AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0002	17 January 2002		

6. ISSUED BY CODE

U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 4970
ATTN: CESAJ-CT-C
JACKSONVILLE, FL 32232-0019
KATHIE DUKE 904-232-3713

7. ADMINISTERED BY *(If other than Item 6)* CODE

U.S. ARMY CORPS OF ENGINEERS
JACKSONVILLE DISTRICT
400 WEST BAY STREET
ATTN: CESAJ-CT-C
JACKSONVILLE, FL 32202-4412

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

CODE FACILITY CODE

(√) X

9A. AMENDMENT OF SOLICITATION NO.
DACW17-02-R-0005

9B. DATED *(SEE ITEM 11)*
7 December 2001

10A. MODIFICATION OF CONTRACTS/ORDER NO.

10B. DATED *(SEE ITEM 13)*

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☒ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(√)

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

CONSTRUCTION DREDGING, 16-FOOT IMPOUNDMENT BASIN; MAINTENANCE DREDGING, 7-FOOT PROJECT, IMPOUNDMENT BASIN AND ENTRANCE CHANNEL, CUT-1 (BASE); NORTH JETTY REHABILITATION (OPTION 1); AND 200-FOOT SOUTH JETTY EXTENSION (OPTION 2); ST LUCIE INLET, MARTIN COUNTY, FLORIDA

Any enclosures accompanying this amendment should be inserted in the plans and/or specifications as applicable. Any pages or drawings with descriptive changes should be marked to indicate appropriate changes. All superseded materials should be removed or adequately marked to indicate that they have been superseded.

THE PROPOSAL DUE DATE FOR THIS SOLICITATION HAS BEEN EXTENDED TO 31 JANUARY 2002 AT 4:00 PM.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY *(Signature of Contracting Officer)*	16C. DATE SIGNED

1. **SPECIFICATIONS:**

A. Either asterisks appear before and after the line or lines where revisions have been made to the text on the enclosed revised or added pages or the text changes have been updated with additions noted with underlined text and deletions noted with line/cross-outs, and pertain only to changes made by this amendment.

B. The text changes may have necessitated reformatting of subsequent text or pages. If this is the case, those pages have also been issued as amended pages but are not marked with asterisks or underlined text and line/cross-outs.

ADD the attached Amendment Number 0002 STANDARD FORM 30 to the Specifications.

SECTION 00010: STANDARD FORM 1442; DELETE pages 00010-1, 00010-2 and 00010-3 "Description of Work" and REPLACE with the attached revised pages 00010-1, 00010-2 and 00010-3 "Description of Work". Also, DELETE the BID SCHEDULE, pages 00010-4 and 00010-5 and REPLACE with the attached revised BID SCHEDULE, pages 00010-4 and 00010-5.

SECTION 01000: GENERAL REQUIREMENTS; DELETE SECTION 01000, excluding the Appendices; except as stated below. REPLACE with the attached revised SECTION 01000, excluding the Appendices except as stated below: ADD the attached additional APPENDIX 01000-H, CORE BORING LOGS AND LABORATORY DATA which includes Boring Logs for Hole No. CB-SLI94-7; Hole No. CB-SLI94-9; Hole No. CB-SLI-M91-7; Hole No. CB-34; Hole No. CB-35; Hole No. CB-36; and Hole No. CB-46; "GRADATION CURVES" for Boring Nos. SLI94-1 through SLI94-13 (including "SUSPENDED SEDIMENT-TIME CURVES" for Boring Nos. CB-SLI94-2; CB-SLI94-9; and CB-SLI94-12); and "GRADATION CURVES" for Boring Nos. CBSLI-M91-1 through CBSLI-M91-3; Boring Nos. CBSLI-M91-5 through CBSLI-M91-7 (2 samples each); Boring No. CBSLI-M91-8 and Boring No. CBSLI-M91-10 (including "SUSPENDED SEDIMENT-TIME CURVES" for Boring Nos. CBSLI-M91-1; CBSLI-M91-6 and CBSLI-M91-7). Also, ADD the attached new APPENDIX 01000-J, "STONE SOURCE INFORMATION".

SECTION 01410: ENVIRONMENT PROTECTION; DELETE SECTION 01410, excluding the Appendices and REPLACE with the attached revised SECTION 01410, excluding the Appendices.

SECTION 01411: TURBIDITY AND PLACEMENT MONITORING; DELETE SECTION 01411, including page 01411-A1 of APPENDIX 01411-A and REPLACE with the attached revised SECTION 01411, including the attached revised page 01411-A1 of APPENDIX 01411-A. Pages 01411-A2 and 01411-A3 remain unchanged.

SECTION 02325: DREDGING; DELETE SECTION 02325, excluding the Appendices and REPLACE with the attached revised SECTION 02325, excluding the Appendices.

SECTION 02370: POLYMERIC MARINE MATTRESS; DELETE SECTION 02370 and REPLACE with the attached revised SECTION 02370.

SECTION 02380: STONE PROTECTION; DELETE SECTION 02380 and REPLACE with the attached revised SECTION 02380.

SECTION 02464: METAL SHEET PILING; DELETE SECTION 02464 and REPLACE with the attached revised SECTION 02464.

DESCRIPTIVE SPECIFICATION CHANGES: The following are descriptive changes to the specifications. Specifications should be adequately marked to indicate that they have been changed.

SECTION 00100 INSTRUCTIONS TO BIDDERS: On page 00100-1, in paragraph P-2.4.1, CHANGE line 3 of the first sentence to read as follows: ".... completed within the past 2 years." Also, on page 00100-2, CHANGE the fifth line from "Estimated daily production rate and beach placement rate for this contract" to read as follows: "Estimated daily production rate for this contract".

SECTION 00800 SPECIAL CONTRACT REQUIREMENTS: ADD the following "QUANTITY SURVEY REQUIREMENTS" paragraph after the Section 00800 Contract Clause "52.236-16 QUANTITY SURVEYS (APR 1984) - ALTERNATE I (APR 1984)" on page 00800-3 of the original Solicitation:

"QUANTITY SURVEY REQUIREMENTS

(Read this paragraph in conjunction with the Quantity Surveys (Alternate I) clause of this contract.) The Contractor shall make such surveys and computations as are necessary to determine the quantities of work performed or placed during each period for which progress payment is to be made. All original field notes, computations, and other records shall be furnished to the Contracting Officer's representative at the site of the work and shall be used by the Contracting Officer to the extent necessary in determining the proper amount of progress payments due the Contractor. A copy of the original notes, computations, and records furnished to the Contracting Officer shall be retained by the Contractor. Unless waived by the Contracting Officer in each specific case, all surveys made by the Contractor shall be made in the presence and under the direction of the Contracting Officer's representative. The Contractor shall notify the Contracting Officer 24 hours in advance of each intent to perform surveys of any nature.

(End of paragraph number 999.236-4011)"

SECTION 01000 GENERAL REQUIREMENTS: REVISE APPENDIX H, "CORE BORING LOGS AND LABORATORY DATA", page 01000-H1 titled "CORE BORING LOGS NOTES:" as follows: CHANGE the paragraph 1 NOTE from "Boring locations for the impoundment basin are shown on the drawings. All other core borings and wash probes included are additional information." to "Boring locations for the impoundment basin, entrance channel (Cut-1) and jetties are shown on the drawings.". Also, CHANGE the paragraph 2 NOTE from "Elevations are in feet and tenths and refer to NGVD 27." to "Elevations are in feet and tenths and refer to Mean Low Water (MLW) which is 1.10' below NGVD 29.".

2. DRAWINGS:

D.O. File No. 15-38,152 for St. Lucie Construction Dredging Drawings (Base) dated November 2000 in 10 Sheets + Combined Cover: DELETE Drawing Nos. 1/2, 1/4, 2/1, 2/2, 3/3, 2/4 and 3/1 and REPLACE with the attached revised Drawing Nos. 1/2, 1/4, 2/1, 2/2, 2/3, 2/4 and 3/1. Drawing Nos. 1/1, 1/3, 3/2 and Cover remain unchanged.

D.O. File No. 15-38,192 for St. Lucie Maintenance Dredging Drawings (Base) dated December 2000 in 12 Sheets + Combined Cover: DELETE Drawing Nos. 1/1M, 1/2M, 1/4M, 2/2M, 2/4M and 3/1M and REPLACE with the attached revised Drawing Nos. 1/1M, 1/2M, 1/4M, 2/2M, 2/4M and 3/1M. Drawing Nos. 1/3M, 2/1M, 2/3M, 3/2M, 3/3M, 3/4M and Cover remain unchanged.

D.O. File No. 15-38,214 for St. Lucie Jetties (Options 1 and 2) dated July 2001 in 25 Sheets + 2 Covers: DELETE Drawing Nos. 1/1J, 1/2J, 1/4J, 2/1J through 2/8J, and 3/2J through 3/13J and REPLACE with the attached revised Drawing Nos. 1/1J, 1/2J, 1/4J, 2/1J through 2/7J, and 3/2J through 3/12J. DELETED Drawing Nos. 2/8J and 3/13J have no replacements and are deleted in their entirety. Drawing Nos. 1/3J, 3/1J and Covers remain unchanged.

SOLICITATION, OFFER, AND AWARD *(Construction, Alteration, or Repair)*	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	DACW17-02-R-0005	☐ SEALED BID *(IFB)* ☒ NEGOTIATED *(RFP)*	7 Dec 2001	

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.
	W32CS510401988	

7. ISSUED BY CODE	8. ADDRESS OFFER TO
US ARMY CORPS OF ENGINEERS JACKSONVILLE DISTRICT 400 WEST BAY STREET ATTN: CESAJ-CT-C (ROOM 867) JACKSONVILLE, FL 32202-4412	IF BY HAND, DELIVERY TO "ISSUED BY" US ARMY CORPS OF ENGINEERS JACKSONVILLE DISTRICT P.O. BOX 4970 ATTN: CESAJ-CT-C (ROOM 867) JACKSONVILLE, FL 32232-0019

9. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE NO. *(Include area code) (NO COLLECT CALLS)*
	KATHIE B. DUKE	904-232-3713

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying no., date):*

CONSTRUCTION DREDGING, 16-FOOT IMPOUNDMENT BASIN; MAINTENANCE DREDGING, 7-FOOT PROJECT, IMPOUNDMENT BASIN AND ENTRANCE CHANNEL, CUT-1 (BASE); NORTH JETTY REHABILITATION (OPTION 1); AND 200-FOOT SOUTH JETTY EXTENSION (OPTION 2), ST. LUCIE INLET, MARTIN COUNTY, FLORIDA

DRAWINGS: D.O. FILE # 15-38,152, 192, & 214, IN SHEETS PLUS COVER.

MAGNITUDE OF CONSTRUCTION IS OVER $10,000,000.00.

DESCRIPTION OF WORK: SEE PAGE 00010-3

THIS IS AN UNRESTRICTED SOLICITATION. ALL BUSINESSES ARE ENCOURAGED TO PARTICIPATE.

YOU MUST BE REGISTERED IN THE CENTRAL CONTRACTOR REGISTRATION IN ORDER TO BE ELIGIBLE TO RECEIVE AN AWARD FROM THIS SOLICITATION. CALL 1-888-227-2423 FOR INFORMATION.

ALL OFFERS, MAILED OR HANDCARRIED, MUST BE DEPOSITED IN THE BID DEPOSITORY LOCATED IN ROOM 867 PRIOR TO THE TIME SET FOR RECEIPT OF PROPOSALS.

11. The Contractor shall begin performance within 30 calendar days and complete it within 320* calendar days after receiving *See Sect 00800

☐ award, ☒ notice to proceed. This performance period is ☒ mandatory, ☐ negotiable. *(See _____.)*

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? *(If "YES," indicate within how may calendar days after award in Item 12B.)*	12B. CALENDAR DAYS
☒ YES ☐ NO	10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 1 copies to perform the work required are due at the place specified in Item 8 by 16:00 *(hour)* local time

* 31 January 2002 *(date).* If this is a sealed bid solicitation, offers will be publicly opened at that time. Sealed envelopes * containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee ☒ is, ☐ is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 60 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

OFFER *(Must be fully completed by offeror)*

14. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*	15. TELEPHONE NO. *(Include area code)*
	16. REMITTANCE ADDRESS *(Include only if different than Item 14)*
CODE FACILITY CODE	

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within _____ calendar days after the date offers are due. *(Insert any number equal to or greater than the minimum requirement stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.*

AMOUNTS ▶

18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGMENT OF AMENDMENTS
(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*	20B. SIGNATURE	20C. OFFER DATE

AWARD *(To be completed by Government)*

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 Copies unless otherwise specified)* ▶	ITEM 26	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO ☐ 10 U.S.C 2304(c) ( ) ☐ 41 U.S.C 253(c) ( )
26. ADMINISTERED BY CODE		27. PAYMENT WILL BE MADE BY
* SOUTH FLORIDA AREA OFFICE U.S. ARMY CORPS OF ENGINEERS 4400 PGA BLVD., SUITE 203, CESAJ-CO-W PALM BEACH GARDENS, FL 33410		USACE FINANCE CENTER 5722 INTEGRITY DRIVE, CEFC-AO-P MILLINGTON, TENN 38054-5005 *

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

☐ 28. NEGOTIATED AGREEMENT *Contractor is required to sign this document and return _____ copies to issuing office.)* Contractor agrees to furnish and deliver all items or perform all work requirements identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this contract.

☐ 29. AWARD *(Contractor is not required to sign this document.)* Your offer on this solicitation is hereby accepted as to the items listed. This award con- summates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN *(Type or print)*		31A. NAME OF CONTRACTING OFFICER *(Type or print)*	
30B. SIGNATURE	30C. DATE	31B. UNITED STATES OF AMERICA BY	31C. AWARD DATE

*Description of Work - Continued from Page 00010-1….

The intent of the Government is to dredge the maintenance portion of this project by sections placing the material in a nearshore disposal area and surveying those sections for payment purposes; dredge the construction portion of the project, which is below the maintenance portion of the project, placing the material in the artificial reef disposal area and surveying the sections for payment purposes. It is also the intent of the Government to expedite the award and NTP of this project.

Project work includes a base and 2 options. The BASE WORK includes the maintenance dredging of approximately 321,000 cubic yards of beach quality material from the entrance channel, Cut-1, and the impoundment basin with placement of beach quality material in the nearshore placement area located approximately 8.5 miles south of St. Lucie Inlet, and landward of the -16-foot MLLW contour. The BASE WORK also includes construction dredging of the St. Lucie Inlet Impoundment Basin to a required depth of 18-feet with 2-feet allowable overdepth removing approximately 297,000 cubic yards of rock and non-beach quality material with placement of material in the Donaldson Artificial Reef Area located approximately 3.5 miles northeast of the St. Lucie Inlet. OPTION 1 WORK includes the rehabilitation of approximately 450 feet of the existing St. Lucie Inlet North Jetty and OPTION 2 WORK includes an approximate 200-foot extension and sand-tightening of the St. Lucie Inlet South Jetty located in Martin County, Florida. Work also includes construction/vibration controls and monitoring, endangered species observers and turbidity monitoring. ATTENTION: The Contractor shall conduct the original and final quantity surveys for any periods which progress payments are requested. The data derived from these surveys shall be used in computing the quantities of work performed and the actual construction completed and in place. ATTENTION: The Contractor should expect sea conditions with waves 3 feet or greater in height and ocean currents exceeding 3 knots a majority of the time in the project area. The dredges will be Coast Guard Certified; all other equipment shall comply with the Seagoing Barge Act. Equipment needed may include, but not be limited to, the following: Hydraulic Excavator Dredge, 3,000 CY Scows and attendant floating plant.

Duration: Estimated construction time is 320 calendar days after receipt of Notice to Proceed (NTP) for the Base (Dredging) portion of the work only (includes 30 days total for mobilization and demobilization). If funding is available for award of the Option 1 (North Jetty Rehabilitation) subsequent to the Base award and NTP, a separate Option 1 NTP will be issued no later than 100 calendar days after receipt of the NTP for the Base portion of the work. Additionally, if funding is available for award of the Option 2 (200-Foot South Jetty Extension) subsequent to the original Base award and NTP, a separate Option 2 NTP will be issued no later than 220 calendar days after receipt of the NTP for the Base portion of the work. If either the Option 1 or the Option 2 is awarded within the timeframes stated above, the total construction time of 320 calendar days for completion of all work will remain unchanged. *

SUPPLIES OR SERVICES AND PRICES/COSTS

CONSTRUCTION DREDGING, 16-FOOT IMPOUNDMENT BASIN, MAINTENANCE DREDGING, 7-FOOT PROJECT, IMPOUNDMENT BASIN AND ENTRANCE CHANNEL, CUT-1, (BASE); NORTH JETTY REHABILITATION (OPTION 1) AND 200-FOOT SOUTH JETTY EXTENSION (OPTION 2); ST. LUCIE INLET, MARTIN COUNTY, FLORIDA

LINE ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
	BASE: CONSTRUCTION AND MAINTENANCE DREDGING				
0001	MOBILIZATION AND DEMOBILIZATION (SEE SECTION 00800)	1	LUMP SUM		$_____
0002	**CONSTRUCTION AND MAINTENANCE DREDGING:**				
*0002AA	EXCAVATION, UNCLASSIFIED: IMPOUNDMENT BASIN WITH PLACEMENT IN ARTIFICIAL REEF (ESTIMATED QUANTITY) (SEE SECTION 02325: DREDGING)	297,000	CUBIC YARD	$_____	$_____*
*0002AB	EXCAVATION, UNCLASSIFIED: IMPOUNDMENT BASIN AND CUT-1 WITH PLACEMENT IN NEARSHORE AREA (ESTIMATED QUANTITY) (SEE SECTION 02325: DREDGING)	321,000	CUBIC YARD	$_____	$_____*
0003	ENDANGERED SPECIES MONITORING (SEE SECTION 01410: ENVIRONMENT PROTECTION)	1	LUMP SUM		$_____
0004	TURBIDITY AND PLACEMENT MONITORING (SEE SECTION 01411: TURBIDITY AND PLACEMENT MONITORING)	1	LUMP SUM		$_____
0005	CONSTRUCTION / VIBRATION CONTROLS AND MONITORING (SEE SECTION 02325: DREDGING)	1	LUMP SUM		$_____
*	(CONSTRUCTION DREDGING ONLY)				*
	TOTAL BASE (LINE ITEMS 0001 THROUGH 0005)				**$**_____
0006	**OPTION 1: NORTH JETTY REHABILITATION:**				
0006AA	ARMOR STONE (ESTIMATED QUANTITY)	12,300	TON	$_____	$_____
*0006AB	BEDDING STONE (ESTIMATED QUANTITY)	3,500	TON	$_____	$_____*
0006AC	12-INCH MARINE MATTRESS (ESTIMATED QUANTITY)	4,000	SQUARE YARD	$_____	$_____
*0006AD	GEOTEXTILE (ESTIMATED QUANTITY)	4,000	SQUARE YARD	$_____	$_____*
0006AE	OPTION 1 ENDANGERED SPECIES MONITORING	1	LUMP SUM		$_____
0006AF	OPTION 1 TURBIDITY MONITORING	1	LUMP SUM		$_____
	TOTAL OPTION 1 (LINE ITEMS 0006AA THROUGH 0006AF)				**$**_____

SUPPLIES OR SERVICES AND PRICES/COSTS

CONSTRUCTION DREDGING, 16-FOOT IMPOUNDMENT BASIN, MAINTENANCE DREDGING, 7-FOOT PROJECT, IMPOUNDMENT BASIN AND ENTRANCE CHANNEL, CUT-1, (BASE); NORTH JETTY REHABILITATION (OPTION 1) AND 200-FOOT SOUTH JETTY EXTENSION (OPTION 2); ST. LUCIE INLET, MARTIN COUNTY, FLORIDA

LINE ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
0007	**OPTION 2: 200-FOOT SOUTH JETTY EXTENSION:**				
*0007AA	ARMOR STONE (ESTIMATED QUANTITY)	9,000	TON	$_____	$_____*
*0007AB	BEDDING STONE (ESTIMATED QUANTITY)	2,000	TON	$_____	$_____*
*0007AC	12-INCH MARINE MATTRESS (ESTIMATED QUANTITY)	2,430	SQUARE YARD	$_____	$_____*
*0007AD	GEOTEXTILE (ESTIMATED QUANTITY)	2,430	SQUARE YARD	$_____	$_____*
*0007AE	SHEET PILING (ESTIMATED QUANTITY)	7,610	SQUARE FOOT	$_____	$_____*
0007AF	OPTION 2 ENDANGERED SPECIES MONITORING	1	LUMP SUM		$_____
0007AG	OPTION 2 TURBIDITY MONITORING	1	LUMP SUM		$_____
	TOTAL OPTION 2 (LINE ITEMS 0007AA THROUGH 0007AG)				**$**_____
	TOTAL (INCLUDES BASE + OPTION 1 + OPTION 2 TOTALS)				$_____

NOTES: (1) ALL OFFERS MUST BE FOR THE ENTIRE WORK AND MUST HAVE EACH BLANK SPACE COMPLETED.

(2) FAILURE TO COMPLETE AND RETURN ALL REQUIRED SUBMISSIONS (SF 1442, SECTION 00010, AND SECTION 00600) COULD RENDER YOUR OFFER NONRESPONSIVE.

(3) SEE SECTION 00100, "INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS."

(4) PROSPECTIVE OFFERORS SHOULD EXPECT SEA CONDITIONS WITH WAVES 3 FEET OR GREATER IN HEIGHT AND OCEAN CURRENTS EXCEEDING 3 KNOTS A MAJORITY OF THE TIME IN THE PROJECT AREAS. ONLY COAST GUARD CERTIFIED VESSELS WILL BE ALLOWED TO WORK ON THIS PROJECT.

(5) ESTIMATED CONSTRUCTION TIME IS 320 CALENDAR DAYS AFTER RECEIPT OF NOTICE TO PROCEED (NTP) FOR THE BASE (DREDGING) PORTION OF THE WORK ONLY (INCLUDES 30 DAYS TOTAL FOR MOBILIZATION AND DEMOBILIZATION). IF FUNDING IS AVAILABLE FOR AWARD OF OPTION 1 (NORTH JETTY REHABILITATION) SUBSEQUENT TO THE BASE AWARD AND NTP, A SEPARATE OPTION 1 NTP WILL BE ISSUED NO LATER THAN 100 CALENDAR DAYS AFTER RECEIPT OF THE NTP FOR THE BASE PORTION OF THE WORK. ADDITIONALLY, IF FUNDING IS AVAILABLE FOR AWARD OF OPTION 2 (200-FOOT SOUTH JETTY EXTENSION) SUBSEQUENT TO THE ORIGINAL BASE AWARD AND NTP, A SEPARATE OPTION 2 NTP WILL BE ISSUED NO LATER THAN 220 CALENDAR DAYS AFTER RECEIPT OF THE NTP FOR THE BASE PORTION OF THE WORK. IF EITHER OPTION 1 OR OPTION 2 IS AWARDED WITHIN THE TIMEFRAMES STATED ABOVE, THE TOTAL CONSTRUCTION TIME OF 320 CALENDAR DAYS FOR COMPLETION OF ALL WORK WILL REMAIN UNCHANGED.

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SECTION 01000

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SECTION 01000

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 PARTNERING

In order to most effectively accomplish this contract, the Government is willing to form a cohesive partnership with the Contractor and its subcontractors. This partnership would strive to draw on the strengths of each organization in an effort to achieve a quality project done right the first time, within budget and on schedule. This partnership would be bilateral in make-up and participation will be totally voluntary. Any cost associated with effectuating this partnership will be agreed to by both parties and will be shared equally by the Government and the Contractor.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CORPS OF ENGINEERS JACKSONVILLE REGULATION (CESAJR)

CESAJR 385-1-1	(1998) Safety and Occupational Health Program

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) Safety and Health Requirements Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1999) National Electrical Code

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Drawings

As-Built Contract Drawings; FIO. Electronic As-Built Files; FIO.

Refer to paragraph PROJECT RECORD DOCUMENTS for procedure.

1.4 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK

a. Read this paragraph in conjunction with the Clause COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (FAR 52.211-10) of Section 00800 SPECIAL CONTRACT REQUIREMENTS.

b. In addition to the above, the following shall apply: Should the total quantity of material to be paid for actually removed under the contract exceed the limit established in the Clause VARIATION IN ESTIMATED QUANTITY--DREDGING of Section 00800 SPECIAL CONTRACT REQUIREMENTS, additional time will be allowed at the rate of 30 calendar days for each 60,000 cubic yards in excess of the established limit.

c. In addition to the above, the following shall apply: The words "commence work" means "commence dredging." The commencement time of 30 days applies unless precluded by inclement weather as determined by the Contracting Officer.

1.5 LIQUIDATED DAMAGES-CONSTRUCTION

Refer to the Clause LIQUIDATED DAMAGES-CONSTRUCTION (FAR 52.211-12) of Section 00800 SPECIAL CONTRACT REQUIREMENTS.

1.6 AS-BUILT DRAWINGS

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings. At the Preconstruction Conference, the Contracting Officer's Representative will furnish to the Contractor one set of electronic files which reflect the contract drawings as awarded. The files will be furnished in the latest version of Microstation by Bentley Systems, Inc., on CD-ROM.

1.6.1 As-Built Contract Drawings

The Contractor shall maintain a separate set of full-size contract drawings, marked up in red, to indicate as-built conditions. Each as-built contract drawing shall include the Contract Number DACW17-XX-C-XXXX associated with the contract. These drawings shall be maintained in a current condition at all times until completion of the work and shall be available for review by Government personnel at all times. All variations from the contract drawings, for whatever reason, including those caused by modifications, optional materials, and the required coordination between trades, shall be indicated. These variations shall be shown in the same general detail utilized in the contract drawings. Upon completion of the work, the Contractor shall sign the marked-up drawings in the following manner: "I CERTIFY THAT THESE CORRECTED DRAWINGS INDICATE CONSTRUCTION AS ACTUALLY PERFORMED AND ARE AN ACCURATE REPRESENTATION OF THE SPECIFIED WORK. THESE CORRECTED DRAWINGS ARE APPROVED FOR PREPARATION OF AS-BUILT CONSTRUCTION DRAWINGS." The marked-up drawings shall then be furnished to the Contracting Officer prior to acceptance of the work. The Government reserves the right to withhold final payment until acceptable as-built contract drawings have been submitted.

