Maine . Coastal Zone Management Program

FIVE ISLANDS WHARF STUDY,

GEORGETOWN, MAINE

June 7, 1990

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FIVE ISLANDS WHARF STUDY,

GEORGETOWN, MAINE

June 7, 1990

STATE OF MAINE
STEPHEN C. DEWICK
No. 2329
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Prepared for: Town Owned Property Management Board
Georgetown, Maine

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June 6, 1990

Mr. Carroll Plummer, Chairman
Town Owned Property Management Board
Town Office
Georgetown, Maine 04548

Subject: Five Islands Wharf Study 89-2783
Final Report

Dear Mr. Plummer:

In accordance with our agreement, dated October 18, 1989, we are pleased to submit our report on the Five Islands Wharf.

The data upon which this study and its recommendations have been based are the most current available. The advice and participation by the Board and members of your community have been appreciated while conducting this study.

Thank you for selecting Kimball Chase to assist you with this study.

Very truly yours,

Kimball Chase Company, Inc.

Stephen C. DeWick

Stephen C. DeWick, P.E.
Project Manager

SCD/sla
Enclosures

cc: Kirk Schlummer, DECD (7 copies)

PROJECT CREDITS

This project has been sponsored by the Town of Georgetown, Maine. Administration of the Project has been under the direction of the Town Owned Property Management Board. Members of the Board included:

Carroll Plummer, Chairman
Ken Malsch
Frank Sarcione

"Financial assistance for preparation of this document was provided by a Grant from MAINE'S COASTAL PROGRAM, through funding provided by U.S. Department of Commerce, Office of Coastal Zone Management, under the Coastal Zone Management Act of 1972, as amended."

The cooperation and assistance of the people responding to the questionnaire is appreciated.

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Appendix A

A-1 Scope of Services A-1

SECTION 1

SUMMARY & FINDINGS

Summary

Inspections of the Five Islands Wharf were made by the project team on October 18, and 26, 1989. The wharf was also thoroughly inspected with the Town Owned Property Management Board (TOPMB) on October 21, 1989. During these visits, detailed measurements of the wharf were made, penetrations and probings of wooden members were conducted and records prepared of the wharf's overall condition.

Findings

Based upon the investigations described above, the following findings have been made:

1) The wharf, which was reconstructed in 1978, is in moderately good condition.

2) The wharf decking has been partially replaced with new decking since 1978. Much of the remaining deck will require replacement over the next five years.

3) The support timbers under the decking are arranged in an orderly fashion, except for those under the south side, and those next to the Cooker/Cooler building. Wooden blocking has been used to achieve the correct support height over some of the shorter piles.

4) Many of the piles resting upon ledge are pinned. Evidence of anchor ties, which were also pinned, are still visible but are not in use.

5) The wharf's general structural integrity is achieved through numerous cross braces which are arranged in an orderly fashion and are generally in good condition.

6) The piles are arranged in a fashion to take advantage of the ledge conditions and with limited surficial material available at the outer eastern end. Most piles seem to be in good condition, with the exception of 5 piles on the south side.

7) The Love Nest, which is the oldest building at the wharf, is in fair condition. The original hand hewn beams, are visible in most of the structure. Much of the wiring, plumbing, and more recent improvements do not comply with the latest building codes.

8) The Shrimp Building, which was built in 1970, is in good condition and is comprised of a concrete floor. The reinforcing arrangement in the concrete floor is unknown. Floor drains located at convenient spots within the floor discharge directly on to many of the piles and cross members. The electrical wiring system beneath the building does not comply with existing codes.

9) The Cooker/Cooler Building, which contains the bait shed and the steam cooker for lobsters, clams, and corn is in a state of disrepair. Much of the concrete floor, especially in the bait shed, is broken and structural integrity of the decking beneath it is questionable. The addition to the north of this building is of no use in its current state.

10) A public nuisance condition exists most of the time beneath the Bait Shed, the Love Nest, and a portion of the Shrimp Building. This is caused by bait, wash water, and other waste materials discharging untreated to a pocket in the ledge. This pocket drains slowly and generally filled with wastewater which emanates a significant odor.

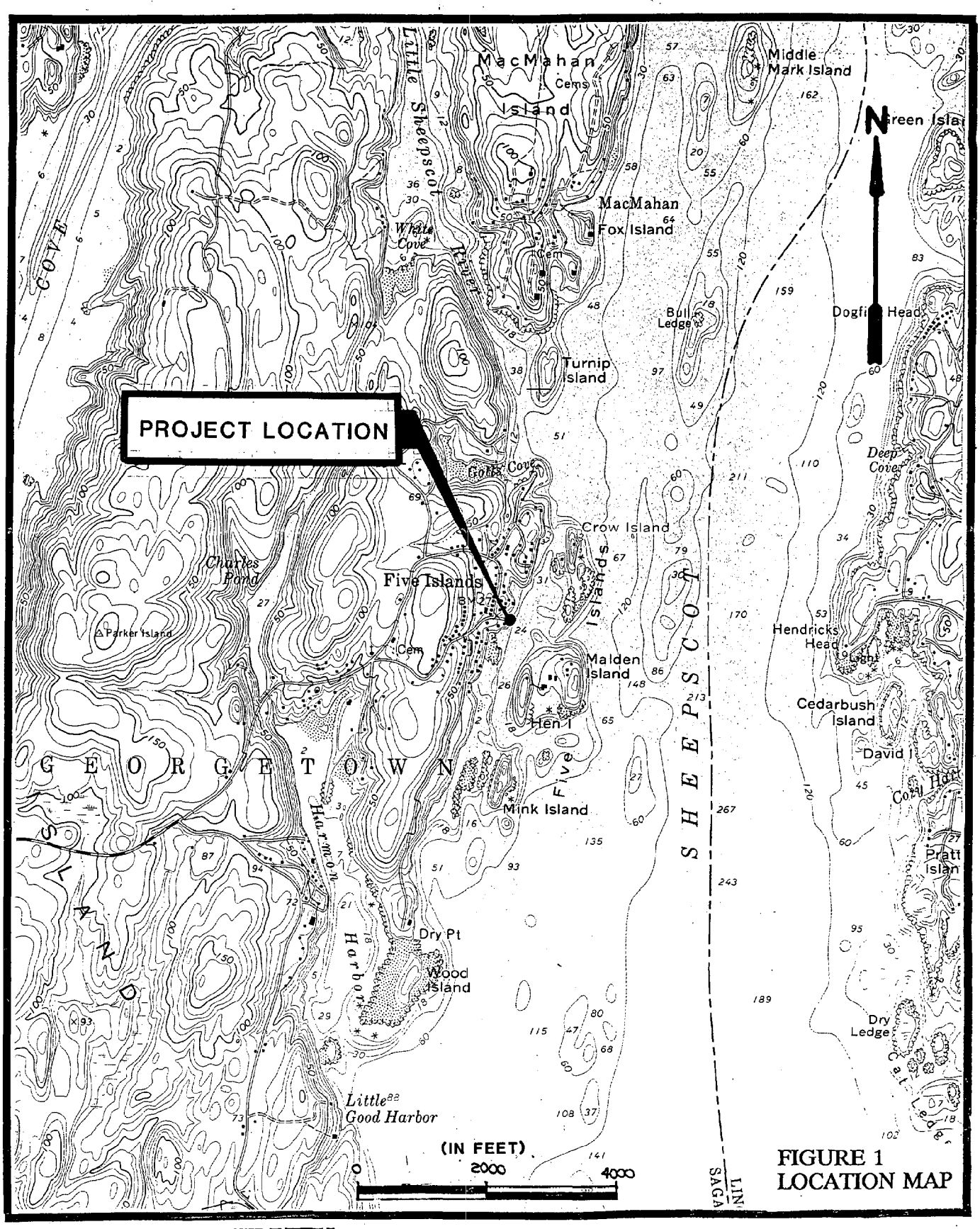
SECTION 2

INTRODUCTION

The Five Islands Wharf is located in the Village of Five Islands, on the eastern shore of Georgetown, Maine. The Village name originates from the five islands located near the Village, which include Crow, Malden, Hen, Mink, and Wood Islands (see Figure 1). The wharf is located on town-owned property and serves the purposes of local fishermen and the general public. The history of the wharf dates back to 1753, as discussed in the publication "Preserving An Inheritance" by Martha Oaks, 1982. In its early days, the wharf served as a facility associated with steamboat lines. The wharf was reconstructed in 1877 for H.G. Rowe & Company.

During the hurricane of 1978, the wharf was practically demolished. It was replaced at that time in its current state, which is the subject of this study. Demands for the wharf's use have increased, particularly as it relates to public access. The wharf's future ability to serve both the needs of the local fishermen and the general public will be one of the challenges the TOPMB will have to meet.

This study is being funded jointly by the Town of Georgetown and by a Coastal Zone Management Grant from the Department of Economic and Community Development. This initial study is the first phase in a long-range program to upgrade the wharf facilities at Five Islands.



