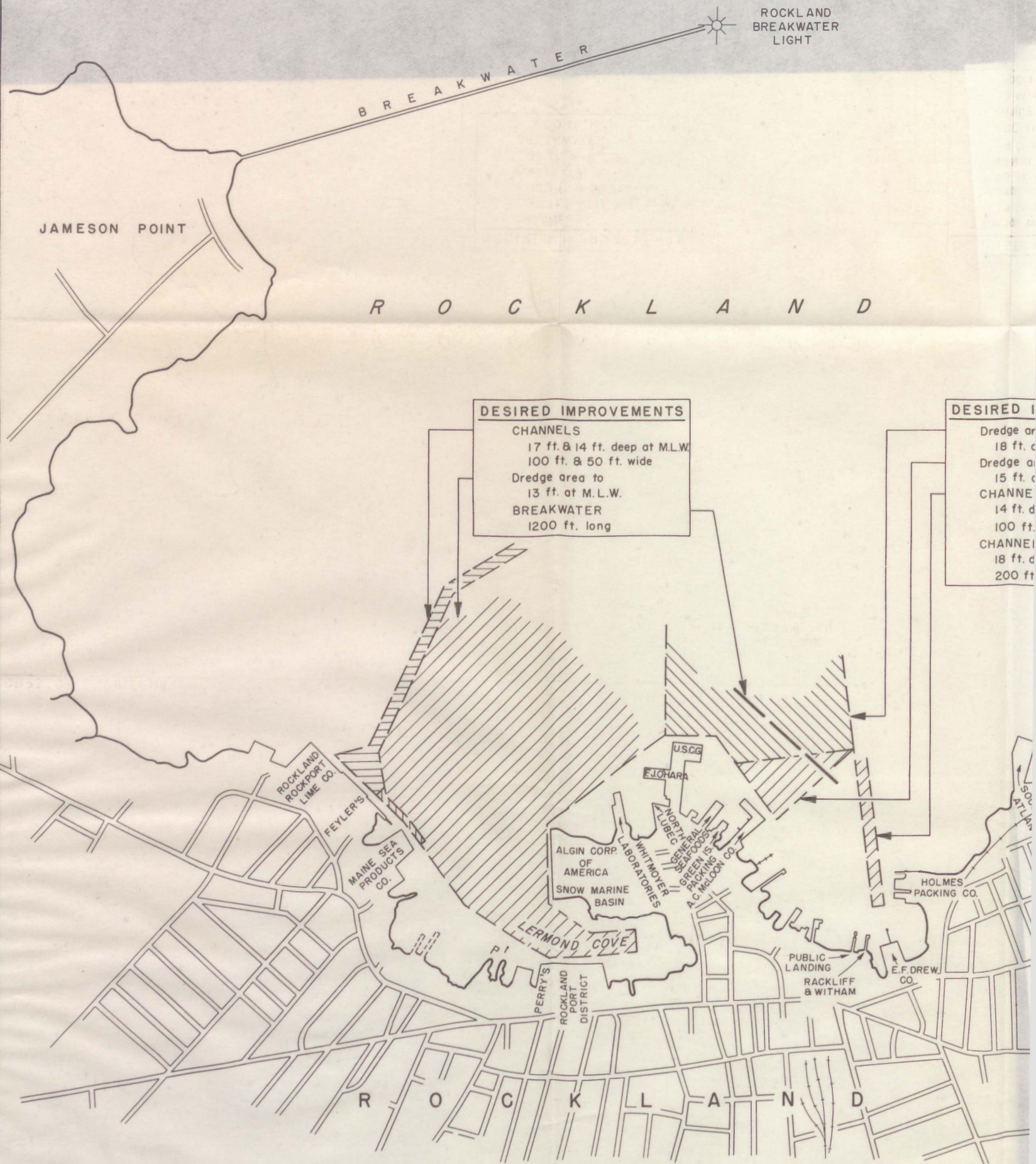
TO ACCOMPANY SURVEY REPORT  
DATED: FEBRUARY 4, 1955.

FILE NO. 1243 D-8-4











ea to  
at M.L.W.  
rea to  
at M.L.W.  
L  
leep at M.L.W.  
wide  
-  
leep at M.L.W.  
wide

SEAL  
LEDGE

*Topography from Aerial Survey and U.S.C. & G.S.  
Chart No. 209.*

MEAN HIGH WATER 9.7 FT.  
DESIRED IMPROVEMENT ..



IN 1 SHEET                      SCALE IN FEET  
500                      0                      500                      1000                      1500

NEW ENGLAND DIVISION, BOSTON, MASS. JAN. 8, 1955

APPROVED:  
*[Signature]*  
CHIEF ENGINEERING DIVISION

SUBMITTED: E.A. Childs  
CHIEF, PLANNING AND REPORTS BRANCH

F. W. Fogarty  
CHIEF, RIVER AND WILDERNESS SEC.

APPROVED: *Robert J. Hennings*  
COL. C.E. DIVISION ENGINEER

TO ACCOMPANY SURVEY REPORT  
DATED: FEBRUARY 4, 1955.

FILE NO. 1245 D-8-4