1.6.2 Electronic As-Built Files

In addition to the As-Built Contract Drawings specified above, the Contractor shall furnish electronic files reflecting the as-built condition. The Contractor shall download electronic files furnished at the Preconstruction Conference by the Contracting Officer's Representative into his own system and shall use the downloaded files in creating an electronic file for recording the "as-built" conditions. On a monthly basis, the

Contractor shall furnish a copy of the electronic "as-built" files to the Contracting Officer's Representative for review. If the Contractor's approved shop drawings significantly change the contract drawings to the extent that it is not possible to revise the files electronically, then the contract drawing area effected shall be enclosed and cross referenced to the "as-built" shop drawings. Upon completion of construction, and as a condition to final payment, the Contractor shall furnish to the Contracting Officer two sets of electronic files, as approved by the Contracting Officer's Representative, reflecting the final "as-built" contract drawings. The files shall be furnished in the latest version of Microstation.

1.7 PHYSICAL DATA

Read this paragraph in conjunction with the Clause PHYSICAL DATA (FAR 52.236-4) of Section 00800 SPECIAL CONTRACT REQUIREMENTS.

1.7.1 Physical Conditions

The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys and/or by core borings. When the indicated physical conditions are the result of site investigations by core borings, the core boring logs and laboratory data are appended to the end of this Section and the core boring locations are shown on the drawings. While the Government's borings are representative of subsurface conditions at their respective locations and vertical reaches, local variations characteristic of the rocks and subsurface materials of this region are to be expected. Select material recovered from the core borings is available for inspection by prospective bidders at the Corps of Engineers District Warehouse, Talleyrand Avenue at 20th Street, Jacksonville, Florida during the entire bid period, and prospective bidders are strongly urged to examine the material and assure themselves that they have made the best possible evaluation of the subsurface conditions. Prospective bidders shall notify the Jacksonville District Explorations Manager at (904) 232-3295 at least four (4) working days before the visit with the following information: (1) the project title; (2) the specific core borings or entire set which are to be viewed; (3) the date, time, and duration of the visit; (4) the name of the person(s) and company to view the borings; and, (5) a point of contact and phone number regarding the visit. Bidders shall form their own conclusions from this examination prior to submission of their bids. Bidders shall record their core examination visit in a record book maintained at the inspection site. See "Description of Work" on page 00010-1, SF 1442, addressing normal physical conditions.

1.7.2 Location

The project site is located on the east coast of Florida in Martin County approximately 5 miles southeast of Stuart, Florida. The Donaldson Reef Site is located about 3.5 miles northeast of St. Lucie Inlet in the Atlantic Ocean and the Near Shore Placement Area is located south of St. Lucie Inlet.

1.7.2.1 Staging Areas

No Government furnished staging or stockpiling areas are provided for Contractor use under this contract.

1.7.3 Weather Conditions

The climate of the area is essentially subtropical, marine. Temperatures below freezing are rare. The wet season in the project area is from May through October. In general, the winter months constitute the dry season and rainfall is usually associated with mid-latitude systems (fronts and low pressure systems) and is distributed in a spatially uniform pattern. The summer months comprise the wet season and rainfall is closely associated with convective activity. These rainfall events are normally of short duration and amounts are quite variable spatially. Much of the volume of summer rainfall occurs on a few distributed days when the rainfall is more uniformly distributed. Occasionally, daily rainfall in the dry season can be quite heavy as mid-latitude systems penetrate into Florida. The project site is subject to tropical storms and hurricanes from June through November, extreme sea conditions and windy and/or rainy weather can be experienced throughout the year.

It shall be the Contractor's responsibility to obtain information concerning rain, wind and wave conditions that could influence his construction dredging and disposal operations. Reference is made to the following publication which contain climatological and meteorological observations and data. The below publication is available for review in the office of the U.S. Army Corps of Engineers, Jacksonville District Office, 400 West Bay Street, Jacksonville, Florida.

1.7.3.1 Local Climatological Data - Monthly Summary

Local Climatological Data - Monthly Summary published by NOAA, Asheville, NC. Subscription price and ordering information available from the National Climatic Data Center, Federal Building, Asheville, NC 28801.

This publication gives hourly wind speed and direction observations for West Palm Beach Airport, Florida. The Annual Summary gives a summary of the observations for the period of record.

1.7.3.2 Publications

The following publications include wave, wind and tide information and are available for review in the Jacksonville District Office or can be purchased from the agencies indicated:

1. **Hindcast Wave Information for the U.S. Atlantic Coast, Wave Information Studies of U.S. Coastlines, WIS Report 30, Waterways Experiment Station, March 1993.** This report presents 20-year wave hindcast summaries at various stations located along the U.S. Atlantic Ocean shoreline, including the area offshore of the St. Lucie Inlet project area. Available data includes wave height, period, and direction tables for two 20-year periods: 1956-1975 (excludes tropical disturbances/hurricanes), and 1976-1995 (includes tropical disturbances/hurricanes), summary wind speed and wind direction tables, summary tables of mean wave heights by month and year, largest wave heights by month and year, and a table of extreme wave events. The project site is protected from direct impact from ocean waves, but other meteorological data contained in this publication may be useful. This publication is available from National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22151. Time series listings of wave data for both 20-year periods and some summary information are available at the Waterways Experiment Station Website at: "http://bigfoot.wes.army.mil/u003.html.

2. **National Data Buoy Center (NDBC) Website.** This Internet website provides a wide range of meteorological and oceanographic buoy data collected worldwide. The project area lies almost midway between two sets of data buoys--buoy #~~41080~~41008, which lies off the Georgia coast near Savannah, and buoys #41009 and #41010, which lie offshore of Cape Canaveral. Data provided on this website includes wind speed, wind gusts, atmospheric pressure, air temperature, sea temperature, wave height, and wave period. In addition, a C-MAN station (station SAUF1, providing meteorological data only--no wave data) is located at the St. Augustine Beach pier, and may provide some data which is applicable to the project area. Gage readings are updated hourly. Achieved data is available for these buoys from 1988 to the present. The Website address is: http://www.~~seaboard.~~ndbc.noaa.gov/maps/florida.

1.7.4 Transportation Facilities

1.7.4.1 Major Highways, Airports, Port Facilities, and Rail Access

The project area is accessible by water from the Intracoastal Waterway, Okeechobee Waterway and Atlantic Ocean. The town of Stuart, Florida is served by Interstate 95, U.S. Highway No. 1, local and state connectors, commercial airlines, and Florida East Coast Railroad.

1.7.4.2 Contractor Investigation

In addition to the information given in the contract drawings, the Contractor shall make his own investigation of available roads for transportation, load limits for bridges and roads, and other road conditions affecting the transportation of materials and equipment to the site. The Contractor shall investigate the availability of railroad sidings, and shall make all arrangements for use of any sidings for the delivery of any materials and equipment to be used on the work.

1.7.5 Maritime Traffic

Marine Traffic in the project area consists of commercial, pleasure, and small recreational vessels of all types and sizes which can be accommodated by existing depths.

1.7.6 Local Conditions - Water Stages and Tides

1.7.6.1 Water Fluctuations

The below stated water fluctuations are for information only and are not to be utilized in conjunction with any contract related hydrographic surveying. Reference should be made to the water level datum for surveying purposes as noted on the control drawings(s) of the contract plans.

1.7.6.2 Water Stages and Tides

Water levels in the project area are affected primarily by tidal fluctuations in the Atlantic Ocean. The project area is also subject to storm surges from hurricanes, tropical storms and extratropical storms. The National Ocean Service (NOS) tidal bench mark data are provided in the following table:

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

TIDAL BENCH MARKS

SEWELL POINT, INDIAN RIVER

LATITUDE: 27 degrees 10.5 minutes N
LONGITUDE: 80 degrees 11.3 minutes W
NOAA CHART: 11474 USGS QUAD: ST. LUCIE INLET

Tidal datums at Sewall Point, Indian River are based on the following:

LENGTH OF SERIES	=	12 MONTHS
TIME PERIOD	=	JULY 1969-JUNE 1970
TIDAL EPOCH	=	1960-1978
CONTROL TIDE STATION	=	MIAMI BEACH (872 3170)

Elevations of tidal datums referred to mean lower low water (MLLW) are as follows:

MEAN HIGHER HIGH WATER (MHHW)	=	1.18 FEET
MEAN HIGH WATER (MHW)	=	1.07 FEET
MEAN TIDE LEVEL (MTL)	=	0.60 FEET
*NATIONAL GEODETIC VERTICAL DATUM-1929 (NGVD)	=	0.34 FEET
MEAN LOW WATER (MLW)	=	0.13 FEET
MEAN LOWER LOW WATER (MLLW)	=	0.00 FEET

*NGVD reference based on elevations published in Quad 270802, February 1972, and NOS leveling of 1980.

The estimated highest and lowest water level to the nearest half-foot are 5.0 feet above and 1.5 feet below mean lower low water, respectively. Estimates are based on observed extreme water levels at Miami Beach (872 3170).

1.7.7 Subsurface Investigations

Refer to core boring logs and laboratory data appended to the end of this Section.

1.7.8 Obstruction of Channel

The Government will not undertake to keep the channel free from vessels or other obstructions, except to the extent of such regulations, if any, as may be prescribed by the Secretary of the Army, in accordance with the provisions of Section 7 of the River and Harbor Act approved 8 August 1917. The Contractor will be required to conduct the work in such manner as to obstruct navigation as little as possible, and in case the Contractor's plant so obstructs the channel as to make difficult or endanger the passage of any vessels, said plant shall be promptly moved on the approach of any vessel to such an extent as may be necessary to afford a practicable passage. Upon completion of the work the Contractor shall promptly remove his plant, including ranges, buoys, piles, and other marks placed by him under the contract in navigable waters or on shore.

1.8 PROGRESS CHARTS

1.8.1 Schedules for Construction Contracts

In conjunction with the Clause SCHEDULES FOR CONSTRUCTION CONTRACTS of Section 00700 CONTRACT CLAUSES, the Contractor shall be guided by the following requirements and procedures as pertain to submission of an initial and subsequent periodic construction progress charts. These charts as approved and updated shall provide the basis for determination of the amounts of partial payments.

1.8.2 Forms 2454

Blank ENG Forms 2454 will be furnished to the Contractor as soon after award as practicable for his use in submitting his contract progress schedules for approval. Three copies of full size and legible monthly updated progress schedules are to be furnished by the Contractor and submitted with all progress payments. Sample ENG 2454 is appended to the end of this Section.

1.8.3 Preparation of Progress Chart

The Contractor shall indicate on the progress chart the bid items contained in the contract, showing the amount of the item and its relative weighted percentage of the total contract. The Contractor may separate features of work under each item to show salient work elements such as procurement of materials, plant and equipment, and supplemental work elements such as excavation, reinforcing steel, backfill, etc. These salient features shall total to the cost and weighted percentages shown for the major bid item. When quantity variations impact the weighted percentage of a separate item by five percent or more, the Contractor shall revise the contract progress charts to accurately reflect the impact of such variations.

1.8.4 Modifications

Modifications to the contract which are minor in nature shall be listed and scheduled separately in order of their issuance and as reported on the associated request for partial payment. Completion of work on minor modifications shall be noted as work progresses. When major modifications are issued in which one or more of the bid items are significantly changed monetarily or in time of completion, the progress schedule should be revised to incorporate such changes showing revised item completion dates and overall new completion date, as applicable.

1.9 LAYOUT OF WORK

1.9.1 Established Monuments

The Government has established monuments, control data and elevations for the work site(s) as indicated on the contract drawings. Control monument descriptions are appended to the end of this Section.

1.9.2 Layout

From the monuments, control data and elevations established by the Government, the Contractor shall complete the layout of the work and shall be responsible for all measurements that may be required for the execution of the work to the location and limit marks prescribed in the specifications or on the contract drawings, subject to such modifications as the Contracting Officer may require to meet changed conditions or as a

result of necessary modifications to the contract work.

1.9.3 Survey

The Contractor shall furnish, at his own expense, such stakes, templates, platforms, equipment, tools and material, and all labor as may be required in laying out any part of the work from the monuments, control data and elevations established by the Government. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Contracting Officer until authorized to remove them, and if such marks are destroyed by the Contractor or through his negligence, prior to their authorized removal, they may be replaced by the Contracting Officer, at his discretion, and the expense of replacement will be deducted from any amounts due or to become due the Contractor. The Contracting Officer may require that work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking of the work.

1.10 INSPECTION

1.10.1 Quality Assurance Representative (QAR)

The QAR shall be notified 48 hours prior to the establishment of horizontal control work (baseline layout, ranges, station flags, shore-based control for EPS/RPS, etc.) and vertical control work (tide staff(s), upland cross sections, construction elevations top/invert, maximum/minimum elevations of dredged materials within disposal area(s), etc.), but the presence or absence of the QAR shall not relieve the Contractor of his responsibility for proper execution of the work in accordance with the specifications. The Contractor will be required:

a. To furnish, on the request of the Contracting Officer or any QAR, the use of such boats, boatmen, laborers, and material forming a part of the ordinary and usual equipment and crew of the dredging plant as may be reasonably necessary in inspecting and supervising the work. The Contractor will be required to furnish such facilities for the surveys prescribed in the paragraph CONTRACTOR'S SURVEY REQUIREMENTS in SECTION 02325.

b. To furnish, on the request of the Contracting Officer or any QAR, suitable transportation from all points on shore designed by the Contracting Officer to and from the various pieces of plant, and to and from the Impoundment Basin and artificial reef construction site.

1.10.2 Failure to Comply

In conjunction with the Clause INSPECTION OF CONSTRUCTION of Section 00700 CONTRACT CLAUSES, should the Contractor refuse, neglect, or delay compliance with these requirements, the specific facilities may be furnished and maintained by the Contracting Officer and the cost thereof will be deducted from any amounts due or to become due the Contractor.

1.11 STONE SOURCES (JAN 2000)

The Contractor shall be responsible for all arrangements in obtaining and testing of proposed stone sources. Bidders must verify that sources can meet gradation and quantity requirements. The Contractor shall submit within 10 days after Notice of Award, the proposed stone sources for all classes of stone, including all laboratory test data and service records

for the proposed stone source(s). The Contractor shall submit a letter stating that he has verified that the stone, or sources, which he plans to use will be able to produce, either solely or collectively, the quantity of stone, of an acceptable quality, necessary for this project. This letter must include a list of the source or sources from which the Contractor plans to obtain the stone. The Government reserves the right to revoke approval and reject any or all material furnished from any source at any time during the course of the contract if and when it is determined by the Contracting Officer that such material does not conform to the gradation or quality specified. The Contractor's attention is called to the fact that the specified gradations are not industry standard and processing of materials will be required to meet the specified gradations. The Contractor shall submit the "Stone Source Information" form for each stone source. A sample of this form is appended to the end of Section 01000. See APPENDIX 01000-J.

1.12 RETESTING OF CONSTRUCTION MATERIALS

Where specified, initial tests on construction materials, which are specifically indicated in these specifications to be tested by the Government, will be performed at the expense of the Government unless otherwise specified hereinafter. Any retesting due to failure of the materials to meet the requirements in the initial test or any retesting requested by the Contractor shall be performed at the Contractor's expense. The retests shall be at laboratories approved by the Contracting Officer. The cost of retests made at Government Laboratories will be deducted from the total amount due the Contractor.

1.13 SHOALING

If, before the contract is completed, shoaling occurs in any section previously accepted, including shoaling in the finished basin because of the natural lowering of the side slopes, redredging at contract price, within the limits of available funds may be done if agreeable to both the Contractor and the Contracting Officer.

1.14 CRITICAL LIFT PLAN OPERATION

1.14.1 Definition of a Critical Lift

A non-routine crane lift which requires detailed planning and additional or unusual safety precautions. Critical lifts include lifts made when the load weight is 75 percent of the rated capacity of the crane; lifts which require that the load will be lifted, swung, or placed out of the operator's view; lifts made with more than one crane; lifts involving a non-routine or technically difficult rigging arrangement; or, any lift which the crane operator believes should be considered critical.

1.14.2 Critical Lift Plan Submittal

In such a case, the Contractor shall submit a Critical Lift Plan, hereinafter referred to as "Plan", prior to making a critical lift. The Plan shall be prepared by the crane operator, lift supervisor, and rigger. All personnel involved in the lift shall review and sign the Plan. The Plan shall be documented and a copy provided to the Contracting Officer for approval. The Plan shall be submitted at the Preconstruction Conference to permit time for review and shall contain the following information:

a. The Plan shall specify the exact size and weight of the load to be

lifted as well as all crane and rigging components which add to the weight.

b. The Plan shall specify the lift geometry and procedures, including the crane position, height of the lift, the load radius, the boom length, and angle for the entire range of the lift.

c. The Plan shall designate the crane operator, lift supervisor, and rigger, and state their qualifications.

d. The Plan shall include a rigging plan which shows the lift points, describes rigging procedures, and hardware requirements.

e. The Plan shall describe the ground conditions, outrigger or crawler track requirements, and if necessary, the design of mats necessary to achieve a level, stable foundation of sufficient bearing capacity for the lift. For floating cranes or derricks, the plan shall describe the operating base (platform) condition.

f. The Plan shall list environmental conditions under which lift operations are to be stopped.

g. The Plan shall specify coordination and communication requirements for the lift operation.

h. For tandem or tailing crane lifts, the Plan shall specify the make and model of the cranes, the line, boom and swing speeds, and requirements for an equalizer beam.

1.15 CONSTRUCTION PROJECT SIGNS

Except when otherwise directed by the Contracting Officer, the Contractor shall furnish, install, and maintain the construction project signs at the worksite(s) covered under this contract. The construction project signs (a project identification sign and a safety performance sign) shall be as indicated in the appendix at the end of this Section, and shall be erected, where directed, within thirty (30) calendar days after receipt of the Notice to Proceed. The sample Safety Scoreboard sign appended to the end of this Section shall be used on board the dredge in lieu of the safety performance sign. This applies only to the dredge. The signs shall be of the construction, size, format, and style indicated, shall be neatly and sturdily constructed, and shall be securely erected in a workmanlike manner to support the sign properly for the life of the contract. The name of the facilities shown in the appendix are for illustration only. No sign shall be prepared until the facility name applicable to the work under the contract has been furnished by the Contracting Officer.

1.15.1 Signage Removal

Upon completion of construction and when so directed by the Contracting Officer, the construction project signs shall be removed by the Contractor during the final cleanup process. The signs shall be disposed of by the Contractor in a manner satisfactory to the Contracting Officer.

1.15.2 Signage Costs

All costs connected with the furnishing, installation, maintenance, and removal of the construction project signs shall be included in the total contract price of the items listed in the Bidding Schedule.

1.16 CONSTRUCTION FENCING AND DANGER SIGNS

a. The Contractor shall furnish, install, and maintain chain-link fencing as shown on drawings. The fence shall be installed prior to construction. The fence shall be at least 4 feet in height. Access gates (size and quantity determined by the Contractor) shall be provided to permit authorized personnel entry. The fence shall be grounded to reduce possibilities of electrical shock. The fence shall be maintained to restrain the public until completion of construction dredging.

b. The Contractor shall furnish 6 danger signs, as indicated on the sketch appended to the end of Section 01000 GENERAL REQUIREMENTS, and post them on the fence at locations directed by the Contracting Officer. The signs shall be of the format, style, and minimum size indicated, shall be neatly and sturdily constructed, and shall be securely erected in a workmanlike manner to support the sign properly for the life of the contract. See Sketch DB-2 in APPENDIX 01000-C.

c. Upon completion of construction dredging and when so directed by the Contracting Officer, the fencing and signs shall be removed by the Contractor during the final cleanup process. The fencing and signs shall be disposed of by the Contractor in a manner satisfactory to the Contracting Officer.

d. All costs connected with the furnishing, installation, maintenance, removal, and disposal of the fencing and signs shall be included in the total contract price of the items listed in the Bidding Schedule.

1.17 WATER

a. The responsibility shall be upon the Contractor to provide and maintain at his own expense an adequate supply of water for his use for construction, and to install and maintain necessary supply connections and piping for same, but only at such locations and in such manner as may be approved by the Contracting Officer. In the event water is made available by the Government, the Contractor shall, at his own expense, install a meter to determine the amount of water used by him and such water will be paid for by, or charged to, the Contractor at prevailing rates or at reasonable rates as determined by the Contracting Officer. Before final acceptance, temporary connections and piping installed by the Contractor shall be removed in a manner satisfactory to the Contracting Officer.

b. The Contractor shall provide and maintain his own temporary toilet and washing facilities. Toilet and washing facilities shall be installed and maintained in compliance with the provisions of the latest version of EM 385-1-1 in a location approved by the Contracting Officer.

1.18 ELECTRICITY

a. All electric current required by the Contractor shall be furnished at his own expense. All temporary connections for electricity shall conform to the requirements of the latest versions of EM 385-1-1, CESAJR 385-1-1, and NFPA 70, and be subject to the approval of the Contracting Officer. In the event electricity is made available by the Government, the Contractor shall, at his own expense, install a meter

to determine the amount of current used by him and such electricity will be paid for by, or charged to, the Contractor at prevailing rates or at reasonable rates as determined by the Contracting Officer. All temporary lines will be furnished, installed, connected, and maintained by the Contractor in a workmanlike manner satisfactory to the Contracting Officer and shall be removed by the Contractor in like manner at his expense prior to completion of the construction.

b. In accordance with the latest versions of EM 385-1-1, CESAJR 385-1-1, and NFPA 70, the Contractor shall provide Ground Fault Circuit Interruption (GFCI) on all 120 volt, 15 and 20 ampere, single phase receptacles used for construction power. Ground Fault Circuit Interrupters are not an acceptable substitute for grounding.

1.19 HURRICANE AND SEVERE STORM PLAN

1.19.1 Plan Contents

Within ten (10) calendar days after the Notice of Award, the Contractor shall submit as an attachment to his Accident Prevention Plan, a Hurricane and Severe Storm Plan for review and acceptance. This plan shall include but not be limited to the following:

a. Types of storms anticipated (Winter storm, Hurricane, Tornado).

b. Time intervals before storms when action will be taken and details of the actions taken.

c. List of the equipment to be used on the job and its ability to handle adverse weather.

d. List of safe harbors and the distance from the work area to these harbors and the time required to move the equipment to these harbors. Copies of letters of approval for the use of these safe harbors (local authorities, U.S. Coast Guard, etc.) where applicable.

e. Method of securing equipment in these safe harbors.

f. List of equipment to be utilized to make this move to safe harbors (tug boats, work boats, etc.) to include the name, if available, and horsepower of this equipment.

g. Methods of securing equipment not moved; i.e., pipelines (floating or submerged), pumpout stations, etc.

h. Plan of evacuation to include interim measures, i.e., immediate reaction plans to be taken for all storm occurrences, particularly sudden/flash storms.

i. Operating procedures to be undertaken when critical dredge equipment fails during sudden and severe adverse weather conditions, to include breaking of spuds, swing wires, anchor wires, or other mooring equipment or facilities.

1.19.2 Sample Plan

Appended to the end of this Section is a sample Hurricane and Severe Storm Plan to be used for illustrative purposes only.

1.19.3 Monitoring of Weather

The Contractor shall maintain full-time monitoring of the NOAA marine weather broadcasts, and avail themselves of such other local commercial weather forecasting services as may be available. These information broadcasts shall be the Contractor's primary source in the decision process to implement action under the approved storm plan.

1.20 PRECONSTRUCTION CONFERENCE

A Preconstruction Conference will be arranged by the Contracting Officer's Representative after award of contract and shall be held before Notice to Proceed is issued. The Contracting Officer's Representative will notify the Contractor of the time and date set for the meeting. At this conference, the Contractor shall be oriented with respect to Government procedures and line of authority, contractual, administrative, and construction matters. Additionally, a schedule of required submittals will be discussed. Minutes of the meeting shall be prepared by the Contracting Officer or Contracting Officer's Representative and signed by both the Contractor and the Contracting Officer or Contracting Officer's Representative. The minutes shall become a part of the contract file. There may also be occasions when subsequent conferences will be called to reconfirm mutual understanding.

1.20.1 Preconstruction Conference Submittal Items

Within ten (10) calendar days after the date of the Notice of Award, the Contractor shall submit the following items in either completed or draft form for review by the Contracting Officer's Representative prior to the preconstruction conference:

Letter Appointing Superintendent

Power of Attorney and Certified Copy of Resolution for local representatives (if local representative will be allowed to sign contract documents)

Affirmative Action Plan, Refer to Clause EQUAL OPPORTUNITY of Section 00700 CONTRACT CLAUSES.

Drug-Free Workplace, Refer to Clause DRUG-FREE WORKPLACE of Section 00700 CONTRACT CLAUSES.

List of Subcontractors

Accident Prevention Plan (including Activity Hazards Analysis as outlined in EM 385-1-1, Appendix A and Figure 1 of Section 1, Hurricane and Severe Storm Plan, and Employee Safety and Health Indoctrination (ESHI) (sample ESHI appended to the end of this Section).

Critical Lift Plan Operation, Refer to paragraph CRITICAL LIFT PLAN OPERATION of this Section.

Hazard Communication Program, Refer to Clause HAZARD COMMUNICATION of Section 00800 SPECIAL CONTRACT REQUIREMENTS.

Confined Space Entry Plan, Refer to Clause CONFINED SPACE ENTRY of Section 00800 SPECIAL CONTRACT REQUIREMENTS.

Hurricane and Severe Storm Plan, Refer to paragraph HURRICANE AND SEVERE STORM PLAN of this Section.

Diving Plan (including Activity Hazards Analysis), Refer to Clause DIVING PLAN of Section 00800 SPECIAL CONTRACT REQUIREMENTS.

Quality Control Plan, Refer to Section 01451 CONTRACTOR QUALITY CONTROL.

Completed Electronic Submittal Register

Progress Charts, Refer to Clause SCHEDULES FOR CONSTRUCTION CONTRACTS of Section 00700 CONTRACT CLAUSES.

Environmental Protection Plan, Refer to Section 01410 ENVIRONMENT PROTECTION.

