

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE N/A	PAGE OF PAGES 1 105
-----------------------------------------------------------	--	--	----------------------------	--------------------------

2. AMENDMENT/MODIFICATION NO. 0001	3. EFFECTIVE DATE 16 AUG 2004	4. REQUISITION/PURCHASE REQ. NO. N/A	5. PROJECT NO. (If applicable)
---------------------------------------	----------------------------------	-----------------------------------------	--------------------------------

6. ISSUED BY USACE SACRAMENTO DISTRICT ATTN: CONTRACTING DIVISION 1325 J STREET SACRAMENTO, CALIFORNIA 95814-2922	CODE	7. ADMINISTERED BY (If other than Item 6) SEE ITEM 6	CODE
-----------------------------------------------------------------------------------------------------------------------------------	------	-------------------------------------------------------------	------

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)	(√) <input checked="" type="checkbox"/>	9A. AMENDMENT OF SOLICITATION NO. W9123P7-04-B-0006
	<input checked="" type="checkbox"/>	9B. DATED (SEE ITEM 11) 30 JUL 2004
		10A. MODIFICATION OF CONTRACTS/ORDER NO. N/A
		10B. DATED (SEE ITEM 13) N/A
CODE	FACILITY CODE	

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.)
WIDENING OF INNER HARBOR TURNING BASIN PORT OF OAKLAND PHASE 1 B - BULKHEAD, DREDGING & PARTIAL DEMOLITION OF PIERS 2 & 5 ALAMEDA AND SAN FRANCISCO COUNTIES, CALIFORNIA

1 ENCL: 1) PRICING SCHEDULE, 00100, TABLE OF CONTENTS, 01330, SUBMITTALS, 01331, 01525, 02325, 02464, 03307 AND 05055.

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

PRICING SCHEDULE

CONTRACTOR SHALL FURNISH ALL PLANT, LABOR, MATERIAL, EQUIPMENT, ETC. NECESSARY TO PERFORM ALL WORK IN STRICT ACCORDANCE WITH THE TERMS AND CONDITIONS SET FORTH IN THE CONTRACT TO INCLUDE ALL ATTACHMENTS THERETO.

<u>Item</u>	<u>Description</u>	<u>Quantity</u>	<u>U/M</u>	<u>U/P</u>	<u>Amount</u>
0001	Mobilization and Demobilization	1	LUMP SUM	LUMP SUM	\$ _____
0002	Demolition of Pier 5 Dolphins and Walkway	1	LUMP SUM	LUMP SUM	\$ _____
0003	Demolition of Pier 2 – Partial	1	LUMP SUM	LUMP SUM	\$ _____
0004	Retrofit Remaining Pier 2	1	LUMP SUM	LUMP SUM	\$ _____
0005	Remove Shoreline Debris	1	LUMP SUM	LUMP SUM	\$ _____
0006	Berth 10 Dike and Weir Removal	1	LUMP SUM	LUMP SUM	\$ _____
0007	Excavation	1	LUMP SUM	LUMP SUM	\$ _____
0008	Furnish Steel Sheet Pile	56,168*	SF		\$ _____ \$ _____
0009	Install Bulkhead Steel Sheet Pile	56,168*	SF		\$ _____ \$ _____
0010	Cut-Offs (allowance)	10	EA		\$ _____ \$ _____
0011	Pulled Pilings (allowance)	4	EA		\$ _____ \$ _____
0012	Furnish Steel H-Piles	15,886*	LF		\$ _____ \$ _____
0013	Install Steel H-Piles	135	EA		\$ _____ \$ _____
0014	Reinforced Concrete Pile Cap Beam	861	EA		\$ _____ \$ _____
0015	Structure Backfill	12,500*	TN		\$ _____ \$ _____
0016	Dredging of Wet Basin and Inner Bulkhead Area – YBM	97,500**	CY		\$ _____ \$ _____
0017	Dredging of Wet Basin and Inner Bulkhead Area – SAF & OBM	58,000**	CY		\$ _____ \$ _____
0018	Overdredge Allowance – SAF & OBM	7,500**	CY		\$ _____ \$ _____
0019	Dredge Debris Removal	1,800*	TN		\$ _____ \$ _____
0020	Rock Buttress	27,240*	TN		\$ _____ \$ _____

0021 Install K-Rail at Berth 10	3,180*	LF	\$ _____	\$ _____
0022 Remove Portion of Existing Sheet Wall	480*	LF	\$ _____	\$ _____
0023 Bulkhead – Combination Wall	5,438*	SF	\$ _____	\$ _____

TOTAL ESTIMATED PRICE \$ _____

* QUANTITY IS AN ESTIMATED AMOUNT. SEE SECTION 00700, FAR 52.211-18, FOR VARIATION IN ESTIMATED QUANTITY CONTRACT CLAUSE.