CONDITION SURVEY
FIVE ISLANDS WHARF
GEORGETOWN, MAINE

Kimball Chase

SECTION 3

SURVEY TECHNIQUES/CONDITION SURVEY

After reviewing the scope of services (see Appendix A) agreed to by the TOPMB and Kimball Chase Company, a two-man team of engineering technicians inspected the Five Islands Wharf. Inspections by the team took place on October 18, and 26, 1989. The first inspection was scheduled to correspond with low tide which occurred at 7:50 a.m., while the second inspection was scheduled to occur at high tide at 8:34 a.m. Inspections at these different tide stages allowed detailed investigations of the lower portion of the piles secured to ledge, as well as pile condition directly beneath the timber supports and decking.

During both inspections, detailed measurements were made of the decking, the piles, support timbers, cross bracing, and the three buildings situated on the wharf. From these measurements, plans were prepared. The total area of the wharf's deck is 6,460 square feet. The Cooker/Cooler Building measures 695± square feet, the shrimp building measures 720± square feet and the Love Nest is 525± square feet.

The elevation of the wharf is 11.2 feet above mean sea level (15.7 feet above low tide).

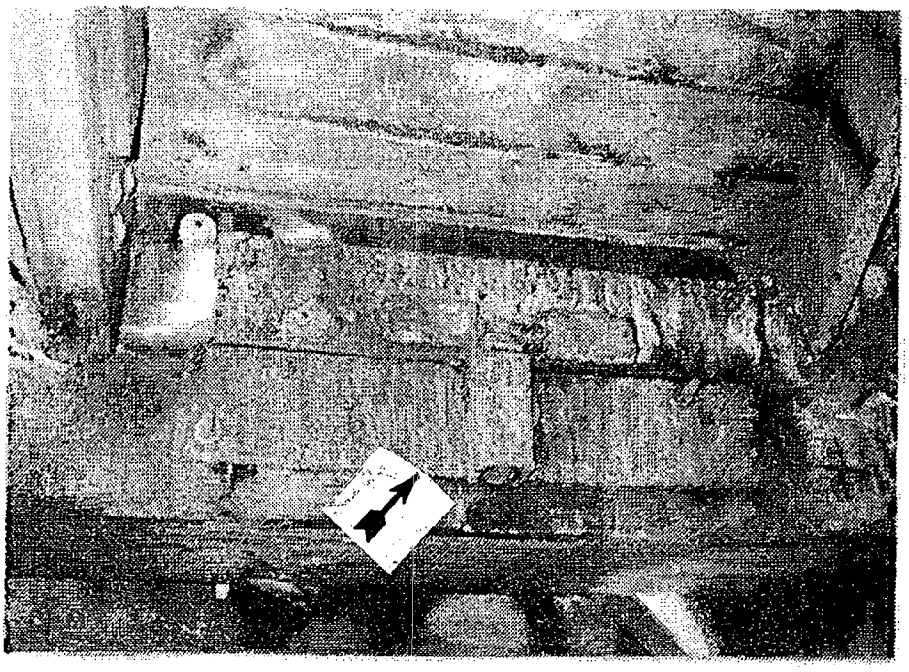
All members of the wharf, including the deck support timbers, piles and cross bracing were tested for structural integrity. Ice pick penetrations ranged from 1/2 to 1 inch in the deck, 1/2 to 2 inches in the support timbers, and 1/4 to 5/8 inches in the piles and cross bracing. Moist conditions and rot were evident under the decking and under some of the support timber, particularly toward the south side.

A survey of the building was conducted to determine the general structural condition, exterior condition and the adequacy of the utilities.

Photographs taken during the survey show:

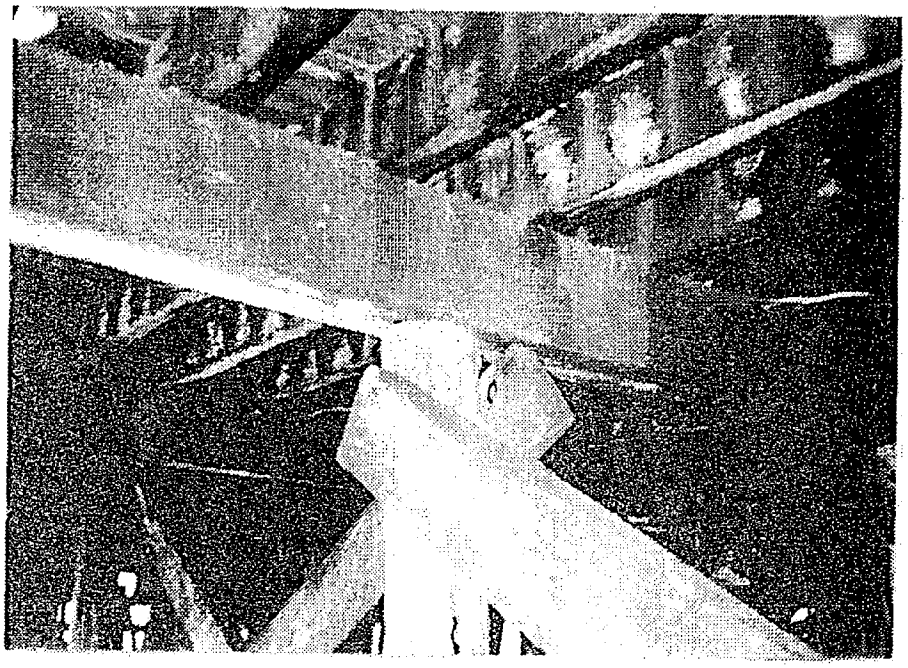
Figure No.	Description
2A	Rusted hinge under float ramp badly in need of repair
2B	Typical pile, beam and rafter
3A	South end of dock showing rotting of decking and beams
3B	Overall view of south end of dock
4A	Typical piles and cross members
4B	Typical cross beam design, built to get desired elevation

Figure No.	Description
5A	Typical piles and cross bracing towards front of dock
5B	Typical blocking used for elevation desired
6A	Deteriorated decking out by town float
6B	Photo showing decking towards front of dock
7A	Severe rotting of beam at south end of dock
7B	South end of dock showing pipes & wires not to standard codes
8A	Typical cross bracing towards front of dock
8B	Double row of piles in front of dock
9A	Piles and lower unused deck north of Cooker
9B	Typical failed beams on lower deck from above, north of Cooker
10A	Typical cross bracing under Cook House
10B	North end of dock looking towards Cook House
11A	Typical photo showing rotting rafters under Cook House
11B	Typical rotting decking and beams
12A	Town float, some beams showing signs of decay
12B	Checking for rot at rafter



A

rusted hinge under float ramp badly in need of repair.



B

Typ. pile, beam and rafter.

FIGURE 2

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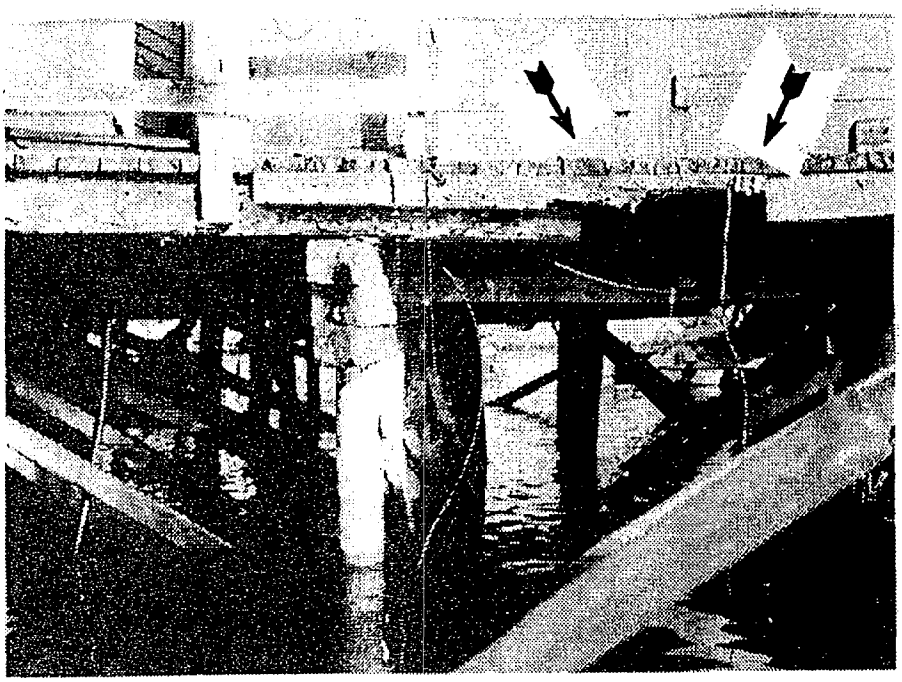
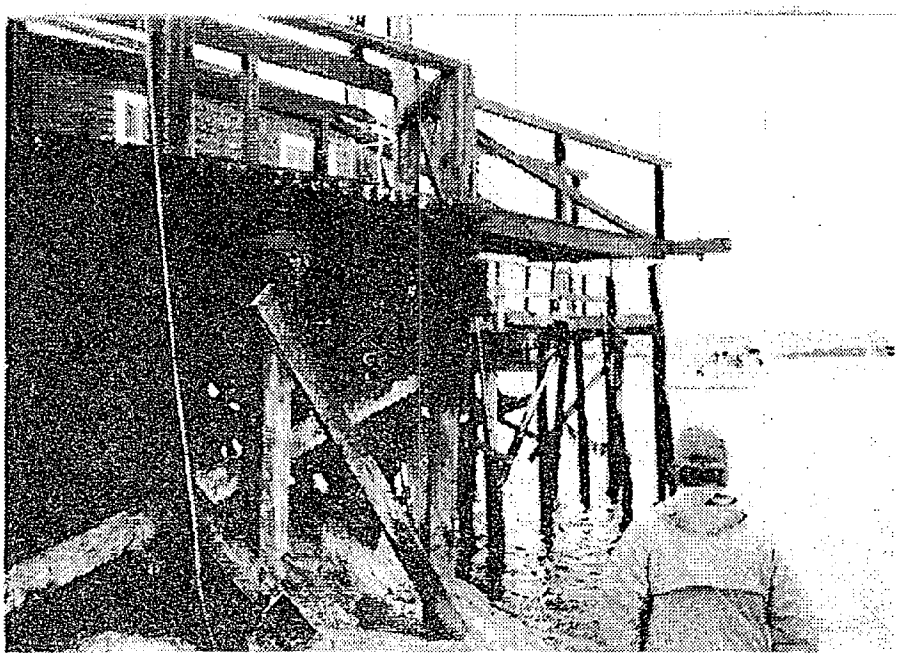


