

# MAINE STATE LEGISLATURE

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MAINE DEPARTMENT OF TRANSPORTATION

CARGO PORT ALTERNATIVES

September, 1978

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1978

Fay, Spofford & Thorndike, Inc.  
Boston



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## I. INTRODUCTION

Fay, Spofford & Thorndike, Inc. (FST) has been requested by the Maine Department of Transportation to conduct further investigations regarding cargo port feasibility within the State of Maine. Specifically, FST was requested to perform the following tasks:

- 1) Provide sketches and cost estimates for two schemes for a completely new cargo facility on Sears Island located farther north along the western shore of the island than that site originally proposed.
- 2) Update past cost estimates for the development of a modern cargo terminal at the Portland Terminal site and supply appropriate sketches.
- 3) Update past cost estimates for a modern cargo terminal at the so-called MDOT/Canadian National site in Portland and supply appropriate sketches.
- 4) Develop cost estimates for the construction of a heavy duty platform, including related equipment, and supply appropriate sketches for improvements at the Maine State Pier in Portland.
- 5) Develop cost estimates for the construction of a heavy duty platform, including related equipment, and supply appropriate sketches for improvements at the Bangor and Aroostook site in Searsport, and

- 6) Determine operating and maintenance costs, revenues, a financing plan, and an organizational structure for the proposed new Sears Island cargo facility.

Details of the work performed in each of these tasks are given in the following sections.

## II. PORT LAYOUTS

### A. Relocated Sears Island Facility

In January 1978, Fay, Spofford & Thorndike, Inc. prepared a report for the Maine Department of Transportation, entitled Feasibility Study of the Development of Cargo Handling Facilities at Maine Ports, in which a recommendation for the development of a new cargo port facility on Sears Island at Searsport was made. This initial recommendation suggested that the proposed facility be situated near the southwest corner of the island. The configuration proposed included a "causeway" approximately 2400 feet in length extending offshore from the island on which many of the required facilities, such as the sheds, the crane, the freezer building, and container storage areas, were located. Much of this causeway would be constructed on fill in fairly shallow water. One of the reasons for the length of this causeway was the desire to locate the wharf structure itself at the edge of natural deep water so that extensive dredging would not be required. In the area suggested, water depths are in the order of 40-45 feet.

The Maine Department of Transportation has requested that an alternative site on Sears Island be investigated. The site under consideration is further north along the western shore of the island in the vicinity of the R6 buoy. MDOT's reasoning behind this location is that the shorter distance from the shore to "deep water" at that point would result in less fill being required and, thus, a lower construction cost. However,



the water depth at this location is only 35 feet and, accordingly, would require some dredging if depths comparable to the original location (40-45 feet) were desired.

In response to MDOT's request to consider an alternative location on Sears Island, FST has presented four possible configurations for consideration. They all have the same basic features as the initial proposed facility located further to the south, including a 1200-foot berthing area, a paper transit shed, a general cargo shed, a freezer, a Ro-Ro facility, and an administrative complex.

The general shape of Scheme A is shown in Figure 1. It is basically rectangular, with all of the major buildings except the administrative complex being located parallel to the wharf apron.

Container storage is provided both on the filled-in land and on Sears Island, although this latter area would not be developed at first.

Rail service is provided to all major structures with the provision for a future loop track.

Scheme B has an overall configuration similar to Scheme A, as shown in Figure 2. That is, it is rectangular in shape. However, the major difference between the two is that the various buildings have been relocated away from the wharf apron. As with Scheme A, rail service is provided to the major buildings with a provision for a future loop track.

Scheme C, shown as Figure 3, more closely resembles the configuration originally proposed in that it is basically

AREA NO. CONTAINERS  
20 FT. HIGH

A	1	⊙	256	=	256
B	3	⊙	112	=	336
C	4	⊙	288	=	1152
D	2	⊙	252	=	<u>504</u>
					2248

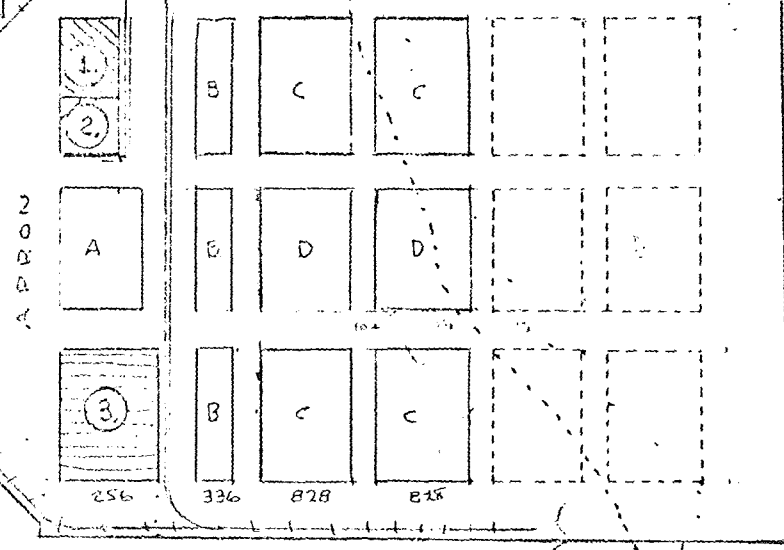
EXISTING BRIDGE & APPROX. PIER

EXISTING 35 FT TURNING BASIN

EXISTING 35 FT CHANNEL

R.G.

BERTH



- 1 = GENERAL TRANSIT SHED - 30,000 S.F.
- 2 = FREEZER - 19,500 S.F.
- 3 = PAPER TRANSIT SHED = 87,000 S.F.

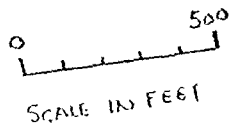


FIG. 1  
MAINE DEPT. TRANSPORTATION  
SEASPORT MARINE TERMINAL  
GENERAL PLAN - SCHEME

EXISTING BANGOR & ARDOSTOCK R.R. PIER

EXISTING 35-FT TURNING BASIN

EXISTING 35 FT CHANNEL

- ① GENERAL-TRANSIT SHED 30,000 SF
- ② FREEZER " " 19,500 S.F
- ③ PAPER TRANSIT SHED 87,000 SF
- (c) = 288-20 FT CONTAINERS (1 HIGH)
- 8x288 = 2304 CONTAINERS (1 HIGH)

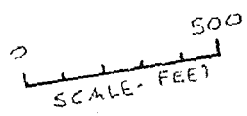
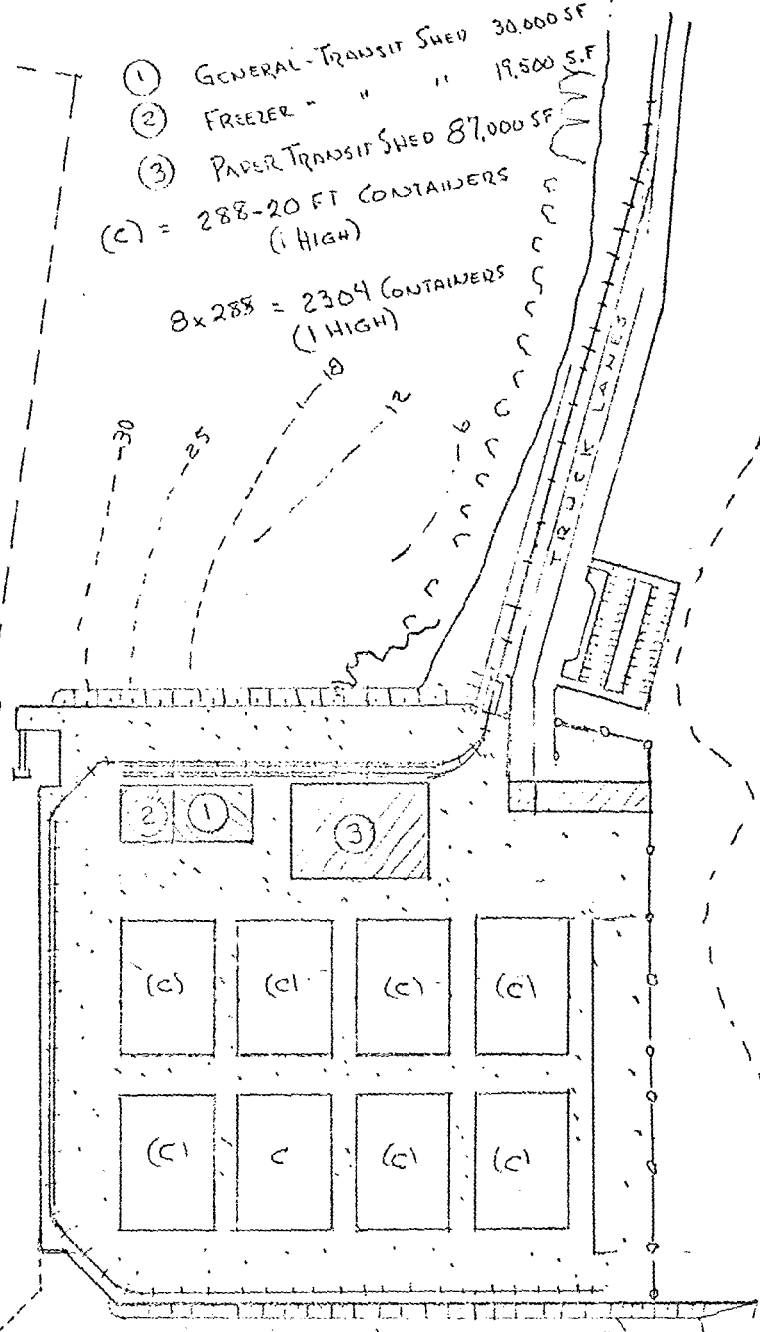


FIG. 2  
 MAINE DEPT. OF TRANSPORTATION  
 SEARSPORT MARINE TERMINAL  
 GENERAL PLAN - SCHEME B  
 FAY, SPOFFORD & THORNTON INC.