**QUANTITY IS AN ESTIMATED AMOUNT. SEE SECTION 00800, 52.2900-4021 VARIATIONS IN ESTIMATED QUANTITIES – DREDGING.

- Prices must be submitted on all individual items of this Pricing Schedule. Failure to do so may be cause for rejection of bids.
- If a modification to a price based on unit price is submitted which provides for a lump sum adjustment to the total estimated price, the applications of the lump sum adjustment to each unit price in the Pricing Schedule must be stated. If it is not stated, the bidder/offeror agrees that the lump sum adjustment shall be applied on a pro rata basis to every unit price in the Pricing Schedule.
- The bidder/offeror shall distribute his indirect costs (overhead, profit, bond, etc.) over all the items in the Pricing Schedule. The Government will review all submitted Pricing Schedules for any unbalancing of the items. Any submitted Pricing Schedule determined to be unbalanced may be considered nonresponsive and cause the bidder to be ineligible for award.
- The lump sum, "LS", line items above are not "estimated quantity" line items and therefore are not subject to the Variation in Quantity contract clause.

5. DREDGING PLANT AND EQUIPMENT SCHEDULE.

(a) Bidders are to complete and submit attached "Dredging Plant and Equipment Schedule," (See Attachments P.1 and P.2). It will be required from only the low bidder. The purpose of this Dredging Plant and Equipment Schedule is to assist the Contracting Officer in determining Contractors responsibility.

6 EFARS 52.214-5000 ARITHMETIC DISCREPANCIES

(a) For the purpose of initial evaluation of bids, the following will be utilized in the resolving arithmetic discrepancies found on the face of Pricing Schedule as submitted by the bidder:

- Obviously misplaced decimal points will be corrected;
- Discrepancy between unit price and extended price, the unit price will govern;
- Apparent errors in extension of unit prices will be corrected;
- Apparent errors in addition of lump-sum and extended prices will be corrected.

(b) For the purpose of bid evaluation, the Government will proceed on the assumption that the bidder intends the bid to be evaluated on basis of the unit prices, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

(c) These correction procedures shall not be used to resolve any ambiguity concerning which bid is low.

52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from

Contracting Officer
1325 J Street, Room 878
Sacramento, California 95814

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.236-27 SITE VISIT (CONSTRUCTION) ALTERNATE I

(a) An organized site visit has been scheduled for 15 Jul 2004 @ 1:30 p.m. **and 17 Aug @ 2:00 pm.**

(b) Participants will meet at Alameda Project Office. Please contact Robert Smith at (510) 337-8846 to get directions to the Project Office.

(End of provision)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es): <http://www.acqnet.gov>

(End of provision)

52.252-3 ALTERATIONS IN SOLICITATION (APR 1984)

Portions of this solicitation are altered as follows: N/A

52.252-5 AUTHORIZED DEVIATIONS IN PROVISIONS (APR 1984)

(a) The use in this solicitation of any Federal Acquisition Regulation (48 CFR Chapter 1) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the provision.

PROJECT TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01005 SUPPLEMENTARY CONDITIONS
01090 SOURCES FOR REFERENCE PUBLICATIONS
01270 MEASUREMENT AND PAYMENT
01312 RESIDENT MANAGEMENT SYSTEM (RMS)
01320 PROJECT SCHEDULE
01330 SUBMITTAL PROCEDURES
01331 HYDROGRAPHIC SURVEYING
01354 ENVIRONMENTAL PROTECTION FOR CIVIL WORKS
01451 CONTRACTOR QUALITY CONTROL
01500 TEMPORARY CONSTRUCTION FACILITIES
01525 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
01780 CLOSEOUT SUBMITTALS

DIVISION 02 - SITE WORK

02220 DEMOLITION
02300 EARTHWORK
02325 DREDGING
02378 GEOTEXTILES USED AS FILTERS
02380 ROCK BUTTRESS FOR BULKHEAD
02456 STEEL PILES
02464 METAL SHEET PILING

