SIMPLEX MOOR
INSTALLATION PLAN

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OCEAN ENGINEERING AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D. C. 20374
**Report Title:** Simplex Moor Installation Plan

**Personal Authors:** A. Sutherland, R. Asher, L. Mendlow

**Date of Report:** 6/78

**Pages:** 42

**Abstract:**

This document provides the information and procedures required to install a modified Class B riser moor, with sinkers, in the Piscataqua River near the Simplex Cable and Wireless Company, Newington, New Hampshire. The project is referred to as the Simplex Moor. (Con't)
BLOCK 19 (Con't)

Contained in this document is a description of the moor, the implant schedule, staging and preassembly requirements and the detailed operational scenario.
SIMPLEX MOOR
INSTALLATION PLAN

A. SUTHERLAND.
R. ASHER
L. MENDLOW

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This plan is subject to the review and concurrence of the U. S. Coast Guard.
1.0 INTRODUCTION

1.1 General

This document provides the information and procedures required to install a modified Class B riser moor, with sinkers, in the Piscataqua River near the Simplex Cable and Wireless Company, Newington, New Hampshire. The project is referred to as the Simplex Moor.

Contained in this document is a description of the moor, the implant schedule, staging and preassembly requirements and the detailed operational scenario.

1.2 Tasking and Participating Organizations

The moor installation is in response to a task initiated by the Naval Electronic Systems Command (NAVELEX). Moor design, acquisition and installation planning is the responsibility of the Chesapeake Division of the Naval Facilities Engineering Command (CHESDIV). The U. S. Coast Guard, First District, has accepted a request from CHESDIV to provide an installation vessel and crew. A brief synopsis of the Simplex Moor participants and their major function is provided in Table 1.1.
**SIMPLEX MOOR PARTICIPANTS**

<table>
<thead>
<tr>
<th>UNIT</th>
<th>MAJOR FUNCTIONS</th>
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<tr>
<td>Naval Electronic Systems Command (NAVELEX)</td>
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<td>o Funding</td>
</tr>
<tr>
<td></td>
<td>o Procurement Support</td>
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<tr>
<td>Chesapeake Division, Naval Facilities Engineering Command (CHESDIV)</td>
<td>o Moor Design</td>
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<tr>
<td></td>
<td>o Moor Acquisition</td>
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<tr>
<td></td>
<td>o Permit Applications</td>
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<tr>
<td></td>
<td>o Survey</td>
</tr>
<tr>
<td></td>
<td>o Moor Installation Planning and Technical Direction</td>
</tr>
<tr>
<td></td>
<td>o Reports</td>
</tr>
<tr>
<td>U. S. Coast Guard 1st District</td>
<td>o Assign Installation Vessel and Crew</td>
</tr>
<tr>
<td></td>
<td>o Provide, on Reimbursible Basis, three 8,200 lb sinkers for mooring</td>
</tr>
<tr>
<td></td>
<td>o Provide Installation Planning Assistance</td>
</tr>
<tr>
<td>U. S. Coast Guard Vessels SPAR and BITTERSWEET</td>
<td>o Vessels Assigned to Perform Installation. SPAR Primary Vessel, BITTERSWEET Backup</td>
</tr>
<tr>
<td>Portsmouth Naval Shipyard (PNSY)</td>
<td>o Receive Mooring Hardware</td>
</tr>
<tr>
<td></td>
<td>o Provide Rigging Assistance as Necessary</td>
</tr>
<tr>
<td></td>
<td>o Provide Divers</td>
</tr>
<tr>
<td>Simplex Wire and Cable Company</td>
<td>o Provide Logistic Support (via NAVELEX Tasking)</td>
</tr>
<tr>
<td>Naval Facilities Engineering Command (NAVFAC)</td>
<td>o Provide Ocean Engineering Program Support</td>
</tr>
<tr>
<td></td>
<td>o Authorize use of NAVFAC Fleet Moor Equipment</td>
</tr>
<tr>
<td>CBC Gulfport</td>
<td>o Provide Mooring Equipment</td>
</tr>
<tr>
<td></td>
<td>o Package and Preassemble Moor</td>
</tr>
<tr>
<td></td>
<td>o Ship Moor to PNSY</td>
</tr>
</tbody>
</table>

Table 1.1
1.3 Site Description

The moor will be located in the Piscataqua River which is situated in the South Eastern corner of New Hampshire. It is to be installed in an area directly north of a pier maintained by the Simplex Wire and Cable Company.