← BARRIER OF APPROX 700X R.R.G. PIER

- ① GENERAL TRANSIT SHED - 30,000 S.F
- ② FREEZER " " - 19,500 S.F
- ③ PAPER " " - 87,000 S.F
- Ⓞ 288 - 20 FT CONTAINERS (1 HIGH)  
8x288 = 2304 CONTAINERS (1 HIGH) (20FT)

EXISTING TURNING BASIN  
75 FT

EXISTING CHANNEL  
35 FT

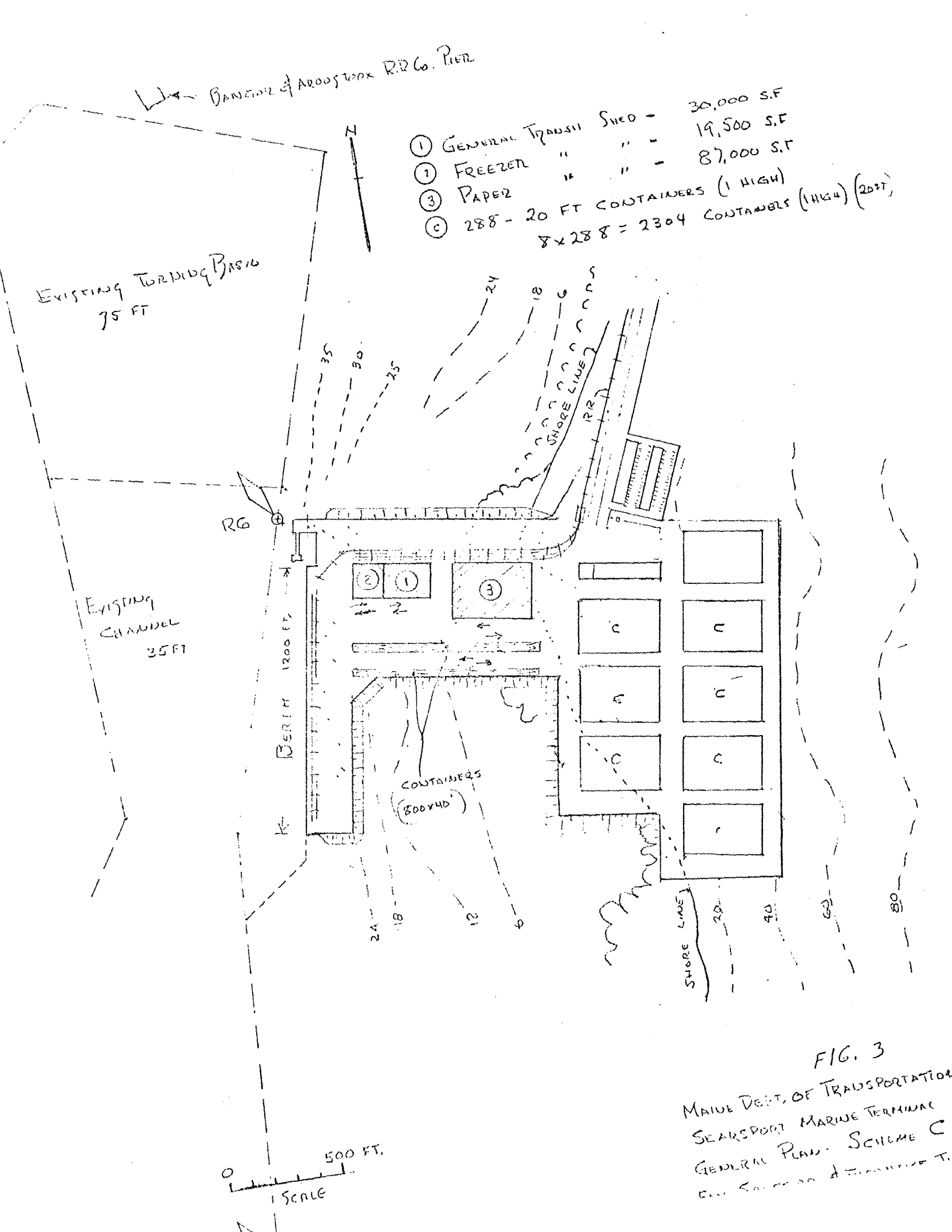
R.G.

BERM 1200 FT

CONTAINERS  
(800YD)

0 500 FT.  
SCALE

FIG. 3  
MAINE DEPT. OF TRANSPORTATION  
SEASIDE MARINE TERMINAL  
GENERAL PLAN - SCHEME C  
See Section 4 of Appendix T.



L-shaped. The major difference is that the transit sheds and freezer have been moved away from the wharf apron, as they were for Scheme B.

Space is provided for container storage on the embankment with future storage development possible in the area of excavation used to provide fill for the embankment.

Figure 4 illustrates the general layout of Scheme D, the recommended layout. It is very similar to Scheme C, the only difference being a small change in the location of the sheds and freezer. The paper transit shed has been moved closer to shore while all three buildings have been moved slightly north on the embankment to provide a better configuration for container storage on the embankment. As with other schemes, the area of borrow can eventually be used for additional storage or other purposes, although such development is not proposed at this time.

Figure 5 shows the configuration of Scheme D in relation to all of Sears Island and the town of Searsport.

The estimated cost of Scheme D is given in Table 1.

#### B. Upgraded Searsport Bangor & Aroostook Facility

Figure 6 shows a plan view of the existing facilities at Searsport owned by the Bangor and Aroostook Railroad with the addition of a new 60-foot-wide pier apron. Provision is made for a 600-foot berth dredged to a depth of 40 feet at mean low water. While its length is 600 feet, a ship of up to 800 feet in length could be accommodated. The width of the berth is 150 feet. The pier apron would be approximately

BAUGWIZ & ARROSTOCK R.R. Co. PLTZ.

- ① GENERAL TRANSIT SHED - 30,000 S.F.
- ② FREEZER " " - 19,500 S.F.
- ③ PAPER " " - 87,000 S.F.
- ④ OFFICE-MAINTENANCE-SCALES
- Ⓢ 288 - 20 FT CONTAINERS (1 HIGH)
- 8x288 = 2304 CONTAINERS 20FT (HIGH)

EXISTING TIDING BASIN  
35 FT

EXISTING CHANNEL  
35 FT

BERTH - 1200 FT

120-CAR PARKING

FENCE

CONTAINERS  
40 FT  
80 = 200/  
80-LAYER

INITIAL PAVING DRAINAGE  
& LIGHTING.

AREA OF BORROW  
FOR FILL, PAVING, DRAINAGE  
& LIGHTING DEFERRED.

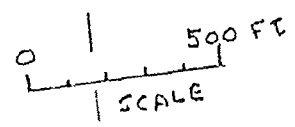


FIG 4

MAINE DEPT. OF TRANSPORTATION  
SEASPORT MARINE TERMINAL  
GENERAL PLAN - SCHEME D

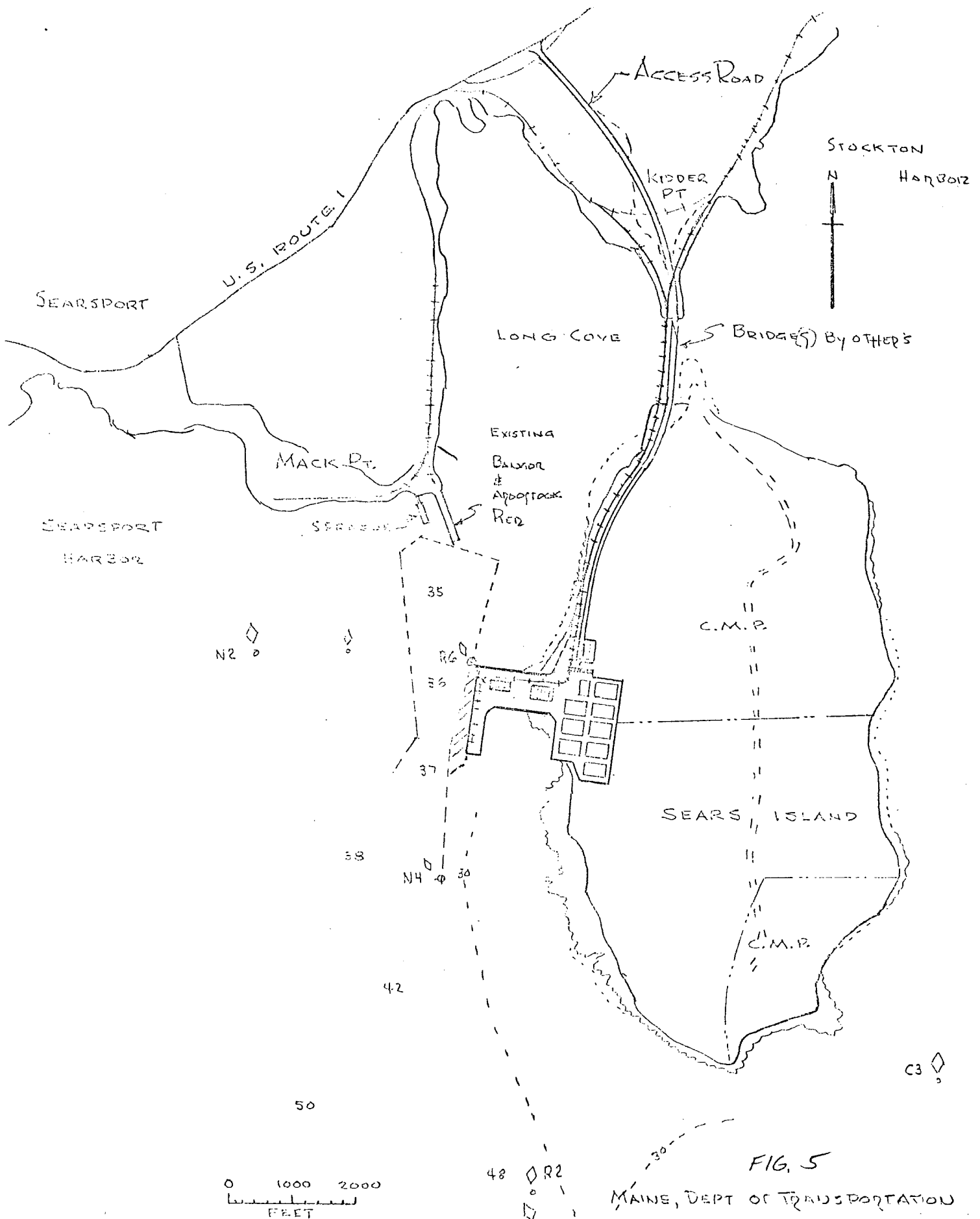


FIG. 5

MAINE, DEPT OF TRANSPORTATION  
SEARSPT MARINE TERMINAL  
LOCATION PLAN - SCHEME D

FAY, SPOFFORD & THORNDIKE INC.