Maritime Traffic Control Plan

Other Items as May be Specified Elsewhere

Each Plan shall be submitted as an enclosure to a letter, signed by a Corporate Official of the Contractor. The letter shall state that the Plan complies with all requirements of the contract.

1.20.2 Failure to Comply

Failure to comply with the above requirements within the time prescribed will be considered a condition endangering the performance of the contract and may be considered grounds for termination of the contract in accordance with the Clause DEFAULT (FIXED-PRICE CONSTRUCTION) of Section 00700 CONTRACT CLAUSES.

1.20.3 Contracting Officer Representative Responsibility

1.20.3.1 Report Preparation Instruction

Instruct the Contractor in the preparation of the Daily Report(s) which the Contractor will submit.

1.20.3.2 Contractor Indoctrination

Inform the Contractor of the requirements to indoctrinate ALL personnel on job site safety prior to the employee commencing any work. The indoctrination shall be signed and dated by the employee and the Supervisor. A copy shall be maintained by the Contractor at the job site.

1.20.3.3 Letter of Record

The letter of record will be written documenting all items discussed at the conference and a copy will be furnished by the Contracting Officer's Representative to all in attendance.

1.21 NOTICE TO PROCEED

The Notice to Proceed (NTP) will not be issued to the Contractor until after the Preconstruction Conference has been completed. However, if the Contractor fails to submit an acceptable Quality Control (QC) Plan, Environmental Protection Plan, Accident Prevention Plan, or other plan(s) required under these specifications, within the time prescribed,

construction **SHALL NOT** start unless an acceptable interim plan is submitted. While the Contractor is operating under an acceptable interim plan, the Contracting Officer may retain funds from progress payments in accordance with the Clause PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS of Section 00700 CONTRACT CLAUSES until such time as the Contractor submits an acceptable final plan. If an acceptable final plan is not submitted within a reasonable time, as determined by the Contracting Officer, the Contracting Officer may order the Contractor to stop work until such time as an acceptable plan has been submitted. Any such stop work order shall not be considered a suspension of work for an unreasonable period of time under the Clause SUSPENSION OF WORK of Section 00700 CONTRACT CLAUSES and the Contractor shall not be entitled to pay adjustments as a result of the stop work order.

1.22 REPORT OF OPERATIONS, ENG FORM 4267

See APPENDIX 01000-A at the end of this Section (2 pages).

1.23 CONSTRUCTION PROGRESS CHART, ENG FORM 2454

See APPENDIX 01000-B at the end of this Section (1 page).

1.24 CONSTRUCTION PROJECT AND FENCING AND DANGER SIGNS

See APPENDIX 01000-C at the end of this Section (7 pages).

1.25 DECLARATION OF INSPECTION FOR REFUELING

See APPENDIX 01000-D at the end of this Section (3 pages).

1.26 SAMPLE - HURRICANE AND SEVERE STORM PLAN

See APPENDIX 01000-E at the end of this Section (4 pages).

1.27 SAMPLE - GUIDE FOR EMPLOYEE SAFETY AND OCCUPATIONAL HEALTH INDOCTRINATION

See APPENDIX 01000-F at the end of this Section (2 pages).

1.28 CONTROL MONUMENT DESCRIPTIONS

See APPENDIX 01000-G at the end of this Section (5 pages).

1.29 CORE BORING LOGS AND LABORATORY DATA

See APPENDIX 01000-H at the end of this Section (~~5~~896 pages).

1.30 STONE SOURCE INFORMATION

See APPENDIX 01000-J at the end of this Section (2 pages).

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --

Reference Separate attached .pdf Files (38 pages total)

*

STONE SOURCE INFORMATION

Date _____

1. Quarry:

   a. Name of quarry _____

   b. Name and address of owner of quarry _____

_____

   c. State whether undeveloped, commercial, or abandoned

_____

   d. Location of quarry:

(1) Latitude and longitude to the nearest one degree for the latitude line south of the point and the longitude line east of the point from which the sample was obtained:

Latitude _____ Longitude _____

(2) Sufficient information to permit the location to be found by a person unfamiliar with the region, e.g., from Clewiston, FL, go north on Highway 27 to Highway 80; go west on Highway 80 to SR 29; go 5 miles south on SR 29 to a dirt road; go east 3 miles on dirt road; quarry on the right.

_____

_____

2. Name of the Project _____

3. Name of the project or projects in which the stone has been used, and dates (since 1946):

_____

4. Name of individual performing the sampling:

_____

*

* **STONE SOURCE INFORMATION--Continued**

5. Give data as closely as it is known concerning geological formation, age, and rock type.

_____

_____

_____
Signature

_____
Title

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SECTION 01270

MEASUREMENT AND PAYMENT [BASE ITEMS]

PART 1 GENERAL

1.1 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.1.1 Mobilization and Demobilization: Line Item 0001

Payment will be made for costs associated with or incidental to mobilization and demobilization and establishment of initial project management and coordination. See Clause PAYMENT FOR MOBILIZATION AND DEMOBILIZATION of Section 00800 SPECIAL CONTRACT REQUIREMENTS.

1.1.2 Endangered Species Observers: Line Item 0003

Payment will be made for costs associated with or incidental to endangered species observers. See Section 01410 ENVIRONMENT PROTECTION.

1.1.3 Turbidity and Placement Monitoring: Line Item 0004

Payment will be made for costs associated with or incidental to obtaining, analyzing, reporting the results of monitoring for turbidity. See Section 01411 TURBIDITY AND PLACEMENT MONITORING.

1.1.4 Construction / Vibration Controls and Monitoring: Line Item 0005

Payment will be made for costs associated with or incidental to construction / vibration controls and monitoring. See Section 02325 DREDGING.

1.2 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.2.1 Excavation, Unclassified: Line Items 0002AA and 0002AB

1.2.1.1 Payment

a. Payment will be made for costs associated with or incidental to excavation, transportation, and placement of materials; performing quantity surveys and providing electronic survey data; providing and maintaining access to the work site(s) and placement area(s); noise control; debris removal; and installation, operation or maintenance of the electronic tracking system for surveillance of all dredging and placement activities. See Sections 01410 ENVIRONMENT PROTECTION and 02325 DREDGING.

b. Insofar as consistent with the paragraph CONTINUITY OF WORK of Section 00800 SPECIAL CONTRACT REQUIREMENTS, monthly partial payments will be based on approximate quantities determined by soundings performed by the Contractor behind the dredge. The term "area designated by the Contracting Officer" as used in the CONTINUITY OF WORK paragraph, is defined as "acceptance section".

c. The Contractor shall submit for acceptance an acceptance section plan for construction dredging of the impoundment basin. A maximum of six acceptance sections will be required for payment purposes. The acceptance section plan shall be submitted to the Contracting Officer's Representative (COR) within 10 days after receipt of the Notice to Proceed.

d. The Contractor will be required to complete an after-dredge pay survey upon removal of beach quality material from the impoundment basin prior to commencement of construction dredging. All maintenance-excavated material measured by this survey will be paid at Specification Section 00010 Line Item (Base Bid) 0002AB unit price rate per cubic yard in place.

1.2.1.2 Measurement

a. The maps and/or drawings already prepared (paragraph CONTRACT DRAWINGS, MAPS, AND SPECIFICATIONS of Section 00800 SPECIAL CONTRACT REQUIREMENTS) are believed to represent accurately average existing conditions, but the depths shown thereon may be verified and corrected by soundings taken before dredging. Determination of quantities removed and the deductions made therefrom to determine quantities by in-place measurement to be paid for in the area specified, after having once been made, will not be reopened, except on evidence of collusion, fraud, or obvious error.

b. The total amount of material removed, and to be paid for under the contract, will be measured by the cubic yard in place. The volume computed shall be between the bottom surface shown by soundings taken within one (1) week before dredging and the bottom surface shown by the soundings taken within one (1) week after the work specified in each acceptance section based on the approved Acceptance Section Plan has been completed. The Contractor shall give seven (7) days advance notice, in writing, to the Contracting Officer's Representative of the intent to perform a pre-dredging survey or after-dredging survey for each acceptance section. The quantity shall include the volume within the limits of the side slopes described in subparagraph "Side Slopes" of paragraph REQUIRED DEPTH, ALLOWABLE OVERDEPTH, AND SIDE SLOPES of Section 02325 DREDGING, less any deductions that may be required for

misplaced material described in subparagraph "Misplaced Materials" of paragraph DISPOSAL OF EXCAVATED MATERIAL of Section 02325 DREDGING.

1.2.1.3 Unit of Measure

Cubic yard.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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SECTION 01270

MEASUREMENT AND PAYMENT [OPTION ITEMS]

PART 1 GENERAL

1.1 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.1.1 Endangered Species Monitoring: Line Items 0006AE and ~~0006AF~~0007AF

Payment will be made for costs associated with or incidental to endangered species monitoring. See Section 01410 ENVIRONMENT PROTECTION.

1.1.2 Turbidity Monitoring: Line Items 0006AF and 0007AG

Payment will be made for costs associated with or incidental to obtaining, analyzing, reporting the results of monitoring for turbidity. See Section 01411 TURBIDITY AND PLACEMENT MONITORING.

1.2 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.3 SECTION 02370 MEASUREMENT AND PAYMENT (12-INCH MARINE MATTRESS): Line Items 0006AC and 0007AC

1.3.1 Unit of Measure

Unit of measure: square yard in place.

1.3.2 Payment

12-Inch Marine Mattress installed and accepted will be paid for at the respective contract unit price in the bidding schedule. This unit price shall include the cost of materials, equipment, installation, testing, and other costs associated with placement of the 12-Inch Marine Mattress.

1.4 SECTION 02373 MEASUREMENT AND PAYMENT (GEOTEXTILE): Line Items 0006AD and 0007AD

1.4.1 Unit of Measure

Unit of measure: square yard in place.

1.4.2 Payment

Geotextile installed and accepted will be paid for at the respective contract unit price in the bidding schedule. This unit price shall include the cost of materials, equipment, installation, testing, and other costs associated with placement of the Geotextile.

1.5 SECTION 02380 (STONE PROTECTION) UNIT PRICES

1.5.1 Bedding Stone: Line Items 0006AB and 0007AB

1.5.1.1 Payment

Payment for stone placed for bedding will be made at the applicable contract unit prices for Bedding Stone. Price(s) and payment(s) shall include all costs of furnishing, hauling, placing and maintaining the bedding material until placement of the stone cover is completed and accepted. Preparation of the base will not be paid for separately and all costs incidental thereto shall be included in contract prices for other items for which payment will be made. No payment will be made for excess thickness of bedding and/or filter material, nor for material required to replace subgrade material lost by rainwash, wind erosion, overexcavation or otherwise.

1.5.1.2 Measurement

Bedding stone will be measured for payment by the ton. Quantities will be computed to the nearest whole ton. Bedding stone will be measured for payment, in the presence of the Contracting Officer, by weighing on approved, accurately calibrated scales furnished by and at the expense of the Contractor. The scales shall be capable of printing a weight ticket including time, date, truck number, and weight.

1.5.1.3 Unit of Measure

Unit of measure: ton.

1.5.2 Armor Stone: Line Items 0006AA and 0007AA

1.5.2.1 Payment

Payment for armor stone will be made at the applicable contract unit price for Armor Stone. Price(s) and payment(s) shall constitute full compensation for furnishing, hauling, handling, placing, and maintaining the stone until final acceptance by the Government. No separate payment will be made for the stockpiling of stone, and all cost in connection with stockpiling shall be included in the contract unit price for stone.

Payment for stone satisfactorily placed in constructing the jetties will be made at the contract unit prices. Price(s) and payment(s) shall constitute full compensation for furnishing all plant, labor, and performing all work necessary in placing the stone in constructing the jetties as specified

herein or shown on the drawings.

1.5.2.2 Measurement

Stone will be measured for payment by the ton. Quantities will be computed to the nearest whole ton. Stone will be measured for payment, in the presence of the Contracting Officer, by weighing on approved, accurately calibrated scales furnished by and at the expense of the Contractor. The scales shall be capable of printing a weight ticket including time, date, truck number, and weight. Weight certificates furnished by a public weighmaster will be acceptable.

Stone will be measured for payment by the ton as determined by barge displacement, certified railroad weights, where direct placement into structure(s) is practicable, or by weighing by the truckload on approved scales meeting the requirements of paragraph TRUCKLOAD.

a. Truckload. Each truck load will be weighed to the nearest 0.1 ton and the final quantity rounded to the nearest whole ton. Stone will be measured for payment by weighing on approved scales before being placed in the work. Scales shall be of sufficient length to permit simultaneous weighing of all axle loads and shall have an accuracy within 0.2 percent throughout the range of the scales. The scale's accuracy shall conform to the applicable requirements of NIST HB 44 and shall be certified by an acceptable scales company representative or by an inspector of the State Inspection Bureau charged with scales inspection within the state in which the project is located prior to weighing any stone. The scales shall be located at the site of work. The scales shall be capable of printing a weight ticket including time, date, truck number, and weight. The Contractor shall furnish the scales and shall weigh the stone in the presence of the Contracting Officer. Quarry weights will not be accepted.

b. Barge Load

(1) If delivered by barge, stone will be measured for payment by the Contracting Officer by weight determined by barge displacement. The Contractor shall furnish the Contracting Officer a barge displacement table not less than 10 work days prior to unloading the stone from any barge. Each table submitted shall show the name and/or number of the barge owner, the name of the fabricator, and the certification and date of certification of the person or firm preparing the table. The Contractor shall furnish with the barge displacement tables a drawing or sketch of each barge, dimensioned in sufficient detail to permit checking of the tables. The drawings shall show, as a minimum, the length, width, depth of the barge, and dimensions of the rake or rakes. Each such table shall have its accuracy certified by a person or firm, other than the Contractor, customarily performing this service. Each table submitted shall contain, in parallel columns, the freeboard of the barge in feet and tenths from zero to the full depth of the barge and the corresponding gross displacement to the nearest ton. Each barge shall be suitably marked with three displacement gaging locations on each side near each end of the barge and two amidships on opposite sides]. Each gaging location shall be marked by a line perpendicular to the edge of the barge, 4 inches wide and 1 foot long, on both the deck and side of the barge and two amid ship on opposite sides. Barges with rakes shall have the displacement gaging lines placed at each

corner of the box section between the rakes. If a barge has a box end or ends, the gaging locations shall be placed approximately 4 feet from the box end(s). The freeboard will be measured at the six gaging locations and the displacement determined by the use of "STANDARD BARGE TABLES" from the average of these measurements. The displacement will be determined before and after being unloaded and the difference between these values shall be the quantity delivered. Barges shall be loaded so that the readings taken at the gaging locations do not vary more than 1.5 feet port to starboard fore and aft and do not vary more than 0.5 feet port to starboard. If such is not the case, the Contractor shall trim the carrier by shifting the stone until this limit is reached, before the measurement will be accepted. The draft shall be determined from the average of all six readings weighting the readings of the middle gage at double those of the end gages. ($G_1 + G_2 + 2xG_3 + 2xG_4 + G_5 + G_6$) divided by 8 = average draft. All carriers used in transporting stone shall be free of leaks such as would render accurate gauging difficult. Facilities for inspecting the hold of each carrier to determine whether leakage is occurring shall be provided. Each carrier shall also be provided with adequate pumping facilities, and if water is found to be accumulating in the hold, the carrier shall be pumped dry before each gaging, both before and after unloading. Lightening by pumping or by transfer of crew or supplies will not be permitted while stone is being transferred. Rejected stone and unacceptable material shall be left aboard the barge until after the final readings have been taken.

(2) If barge tables are furnished for fresh water and if the Contractor believes that barge displacement measurements made within the contract limits of the work are being taken in water that has salinity, he will have the option of obtaining water samples and determining densities or unit weights of these samples. These water samples shall be taken in accordance with ASTM D 3370 (Practice A - Grab Samples) at depths of 4 feet and 8 feet in the area where measurements are made. Water sampling shall be performed when the ~~[~~barges~~]~~~~[vessels]~~ are measured for quantities, both when fully loaded and when empty. Water samples shall be taken by the Contractor and witnessed by the Contracting Officer with the use of "Polypro" 2000 ml water sampler, or equal. Densities shall be determined as specified in ASTM D 1429 (Method D-Hydrometer Method). Testing shall be done for the Contractor by a certified testing laboratory, and test results certified by the laboratory. After review and approval of the test results by the Contracting Officer, the average of the densities obtained at 4 feet and 8 feet will be used as the suitable salt water conversion factor. In all calculations, the unit weight of 62.4 pounds per cubic foot will be used for fresh water.~~]~~

1.5.2.3 Unit of Measure

Unit of measure: ton.

1.6 SECTION 02464 (METAL SHEET PILING) UNIT PRICES

1.6.1 Sheet Piling: Line Item 0007AE

1.6.1.1 Payment

Payment for sheet piling quantities will be made at the applicable contract price per square foot for furnished and installed sheet piling. Payment shall cover all cost of furnishing, handling, storing and installing piling including placing, driving, cutting holes and other materials and work incident thereto.

1.6.1.2 Measurement

The length of sheet piling installed will be measured to the nearest tenth of a square foot. For installed pilings directed to be cut off before reaching the penetration depth shown, the portion cut off will be measured for payment as the difference between the total length of piling shown on the plans for that location and the length of piling installed below the point of cut-off.

1.6.1.3 Unit of Measure

Unit of measure: square foot.

1.6.2 Cut-Offs

1.6.2.1 Payment

When pilings which have not been driven to penetration depths shown are directed to be cut off except for cut-offs due to excessive battering, a lump sum payment will be made for cutting off each piling.

1.6.2.2 Measurement

An additional sum will be paid for each square foot of the portion cut off and measured for payment. For installed pilings directed to be cut off before reaching the penetration depth shown, the portion cut off will be measured for payment as the difference between the total area of piling shown on the plans for that location and the area of piling installed below the point of cut-off at the rate of 50 percent of the applicable contract unit price.

1.6.2.3 Unit of Measure

Unit of measure: each.

1.6.3 Pulled Pilings

1.6.3.1 Payment

The Contractor furnished pilings which have been installed and are pulled at the direction of the Contracting Officer and found to be in good condition will be paid for at the applicable contract unit price for furnishing and installing the pilings in their initial position plus an equal amount for the cost of pulling.

1.6.3.2 Measurement

When such pulled pilings are redriven, an additional amount equal to 50 percent of the applicable contract unit price for furnishing and driving the pilings will be paid for redriving the pilings. This additional price constitutes payment for redriving only. The cost of furnishing, initial driving, and pulling the pilings is to be paid for as specified. When pilings are pulled and found to be damaged no payment will be made for the

initial furnishing and driving or for the pulling of such pilings. Pilings replacing damaged pilings will be paid for at the applicable contract unit prices.

1.6.3.3 Unit of Measure

Unit of measure: each.

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SECTION 01410

ENVIRONMENT PROTECTION

PART 1 GENERAL

1.1 SCOPE

This section covers prevention of environmental damage as the result of construction operations under this contract and for those measures set forth in other Technical Requirements of these specifications. For the purpose of this specification, environmental damage is defined as the presence of hazardous, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances; affect other species, biological communities, or ecosystems; or degrade the quality of the environment for aesthetic, cultural, and/or historical purposes. The control of environmental damage requires consideration of land, water, and air, and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants.

1.2 QUALITY CONTROL

The Contractor shall establish and maintain quality control for environmental protection of all items set forth herein. The Contractor shall record on daily quality control reports or attachments thereto, any problems in complying with laws, regulations and ordinances, and corrective action taken.

1.3 PERMITS AND AUTHORIZATIONS

a. Florida Department of Environmental Protection St. Lucie Inlet Improvements Permit No. 0129368-002-JC Martin County and Variaence No. 0129368-003-EV: Effective Date: 18 April 2001 and ~~subsequent~~ Modification~~s~~ issued 02 November 2001;
Expiration Date: 18 April 2006.

b. Florida Department of Environmental Protection Donaldson Reef Permit No. 43-0166768-001; Effective Date: 21 August 2000;
Expiration Date: 20 August 2005.

The Contractor shall comply with all requirements under the terms and conditions set out in all permit(s).

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-08 Statements

Environmental Protection Plan; G|PD.

Within 10 calendar days after the date of Notice of Award, the Contractor shall submit an Environmental Protection Plan for review and acceptance by the Contracting Officer. The Government will consider an interim plan for the first 30 days of operations. However, the Contractor shall furnish an acceptable final plan no later than 30 calendar days after receipt of Notice to Proceed. Approval of the Contractor's plan shall not relieve the Contractor of his responsibility for adequate and continuing control of pollutants and other environmental protection measures. Approval of the plan is conditional and predicated on satisfactory performance during construction. The Government reserves the right to require the Contractor to make changes to the Environmental Protection Plan or operations if the Contracting Officer determines that environmental protection requirements are not being met. No physical work at the site shall begin prior to acceptance of the Contractor's plan or an interim plan covering the work to be performed. The Environmental Protection Plan shall include but not be limited to the following:

a. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

b. Methods for protection of features to be preserved within authorized work areas. The Contractor shall prepare a listing of methods to protect resources needing protection, i.e., trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archeological, and cultural resources.

c. Procedures to be implemented to provide the required environmental protection and to comply with the applicable laws and regulations. The Contractor shall provide written assurance that immediate corrective action will be taken to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures set out in accordance with the environmental protection plan.

d. A permit or license for and the location of the solid waste disposal area.

e. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossing, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials.

f. Environmental monitoring plans for the job site, including land, water, air, and noise monitoring.

g. Maritime traffic control plan.

h. Methods of protecting surface and ground water during construction activities.

i. Spill prevention. The Contractor shall specify all potentially hazardous substances to be used on the job site and intended actions to prevent accidental or intentional introduction of such materials into the air, ground, water, wetlands, or drainage areas. The plan shall specify the Contractor's provisions to be taken to meet Federal, State, and local laws and regulations regarding labeling, storage, removal, transport, and disposal of potentially hazardous substances.

j. Spill contingency plan for hazardous, toxic, or petroleum material.

k. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas.

l. Plan of borrow area(s).

m. A statement as to the person who shall be responsible for implementation of the Environmental Protection Plan. The Contractor personnel responsible shall report directly to the Contractor's top management and shall have the authority to act for the Contractor in all environmental protection matters.

n. Recycling and waste management plan. Executive Order 12873 of 20 October 1993 requires a number of considerations in planning a project. Fallen trees should not be burned or buried. Mulching, composting, and other uses for trees should be considered. Also, recovery of metals at the job site, including aluminum cans, should be considered with proceeds to be retained by the Contractor. Non-Federal recycling and waste minimization efforts shall also be incorporated into this plan.

o. Appendices (permits and Ocean Dredged Material Disposal Site Monitoring and Management Plan if applicable). A copy of all permits applicable to the project shall be attached as appendices to the Environmental Protection Plan.

SD-18 Records

Logs/Final Summary Report; FIO.

Contractor shall submit as specified, logs and final summary report of sightings and incidents with endangered species.

Project Environmental Summary Sheet; FIO.

Contractor shall submit within 30 days following completion of the project, a written report of the absence or occurrence of environmental incidents. In addition, for construction activities whose anticipated duration is more than one calendar year, the Contractor shall complete a sheet each May 31st (plus/minus 14 days).

1.5 SUBCONTRACTORS

Assurance of compliance with this section by subcontractors shall be the responsibility of the Contractor.

1.6 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with the aforementioned Federal, State, or local laws or regulations, permits and other elements of the Contractor's environmental protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of proposed corrective action and take such action as may be approved. If the Contractor fails to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time

extensions shall be granted or costs or damages allowed to the Contractor for any such suspension.

Additionally, the Contractor shall notify the Authorized Contracting Officer's Representative (ACOR), in writing, of the absence or occurrence of environmental incidents, as required on the Project Environmental Summary Sheet, copy appended to the end of this Section. (Refer to paragraph SUBMITTALS above.)

1.7 TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL

The Contractor shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and careful installation and monitoring of the project to ensure adequate and continuous environmental pollution control. Quality Control and supervisory personnel shall be thoroughly trained in the proper use of monitoring devices and abatement equipment, and shall be thoroughly knowledgeable of Federal, State, and local laws, regulations, and permits as listed in the Environmental Protection Plan submitted by the Contractor. Quality Control personnel will be identified in the Quality Control Plan submitted in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 PROTECTION OF ENVIRONMENTAL RESOURCES

For contract work, the Contractor shall comply with all applicable Federal, State, or local laws and regulations. The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected at least during the entire period of this contract. The Contractor shall confine his activities to areas defined by the drawings and specifications. Deviations from drawings or specifications (e.g., proposed alternate borrow areas, disposal areas, staging areas, and alternate access routes) could result in the need for the Government to reanalyze and re-approve the project from an environmental standpoint. Environmental protection shall be as stated in the following subparagraphs.

3.1.1 General Project Environmental Design and Installation Criteria

Some project sites have features that shall not be impacted in any way, including cultural, historic, or archeological features. At all sites, project plans should minimize disturbance to existing features at the site to the extent possible, including vegetative, topographic, and drainage pattern features. Wetland impacts (temporary access, detours, staging areas, and other work area impacts) to project sites should be avoided and may require separate permitting action. Any wetlands temporarily impacted shall have its soil restored upon project completion. Expansion of previously permitted project footprints may likewise require separate permitting action.

In all cases, the design and/or installation of project system shall provide for protection of the environment during handling, installing, storing, utilizing, transporting, servicing, testing, refilling, transferring, pumping, processing, removing waste products, repairing and maintaining systems and their components. Necessary design protection

shall also be considered that would prevent contamination of the environment from impacts to the system caused by storm water runoff and flooding. Retrofit of connected systems on project sites to modern environmental protection design standards shall also be considered.

In the event environmental protection measures fail, the Contractor shall implement procedures to control and correct environmental damage.

3.1.1.1 Petroleum-Based Systems Environmental Design and Installation Criteria

For petroleum-based systems, a statement of site suitability shall be provided and shall include what would be necessary to prevent adverse impact to water quality; natural resources; habitat; historic, cultural, and archeological sites; and fragile local resources in the event of a fuel spill. Human error and mechanical/electrical failure of components without human intervention shall also be considered in the design with regard to spills. Additionally, appropriate noise and emissions controls shall be incorporated into the design, including vapor and exhaust controls.