This location is approximately 3 miles up-river from the Portsmouth Naval Shipyard and 5 miles from the Portsmouth Harbor Coast Guard Station. (Refer to Figure (1) for general location).

A survey was conducted by CHESDIV with small boat and crew provided by the Coast Guard Station Portsmouth Harbor and divers provided by the Portsmouth Naval Shipyard (PNSY). This survey, which is detailed in Appendix (5) was conducted during the period 20-24 March 1978.

Briefly the survey determined that: (1) adequate water depth exists in the moor area; (2) the bottom in the area of the anchor drop sites is hard sand probed to a depth in excess of five feet; and (3) maximum measured surface currents in the area of the pier during the aforementioned period were approximately $2\frac{1}{2}$ knots.
1.4 Philosophy

The philosophy of the moor installation has been to provide an installation method which: (1) will proceed swifty (thereby maximizing periods of slack current); (2) will be broken into a series of sequential steps thereby enabling logical break points to allow for re-rigging and standing-by for slack current and importantly; (3) is in consort with the Coast Guard's typical implantment method, i.e., free running.

Installation assistance from the Coast Guard was requested for a variety of reasons; of greatest import was their familiarity with the Piscataqua River and in particular their proven capability to implant large Aids to Navigation Buoys in the area. The moor implant plan has been tailored to coincide with a typical free fall implant of a Coast Guard Aids to Navigation Buoy.
2.0 MOOR DESCRIPTION

2.1 Design Criteria

The mooring was designed for an EC2 hull (liberty ship), with a maximum draft of 20 ft. The moor is configured to hold in a wind of 70 mph and a current (mostly tidal) of 8.0 kts.

2.2 Assembly

Each ground leg consists of an anchor, a shot of chain, a swivel, and three more shots of chain. The chains are 2\(\frac{1}{4}\)", as are two of the swivels. The inshore anchor will be 22,500 lbs and the swivel on this leg will be 2\(\frac{1}{4}\)". The other anchors will be 25,000 lbs. The chain is connected to a ground ring which then connects to a riser chain.

The riser chain (2\(\frac{1}{4}\"\)) runs through the hawse pipe of the buoy. Above the buoy is an F-type bending shackle and an end link. Attached to the chain to hang at the bottom of the buoy is a rubbing casting. Ten links above the bottom of the chain is a swivel.

The keeper leg, a 2" chain, runs between a 10,000 lb anchor and the ground ring. There are 2 shots of chain with a swivel between them.

The shore leg is 550 ft of miscellaneous lengths of 2\(\frac{1}{4}\"\) chain to be connected to the mooring block on shore. Figures (2) through (4) illustrate the moor configuration. A formal report detailing moor design and assembly will be issued at a later date.
LEG 1

LEG 2

LEG 3

LEG 4

PROPOSED MOORING TO BE INSTALLED

MOORING BUOY

LEGSCALE IN MILES

EDG OF CHANNEL

35 FT. FOR A WIDTH OF 400 FT.

TYPICAL POSITION OF MOORED HULL

500 FT

SHORE LEG

EXISTING STRUCTURES

PROPOSED HOEERING IN PISCATAQUA RIVER NEAR SIMPLEX WIRE & CABLE CO. COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE APPLICATION BY U.S. NAVY SHEET 1 OF 1 DATE: 3 APR 78
FIGURE 3

MOORING

- 25,000 lb ANCHOR
- SINKER
- 2 1/2" GROUND CHAIN & FITTINGS (TYP. - 3 EA.)
- 1 000 lb ANCHOR
- SWIVEL
- BOUY
- KEEPER LEG
- 2" CHAIN & FITTINGS
3.0 SCHEDULE

3.1 Overall Schedule

Task formally received from NAVELEX 28 Feb 78
Survey Completed 24 Mar 78
Coast Guard Support Formally Requested 24 Mar 78
Moor Design Completed 3 Apr 78
Mooring Equipment Requested from CBC Gulfport 3 Apr 78
Installation Planning Meeting with Coast Guard 7 Apr 78
Mooring Equipment Shipped from Gulfport 14 Apr 78
Implant Permits (Corp. of Engineers) Complete 21 Apr 78
Mooring Equipment Arrives PNSY 28 Apr 78
Moor Installed 1-10 May 78
### 3.2 DETAILED IMPLANT SCHEDULE

