AD-A167 304 SUBIC BAY FLEET MOORINGS UNDERWATER INSPECTION: PROJECT EXECUTION PLAN(U) NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON DC CHESAPEAKE DIV JUN 82 1/1

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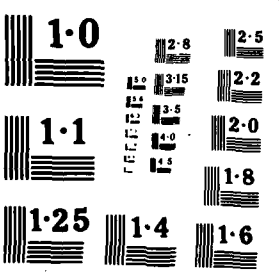
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SECURITY CLASSIFICATION OF THIS PAGE

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REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION AVAILABILITY OF REP. Approved for public release; distribution is unlimited
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER FPO 8223.5	5. MONITORING ORGANIZATION REPORT #
6a. NAME OF PERFORM. ORG. 6b. OFFICE SYM Ocean Engineering & Construction Project Office CHESNAVFACENGCOM	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and Zip Code) BLDG. 212, Washington Navy Yard Washington, D.C. 20374-2121	7b. ADDRESS (City, State, and Zip)
8a. NAME OF FUNDING ORG. 8b. OFFICE SYM	9. PROCUREMENT INSTRUMENT INDENT #
8c. ADDRESS (City, State & Zip)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT # / PROJECT # / TASK # / WORK UNIT ACCESS #

11. TITLE (Including Security Classification)
Subic Bay Fleet Moorings Inspection Report: Project Execution Plan

12. PERSONAL AUTHOR(S)

13a. TYPE OF REPORT	13b. TIME COVERED FROM TO	14. DATE OF REP. (YYMMDD) 82-06 / 15. PAGES 53

16. SUPPLEMENTARY NOTATION

17. COSATI CODES FIELD GROUP SUB-GROUP	18. SUBJECT TERMS (Continue on reverse if nec.) Mooring inspection, Fleet moorings, Subic Bay

19. ABSTRACT (Continue on reverse if necessary & identify by block number)
The purpose of this plan is to accurately define the responsibilities of the task team and to provide a comprehensive plan of action for the inspection of 18 riser type and two telephone type fleet moorings currently operated and maintained by PWC Subic Bay. Underwater Construction Team Two (UCT-2) (Con't)

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT SAME AS RPT.	21. ABSTRACT SECURITY CLASSIFICATION
22a. NAME OF RESPONSIBLE INDIVIDUAL Jacqueline B. Riley	22b. TELEPHONE 202-433-3881 / 22c. OFFICE SYMBOL

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BLOCK 19 (Con't)

will provide underwater inspection personnel and CHESNAVFACENGCOM (code FPO-1) will provide a Project Engineer for technical support.

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SUBIC BAY FLEET MOORINGS
UNDERWATER INSPECTIONS

PROJECT EXECUTION PLAN

JUNE 1982

FORWARD

This Project Execution Plan (PEP) is based on the limited information currently available to CHESNAVFACENGCOM personnel. The Project Engineer will spend the week prior to the commencement of the inspection with PWC SUBIC personnel reviewing the latest data and information that they may have concerning the material condition of the moorings. Upon completion of this review, the PEP will be completed on site, and the final format distributed to interested commands.

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PROJECT EXECUTION PLAN

1.0 PURPOSE: The purpose of this plan is to accurately define the responsibilities of the task team and to provide a comprehensive plan of action for the inspection of 18 riser type and two telephone type fleet moorings currently operated and maintained by PWC Subic Bay. Figure 1 depicts the geographical positions of the mooring sites. Underwater Construction Team Two (UCT-2) will provide underwater inspection personnel and CHESNAVFACENGCOM (code FPO-1) will provide a Project Engineer for technical support.

2.0 REFERENCE DATA:

2.1 NAVFAC DM-26, Design Manual, Harbor and Coastal Facilities, July 1968 including change 1.

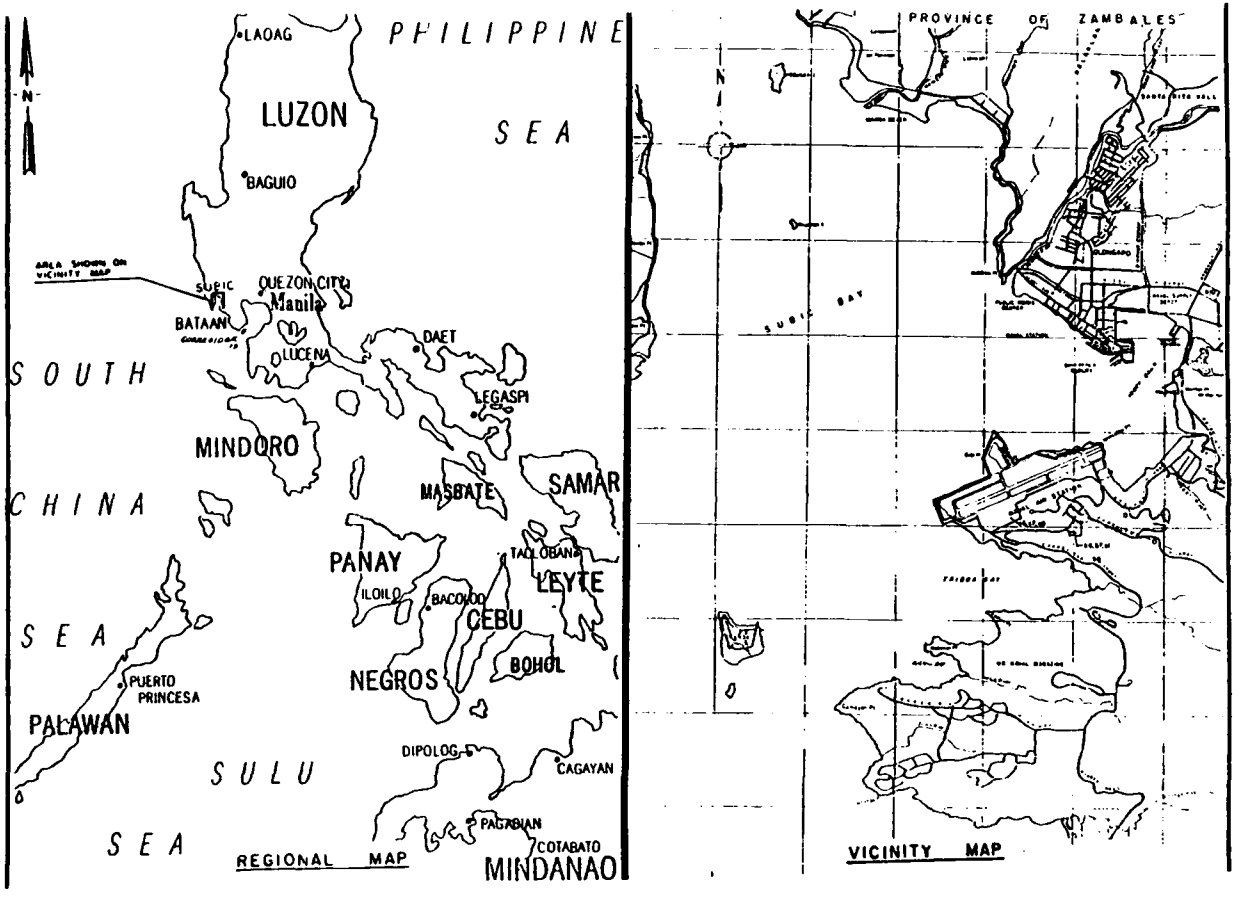
2.2 NAVFAC MO-124, Mooring Maintenance, December 1973.

2.3 Naval Facilities Engineering Command Facilities Management Expense Operating Plan for Procurement and Maintenance of Fleet Moorings, 1981.