A

South end of dock showing rotting of decking and beams.



B

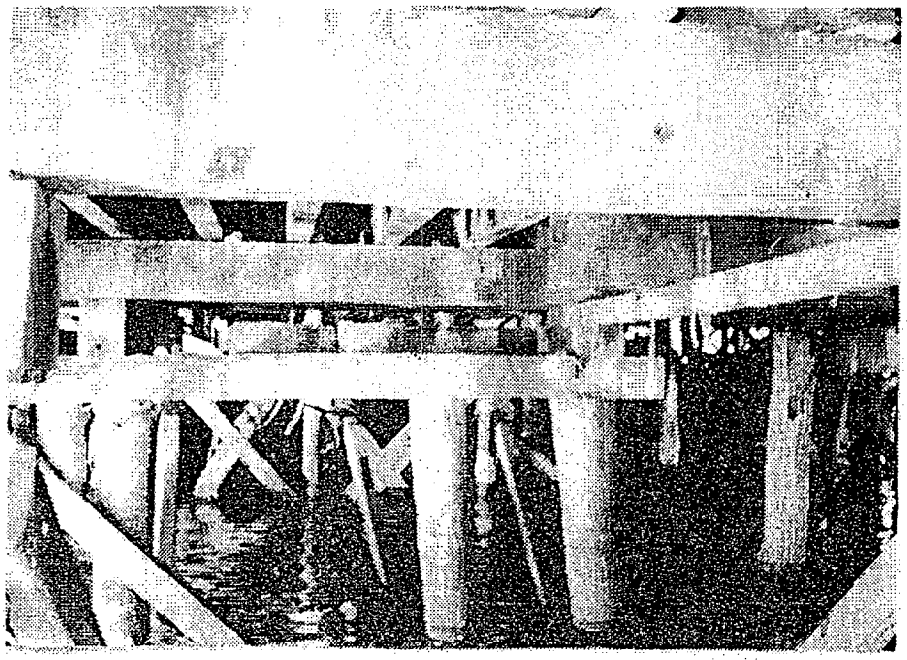
Overall view of south end of dock.

FIGURE 3

Kimball Chase

A

Typ. piles and cross members.

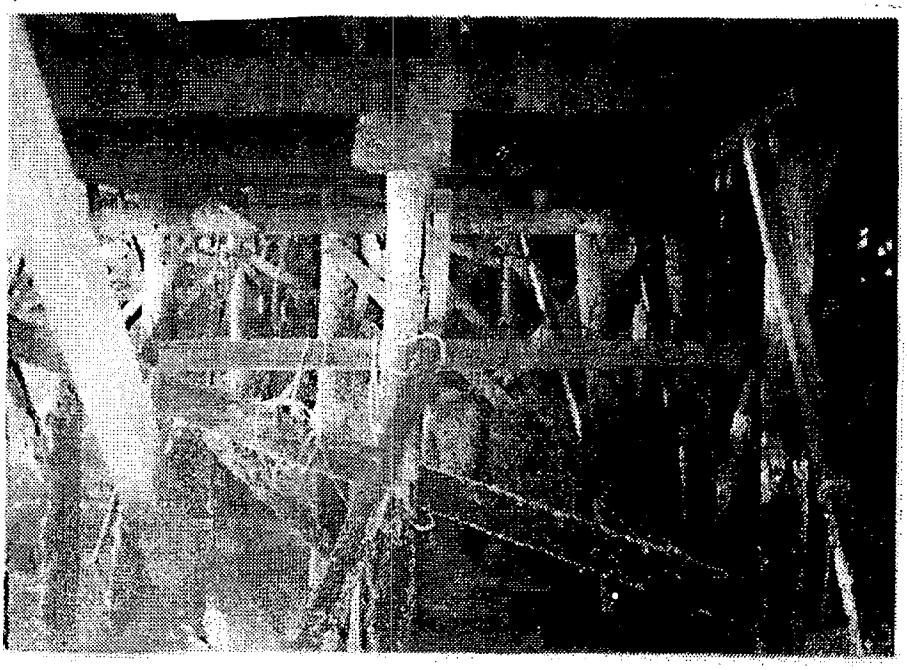


B

Typ. cross beam design, built to get desired elevation.

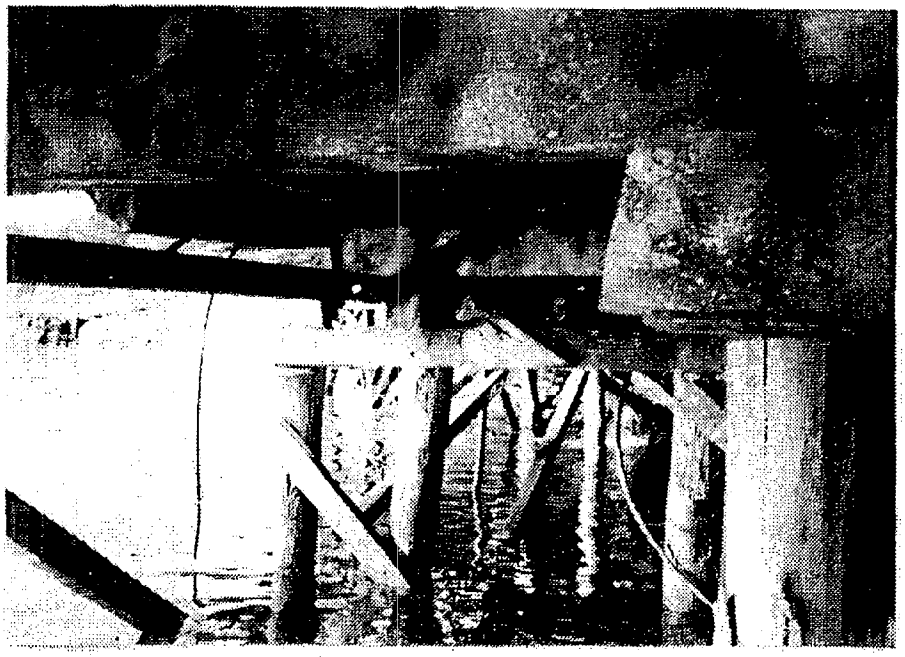
FIGURE 4

Kimball Chase



A

Typ. piles and cross bracing towards front of dock.

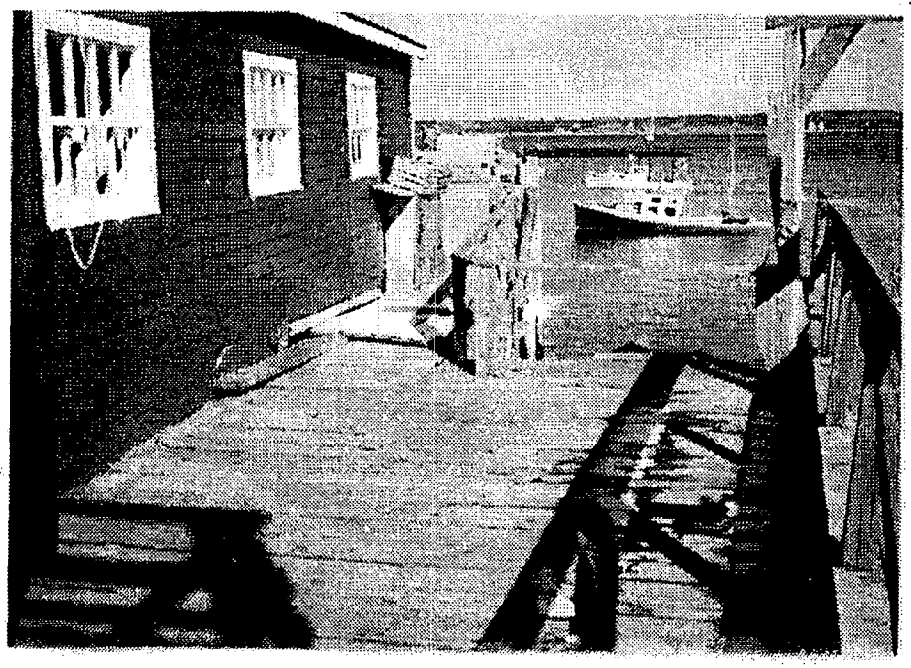


B

Typ. blocking used for elevation desired.