At a minimum, environmental protection design requirements shall also include the following: (1) stationary tanks and piping shall have secondary containment features; (2) approved materials and corrosion protection systems shall be utilized; (3) system leaks shall be readily detected and contained without human intervention; and, (4) overfill containment systems shall be provided.

Applicable Federal, State, and local codes and requirements shall be strictly adhered to in the design, including those of the U.S. Environmental Protection Agency (EPA), the State of Florida, the South Florida Water Management District (SFWMD), and other local governing agencies such as those of counties and municipalities. In the case of the State, requirements include Chapter of the Florida Administrative Code (FAC) such as 62-17 (Approved Materials), 62-252 (Vapor Emissions), 62-296 (Emissions), 62-761 (Underground Storage Tanks), and 62-762 (Aboveground Tanks). Note that Chapters 62-761 and 62-762 of the FAC may be combined into one Chapter. Best Management Practices from the applicable agencies shall also be adhered to in the design.

3.1.1.2 Sewage-Based Systems Environmental Design and Installation Criteria

In general, there shall be no waste or debris discharges of any kind for a project unless authorized by the Contracting Officer. This shall include the Contractor's providing sufficient temporary sanitary equipment and facilities for the project. The design and/or installation of temporary or permanent sewage systems shall ensure that waters will be free of effects of sewage discharges. Applicable Federal, State, or local codes and requirements regarding sewage shall be strictly adhered to in the design, such as those of the EPA and, in the case of the State, Chapter 62-620 (Wastewater Facilities) of the FAC. Best Management Practices from the applicable agencies shall also be adhered to in the design.

3.1.2 Protection of Land Resources

Prior to the beginning of any construction, the Contractor shall identify all land resources to be preserved or avoided within the Contractor's work area. Materials displaced into uncleared areas shall be removed. The Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without

special permission from the Contracting Officer. The Contractor shall engage a qualified tree surgeon to perform all tree surgery. The Contractor shall be responsible to repair injuries to bark, trunk, branches, and roots of protected trees by dressing, cutting, and painting as specified for Class I Fine Pruning, of the National Arborist Association Pruning Standards for Shade Tree or as per State's Agricultural Extension Agency Guidelines, immediately as occurrences arise. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs.

3.1.2.1 Work Area Limits

Prior to any construction, the Contractor shall mark the areas that are not required to accomplish all work to be performed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. The Contractor shall protect from damage all existing trees designated to remain. Protection of tree roots shall be provided against noxious materials in solution caused by run-off or spillage. Fires shall be located outside the canopy of protected trees. No materials, trailers, or equipment shall be stored within the drip line of any protected tree. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor shall convey to his personnel the purpose of marking and/or protection of all necessary objects.

The Contractor shall thoroughly clean all construction equipment at the prior job site in a manner that ensures all residual soil is removed and that egg deposits from plant pests are not present. The Contractor shall consult with the U.S. Department of Agriculture (USDA) regarding additional cleaning requirements that may be necessary.

3.1.2.2 Protection of Landscape

Trees and their roots, shrubs, vines, grasses, land forms, and other landscape features shall be clearly identified and protected by fencing or any other approved techniques. Protection of trees shall be as illustrated in the Tree Protection Plan Detail appended to the end of this Section. Tree protection fencing shall be placed before excavation or grading is begun and maintained in place until construction is complete. Branches of protected trees, if required, shall be removed to clear for construction and pruning shall subsequently be performed to restore the natural shape of the entire tree. Branches or roots, if required, shall be cut with sharp pruning instruments and not broken or chopped. Protected trees shall be fertilized to compensate for root loss with 6-6-6 as per manufacturer's application direction. Any damage to tree crowns or roots shall be repaired promptly after damage occurs.

a. Trench or Bore Under Trees. Where trenching for utilities is required within tree driplines, the Contractor shall hand dig under and around roots or bore under them. The Contractor shall protect roots from drying and cover exposed roots within an hour as specified in subparagraph "Excavation for Structures" below. No lateral roots which interfere with new construction shall be cut. Boring is permitted.

b. Excavation for Structures. Where excavating for new construction is required within tree drip lines, the Contractor shall hand excavate

to minimize damage to root systems. The Contractor shall use narrow tine pitchforks and comb soil to expose roots. The Contractor shall relocate roots in backfill areas. If large, main lateral roots are encountered that are exposed beyond the excavation limits, the Contractor shall bend and relocate these roots without breaking or girdling. If roots are encountered immediately adjacent to new construction such that relocation is not practical, the Contractor shall saw roots approximately 3" back from the new construction, seal with tree wound dressing, and protect any exposed embankment of roots from drying by covering with straw and black plastic. The Contractor shall irrigate affected areas daily until final grade conditions are established and the exposed roots are backfilled properly for continued plant growth.

c. Replacement. The Contractor shall remove dead or damaged protected trees determined, by the Government, to be incapable of restoration to normal health growth. The Contractor shall replace each removed tree up to 4" caliper with tree of equal specie and size. For each tree removed larger than a 4" caliper, the Contractor shall replace the tree with one 4" caliper tree per 4" caliper increment or fraction thereof.

3.1.2.3 Unprotected Erodible Soils

Earthwork brought to final grade shall be finished as indicated. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in instances where the constructed feature obscures borrow areas, quarries, and waste material areas, these areas shall not initially be totally cleared. Clearing of such areas shall progress in reasonably sized increments as needed to use the areas developed as approved by the Contracting Officer.

3.1.2.4 Disturbed Areas

The Contractor shall effectively prevent erosion and control sedimentation through approved methods including, but not limited to, the following:

a. Retardation and Control of Runoff. Runoff from the construction site or from storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, and by any measures required by area wide plans approved under paragraph 208 of the Clean Water Act.

b. Erosion and Sedimentation Control Devices. The Contractor shall construct or install temporary and permanent erosion and sedimentation control features as directed by the Contracting Officer's Representative. Temporary velocity dissipation devices shall be placed along drainage courses so as to provide for non-erosive flows. Temporary erosion and sediment control measures such as berms, dikes, drains, sediment traps, sedimentation basins, grassing, mulching, baled hay or straw, and silt fences shall be maintained until permanent drainage and erosion control facilities are completed and operative. For silt fences, the filter fabric is to be of nylon, polyester, propylene, or ethylene yarn of at least 50 lb/in strength and able to withstand a flow rate of at least 0.3 gal/ft sq/minute. The fabric should contain ultraviolet ray inhibitors and stabilizers and be a minimum of 45 inches in width. The toe of the fence shall be buried at least 8 inches deep to prevent undercutting and shall be secured to

posts by suitable staples, tie wire, or hog rings. Posts shall have a cross section of at least 2"x4" and a minimum of 4 foot in length. Fence shall be overlapped to the next post if fabric joints are necessary.

c. Sediment Basins. Sediment from construction areas shall be trapped in temporary or permanent sediment basins in accordance with basin plans shown on the drawings. The basins shall accommodate the runoff of a local 5-year storm. After each storm, the basins shall be pumped dry and accumulated sediment shall be removed as necessary to maintain basin effectiveness. Overflow shall be controlled by paved weir or by vertical overflow pipe, draining from the surface. The collected topsoil sediment shall be reused for fill on the construction site, and/or conserved (stockpiled) for use at another site(s). The Contractor shall institute effluent quality monitoring programs as required by State and local environmental agencies.

3.1.2.5 Contractor Facilities and Other Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made when approved by the Contracting Officer. Borrow areas shall be managed to minimize erosion and to prevent sediment from entering nearby watercourses, wetlands, or lakes. Spoil areas shall be managed and controlled to limit spoil intrusion into areas designated on the drawings and to prevent erosion of soil or sediment from entering nearby watercourses, wetlands, or lakes. Spoil areas shall be developed in accordance with the grading plan indicated on the drawings. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas from despoilment. If there is suspicion that sediment may be unsuitable for disposal at a specified location, the Contractor shall immediately take measures to contain the suspect sediment and notify the Contracting Officer.

3.1.2.6 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. All handling and disposal shall be conducted to prevent contamination.

a. Disposal of Solid Waste by Removal from Government Property. The Contractor shall transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal.

b. Disposal of Solid Waste on Government Property. Waste materials shall be hauled to the Government landfill site designated by the Contracting Officer. The Contractor shall comply with Federal, State, and local regulations pertaining to the use of landfill areas.

3.1.2.7 Fuel, Oil, and Lubricants

Fuel, oil, and lubricants shall be managed so as to prevent spills and evaporation. To prevent spills, fuel dispensers shall have a 4-foot square, 16-gauge metal pan with borders banded up and welded at corners right below the bibb. Edges of the pans shall be 8-inch minimum in depth to ascertain that no contamination of the ground takes place. Pans shall be cleaned by an approved method immediately after every dispensing of fuel

and wastes disposed of offsite in an approved area. Should any spilling of fuel occur, the Contractor shall immediately recover the contaminated ground and dispose of it offsite in an approved area. Petroleum waste generated shall be stored in marked corrosion-resistant containers and recycled or disposed of in accordance with 40 CFR 279, State and local regulations.

3.1.2.8 Hazardous Waste

Hazardous wastes are defined in 40 CFR 261. The Contractor shall ensure that hazardous wastes are stored and disposed of in accordance with 40 CFR 261 and State and local regulations. The Contractor shall ensure that hazardous wastes are packed, labeled, and transported in accordance with 49 CFR 173 and State and location regulations.

3.1.2.9 Hazardous Materials

The Contractor shall ensure that hazardous materials are labeled, stored, and transported in accordance with 49 CFR 173, State, and local regulations.

3.1.2.10 Disposal of Other Materials

Other materials than previously discussed (Construction and Demolition, vegetative waste, etc.) shall be handled as directed.

3.1.3 Preservation and Recovery of Historic, Archeological, and Cultural Resources

3.1.3.1 Applicable Law

A number of Federal laws require protection of cultural resources. Two laws, in particular, can be potentially involved with dredging activities: (1) the National Historic Preservation Act, as amended; and, (2) the Abandoned Shipwreck Act.

3.1.3.2 Inadvertent Discoveries

If, during or other construction activities, the Contractor observes items that may have historic or archeological value, such observations shall be reported immediately to the Contracting Officer so that the appropriate Corps staff may be notified and a determination for what, if any, additional action is needed. Examples of historic, archeological and cultural resources are bones, remains, artifacts, shell, midden, charcoal or other deposits, rocks or coral, evidences of agricultural or other human activity, alignments, and constructed features. The Contractor shall cease all activities that may result in the destruction of these resources and shall prevent his employees from further removing, or otherwise damaging, such resources.

The possibility of encountering submerged cultural resources is inherent in dredging and snagging operations. Such findings could include shipwrecks, shipwreck debris fields (such as streamed engine parts), prehistoric watercraft (such as log "dugouts"), and other structural features intact or displaced. The materials may be deeply buried in sediment, resting in shallow sediments or above them, or protruding into water. Suspected cultural materials inadvertently gathered from a water-saturated context should be kept moist by re-immersion, spraying, or some other expedient means of wetting until the appropriate Corps staff provide further directives. No interviews or other contact with media shall occur without

clear authorization from the Contracting Officer or the appropriate Corps representative.

3.1.3.3 Claims for Downtime due to Inadvertent Discoveries

Upon discovery and subsequent reporting of a possible inadvertent discovery of cultural resources, the Contractor shall seek to continue work well away from, or otherwise protectively avoiding, the area of interest, or in some other manner that strives to continue productive activities in keeping with the contract. Should an inadvertent discovery be of the nature that substantial impact(s) to the work schedule are evident, such delays shall be coordinated with the Contracting Officer.

3.1.4 Protection of Water Resources

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface, ground waters, and wetlands. The Contractor shall plan his operation and perform all work necessary to minimize adverse impact or violation of the water quality standard. Special management techniques as set out below shall be implemented to control water pollution by the listed construction activities which are included in this contract. The Contractor's construction methods shall protect wetland and surface water areas from damage due to mechanical grading, erosion, sedimentation and turbid discharges. There shall be no storage or stockpiling of equipment, tools, or materials within wetlands or along the shoreline within the littoral zone unless specifically authorized.

3.1.4.1 Washing and Curing Water

Waste waters directly derived from construction activities shall not be allowed to enter water areas. These waste waters shall be collected and placed in retention ponds where suspended materials can be settled out or the water evaporates so that pollutants are separated from the water. Analysis shall be performed and results reviewed and approved by Corps staff before water in retention ponds is discharged.

3.1.4.2 Cofferdam and Diversion Operations

Construction for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure shall be controlled at all times to limit the impact of water turbidity on the habitat for wildlife and impacts on water quality for downstream use.

3.1.4.3 Stream Crossings

Stream crossings shall be controlled during construction. Crossings shall provide movement of materials or equipment without violating water pollution control standards of the Federal, State, or local government.

3.1.4.4 Monitoring of Water Areas

Monitoring of water areas affected by construction activities shall be the responsibility of the Contractor. All water areas affected by construction activities shall be monitored by the Contractor.

3.1.4.5 Turbidity

The Contractor shall conduct his dredging and disposal operations in a

manner to minimize turbidity and shall conform to all water quality standards as prescribed by Chapter 62-302, State of Florida, Department of Environmental Protection (FDEP). FDEP surface water quality standards can be obtained from the following web sites: http://www.dep.state.fl.us/ogc/documents/rules/shared/62-302.pdf and http://www.dep.state.fl.us/ogc/documents/rules/shared/62.302t.pdf.

3.1.4.6 Oil, Fuel, and Hazardous Substance Spill Prevention and Mitigation

The Contractor shall prevent oil, fuel, or other hazardous substances from entering the air, ground, drainage, local bodies of water, or wetlands. This shall be accomplished by design and procedural controls. In the event that a spill occurs despite the design and procedural controls, the following shall occur:

(1) Immediate action shall be taken to contain and cleanup any spill of oil, fuel or other hazardous substance.

(2) Spills shall be immediately reported to the Contracting Officer.

(3) Spill contingency planning shall be strictly in accordance with the criteria of 40 CFR, Part 109.

(4) To control the spread of any potential spill, absorbent materials shall be readily available and capable of absorbing the contents of the single largest tank.

(5) To control the spread of any potential spill, the Contractor shall provide a written certification of commitment of manpower, equipment, and materials required to expeditiously cleanup and dispose of spill materials.

a. Spill Preventive Systems

System design and installation requirements have been discussed at the beginning of this Section. Temporary or portable tanks shall conform to applicable Federal, State, and local codes and requirements and shall not be placed where they may be affected by storm, flooding, or washout. Diversionary structures for spills shall be put in place in advance where practical. Both spill preventive systems and any deviations from associated requirements must be approved by the Contracting Officer prior to implementation.

b. Liabilities

The Contractor shall be liable in the amounts established in 40 CFR, Part 113 when it can be shown that oil was discharged as a result of willful negligence or willful misconduct. The penalty for failure to report the discharge of oil shall be in accordance with the provision of 33 CFR, Part 153.

3.1.5 Protection of Fish and Wildlife Resources

The Contractor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife. Species that require specific attention along with measures for their protection shall be listed in the Contractor's Environmental Protection Plan prior to the beginning of construction

operation.

The Contractor shall instruct all personnel associated with the project of the potential presence of manatees and sea turtles in the area, and the need to avoid harming these animals. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees or sea turtles, or whales which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Florida Manatee Sanctuary Act. The Contractor shall be held responsible and liable for any of the above-mentioned animals that are harmed, harassed, or killed as a result of construction activities. In the event that a threatened or endangered species is harmed as a result of construction activities, the Contractor shall cease all work and notify the Contracting Officer's Representative.

a. Siltation Barriers. If siltation barriers are used, they shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to or exit from essential habitat.

b. Special Operating Conditions

(1) All vessels associated with the project shall operate at "no wake/idle" speeds at all times while in waters where the draft of the vessel provides less than a four-foot clearance from the bottom, and vessels shall follow routes of deep water whenever possible. Boats used to transport personnel shall be shallow-draft vessels, preferably of the light-displacement category, where navigational safety permits. Mooring bumpers shall be placed on all barges, tugs, and similar large vessels wherever and whenever there is a potential for manatees to be crushed between two moored vessels. The bumpers shall provide a minimum stand-off distance of four feet.

(2) If a manatee(s) is sighted within 100 yards of the project area, all appropriate precautions shall be implemented by the Contractor to ensure protection of the manatee. These precautions shall include the operation of all moving equipment no closer than 50 feet of a manatee. If a manatee is closer than 50 feet to moving equipment or the project area, the equipment shall be shut down and all construction activities shall cease within the waterway to ensure protection of the manatee. Construction activities shall not resume until the manatee has departed the project area.

(3) During the period December through March, hopper dredges moving through the designated critical habitat of the right whale (Eubalaena glacilis) shall take the following precautions. During evening hours or when there is limited visibility due to fog or sea states greater than Beaufort 3, the dredge operator shall slow down to 5 knots or less when traversing between areas if whales have been spotted within 15 nautical miles (nm) of the vessel's path within the previous 24 hours. In addition, the dredge operator shall maintain a 500-yard buffer between the vessel and any whale. The area designated as critical habitat in the southeastern United States encompasses waters between 31°15'N (approximately located at the mouth of the Altamaha River, GA) and 30°15'N (approximately Jacksonville, FL) from the shoreline out

to 15 nm offshore; and the waters between 30~~(~~°15'N and 28~~(~~°00'N (approximately Sebastian Inlet, FL) from the shoreline out to 5 nm.

c. Manatee Monitoring. During performance of all in-water work~~ater~~, a dedicated observer shall monitor for the presence of manatees. If manatees are present, the observer shall document all activities with the use of a video camera with the capabilities of video taping at night. The video tape shall have date/time signature and record all manatee movements in the construction area and note any reactions to turbidity, sound, and light. The Contractor shall forward 3 copies to the Acting Chief, Environmental Branch, P.O. Box 4970, Jacksonville, Florida, 32232-0019, within 10 days of completion of the dredging. Movement of a work barge, other associated vessels, or the performance of any in-water work shall be minimized to the extent possible after sunset when the possibility of spotting manatees is negligible.

3.1.5.1 Sea Turtle Monitoring

a. Sea Turtle Monitoring. If dredging of material in the beach area along St. Lucie Inlet has commenced on or before March 1st, turtle monitoring and nest location and re-location shall commence on March 1st and continue concurrently with the performance of work. The permittee, Martin County, will ensure that the project area and access sites are surveyed for marine turtle nesting activity per requirements of the referenced State DEP Water Quality Certificate.

b. Daily Beach Sea Turtle Inspections. Daily marine turtle nest survey of the nesting beach in the vicinity of project shall be conducted starting March 1 and continue until October 31. Only nests that may be affected by construction activities shall be relocated. No construction activity may commence until completion of the marine turtle survey each day unless the permittee, Martin County, has made provisions for nighttime marine turtle surveys of the area. The permittee shall obtain authorization for incidental take from the U. S. Fish and Wildlife Service. The permittee will be responsible for daily logs and all reports, as required.

c. Sea Turtle Monitors. The permittee, Martin County, will be responsible for providing a FF&WWC permitted sea turtle monitor(s).

3.1.5.2 Contractor Construction Responsibilities

a. Project Lighting. Project lighting shall be limited to the immediate area of activity construction only and shall be minimal lighting necessary to comply with U. S. Coast Guard and/or OSHA requirements. Stationary lighting on the beach and all lighting on the dredge shall be minimized to reduce illumination of the nesting beach and water. The contractor may minimize lighting through reduction, shielding, lowering, and appropriate placement of lights.

b. Sea Turtle Protection Meeting. The permittee, Martin County, shall coordinate a meeting with the Contractor, the Contracting Officers Representative, the Department of FWC, and the permitted person(s) responsible for egg relocation at least 30 days prior to commencement of dredging. 10 days advance notice is requested. This meeting will provide opportunities to explain and/or clarify the sea turtle protection measures required.

c. Staging Area. To minimize disturbance to sea turtle nesting and hatching activities, all construction equipment shall be ~~located/stored off~~

prohibited from all beach areas within the project site during ~~dredging~~all construction activities.

3.1.5.3 Manatee, Sea Turtle, and Whale Sighting Reports

Any collisions with a manatee, sea turtle, or whale or sighting of any injured or incapacitated manatees, sea turtles, or whales shall be reported immediately to the Corps of Engineers. The order of contact within the Corps of Engineers shall be as follows:

Order of Contact of Corps Personnel for Dredging
Contractor to Report Endangered Species Death or Injury

Title	Telephone Number Work Hours	After Hours
Corps, Inspector	On site	Lodging Location
Mr. John G. Cooper, Area Engineer, South Florida Area Office (CESAJ-CO-W)	561-626-5299	To be Provided
Acting Chief, Environmental Branch, Planning Division (CESAJ-PD-E)	904-232-1685	To be Provided
Mr. Charles McGehee, Chief, Construction Branch, Construction-Operations Division (CESAJ-CO-C)	904-232-1122	To be Provided
Mr. Gordon M. Butler, Jr., Chief, Construction-Operations Division (CESAJ-CO)	904-232-3765	To be Provided

The Contractor shall also immediately report any collision with and/or injury to a manatee to the Florida Marine Patrol "Manatee Hotline" 1-800-342-5367 as well as the U.S. Fish and Wildlife Service, Vero Beach Field Office 561-562-3909 for South Florida.

3.1.5.4 Disposition of Turtles or Turtle Parts

Positively identified turtle parts shall be disposed of at the disposal site(s). Turtle parts which cannot be positively identified on board the dredge or barge(s) shall be preserved by the observer(s) for later identification. Observer(s) shall measure, weigh, tag, and release any uninjured turtles incidentally taken by the dredge. Observer(s) (or their authorized representative) shall transport, as soon as possible, any injured turtles to a rehabilitation facility such as Sea World at Orlando, Florida.

3.1.5.5 Report Submission

The Contractor shall maintain a log detailing all incidents, including sightings, collisions with, injuries, or killing of manatees, sea turtles, or whales occurring during the contract period. The data shall be recorded on forms provided by the Contracting Officer (sample forms are appended to the end of this Section). All data in original form shall be forwarded directly to the Acting Chief, Environmental Branch, P. O. Box 4970, Jacksonville, Florida, 32232-0019, within 10 days of collection and copies of the data shall be supplied to the Contracting Officer. Following project completion, a report summarizing the above incidents and sightings

shall be submitted to the following:

Florida Fish and Wildlife Conservation Commission
Bureau of Protected Species Management
620 South Meridian Street
Tallahassee, Florida 32399-1600

Acting Chief, Environmental Branch
U.S. Army Corps of Engineers (CESAJ-PD-E)
P.O. Box 4970
Jacksonville, Florida 32232-0019

U.S. Fish and Wildlife Service
P. O. Box 2676
Vero Beach, Florida 32961-2676

National Marine Fisheries Service
Protected Species Management Branch
9721 Executive Center Drive
St. Petersburg, Florida 33702

3.1.6 Seagrass and Hardbottom Protection Measures

a. The Contractor shall instruct all personnel associated with the project of the presence of seagrasses, especially the Federally-listed threatened Johnson's Seagrass (Halophlia johnsonii), and the need to avoid contact with seagrasses.

b. All construction personnel shall be advised that there are civil and criminal penalties for harming or destroying seagrasses, especially Johnson's Seagrass which is protected under the Endangered Species Act of 1973, as amended. The Contractor may be held responsible for any seagrasses harmed or destroyed due to construction activities.

c. The Contractor shall not anchor, place pipeline, or stage equipment in a manner that will cause any damage to seagrasses or hardbottoms. Anchoring, placing pipeline, or staging equipment shall avoid these sensitive areas. If such activities cannot be done without affecting these sensitive areas, the activities shall cease and the Contracting Officer and Acting Chief, Environmental Branch (904-232-1685) shall be immediately notified (no later than the morning following the next working day if the incident occurs after normal working hours). Any actual or potential incident involving damage to, or disturbance of, seagrasses or hardbottoms shall be reported.

3.1.7 Protection of Air Resources

The Contractor shall keep construction activities under surveillance, management, and control to minimize pollution of air resources. All activities, equipment, processes and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with the applicable air pollution standards of the State of Florida (Florida Statute, Chapter 403 and others and Chapters 200 series of the FAC) and all Federal emission and performance laws and standards, including the U.S. Environmental Protection Agency's Ambient Air Quality Standards. Information regarding Florida Statutes can be obtained from the following websites:
http://www.dep.state.fl.us/ogc/documents/statutes/text/403.doc;
http://www.dep.state.fl.us/ogc/documents/rules/aiur/62-213.doc; and,

http://www.dep.state.fl.us/ogc/documents/rules/mainrule.htm.

3.1.7.1 Particulates

Particulates, such as dust, shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and work areas within or outside the project boundaries free from particulates that would cause air pollution standards to be exceeded or that would cause a hazard or nuisance. The Contractor shall have the necessary equipment and approved methods to control particulates as the work proceeds and before a problem develops.

3.1.7.2 Burning

All burning shall be subject to State and local requirements, including requirements for burn permits and bans during certain conditions such as droughts.

3.1.7.3 Odors

Odors shall be controlled at all times for all construction activities.

3.1.8 Protection of Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize damage to the environment by noise.

3.2 POSTCONSTRUCTION CLEANUP

The Contractor shall clean up any area(s) used for construction.

3.3 PRESERVATION AND RESTORATION OF LANDSCAPE AND MARINE VEGETATION DAMAGES

The Contractor shall restore all landscape features and marine vegetation damaged or destroyed during construction operations outside the limits of the approved work areas. Such restoration shall be a part of the Environmental Protection Plan as defined in subparagraph "Environmental Protection Plan" of paragraph SUBMITTALS above. This work shall be accomplished at the Contractor's expense.

3.4 MAINTENANCE OF POLLUTION CONTROL FACILITIES

The Contractor shall maintain all constructed facilities and pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.5 50-ACRE DONALDSON REEF CONSTRUCTION SITE

~~All~~Non beach-quality material dredged from the St. Lucie Inlet Impoundment Basin shall be placed in the 50-acre Donaldson Reef construction site. See APPENDIX 01410-F for location map and depths. Also, see Section 02325 DREDGING.

3.6 TREE PROTECTION PLAN DETAIL

See APPENDIX 01410-A at the end of this Section (1 page).

3.7 SAMPLE - MANATEE CAUTION SIGNS

See APPENDIX 01410-B at the end of this Section (2 pages).