2.4 BUDOCKS and NAVFAC Mooring Reports for Subic Bay during the period of 1949 to 1981.

2.5 NAVFAC Drawing Number 7161765, 29 November 1976, Navigational Aids and Fleet Mooring Buoys System at Subic Bay.

3.0 GENERAL DESCRIPTION: Current reports indicate that PWC Subic maintains 20 Fleet Moorings ranging in size from Class A to Class D with designed holding powers from 150 to 50 Kips respectively. Figure B-1 in Annex B shows the 1977 locations of these moorings. The water depths in which these moorings are located range from 26 to 120 feet. In view of the known bottom conditions and age of the moorings, a major portion of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NEGROS
PUERTO
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PALAWAN
SULU
SEA
DIPOLOG
CAGAYAN
PAGADIAN
COTABATO
MINDANAO
REGIONAL MAP
PROVINCE OF ZAMBALES
SUBIC BAY
VICINITY MAP

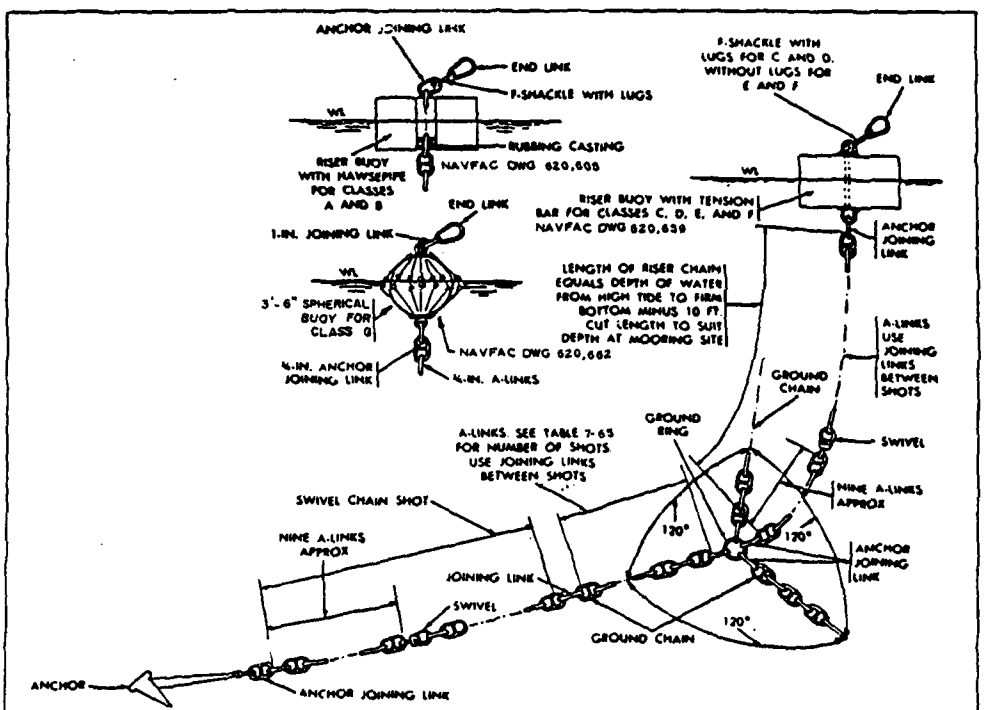
FIGURE 1.

these mooring systems may be buried in mud at or below the lower end of the riser, and the ground ring, ground legs, and anchors could be buried in the bottom. In addition, there is no evidence that a cathodic protection system has ever been installed on any of these moorings. Figures 2 and 3 show typical riser and telephone type moorings respectively.

The inspection scenario is to conduct a diver inspection of each of the 20 moorings using surface supplied air and voice communications equipment. Physical measurements, using pre-cut gauges and calipers, will be taken of all accessible components. Accurate position data will be generated for the buoys and the ground legs. The buoys will be sighted from known reference locations on land. The ground leg orientation will be determined by marking anchor locations, if found, with marker buoys and sighting from the mooring buoy. Potential readings will be taken using underwater voltmeters, on any mooring or buoys found to be cathodically protected.

Time permitting, several methods for exposing buried chain for measurement will be explored. Lift bags of various capacities will be employed to attempt lifting the ground ring out of the mud without disrupting the anchors. A commercial gold dredge, which is capable of moving a few feet of sediment, may also be utilized to try to expose more chain.

While not assisting in the diver inspection, the CHESNAVFACENGCOM Engineer will assess the types, condition, and quantities of stored mooring material inventories, identify available Navy mooring maintenance support equipment, and document local commercial construction capabilities and rates.



NOTES

1. Holding power of mooring is based on anchors being planted in firm sand. Where bottom less favorable than firm sand occurs, the use of an anchor of greater holding power is indicated.
2. When ordering moorings for field shipment, specify as follows:
   a. Class, type, and assembly number.
   b. Depth of water.

FIGURE 2. TYPICAL RISER-TYPE MOORING

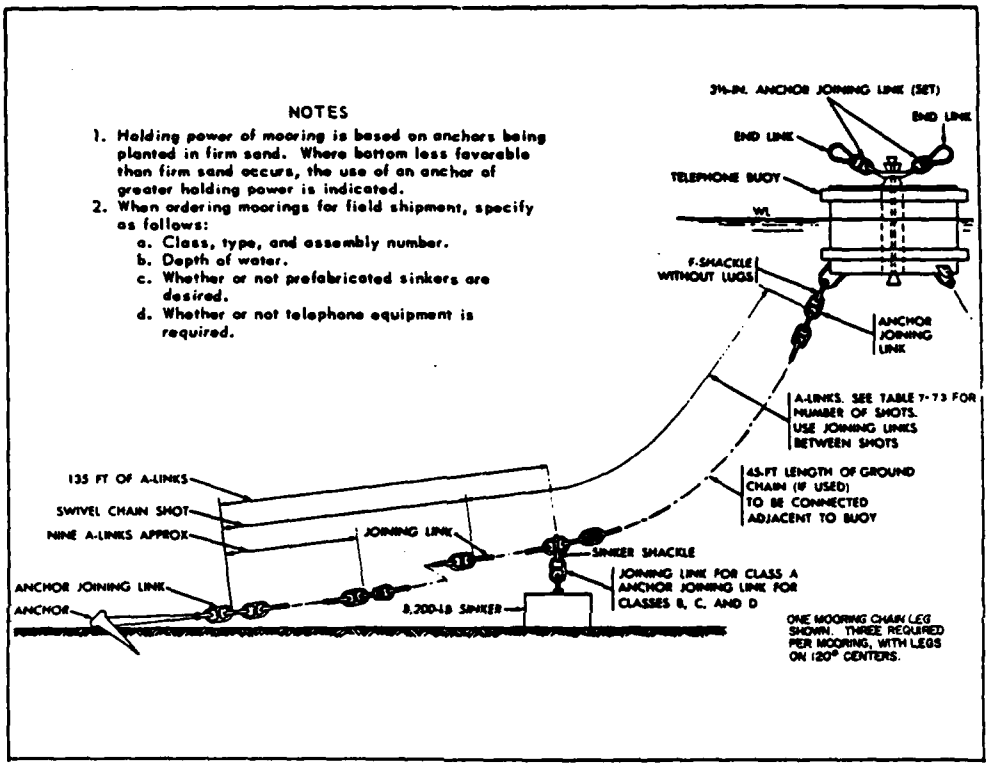


FIGURE 3. TYPICAL TELEPHONE-TYPE MOORING

4.0 INSPECTION PROCEDURES: The following are the general inspection procedures that will be followed. Schematic drawings of locations to be measured in riser or telephone type moorings appear in Figure 4 and 5 respectively.

4.1 Site Survey: Each buoy is to be accurately sighted from land. Reference drawing 7161765 gives known coordinates for land points. If a ship is moored, this is to be noted along with current and wind speeds and directions at the time of the survey.

4.2 Buoy:

4.2.1 Buoy Topside: The buoy shall be observed to determine its general condition. The buoy markings shall be checked for conformance to those noted in applicable charts. Physical damage such as holes, dents, or listing shall be described. If the buoy is fiberglass coated, then the fiberglass should be inspected for cracks, wear, or peeling. A check will be made to see if the hatches have been fiberglassed over. If the buoy has not been fiberglassed, then the paint will be checked for cracking, chipping, and peeling. Hatches, openings, and penetrations will be examined and broken parts and rust will be reported.

The buoy fenders and rubbing rails shall be checked for integrity and sound connection to the buoy.

Buoy top jewelry shall be described and measured with calipers to find the overall outside dimensions and areas of most severe reduction in wire size.