FIGURE 5

Kimball Chase



Deteriorated decking out by town float.

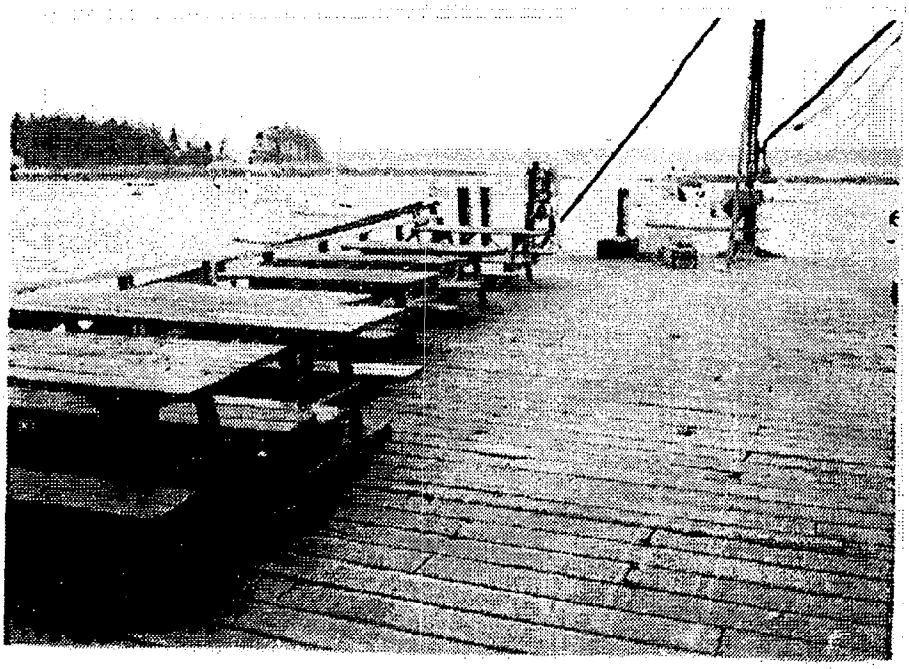
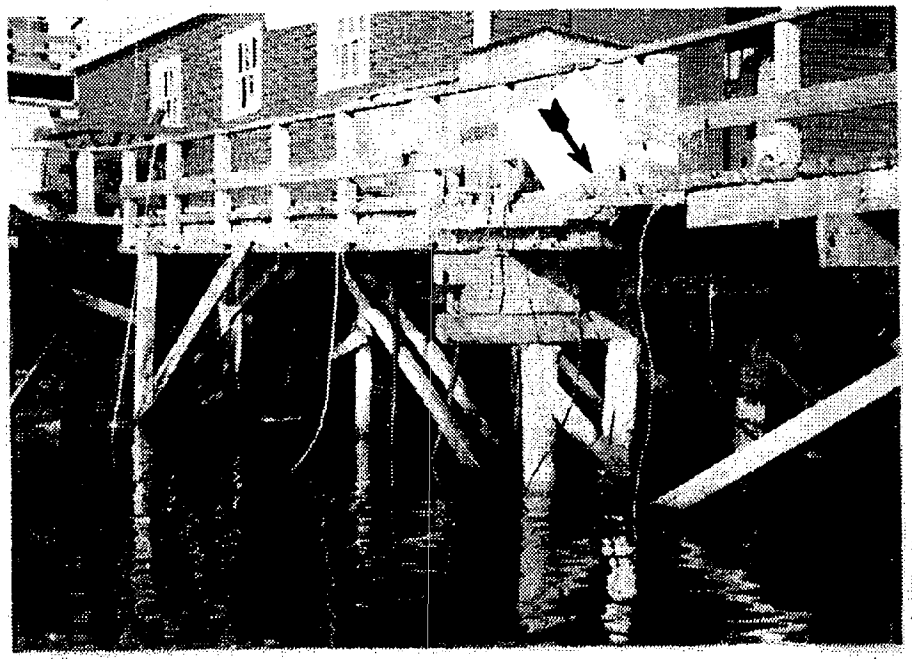


Photo showing decking towards front of dock.

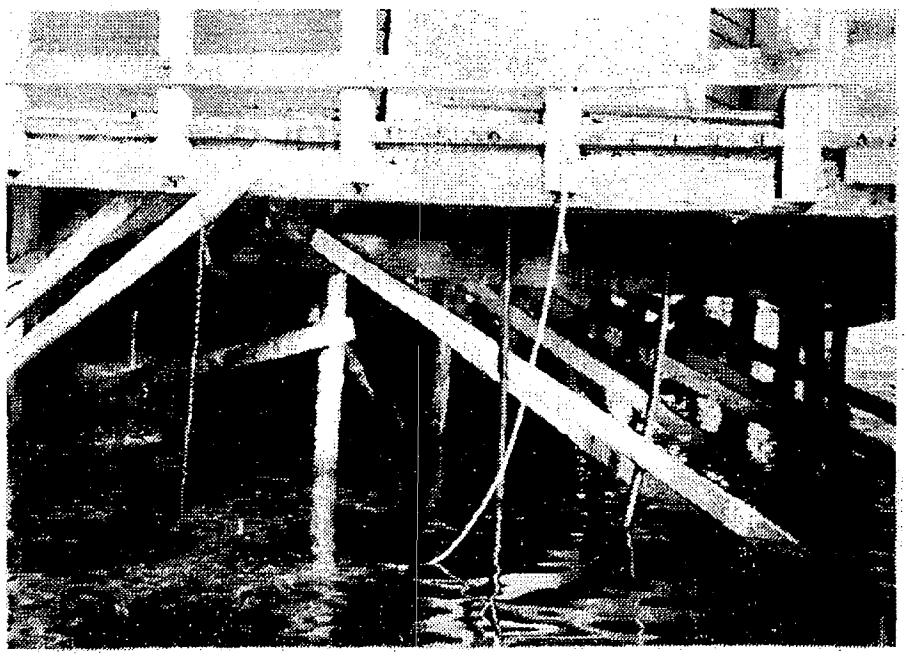
FIGURE 6

Kimball Chase



A

Severe rotting of beam at south end of dock.

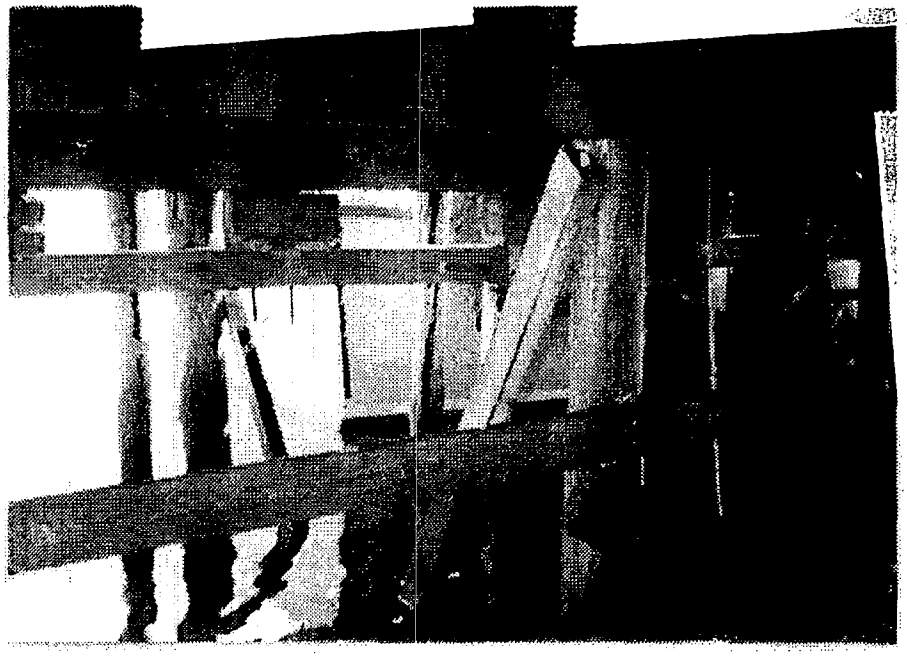


B

South end of dock showing pipes and wires not to standard codes.

FIGURE 7

Kimball Chase



A

Typ. cross bracing towards front of dock.