DIVISION 03 - CONCRETE

03100 STRUCTURAL CONCRETE FORMWORK
03150 EXPANSION JOINTS AND CONTRACTION JOINTS
03201 CONCRETE REINFORCEMENT
03307 CONCRETE FOR STRUCTURES

DIVISION 05 - METALS

05055 METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS

DIVISION 09 - FINISHES

09967 COATING OF STEEL STRUCTURES

-- End of Project Table of Contents --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

- 1.1 SUBMITTALS
- 1.2 SUBMITTAL CLASSIFICATION
 - 1.2.1 Government Approved
 - 1.2.2 For Information Only -- FIO
- 1.3 APPROVED SUBMITTALS
- 1.4 DISAPPROVED SUBMITTALS
- 1.5 CERTIFICATE OF COMPLIANCE
- 1.6 WITHHOLDING OF PAYMENT
- 1.7 SUBMITTAL COPIES
 - 1.7.1 Paper Submittals
 - 1.7.2 Electronic Versions
 - 1.7.3 Samples
- 1.8 SUBMITTALS

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

- 3.1 GENERAL
- 3.2 SUBMITTAL REGISTER (ENG FORM 4288)
- 3.3 SCHEDULING
- 3.4 TRANSMITTAL FORM (ENG FORM 4025)
- 3.5 SUBMITTAL PROCEDURE FOR DEVIATIONS
 - 3.5.1 Procedure
 - 3.5.2 Deviations
 - 3.5.3 Submittal Format
- 3.6 CONTROL OF SUBMITTALS
- 3.7 GOVERNMENT APPROVED SUBMITTALS
- 3.8 FOR INFORMATION ONLY SUBMITTALS
- 3.9 PAYMENT
- 3.10 STAMPS

-- End of Section Table of Contents --

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTALS

Submittals required are identified by SD numbers as follows:

SD-01 Data

SD-04 Drawings

SD-06 Instructions

SD-07 Schedules

SD-08 Statements

SD-09 Reports

SD-13 Certificates

SD-14 Samples

SD-18 Records

SD-19 Operation and Maintenance Manuals

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.2.2 For Information Only -- FIO

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.3 APPROVED SUBMITTALS

The approval of submittals by the Contracting Officer shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the

responsibility for any error that may exist, as the Contractor under the CQC requirements of this contract is responsible for the dimensions, details and satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be given consideration unless accompanied by an explanation as to why a substitution is necessary.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, notice as required under the Contract Clause entitled "Changes" shall be given promptly to the Contracting Officer.

1.5 CERTIFICATE OF COMPLIANCE

Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in original and three copies. Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet specific requirements.

1.6 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

1.7 SUBMITTAL COPIES

1.7.1 Paper Submittals

The Contractor shall provide one original, signed where required, and 3 copies of all paper submittals, including such things as manufacturer's specifications, test reports and certifications.

1.7.2 Electronic Versions

When required by the specifications or at the request of the Contracting Officer, and otherwise whenever possible, the Contractor shall provide an electronic version of the submittals either as an email attachment (zipped as necessary) or on CD. The preferred electronic version would be as a file from such commonly-used programs as MS Word, Excel or Access. Files from the Contractor-provided Project Scheduling SW shall be included with Project Schedule submissions

1.7.3 Samples

When material samples are to be submitted i.a.w. the technical sections, the Contractor shall propose by letter, or email, for Government approval the number of samples that will be provided for Government review.

1.8 SUBMITTALS

Submittal Register via RMS (3.6); GA

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER (ENG FORM 4288)

The Contractor shall submit all items listed on the Submittal Register (ENG Form 4288) or specified in the other sections of these specifications. The Contracting Officer may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective section. Units of weights and measures used on all submittals shall be the same used in the contract drawings. Submittals shall be made in the respective number of copies and to the respective addresses set forth below. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each respective transmittal form (ENG Form 4025) shall be stamped, signed, and dated by the CQC representative certifying that the accompanying submittal complies with the contract requirements. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts; diagrams; test reports; samples; certifications; warranties and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby.

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 7 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delays, damages or time extensions will be allowed for time lost in late submittals.