TABLE 1

MAINE PORT DEVELOPMENT STUDY COST ESTIMATE

SEARSPORT MARINE TERMINAL  
 SEARS ISLAND--SCHEME D

<u>Item</u>	<u>Estimated Cost</u>
1. Wharf	\$ 9,600,000
2. Embankment	7,800,000
3. Rip-Rap	1,700,000
4. Paving, Drainage, Lighting	2,900,000
5. Dredging	600,000
6. Warehouses:	
Paper Transit Shed	5,500,000
General Transit Shed	930,000
Freezer Facility	780,000
7. Miscellaneous Structures:	
Administration	600,000
Maintenance	560,000
Equipment Garage	250,000
Locker Room	180,000
Scales and Support Facilities	320,000
8. Ro-Ro Facility	625,000
9. Water:	
Connection to Searsport	700,000
Elevator Tank and Equipment	550,000
10. Railroad Track:	
Main Line to Site (Bridge by Others)	1,300,000
On Site	400,000
11. Entrance Road (Bridge by Others)	500,000
12. Equipment:	
Mobile Gantry Crane (40-Ton Capacity at 100 Feet)	1,700,000
Forklifts (2) (120,000-Pound Capacity)	600,000
Miscellaneous Vehicles	480,000
	<hr/>
	\$38,575,000
TOTAL ESTIMATED COST-USE:	\$38,600,000



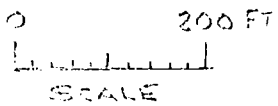
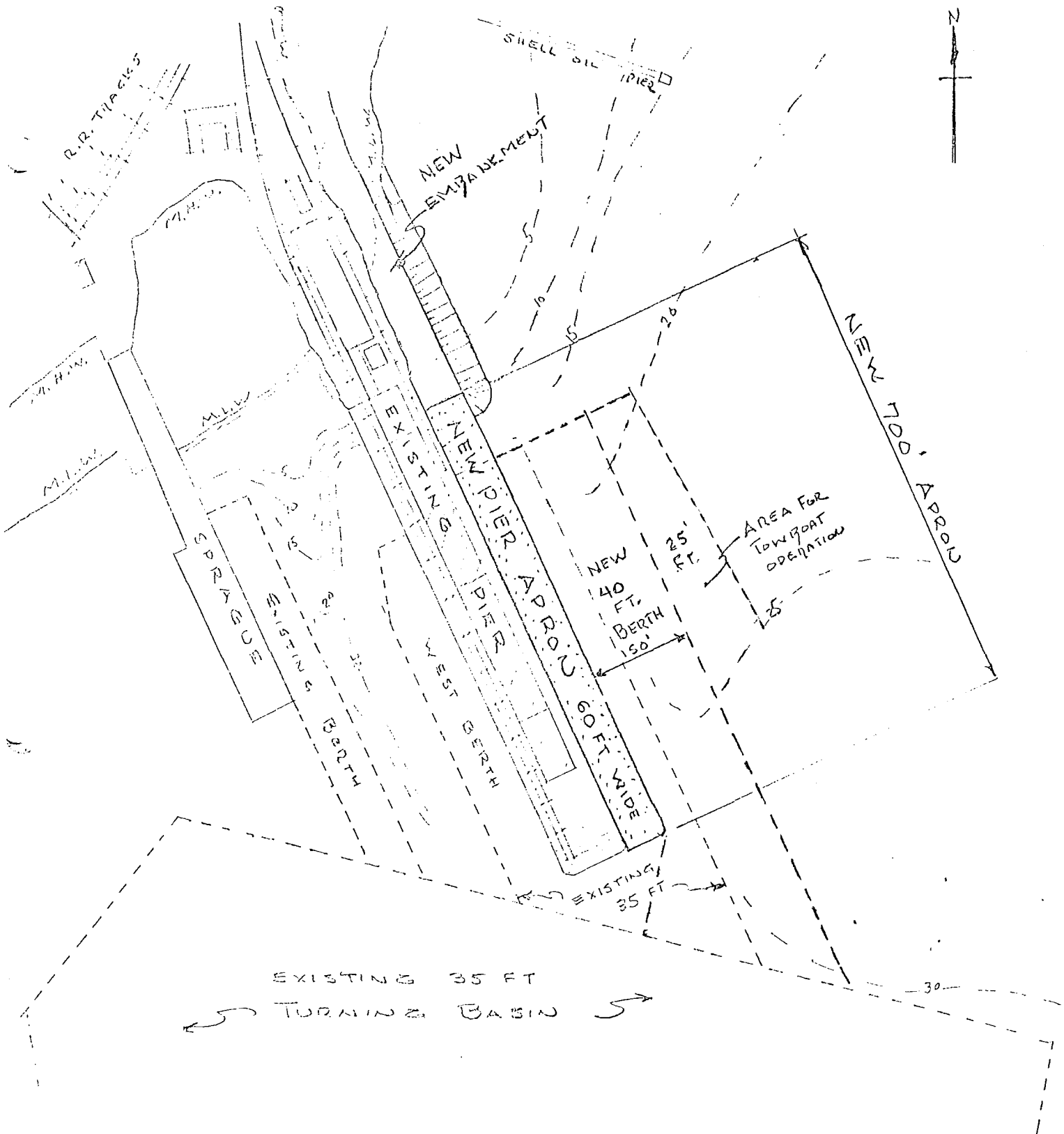


FIG. 6  
 MAINE DEPARTMENT OF TRANSPORTATION  
 SEARS PORT TERMINAL STUDY  
 BANGOR & ARDOSTOOK R.R. CO. PIER - SEARS PORT  
 NEW PIER APRON - PLAN

FAY, SPOFFORD & THORNDIKE INC. BOSTON

700 feet long and would be constructed on piles. It would be connected to the mainland by means of a new embankment area having a length of several hundred feet.

A cross-section of the existing and new structure at Searsport is shown as Figure 7.

The costs to construct the new facilities at the Bangor & Aroostook pier in Searsport are given in Table 2. Note that these costs do not include any new sheds, freezers or operating equipment.

#### C. Upgraded Maine State Pier at Portland

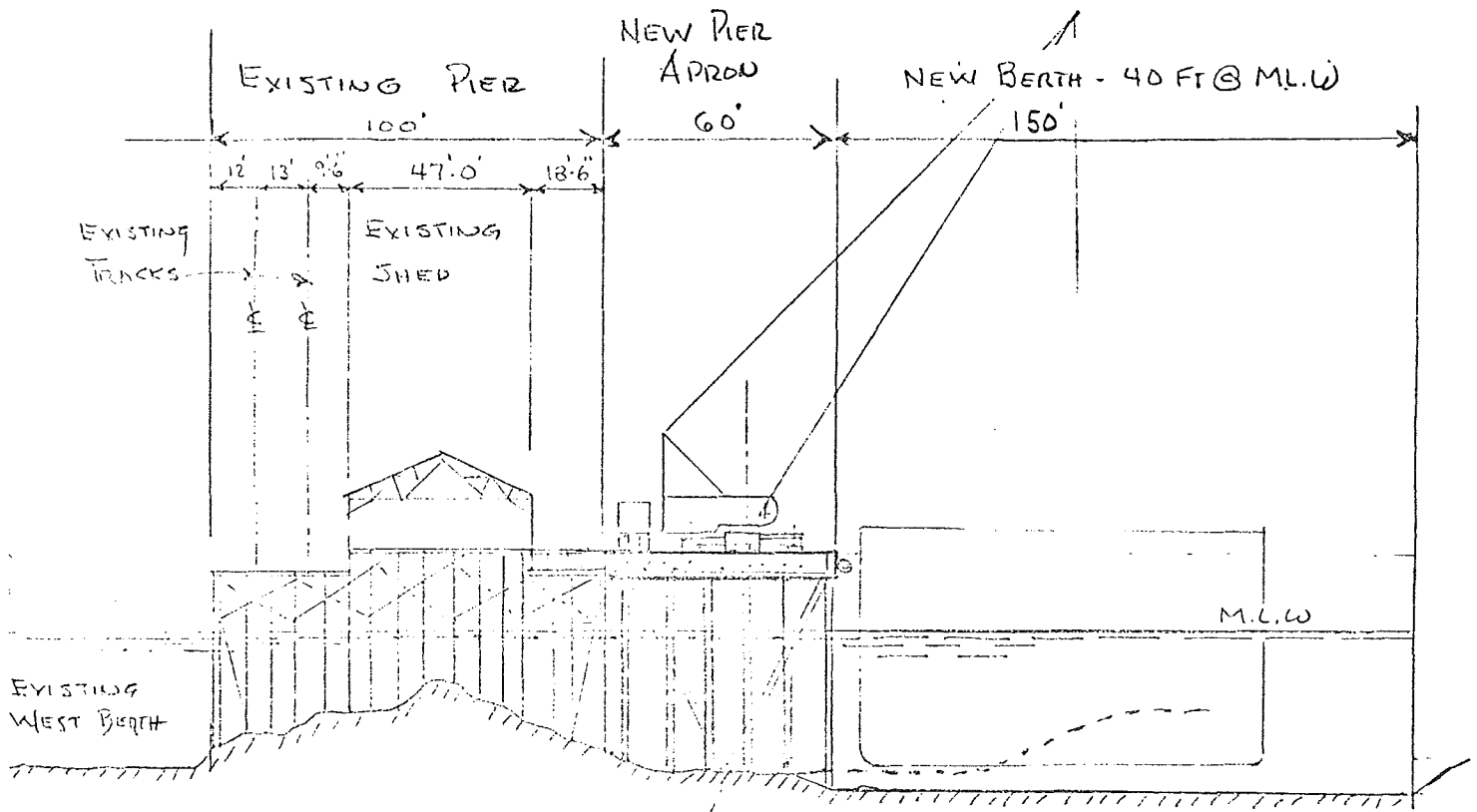
It would be possible to construct a new pier apron on the east side of the existing Maine State Pier in Portland, as shown in Figure 8. Such a structure is proposed to be approximately 1000 feet in length and 60 feet in width and constructed on piles. Also shown in Figure 8 is an 800-foot by 150-foot berthing area dredged to a depth of 40 feet at mean low water. Note that a portion of the Atlantic Wharf ruins would have to be cleared to provide for an area for towboats serving the new berth to maneuver.

Cross-sections through two locations along the pier apron and existing structures are shown in Figure 9. Note the location of the Atlantic Wharf ruins.

The estimated costs to construct these improvements at the Maine State Pier are given in Table 2.

#### D. Upgraded Portland Terminal No. 3 Site

A possible configuration for a berthing area at the Portland Terminal No. 3 site is shown in Figure 10. A 600-foot by



CROSS SECTION  
LOOKING NORTH

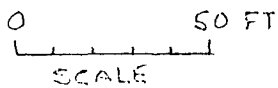


FIG. 7

MAINE DEPT OF TRANSPORTATION  
SEASIDE TERMINAL STUDY  
BANGOR & ARDOSTOCK P.R. CO. PIER - SEASIDE  
NEW PIER APRON - CROSS SECTION

FAY, SPOFFORD & THORNDIKE INC. BOSTON

TABLE 2

MAINE PORT DEVELOPMENT STUDY COST ESTIMATE

Item	ESTIMATED COST		
	Searsport Bangor & Aroostook R.R. Co. Pier	Portland, Maine State Pier	Portland-- Portland Terminal Wharf 3
1. Basic 600-Foot- Long Wharf	\$4,300,000	\$ 6,100,000	\$5,400,000
2. Wharf Approach Structure	750,000	3,000,000	600,000
3. Wharf Extension to Limit of Existing State Pier	--	1,000,000	--
4. Excavation and Dredging	600,000	200,000	1,250,000
5. Approach Embank- ment and Roadway	200,000	--	--
6. Rip-Rap for Slopes	50,000	--	450,000
TOTAL ESTIMATED COST:	\$5,900,000	\$10,300,000	\$7,700,000

NOTE: Estimate based on November, 1977 construction costs for comparison with Maine Port Development Study Report.