3.8 SAMPLE - DAILY MANATEE REPORTING LOG

See APPENDIX 01410-C at the end of this Section (1 page).

3.9 SAMPLE - INCIDENT REPORT OF SEA TURTLE MORTALITY AND DREDGING ACTIVITIES

See APPENDIX 01410-D at the end of this Section (1 page).

3.10 PROJECT ENVIRONMENTAL SUMMARY SHEET

See APPENDIX 01410-E at the end of this Section (2 pages).

3.11 DONALDSON REEF CONSTRUCTION SITE LOCATION MAP

See APPENDIX 01410-F at the end of this Section (1 page).

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-- End of Section Table of Contents --

SECTION 01411

TURBIDITY AND PLACEMENT MONITORING

PART 1 GENERAL

1.1 SCOPE

The work covered by this section consists of furnishing all labor, materials, and equipment, and performing all work required to obtain, analyze, and report the results of turbidity and placement monitoring.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-06 Instructions

Calibration Standard; FIO.

The Contractor shall furnish to the Contracting Officer's Representative (COR) a copy of the operating instructions and standards used in calibrating equipment used in collecting samples for turbidity.

SD-09 Reports

Turbidity Monitoring; FIO.

All required turbidity test reports shall be submitted preferably by electronic mail to the COR, to the Environmental Quality Section (CESAJ-PD-EE), within 24 hours after completion of each test.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 MONITORING REQUIREMENTS

3.1.1 General

Nearshore, inland, and reef water samples shall be obtained and analyzed for turbidity. Sampling shall be conducted in accordance with techniques described in the latest edition of "Standard Methods" published by the American Public Health Association (APHA), American Waterworks Association (AWWA), and Water Pollution Control Federation (WPCF), and other current techniques recognized by the scientific community and approved by the Jacksonville District, Corps of Engineers. Samples obtained for turbidity analysis shall be analyzed within 30 minutes of collection. Samples shall be taken with a sampler obtaining samples uncontaminated by water from any other depth.

3.1.1.1 Turbidity Monitoring Equipment

Monitoring required for turbidity shall be measured in Nephelometric Turbidity Units (NTU) using a standard Nephelometer.

3.1.2 Dredging and Placement Locations

Routine monitoring shall occur at the following stations and/or locations:

3.1.2.1 Impoundment Basin ~~and Jetty~~ Construction, and Entrance Channel, Cut-1 Station Descriptions

a. Stations for Background

1. During floodtide the background or average of measurements taken at (seaward) Stations A1, A2, and A3, and taken at mid-depth.

2. During ebb tide the background or average of measurements taken at (landward) Stations B1, B2, and B3, and taken at mid-depth.

b. Stations for Compliance

1. During floodtide the background or average of measurements taken at (landward) Stations B1, B2, and B3, and taken at mid-depth.

2. During ebb tide the background or average of measurements taken at (seaward) Stations A1, A2, and A3, and taken at mid-depth.

c. Locations of Background and Compliance Stations

X-Y coordinates are referenced to the Florida State Plane Coordinates System, East Zone, NAD 1927.

POINT
NORTHING(Y)
EASTING(X)

A1
1,030,675
776,586
A2
1,029,709
775,597
A3
1,029,225
774,124
B1
1,032,148
769,992
B2
1,030,917
769,014
B3
1,029,893
768,059

d. Turbidity Frequency

Turbidity samples shall be taken twice each day during dredging operations at 1) midpoint of the tidal cycle during flood tide, and 2) at the mid-point of the tidal cycle during an ebb tide. Refer to background and compliance stations above.

3.1.2.2 Donaldson Artificial Reef, ~~and~~ Near Shore Placement Area Station Descriptions, and Offshore Spider Barge Unloader, if applicable.

a. Station 1 (Background)

At least 500 meters upcurrent from the barge discharge location, outside of any visible turbidity plume, at mid-depth.

b. Station 2 (Compliance)

No more than 150 meters downcurrent from the barge discharge location, within the densest portion of any visible turbidity plume, at mid-depth.

c. Turbidity Frequency

Turbidity samples for the Donaldson Artificial Reef Site and Near Shore Placement Area shall be taken at the completion of each barge load of excavated material.

3.2 TURBIDITY TESTS

3.2.1 Testing

The Contractor shall provide the Government with a certification, attesting to the accuracy of his testing equipment and procedure. The Contractor shall also provide the Government with a duplicate of the standard used to calibrate his testing instrument as well as a complete set of operating instructions for the turbidity testing equipment. The Contractor and the Corps will use this standard throughout the project to maintain the calibration of the equipment. Whenever there is doubt as to the adequacy of the testing or validity of the results, the COR may direct that additional tests be performed at no additional cost to the Government.

3.2.2 Reporting

The monitoring data shall be recorded on forms that contain the pertinent information in the following paragraphs. Example forms are appended to the end of this Section. Other data shall be submitted in the form supplied by the laboratory chosen to do the analysis. All data shall be forwarded preferably electronically to the COR, Environmental Quality Section (CESAJ-PD-EE), within 24 hours of collection. Electronic mail addresses of the Corps personnel to receive these reports are provided below. Reports shall be provided in a common format such as Excel Spreadsheet (.xls) files, Word (.doc) files, and Web Graphics (Joint Photographic Group or .jpg) files.

NAME	ORGANIZATION	E-MAIL ADDRESS
John Cooper	USACE COR	john.g.cooper@usace.army.mil
~~Jose Carrio~~	~~USACE COR~~	~~jose.r.carrio@usace.army.mil~~
Luis A. Lopez	USACE COR	luis.a.lopez@usace.army.mil
Diana Gerland	USACE COR	diana.r.gerland@usace.army.mil
Matt Miller	USACE PD-EE	matthew.j.miller@usace.army.mil

3.2.2.1 Report Contents

a. Permit application number.

b. Dates of sampling and analysis.

c. A statement describing the methods used in collection, handling, storage, and quality control methods used in the analysis of the samples.

d. A map indicating the sampling location and plume configuration, if any (example map appended to the end of this Section).

e. A statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection, and accuracy of the data.

f. Results of the analyses.

g. A description of any factors influencing the dredging operations or the sampling program. Reports shall be furnished daily even when no sampling is conducted. When sampling is not conducted, a brief statement shall be given in the report explaining the reason for not conducting the sampling, such as "dredge not working due to mechanical problems" or "no sampling taken due to high seas".

3.2.2.2 Monitoring Reports

Monitoring reports shall also include the following information for each day that samples are taken:

a. Time of day and date samples were taken.
b. Depth of water body.
c. Depth of sample.
d. Antecedent weather conditions.
e. Tidal stage and direction of flow.
f. Dredge location (station location and map).
g. Water sample location.
h. Wind direction and velocity.

3.2.2.3 Notification

If turbidity exceeds background levels by more than 29 NTU, the Contractor shall immediately notify the Acting Chief, Environmental Branch at 904-232-1685 and the COR, or on the morning of the following work day if it occurs after normal work hours. In addition, all dredging activities~~y~~ shall cease immediately and all measures to reduce turbidity shall be taken. ~~Dredging~~Work shall not resume until corrective measures have been taken and turbidity has returned to acceptable levels as determined by proper testing described in subparagraph "Dredging and Placement Locations" above.

3.3 DONALDSON REEF SITE (DRS) AND NEAR SHORE PLACEMENT AREA (NSPA) REPORTING AND NOTIFICATION

See SECTION 02325 DREDGING for DRS and NSPA monitoring data and tracking system equipment and/or requirements. Placement reports containing this data shall be submitted to the COR on a weekly basis.

The Contractor shall notify the Acting Chief, Environmental Branch at 904-232-1685 and the COR within 24 hours if placement is suspected to have occurred outside the DRS and NSPA. If material is determined to have been disposed of outside the DRS and NSPA, the Contractor may be held responsible for determination of damage to resources outside the DRS and NSPA, recovery of misplaced material, and restoration of resources outside the DRS and NSPA.

The Contractor shall also provide pre- and post-bathymetric surveys of the DRS and NSPA site in both hard and electronic format. Within three weeks of dredging and placement, a survey shall be performed. The post-placement survey shall be conducted within 10 days after completion of dredging for each site. All surveys shall be sufficient to encompass the DRS and NSPA and a 0.25 nautical mile (nm) wide area around the DRS. The surveys shall be taken along lines spaced at 50.0-foot intervals or less. Accuracy of the surveys shall be within 0.5 feet vertical. Horizontal location of the survey lines and depth sounding points shall be determined by an automated positioning system utilizing either a microwave line of site system or differential global positioning system. The vertical datum shall be mean lower low water (MLLW) and the horizontal datum Florida State Plane or Geographic (NAD 1983 or NAD 1927).

3.4 WORK DELAY

Delays in work due to the fault or negligence of the Contractor or the Contractor's failure to comply with this specification shall not be compensable. Any adjustments to the contract performance period or price that are required as a result of compliance with this section shall be made in accordance with the provisions of the Clause SUSPENSION OF WORK of Section 00700 CONTRACT CLAUSES.

3.5 SAMPLE - TURBIDITY MONITORING TEST REPORT AND ST. LUCIE INLET TURBIDITY STATIONS

See APPENDIX 01411-A at the end of this Section (Includes location map of St. Lucie Inlet Turbidity Stations) (3 pages).

-- End of Section --

PROJECT:
DEP PERMIT NUMBER:

TURBIDITY MONITORING

DATE: _____; TIME: _____; COLLECTOR: _____

LOCATION INFORMATION: ____Dredge or ____Disposal Site
Dredging in progress? ____Yes ____No
Disposal in progress? ____Yes ____No
Station: _____ Range: _____ Cut: _____

WEATHER AND WATER OBSERVATIONS
Wind velocity: _____, Wind direction from: _____, Current direction to: _____
Tidal stage: _____ Predicted tidal stage (EST): High _____ Low _____

WEATHER CONDITIONS: _____

*

COMPLIANCE STATION DATA:	MID-DEPTH
Collection Depth	
Depth of Water Body	
Collection Time	
Analysis Time	
Turbidity (NTU)	
Analysis Date	

BACKGROUND STATION DATA:	
Collection Depth	
Depth of Water Body	
Collection Time	
Analysis Time	
Turbidity (NTU)	
Analysis Date	

TURBIDITY REVIEW:
Compliance minus Background (NTU) _____ *

Compliance NTU ___ did ___ did not exceed background NTU by more than 29 NTU.

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SECTION 02325

DREDGING

PART 1 GENERAL

1.1 SCOPE

The work covered by this section consists of furnishing all labor, materials, and equipment, and performing all excavation, in-place measurement surveys, and placement of all material as specified herein or indicated on the drawings. This scope also includes all necessary measures for protection of the environment. Environmental protection requirements under this contract are as important to overall completion of the work as other technical aspects. Failure to meet the requirements of these specifications for environmental protection may result in work stoppages or termination for default. No part of the time lost due to any such work stoppages shall be made the subject of claims for extensions of time or for excess costs or damages by the Contractor. If the Contractor fails or refuses to promptly repair any damage caused by violation of the provisions of these specifications, the Contracting Officer may have the necessary work performed and charge the cost thereof to the Contractor.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ENGINEERING MANUALS (EM)

EM 1110-1-1003	(1996) NAVSTAR Global Positioning System Surveying
EM 1110-1-1005	Topographic Surveying
EM 1110-1-2909	(1998; Chg 2) Geospatial Data and Systems
EM 1110-2-1003	(Jan 2001 Draft) Hydrographic Surveying

FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS (FBPSM)

FBPSM	Minimum Technical Standards, Chapters 177, 472, 61G17

CADD/GIS TECHNOLOGY CENTER SPATIAL DATA STANDARDS (SDS)

SDS	(2001) A/E/C CADD Standards

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Electronic Tracking System Data; FIO.

The Contractor shall furnish required discs, CD-ROM, and charts to the Contracting Officer's Representative (COR).

In-Place Measurement Survey Data; FIO.

The Contractor shall furnish required survey data to the Contracting Officer's Representative (COR) on discs or CD-ROM.

Equipment and Performance Data; FIO.

The Contractor shall furnish proof of electronic positioning equipment calibration to the COR.

SD-08 Statements

Vibration Control Plan; G.

After the Notice to Proceed and prior to mobilization of equipment, the Contractor shall submit a Vibration Control Plan. Approval of the plan will not relieve the Contractor of his responsibility to document preexisting conditions and to avoid damaging existing structures whether or not the structures were determined to be susceptible to vibration damage; this includes but is not limited to damages as a result of equipment impact and/or vibration induced damages. The Vibration Control Plan shall include, but not be limited to, the following:

a. Name of Vibration Control Specialist and alternate.

b. List of structures that are susceptible to vibration damage.

c. Number of monitors (seismographs) required for the project, monitor locations, and the number of monitors that will operate simultaneously during the project.

d. Calibration data for each seismograph that will be used on the project. Calibrations shall be current, not older than one year, and follow the manufacturer's recommended procedures.

e. List of methods and procedures to reduce ground vibrations induced by construction activities to below the predetermined maximum allowable vibration level for the designated vibration sensitive structure; i.e., reducing equipment speed, changing fill placement method, reducing equipment size, and using manual labor.

f. Plan for each work area showing the proposed construction equipment in the area, the description of susceptible structure(s) in the work area, monitors in the work area, and the list of methods and procedures in subparagraph "e" above.

g. The minimum safe working distance that vibration producing equipment may operate from each vibration sensitive structure.

h. The maximum allowable ground vibration level that is permissible without causing threshold damage to each vibration sensitive

structure(s).

i. The Pre-construction Survey.

Reef Construction Site Placement Plan; G|EN

Within 10 calendar days after receipt of Notice to Proceed, the Contractor shall submit a Reef Construction Site Placement Plan (RCSPP) for acceptance by the Contracting Officer. The RCSPP shall provide activities and equipment that will be used to locate the reef construction site, to control placement of dredged material, and to provide precise placement data to local officials and the Contracting Officer's Representative (COR). Refer to Sections 01411 and 02325 for tracking system and reporting requirements. Turbidity Monitoring data shall be submitted in separate reports. The RCSPP activities and equipment shall include the following:

a. Provide a 150-foot buffer zone as shown on the contract drawings with the RCSPP.

b. Install buoys at four (4) initial target locations shown on drawings to commence placement and four (4) additional buoys at corners of reef site and buffer zone boundaries.

c. Control placement of stone. Transport barge shall come to a stall before releasing dredged material. X-Y coordinates for each load will be recorded, plotted in dgn format, and a scatter plot with number of each load submitted weekly for monitoring purposes. Elevation of stone shall not exceed one-half distance between ocean floor to water surface.

d. Determine type of equipment, i.e., size tugs and barges. All equipment must be Coast Guard certified.

e. Submit tracking plan, and equipment to be used to monitor location (X-Y) and depth of each load.

f. Include on-board computer monitors with real-time tracking during each cycle.

SD-09 Reports

Monitoring Report; FIO.

The Contractor's Vibration Control Specialist shall submit a written vibration monitoring report (every two weeks) to the Contracting Officer which details the daily activities of the vibration monitoring program. This report shall include, but not be limited to, location of monitoring equipment; instrument serial number; date and times of readings; magnitude of vibration levels; a sketch for each monitoring station showing the relationship of each monitor to vibration sensitive structures; daily instrument logs - as defined below; instructions transmitted to the Contractor's personnel regarding the modification or stoppage of work operations to keep vibrations below the allowable levels; and, any other information pertinent to the vibration monitoring program.

Monitoring Location Set-Up; FIO.

Submit (every two weeks) photograph (3" X 5") and sketch of each monitoring location after equipment is installed. Show general location of the monitoring site on the sketch.

Daily Instrument Logs; FIO.

Submit (every two weeks) daily instrument logs to document satisfactory performance of the equipment during monitoring periods. Document strip charts daily with monitoring station number, date, operator signature, and instrument serial number.

Post-Construction Structural Survey; FIO.

Submit two copies of the post-construction survey report within two weeks after completion of the inspection.

SD-18 Records

Notice of Intent to Dredge; FIO.

Prior to commencement of work on this contract, the Contractor shall notify the Commander, Seventh Coast Guard District of his intended operations to dredge and request that it be published in the Local Notice to Mariners. This notification must be given in sufficient time so that it appears in the Notice to Mariners at least two weeks prior to the commencement of this dredging operation. A copy of the notification shall be provided to the COR.

Relocation of Navigation Aids; FIO.

The Contractor shall not remove, change the location of, obstruct, willfully damage, make fast to, or interfere with any aid to navigation. The Contractor shall notify the Commander, Seventh Coast Guard District, Miami, Florida, in writing, with a copy to the Contracting Officer, 30 days in advance of the time he plans to dredge adjacent to any aids which require relocation to facilitate dredging. The Contractor shall contact the U.S. Coast Guard for information concerning the position to which the aids will be relocated. A copy of the notification shall be provided to the COR.

Notification of Discovery of Historical Period Shipwreck Sites; FIO.

The Contractor shall immediately notify the COR if any shipwreck, artifact, or other objects of antiquity that have scientific or historical value, or are of interest to the public, are discovered, located, and/or recovered.

Notice of Intent to Perform Dredging Survey; FIO.

The Contractor shall give 7 days advance notice, in writing, to the COR of the intent to perform a pre-dredging survey or after-dredging survey for final acceptance for each acceptance section.

Daily/Monthly Report of Operations; FIO.

The Contractor shall prepare and submit three (3) copies of the Daily Report of Operations, using either ENG Form No. 27A and/or ENG Form No. 4267, for each dredge and/or unloader working. This report shall be submitted on a daily basis and not in groups (groups = multi-days reports packaged together at one time) except as noted in subparagraph a. below. A copy of these forms are appended to the end of this Section. In addition to the daily report, the Contractor shall prepare a Monthly Report of Operations for each month or partial month's work on either ENG Form No.

27A and/or ENG Form No. 4267. The monthly report shall be submitted on or before the 7th of each month, consolidating the previous month's work. Upon completion of the job, the Contractor shall submit a consolidated job report, combining the monthly reports. The Contractor shall distribute one copy of each report to the following:

a. District Engineer; ATTN: CESAJ-EN-C; U.S. Army Engineer District, Jacksonville, P.O. Box 4970; Jacksonville, Florida 32232-0019. Reports shall be submitted on a monthly basis with daily reports accompanying the monthly report and job report.

b. Quality Assurance Representative (QAR) assigned to the dredge/project.

Additionally, one copy of these shall be maintained by the Contractor on the dredge(s) for the Government's inspection purpose. Further instructions on the preparation of the reports will be furnished at the Preconstruction Conference.

Notice of Misplaced Material; FIO.

The Contractor shall notify the U.S. Coast Guard Marine Safety Office of any misplaced material as stated in the Clause OBSTRUCTION OF NAVIGABLE WATERWAYS of Section 00700 CONTRACT CLAUSES.

1.4 DREDGING RESTRICTIONS

1.4.1 Order of Work

There is no specific order of work for the Base Bid Construction and Maintenance Dredging work for this project. However, before switching from nearshore disposal to artificial reef disposal in any acceptance section, the Contractor shall provide a survey confirming that maintenance depth has been achieved in that section. The dredging performed by all dredges shall be continuous within reaches approved by the COR. Option 1 Bid North Jetty Rehabilitation work and Option 2 Bid 200-Foot South Jetty Extension work ~~may~~ shall be scheduled concurrently with Base Bid work, if awarded. See Section 00800 SPECIAL CONTRACT REQUIREMENTS.

1.4.2 Blasting Restriction

Blasting is prohibited.

1.4.3 Transportation of Material

Water and dredge material shall not be permitted to overflow or spill out of barges or hopper dredges during transport to the reef construction site.

1.4.4 Placement of Excavated Rock

All rock materials excavated from the impoundment basin during the maintenance or construction phase of this contract shall be placed in the Donaldson Reef Placement Site. See Section 01270 (Base Bid) for additional details.

1.5 PUMPING OF BILGES

Contractors are warned that pumping oil or bilge water containing oil into navigable waters, or into areas which would permit the oil to flow into

such waters, is prohibited by Section 13 of the River and Harbor Act of 1899, approved 3 March 1899 (30 Stat. 1152; 33 U.S.C. 407). Violation of this prohibition is subject to the penalties under the referenced Acts.

1.6 HISTORICAL PERIOD SHIPWRECK SITES

If any shipwreck, artifact, or other objects of antiquity that have scientific or historical value, or are of interest to the public, are discovered, located, and/or recovered, the Contractor acknowledges that:

a. The site(s), articles, or other materials are the property of the State of Florida, with title vested in the Department of State, Division of Historical Resource; and that,

b. He will immediately notify the Contracting Officer.

1.7 PERMITS

The Contractor's attention is directed to the Clause PERMITS AND RESPONSIBILITIES of Section 00700 CONTRACT CLAUSES and the paragraph PERMITS AND AUTHORIZATIONS of Section 01410 ENVIRONMENT PROTECTION.

1.8 FINAL CLEANUP

Final cleanup, as stated in the paragraph COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK of Section 00800 SPECIAL CONTRACT REQUIREMENTS, shall include the removal of all the Contractor's plant and equipment either for disposal or reuse. Plant and/or equipment and/or materials to be disposed of shall **ONLY** be disposed in a manner and at locations approved by the COR. Unless otherwise approved by the COR, the Contractor will not be permitted to abandon any equipment in the placement area or other areas adjacent to the worksite.

a. Failure to promptly remove all plant, pipeline, equipment, and materials upon completion of the dredging will be considered a delay in the completion of the final cleanup and demobilization work. In such case, the Government will exercise its right as stated in Clause DEFAULT (FIXED-PRICE CONSTRUCTION) of Section 00700 CONTRACT CLAUSES to remove any plant and/or equipment and/or materials at the Contractor's expense.

1.9 MEASUREMENT

Refer to Section 01270 MEASUREMENT AND PAYMENT and Acceptance Section Plan requirements.

1.10 PAYMENT

Refer to Section 01270 MEASUREMENT AND PAYMENT and Acceptance Section Plan requirements.

1.11 WORK VIOLATIONS

Work done in violation of these specifications or a verbal or written stop order of the Contracting Officer or his Authorized Representative will be considered as unsatisfactory progress for purposes of progress payments in accordance with Clause PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS of Section 00700 CONTRACT CLAUSES.

PART 2 PRODUCTS

2.1 CHARACTER OF MATERIALS

2.1.1 Material

The materials to be excavated from St Lucie Inlet Impoundment Basin consist of shoaling material and rock. The available USACE geotechnical information for St. Lucie Inlet dates back to 1970. There were several periods of sampling including core borings and wash probings during 1970, 1976, 1978, 1981, 1984, 1991, 1994, 1996 and 2000. Eighteen wash probes WPSLI00-1 through WPSLI00-18 were completed in the impoundment basin in July 2000 during active dredging. The wash probes were completed to determine the sediment thickness and depth to refusal. The unconsolidated sediment above the rock was investigated for previous dredging events and some of the materials are documented in the core logs. For details see core boring notes, core boring logs, core boring location map and laboratory test results.

2.1.2 Historical Material

Historically, the shoaling material has been fine to medium grained quartz sands with a trace to some silt and clay. The sands contain variable amounts of sand to gravel sized whole and broken shell fragments. These materials were most recently documented in core borings CB-SLI96-1 through CB-SLI96-4 and CBSLI96-6 and associated gradation curves. The materials are generally poorly graded sand (SP) with lesser amounts of silty sand (SM), lean clay (CL) and fat clay (CH). It should be noted that laboratory classifications and the gradation curves for the samples take precedence over the visually based classifications shown in the core logs.

The Contractor should note the relatively high blow counts shown on the core logs. The fine-grained, quartz, poorly graded sands form dense masses that resist excavation. The blow counts shown are for a 140-pound hammer with a 30-inch drop used to drive the sampler.

Below the unconsolidated sediment is a highly irregular rock surface consisting of massive, moderately hard to hard, fossiliferous limestone and sandstone.

2.1.3 Impoundment Basin

The impoundment basin was investigated by core borings and wash probings throughout the various sampling periods including the most recent effort. Based on the geotechnical information, the top of rock surface in the impoundment basin has an irregular surface, generally ranging from -9 MLLW in the northwest corner to -20 MLLW on the eastern edge.~~average MLW elevation of -10 to -12 feet.~~ The rock shall be excavated from 1750 foot long by 450 foot wide cut to elevation -20 feet ~~MLW~~MLLW. The top of rock contour values were computer generated from core boring and wash probe data.

2.1.4 Unconfined Compressive Strength Tests

In 1996 five unconfined compressive strength tests were performed on samples from four core borings in the area planned for the impoundment basin. The final design of the impoundment basin placed all five sample locations outside of the dredging prism. The location of the impoundment basin shifted 150 feet to the east placing three of the samples tested outside of the impoundment basin (CB-SLI96-3 and 4). The remaining two

samples tested were below the final dredging grade (CB-SLI96-1 and 2).