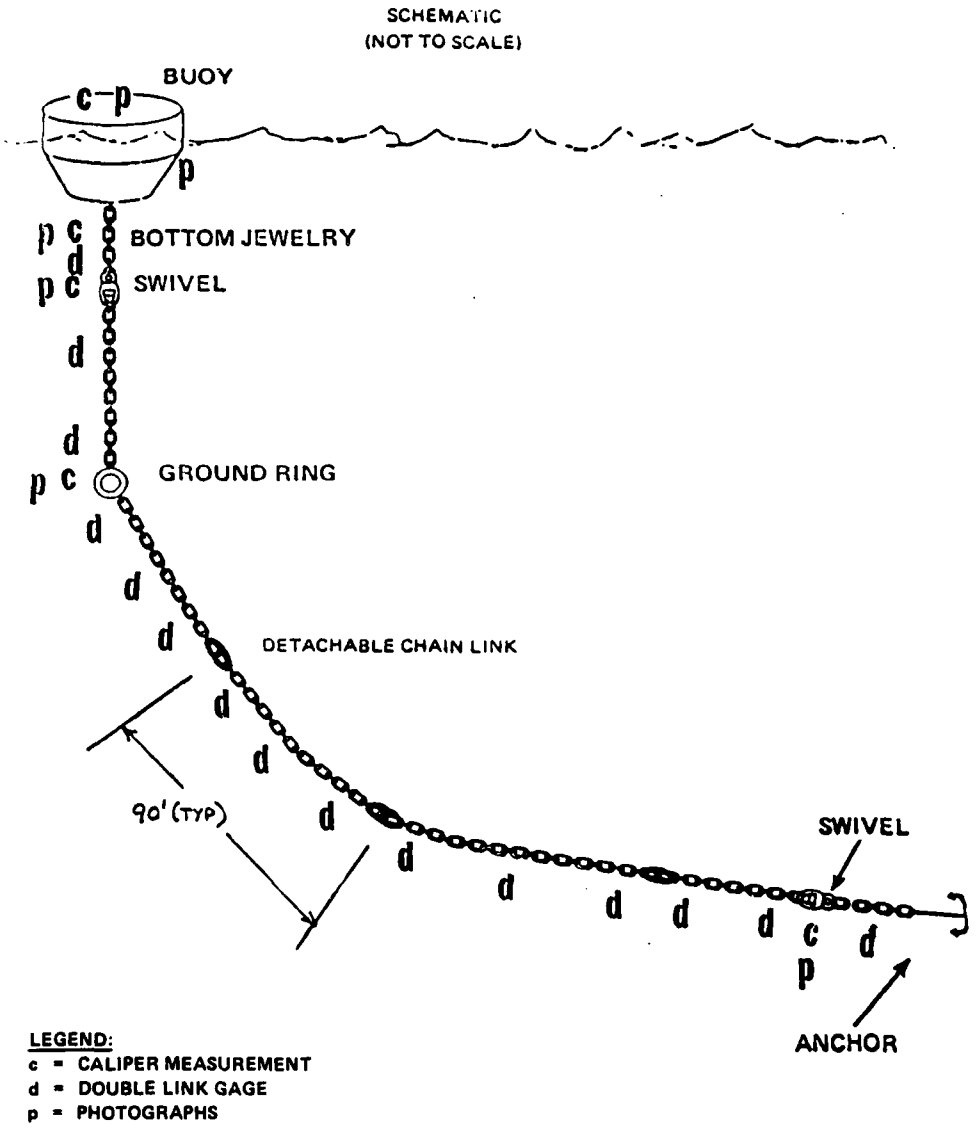


FIGURE 4. MEASUREMENT LOCATIONS RISER-TYPE MOORINGS

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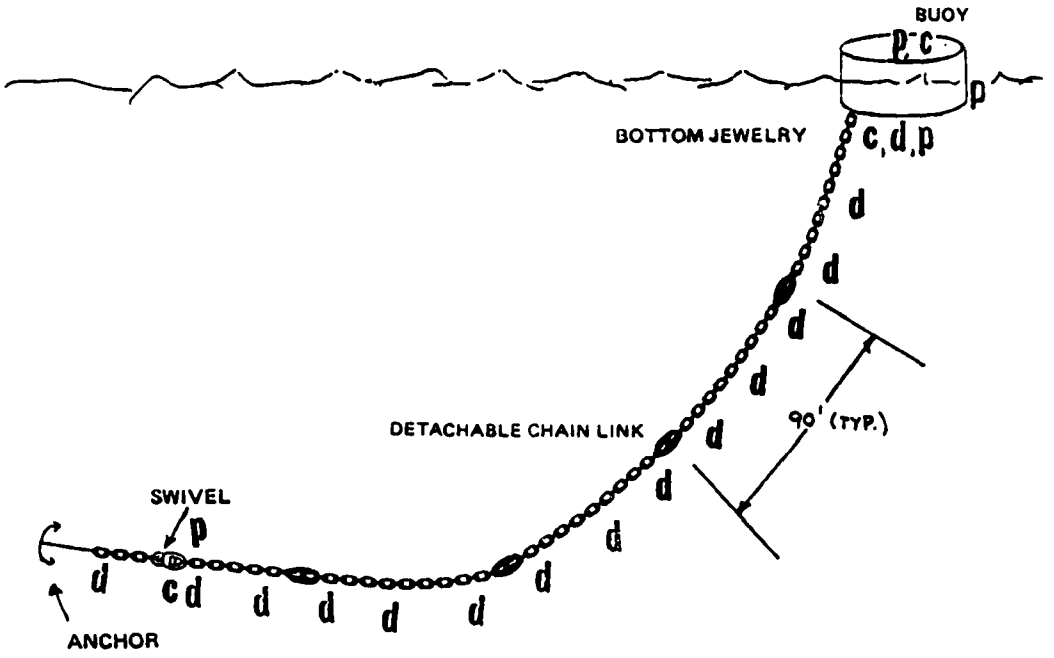


LEGEND:
c = CALIPER MEASUREMENT
d = DOUBLE LINK GAGE
p = PHOTOGRAPHS

FIGURE 5. MEASUREMENT LOCATIONS TELEPHONE-TYPE MOORING

4.2.2 Buoy Lower Portion: Divers shall thoroughly inspect the buoy below the waterline. The thickness of marine growth shall be recorded, three one foot square areas shall be selected and cleared of growth without damaging the paint or fiberglass, and the condition of the paint or fiberglass will be noted. If the buoy is a riser type with a hawse pipe, the presence and condition of the rubbing casting shall be recorded. If the buoy is cathodically protected, the condition, dimensions, and connection of anodes are to be noted. Then, electrical potential readings are to be taken with an underwater voltmeter at three locations on the buoy bottom.

4.3 Bottom Jewelry: On all moorings, the bottom jewelry connecting the buoy to the riser (or to the ground legs in a telephone mooring) shall be identified and measured with calipers. Again, as in the topside jewelry, the overall dimensions and the smallest wire size will be recorded.

4.4 Riser: Each 90' shot or large fraction thereof shall be inspected in the same manner. Three consecutive double link measurements using pre-cut gauges will be made at both ends and near the center of each shot of chain. In those cases that a segment of chain is resting on the bottom and not in tension, single link measurements will be substituted for double link measurements. The shots of chain are joined with detachable links which shall be marked with plastic tags for future reference.

All connecting hardware including detachable links, anchor joining links, pear links, end links, swivels, and shackles shall be identified and measured with calipers. Worn hardware and unusual chain joining practices, if found, shall be recorded.

4.5 Ground Ring (Riser Type Only): The ground ring shall be examined for general and localized wear. Caliper measurements shall be made of the wire size in the region of the most severe wear and across the inner diameter.

4.6 Ground Legs: Repeat procedure for Riser chain in paragraph 4.4 above.

Proceeding in a clockwise manner, from north, the legs shall be labeled A, B, C, etc. consecutively, and their orientation sketched.

4.7 Anchors: The hardware connecting the anchors to the ground legs shall be measured by calipers in the same manner as the bottom jewelry.

When located, an anchor shall be marked with a marker buoy so that its relative position from the mooring buoy is visible from the surface. This position shall be recorded.

At each anchor location the bottom type shall be recorded.

4.8 Photography:

4.8.1 Topside: Topside photography and ashore photographs are the responsibility of the CHESNAVFACENGCOM Project Engineer.

Photographs will be taken of all buoys showing general conditions. Photographs of the topside jewelry and damaged buoy components will be taken as deemed appropriate by the Project Engineer.

Photographs will be taken of ashore spare mooring material inventories and construction equipment as deemed necessary.

4.8.2 Underwater Photography: Underwater photography shall be the responsibility of UCT-2. Buoy bottoms, anodes, bottom jewelry, worn links, working swivels, ground rings, and other hardware shall be photographed wherever required to support material conditions and when environmentally feasible. Photographs shall include clear annotation as to the location of the hardware being photographed.