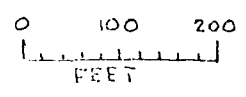
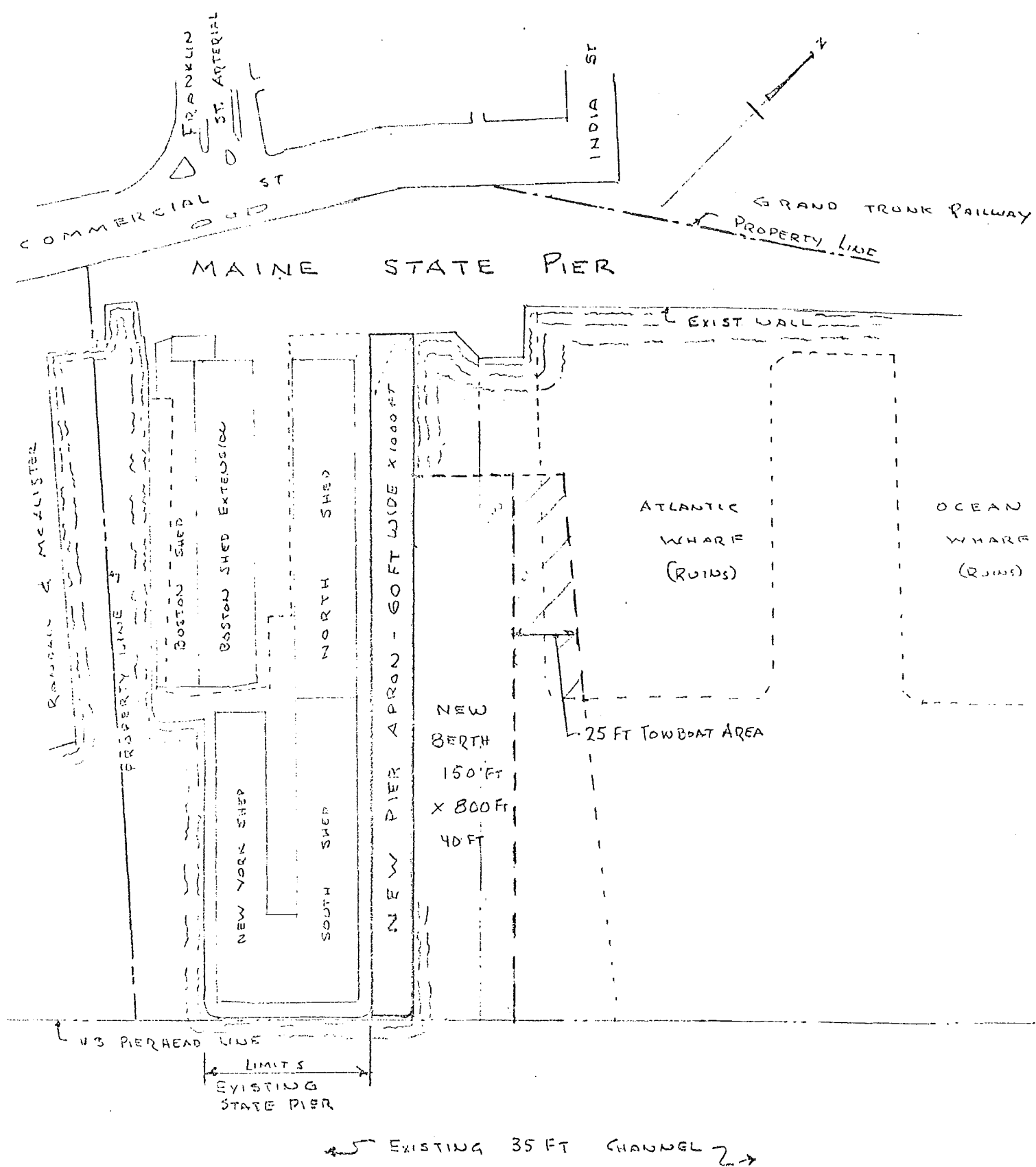
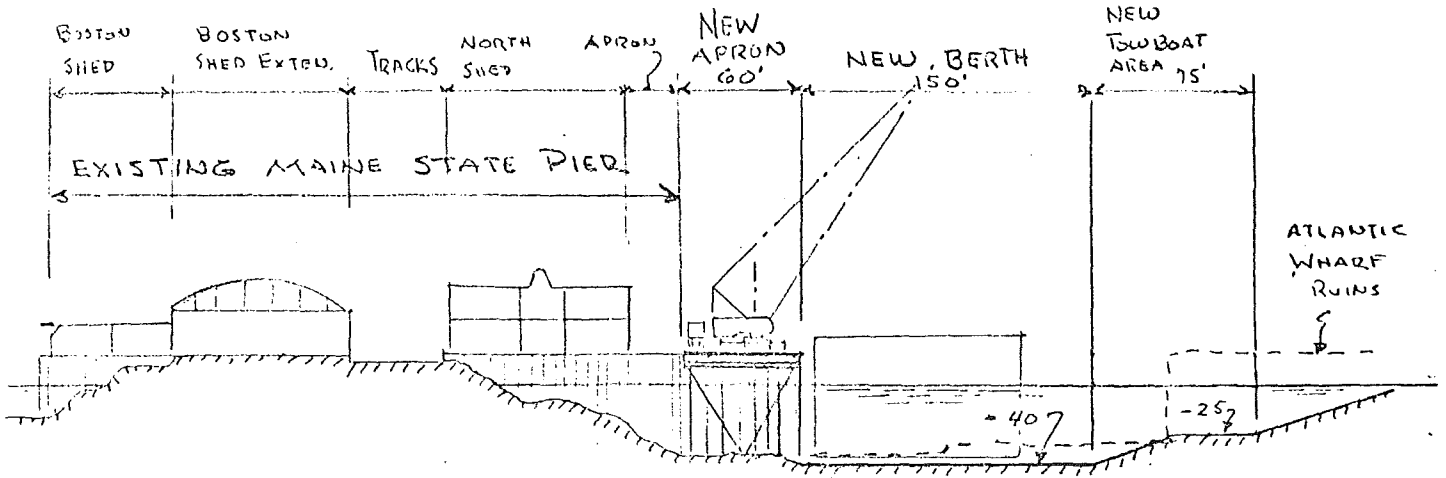


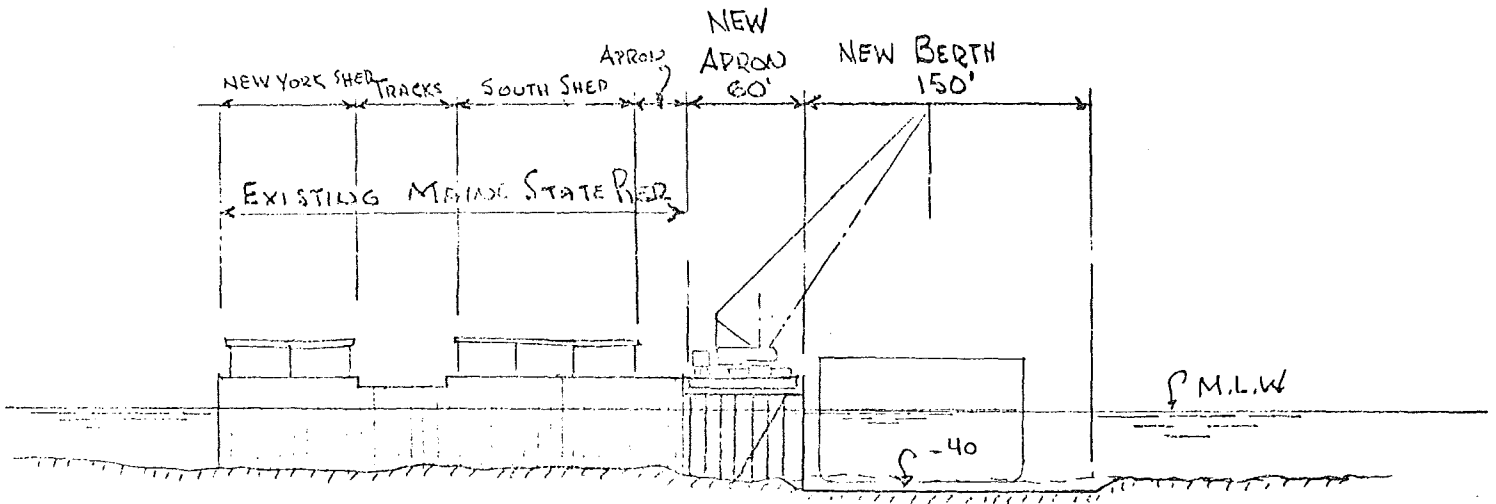
FIG. 8

MAINE DEPT OF TRANSPORTATION  
MARINE TERMINAL STUDY  
MAINE STATE PIER - PORTLAND  
NEW PIER APRON - PLAN

FAY SPOFFORD & THORNDIKE INC Boston



CROSS SECTION AT INSHORE END OF PIER



CROSS SECTION AT OUTBOARD END OF PIER

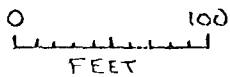


FIG. 9

MAINE DEPT. OF TRANSPORTATION  
 MARITIME TERMINAL STUDY  
 MAINE STATE PIER - PORTLAND  
 NEW PIER APRON - CROSS SECTIONS