The results of these tests are:

~~**Table 1 - Unconfined Compression Strength of Rock Cores**~~

~~Core Boring~~	~~Elevation (ft) MLW~~	~~Depth (ft)~~	~~Diameter (in)~~	~~Unit Weight (pcf~~	~~Compressive Strength (psi)~~
~~CB-SLI96-1~~	~~-21.1 to -22.4~~	~~16.8 to 18.1~~	~~5.91~~	~~127.4~~	~~466~~
~~CB-SLI96-2~~	~~-21.2 to -22.4~~	~~16.2 to 17.4~~	~~3.83~~	~~132.3~~	~~1072~~
~~CB-SLI96-3~~	~~-19.6 to -21.4~~	~~13.0 to 14.8~~	~~5.91~~	~~129.1~~	~~971~~
~~CB-SLI96-3~~	~~-22.2 to -23.4~~	~~15.6 to 16.8~~	~~5.91~~	~~133.0~~	~~483~~
~~CB-SLI96-4~~	~~-18.6 to -19.8~~	~~13.0 to 14.2~~	~~3.85~~	~~115.3~~	~~436~~

Table 1 - Unconfined Compression Strength of Rock Cores

Core Boring	Elevation (ft) MLW	Diameter (in)	Unit Weight (pcf)	Compressive Strength (psi)
CB-SLI96-1	-16.8 to -18.1	5.91	127.4	466
CB-SLI96-2	-16.2 to -17.4	3.83	132.3	1072
CB-SLI96-3	-13.0 to -14.8	5.91	129.1	971
CB-SLI96-3	-15.6 to -16.8	5.91	133.0	483
CB-SLI96-4	-13.0 to -14.2	3.85	115.3	436

~~Recently, a~~Additional tests were performed on samples taken within the dredging prism at the request of a Contractor. These tests were run on samples taken in 1978 and 1996. As the samples are old, the rock has dried out which can affect the results of the tests. Testing procedure requires the samples be waxed and tested soon after being cored. The results are as follows:

~~**Table 2 - Unconfined Compression Strength of Old Rock Cores**~~

~~Core Boring~~	~~Elevation (ft) MLW~~	~~Depth (ft)~~	~~Diameter (in)~~	~~Unit Weight (pcf~~	~~Compressive Strength (psi)~~
~~CB-SLI96-2~~	~~-14.6 to -15.6~~	~~9.6 to 10.6~~	~~3.87~~	~~N/A~~	~~990~~
~~CB-SLI96-2~~	~~-18.6 to -19.3~~	~~13.6 to 14.3~~	~~3.90~~	~~N/A~~	~~5110~~
~~CB-5~~	~~-14.4 to -15.2~~	~~10.9 to 11.7~~	~~3.86~~	~~N/A~~	~~620~~
~~CB-5~~	~~-18.6 to -19.3~~	~~15.1 to 15.8~~	~~2.10~~	~~N/A~~	~~630~~
~~CB-7~~	~~-14.1 to -15.2~~	~~8.5 to 9.6~~	~~3.86~~	~~N/A~~	~~1570~~
~~CB-7~~	~~-18.0 to -18.8~~	~~12.4 to 13.2~~	~~3.88~~	~~N/A~~	~~780~~
~~CB-8~~	~~-17.0 to -18.0~~	~~10.3 to 11.3~~	~~3.83~~	~~N/A~~	~~1180~~

~~CB-46 -14.2 to -14.6 16.0 to 16.4 2.13 N/A 390~~

Table 2 - Unconfined Compression Strength of Old Rock Cores

Core Boring	Elevation (ft) MLW	Diameter (in)	Unit Weight (pcf)	Compressive Strength (psi)
CB-SLI96-2	-14.6 to -15.6	3.87	N/A	990
CB-SLI96-2	-18.6 to -19.3	3.90	N/A	5110
CB-5	-14.4 to -15.2	3.86	N/A	620
CB-5	-18.6 to -19.3	2.10	N/A	630
CB-7	-14.1 to -15.2	3.86	N/A	1570
CB-7	-18.0 to -18.8	3.88	N/A	780
CB-8	-17.0 to -18.0	3.83	N/A	1180
CB-46	-14.2 to -14.6	2.13	N/A	390

All of the unconfined compressive strength test results are low and test results should not be misinterpreted as an indication of ease of dredging. These values would seem to indicate an easily excavated rock, even though it is logged as a moderately hard to hard rock. Past experience in Florida has shown that rock logged as hard and very hard rock often exhibits low unconfined compressive strength values and has proven more difficult to remove than the unconfined compressive strength tests indicated. The rock in the St. Lucie Inlet impoundment basin is hard, massive and difficult to dredge contrary to the results of the unconfined compressive strength tests.

PART 3 EXECUTION

3.1 NOTIFICATION OF COAST GUARD

3.1.1 Navigation Aids

Navigation aids located within or near the areas required to be dredged will be removed, if necessary, by the U.S. Coast Guard in advance of dredging operations. The Contractor shall not remove, change the location of, obstruct, willfully damage, make fast to, or interfere with any aid of navigation.

3.1.2 Dredging Aids

The Contractor shall obtain approval from the U.S. Coast Guard for all buoys, dredging aid markers to be placed in the water, and dredging aid markers affixed with a light prior to the installation. Dredging aid markers and lights shall not be colored or placed in a manner that they will obstruct or be confused with navigation aids.

3.2 WORK AREA

The Contractor will be permitted to exclude the public from the work areas in the immediate vicinity of his dredging, transporting, and placement operations. Enforcement shall be the Contractor's responsibility at no

additional cost to the Government. The enforcement shall be coordinated with local enforcement agencies and will be subject to approval of the COR. See Section 01000 GENERAL REQUIREMENTS for fencing requirements.

3.2.1 Access

The Contractor shall be responsible for providing and maintaining access necessary for his equipment and plant to and from the work site, mooring area, and placement area. The Contractor shall ascertain the environmental conditions which can affect the access such as climate, winds, currents, waves, depths, shoaling, and scouring tendencies. Waves three (3) feet or greater in height and currents greater than three (3) knots can be expected a majority of the time in the project area. See Section 01000 GENERAL REQUIREMENTS for additional weather information.

3.2.2 Protection of Existing Waterways

The Contractor shall conduct his operations in such a manner that material or other debris are not pushed outside of dredging limits or otherwise deposited in existing side channels, basins, docking areas, or other areas being utilized by vessels. The Contractor will be required to change his method of operations as may be required to comply with the above requirements. Should any bottom material or other debris be pushed into areas described above, as a result of the Contractor's operations, the same must be promptly removed by and at the expense of the Contractor to the satisfaction of the COR.

3.2.3 Adjacent Property and Structures

No dredging will be permitted within 25 feet of any structure. Any damage to private or public property or structures resulting from the placement or dredging operations shall be repaired promptly by the Contractor at his expense. Any damage to structures as a result of Contractor's negligence will result in suspension of dredging and require prompt repair at the Contractor's expense as a prerequisite to the resumption of dredging.

3.2.4 Subaqueous Cable Crossings

The Contractor shall be responsible for verifying the locations and depths of all utility crossings and take precautions against damages which might result from his operations, especially the sinking of dredge spuds and/or anchors into the channel bottom, in the vicinity of utility crossings. If any damage occurs as a result of his operations, the Contractor will be required to suspend dredging until the damage is repaired and approved by the COR. Costs of such repairs and downtime of the dredge and attendant plant shall be at the Contractor's expense.

3.3 PLACEMENT OF EXCAVATED MATERIAL

3.3.1 General

Beach quality material maintenance dredged from Cut-1 and the Impoundment Basin shall be transported to and placed in the near shore area designated on the drawings. The average and maximum distances to which the beach quality material will have to be transported are approximately 10.0 miles and 12.0 miles, respectively. Non-beach quality material construction dredged from the Impoundment Basin shall be transported to and placed in the reef area designated on the drawings. The average distance to which the non-beach quality material will have to be transported is approximately

3.5 miles.

3.3.2 Placement Sites

3.3.2.1 Donaldson Reef Placement Site

The non-beach quality material excavated shall be transported to and placed in the 50-acre reef construction site within Donaldson Reef as shown on the drawings. The plane coordinates are based on Transverse Mercator Projection for Florida, East Zone. Dredged material shall not be placed higher than one-half (1/2) the distance from the ocean bottom to the water surface. Provide pre- and post-survey of 50-acre site in the same format as required as-builts. Run sections every 50 feet on North-South alignment. Provide pre-placement survey of site one week prior to the commencement of dredging.

3.3.2.2 Near Shore Placement Area

Beach quality material maintenance dredged from Cut-1 and the Impoundment Basin shall be transported and placed in the near shore area that is located approximately 8.3 miles south of St. Lucie Inlet in the Atlantic Ocean, and extends southerly for approximately 3.3 miles as shown on the contract drawings. Material shall be placed landward of the 16-foot contour between Florida State DEP monuments ~~88~~89 and 108. The Contractor shall place material as close to the beach as conditions permit maximizing the use of the disposal area between the 0-ft mllw contour line and the 16-ft mllw contour line. Dredged material shall be placed in a continuous manner preventing excessive ridging or mounding of excavated material. Provide pre- and post-survey of near shore area in the same contract format requirements as required project as-builts.

3.3.2.3 Misplaced Materials

Materials deposited outside of the placement areas will be classified as misplaced material and will result in a suspension of dredging operations and require the removal of such materials as a prerequisite to the resumption of dredging. The Contractor will be required to remove and redeposit such misplaced materials at his expense. Plant downtime to remove and redeposit such misplaced materials will be at no added cost to the Government or a basis for time extensions.

3.3.3 Logs

The Contractor shall keep a log for each load placed in the near shore and 50-acre Reef Placement Areas. The log entry for each load shall include the date, the time of dump, the approximate volume of material in the load, the EPS coordinates at the dump location, and a map of the area showing the location of the dump. At the completion of dredging, the log(s) shall be submitted to the COR for forwarding to the appropriate State agency. Refer to Section 01411 TURBIDITY AND PLACEMENT MONITORING and Paragraph 3.3.5.2 "ETS Data Requirements and Submissions" below.

3.3.4 Barges

Water and dredged materials shall not be permitted to overflow or spill out of barges while transporting to the placement sites. Failure to repair leaks or change the method of operation which is resulting in overflow or spillage will result in suspension of dredging operations and require prompt repair or change of operation to prevent overflow or spillage as a

prerequisite to the resumption of dredging.

3.3.5 Electronic Tracking System (ETS) for Ocean Placement Vessels

The Contractor shall furnish an ETS for surveillance of the movement and disposition of dredged material during ocean placement. This ETS shall be established, operated and maintained by the Contractor to continuously track in real-time the horizontal location and draft condition of the placement vessel for the placement cycle. The ETS shall be capable of displaying and recording in real-time the placement vessel's draft and location.

3.3.5.1 ETS Standards

The Contractor shall provide automated (computer) system and components to perform in accordance with EM 1110-1-2909. A copy of the EM can be downloaded from the following website:

http://www.usace.army.mil/inet/usace-docs/eng-manuals/em.htm.

Horizontal location shall have an accuracy equal to or better than a standard DGPS system, equal to or better than + 10 feet (horizontal repeatability). Vertical (draft) data shall have an accuracy of + 0.5 foot. Horizontal location and vertical data shall be collected in sets and each data set shall be referenced in real-time to date and local time (to nearest minute), and shall be referenced to the same state plane coordinate system used for the survey(s) shown in the contract plans. The ETS shall be calibrated, as required, in the presence of the COR at the work location before placement operations have started, and at 30-day intervals while work is in progress. The COR shall have access to the ETS in order to observe its operation. Placement operations will not commence until the ETS to be used by the Contractor is certified by the COR to be operational and within acceptable accuracy. It is the Contractor's responsibility to select a system that will operate properly at the work location. The complete system shall be subject to the COR's approval.

3.3.5.2 ETS Data Requirements and Submissions

a. The ETS for each placement vessel shall be in operation for all dredging and placement activities and shall record the full round trip for each loading and placement cycle. [Note: A dredging and placement cycle constitutes the time from commencement of dredging to complete discharge of the material.] The COR shall be notified immediately in the event of ETS failure and all dredging operations for the vessel shall cease until the ETS is fully operational. Any delays resulting from ETS failure shall be at the Contractor's expense.

b. All data shall be collected and stored on 3 1/2 inch disk or CD-ROM(s) in ASCII format and shall be readable by MS Windows compatible software. Each placement cycle will be a separate and distinct ASCII file, labeled by the trip number. More than one file may be stored on the disk(s) or CD-ROM(s).

c. Data shall be collected, during the placement cycle, every 500 feet (at least) during travel to the reef placement area, and every minute or every 200 feet, whichever is smaller, while approaching within 1,000 feet and within the reef placement area.

d. The required digital data to be collected for each placement cycle

includes the following:

(1) Trip Number
(2) Date
(3) Time
(4) Vessel ID
(5) Vessel Captain
(6) State Plane X Coordinate - in accordance with c. above
(7) State Plane Y Coordinate - in accordance with c. above
(8) Vessel Draft
(9) Type of Placement Vessel
(10) Exact State Plane X & Y coordinate at start of placement
(11) Volume of Material Placed

e. Plot Reporting (2 types):

(1) Tracking Plot - For each placement event, data collected while the placement vessel is in the vicinity of the placement area shall be plotted in chart form, in 200-foot intervals, to show the track and draft of the placement vessel approaching and traversing the placement area. Each plot will be attached to the corresponding ASCII data table when submitted.

(2) Scatter Plot - Following completion of all placement events, a single and separate plot will be prepared to show the exact placement locations of all dumps. Additionally, a weekly plot showing the location of all dumps completed in that time period shall be submitted to the Contracting Officer's Representative in MicroStation format or a similar format. Every plotted location shall coincide with the beginning of the respective dump. Each dump will be labeled with the corresponding Trip Number and shall be at a small but readable scale. To accompany the Scatter Plot, a single and separate table will be prepared of the corresponding ETS data for every dump location. The volume of material placed for each trip will be included in this table.

f. All digital ETS data shall be furnished to the COR within 24 hours of collection. The digital plot files should be in an easily readable format such as Adobe Acrobat PDF file, MicroStation DGN file, JPEG, BMP, TIFF, or similar. The hardcopy of the ETS data and tracking plots shall be both maintained onboard the vessel and submitted to the COR on a weekly basis.

3.4 REQUIRED DEPTH, ALLOWABLE OVERDEPTH, AND SIDE SLOPES

3.4.1 Required Depth

The material actually removed from within the specific areas to be dredged to a depth of not more than the required depth shown on the drawings will be estimated and paid for in accordance with the provisions contained in the paragraphs MEASUREMENT and PAYMENT above.

3.4.2 Allowable Overdepth

To cover the inaccuracies of the dredging process, material actually removed from the specified areas to be dredged, to a depth below the required depth of not more than the allowable overdepth shown on the drawings, will be measured and paid for in accordance with the provisions contained in the paragraphs MEASUREMENT and PAYMENT above.

3.4.3 Side Slopes

Although dredging of side slope material may be necessary to provide the required project channel dimensions (depth and width), the side slopes shown on the drawings are provided for payment purposes only. Side slopes may be formed by box cutting or dredging along the side slope. Material actually removed, within the limits approved by the COR, to provide for final side slopes not flatter than that shown on the contract drawings, but not in excess of the amount originally lying above this limiting side slope, will be measured and paid for in accordance with the provisions contained in the paragraphs MEASUREMENT and PAYMENT above. Such amount will be estimated and paid for whether dredged in original position or by box cut dredging whereby a space is dredged below the allowable side slope plane on the bottom of the slope for upslope material capable of falling into the cut. End slopes and transition slopes will be estimated or paid for under the construction dredging contract. In such cases, upslope allowance provisions apply outside the required prism.

3.4.4 Excessive Dredging

Material taken from beyond the limits as described in subparagraphs "Allowable Overdepth" and "Side Slopes" above, will be deducted from the total amount dredged as excessive overdepth dredging, or excessive side slope dredging, for which payment will not be made. Nothing herein shall be construed to prevent payment for the removal of shoals performed in accordance with the applicable provisions of the paragraphs FINAL EXAMINATION AND ACCEPTANCE or SHOALING of Section 01000 GENERAL REQUIREMENTS.

3.5 CONTRACTOR'S SURVEY REQUIREMENTS

3.5.1 General

The COR shall be notified, in writing, 7 days in advance of the Contractor's intent to perform pre-dredging and after-dredging surveys. The Contractor shall conduct Pre-Dredging and After-Dredging surveys using Coastal Oceanographics, Inc. HYPACK software to acquire, measure and certify in-place quantities. Surveys shall be performed in accordance with the paragraph QUANTITY SURVEYS of Section 00800 SPECIAL CONTRACT REQUIREMENTS; Paragraph LAYOUT OF WORK of Section 01000 GENERAL REQUIREMENTS; and Section 01451 CONTRACTOR QUALITY CONTROL.

3.5.2 Compliance

Surveying and Mapping shall be in strict compliance with EM 1110-1-1003 NAVSTAR Global Positioning System Surveying; EM 1110-1-1005 Topographic Surveying; EM 1110-2-1003 Hydrographic Surveying (1 Jan 01 draft); EM 1110-1-2909, Geospatial Data and Systems, change 1 & 2; A/E/C CADD Standards; CADD/GIS Technology Center Spatial Data Standards (SDS); and Chapters 177, 472, & 61G17 of the Minimum Technical Standards set by the Florida Board of Professional Surveyors and Mappers (FBPSM). Engineering Manuals can be downloaded from the Internet @ http://www.usace.army.mil/inet/usace-docs/eng-manuals/em.htm. EM 1110-2-1003 Hydrographic Surveying (1 Jan 01 draft) can be downloaded from the Internet @ http://www.saj.usace.army.mil/conops/navigation/surveys/hydro.htm. The SDS and A/E/C CADD Standards can be downloaded from the Internet @ http://tsc.wes.army.mil/.

3.5.3 Government Quality Assurance Representative (QAR)

All in-place measurement surveys shall be performed with a representative of the Government on-board the Contractor's platform during the full execution of the survey. No in-place measurement surveys shall be performed without a representative of the Government on-board the survey vessel. The Contractor's survey personnel shall be fully knowledgeable in offshore construction subsurface surveying procedures and techniques, state-of-the-art equipment, horizontal and vertical calibration methods, and horizontal and vertical accuracy limitations, as detailed in the 1 Jan 01 draft of EM 1110-2-1003. The Government's QAR will observe and review, in progress, the adequacy and accuracy of the survey for in-place payment purposes, and for the potential existence of collusion, fraud, or obvious error in the data.

3.5.4 In-Place Measurement Survey Certification

a. Immediately upon completion of any survey, the Contractor's representative and the Government's QAR shall, based on their on-site review of the survey execution, determine that the survey contains no evidence of collusion, fraud, obvious error, and that subsequent horizontal and vertical errors are accurately documented.

b. The Contractor's survey personnel shall have aboard the survey vessel a blank copy of the Statement of Survey Observation. The Contractor's authorized representative and the Government's QAR shall both attest to an acceptable survey by signing the Statement of Survey Observation before leaving the vessel. A sample copy of the Statement of Survey Observation is appended to the end of this Section.

c. In the event the Government's QAR observes (and quantifies) specific documentary evidence of fraud, collusion, or obvious error, the survey will be immediately rerun. Re-surveys will totally supersede and previously run survey and will be run over the full reach of any particular Acceptance Section.

d. If acceptability is not acquired after performing one re-survey of an Acceptance Section, a meeting shall be between the Contractor and the COR to expeditiously resolve the issue causing rejection of the survey. Contractor equipment and personnel standby time to resolve non-acceptability of the survey shall be at the Contractor's expense.

e. In no case shall a previously unacceptable survey be later judged acceptable, unless such a reassessment/reevaluation is performed within 24 hours after the original survey and prior to initiating and re-survey action based upon identifiable collusion, fraud, or obvious error.

f. Should either party refuse to certify to the acceptability of a survey for contract payment without identifiable collusion, fraud, or obvious error, then the following actions will follow:

(1) Preconstruction (Pre-Dredging) Survey

Excavation shall not commence until representatives of the Contractor and COR have met and resolved the basis for refusal of certification. Should the Contractor commence excavation prior to obtaining an acceptable survey, he shall be liable for any excavation performed. If a re-survey is performed, and accepted, prior excavation will not be measured, estimated, or paid for.

(2) Post-Construction (After-Dredging) Survey

The one week survey window allowed under subparagraph "Measurement" of Section 01270 MEASUREMENT AND PAYMENT will be indefinitely extended until a final survey is accepted. Any material accretion that might occur due to such a time extension would neither be measured, estimated, or paid for.

(3) Refusal to Certify

Contractor equipment and personnel standby time to resolve the non-acceptability of a survey when there is no identifiable collusion, fraud, or obvious error shall be at the Contractor's expense and resultant delays shall not be the basis for time extensions of the contract.

g. Intermediate surveys performed by the Contractor between the Pre-Dredging and Post-dredging surveys will not be considered for the purposes of determining quantities for final payment and acceptance of the area dredged. The Government reserves the right and intends to perform check surveys following the Contractor's Pre-Dredging and Post-Dredging surveys.

3.5.5 Survey Quality Control and Procedures

a. Surveys accuracies shall meet the Minimum Performance Standards for Corps of Engineers Hydrographic Surveys as specified in Table 3-1, EM 1110-2-1003, Hydrographic Surveying (1 Jan 01 draft) and Topographic Surveys as specified in EM 1110-1-1005, Topographic Surveys.

b. Survey procedures and quality control shall be in strict accordance with Chapter 3, Corps Accuracy Standards, Quality Control, and Quality Assurance Requirements, EM 1110-2-1003, Hydrographic Survey (1 Jan 01 draft) and Topographic Surveys as specified in EM 1110-1-1005, Topographic Surveys.

c. Surveys shall be horizontally referenced to the State Plane Coordinate System based on the Transverse Mercator Projection for the East Zone of Florida and referenced to the North American Datum of 1927 (NAD27).

d. Elevations shall be in feet and tenths and referenced to Mean Lower Low Water (MLLW) tidal datum.

e. Depth measurements shall be recorded using a high frequency (200 +/- 10% kHz) transducer.

3.5.6 Deliverables

a. Hydrographic survey data will be submitted to the Government conforming to the following data requirements:

(1) Raw and edited HYPACK data files
(2) Tide files (if not entered in real-time)
(3) HYPACK line, plan, and/or channel files
(4) HYPACK target files (aids to navigation locations)
(5) XYZ files (all data points)
(6) All other pertinent files and materials, i.e. field books, depth sounder charts, and log sheets showing stations run, start and stop times, tides, any other significant events encountered during survey.

b. Plan-view drawings of the Pre-Dredging and After-Dredging surveys will be submitted to the Government in MicroStation DGN format. Scales, line spacing, sounding interval, etc. shall be comparable to drawings furnished in Plans and Specifications.

c. The Contractor shall perform volume computations using HYPACK software. Payment volume computations and methods shall be performed in strict accordance with Paragraph 15-11 and Table 15-2, Dredge Measurement and Payment Volume Computations, EM 1110-2-1003, Hydrographic Surveying (1 Jan 01 draft). All pertinent digital files, paper printouts of cross-sections, etc. shall be submitted to the Government for Quality Assurance. The Government reserves the right and intends to perform check surveys and calculations based on the Contractor's Pre-Dredging and Post-Dredging surveys.

3.5.7 Final After-Dredging Survey and Acceptance

The Contractor shall perform a ~~Multi~~Single ~~b~~Beam survey for final acceptance and payment. ~~Multi~~Single ~~b~~Beam ~~s~~Survey procedures and quality control shall be in strict accordance with Chapter ~~11~~9, Single Beam Acoustic Depth Measurement Techniques~~Acoustic Multibeam Survey Systems for Deep-Draft Navigation Projects~~ and Table ~~11-2~~9-6, ~~Critical~~ Quality Control and Quality Assurance Criteria for ~~Multi~~Single ~~b~~Beam Surveys, EM 1110-2-1003, Hydrographic Surveying (1 January 01 ~~d~~Draft). After-Dredging volume computations, based on ~~Multi~~Single ~~b~~Beam data, should be performed with the same method used for Pre-Dredging computations.

Additional lines shall be run longitudinally through the construction area and examined for final acceptance and payment. These lines shall be taken at an interval specified by the Government Construction representative onsite as a Quality Assurance check to insure Contract requirements have been met.

3.5.8 Metadata

Metadata is "data about data". It describes the content, identification, data quality, spatial data organization, spatial reference, and other characteristics of data. Each survey shall have metadata submitted with the final data submittal. The Contractor shall furnish a digital file using CORPSMET95 (Metadata Software) with all appropriate data included. CORPSMET95 can be downloaded from the Internet @ http://corpsgeo1.usace.army.mil/.

3.5.9 Digital Data Media

All digital data shall be submitted on CD-ROM media.

3.6 NOISE CONTROL

All hauling and excavating equipment and dredges used on this work shall be equipped with satisfactory mufflers or other noise abatement devices. The Contractor shall conduct his operations so as to comply with all Federal, Commonwealth and local laws pertaining to noise.

3.7 DREDGE SAFETY

During dredging operations the Contractor's dredge shall have a current Certificate of Inspection issued by the U.S. Coast Guard.

3.8 PROTECTION OF EXISTING STRUCTURES FROM CONSTRUCTION ACTIVITIES

3.8.1 Protection Program

The Contractor shall implement a protection program that will protect existing structures from damages that result from construction dredging equipment operations and vibrations. The protection program shall consist of a Pre-Construction Structural Survey, a Vibration Control Plan, a Vibration Control Program, and a Post-Construction Survey.

3.8.1.1 Existing Structures

Existing structures adjacent to the impoundment basin beach area are either residential, commercial, or public properties. Structures are comprised of buildings, patios, slabs, swimming pools, pool decks, bulkheads, seawalls, wooden walkways, etc. The purpose of the program is to avoid damages and potential claims that allege damages were caused by construction dredging activities.

3.8.2 Contractor's Responsibility

The Contractor shall assume all responsibility for damages to existing structures within and bordering the project boundaries that may be attributed to project activities. The Contractor shall also be responsible for any work stoppage that results from monitoring, inspection, damages, damage claims and/or damage avoidance activities.

3.8.3 Pre-Construction Structural Survey

The Contractor shall inspect existing structures within 200 feet from the work area limit as to their potential susceptibility to vibration damage from construction equipment induced ground vibration. Visible structural and/or cosmetic damage to buildings, exterior walls, foundations, decks, pools, bulkheads, seawalls, etc., shall be documented by photographs, sketches, and field notes. Copies of all documentation shall be provided to the COR before commencement of any work involving heavy equipment capable of producing vibrations.

a. Factors to consider in determining potential susceptibility shall include but not be limited to: foundation design; foundation conditions; soils testing data; changes in structural loads and local water levels due to beach losses; structural condition including construction materials, past damage history and existing stresses; magnitude, frequency, and duration of predicted vibrations from construction equipment; and distance from working equipment.

b. The Contractor shall inspect all existing structures that are determined to be vibration sensitive. Any damage found shall be documented thoroughly by photographs (supplemented with video as necessary), sketches of visible structural and/or cosmetic damage, and field notes. Photographs shall be at least 3 1/2" X 5" and shall provide a detailed visual explanation of the damage. Include a reference scale in each close-up photograph. Sketches shall show the general damage location and extent. All inspection items shall be indexed and cross referenced and shall use the stationing and locations shown on the contract drawings. Include hotel/motel names and addresses where applicable. Structural damage shall be additionally documented by measuring crack or damage size, width, and length. Every effort shall be made to inspect and document the condition of the

building's interior where the building has been determined to be extremely susceptible to vibration damage. Structures determined not to be susceptible to vibration damage shall be noted as such.