5.0 DOCUMENTATION: The CHESNAVFACENGCOM Engineer will document the inspection procedures used and record the data obtained by the diving team. He will recommend additional alternative inspection requirements as deemed necessary during the course of the inspection.

While on site, the CHESNAVFACENGCOM Engineer will investigate the availability and cost of local mooring maintenance support. In addition he will obtain an inventory and document the physical condition of any spare or surplus mooring equipment in storage at PWC Subic.

6.0 MEETINGS/BRIEFINGS: A CHESNAVFACENGCOM Engineer will conduct a preinspection visit to PWC Subic and will meet with station personnel to gather the latest information concerning the moorings and establish project logistics support.

Upon the teams arrival at Subic, the Engineer will conduct a pre-dive briefing to familiarize all diver personnel with component design and inspection criteria and to advise them of possible modifications to this execution plan.

Prior to commencement of the inspection, another meeting will be held with station personnel to confirm logistic support.

A post inspection briefing will be provided to advise station personnel of preliminary inspection findings.

After return to CONUS, presentations will be given to FPO-1 personnel.

The Project Engineer will write a Project Completion Report which will contain the results of the inspection and recommendations for corrective maintenance actions. This report, when approved by CHESNAVFACENGCOM, will be forwarded to all interested commands.

7.0 LOGISTICS: The inspection sequence is for a CHESNAVFACENGCOM Project Engineer to make initial contact with a visit to Subic in early to mid May 1982 on the way to the Fleet Mooring Inspection in Diego Garcia. He will obtain supplemental data concerning the moorings' history, current as-built data, existing drawings, environmental conditions, planned maintenance schedules, usage, and known fleet requirements. At that time, logistics for the proposed mid-summer 1982 inspection by UCT-2 will be re-examined. Exact inspection scheduling is dependent upon UCT-2's completion of earlier scheduled tasks in Okinawa and Diego Garcia. The underwater inspection is tentatively planned for mid July and is anticipated to require about four weeks of effort.

UCT-2 will coordinate transportation of personnel and equipment to the site and arrange for on-site berthing and messing.

The following equipment will be provided by UCT-2 in support of the inspection:

* All diving support equipment sets

* Measuring aids

  Outside calipers 24 inch minimum

  100' tape measures

  Scales 1, 2, and 3 feet with large numbers suitable for photo documentation

  Go-no-go gauges (2 sets)

  Accurate depth gauges

* Survey equipment

  Compass (divers)

  Survey buoys with line (pop floats)

* Two Underwater still cameras (35mm) with film (color and B & W) flash with spare batteries

* Underwater Voltmeters (2) with spare batteries, reference cell and operations manual

* Cleaning equipment - Hand tools including wire brushes, chipping hammers and sharp chisels. Water blaster with water or hydraulic power supply and brush tool.

* Waterproof paper

* Lift bags - two (2,000 pound capacity)

* Marker tags to relocate or mark chain links

* Maintenance hand tools, including strong bars, hacksaws, puller hoists, cable cutter, shovels, rigging, wire slings.

The CHESNAVFACENGCOM Project Engineer will provide the following:

* Inspection plan

* Data sheets and log books

* 35mm surface camera and film

* Drafting supplies, graph paper, scales

* Calculator

* Full size and ½ size drawings

* Predive briefing data

* DM 26

8.0 TRANSPORTATION: Transportation of personnel and equipment will be the responsibility of UCT-2. The Project Engineer will arrange his own transportation and will meet the team on site on the date selected.

9.0 MESSAGE TRAFFIC: Summary status reports will be prepared on site by UCT-2 personnel and reported via message on a weekly basis to CHESNAVFACENGCOM and the UCT's home port.

ANNEX A

1.0 MEASURING DEVICES AND LOCATIONS

Tables A-1 and A-2 outline the 80 and 90 percent measurements for mooring components for both the riser and telephone types of mooring classes. These tables are based on the standard moorings listed in DM-26 and can be used to preset calipers before measuring various items. For example, a class BB riser type mooring will require calipers set to 3.15" (90%) and 2.80" (80%) for single link measurements on the riser; 6.30" (90%) and 5.60" (80%) for double link on the riser; 2.25" and 2.00" for single link on the ground legs; 4.50" and 4.00" for double link on the ground legs; and for the ground ring 5.85" and 5.20".

The preferred measuring devices, however, are back-to-back 80 and 90 percent "go - no go" gauges. These gauges simplify the diver's job in that, unlike calipers, they cannot be knocked out of adjustment underwater, and they do not have to be checked and reset between dives. Figure A-3 contains the drawings and data required to fabricate these gauges. Although these gauges are a quick and efficient way of sampling the wire size of chain links and some jewelry, the diver's still have to carry calipers to measure ground rings and chain connecting links.

Measurement locations for mooring chain are shown in Figure A-4.

TABLE A-1. SINGLE LINK MEASUREMENTS FOR COMPONENTS OF RISER-TYPE MOORINGS (DOUBLE VALUES FOR DOUBLE LINK MEASUREMENTS)

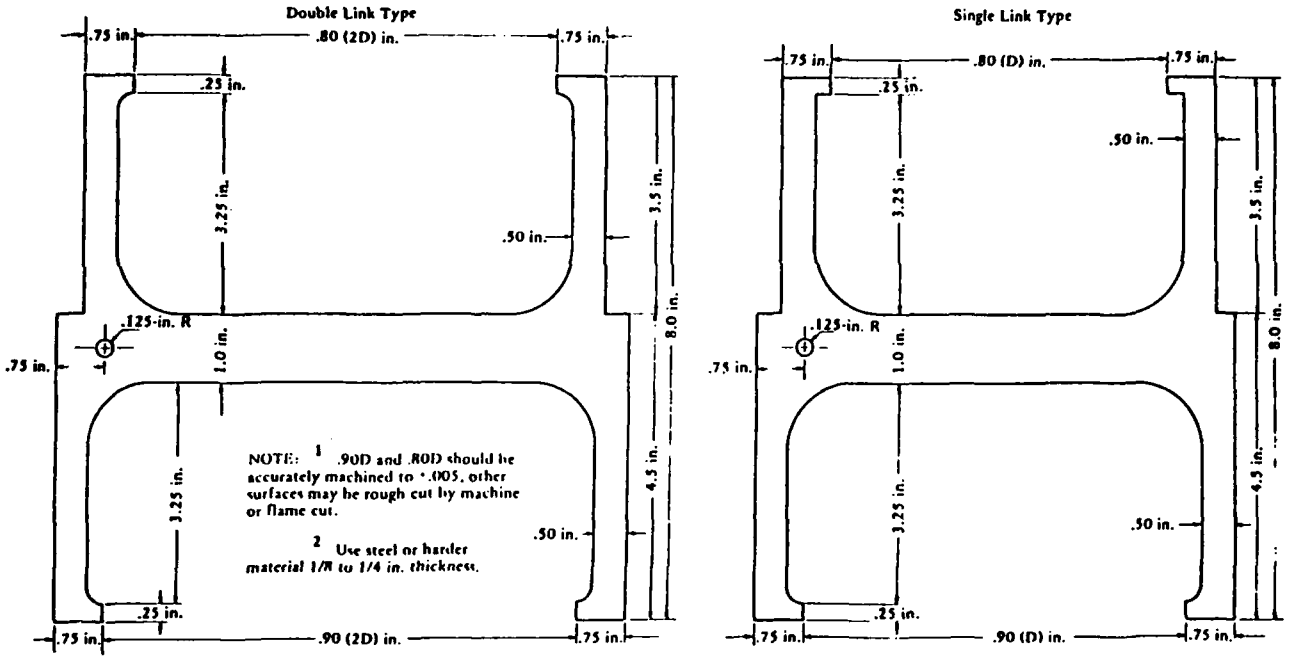
Class Mooring	Percent Remaining	Top of Buoy			Riser	Ground Ring			Ground Tackle		Anchor[2]	
		F-Shackle	End Link	AJL[1]	Chain	AJL[1]	Ring	Spider	Chain[3]	AJL[1]	Stockless w/Stabilizer	LWT
A-A	100	5 3/8	4¼	4"	4	4"	6½	4 3	2 3/4	2 3/4"		
	90	4.838	3.285	type	3.6	type	5.85	3.6 2.7	2.475	type	25,000	-
	80	4.3	2.92		3.2		5.2	3.2 2.4	2.2			
B-B	100	4 15/16	3 15/16	3½"	3½	3½"	6½	4 3	2½	2½"		
	90	4.44	3.544	type	3.15	type	5.85	3.6 2.7	2.25	type	20,000	13,000
	80	3.75	3.15		2.8		5.2	3.2 2.4	2.0			
C-C	100	4 15/16	3 15/16	3½"	3½	3½"	6½	4 3	2¼	2¼"		
	90	4.44	3.544	type	3.15	type	5.85	3.6 2.7	2.025	type	18,000	10,000
	80	3.95	3.15		2.8		5.2	3.2 2.4	1.8			
D-D	100	4 3/16	3 3/4	3"	3	3"	6		3	3"		
	90	3.769	3.375	type	2.7	type	5.4	-	2.7	type	30,000	-
	80	3.35	3		2.4		4.8		2.4			
A	100	3 7/8	3 3/8	2 3/4"	2 3/4	2 3/4"	5½		2 3/4	2 3/4"		
	90	3.488	3.038	type	2.475	type	4.95	-	2.475	type	25,000	-
	80	3.1	2.7		2.2		4.4		2.2			
B	100	3½	3 1/8	2½"	2½	2½"	4 3/4		2½	2½"		
	90	3.15	2.813	type	2.25	type	4.275	-	2.25	type	20,000	13,000
	80	2.8	2.5		2.0		3.8					
C	100	3 1/8	2 3/4	2¼"	2¼	2¼"	4½		2¼	2¼"		
	90	2.813	2.813	type	2.025	type	4.05	-	2.025	type	18,000	10,000
	80	2.5	2.5		1.8		3.6	-	1.8			
D	100	2 13/16	2½	2"	2	2"	4		2	2"		
	90	2.531	2.25	type	1.8	type	3.6		1.8	type	13,000	6,000
	80	2.25	2.0		1.6		3.2		1.6			
E	100	2 7/16	2¼	1 3/4"	1 3/4	1 3/4"	3½		1 3/4	1 3/4"		
	90	2.174	2.025	type	1.575	type	3 15	-	1.575	type	9,000	4,000
	80	1.95	1.8		1.4		2.8		1.4			
F	100	1 3/4	1 3/4	1¼"	1¼	1¼"	2 3/4		1¼	1¼"		
	90	1.575	1.575	type	1.125	type	2.813	-	1.125	type	5,000	2,000
	80	1.4	1.4		1.0		2.5		1.0			
G	100	1 1/16	.1	3/4"	3/4	3/4"	1 7/8		3/4	1"		
	90	.956	.9	type	.675	type	1.688	-	.675	type	3,000	300
	80	.85	.8		.6		1.5		.6			