FAY, SPOFFORD & THORNDIKE, INC. - BOSTON

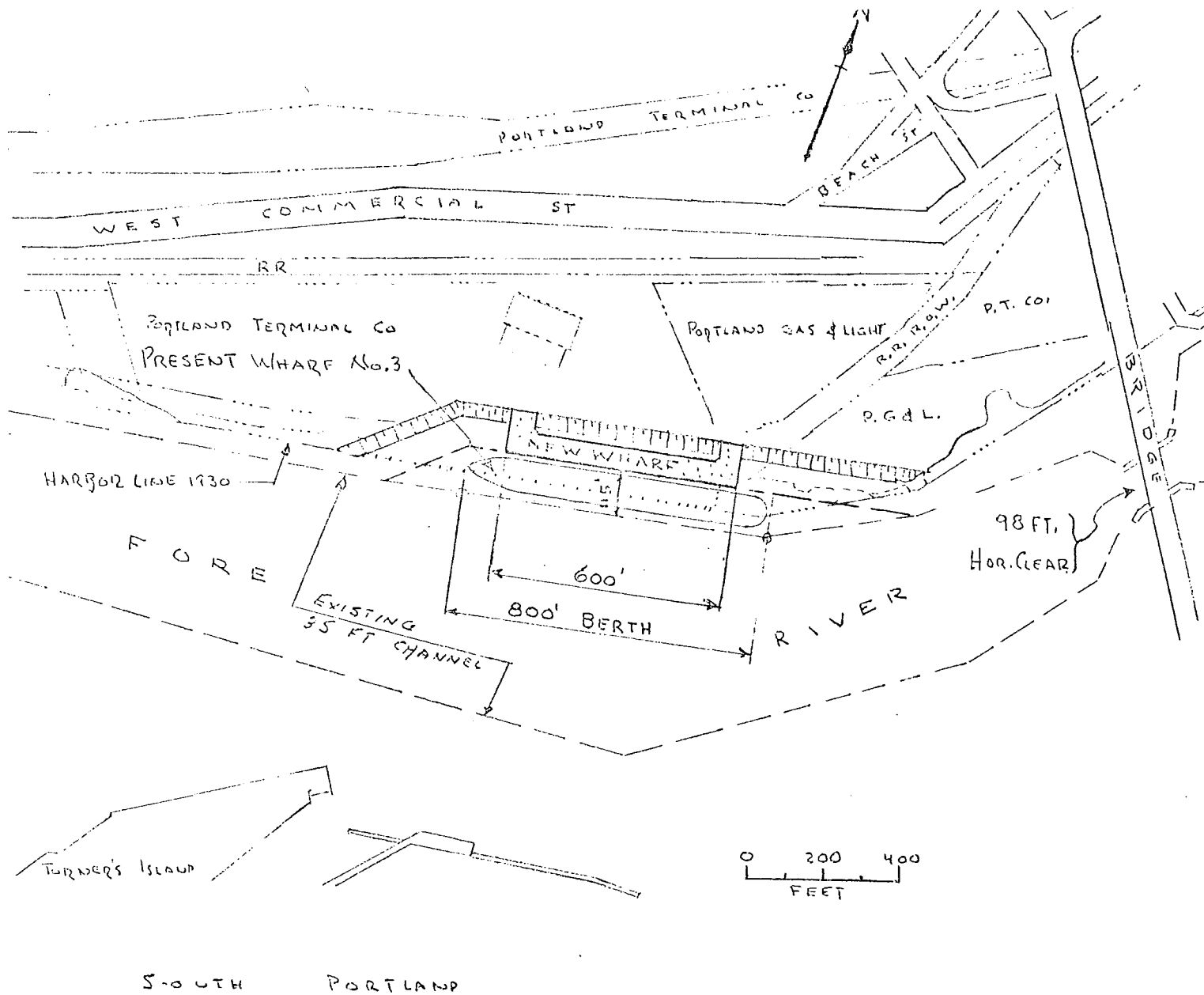


FIG. 10

MAINE DEPT. OF TRANSPORTATION  
 MARINE TERMINAL STUDY  
 PORTLAND TERMINAL WHARF No. 3 AREA - PORTLAND  
 NEW WHARF - PLAN

FAY, SPOFFORD & THORNDIKE, INC., BOSTON.

60-foot wharf is proposed to serve an 800-foot berth. The wharf would be built on piles and connected to the land by means of access trestles at each end of the wharf.

Construction at this location would require demolition of a significant portion of the present wharf face, as can be clearly seen from the cross-section shown as Figure 11 and from Figure 10.

The berth would be 115 feet in width and would be dredged to a depth of 40 feet at mean low water (note that the present bridge located downstream from this site has a maximum clearance of 98 feet, thus limiting this site's potential).

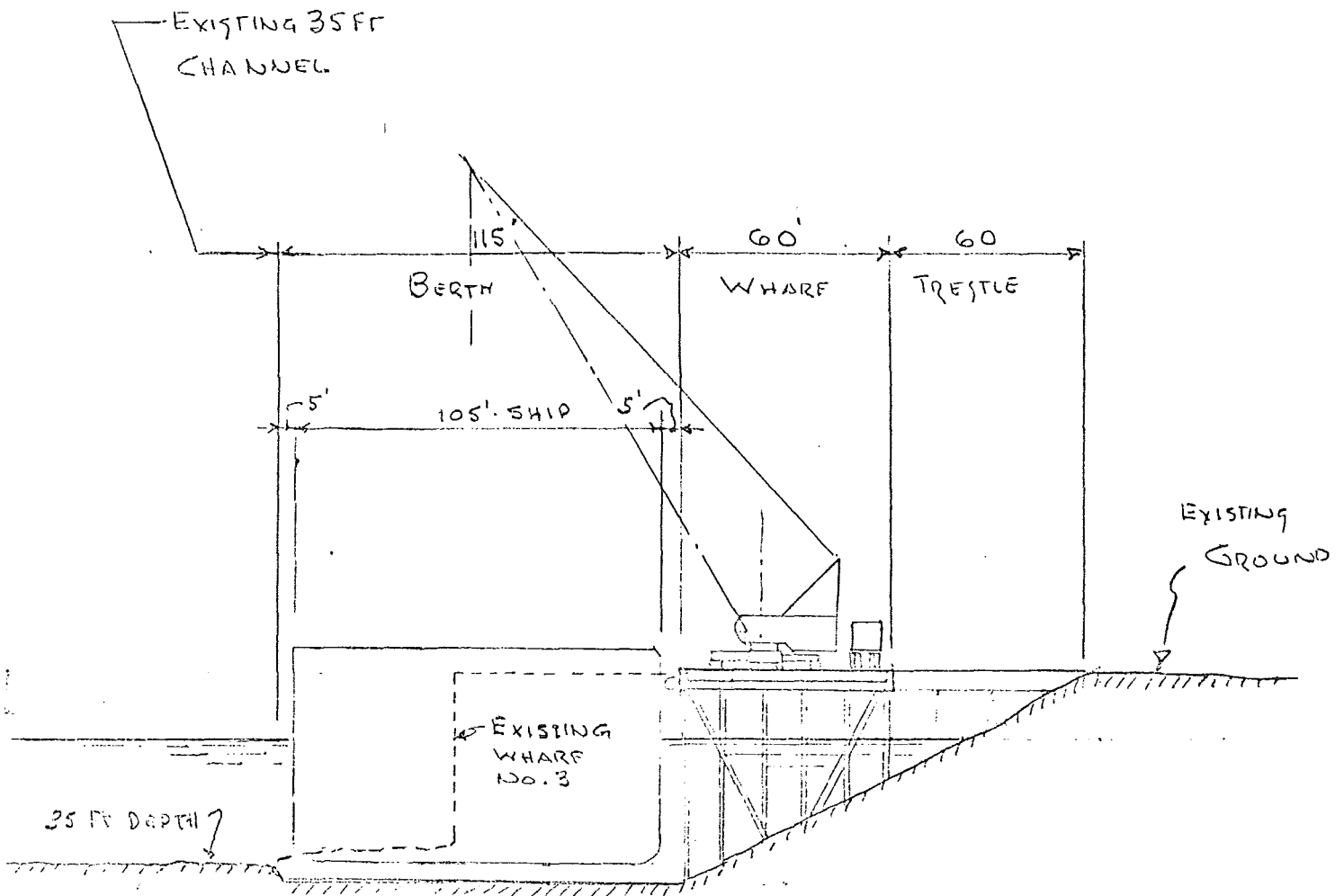
Table 2 shows the estimated costs to construct the facilities shown in Figure 10. Again note that these estimates do not include costs for the development of the landside area, any transit sheds and freezers, the administrative complex, and equipment. The costs of these items would be similar to those given for similar items at Sears Island.

#### E. Canadian National/NEECO Site

The final configuration studied was that for a completely new terminal at the so-called Canadian National site in Portland. The configuration shown in Figure 12 is based on a facility proposed for the New England Energy Company (NEECO) in 1974. It consists of a pile-supported rectangular pier with berthing areas for three vessels.

A heavy crane operating area of 60-foot width has been provided around the edge of the structure. The inner portion of the cargo pier could be used for container storage.