3.8.4 Vibration Control Program

The Contractor shall use the results of the Pre-Construction Survey to develop the Vibration Control Plan. The Vibration Control Program shall use the plan to monitor and adjust daily mobilization, demobilization, and dredging operations, as necessary. The program shall use the appropriate tolerable vibrations to monitor each structure that has been determined to be susceptible to vibration damage. Should ground vibrations equal or exceed the predetermined maximum vibration level(s), construction operations shall be halted and corrective measures taken in accordance with the approved Vibration Control Plan.

a. The minimum safe working distance that vibration producing equipment may operate from each vibration sensitive structure shall be documented in the Vibration Control Plan.

b. The maximum allowable ground vibration level that is permissible without causing threshold damage to each vibration sensitive structure shall be documented in the Vibration Control Plan. Threshold damage is defined as the occurance of cosmetic damage.

c. Each seismograph shall have the capability to measure peak particle velocity and frequency and shall be equipped with an alarm system to alert the on site Vibration Control Specialist that ground vibrations are approaching the maximum tolerable ground vibration level.

3.8.5 Vibration Control Specialist

The Contractor's personnel responsible for implementation of the Vibration Control Plan is hereafter called Vibration Control Specialist. The Vibration Control Specialist shall be on the site during mobilization, demobilization, and operation of dredging equipment. The pre-approved alternate may serve in the event of the Vibration Control Specialist's absence. Periods of absence shall not exceed one week at any one time and not more than 15 workdays during a calendar year. The requirements for the alternate are the same as for the designated Vibration Control Specialist.

3.8.6 Post-Construction Structural Survey

After completion of work, the Contractor shall conduct a post-construction inspection of the structures previously inspected under the pre-construction structural survey. Documentation procedures shall be identical to those performed under the pre-construction inspection. Changes or deviations from the pre-construction inspection conditions in any structure shall be identified and described in the inspection documentation. Copies of all documentation shall be provided to the Contracting Officer not later than 15 calendar days after completion of the work on each segment.

3.8.7 Qualifications for Structural Inspection/Evaluation and Vibration Control Program Personnel

The Contractor shall provide personnel for structural inspections and vibration monitoring which meet at least the following minimum qualifications outlined below. The Contractor shall provide documentation

verifying the qualifications to the COR for approval within 7 calendar days after the date of Notice of Award. The COR reserves the right to reject any individual(s) not meeting the qualifications specified and to request resubmittal of other personnel at no cost to the Government.

3.8.7.1 Structural Inspection/Evaluation Personnel

Structural inspections shall be performed by structural engineers registered in the State of Florida with a minimum of 3 years of demonstrated experience in structural condition inspections.

3.8.7.2 Vibration Monitoring Personnel, Including Vibration Control Specialist

Personnel responsible for the Vibration Control Program and Plan shall be registered in the State of Florida with a background in geotechnical and structural engineering and shall have a minimum of 3 years of demonstrated experience in vibration monitoring and related work.

3.8.7.3 Approval of New Personnel

The Contractor shall obtain approval of new personnel that replace personnel that were approved as part of any submitted Vibration Control Plan. Approval requests shall include the same requirements as specified for the original personnel.

-- End of Section --

CERTIFICATION STATEMENT

CONTRACT: _____

ACCEPTANCE SECTION/SURVEY: _____

REFERENCED SOURCE DOCUMENT: _____

I have fully observed the performance of the subject survey and have determined, based on my review of the referenced source document record, that the data contains no evidence of collusion, fraud, or obvious error. The recorded data, including calibration corrections thereto, have been obtained in accordance with the systematic/procedural methods and techniques described under SECTION 02325: DREDGING of the contract specifications, that all known and unknown systematic and random errors have been minimized consistent with: (1) The relative precision levels of the equipment utilized; and, (2) Absolute accuracies expected (or likely) given current (state-of-the-art) horizontal and vertical measurement limitations associated with offshore survey systems, procedures, and related variables; and, as such, the observed/recorded data are fully and finally acceptable for determining and measuring contract performance and payment.

AUTHORIZED REPRESENTATIVE: _____

/s/

TITLE: _____

DATE: _____

CF: Contractor Representative Area Office

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SECTION 02370

POLYMERIC MARINE MATTRESS

PART 1 GENERAL

1.1 SUMMARY

This section consists for furnishing a Polymeric Marine Mattress (PMM) system with structural geogrid, braid, mechanical connection elements and stone fill, and providing a geogrid composite as specified herein and shown on the contract drawings. The geogrid material for the mattress shall include sufficient quantities to form lifting hoops for the units. Fabricating, filling and placing PMM units in accordance with this section and in reasonably close conformity with the lines, grades and dimensions shown on the contract drawings or ~~fffff~~established by the Contracting Officer's Representative (COR). Some prefabrication of the units may be accomplished prior to delivery to the site.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO	(1997 Interim) Standard Specification for Highway Bridges

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1388	(1996) Stiffness of Fabrics (Option A)
ASTM D 4355	(1992) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D 4759	(1988; R 1996) Standard Practice for Determining the Specification Conformance of Geosynthetics
ASTM D 5818	(1995) Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage

GEOSYNTHETIC RESEARCH INSTITUTE (GRI)

GRI GG1-87	Standard Test Method for Geogrid Rib Tensile Strength
GRI GG2-87	Standard Test for Geogrid Junction Strength

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 9090	Compatibility Test for Wastes and Membrane Liners

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Drawings

Shop Drawings; GA.

The Contractor shall submit details of the typical sections and connections.

SD-06 Instructions

Manufacturer's Instructions; FIO.

The Contractor shall submit manufacturer's fabrication instructions, installation instructions, and general recommendations.

SD-09 Reports

Roll Values;FIO.

SD-13 Certifications

Geogrid; FIO.

The Contractor shall submit geogrid product data sheet and certification from the manufacturer that the geogrid product supplied meets the requirements.

SD-14 Samples

The Contractor shall submit product samples for the following:

Geogrid; FIO.
Braid; FIO.
Mechanical Connection Elements; FIO.

1.4 DEFINITIONS

1.4.1 Polymeric Marine Mattress

A non-metallic compartmental structure filled densely and tightly with stone prior to installation. Filling is achieved while each unit is positioned on edge prior to installation. Units are comprised of structural geogrid, braid, and mechanical connection elements fabricated to allow placement and provide containment of aggregate fill.

1.4.2 Geogrid

An integrally formed grid structure manufactured of a stress resistance high density polyethylene (HDPE) material with molecular weight and

molecular characteristics which impart high resistance to:

a. Loss of load capacity or structural integrity when the geogrid is subjected to mechanical stress in installation.

b. Deformation when the geogrid is subjected to applied force in use.

c. Loss of load capacity or structural integrity when the geogrid is subjected to long-term environmental stress.

1.4.3 Minimum Average Roll Values

Value based on testing and determined in accordance with ASTM D 4759.

1.4.4 True Tensile Modulus in Use

The ratio of tensile strength to corresponding strain (e.g., 1%). The tensile strength is measured via GRI GG1-87 as modified by AASHTO using a single rib having the greater of 3 junctions or 8 inches and tested at a strain rate of 10 percent per minute based on this gauge length without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties. Values shown are minimum average roll values.

1.4.5 Junction Strength

Breaking tensile strength of junctions when tested in accordance with GRI GG2-87 as modified by AASHTO using a single rib having the greater of 3 junctions or 8 inches and tested at a strain rate of 10 percent per minute based on this gauge length. Values shown are minimum average roll values.

1.4.6 Flexural Stiffness (Also Known as Flexural Rigidity)

Resistance to bending force measured via ASTM D 1388. Values shown are minimum average roll values.

1.4.7 Resistance to Installation Damage

Resistance to loss of load capacity or structural integrity when subjected to mechanical stress in installation measured via ASTM D 5818 in a crushed stone classified as a poorly graded gravel with a maximum 2 inch particle size (GP). Values shown are typical values.

1.4.8 Resistance to Long Term Degradation

Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments measured via EPA 9090 immersion testing. Values shown are typical values.

1.4.9 Ultraviolet Stability

The ratio of tensile strength after exposure to the tensile strength prior to exposure with exposure per ASTM D 4355 and tensile strengths measured via GRI GG1-87 as specified in subparagraph "True Tensile Modulus in Use" of paragraph DEFINITIONS above.

1.5 QUALITY ASSURANCE

Prior to the installation of the units, the Contractor shall arrange a

meeting at the site with the system supplier and, where applicable, the system installer. The COR shall be notified at least 3 days in advance of the time of the meeting.

1.6 PAYMENT

1.6.1 Marine Mattress

All costs for work specified in this section and all appropriate costs in connection therewith or incidental thereto shall be included in the applicable contract unit price per square yard for Bid Item Nos. 0006AC and 0007AC, "12"– Marine Mattress" of the Bidding Schedule.

1.6.2 Geotextile Underlayer

All costs for work specified in this section and all appropriate costs in connection therewith or incidental thereto shall be included in the applicable contract unit price per square yard for Bid Item Nos. 0006AD and 0007AD, "~~12" Marine Mattress~~Geotextile" of the Bidding Schedule.

PART 2 PRODUCTS

2.1 MANUFACTURERS

An approved source of geogrid is Tensar Earth Technologies, Inc., or approved equivalent.

2.2 MATERIALS

2.2.1 Structural Geogrid

a. Unless otherwise specified on the contract drawings, shop drawings, or directed by the COR, the structural geogrid type shall be:

(1) Type 1 for the internal diaphragms of the units.

(2) Type 2 for the top, bottom and sides of the units.

b. The structural geogrid shall be produced from virgin resin and classified as HDPE and shall possess complete continuity of all properties throughout its structure.

c. The structural geogrid shall accept applied force in use by positive mechanical interlock (i.e., direct mechanical keying) with:

(1) Compacted soil or construction fill materials;

(2) Contiguous sections of itself when overlapped and embedded in compacted soil or construction fill materials; and,

(3) Rigid mechanical connection elements such as bodkins, pins or hooks.

d. The structural geogrid shall have the following characteristics:

PROPERTY	UNITS	TYPE 1	TYPE 2
True 1% Tensile Modulus in Use (MD)	kN/m (lb/ft)	750 (51,400)	1,650 (113,090)
Junction Strength (MD)	kN/m (lb/ft)	48.60 (3,330)	100.8 (6,908)
Flexural Stiffness	mg-cm	670,000	6,600,000
Resistance to Installation Damage	%GP	85	85
Resistance to Long Term Degradation	%	100	100
Ultraviolet Stability (Retained Strength @ 500 hours)	%	100	100

2.2.2 Mechanical Connection Elements

a. The mechanical connection elements shall be as shown on the contract drawings and shop drawings and shall be composed of high density HDPE, unless otherwise approved by the COR.

b. The mechanical connection used shall be bodkin type, unless otherwise approved by the COR.

2.2.3 UV Stabilized Braid

a. The braid used for tying and lacing in the fabrication of the units shall be 8-strand hollow-core braid composed of HDPE. Each strand shall consist of a bundle of monofilament HDPE.

b. The braid shall have a nominal diameter of not less than 3/16 inch and a breaking strength of not less than 400 pounds on a test specimen 36 inches in length.

c. The braid shall be UV stabilized with a minimum carbon black content of 2.0% by weight.

2.2.4 Stone Fill Materials

a. The stone fill shall be sound and durable, free of cracks, soft seams, and other structural defects.

b. Unless otherwise shown on the contract drawings and shop drawings or approved by the COR:

(1) The stone fill shall possess a specific gravity of at least 2.16.

(2) The loss when the stone is subjected to the Los Angeles Abrasion Test shall not exceed 40%.

(3) ~~The minimum diameter of stone used shall be inches across the smallest dimension of the stone. The maximum diameter of stone used shall be 8 inches.~~Refer to SECTION 02380 "STONE PROTECTION" for mattress stone requirements.

c. Contingent on approval of the COR, recycles, processed concrete meeting these requirements may be used as stone fill.

2.2.5 Biaxial Grid Composite

The grid composite shall be a regular grid structure formed by biaxially drawing a continuous sheet of select polypropylene material which is heat bonded to a polyester fabric, and shall have aperture geometry and rib and junction cross-sections sufficient to permit significant mechanical interlock with the material being reinforced. The geogrid shall have high flexural rigidity and high tensile modulus in relation to the material being reinforced and shall also have high continuity of tensile strength through all ribs and junctions of the grid structure. The geogrid shall maintain its reinforcement and interlock capabilities under repeated dynamic loads while in service and shall also be resistant to ultraviolet degradation, to damage under normal construction practices and to all forms of biological or chemical degradation normally encountered in the material being reinforced. The geogrid shall also conform in all respects to the property requirements listed below:

PROPERTY	**TEST METHOD**	**UNITS**	**VALUE**
Interlock:			
* aperture size1	I.D. Calipered2		
@ MD		in	1.8 (nom)
@ CMD		in	2.5 (nom)
* open area	COE Method3	%	75 (min)
* thickness	ASTM D 1777		
@ ribs		in	0.07 (nom)
@ junctions		in	0.20 (nom)
Reinforcement:			
* flexural rigidity	ASTM D 13884	mg-cm	
MD			600,000 (min)
CMD			800,000 (min)
* tensile modulus	GRI GG1-875	lb/ft	
MD			20,000 (min)
CMD			21,000 (min)
* junction strength	GRI GG2-876	lb/ft	
MD			1,350 (min)
CMD			1,350 (min)
* junction efficiency	GRI GG2-876	%	90 (min)
Material:			
* copolymer polypropylene	ASTM D 4101 Group 2/Class 1/ Grade 1	%	97 (min)
* colorant and UV inhibitor	ASTM D 4218	%	2.0 (min)

PROPERTY	TEST METHOD	UNITS	VALUE
Geotextile:			
* Grab tensile strength	ASTM D 1682	lbs	285/250
* EOS	ASTM D 422	US Std Sv Sz	70
* Weight	ASTM D 1910	oz/sy	8.0
Dimensions:			
* roll length		ft	200
* roll width		ft	13
* roll weight		lb	210 & 260

Notes:

1. MD dimension is along roll length. CMD dimension is across roll width.
2. Maximum inside dimension in each principal direction measured by calipers.
3. Percent open area measured without magnification by COE method as specified in CW 02215 Civil Works Construction Guide, November 1977.
4. ASTM D 1388 modified to account for wide specimen testing as described in Tensar test method TTM-5.0 "Stiffness of Geosynthetics".
5. Secant modulus at 2% elongation measured by GRI GG1-87. No offset allowances are made in calculating secant modulus.
6. Geogrid junction strength and junction efficiency measured by GRI GG2-87.

PART 3 EXECUTION

3.1 EXAMINATION

The Contractor shall check the geogrid, braid and mechanical connection elements upon delivery to verify that the proper material has been received. These materials shall be inspected by the Contractor to be free of flaws or damage occurring during manufacturing, shipping, or handling.

3.2 FINAL FABRICATION AND FILLING

3.2.1 Mechanical Connections

The joints where the ends and baffles of each unit join the top or bottom of the unit shall be made with a mechanical connection between geogrid elements as shown on the contract drawings and shop drawings.

3.2.2 Seaming

Unless otherwise shown on the contract drawings and shop drawings or approved by the COR:

a. The joints along the sides of each unit shall be secured by seaming with braid using a lock-stitch configuration to provide complete

closure of each unit.

b. Stitches shall be spaced evenly along each seam, with a minimum of 6 stitches per foot of seam. The braid material shall be securely knotted to the geogrid material at each end of each seam and at a minimum 3-foot spacing along each seam. The ends of each piece of braid used shall be knotted to prevent raveling of the braid.

c. The braiding shall be sufficiently tight to prevent openings greater than 1 inch along the seam, but shall not be cinched so tightly that overlaps and binding result.

d. Seaming to connect adjacent units is not required.

3.2.3 Filling

Unless otherwise shown on the contract drawings and shop drawings or approved by the COR:

a. Each unit shall be filled and the fill densified while the unit is supported in an upright position resting on its side. The filling sequence of the compartments within each unit shall be appropriate to prevent excess deformation or displacement of the interior diaphragms.

b. Densification of the stone fill material and complete filling of each compartment shall be accomplished by rodding and/or vibration.

c. Lifting hoops shall be formed by joining the top and bottom layers of grid from each unit by means of approved mechanical connections.

d. When filling and fabrication of a unit are complete, the unit shall be rotated to a horizontal position resting on its bottom in order to facilitate subsequent lifting.

e. Filling shall be accomplished in a manner that does not cause excessive damage to the geogrid, mechanical connection elements or the braid.

3.3 PREPARATION

3.3.1 Subgrade

The subgrade soil shall be prepared as indicated on the contract drawings or as directed by the COR.

3.3.2 Geotextile Underlayer

a. The geotextile underlayer shall be installed as indicated on the contract drawings or as directed by the COR.

b. The COR may approve placing the geotextile simultaneously with the units by pre-attaching the geotextile material to each unit with provision for sufficient overlap of the geotextile.

3.4 INSTALLATION

3.4.1 Position

The units shall be placed at the proper elevation, alignment and

orientation as shown on the contract drawings or as directed by the COR.

3.4.2 Placement Procedures

a. The procedure used in placement of the units shall be in accordance with the recommendations of the system supplier and as approved by the COR.

b. For lifting of each unit, a spreader beam and/or spreader bars shall be used in a manner that the unit is not subjected to severe bending or distortion and that the top and bottom layers of geogrid are tensioned uniformly across their width. Units should generally be lifted from a horizontal position.

c. Personnel shall stay clear of the area beneath units and rigging during lifting. Tag lines and/or divers may be required to facilitate proper placement of the units.

3.4.3 Splicing and Anchoring

Where applicable, splicing and/or anchoring of the units shall be accomplished as shown on the contract drawings, the shop drawings, or as directed by the COR.

3.5 REPAIR

Any units damaged during installation shall be repaired in a manner approved by the COR or shall be replaced by the Contractor. Any such measures required shall be at no additional cost to the Government.

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SECTION 02380

STONE PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 127	(1988; R 1993) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 295	(1998) Petrographic Examination of Aggregates for Concrete
ASTM D 5312	(1992) Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions
ASTM D 5313	(1992; R 1997) Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Armor; G
Bedding Material; G
Mattress Material; G

Submit the source for materials.

Gaging Table Data; FIO

Submit stone hauling vessel gaging tables.

SD-04 Samples

Stone; G

Submit suitable stone samples prior to delivery of any such material to the worksite.

SD-06 Test Reports

Gradation Test; G

Submit the gradation tests using the GRADATION TEST DATA SHEET enclosed at end of this section for stone.

Bulk Specific Gravity; FIO

At least 120 calendar days in advance of shipment of stone to the work site, submit a copy of bulk specific gravity test results for each gradation range of stone proposed to be furnished. The information shall be furnished prior to preparation of pre-production demonstration stockpiles.

SD-07 Certificates

Armor Stone; FIO
Bedding Stone; FIO
Mattress Stone; FIO

Submit certificates of compliance attesting that the materials meet specification requirements.

Weigh Scale Certification; FIO

Submit a copy of the certification from the regulation agency attesting to the scale's accuracy.

Certified Weight Scale Tickets; FIO

Submit a copy of each certified weight scale ticket 1 working day after weighing.

1.3 DESIGN REQUIREMENTS

1.3.1 Factors Used for Converting In-Place Volume to Weights

The following factors were used in converting the in-place volume to the quantities shown in the BIDDING SCHEDULE.

STONE MATERIAL	BULK SPECIFIC GRAVITY (SSD)	PERCENT VOIDS	CUBIC FEET OF VOLUME PER TON INCLUDING COMPENSATION FOR VOIDS (For Excess Quantity Calculations)
Mattress	2.24	25	0.74
Bedding	2.24	25	0.74
Armor	2.64	35	0.54

1.3.1.1 Revision of Bidding Schedule Quantities

The estimated quantities of stone listed in the BIDDING SCHEDULE were computed on the basis of stone having a percentage of voids and a bulk specific gravity (saturated surface dry (SSD) basis) as shown in the above table based on water having a unit weight of 62.4 pounds per cubic foot.

When the bulk specific gravity (SSD) of the stone to be used in the work is other than that shown in the above table, the estimated quantities will be revised by multiplying them by the fraction which results when the bulk specific gravity (SSD) of the stone furnished is divided by the value shown in the above table for each respective stone gradation. Revision for the percentage of voids will likewise be made. The Contracting Officer will issue a modification to the contract in accordance with the Contract Clause, CHANGES, in Section 00700 CONTRACT CLAUSES to adjust the estimated quantities in the BIDDING SCHEDULE. The revised quantities will then be the quantities from which the allowable fifteen percent (15%) variation in estimated quantity, for payment purposes, will be determined as defined in Contract Clause, VARIATIONS IN ESTIMATED QUANTITIES, in Section 00700 CONTRACT CLAUSES.

1.3.1.2 Re-revision of Estimated Quantities

If during the progress of the work it is determined that the delivered stone actually placed has a percentage of voids or a bulk specific gravity range different from that on which the BIDDING SCHEDULE is based, the BIDDING SCHEDULE will be further revised in accordance with paragraph REVISION OF BIDDING SCHEDULE QUANTITIES.

1.4 GOVERNMENT TESTING AND STUDIES

1.4.1 Stone

1.4.1.1 General

All stone shall be durable material as approved by the Contracting Officer. The Contractor shall show that an adequate quantity of material is available from the proposed source. Stone shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, blast fractures, bedding, seams and other defects that would tend to increase its deterioration from natural causes. If, by visual examination, it is determined that 10 percent or more of the stone produced contains hairline cracks, then all stone produced by the means and measures which caused the fractures shall be rejected. A hairline crack that is defined as being detrimental shall have a minimum width of 4 mil and shall be continuous for one-third the dimension of at least two sides of the stone. The stone shall be clean and reasonably free from soil, quarry fines, and shall contain no refuse.

1.4.1.2 Sources

Stone may be furnished from any source designated by the Contractor and accepted by the Contracting Officer, subject to the conditions herein stated. Satisfactory stone quality records on other work may be acceptable provided the tests were conducted within 2 years of the proposed start of stone placement and the stone is to be mined from the same portion of the quarry. Stone quality records shall show testing of the stone that meets the qualities in paragraph EVALUATION TESTING OF STONE below. If no such records are available, the Government will conduct tests to assure the acceptability of the stone.

a. Selection of Source. The Contractor shall designate in writing only one source or one combination of sources from which he proposes to furnish stone. It is the Contractor's responsibility to determine that the stone source or combination of sources selected is capable of providing the quality, quantities and gradation needed and at the rate

needed to maintain the scheduled progress of the work. Samples for acceptance testing shall be provided in accordance with paragraph EVALUATION TESTING OF STONE below. If a source for stone so designated by the Contractor is not accepted for use by the Contracting Officer, testing of other sources shall be performed at no additional cost to the Government.

b. Acceptance of Materials. Acceptance of a source of stone is not to be construed as acceptance of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for stone as determined by the Contracting Officer. The Contracting Officer also reserves the right to reject individual units of produced specified materials in stockpiles at the quarry, all transfer points, and at the project construction site when such materials are determined to be unsuitable. During the course of the work, the stone may be tested by the Government, if the Contracting Officer determines that testing is necessary. If such tests are determined necessary, the testing will be done in the Government's testing laboratory or commercial laboratory selected by the Government. This additional sampling and testing shall be performed at the Contractor's expense when test results indicate that the materials do not meet specified requirements. When test results indicate that materials meet specified requirements, an equitable adjustment in the contract price will be made for the sampling and testing. Any material rejected shall be removed or disposed of as specified and at the Contractor's expense.

c. Samples. Samples of stone shall be taken by a representative of the quarry under the supervision of the Contracting Officer for testing and acceptance prior to delivery of any stone from this source to the site of the work. Samples shall consist of at least three pieces of stone, roughly cubical in shape and 12 inches in the least dimension. Samples shall be taken for each unit that will be used in the production of the required stone. If different sources are proposed for each gradation of stone, samples shall be collected from each source as specified above. The samples shall be shipped at the Contractor's expense to a commercial laboratory designated by the Government at least 65 days before the production stone leaves the quarry. The Contracting Officer shall be notified to arrange for testing at least 75 days before the production stone leaves the quarry.

1.5 CONSTRUCTION TOLERANCES

The finished surface and stone layer thickness shall not deviate from the lines and grades shown by more than the tolerances listed below. Tolerances are measured perpendicular to the indicated neatlines. Extreme limits of the tolerances given shall not be continuous in any direction for more than five (5) times the nominal stone dimension nor for an area greater than 1000 square feet of the structure surface.

NEATLINE TOLERANCES

MATERIAL	ABOVE NEATLINE inches	BELOW NEATLINE inches
Bedding	12	6
Armor	36	18

The intention is that the work shall be built generally to the required

elevations, slope and grade and that the outer surfaces shall be even and present a neat appearance. Placed material not meeting these limits shall be removed or reworked as directed by the Contracting Officer. Payment will not be made for excess material which the Contracting Officer permits to remain in place.

PART 2 PRODUCTS

2.1 MATTRESS STONE

Mattress stone shall be composed of tough, durable particles, adequately free from thin, flat and elongated pieces, and shall contain no organic matter nor soft, friable particles in quantities considered objectionable by the Contracting Officer. All stones shall be roughly angular in shape, with the least dimension of any stone no less than one-third of its greater dimension. All stones shall have density of not less than 140 pounds per cubic ~~foor~~foot (saturated, surface dry). The stone shall be well-graded from 2 to 5 inches.

2.2 BEDDING STONE

Bedding stone shall be composed of tough, durable particles, adequately free from thin, flat and elongated pieces, and shall contain no organic matter nor soft, friable particles in quantities considered objectionable by the Contracting Officer. All stones shall be roughly angular in shape, with the least dimension of any stone no less than one-third of its greater dimension. All stones shall have density of not less than 140 pounds per cubic foor (saturated, surface dry). Gradation shall conform to the following requirements:

BEDDING STONE GRADATION

STONE WEIGHT (lbs)	PERCENT BY WEIGHT, LESS THAN
4000	100
2000	80-90
1070	40-65
400	10-30
133	0-10

The bedding material shall be well-graded between the limits shown. At least one test shall be performed on each 1000 tons to be delivered to the project site in accordance with subparagraph Evaluation Testing of Stone.