<table>
<thead>
<tr>
<th>28 Apr Fri</th>
<th>29 Apr Sat</th>
<th>30 Apr Sun</th>
<th>1 May Mon</th>
<th>2 May Tues</th>
<th>3 May Wed</th>
<th>4 May Thurs</th>
<th>5 May Fri</th>
<th>6 May Sat</th>
<th>7 May Sun</th>
<th>10 May Wed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moor arr PNSY stage near berth 6</td>
<td>-</td>
<td>-</td>
<td>Pre-rig moor (PNSY)</td>
<td>Load out first two legs of moor</td>
<td>Implant first two legs</td>
<td>Load out 3rd leg</td>
<td>Implant 4th leg</td>
<td>Finish removal of crown lines</td>
<td>Contingency clean up ship out</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coast Guard vessel implant marker buoy</td>
<td></td>
<td>Implant leg prepare beach for shore leg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.0 STAGING AND PREASSEMBLY

4.1 Gulfport

Initial staging and preassembly operations transpired at the Construction Battalion Center, Gulfport, MS (CBC). All anchors, chains, fittings, and the riser buoy were supplied by the NAVFAC Fleet Mooring pool stored at CBC Gulfport.

Each anchor leg was assembled, assuring that all hardware fitted properly.

The legs were color coded, permitting easy reassembly once dismantled. The color coding is as follows:

- Ground Legs
  - #1 (w/2\(\frac{1}{2}\)" swivel) - red
  - #2 (w/2\(\frac{3}{4}\)" swivel) - white
  - #3 (w/2\(\frac{3}{4}\)" swivel) - yellow

- Riser Chain - green
- Keeper Leg - black
- Shore Leg - yellow w/red stripe

The chains were broken down for shipping. Shots that were to remain joined were connected and sealed. The pin was heated and peened. On joining links to be opened again, the links were attached to one side of the chain, put together, the pin fitted and tied with wire and tape. The legs were broken as follows:
1. Ground Legs - 3 pieces
   a) Two shots with swivel between; runs from anchor
   b) One shot - joining links at both ends
   c) One shot - anchor joining link at one end; runs from ground ring.

2. Riser chain - 1 piece with all hardware

3. Keeper leg - 1 piece (2 shots) with all hardware

4. Shore leg - 3 pieces; miscellaneous lengths of approximately 200 ft, 200 ft, 155 ft; with connecting links.

Each piece is packed separately in a box. Each box is color coded and marked, and was loaded onto a railcar.

The riser buoy was cleaned, sand blasted and painted in preparation for the mooring. It was then loaded onto a railcar. The anchors were color coded and also put on the railcar for shipment to the Portsmouth Naval Shipyard (PNSY).
4.2 Portsmouth

At PNSY the shipment will be offloaded and transferred to berth 6.

Under the guidance of a CHESDIV representative, PNSY riggers will assemble the riser buoy, arrange all gear for transfer to the Coast Guard vessel, and will assemble the crown lines.

4.2.1 Buoy Assembly

The riser chain will be fitted into the buoy. A half shot of chain will be cut off of legs one and three and will be joined to the ground ring at the bottom of the riser leg. The other end of the half shots will be affixed to the top of the buoy. Approximately 10 feet of the half shots at the top of the buoy will be rigged as lazy pennants. The ground ring will then also be brought to the top of the buoy and will be connected to a quick release. A safety strap will be affixed to the ground ring. Care must be taken to assure that the load is balanced and securely rigged so that weight cannot shift during transit.

4.2.2 Crown Lines

Four crown lines will be rigged in the manner shown in Figure (5). Means of attachment to the crown of the anchor will be determined on site.
CROWN LINE

3' Ø BUOY

7/8" OBLONG LINK

60' - 1 1/2" W.R.

PELICAN HOOK

FIG. 5

15 TO ANCHOR CROWN
5.0 OPERATIONS

5.1 Marker Drop

Marker buoys will be dropped at each of the four anchor drop sites, at the riser buoy position and at the site of the shore leg bitter end.

The moor installation vessel (hereafter referred to as the SPAR although the BITTERSWEET may be assigned) will be used to install the marker buoys.

This operation, in addition to implanting the buoy, will acquaint the SPAR crew with the exact location of the moor and will provide data relative to her handling characteristics in the current stream.

The SPAR will be guided to each drop site by triangulation from two shore based transits manned by CHESDIV representatives.

5.2 Implant of Legs Two, Four and Riser Buoy

5.2.1 Deck Layout

The deck will be laid out in a manner similar to that shown in Figure (6).