CROSS SECTION LOOKING UPSTREAM

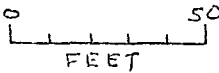
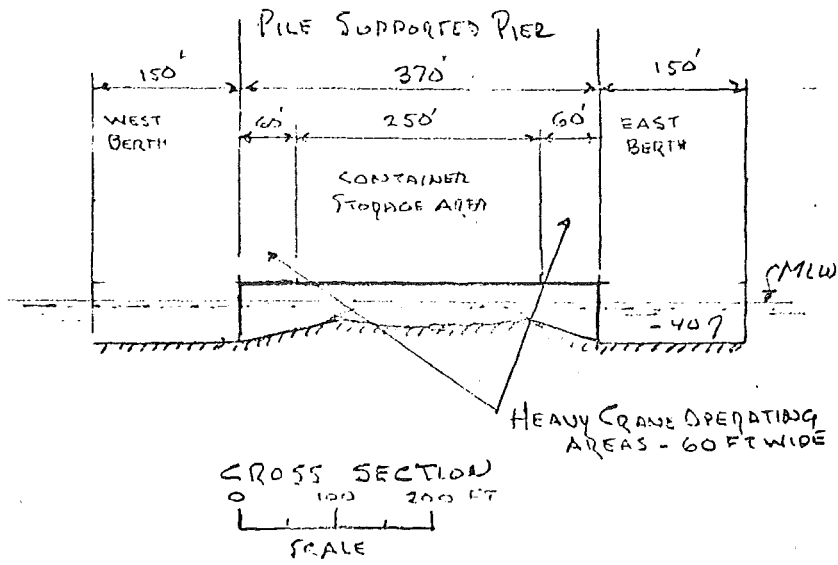
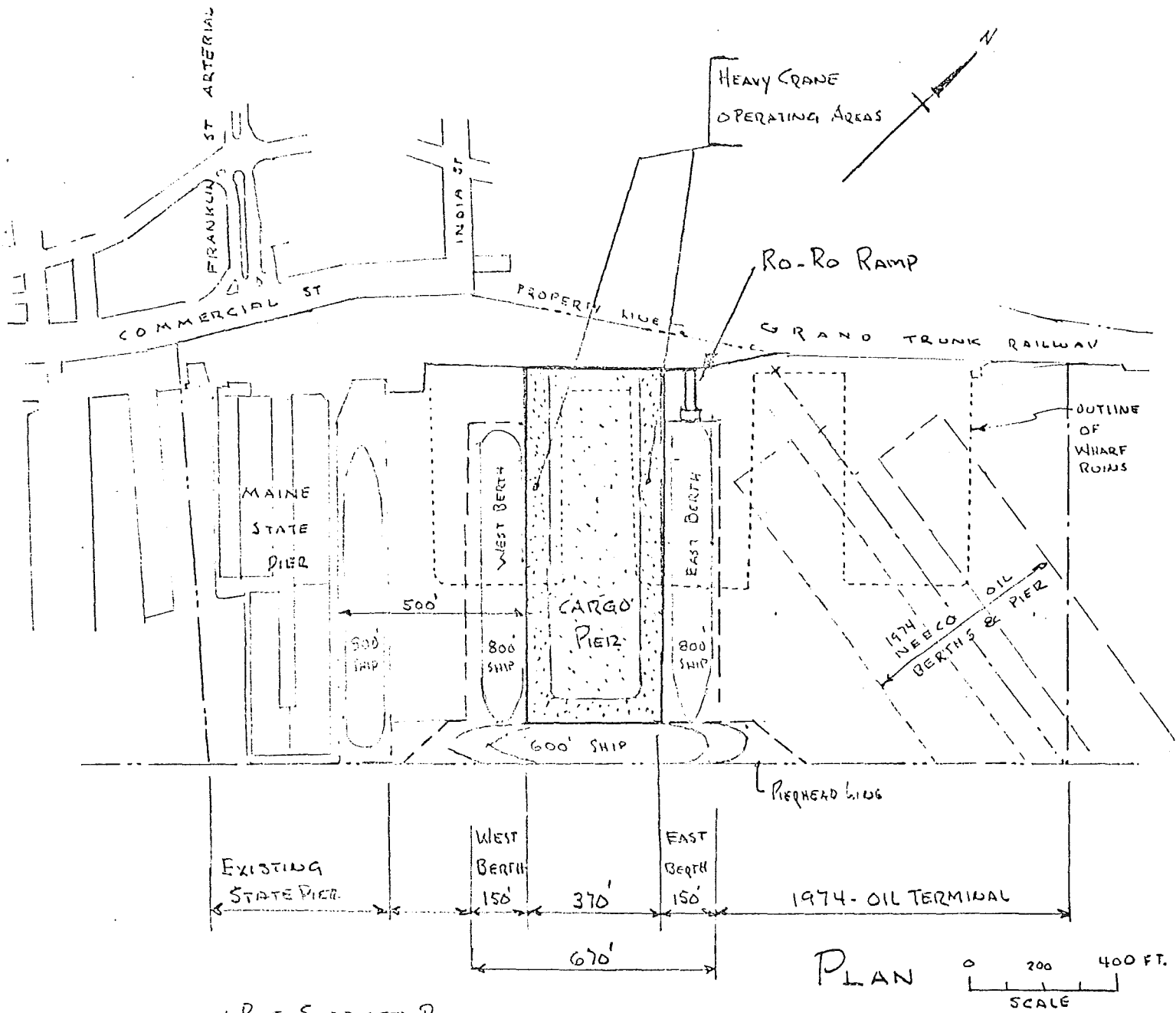


FIG. 11

MAINE DEPT OF TRANSPORTATION  
 MARINE TERMINAL STUDY  
 PORTLAND TERMINAL No. 3 AREA - PORTLAND  
 NEW WHARF - CROSS SECTION

FAY, SPOFFORD & THORNDIKE, INC., BOSTON



NOTE: SIZE AND LOCATION OF STRUCTURES BASED ON PROPOSED CARGO FACILITY BY NEW ENGLAND ENERGY CO (NEECO) IN 1974.

FIG. 12

MAINE DEPT OF TRANSPORTATION  
MARINE TERMINAL STUDY  
MAINE STATE PIER - PORTLAND  
PIER AT "NEECO" LOCATION  
PLAN & SECTION  
FLY, SPOFFORD & THORNDIKE Inc

Note that dredging would be required to provide for 40-foot berths. In addition, portions of wharf ruins would have to be removed.

Table 3 contains a cost estimate for what is shown in Figure 12. Again, the reader should be aware that the costs of any buildings and equipment, as well as any shoreside development, have not been included.

#### F. Other Considerations

The advantages and disadvantages of the various alternative locations for a cargo facility with regard to harbor depths, land and rail access, cargo potential, etc., have not been discussed here. Such discussions can be found in the original report.

TABLE 3

MAINE PORT DEVELOPMENT STUDY COST ESTIMATE

PIER AT "NEECO" LOCATION

<u>Item</u>	<u>Estimated Cost</u>
1. Wharf Structure Crane Operating Areas 123,000 Square Feet	\$19,700,000
2. Wharf Structure Container Storage Area 210,000 Square Feet	16,800,000
3. Ro-Ro Facility	300,000
4. Dredging	<u>800,000</u>
TOTAL ESTIMATED COST:	\$37,600,000

NOTE: Estimate based on November, 1977 construction costs for comparison with Maine Port Development Study Report.

III. OPERATIONS AT SEARS ISLAND

This section describes, in more definitive terms than previously presented, port cargo facility operations as they may be expected to occur at the Sears Island site. Topics discussed include cargo projections, leasing arrangements, employment opportunities, revenues, costs, and other applicable items. It should be noted, however, that the values presented in this section are only preliminary planning estimates. Actual operations may, of course, vary.

A. Cargo Projections

This study required more detailed estimates of cargo which a Sears Island facility might handle, and they are presented here. It has been assumed that Sears Island's share of the total State tonnages presented in the original report will be 80 per cent, and that the "middle" range of estimates presented in the report are the most appropriate. Accordingly, the following cargo projections\* result:

1980 EXPORTS (Sears Island)

	<u>Total Tonnage</u>	<u>Containerized Tonnage</u>	<u>Number of Containers</u>
Pulp, Paper and Wood Chips	240,000	60,000	3,000
Food Products	80,800	26,700	1,200
Other	<u>9,600</u>	<u>4,300</u>	<u>400</u>
Total	330,400	91,000	4,600

\*These projections do not include bulk cargo.

1980 IMPORTS (Sears Island)

	<u>Total Tonnage</u>	<u>Containerized Tonnage</u>	<u>Number of Containers</u>
All Products	68,000	22,400	1,100

As can be seen, there is a significant imbalance between estimated outbound and inbound cargo with exports exceeding imports 4 to 1.

B. Leasing-Operating Recommendations

A list of major recommendations with regard to leasing arrangements and operating procedures is presented below.

Explanations of these recommendations will follow.

- The State of Maine should not directly be involved in the day-to-day operation of the facility; rather a leasing arrangement should be made with a private operator.
- The lease should be written so that the terminal operator's fortunes are tied to his performance and the port's cargo volume. A strictly managerial roll for the operator whereby he receives a fixed fee for his services and turns over all revenues to the State is not recommended.
- The lease between the State and the private operator should be long-term.
- The lease should contain provisions allowing either party the right to terminate the lease under specified conditions.
- The lease should clearly define settlement arrangements in the event that the lease is terminated.
- The operator should be allowed to undertake specified types of private construction on the facility.
- The lessor (the State) should be responsible for the overall structural integrity of the facility while the lessee should be responsible for its day-to-day maintenance.

- . Fire insurance should be the responsibility of the lessor.
- . Priorities should be established for the use of the premises.
- . Rent should be paid monthly with the amount being a reflection of potential business and the State's goals.
- . The lease should contain provisions for rent abatements under specified conditions.
- . No portion of the property should be dedicated to a single specific operation with the exception of those areas leased by specific users.
- . The lessee should be exempted from personal property taxes on all activities directly related to the port's operation.
- . Rates should be set by the lessee.

The following paragraphs briefly discuss some of the reasons behind the recommendations just presented.

The primary reason behind the recommendation to lease the operation of the facility to a private party is that it puts the day-to-day operation in the hands of individuals experienced in port operation, thus maximizing the chances for success. At the same time it is likely that a private operator could operate with more efficiency and, most likely, at a lower overall cost than could the State. Additionally, a private operator would be able to provide more flexibility with regard to day-to-day operations. For example, a private operator can probably more quickly make decisions affecting port operation and respond to changing conditions, whereas the State operator would most likely have to go through a bureaucratic chain of command.

Although a long-term leasing arrangement is recommended, a short-term lease (3-5 years typically) has some advantages over a long-term lease (typically, up to 25 years). The short-term lease has the advantage to the State that it may retain close control of the operation and may designate a new operator within a reasonable period of time, if desired. That is, if the State is not satisfied with the current operator's performance, it is not tied down to that operator for an extended period, and can seek a new operator. A major disadvantage to the short-term lease is that the operator is not assured permanency and, therefore, may not be inclined to develop the property to its potential. Similarly, if the operator feels that he may be soon replaced, he may abuse the property or otherwise take advantage of the port.

A long-term lease, on the other hand, does permit the operator to sense permanency and encourage him to actively solicit business and to develop the property. The long-term lease also may make the financing of bonds easier and serve to develop better relationships between the operator and shipping companies. The major disadvantage of the long-term lease is that if the operator does not perform up to expectations, he cannot be quickly replaced unless evidence can be obtained that the provisions of the lease have not been met.

In somewhat the same vein, the lease should in some way tie the operator's fortunes to the success of the port. That is, he should collect all revenues and attempt to meet his costs



from these revenues (a special provision for subsidies may be required if it is apparent that operating costs cannot be met, even with an efficient operation). An alternative scheme whereby the terminal operator is automatically paid a fixed amount per year for managing the terminal with all collected revenues turned over to the State is not recommended since it provides no incentive to the operator to operate efficiently or to actively solicit business.

The lease, as adopted, should contain provisions under which either party has the right to terminate the lease. An example might be where an operator, in good faith, signs a lease, fully expecting the cargo projection figures supplied by the lessor to be met. Yet, if it is later found that these projections were overly optimistic and, through no fault of his own, the operator is unsuccessful with heavy losses, he should be able to terminate.

The lease should clearly spell out settlements in the event that the lease is terminated. In general, the operator should be reimbursed for the unamortized portions of his port-related private construction.

The lease should also clearly define what types of private construction will be allowed at the facility. The lessee should be allowed to construct, with the lessor's approval, and with private funds, fixed facilities, such as a transit shed, that are clearly port-related. It is this type of construction that should be included in a settlement in the event of lease

termination. Another type of construction which should be allowed is that of facilities which may not be port-related but which will serve to increase the utilization of the area and, hence, income to the port operator. An example of this type of construction could be a small manufacturing plant. However, such a facility would not be eligible for a settlement upon lease termination. It would be eligible for reimbursement if taken by eminent domain. Finally, the lessor should have absolute veto power over specific types of operator-proposed activities at the port facility, such as, say, piggeries, dumps, etc.