B

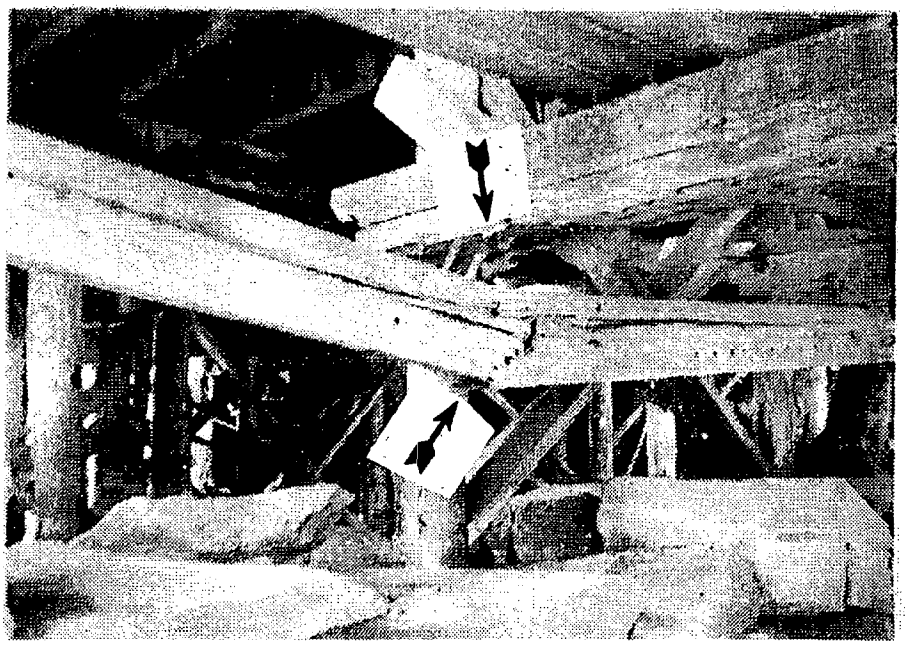
Double row of piles in front of dock.

FIGURE 8

Kimball Chase

A

Piles and lower unused deck north of Cooker.

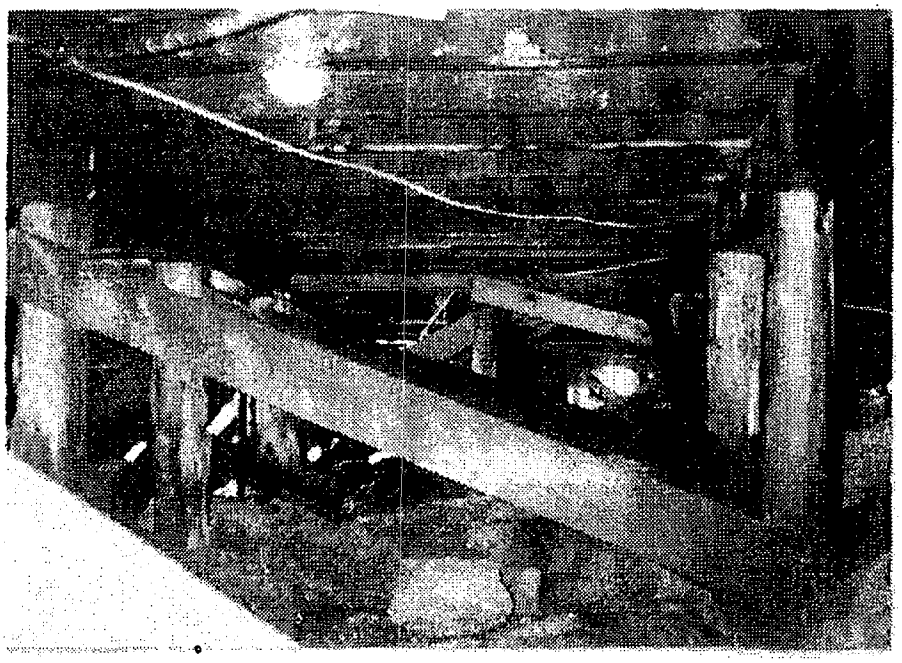


B

Typ. failed beams on lower deck from above, north of Cooker.

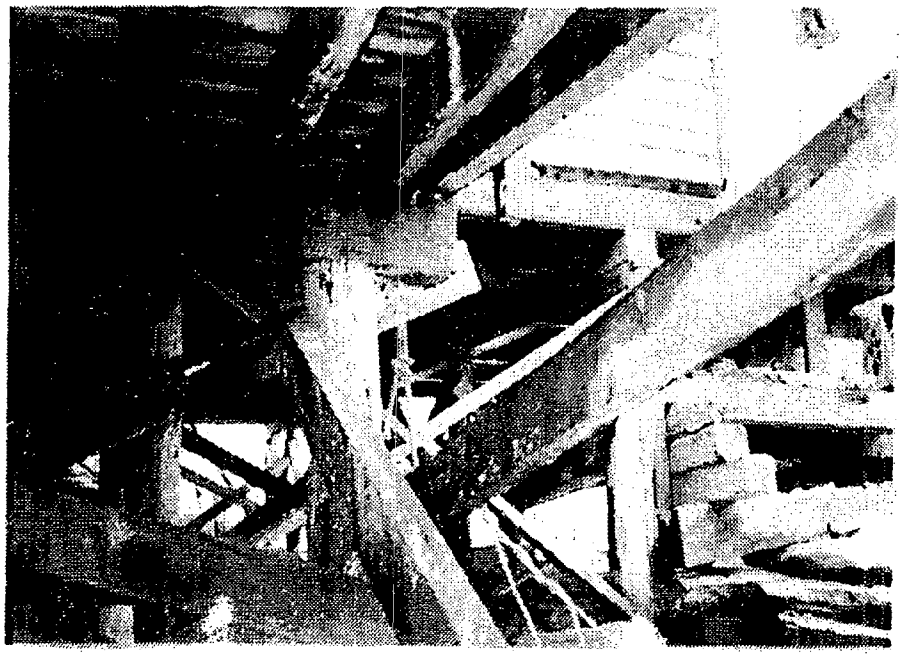
FIGURE 9

Kimball Chase



A

Typ. cross bracing, under Cook house.

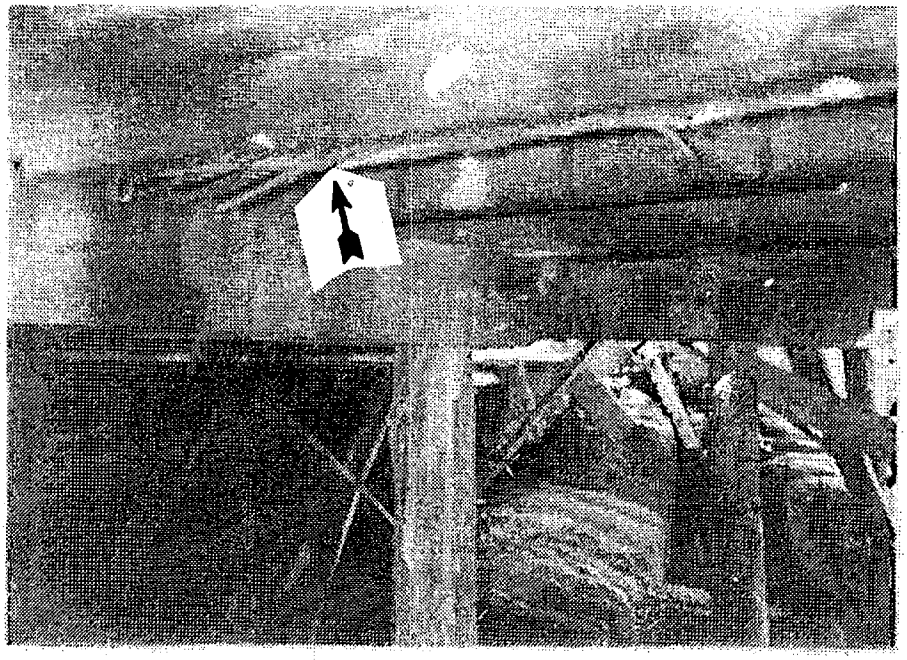


B

North end of dock looking towards Cook house.

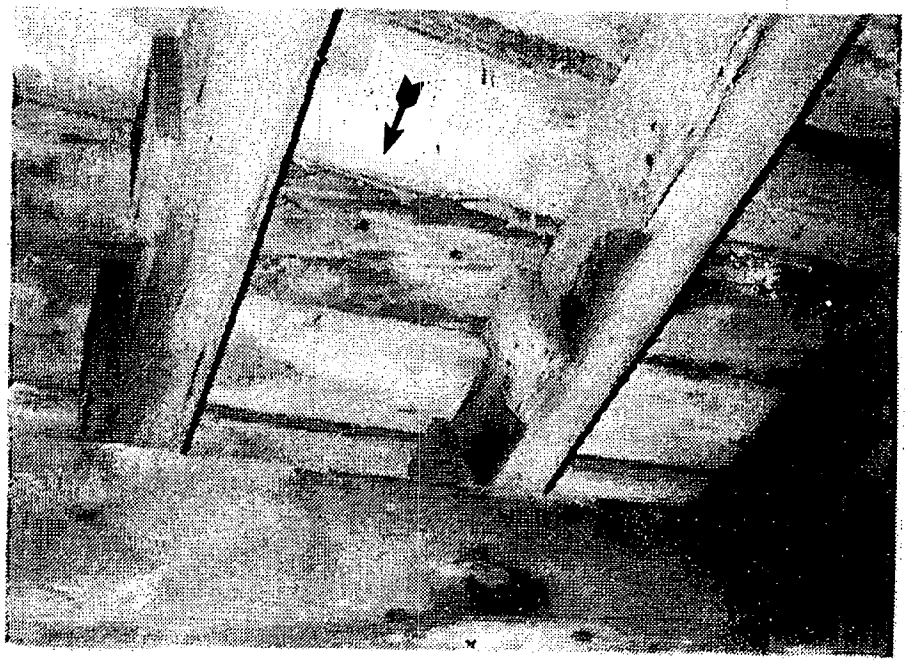
FIGURE 10

Kimball Chase



A

Typ. photo showing rotting rafters under Cook house.