Exact deck layout will be determined on site. Rigging of the deck will be at the discretion of the Coast Guard. The rigging scheme shown on Figure (6) presumes the SPAR will lay the first two anchor legs (2 and 4)
RISER BUOY

8200' SINKER

2 1/2" CHAIN
2 1/2 SHOTS

2 1/2" CHA
1 1/2 SHOT

Cluster SPAR PORT SIDE WORK DECK

USED FOR LAYING LEGS 2 & 4 AND RISER BUOY
25,000 lb. Anchor

Crown Line
60'-1½" Ø W.R.

Crown Buoy

"Chain
Hots"
by backing down with her bow pointed up river. However, during install-
ation of marker buoys it may be determined to install in another manner
(e.g., bow pointed down river going forward). In that event the deck
layout will be rearranged accordingly.

Load out of the deck will proceed as follows:

1. Pier crane load anchors aboard
2. Attach crown lines
3. Bring chain aboard
4. Attach chain to anchors
5. Hang anchors over side using pier crane or ships boom
6. Secure anchors using Pelican Hooks or synthetic line tie downs
7. Attach crown buoys and crown lines to bulwark using breakaway ties
8. Bring sinker aboard
9. Attach chain to sinker and hang over side. Secure as in step 6
10. Pier crane place riser buoy in water at desired position
11. Attach chain from legs 2 and 4 to ground ring
   Note: This operation can be done either on the buoy or, by hauling
   the ground ring aboard, on deck. If done on the buoy, a safety
   lanyard must be tied to all joining link components in order to
   prevent loss overboard. Spares are not available
12. Securely grip buoy to side. Being certain that all chain hanging
   from buoy is secure and will not be torn off buoy top by differential movement
   between ship and buoy.
13. Secure each bight of chain (approximately 20 ft lengths) to deck
padeyes with two wraps of 21 thread. This will provide enough strength
to hold the dead weight of the suspended chain but will break away when the
ship pulls or can be cut when desired.

This completes deck rigging. Each tie-down should be rechecked for
adequacy and safety.

5.2.2 Operations

When fully rigged, the SPAR will proceed to the moor implant site and will
check positioning and control. She will then proceed to anchor number two
marker buoy.

The safety strap on the ground ring will be removed and the ground
ring on the riser buoy will be trip released. Note: chain from legs two and
four will have been securely stopped off to permit the running of only forty
feet of chain.

When the 25,000# anchor is abreast of the marker, the SPAR will begin
backing down. When backing motion is observed, the 25,000# anchor will
be released upon the word of the SPAR Bosun.

The SPAR will continue backing down releasing, in order, the sinker,
the riser buoy and the 10,000 lb anchor. Chain will be stretched between
each successive release of hardware.
With all equipment released, the moor may then be repositioned as necessary by pulling on either of the crown lines.

The SPAR will then return to PNSY to load out for leg number three.

5.3 Implant of Leg Three

5.3.1 Deck Layout

The deck layout will be similar to the previous layout with the obvious exception that there will be no 10,000 lb anchor and leg and no riser buoy.

5.3.2 Operations

The SPAR will proceed to the moor implant site and will come alongside the riser buoy.

The 10 ft lazy pennant from leg three will be retrieved from the top of the buoy and brought aboard and secured. The leg 3 chain can then be disconnected from the top of the buoy.

The chain will then be joined to the bitter end of the chain layed out on deck and the SPAR will proceed toward marker buoy three. Sinker and anchor will be released as before.

Adjustment of anchor position can be made by heaving on the crown line.

The SPAR will then return to PNSY to load out for leg number one.
5.4 Implant of Leg One

Leg one deck layout and implant is identical to that for leg three with the exception that all equipment will be hung off the starboard side.

Note - It may be feasible to load legs one and three at the same time. Implantment of one and three could possibly be done in the same day.

5.5 Anchor Set and Dive Inspection

5.5.1 Anchor Set

After the moor is implanted and all anchors are adjusted by heaving on the crown lines, the SPAR will tie up, stern to, to the riser buoy with her bow facing down river. The SPAR will line up on a radial line opposite to one of the legs and will move out along that line a distance of 50 - 100 ft. She will then exert a maximum thrust estimated to be 24,000 lbs. The anchor crown buoy will be watched for any discernable movement. This procedure will be repeated for each of the radial lines to line with legs one, two and three.