One of the most critical items of the lease concerns the division of responsibility for maintenance. It is recommended that the lessee be responsible for all day-to-day maintenance. Although a definition of day-to-day maintenance is not easily achieved, it would include yard cleanliness, snow removal, etc. The lessee should be responsible for property inspection to guard against unwarranted damage and needless deterioration. The lessee should constantly report to the lessor the results of these inspections. For example, if a roof leak develops and the lessee does not promptly report it to the lessor, then the lessee should be responsible. Similarly, the lessee should be responsible for the entire fender system except for normal wear and tear. A worn pile that breaks is normal if it breaks because of the wear. A freshly broken pile is not normal. If a pile is broken and not reported or not collected for, the

lessee has not discharged his obligations and should be responsible. In this regard, there should always be a representative of the terminal present when a vessel docks. If the vessel causes damage, it should be attached if necessary.

A similar line of reasoning to the above should apply, where practical, to other areas of the facility, such as, say, the truck docks. Here, however, minor damage should be considered normal wear and tear unless the party responsible can be ascertained.

In summary, the lessor should be responsible for the basic integrity of the facility with the lessee being responsible for day-to-day upkeep. The lease should also say that, unless specifically stated otherwise, the lessor and the lessee should have the same obligations to any subleased premises.

Insurance is another item for which details should be spelled out very clearly in the lease. Fire insurance, for example, is typically the responsibility of the lessor. The lessee should carry various insurances and should defend against all suits except those caused by the negligence of the lessor. The lessee must protect the lessor from third-party suits.

The lease should be very specific on how the property is to be used. First priority should, of course, be given to waterborne commerce, both foreign and domestic. However, it would probably be most desirable to permit the operator (lessee) to deal in commerce which is not necessarily waterborne. That is, for example, he might want to temporarily store some locally

produced goods in the sheds that will eventually be trucked to various locations. This additional use of the facilities will generate more revenue and will make the lessee's position more viable. A third priority should be for services which will further the above two.

In order to maximize the utilization and efficiency of the facility the following clause in the lease might be desirable: "In no way shall any portion of the premises be dedicated to a single specific operation with the exception of those areas leased by specific users."

The basis for payment of rent is one of the important aspects of the lease. In general, the basic rent should attempt to cover the debt service if practical. Additional rent should be collected after the tonnage level or the number of containers or other cargo handled exceeds a certain agreed-upon level. From another point of view, if the rent is based upon gross revenues, then revenues resulting from physical services should not be part of the basis for rent. The rent should be paid monthly. It may be desirable for the rent provisions to be reviewed several times during the course of the lease by either party. Options to cancel could be part of the review process. For example, if the lessee approaches the lessor and asks for a rent cut and the parties cannot agree, the lessor should be able to cancel the agreement. Or, if the lessor approaches the lessee and asks for a rent increase and the parties cannot agree, the lessee should be able to cancel.

There should also be a clause in the lease which should provide for a reduction in the rent if there is a loss not caused by the negligence of the lessee. For example, if the wharf should be destroyed from a ship collision, thus rendering much of the whole terminal facility temporarily unusable, the lessee should receive a rent abatement.

Regarding taxes, the lessee should be exempt from property taxation on all the three types of operations described previously as use of the premises. He should, however, be taxed on all revenue-producing operations which were not covered previously, such as manufacturing facilities, etc. This tax arrangement could be similar to that recently agreed upon by Massport for Logan Airport, whereby the terminal buildings are not taxed but other non-aviation facilities on the property, such as the hotel, are taxed. The lease should also contain a clause exempting the lessee from personal property taxes on equipment owned by the lessor.

It is recommended that the State should not become directly involved with the rates charged by the lessee. The State should require, however, that the rates be competitive with other nearby ports. In any case, the lessee will be subject to the rules of the Federal Maritime Commission.

As a final comment, the State should seek the advice of someone thoroughly familiar with port leases to assist in drawing up the lease.

### C. Port Employment and Organization

People employed at any new major cargo port in Maine will most likely be divided among three major categories. These are (1) permanent people employed by the terminal operator, (2) workers employed by the stevedore, and (3) employees of private firms or operations which may be established at the site.

The employees in the first category above are those who will be discussed here. For the most part, they will work full time and their number is somewhat independent of the amount of cargo handled. On the other hand, the total number of stevedore employees is very much dependent on the amount of cargo handled, and gang size is an item that the State would have little control over. Additionally, these people are generally not employed full time at the port but work only when a ship is in port.

Employees of private firms will also not be discussed here since there is no way at this time to predict the occurrence and/or magnitude of such employment as it may take place on the site. Examples of such employment might include a warehouse operated by a major port user(s) for its own use only, a restaurant for port employees, etc.

The following paragraphs will discuss the types and numbers of permanent employees that the terminal operator could be expected to employ. These are estimates only and based on experiences from other ports. The actual number and type of employees would, of course, ultimately be the decision of the terminal operator.

The staff would be led by the terminal manager (superintendent) and his assistant. They would be responsible for the overall operation of the facility. Also working in the administrative area would be one or two accountants, a chief clerk, a clerk, a timekeeper and a secretary. With regard to clerking, there are often two clerking staffs: one staff is maintained by the terminal operator to handle in-terminal matters. The second clerking staff is maintained by the steamship agent to process his business with the various parties with which he must deal.

In charge of maintenance would be the Maintenance Superintendent (working superintendent). He would most likely be assisted by three or more individuals who would take care of the grounds, buildings, etc.

Operating people would consist of the crane operator and his assistant, two or three lift truck operators, and other operating equipment people, who would perform a variety of tasks.

Rounding out the staff would be security personnel. In order to provide 24-hour security at the entrance gate, a staff of 5 men would most likely be required. Additionally, it would be highly desirable to have a roving security person on duty while a ship is in. Depending upon traffic, this would probably require at least one additional staff member.

In summary, it is probable that a full-time staff of 25-35 people would be directly employed by the terminal operator, once operations had been established over a period of time.

(The start-up number of employees would be less than this figure). Assuming an average annual cost of up to \$20,000 for each individual would result in a payroll of \$500,000 to \$700,000 per year.

Figure 13 has been prepared to depict the various parties involved in port operations and, in a simplified form, the flow of money involved in normal operations. The following example will illustrate a typical export transaction and is based on the operating arrangements suggested in this report.

The manufacturer of the product to be shipped would make arrangements for his product to be sent to the port for temporary storage. He would pay a rental fee for use of any warehouse space. After a sufficient quantity of his product had accumulated and a buyer found in, say, Rotterdam, he would notify a steamship agent that a shipment of goods was available.

At this point, the steamship agent makes arrangements for a vessel to pick up the cargo. The agent notifies the terminal operator when the vessel will arrive and also makes arrangements for other services which shall be required, such as a pilot, towboats, line handling, stevedoring, etc. He also makes arrangements for the dockage and wharfage charges. The next step is for the vessel to arrive and the cargo to be loaded.

In general, the shipper pays storage charges directly to the terminal operator. Freight charges (for the vessel) are paid by the shipper to the agent who then pays them to the vessel. Usage charges are also paid by the shipper to the agent who then



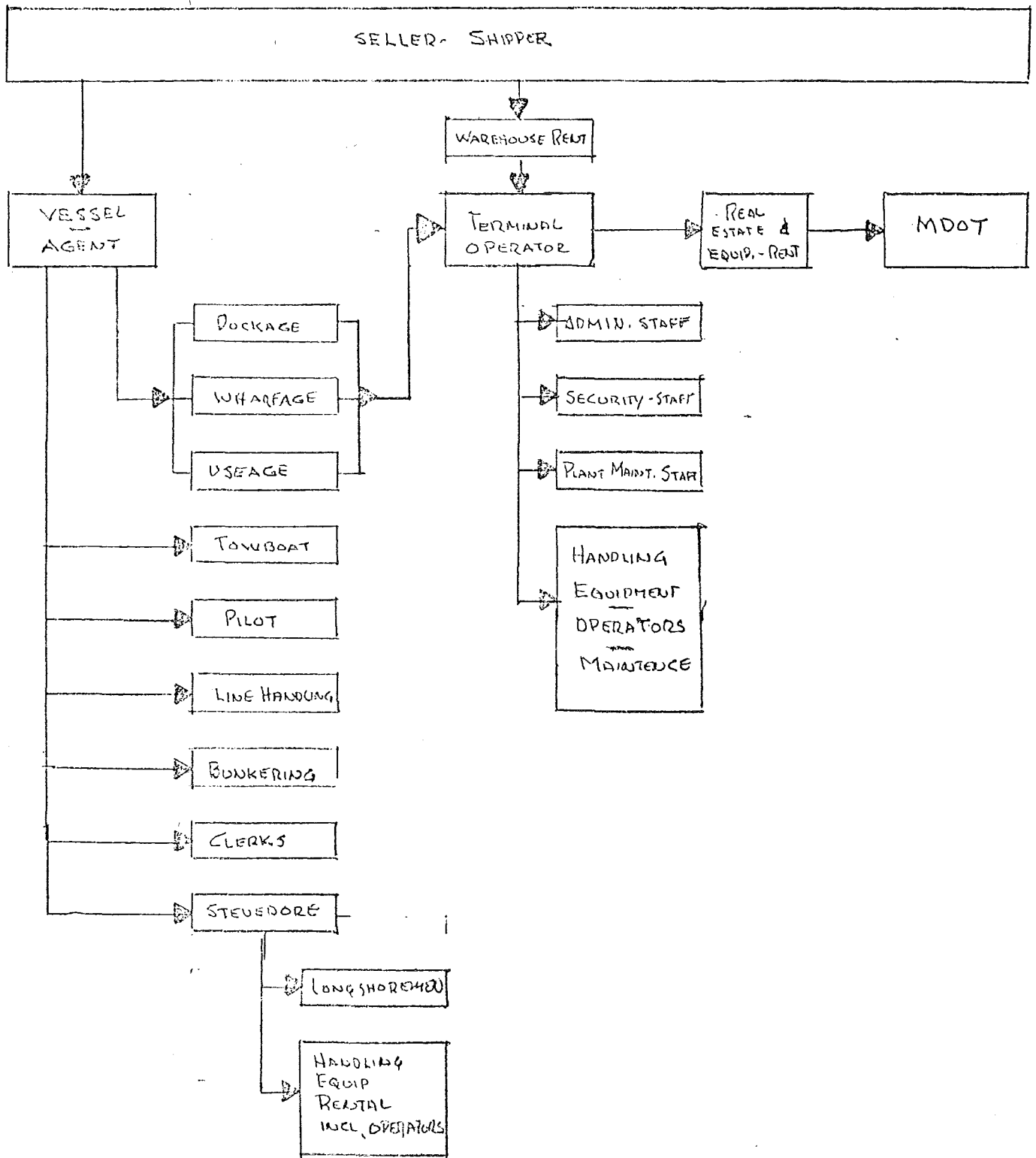


FIG. 13  
 MAINE DEPT OF TRANSPORTATION  
 SEAPORT MARINE TERMINAL  
 PORT FLOW CHART  
 FAY, SPOFFORD & THORNDIKE INC

pays them to the terminal operator. The vessel pays the wharfage and dockage charges to the agent who also then pays them to the terminal operator. Stevedoring costs are paid by the vessel to the stevedoring organization through the agent. Any clerking fees required as well as agent fees are paid directly to the agent by the vessel.