1. AJL measurement vary according to manufacturer, see DM-26
2. Assumes firm sand bottom
3. Assumes cast steel chain

TABLE A-2. SINGLE LINK MEASUREMENTS FOR COMPONENTS OF TELEPHONE-TYPE MOORINGS (DOUBLE VALUES FOR DOUBLE LINK MEASUREMENTS)

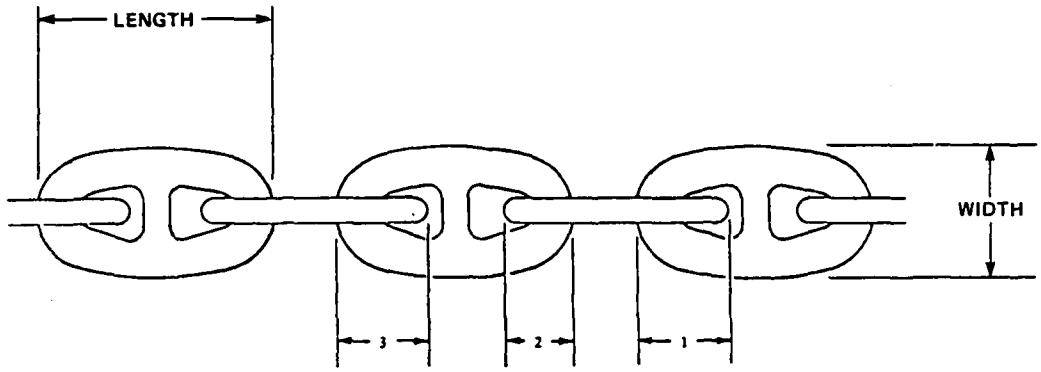
Class Mooring	Percent Remaining	Top of Buoy		Buoy-to-Ground Tackle				Ground Tackle		Anchor[2]	
		End Link	AJL[1]	D/F-Shackle	AJL[1]	Spider		AJL[1]	Chain	Stockless/Stabilizer	LWT
A-A	100	4¼	4"	4 11/16	4"	4	3	2 3/4"	2 3/4		
	90	3.285	type	4.219	type	3.6	2.7	type	2.475	25,000	-
	80	2.92		3.75		3.2	2.4		2.2		
B-B	100	4¼	4"	4 11/16	3½"	4	3	2½"	2¼		
	90	3.285	type	4.219	type	3.6	2.7	type	2.25	20,000	13,000
	80	2.92		3.75		3.2	2.4		2.0		
C-C	100	4¼	4"	4 11/16	3½"	4	3	2½"	2¼		
	90	3.285	type	4.219	type	3.6	2.7	type	2.025	18,000	10,000
	80	2.92		3.75		3.2	2.4		1.8		
D-D	100	4¼	4"	4 11/16	3"			3"	3		
	90	3.285	type	4.219	type			type	2.7	30,000	-
	80	2.92		3.75					2.4		
A	100	3 3/8	3½"	3 7/8	2 3/4"			2 3/4"	2 3/4		
	90	3.038	type	3.488	type			type	2.475	25,000	-
	80	2.7		3.1					2.2		
C	100	3 3/8	3½"	3½	2½"			2½"	2¼		
	90	3.038	type	3.15	type			type	2.25	20,000	13,000
	80	2.7		2.8					2.0		
C	100	3 3/8	3½"	3 1/8	2½"			2½"	2¼		
	90	3.038	type	2.813	type			type	2.025	18,000	10,000
	80	2.7		2.5					1.8		
D	100	3 1/8	3½"	2 13/16	2"			2"	2		
	90	3.038	type	2.531	type			type	1.8	13,000	6,000
	80	2.7		2.25					1.6		

1. AJL measurements vary according to manufacturer, see DM-26
2. Assumes firm sand bottom
3. Assumes cast steel chain

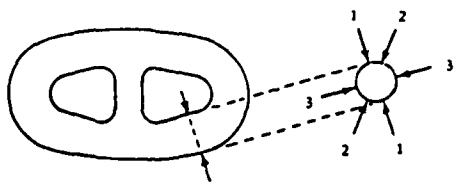


D"	Single Link		Double Link		D"	Single Link		Double Link		D"	Single Link		Double Link	
	.90D	.80D	.90(2D)	.80(2D)		.90D	.80D	.90(2D)	.80(2D)		.90D	.80D	.90(2D)	.80(2D)
6-1/2	① 5.85	5.20	–	–	3-1/2	⑥ 3.15	2.80	⑮ 6.30	5.60	2	⑪ 1.80	1.60	㉓ 3.60	3.20
6	② 5.40	4.80	–	–	3	⑦ 2.70	2.40	⑯ 5.40	4.80	1-7/8	⑫ 1.69	1.50	–	–
5-1/2	③ 4.95	4.40	–	–	2-3/4	⑧ 2.48	2.20	⑰ 4.96	4.40	1-3/4	⑬ 1.58	1.40	㉔ 3.06	2.80
4-1/2	④ 4.05	3.60	–	–	2-1/2	⑨ 2.25	2.00	㉑ 4.50	4.00	1-1/2	⑭ 1.35	1.20	㉕ 2.70	2.40
4	⑤ 3.60	3.20	⑱ 7.20	6.40	2-1/4	⑩ 2.03	1.80	㉒ 4.06	3.60	1-1/4	⑮ 1.125	1.00	–	–

FIGURE A-3. 10 PERCENT "GO-NO-GO" GAUGES



Double Link Measurement



Single Link Measurement

FIGURE A-4. LOCATIONS FOR TAKING CHAIN LINK MEASUREMENTS

ANNEX B

1.0 MOORING DATA

This section contains pertinent information on an individual mooring basis.