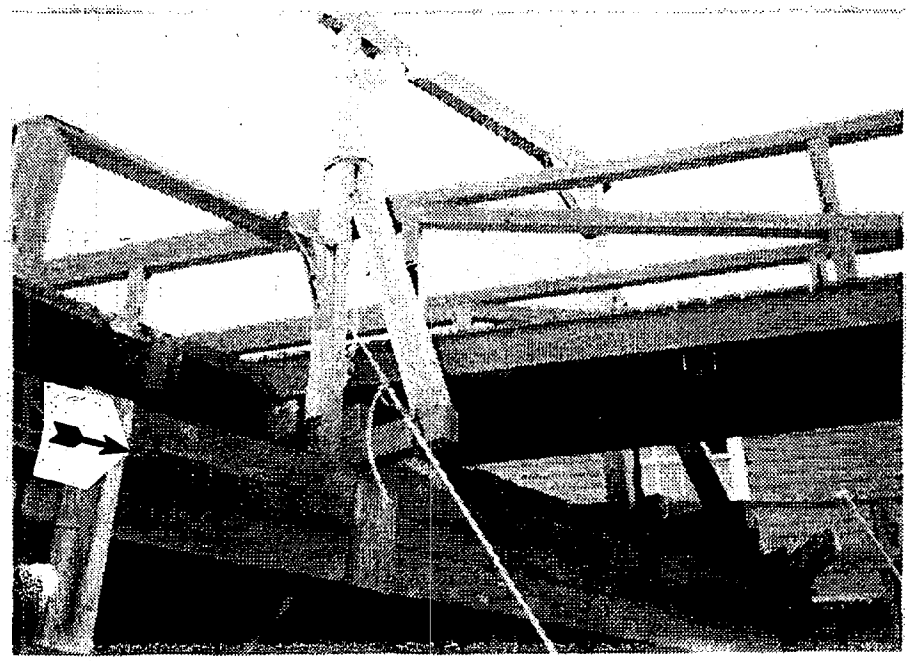


B

Typ. rotting decking and beams.

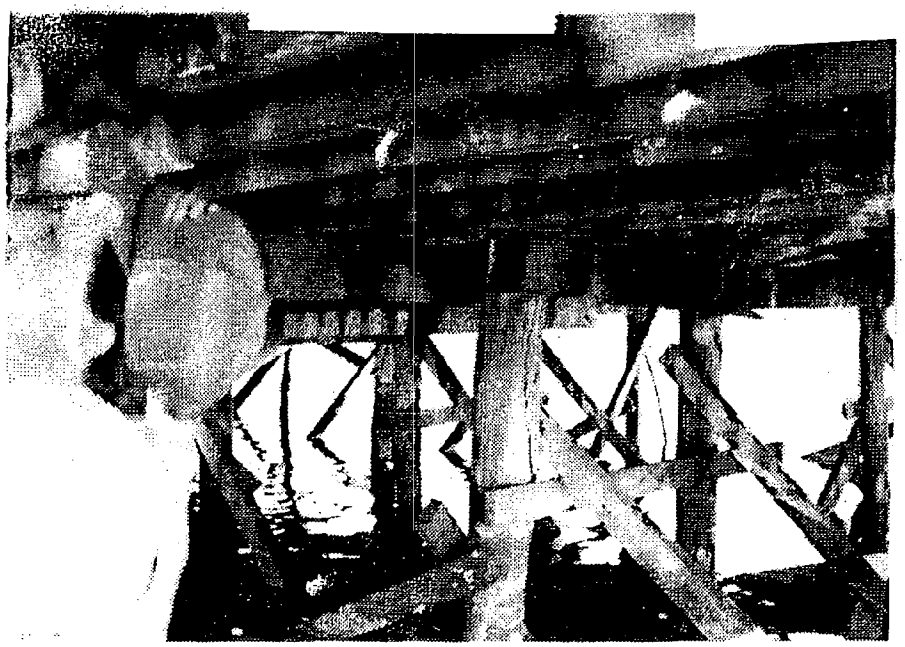
FIGURE 11

Kimball Chase



A

Town float, some beams showing signs of decay.



B

Checking for rot at rafter.

FIGURE 12

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SECTION 4

WHARF MAINTENANCE OPTIONS

The condition survey shows much of the Five Islands Wharf to be in good condition. Parts of the wharf which are not in good condition, include:

- The Cooker/Cooler Building
- The North Side of the Wharf Behind the Cooker/Cooler Building
- The Commercial Gangway and Float
- Electrical Wiring
- Building Floor Drains

The expected useful life of wood material in a marine environment is listed below:

Table 1
Life of Wood Members

Wharf Members	Years
Support Piles	
Untreated Softwood	10 - 15
Treated Softwood	20+
Untreated Oak w/Bark	20+
Pile Caps	
Untreated	10 - 15
Treated	20+
Stringers & Cross Bracing	
Untreated	5 - 10
Treated	10 - 15
Deck	
Untreated	5
Treated	10 - 15

Option 1 **Repair as needed**

Maintenance costs for the existing facility, based upon its size, age and general condition, would include expenses for the replacement of decking and stringers, repaired on an as-needed basis, float and gangway repair and hoist maintenance. The following table presents the expected yearly maintenance costs for the existing wharf anticipating reconstruction in 2003 when pile replacement will be necessary.

Table 2
Option 1 Repairs As Needed
Maintenance Matrix (Building New Wharf in 2003)

Item	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Decking	510	638	765	893	1020	1148	1275	1403	1530	1658	1785	1913	2040
Stringers & Bracing	226		620		846		1070		1297		1522		1748
Pile Caps		312		468		624		624		624		624	
Gangways (Replaced 1992 & 1994)	100	100	2050	50	2025	25	50	50	75	75	100	100	100
Railing	150	150	150	150	150	150	150	150	150	150	150	150	150
Hoist	100	100	100	100	100	100	100	100	100	100	100	100	100
Float Repair	240	240	240	240	240	240	240	240	240	240	240	240	240
Keeper Chains, Fittings, & Float Hdwre.	300	300	300	300	300	300	300	300	300	300	300	300	300
Subtotal	$1,626	$1,840	$4,225	$2,201	$4,681	$2,587	$3,185	$2,867	$3,692	$3,147	$4,197	$3,427	$4,678
Contingency	174	210	425	249	469	263	315	283	358	303	403	323	1,472
TOTAL	$1,800	$2,050	$4,650	$2,450	$5,150	$2,850	$3,500	$3,150	$4,050	$3,450	$4,600	$3,750	$5,150

Option 2 Repair as needed after wharf upgrade

After an initial upgrade of the wharf with some new piles and some spliced piles, a system of pile caps, stringers, and deck would be constructed. Table 3 below presents the approximate costs of wharf upgrade. The Table 4 on the following page shows the annual maintenance costs after upgrade.

Table 3
Wharf Upgrade Costs

Demolition 4,250 s.f. @ $10/s.f.		$ 42,500
Cost of Upgrade (Untreated)		
65 new piles		21,450
65 spliced piles		11,000
New Pile Caps		15,600
New Stringers		21,900
New Deck		25,500
	Subtotal	$137,950
	Contingency	13,800
	Engineering	25,000
	Survey	2,500
	Boring	0
	TOTAL	$179,250

Table 4
OPTION 2 (PARTIAL UPGRADE)
ANNUAL COST FOR WHARF MAINTENANCE

Item	1992-1997	1997-2002	2002-2007*	2007-2012	2012-2017
Decking	$ 255	$ 510	$ 5,100	$ 255	$ 510
Stringers & Bracing	325	325	6,430	325	325
Pilecaps	-	-	-	312	312
Gangways & Crate Slide	240	240	240	240	240
Railing	-	150	150	150	150
Hoist	100	100	100	100	100
Floats	240	240	240	240	240
Keeper Chains, Fittings, & Float Hardware	-	300	300	300	300
Subtotal	1,160	1,865	12,560	1,922	2,177
Contingency	140	185	1,240	138	223
TOTAL	$ 1,300/yr	$ 2,050/yr	$13,800/yr	$ 2,100/yr	$ 2,400/yr

* Entire deck replaced between 2002 and 2007.