The following section will examine port operations from a financial point of view.

#### D. Terminal Operator's Income and Expenses

The terminal operator can expect to receive income from a variety of sources. Chief among these will be that income derived from wharfage, dockage, and usage fees. Other income sources might include rent from the use of equipment by others, storage rent from facility users, demurrage charges, etc. The income to be derived from wharfage, dockage, and usage can be predicted fairly accurately based on assumptions with regard to the amount and type of cargo to be handled, tariffs, loading and unloading efficiency, etc. Income from the other sources is much more difficult to predict since, for example, there is no way of knowing beforehand if a particular shipper will use the transit shed and for how long. Accordingly, the thrust of this discussion will focus on receipts from wharfage, dockage, and usage.

The amount and types of cargo which the Sears Island facility might handle in the future has been previously discussed in this report and will be used as the basis for income

projections. The rates shown in the following calculations are averages based on what is currently charged at certain Boston facilities. In order to be competitive, the rates charged at Sears Island could be expected to be similar to these.

### Exports

#### Wharfage

Wood Pulp, etc.:	180,000T (break bulk) @ \$0.80/T	\$144,000
	3000 containers @ \$9.00	27,000
Food, Etc.:	59,400T (break bulk) @ \$0.80/T	47,500
	1600 containers @ \$9.00	14,400

#### Usage

Wood Pulp, etc.:	180,000T (break bulk) @ \$0.90/T	162,000
	3000 containers @ \$13.00	39,000
Food, Etc.:	59,400T (break bulk) @ \$2.00/T	118,800
	1600 containers @ \$13.00	20,800

#### Dockage

For break bulk cargo:	239,400T @ 30T/hr.	
	= 7980 hatch hours per year	
	@ 5 hatches per ship	
	= 1596 ship hours	
	@ 8 hrs/day	
	= 200 days @ \$250/day	50,000
For containers:	4600 containers @ \$7.00	32,200
		<u>\$655,700</u>

### Imports

#### Wharfage

45,600T (break bulk) @ \$0.80/T	\$ 36,500
1100 containers @ \$9.00	9,900

#### Usage

45,600T (break bulk) @ \$2.00/T	91,200
1100 containers @ \$2.00/T @ \$13.00	14,300

#### Dockage

For break bulk cargo:	45,600T @ 30T/hr.	
	= 1520 hatch hours per year	
	@ 5 hatches per ship	
	= 304 ship hours	
	@ 8 hrs/day	
	= 38 days @ \$250/day	9,500
For containers:	1100 containers @ \$7.00	7,700
		<u>\$169,100</u>

From the previous calculations it can be seen that revenues from wharfage, usage, and dockage charges could yield approximately \$825,000 per year to the terminal operator. In addition, he could receive revenue from various other sources, as discussed previously. However, the bulk of his revenue would be from the wharfage, usage, and dockage charges. (Note: No estimation has been made for revenues from handling, car loading, etc., since such revenues generally balance the costs to provide the services, the net being essentially zero.)

Only a few major types of expenses which will be incurred by the terminal operator will be briefly discussed here in order to simplify the discussion. These expenses must be then compared with revenues to determine whether the port operation is financially feasible.

The two largest expenses which will be incurred by the terminal operator are payroll and rent. Another section in this report has estimated that the terminal operator's payroll expenses would probably be in the vicinity of \$500,000 per year. A reasonable figure for rent for the Sears Island facility would be approximately \$400,000 per year, based on practices at other facilities. Thus, the terminal operator is faced with costs of at least \$900,000. Other expenses could add another \$100,000 to this total so that the terminal operator's expenses per year could very likely be in the vicinity of \$1,000,000.

(Maintenance costs to the operator have not been specifically estimated since much of such costs are implicitly included in payroll costs.)

A comparison of revenues to costs shows revenues from wharfage, usage, and dockage to be \$825,000 per year while expenses would be \$1,000,000 per year. Thus, there would be a shortfall to the terminal operator of \$175,000. This shortfall, plus any profit, would have to be made up from other revenue sources (rental of equipment, space, etc.) or by reducing costs to the extent possible.

From the previous discussions it is apparent that the port operation would be a marginal type of operation for the terminal operator whereby operating expenses could possibly be met through judicious and aggressive port operations. However, it is unlikely that any revenue would be available as income to the State.

The costs of port operation to the State will be discussed in the following section.

#### E. State of Maine Income and Expenses

The State of Maine will incur certain costs of port operation on an annual basis. Broad categories of costs to the State will be briefly discussed here.

The original cargo port study prepared by FST estimated that the State would have to finance approximately \$29 million of the \$41 million construction cost of the facility originally proposed for Sears Island. Assuming a 6 percent interest rate over a 25-year payback period would give a present value of State costs of \$58 million. Thus principal and interest costs are about equal.

From the above, the State's annual costs would be \$1,160,000 for principal and \$1,160,000 for interest. The State's annual revenue would most likely be limited to the rent paid for the facility, or \$400,000. Comparing the rent received against interest costs results in an annual shortfall to the State of \$760,000. The payment on the principal was not included in the comparison since the State would own the facility.

Other expenses which would be incurred by the State would include the costs of an annual inspection plus major maintenance. The annual inspection would probably involve two weeks' time of up to 3 individuals for a cost of, say, \$10,000. Major maintenance would not be a problem during the early years of the terminal. (It is assumed that the costs of any accidental damages incurred would be the responsibility of the parties responsible, whether they be the terminal operator, the ship, etc.). However, it could be expected that rehabilitative work could be required at the end of, say, 20 years. The extent of this rehabilitation is very difficult to estimate, though. Therefore, it is assumed that State maintenance costs will be minimal for this analysis. A figure of \$50,000 per year will be used.

Thus, it is clear that the State will be faced with paying over \$1 million annually in costs of the principal plus somewhat over \$800,000 to cover rent shortfalls on the interest costs, inspection costs, and maintenance costs. The decision

must be made whether those costs to the taxpayer are overshadowed by the benefits which a modern port would provide to the State and its people.

#### F. Comments on Facility Location

A critical issue with regard to site selection on Sears Island is depth of water. The original layout for Sears Island provided for water depths at the wharf of 40 to 45 feet at mean low water with no dredging required. However, at the R6 site the channel depth is only 35 feet at mean low water. Thus, dredging would be required at that location at least alongside the wharf to attain a comparable 40 to 45 foot depth. If just the area alongside the wharf is dredged, ships with drafts greater than 35 feet could not pass through the channel and dock at the facility during times of low tide.

The original cargo port study prepared by FST mentioned the fact that ships of all types are rapidly becoming larger and larger with greater drafts and beams. This trend is expected to continue. Recognizing this fact, ports throughout the world are attempting to provide improved channel depths and widths. In fact, in a recent publication<sup>1</sup> of the New England River Basins Commission, high implementation priorities are set for such projects in Boston and Tiverton/Fall River. To quote, "This project (Boston) will result in a 40-foot channel that is 1200 feet wide." Also, "By 1990, it is anticipated

<sup>1</sup>Schedule of Priorities: 1980-84 New England River Basins Commission, Boston, MA July, 1978

that many of the tankers and dry cargo vessels using the harbors in Tiverton and Fall River will have drafts of between 35 and 39 feet. The Southeastern New England Study therefore recommended that the Corps of Engineers deepen the current 35-foot channels . . . . . to 40 feet to assist navigation."

Therefore, the State of Maine is faced with a tradeoff. A facility can be built at the R6 site for somewhat less than at the initially proposed location. However, this alternative location suffers from the disadvantage of being more restrictive in the size of ships which it can handle. A decision must be made whether the cost savings outweigh the potential handicaps.

#### G. Port Benefits

The benefits and impact to the economy of Maine of a major new cargo port in Maine were discussed at some length in the original report and will not be repeated here. However, a brief discussion of port benefits from another point of view will be briefly highlighted.

In Massport's Annual Report for 1977 the statement is made that . . . "North Atlantic ports generate \$35 to their local economies for every ton of general cargo handled." While the derivation of this figure was not explained and therefore cannot be judged for its accuracy, its face value application to the projected Sears Island tonnages is certainly of interest.

Sears Island is projected in 1980 to handle 330,000 tons of exports and 68,000 tons of imports for an approximate



400,000-ton total. At \$35 per ton, the resulting impact on the economy is \$14,000,000 annually. Thus, in one sense, the cost of the facility can be recovered through benefits to the economy in a matter of a few years. However, the reader should be cautioned that this figure is no doubt an exaggeration since it is likely that a significant percentage of these benefits are already existing in the economy in terms of people employed in the current production of many of the products to be shipped from Sears Island. As an example, suppose in one year that a manufacturer in Maine produces 10,000 rolling pins and sells them all locally. In the following year he also produces 10,000 rolling pins but exports all of them. For this latter case, the wages, etc., of the people involved in the rolling pin production would no doubt be included in the "benefits" provided by the port. In actuality, however, they are not really port benefits in the true sense since the goods were being produced regardless of whether the port was there or not. On the other hand, if production was increased because of the port's presence, then this added production would be a true benefit. In either case, the labor at the port would be a benefit since employment was provided to handle the exported goods.

In summary, the benefits to the economy provided by a port can be very difficult to isolate and quoted figures should be used with caution. Nevertheless, a modern port is certainly an asset to a state and would, no doubt, provide certain benefits to its economy.

## H. Conclusion

This report has presented layouts and cost estimates for improved cargo-handling facilities at a number of sites in Maine. Particular emphasis has been placed on such a facility located near the R6 buoy on Sears Island.

The report has also discussed the operational structure and financial feasibility of a modern cargo port at Sears Island. One of the main conclusions of the report is that the port may be marginally successful for the terminal operator but that annual contributions by the State to pay principal and interest costs would be required. Accordingly, a decision must be made whether the costs to construct and maintain a major new port facility are outweighed by the benefits that it could provide.