2.3 ARMOR STONE

Armor stone shall be graded as shown below. Armor stone shall be hard, close grained, free of cracks, seams or other imperfections which might adversely affect its durability when exposed to weathering and wave action of the inlet environment. All stones shall be roughly angular in shape, with the least dimension of any stone no less than one-third of its greater dimension. Flat stones will not be accepted. All stones shall have density of not less than 165 pounds per cubic foot (saturated, surface dry). The inclusion of objectionable quantities of dirt, sand, clay and rock fines will not be permitted.

ARMOR STONE GRADATION

Stone Weight (tons)	Percent by Weight Passing
~~30~~15	100
~~15~~12	80-90
8	40-65
~~3~~5	10-30
~~1~~3	0-10

2.4 EVALUATION TESTING OF STONE

2.4.1 Evaluation Testing of Stone

The tests to which the stone shall be subjected will include unit weight, absorption, sulfate soundness, abrasion, freezing and thawing, wetting and drying, and petrographic analysis in order to demonstrate that the stone is of a satisfactory quality. Stone shall meet the following requirements:

STONE ACCEPTANCE CRITERIA

TEST	ASTM	STONE TYPE	
		Armor	Bedding and Mattress Stone
Unit Weight	ASTM C 127	165 pcf	140 pcf
Absorption	ASTM C 127	Less than 1% loss	Less than 8% loss
Sulfite Soundness	ASTM C 88 15 cycles	Less than 5% loss	Less than 12% loss
LA Abrasion	ASTM C 535 1000 rev.	Less than 20% loss	Less than 45% loss
Freeze and Thaw	ASTM D 5312	Less than 10% loss for 20 cycles	
Wetting and Drying	ASTM D 5313 30 cycles	Less than 1% loss	Less than 8% loss
Petrography	ASTM C 295	Fresh, interlocking crystalline, no clay minerals, and no soluble materials.	

2.4.2 Stone Quality Testing During Construction

The Contractor shall submit on a weekly basis, for all material delivered during the week, a certification that the material meets all the requirements of the contract specifications. During the course of the work, the stone may be tested by the Government, if the COR determines that testing is necessary. If such tests are determined necessary, the testing will be done in the Government's testing laboratory. The Contractor will

be required to obtain, under the supervision of the COR, samples of at least five (5) pieces of armor stone and 100 pounds of bedding and mattresss stone, and deliver them at his own expense to the Government approved testing laboratory in the state of Florida. This additional sampling and testing shall be performed at the Contractor's expense when test results indicate that the materials do not meet specified requirements. When test results indicate that materials meet specified requirements, an equitable adjustment in the contract price will be made for the sampling and testing. Any material rejected shall be removed or disposed of at the Contractor's expense. Stone of suitable quality shall be furnished and placed at no additional cost to the Government. All stone will be subject to inspection during loading at the source and at the site of the work prior to placement.

2.4.3 Gradation Test

a. The Contractor shall perform a gradation test or tests on each stone gradation at the quarry. The sample shall be taken by the Contractor in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer not less than 3 days in advance of each test. In the event of unavailability of the Contracting Officer, the Contractor shall perform the tests and certify to the Contracting Officer that the stone shipped complies with the specifications. The gradation tests shall be reported using the GRADATION TEST DATA SHEET or ENG FORM 2087, attached at end of this section. The sample shall be collected in a random manner which will provide a sample which accurately reflects the actual gradation arriving at the jobsite. Failure of the test on the initial sample and on an additional sample will be considered cause for rejection of the quarry and/or quarry process, and all stone represented by the failed tests shall be set aside and not incorporated into the work. Any additional tests required because of the failure of an initial test sample will not be considered as one of the other required tests. If collected by the truckload, each truckload shall be representative of the gradation requirements. The mattress stone shall be tested in accordance with ASTM C 136.

b. The weight of the individual pieces of armor stone, representing the minimum, maximum and 50 percent greater than sizes for the specified armor stone gradation, shall be printed on each stone and be placed in a location adjacent to the work site in order to provide a basis for visual comparison during placement of the armor stone. These stones shall be used as the last order of work. The Contracting Officer may direct additional testing of the stone at the project site if the stone appears, by visual inspection, to be out of gradation. The additional tests shall be performed on random loads or stockpiled material selected by the Contracting Officer. The Contracting Officer may direct this testing under the Contract Clause INSPECTION OF CONSTRUCTION. The Contractor shall provide all necessary screens, scales and other equipment, and operating personnel, and shall grade the sample. The quantity selected for testing shall be of the more representative appearing material. The minimum sample size and the number of tests required shall be as follows:

Gradation	Minimum Sample Weight	Number of Tests
Armor Stone	750 tons	2 min.
Bedding Stone	100 tons	1 per 1000 tons
Mattress Stone	1000 pounds	1 per 10 tons

2.4.4 Stone Stockpile

~~Storage areas designated on the drawings may be used for stockpiling of stone with approval of the Contracting Officer.~~Stockpiling or staging areas will not be available at the project site. The Government will not provide stockpile or staging areas. If the Contractor elects to provide off-site stockpiling or staging areas, the Contracting Officer shall be notified by the Contractor of all such areas. After being stockpiled, any stone which has become contaminated with soil or refuse shall not be put into the work unless the contaminating material has been removed from the stone prior to placement.

PART 3 EXECUTION

3.1 BASE PREPARATION

Areas on which geotextile and the marine mattress are to be placed shall be inspected by the Contractor prior to placement of any materials. Debris or displaced stones from the existing jetty that are within the limits of the geotextile and marine mattress shall be removed prior to placement. Debris shall become the property of the Contractor and shall be removed and disposed of by the Contractor. All material shall be properly disposed of in accordance with the requirements of Section 01410 ENVIRONMENT PROTECTION, including any applicable local requirements. Displaced stone shall be placed on the existing jetty. There will be no measurement and payment for the debris or stone removal and all costs will be considered incidental to the contract.

3.2 LIMITATIONS OF PLACEMENT PROCEDURES

Stone construction in advance of completed permanent protection except as specified herein shall be at the Contractor's risk. The Contractor shall keep the Contracting Officer informed as to any and all situations that may result in a possible interruption of work.

3.2.1 Interruptions

If the Government can anticipate that the stone construction will be interrupted for more than four (4) continuous days, including weekends and holidays, the Contractor may be required to complete the placement of armor stone and provide protection of the exposed ends prior to the start of the interruption. The above-required protection for the exposed ends of the jetty shall consist of the same type of armor stone. All material used for protecting the exposed ends shall be removed after the need therefor has ended and shall be appropriately incorporated into the required permanent construction. All materials which are removed and placed in the permanent construction, in accordance with the provisions of this section, will be measured and paid for only once. When temporary protection of exposed ends of construction in progress is ordered or directed by the Contracting Officer, an equitable adjustment will be made for the work of temporarily placing and removing the stone materials. The Government has no obligation to order that exposed ends be protected. If the Government takes no action to have exposed ends protected, then the provisions of the paragraph MATERIAL PLACEMENT IN ADVANCE shall apply.

3.2.2 Material Placement in Advance

The jetty shall not be constructed more than 50 feet in advance of completed placement of the armor stone. Armor stone shall be brought up evenly on both sides of the steel sheet pile wall (South Jetty only). In the event an unprotected section of any length unsurveyed is left during a

nonwork period or is left unprotected for a period longer than four continuous days and is damaged or causes damage to a completed section, the damaged portion(s) shall be replaced or reshaped as approved by the Contracting Officer at no additional cost to the Government.

3.2.3 Placement Control

The Contractor shall be responsible for control of the placement of stone in the jetty, and he shall furnish, operate, and maintain necessary equipment and furnish all necessary material and supplies. At all times when stone placement from floating plant is underway, the means by which the Contractor positions his plant, equipment, and stone supply barges must function accurately and consistently. ~~The Contractor's plant and equipment shall have a dragline or backhoe capable of being mobile on the spud barge and the flexibility to perform stone placement by the drag-off method.~~ The kick-off method for stone placement shall not be used unless approved by the Contracting Officer. Whatever the method employed, it must permit the Contractor and the Government inspector readily to determine the exact position of the stone-placing operation. The Contractor shall not place anchors for the purpose of holding floating plant in place over existing or partially completed stone work.

3.2.3.1 Alignment Control

The method of alignment control shall be either a manned transit or laser or either colored or polarized light beams, or any other method demonstrated to be practicable and sufficiently precise and reliable as approved by the Contracting Officer.

3.2.3.2 Distance Control

The method of distance control for floating plant engaged in the subaqueous placement of stone shall be either wire distance wheel or another equally accurate measuring device as approved by the Contracting Officer.

3.2.3.3 Depth Finder

An electronic recording depth finder, approved by the Contracting Officer, in writing, shall be provided during the construction of the jetty. The depth finder shall have a recording scroll not less than 6 inches wide with a scale of not more than 10 feet of depth to the in. The depth finder shall be capable of obtaining accurate profiles and cross-sections during construction of the jetty and shall be used to monitor anticipated and actual scour and as an aid in the control of stone placement. The Contractor shall furnish and maintain an adequate stock of recording paper for the depth finder.

3.2.3.4 Nonpermitted Devices

The use of buoys and piles of stone placed above the water surface as placement control devices will not be permitted. The use of bank targets for alignment control will not be permitted for work distances of more than 400 feet without prior approval, in writing, by the Contracting Officer.

3.3 STEEL SHEET PILE

Installation of the steel sheet pile shall be in accordance with Section 02464 METAL SHEET PILING. Responsibility for damage to the structure due to stone placement operations shall rest with the Contractor.

3.4 PLACEMENT OF GEOTEXTILE AND MARINE MATTRESS

The geotextile and marine mattress shall be installed to the lines and grades as indicated on the contract drawings. Placement shall begin at the bottom of the area to be covered and continue up slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. Placement shall conform to SECTION 02370 POLYMERIC MARINE MATTRESS and SECTION 02373 SEPARATION/FILTRATION GEOTEXTILE.

3.5 PLACEMENT OF BEDDING LAYER

Bedding stone shall be spread uniformly on the marine mattress to the lines and grades as indicated on the contract drawings and in such manner as to avoid damage to the mattress. Placement shall begin at the bottom of the area to be covered and continue up slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. Placing of bedding stone by methods which tend to segregate the particle sizes within the layer will not be permitted. Any damage to the surface of the mattress during placement of bedding stone shall be repaired before proceeding with the work. Compaction of bedding stone will not be required, but shall be finished to present an adequately even surface, free from mounds or windrows.

3.6 PLACEMENT OF ARMOR STONE

Stone shall be placed in the locations and at the thickness shown without deviating from the lines and grade shown, including allowance for tolerances. Stone shall be brought up evenly on both sides of the steel sheet pile wall (South Jetty only). Final shaping of the slope shall be performed concurrently with the initial placement of the stone. Stones shall be randomly selected and set in contact with each other so that the interstices between adjacent stones shall be as small as the character of the stone will permit. The face of stone having the largest area shall be placed against the surface of the underlying material. Placement shall begin at the bottom of the slope. Stones shall be placed in a manner to avoid displacing underlying materials or placing undue impact force on underlying material that would cause the breaking of stones. Unless otherwise specified, stone shall not be dropped from a height greater than two feet. The equipment used in placing the stone shall be suitable for handling materials of the sizes required including the ability to place the stone over its final position before release and if necessary pick up and reposition the stone. Dragline buckets and skips shall not be used in placement. Moving stone by drifting or manipulating down the slope will not be permitted. The finished work shall be a well distributed mass, free of pockets of either smaller or larger stone, having a minimum of voids and with the maximum of interlocking of stones. It should be anticipated that rehandling of individual stones after initial placement will be required to achieve the above requirements.

3.6.1 Chinking of Armor Stone

Following placement of the cap stones, the remaining spaces between individual stones shall be filled with pieces of smaller stone obtained from the required stone gradation materials being supplied for this contract. The spaces between cap stones shall be filled with selected stones of the maximum size which will fit in each remaining space. At the elevation of the upper horizontal surface of the cap stones, the stones

used for chinking shall be placed with their elongated dimension in a vertical direction and forced into place in the spaces between stones such that they become firmly wedged in place.

3.6.2 Slides

In the event of the sliding or failure of any part of the structure during its construction, or after its completion, but prior to its acceptance, the Contractor shall, upon written order of the Contracting Officer, cut out and remove the slide from the structure and then rebuild that portion of the structure with new materials or reuse the displaced materials for rebuilding if deemed appropriate. The Contracting Officer shall determine the nature and cause of the slide. In case the slide is caused through fault of the Contractor, the foregoing operations shall be performed without cost to the Government.

3.7 SURVEYS

The Contractor shall establish and maintain quality control for all work performed at the job site under this section to assure compliance with contract requirements. He shall maintain records of his quality control tests, inspections and corrective actions. Quality control measures shall cover all construction operations including, but not limited to, the placement of all materials to the slope and grade lines shown and in accordance with this section.

3.7.1 Check Surveys

Surveys made by the Contractor are required on each material placed for determining that the materials are acceptably placed in the work. The Contractor shall make checks as the work progresses to verify lines, grades and thicknesses established for completed work. At least one (1) check survey as specified below shall be made by the Contractor for each twenty-five (25) foot section as shown as practicable after completion. Following placement of each type of material, the cross section of each step of the work shall be approved by the Contracting Officer before proceeding with the next step of the work. Approval of cross sections based upon check surveys shall not constitute final acceptance of the work. Cross sections shall be taken by the Contractor on lines 25 feet apart, measured along the structure reference line, with readings at 5-foot intervals and at breaks along the lines. However, other cross section spacing and reading intervals may be used if determined appropriate by the Contracting Officer. Additional elevations and soundings shall be taken as the Contracting Officer may deem necessary or advisable. The surveys shall be conducted in the presence of an authorized representative of the Contracting Officer, unless this requirement is waived by the Contracting Officer.

a. Above Water: The elevation of stone above the water surface shall be determined by the use of a leveling instrument and a rod having a base 12 inches in diameter. If approved by the Contracting Officer other means may also be used.

b. Below Water: For portions of the work that are under water, sounding surveys shall be performed either by means of a sounding pole or a sounding basket weighing about 8 1/2 pounds, each of which has a base measuring 12 inches in diameter.

c. Gage Board: The gage shall be checked prior to any survey. The

Contractor shall install a gage board at the project site.

d. Electronic Depth Recorder Method: When using an electronic depth recorder the following procedures shall be used.

(1) The depth recorder shall be calibrated and adjusted for the gage, with check bar, at least six (6) times within a normal eight (8) hour work day.

(2) Normal calibration times shall be at the beginning of the work day, mid-morning, close of morning's work, start of afternoon's work, mid-afternoon, and the end of the day.

(3) Further calibrations shall be performed whenever there is any malfunction within the depth recorder or transducer which might affect the soundings, a major gage change, or change in water temperature due to industrial discharge or other causes.

(4) The check bar shall be set at approximately the deepest sounding in the area to be sounded.

(5) The depth recorder shall be calibrated to read at low water datum.

(6) When checking the calibration at mid-morning, end of morning, mid-afternoon and end of work, the same setting used for the previous calibration shall be used.

(7) If the calibration check does not agree with the previous calibration, the depth recorder shall be calibrated to the proper setting.

(8) Under no circumstances shall the setting of the depth recorder be changed between calibrations.

e. Electronic Depth Recorder: The survey depth recorder used must be a standard model acceptable to the Contracting Officer using a sounding chart that can be read directly to the nearest foot and estimated to the nearest tenth (0.1) of a foot. Accuracy shall be better than 1/2 of 1 percent.

f. Tagline Method of Horizontal Location Along Station: If a tagline is used with a depth recorder, the soundings shall be marked with a fix every 5 feet.

g. Predetermined Transit Angle Method or Ranges Method: The interval between predetermined angles or ranges along a sounding line shall not exceed 200 feet along the entire length of the sounding line. No predetermined angle shall form an intersection with the sounding line of less than 45 degrees.

h. Speed of the Sounding Boat: When sounding, the speed of the sounding boat shall be as constant as possible, preferably between 180 and 220 feet per minute.

i. Checking Gage: The gage shall be checked prior to each calibration and recorded on the sounding chart or in the field notes.

G R A D A T I O N T E S T D A T A S H E E T

Quarry _____ Type of Stone Tested _____

Date of Test _____ Testing Rate _____

T E S T R E P R E S E N T S

Contract No.	District	Tons
	TOTAL	

G R A D A T I O N

Stone Size (kg)	Weight Retained	Individual % Retained	Cumulative % Ret.	Cumulative % Pass	Specification % Finer by wt
Total Weight					

Max Size Stone =	

Remarks:

I certify that the above stone sample is representative of the total tonnage covered by this test report.

Contractor Representative _____

Government Representative _____

EXAMPLE GRADATION SPECIFICATIONS

PERCENT LIGHTER BY WEIGHT	STONE WEIGHT IN LBS.
100	400 - 160
50	160 - 80
15	80 - 30

EXAMPLE WORKSHEET

STONE SIZE LBS.	INDIVIDUAL WT. RETAINED	INDIVIDUAL PERCENT RETAINED	CUMULATIVE PERCENT RETAINED	CUMULATIVE PERCENT PASSING
400	0	0	0	100
160	9,600	30	30	70
80	11,200	35	65	35
30	8,000	25	90	10
<30	3,200	10	100	-
TOTAL	32,000 pounds			

NOTE: Largest stone 251 pounds

G R A D A T I O N T E S T D A T A S H E E T

Quarry _____ Type of Stone Tested _____

Date of Test _____ Testing Rate _____

T E S T R E P R E S E N T S

Contract No.	District	Tons
	TOTAL	

G R A D A T I O N

Stone Size (lbs)	Weight Retained	Individual % Retained	Cumulative % Ret.	Cumulative % Pass	Specification % Finer by wt
Total Weight					

Max Size Stone =	

Remarks:

I certify that the above stone sample is representative of the total tonnage covered by this test report.

Contractor Representative _____

Government Representative _____

-- End of Section --

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SECTION 02464

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SECTION 02464

METAL SHEET PILING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 6/A 6M	(2000) General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
ASTM A 690/A 690M	(1994) High-Strength Low-Alloy Steel H-Piles and Sheet Piling for Use in Marine Environments

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Metal Sheet Piling; G|EN

Detail drawings for sheet piling including fabricated sections shall show complete piling dimensions and details, driving sequence and location of installed piling. Detail drawings shall include details and dimensions of templates and other temporary guide structures for installing piling. Detail drawings shall provide details of the method of handling piling to prevent permanent deflection, distortion or damage to piling interlocks.

Driving; FIO

Records of the sheet piling driving operations shall be submitted after driving is completed. These records shall provide a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling.

SD-03 Product Data

Pile Driving Equipment; G|EN

Complete descriptions of sheet piling driving equipment including hammers, extractors, protection caps and other installation appurtenances shall be submitted for approval prior to commencement of work.

Pulling and Redriving; G|EN

The proposed method of pulling sheet piling shall be submitted and approved prior to pulling any piling.

SD-06 Test Reports

Materials Tests; FIO

Certified materials tests reports showing that sheet piling and appurtenant metal materials meet the specified requirements shall be submitted for each shipment and identified with specific lots prior to installing materials. Material test reports shall meet the requirements of ASTM A 6/A 6M.

1.3 DELIVERY, STORAGE AND HANDLING

Materials delivered to the site shall be new and undamaged and shall be accompanied by certified test reports. The manufacturer's logo and mill identification mark shall be provided on the sheet piling as required by the referenced specifications. Sheet piling shall be stored and handled in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks. Storage of sheet piling should also facilitate required inspection activities.

PART 2 PRODUCTS

2.1 METAL SHEET PILING

Metal sheet piling shall be hot-rolled steel sections conforming to ASTM A 690/A 690M. The interlocks of sheet piling shall be free-sliding, provide a swing angle suitable for the intended installation but not less than 5 degrees when interlocked, and maintain continuous interlocking when installed. Sheet piling including special fabricated sections shall be sections of the dimensions shown. Fabricated sections shall conform to the requirement and the piling manufacturer's recommendations for fabricated sections for fabricated sections. Fabricated tees, wyes and cross pieces shall be fabricated of piling sections with a minimum web thickness of 1/2 inch. Sheet piling shall be provided with standard pulling holes.

2.2 APPURTENANT METAL MATERIALS

Metal plates, shapes, bolts, nuts, rivets and other appurtenant fabrication and installation materials shall conform to manufacturer's standards and to the requirements specified in the respective sheet piling standards.

2.3 CORROSION COATINGS

A corrosion resistant coating shall be applied to the sheet pile sections extending from the top of the pile to a depth of 10 feet below the soil surface. Coatings shall conform to Section 09965A PAINTING.

2.4 TESTS, INSPECTIONS, AND VERIFICATIONS

2.4.1 Materials Tests

Materials tests shall conform to the following requirements. Sheet piling and appurtenant materials shall be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site. Testing of sheet piling for mechanical properties shall be performed after the completion of all rolling and forming operations. Testing of sheet piling shall meet the requirements of ASTM A 6/A 6M.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Pile Driving Equipment

Pile driving equipment shall conform to the following requirements.

3.1.1.1 Driving Hammers

Hammers shall be steam, air, or diesel drop, single-acting, double-acting, differential-acting, or vibratory type. The driving energy of the hammers shall be between 8,750 and 16,000 foot-pounds as recommended by the manufacturer for the piling weights and subsurface materials to be encountered.

3.1.2 Placing and Driving

3.1.2.1 Placing

Pilings shall be carefully located as shown on the contract drawings. Pilings shall be placed plumb with out-of-plumbness not exceeding 1/8 inch per foot of length and true to line. Temporary wales, templates, or guide structures shall be provided to insure that the pilings are placed and driven to the correct alignment. At least two templates shall be used in placing each piling and the maximum spacing of templates shall not exceed 20 feet. Pilings properly placed and driven shall be interlocked throughout their length with adjacent pilings to form a continuous diaphragm throughout the length or run of piling wall.

3.1.2.2 Driving

Prior to driving pilings in water a horizontal line shall be painted on both sides of each piling at a fixed distance from the bottom so that it shall be visible above the water line after installation. This line shall indicate the profile of the bottom elevation of installed pilings and potential problem areas can be identified by abrupt changes in its elevation. Pilings shall be driven with the proper size hammer and by approved methods so as not to subject the pilings to damage and to ensure proper interlocking throughout their lengths. Driving hammers shall be maintained in proper alignment during driving operations by use of leads or guides attached to the hammer. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damages. The use of vibratory hammers should be discontinued and impact hammers employed when the penetration rate due to vibratory loading is one foot or less per minute. A protecting cap shall be employed in driving when using impact hammers to prevent damage to the tops of pilings. Pilings damaged during driving or driven out of interlock shall be removed and replaced at the Contractor's expense. Pilings shall

be driven without the aid of a water jet unless otherwise authorized. Adequate precautions shall be taken to insure that pilings are driven plumb. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb in the plane of the wall the piling being driven shall be driven to the required depth and tapered pilings shall be provided and driven to interlock with the out-of-plumb leading edge or other approved corrective measures shall be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length. Pilings in each run or continuous length of piling wall shall be driven alternately in increments of depth to the required depth or elevation. No piling shall be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. If the piling next to the one being driven tends to follow below final elevation it may be pinned to the next adjacent piling. If obstructions restrict driving a piling to the specified penetration the obstructions shall be removed or penetrated with a chisel beam. Pilings shall be driven to depths shown and shall extend up to the elevation indicated for the top of pilings. A tolerance of 6 inches above the indicated top elevation will be permitted.

3.1.3 Cutting-Off and Splicing

Pilings driven to refusal or to the point where additional penetration cannot be attained and are extending above the required top elevation in excess of the specified tolerance shall be cut off to the required elevation. Pilings driven below the required top elevation and pilings damaged by driving and cut off to permit further driving shall be extended as required to reach the top elevation by splicing when directed at no additional cost to the Government. Pilings adjoining spliced pilings shall be full length unless otherwise approved. Ends of pilings to be spliced shall be squared before splicing to eliminate dips or camber. Pilings shall be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced pilings shall be free sliding and able to obtain the maximum swing with contiguous pilings. The tops of pilings excessively battered during driving shall be trimmed when directed at no cost to the Government. Piling cut-offs shall become the property of the Contractor and shall be removed from the site. The Contractor shall cut holes in pilings for bolts, rods, drains or utilities as shown or as directed. All cutting shall be done in a neat and workmanlike manner. A straight edge shall be used in cuts made by burning to avoid abrupt nicks. Bolt holes in steel piling shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding metal. Holes other than bolt holes shall be reasonably smooth and the proper size for rods and other items to be inserted.

3.1.4 Inspection of Driven Piling

The Contractor shall inspect the interlocked joints of driven pilings extending above ground. Pilings found to be out of interlock shall be removed and replaced at the Contractor's expense.

3.1.5 Pulling and Redriving

In the pulling and redriving of piles as directed, the Contractor shall pull selected pilings after driving to determine the condition of the underground portions of pilings. Any piling so pulled and found to be damaged to the extent that its usefulness in the structure is impaired shall be removed and replaced at the Contractor's expense. Pilings pulled

and found to be in satisfactory condition shall be redriven when directed.

3.2 QUANTITIES

The estimated quantities of sheet piling listed in the unit price schedule of the contract as to be furnished by the Contractor are given for bidding purposes only. Sheet piling quantities for payment shall consist of the ~~linear~~square feet of piling acceptably installed. Installed quantities shall consist of all piling including fabricated sections driven between the required top and bottom elevations of pilings plus any additions thereto resulting from changes in design or alignment as provided in paragraph DRIVING.

3.3 BASE FINISHING

During pile driving operations, voids may form adjacent to the piles due to soil drawdown. If in the judgement of the Contracting Officer, holes developed by pile driving may impact the performance of the marine mattress in supporting the structure, the Contractor shall be required to grade the area prior to placement of the geotextile and marine mattress.

3.4 ADVANCE PLACEMENT

Sheet pile shall not be installed more than six sections in advance of completed stone placement unless otherwise authorized by the Contracting Officer. In the event an unprotected section of any length is left unprotected and is damaged or causes damage to a completed section, the damaged portion(s) shall be replaced or reshaped as approved by the Contracting Officer at no additional cost to the Government.

-- End of Section --