1.1 Figure B-1 is a map depicting the location of the fleet moorings in 1977.

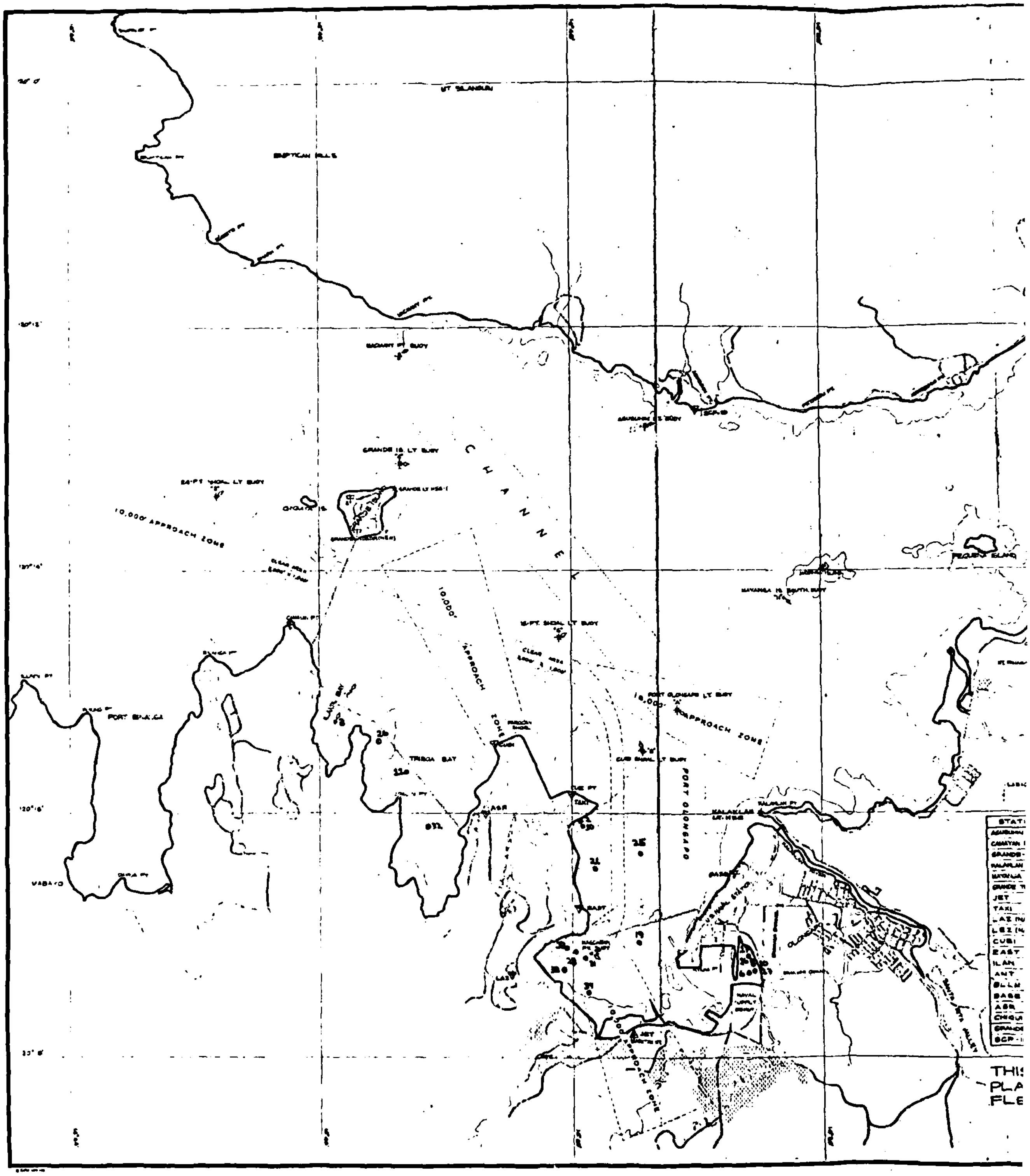

C H A N N E L
10,000' APPROACH ZONE
PORT BINANGA
TRIBOA BAY
PORT OLONGAPO

FIGURE B-1.

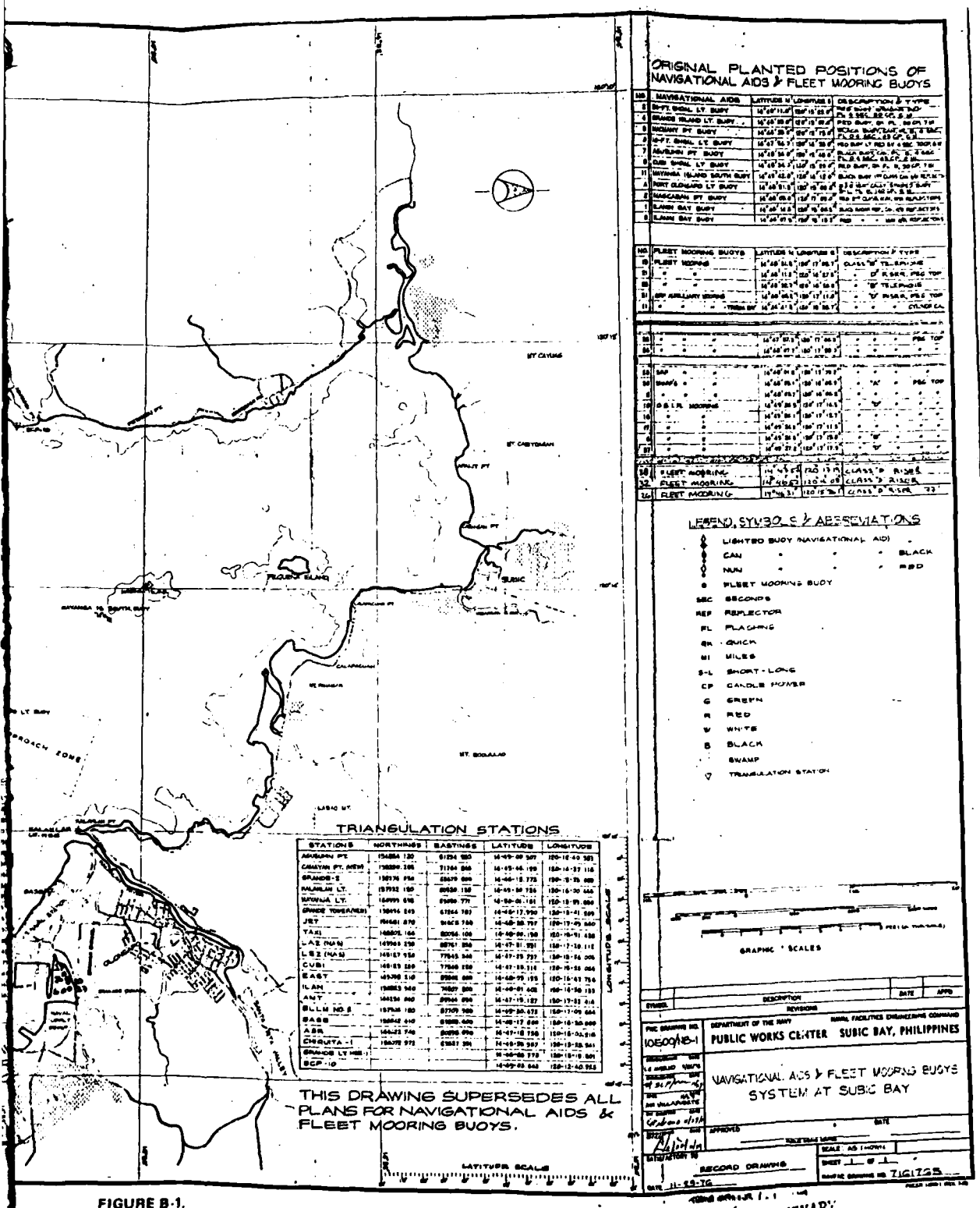

ORIGINAL PLANTED POSITIONS OF NAVIGATIONAL AIDS & FLEET MOORING BUOYS
LEGEND, SYMBOLS & ABBREVIATIONS
LIGHTED BUOY (NAVIGATIONAL AID)
CAN " " BLACK
NUN " " RED
FLEET MOORING BUOY
SEC SECONDS
REF REFLECTOR
FL FLASHING
QK QUICK
MI MILES
S-L SHORT-LONG
CP CANDLE POWER
G GREEN
R RED
W WHITE
B BLACK
SWAMP
TRIANGULATION STATION
GRAPHIC SCALES
TRIANGULATION STATIONS
STATION
NORTHINGS
EASTINGS
LATITUDE
LONGITUDE
THIS DRAWING SUPERSEDES ALL PLANS FOR NAVIGATIONAL AIDS & FLEET MOORING BUOYS.
LATITUDE SCALE
LONGITUDE SCALE
DESCRIPTION
DATE
APPD
REVISIONS
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
PUBLIC WORKS CENTER SUBIC BAY, PHILIPPINES
NAVIGATIONAL AIDS & FLEET MOORING BUOYS SYSTEM AT SUBIC BAY
APPROVED
DATE
SCALE AS SHOWN
RECORD DRAWING
DATE 11-29-76
PRELIMINARY

FIGURE B-1.