5.5.2 Inspection

When SPAR has completed pulling on the three anchor legs, she will stand off while divers from PNSY inspect each leg. They will report if all chain is properly stretched, the anchor is not fouled and that the flukes have begun to deploy. If reports are negative, SPAR will take corrective action by either heaving on the crown line or pulling again on the riser buoy.
5.5.3 Clean Up

After all inspection is complete, the PNSY divers will release the crown line pelican hooks and the crown line will be retrieved aboard either the SPAR or the dive boat.

5.6 Shore Leg Haul

The shore leg consists of 550 ft of 2½-inch chain. The shore end will be affixed to fifty-ton capacity hurricane block. The sea end will be temporarily marked with Dan buoy attached to a 5/8" wire rope riser line.

The line may be hauled out in either of three methods depending upon site conditions and timing.

5.6.1 Method I

- Chain trucked to Simplex facility and layed out on field located shoreward of hurricane block.
- SPAR drops anchor, sends heaving line ashore via shot line.
- Chain hauled to position by SPAR stern capstain. Floats applied to chain as necessary.

5.6.2 Method II

- Chain layed out on SPAR deck tied off in bights.
SPAR drops anchor - sends hauling line ashore

Line fed through prepositioned snatch block and sent back out to SPAR via SPAR's Boston Whaler.

Chain hauled to shore by SPAR's stern capstan.

5.6.3 Method III

A PNSY YC is loaded with chain tied off in bights.

A PNSY tug brings the YC to the site and holds it in position

A hauling line is sent ashore and a dozer, located in the field shoreward of the hurricane block, pulls the chain ashore in successive bights.

5.6.4 General

Each of the above three methods could be used. Method I is the preferred method, although reports from the site indicate that the field shoreward of the hurricane block is a mire due to the spring thaw and an unusual amount of snow - hence it is not known if the field will be dry enough to get a truck into it. Method II is feasible although it requires more rigging than Method I. Method III may be used in the event that the SPAR must leave the area prior to installing the shore leg.
APPENDICES

1. Material List
2. Contacts
3. Detailed Moor Components
4. Tide Tables
5. Survey Results
APPENDIX I

Material List

**Moor Material**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>FSN 4010-240-1034, 2(\frac{1}{2})&quot; Chain</td>
<td>Shot 12</td>
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<td>2.</td>
<td>FSN 2050-227-0529, 2(\frac{1}{4})&quot; Riser Chain</td>
<td>Ft 35</td>
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<tr>
<td>3.</td>
<td>FSN 4010-240-1030, 2(\frac{1}{4})&quot; Chain</td>
<td>Ft 555</td>
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<td>4.</td>
<td>FSN 4010-262-2592, 2&quot; Chain</td>
<td>Shot 2</td>
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<tr>
<td>5.</td>
<td>FSN 4030-527-8870, 2(\frac{1}{4})&quot; Swivel</td>
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<td>6.</td>
<td>FSN 4030-527-8864, 2(\frac{1}{4})&quot; Swivel</td>
<td>Each 2</td>
</tr>
<tr>
<td>7.</td>
<td>FSN 4010-391-0535, 2(\frac{1}{2})&quot; Anchor Joining Links</td>
<td>Each 12</td>
</tr>
<tr>
<td>8.</td>
<td>FSN 4010-391-0534, 2(\frac{3}{4})&quot; Anchor Joining Links</td>
<td>Each 4</td>
</tr>
<tr>
<td>9.</td>
<td>FSN 4010-391-0543, 2(\frac{1}{4})&quot; Joining Links</td>
<td>Each 14</td>
</tr>
<tr>
<td>10.</td>
<td>FSN 4010-391-0542, 2(\frac{1}{4})&quot; Joining Links</td>
<td>Each 6</td>
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<td>11.</td>
<td>FSN 2040-234-4888, 2(\frac{1}{4})&quot; Ground Ring</td>
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<td>12.</td>
<td>FSN 2030-236-8391, 2(\frac{1}{4})&quot; Type F Bending Shackle w/lugs</td>
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<td>13.</td>
<td>FSN 4010-298-5764, 2(\frac{1}{4})&quot; End Link</td>
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<td>14.</td>
<td>FSN 4030-292-3781, 2(\frac{1}{4})&quot; Rubbing Casting</td>
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<td>15.</td>
<td>FSN 4030-267-7076, 2&quot;-3&quot; Sinker Shackle</td>
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<tr>
<td>16.</td>
<td>FSN 2050-270-5779, 3&quot; Sinker Hairpin</td>
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<td>17.</td>
<td>FSN 2040-272-2242, 25,000 lb Anchor</td>
<td>Each 2</td>
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<td>18.</td>
<td>FSN, 22,500 lb Anchor</td>
<td>Each 1</td>
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<tr>
<td>19.</td>
<td>FSN 2040-516-7754, 10,000 lb Anchor</td>
<td>Each 1</td>
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<tr>
<td>20.</td>
<td>FSN 2050-223-3660, Buoy, 12' Diameter x 6' High</td>
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</tr>
<tr>
<td>21.</td>
<td>Coast Guard Sinker 8,200 lb</td>
<td>Each 1</td>
</tr>
</tbody>
</table>
Installation Material