MAINTENANCE PROGRAM

A detailed maintenance program contains three (3) specific parts. These are:

1. Condition Survey
2. Preventative Maintenance
3. Restoration/Replacement

Detailed maintenance programs should be instituted regardless of the wharf's material, age, or condition. What may vary between programs will be the money spent to maintain the facility. The program proposed for the Five Islands Wharf should include the following:

		Frequency		
		Annual	2 Years	5 Years
1.	**Condition Survey**			
A.	Inspection of deck	X		
B.	Inspection of timber supports and pile caps		X	
C.	Inspection of cross-bracing			X
D.	Inspection of piles			X
E.	Inspection of gangways		X	
F.	Inspection of chains and moorings			X
G.	Inspection of building exteriors and roofs		X	
H.	Inspection of floats		X	
2.	**Preventative Maintenance**			
A.	Weather treatment applied to decking		X	
B.	Weather treatment applied to pile caps and timbers		X	
C.	Weather protection applied to gangways		X	
D.	Painting of building exterior			X
E.	Rust removal and painting of chains and metal hinges on gangways			X
F.	Lubrication of wheels and hinges on gangways	X		
3.	**Restoration/Replacement**			
A.	Replacement of deck planking	X		
B.	Replacement of pile caps and support timbers		X	
C.	Replacement of planks and gangways			X
D.	Repair or replacement of chains			X
E.	Replacement of planking on float decks		X	
F.	General repair to building exteriors	X		

REBUILT WHARF

The cost to rebuild the wharf to its existing configuration, with minor changes in elevation, would be approximately $590,609. A detailed breakdown of costs associated with the reconstruction of the wharf is shown in Table 5. Yearly maintenance costs of this option are presented on the following page.

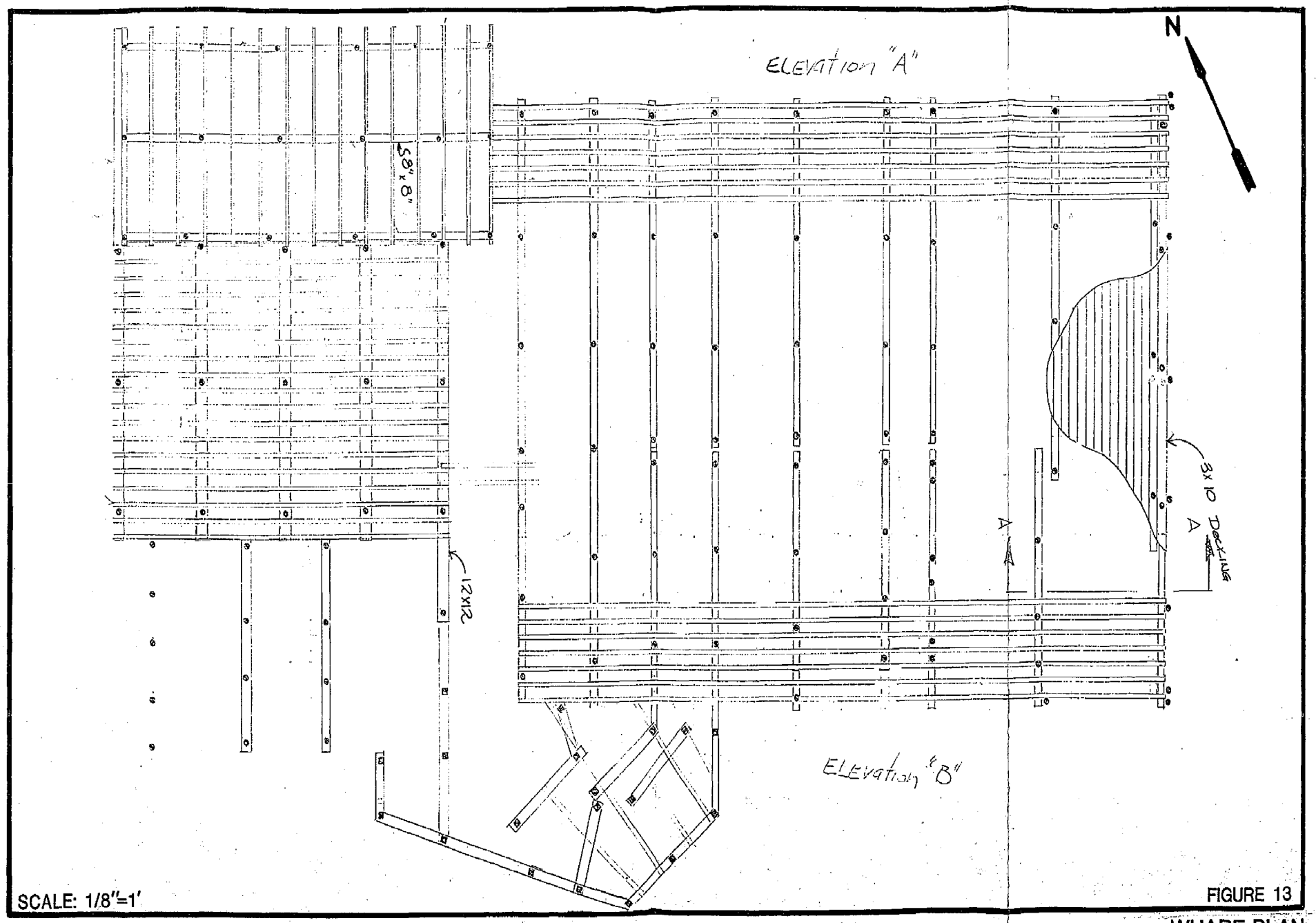
Table 5
New Wharf Constructed to Existing Dimensions

Description	Cost
Piles	$75,570
Pile Caps	21,408
Stringers	26,884
X-Bracing	18,000
Decking	36,046
Handrail	1,000
Floats	8,000
Gangways	5,500
2 Hoists	
(1) Relocated	750
(1) New	5,000
Power	10,000
Demolition	64,500
Building Removal & Reset (Love Nest & Shrimp Building)	35,000
Sitework at Shore	7,080
New Cooker/Cooler Building	32,000
Subtotal:	$346,738
Contractor's Overhead & Profit:	52,010
Contractor's Bond:	10,402
Mobilization:	17,337
	$426,487
Contingency:	106,622
Borings:	0
Topo Survey:	2,500
Permits:	5,000
Engineering:	50,000
TOTAL:	$590,609

Table 6
Rebuilt Wharf Annual Maintenance Costs

Item	1992-1997	1997-2002	2002-2007*	2007-2012	2012-2017
Decking	$ 186	$ 372	$ 7,440	$ 372	$ 744
Stringers & Bracing	230	460	9,200	460	920
Pilecaps	-	-	-	456	456
Gangways & Crate Slide	-	240	240	240	240
Railing	-	150	150	150	150
Hoist	200	200	200	200	200
Floats	120	240	240	240	240
Keeper Chains, Fittings, & Float Hardware	-	300	300	300	300
Subtotal	736	1,962	17,770	2,418	3,250
Contingency	64	188	1,780	232	350
TOTAL	$ 800/yr	$ 2,150/yr	$19,550/yr	$ 2,650/yr	$ 3,600/yr

* Entire deck replaced between 2002 and 2007.



SCALE: 1/8"=1'

FIGURE 13

WHARF PLAN

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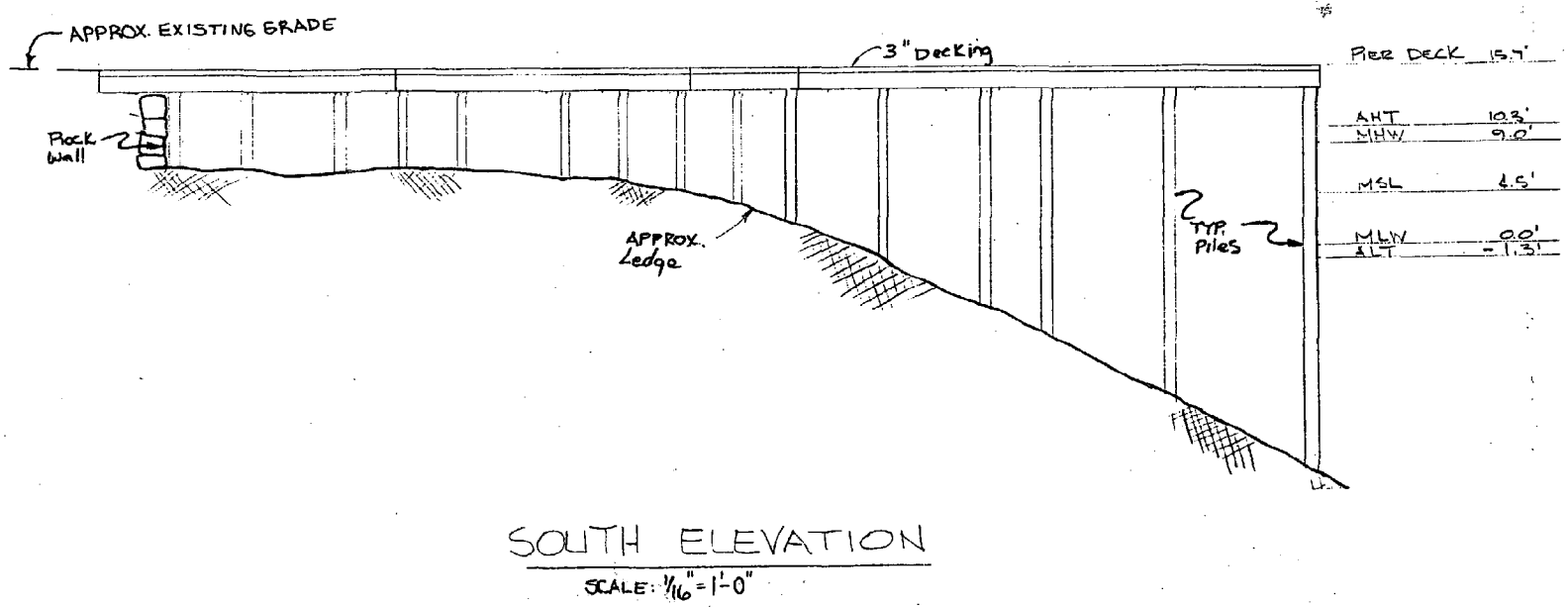