STATION & # - (CLASS) SUBIC - 2 - (A-RISER)

FILE DATA:
7 JUL 78 Inspection Measurements
14 APR 72 Inspection Report
31 JUL 61 Inspection Report

MOST RECENT DATA:

SITE:
Depth = 44'
Bottom = Mud
Lat: 14° 48' 02" Long 120° 16' 06"

CHAIN: (78 Data)
Riser: +90%
G.R.: +90%
Leg 1: +90% DL + 80% SL
Leg 2: +80% DL + SL
Leg 3: +90% DL + 80% SL

VOLTMETER RANGE: -.666 to -.722

COMMENTS:
Anchors Buried In Mud, Not Inspected
O.H. in 80 called "GOOD" in 82
Next O.H. October '86

STATION & # - (CLASS) SUBIC - 6 - (B-RISER)

FILE DATA: 6 JUL 78 Inspection Measurements
24 JAN 73 Inspection Report

MOST RECENT DATA:

SITE: Depth = 26'
Bottom = Mud
Lat: 14° 49' 24" Long 120° 17' 14"

CHAIN: (78 Data) Riser: +90% SL + DL
G.R.: +90% DL (2' Off Bottom)

VOLTMETER RANGE: -.617 to -.625

COMMENTS: Legs & Anchors Buried In Mud, Not Inspected
365 Day Usage
Last O.H. 63 Planned '83 Too Long
Called "GOOD" FY 82

STATION & # - (CLASS) SUBIC - 10 - (D-RISER)

FILE DATA:
6 JUL 63 Mooring Report
28 FEB 73 Inspection Report
6 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE:
Depth = 17'
Bottom = Mud
Lat: 14° 49' 23.5" Long 120° 17' 16.6"

CHAIN: (78 Data)
Riser: +90% SL + DL
G.R.: +90% DL (?)

VOLTMETER RANGE: -.641 to -.658

COMMENTS:
Legs Buried In Mud, Not Inspected
Ring 2' Off Bottom
365 Day Usage
Last O.H. 63 Next O.H. '83 Too Long
Called "GOOD" FY 82
Depth 17' in '63, 26' in 82 ?!

STATION & # - (CLASS) SUBIC - 11 - (D- RISER)

FILE DATA:

3 JUL 63	Mooring Report
15 OCT 65	Mooring Report
7 APR 72	Inspection Report
10 JUL 78	Inspection Measurements

MOST RECENT DATA:

SITE: Depth = 120'
Bottom = Mud
Lat: 14° 46' 46" Long 120° 15' 45"

CHAIN: (78 Data) Riser: +80% SL - 80% DL

VOLTMETER RANGE: -.661 to -.704

COMMENTS: Riser Disappears Into Mud
No Sign of G.R.
Last O.H. 80 Next O.H. '86
No Usage
Called "GOOD" FY 82

STATION & # - (CLASS) SUBIC - 16 - (D-RISER)

FILE DATA: 28 FEB 73 Inspection Report
6 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE: Depth = 26'
Bottom = Mud
Lat: 14° 49' 25" 120° 17' 72"

CHAIN: (78 Data) Riser: +90% DL + SL

VOLTMETER RANGE: -.641 to -.652

COMMENTS: G. R. Buried In Mud
Last O.H. 65 Planned O.H. '70 Overdue
365 Day Usage
Called "GOOD" FY 82

STATION & # - (CLASS) SUBIC - 17 - (D-RISER)

FILE DATA:
15 NOV 68 Mooring Report
24 JAN 73 Inspection Report
6 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE:
Depth = 25'
Bottom = Mud
Lat: 14° 49' 24" Long: 120° 17' 11"

CHAIN: (78 Data)
Riser: +90% DL + SL

VOLTMETER RANGE:
-.641 to -.652

COMMENTS:
G. R. Buried In Mud
365 Day Usage
Last O.H. '79, Next O.H. '84
Called "GOOD" FY 82

STATION & # - (CLASS) SUBIC - 19 - (B-TELEPHONE)

FILE DATA:
31 JUL 61 Mooring Report
24 AUG 67 Mooring Report
1 MAR 73 Inspection Report
10 JUL 78 Inspection Report

MOST RECENT DATA:

SITE:
Depth = 83'
Bottom = Mud
Lat: 14° 48' 31" Long: 120° 17' 04"

CHAIN: (78 Data)
Leg 1: -80% SL + DL
Leg 2: -80% SL + DL
Leg 3: -80% SL + DL

VOLTMETER RANGE: -.636 to -.711

COMMENTS:
Anchors Buried, Not Inspected
Last O.H. in OCT '80, Next O.H. '86
Called "GOOD" FY 82

STATION & # - (CLASS) SUBIC - 21 - (D-RISER)

FILE DATA: 25 MAY 73 Inspection Report
7 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE: Depth = 86'
Bottom = Mud
Lat: 14° 48' 14" Long: 120° 16' 29"

CHAIN: (78 Data)

Riser:	+80% DL + SL
G.R.:	+90% DL
Leg 1:	+90% SL, + 80% DL
Leg 2:	+90% SL, + 80% DL
Leg 3:	+90% DL + SL

VOLTMETER RANGE: -.646 to -.701

COMMENTS: Anchors Buried, Not Inspected - '78
Wirerope Tangled Around G.R.
O.H. in '69 Planned O.H. '81, Overdue
Called "FAIR" FY 82

STATION & # - (CLASS) SUBIC - 25 - (B-TELEPHONE)

FILE DATA: 31 JUL 61 Mooring Report
24 JAN 73 Inspection Report
12 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE: Depth = 110'
Bottom = Mud
Lat: 14° 48' 31" Long: 120° 16' 45"

CHAIN: (78 Data) Leg 1: +90% SL + 80% DL
Leg 2: +90% SL + 80% DL
Leg 3: +90% SL + DL

VOLTMETER RANGE: -.631 to -.665

COMMENTS: Anchors Buried, Not Inspected - '78
Last O.H. in MAY '61, Planned O.H. APR '79, Overdue
Called "FAIR" FY 82

STATION & # - (CLASS) SUBIC - 26 - (D-RISER)

FILE DATA: 31 JUL 61 Mooring Report
31 MAR 77 Mooring Report

MOST RECENT DATA:

SITE: Depth = 84'
Bottom = Mud
Lat: 14° 46' 31" Long: 120° - 15' - 36.1"

COMMENTS: New 30 MAR 77
Planned O.H. MAR 83
Called "GOOD" FY 82

STATION & # - (CLASS) SUBIC - 28 - (D-RISER)

FILE DATA:
28 NOV 67 Mooring Report
9 APR 72 Inspection Report
6 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE:
Depth = 26'
Bottom = Mud
Lat: 14° 47' 58.5"N Long: 120° 17' 09.4"E

CHAIN: (78 Data)

Riser:	+90% SL + 80% DL
G.R.:	+90% DL
Leg 1:	+80% SL, + 90% DL
Leg 2:	-80% SL, - 80% DL
Leg 3:	+90% SL, + 90% DL

VOLTMETER RANGE: -.677 to -.702

COMMENTS:
Ring 20' Off Bottom
All Legs Go Straight Down Into Mud
Anchors Buried, Not Inspected
O.H. AUG 80, Next Planned O.H. '86
Called "GOOD" FY 82
81 Depth Reported as 42'

STATION & # - (CLASS) SUBIC - 30 - (A-RISER)

FILE DATA: 14 APR 72 Inspection Report
7 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE: Depth = 40' - 45'
Bottom = Mud
Lat: 14° 48' 02" Long: 120° 16' 49"