1. Float Balloons
2. Filler Value (for floats)
3. ½" diameter Samson
4. Anchor Clumps (2-300#)
5. Crown Line Buoy (3' diameter)
6. Crown Lines - 1½" W. R. 60' Long Eyes Both Ends
7. Pelican Hooks for 1½" W. R.
8. Pelican Hooks for 2½" Chain
9. Wire Rope 5/8"
10. Dan Buoy
11. 21-Thread Manila
12. Asst'd Release Hooks and Lines

70 each
1 each
600 ft
10 each
4 each
4 each
6 each
6 each
100 ft
1 each
5 cl
LS
## APPENDIX II

### Contacts

<table>
<thead>
<tr>
<th>UNIT</th>
<th>PERSON(S)</th>
<th>TELEPHONE</th>
</tr>
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<tbody>
<tr>
<td>NAVELECSYS.COM</td>
<td>CDR D. R. Wells</td>
<td>202 692-8833</td>
</tr>
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<td></td>
<td>Mr. C. Hambrick</td>
<td>202 692-8833</td>
</tr>
<tr>
<td></td>
<td>Mr. D. Willett</td>
<td>804 444-2377</td>
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<td>USCG SPAR</td>
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<td>LCDR J. Brown</td>
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APPENDIX III

Detailed Moor Components

- Mooring Leg
- Riser Leg
- Keeper Leg
- Detail A
- Detail B
- Detail C
- Detail D
- Detail E
- Detail F
MOORING LEG
3 EA.

4 SHOTS CHAIN - ANCHOR TO RING

1.5 SHOTS - ANCHOR TO SINKER

1 SHOT CHAIN - ANCHOR TO SWIVEL

ANCHOR JOINING LINK

ANCHOR

SWIVEL

SINKER SHACKLE

HAIRPIN

SINKER

ANCHOR JOINING LINK
KEEPER LEG

2 SHOTS - 2" CHAIN

RING

ANCHOR JOINING LINK

JOINING LINK

SWIVEL

10000 lb ANCHOR
DETAIL E

END LINK

F-SHACKLE W/LUGS

ANCHOR JOINING LINK

TO CHAIN
DETAIL F

RING

2 1/2 GROUND

ANCHOR JOINING LINK
APPENDIX V

Survey Results

From 20 March 1978 to 24 March 1978, a bathymetric survey was conducted at the mooring site. Depths were recorded by a Raytheon Recording Depth Recorder. Position was determined by two transits on shore. In addition, divers from the Portsmouth Naval Shipyard carried out an underwater survey of the anchor points.

The results were plotted, (see attached chart). They show 27 feet depths near where the ship will be moored. These depths well exceed the twenty feet draft of the loaded vessel. Near anchor site #1, the depth was 32 feet; near sites #2, #3, and #4, the depth was 27 feet. Divers reported the bottom to be fairly level with few rocks or boulders. It was composed of hard packed sand. The divers were able to drive a probe (1/4" rod) into the bottom the length of the probe (6 feet) with little effort.

A detailed survey report will be issued at a later date.
SIMPLEX WIRE & CABLL MARINE FACILITIES
SOUNDINGS NORTH OF PIER MAR 1978

SOUNDINGS CORRECTED TO MLW

\[
\frac{1}{32} \text{a} = 1 \text{ft}
\]
CROWN LINE
60' - 1½" Ø W.R.
10,000# ANCHOR

2" CHAIN
2 SHOTS...

USCG CUTTER
RIGGED FOR LAY
RISER BUOY

8200 ft
SINKER

2.50 ANC

2½" CHAIN
1½ SHOTS

2½" CHAIN
2½ SHOTS

UTTER "SPAR" PORT SIDE WORK DECK
FOR LAYING LEGS 2 + 4 AND RISER BUOY
END
 FILMED
 4-86
DTIC