SOUTH ELEVATION

SCALE: 1/16" = 1'-0"

FIGURE 14
WHARF ELEVATION

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SECTION 6

CONCEPTUAL PLAN

The conceptual plan, shown in Figure 15, would allow for increased access to all areas of the Five Islands Wharf and would also expand the berthing area. The approximate costs associated with constructing the conceptual plan are as follows:

Table 7
Conceptual Plan Costs

Piles	$53,460
Pile Caps	11,448
Stringers	14,071
X-Bracing	8,640
Decking	20,124
Handrail	1,800
Floats, Moorings, & Chain	51,300
Gangways	4,320
Cooker/Cooler Building	32,000
Subtotal:	$197,163
Contractor's Overhead & Profit:	29,575
Contractor's Bonds:	5,915
Mobilization:	9,858
	$242,511
Contingency:	60,689
Borings:	2,500
Topo Survey:	2,500
Permits:	5,000
Engineering:	25,000
TOTAL:	$338,200

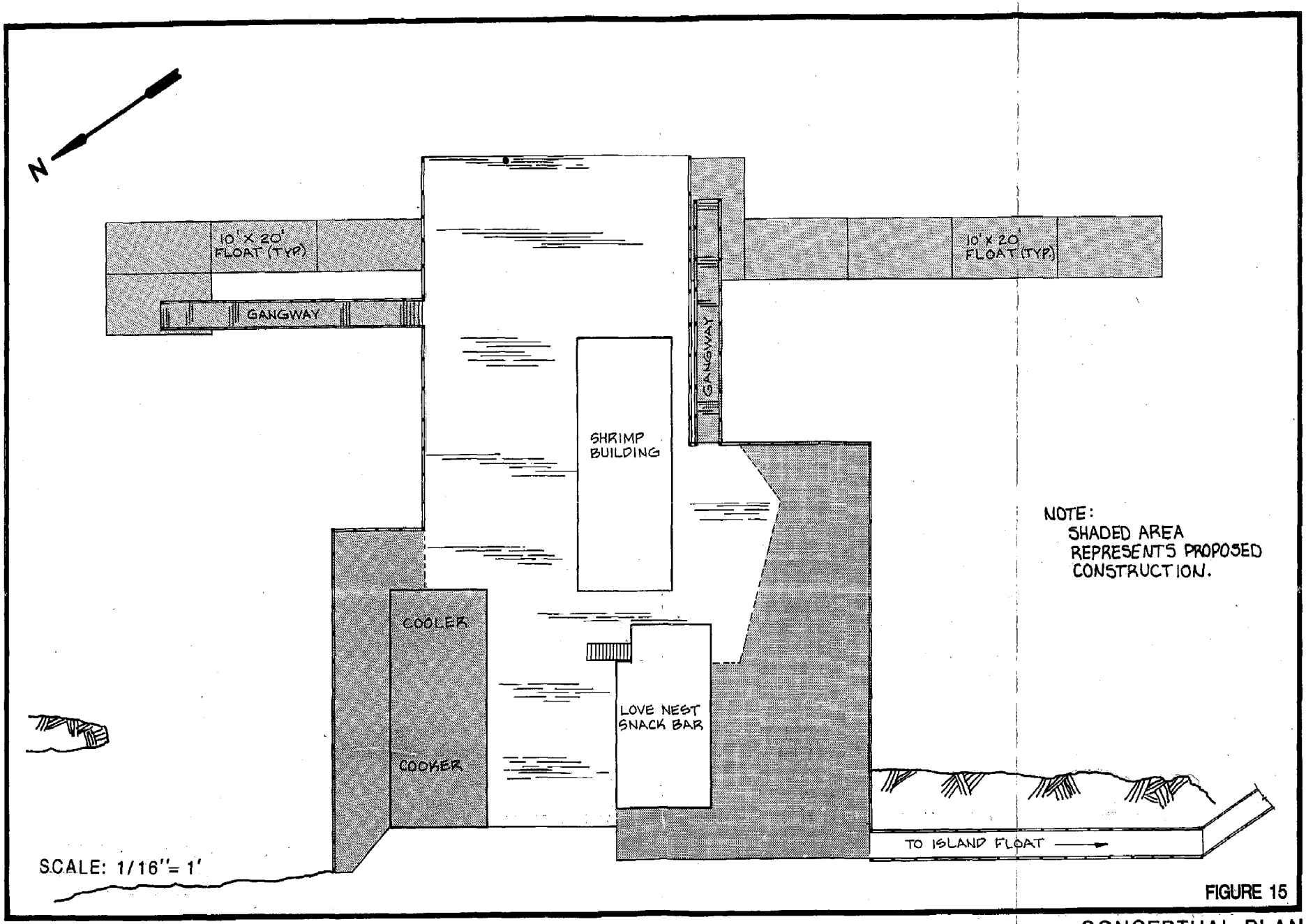

FIGURE 15

CONCEPTUAL PLAN

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APPENDIX A

SCOPE OF SERVICES

The tasks needed to evaluate the condition of the Five Islands wharf and to prepare the engineering study are outlined below.

TASK 1 CONDITION SURVEY

A condition survey of the Five Islands wharf will be conducted by a civil engineer and a structural engineering technician. Detailed measurements of the wharf and pile support system will be made in order to prepare preliminary plans. Penetration, probings of wooden members will be conducted at selected locations to determinestructural integrity. A detailed list of items and their conditions will be prepared for the wharf.

TASK 2 WHARF MAINTENANCE OPTIONS

Based upon the results of Task 1, a detailed evaluation of maintenance options will be presented. Addressed by each option will be the present condition of the wharf, particularly as they relate to safety. The following sub-tasks will be conducted:

Task 2.A An evaluation will be made assuming no investment and maintenance other than those repairs needed to ensure safety of persons using the facility. This may be limited to replacement of deck planks, and some of the support timbers.

Task 2.B The second option will evaluate a higher level of maintenance associated with sister piles, splicing of existing piles, and other temporary repairs to prolong the life of the structure and to maintain its existing level of use.

Task 2.C If the condition survey indicates the wharf can be used at its current level with on-going maintenance, a detail preventive maintenance program will be developed.

TASK 3 REBUILT WHARF

An evaluation will be made to determine the requirements of demolishing and rebuilding the wharf to the existing dimensions, and to the level of use for which it was originally intended. Prepared as part of this task will be the following sub-tasks:

Task 3.A The expected life of a new wharf, which has been totally rebuilt, will be prepared. A program of basic maintenance will be developed and the costs associated with such maintenance included.

Task 3.B This sub-task will detail the items of preventive maintenance which must be undertaken to maximize the service life of the new wharf.

TASK 4 NEW PIER EXPANSION

Based upon discussions with the Town Owned Management Board and various users of the existing wharf, preliminary plans for a new expanded facility will be developed. Included in this evaluation will be details concerning the ways and means to accommodate a larger number of people based upon the expected increase in use over the useful life of the facility. Also addressed under this task will be those requirements to permit such facilities by the Maine Department of Environmental Protection and the U.S. Army Corps of Engineers. A construction cost estimate will be prepared, which will also show other project costs such as engineering, borings, soundings, permits, and construction supervision.

TASK 5 WRITTEN REPORT

All of the findings and results from the above tasks will be included in a written report, presented to the Town Owned Property Management Board. Included in the report will be a summary and clear recommendations for future actions. Also included will be detailed cost estimates in today's dollars, a project implementation schedule along with information concerning possible grants for future phases and construction. Twelve (12) copies of the final report will be presented to the town upon completion of the project.

TASK 6 MEETINGS

The successful undertaking of this evaluation will include a number of meetings with the Town Owned Property Management Board and others. Meetings which are anticipated will include, but not be limited to the following:

JUN 0 8 90

1. Initial Project Meeting to verify scope of work and the requirements of the study.

2. Progress Meeting at 50% completion to review findings of condition survey and details of evaluated options.

3. Final Review will be conducted at the 90% complete stage to verify that the scope of services and requirements of the project have been met. A draft of the final report will be presented at this meeting.

4. Final Meeting - Once the draft of the report has been accepted by the Town Owned Property Management Board, the results of it will be presented at a public meeting. The study will be discussed and the recommendations will be presented.

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