CHAIN: (78 Data)

Riser:	+90% SL + DL
G.R.:	+90% DL
Leg 1:	-80% SL + DL
Leg 2:	-80% SL + DL
Leg 3:	+80% SL + DL

VOLTMETER READINGS: -.663 to -.705

COMMENTS: Anchors Buried, Not Inspected - '78
O.H. FEB 81, Next Planned O.H. FEB 87
Called "GOOD" FY 82

STATION & # - (CLASS) SUBIC - 31 - (D-RISER)

FILE DATA:

15 OCT 65	Mooring Report
28 NOV 70	Mooring Report
13 APR 72	Inspection Report
4 DEC 72	Mooring Report
6 JUL 78	Inspection Measurements

MOST RECENT DATA:

SITE:
Depth = 48'
Bottom = Mud
Lat: 14° 48' 26" Long: 120° 17' 35"

CHAIN: (78 Data)

Riser:	+90% SL + DL
G.R.:	+90% DL
Leg 1:	+90% SL + DL
Leg 2:	+90% SL, + 80% DL
Leg 3:	+90% SL, + 80% DL

VOLTMETER READINGS: -.477 to -.712

COMMENTS:
Anchors Buried, Not Inspected - '78
Last O.H. JUN 72, Next JUN 81 Overdue
"FAIR" FY 82
365 Day Usage

STATION & # - (CLASS) SUBIC - 32 - (D-RISER)

FILE DATA:
15 OCT 65 Mooring Report
13 APR 72 Inspection Report
11 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE:
Depth = 110'
Bottom = Mud
Lat: 14° - 46' - 52" Long: 120° - 16' - 08"

CHAIN: (78 Data)
Riser: +80% SL, - 80% DL
G.R.: +90% DL
Leg 1: +90% DL
Leg 2: -80% DL
Leg 3: -80% DL
No SL Taken

VOLTMETER READINGS: -670 to -.717

COMMENTS:
Anchors Buried, Not Inspected
Last O.H. NOV 79', Next NOV 85
Called "GOOD" FY 82

STATION & # - (CLASS) SUBIC - 34 - (D-RISER)

FILE DATA: 24 JAN 73 Inspection Report
6 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE: Depth = 50'
Bottom = Mud
Lat: 14° 48' 07" Long: 120° 17' 28"

CHAIN: (78 Data)
Riser: +90% SL + DL
G.R.: +90% DL
Leg 1: +80% SL + DL
Leg 2: +80% SL + DL
Leg 3: +80% SL + DL

VOLTMETER READINGS: -.700 to -.716

COMMENTS: Anchors Buried, Not Inspected - 78
Last O.H. MAR 81, Next MAR 87
New in 77
Called "GOOD" FY 82

STATION & # - (CLASS) · SUBIC - 37 - (D-RISER)

FILE DATA: 24 JAN 73 Inspection Report
6 JUL 78 Inspection Measurements

MOST RECENT DATA:

SITE: Depth = 26'
Bottom = Mud
Lat: 14° 49' 24" Long: 120° 17' 18"

CHAIN: (78 Data) Riser: +90% DL + SL

VOLTMETER READINGS: -.640 to -.658

COMMENTS: G.R. Buried - 78
Last O.H. OCT 66, Next OCT 83, Too Long
365 Day Usage

STATION & # - (CLASS) SUBIC - 38 - (D-RISER)

FILE DATA: 29 MAY 75 Mooring Report
25 MAR 76 Mooring Report

MOST RECENT DATA:

SITE: Depth = 42' - 52'
Bottom = Mud & Salt
Lat: 14° 47' 57" Long: 120° 17' 19"

COMMENTS: 365 Day Usage
Last O.H. MAY 79, Next MAY 85
Called "GOOD" FY 82

ANNEX C

1.0 CONTINGENCY PLANS AND PRIORITIZATION.

The inspection plans in Section 4 of this plan are unrealistic in that they assume all of the chain and hardware are accessible and that there is ample time to perform the desired measurements. In the event that conditions for this inspection are not ideal, this section outlines some alternate procedures and sets priorities while remaining flexible.

1.1 Priorities. The following goals are listed in order of importance.

A. Physical measurement of components not buried in mud.

B. Accurate position data for buoys and ground legs.

C. Attempted lifting of buried components for measurement using lift bags.

D. Use of gold dredge to uncover bottom chain for measurement.

E. Mooring material inventory.

F. Local construction capabilities.

1.2 Contingencies.

1.2.1 Ground Legs Buried In Mud. It is anticipated that a large portion of the Subic Bay moorings are buried in mud below the ground rings. When this is the case, the divers shall gather all measurements on the exposed sections of chain and make a brief bottom search to see if the legs reappear or if their orientation can be determined.

Thorough measurement of exposed portions of these moorings are as important as measurements in completely visible moorings. Time permitting, buried moorings will be inspected with more advanced techniques only after the more accessible measurements have been made on all of the moorings.

1.2.2 Excessive Growth On Chain. In Section 4, the divers are instructed to locate the detachable chain connecting links so that the chain on both sides of these links (and midway between these links) can be measured. In the event that the detachable links cannot be located, the divers may substitute gauge measurements at approximate 45' intervals. For convenience, the number of links comprising 45' for different sizes of chain is shown in Table C-1.

In all cases, the approximate length of chain before it disappears into the mud or terminates must be recorded.

TABLE C-1

CHAIN SIZE (IN)	LINKS/SHOT	LINKS/HALF SHOT
3/4	357	179
1 1/4	213	107
1 1/2	179	90
1 3/4	153	77
2	133	67
2 1/4	119	60
2 1/2	107	54
2 3/4	97	49
3	89	45
3 1/2	77	39
4	67	34

Another impact of excessive chain growth will be a reduction in the number of useful photographs. Accordingly, fewer photographs will be requested.

1.2.3 Limited Time. In the event that time is limitted by weather, equipment malfunctions, etc., work will proceed in the order of importance shown in section 1.1 of Appendix C.

ANNEX D

SAMPLE INSPECTION FORMS

1.0 Figures D-1 and D-2 depict two forms divers may use to record measurements and orientations respectively.

1.1 Figure D-3 is for use by the Project Engineer to summarize pertinent data.

MOORING NO.: _____ CLASS: _____ LOCATION: _____ LAT: _____ LONG: _____

WATER DEPTH: _____ TYPE MOORING: _____ BOTTOM TYPE: ☐ SAND ☐ MUD ☐ CLAY ☐ CORAL ☐ ROCK

DATE: _____ DIVERS: _____

ENGINEER: _____

COMPONENT			NOT INSPECTED	CONDITION						COMMENTS
				SINGLE LINK %			DOUBLE LINK %			
LINK TYPE	DEPTH	#		+90	+80	-80	+90	+80	-80	

FIGURE D-1.

TRUE BEARING OF GROUND LEGS

FIGURE D-2.

MOORING # _____ CLASS _____

INSPECTION DATE _____ TYPE _____

BOTTOM TYPE _____ WATER DEPTH _____

BUOY TYPE _____

DIMENSIONS _____

CONDITION _____

TOP HARDWARE _____

BOTTOM HARDWARE _____

RISER LENGTH _____

TYPE CHAIN _____

LINK WIDTH _____

WIRE DIAM. _____

_____

_____

_____

GROUND RING LOC. _____

OUTER DIAM. _____

WIRE DIAM. _____

CONDITION _____

LEG A LENGTH _____

EXPOSED LENGTH _____

TYPE CHAIN _____

LINK WIDTH _____

WIRE DIAM. _____

_____

_____

_____

LEG B LENGTH _____

EXPOSED LENGTH _____

TYPE CHAIN _____

LINK WIDTH _____

WIRE DIAM. _____

_____

_____

_____

LEG C LENGTH _____

EXPOSED LENGTH _____

TYPE CHAIN _____

LINK WIDTH _____

WIRE DIAM. _____

_____

_____

_____

LEG D LENGTH _____

EXPOSED LENGTH _____

TYPE CHAIN _____

LINK WIDTH _____

WIRE DIAM. _____

_____

_____

_____

RISER CONNECTIONS _____

_____

_____

_____

LEG CONNECTIONS _____

_____

_____

_____

OTHER _____

_____

_____

_____

FIGURE D-3. MOORING DATA SUMMARY FOR PREPARATION OF "AS BUILTS"

END

DATE
FILMED

6-86

DTIC