3.4 TRANSMITTAL FORM (ENG FORM 4025)

The transmittal form generated by the RMS shall be used for submitting both Government Approved (GA) and For Information Only (FIO) submittals. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care will be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.5 SUBMITTAL PROCEDURE FOR DEVIATIONS

3.5.1 Procedure

Within seven (7) calendar days after receipt of notice to proceed, the Contractor shall complete and submit to the Contracting Officer, in duplicate, the submittal register (ENG FORM 4288) listing all submittals required under the contract and dates of submittal. The scheduled need dates shall be recorded on the register for each item for control purposes.

Scheduling shall be coordinated with the approved progress schedule. The Contractor's quality control representative shall review the register at least every 7 days and take appropriate action to maintain an effective system. Updated or corrected copies of the register shall be submitted in duplicate within seven (7) calendar days.

3.5.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG FORM 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.5.3 Submittal Format

Regardless of statements elsewhere in these contract documents, all submittals shall be submitted in hardcopy on paper in addition to any other formate specified elsewhere (e.g., electronic formate, electronic mail, etc.)

3.6 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register" via RMS.

3.7 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Three copies of the submittal will be retained by the Contracting Officer and 1 copy of the submittal will be returned to the Contractor.

3.8 FOR INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

3.9 PAYMENT

No separate or direct payment will be made for the work covered under this section, and all costs in connection therewith will be considered a subsidiary obligation of the Contractor.

3.10 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR	
(Firm Name)	
WIDENING OF INNER HARBOR TURNING BASIN AT PORT OF OAKLAND PHASE I	
_____	Approved
_____	Approved with corrections as noted on submittal data and/or attached sheets(s).
SIGNATURE:	_____
TITLE:	_____
DATE:	_____

-- End of Section --

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO. **03307**

SPECIFICATION SECTION

TITLE AND LOCATION **Widening of Inner Harbor Turning Basin - Phase 1B**

a.	b.	c.	d.	e.	TYPE OF SUBMITTAL										CLASSIFICATION	CONTRACTOR	CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION		GOVERNMENT ACTION		REMARKS														
					f.	g.	h.	i.	j.	k.	l.	m.	n.	o.			p.	q.	r.	s.	t.	u.	v.		w.	x.	y.	z.	aa.									
			2.1.3.1	Air-Entraining Admixture												X																						
			2.1.3.2	Accelerating Admixture												X																						
			2.1.3.3	Water-Reducing or Retarding Admixture												X																						
			2.1.5	Curing Materials												X																						
			2.1.2	Aggregates												X																						
			1.3.3	Concrete Mixture Proportions												X																						
			2.1.1	Cementitious Materials												X																						
			2.1.2	Aggregates												X																						
			3.1.4.3	Batching and Mixing Equipment												X																						

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01331

HYDROGRAPHIC SURVEYING

PART 1	GENERAL
1.1	DESCRIPTION OF WORK
1.2	REFERENCES
1.3	SUBMITTALS
1.3.1	Surveying Equipment Data
1.3.2	Basic Survey Documentation
1.3.3	Progress Payment Survey Documentation
1.4	RESPONSIBILITIES
1.5	SURVEY EQUIPMENT
1.6	SOFTWARE
PART 2	PRODUCTS (Not Applicable)
PART 3	EXECUTION
3.1	SURVEYING PROCEDURES
3.1.1	QC Surveys
3.1.2	Progress Payment Surveys
3.1.3	Government Observers
3.1.4	Onsite Quality Assurance (QA)
3.1.5	Calibration and Controls
3.1.6	Survey Line Integrity
3.2	GOVERNMENT SURVEYS
3.2.1	Pre-dredge Survey
3.2.2	Post-dredge Survey
3.2.3	Contractor Survey Certification
3.2.4	QA Surveys
3.3	SURVEY DATA
3.3.1	Basic Survey Documentation
3.3.2	Field Data
3.3.3	Progress Payment Survey Documentation
3.3.4	Final Payment Survey Documentation
3.4	QUANTITY CALCULATIONS
3.4.1	Volume Calculations
3.4.2	Final Payment Quantities
3.5	SURVEYING PAYMENTS

SECTION 01331

CLASS I HYDROGRAPHIC SURVEYING

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The Contractor shall use hydrographic surveys to perform (Section 01405) Quality Control (QC) of the dredging, to update the (Section 01320) Project Schedule and the (Section 02325) Dredging and Disposal Plan, to determine the volume of material removed for progress payment requests and to provide information to the Contracting Officer or to the Contracting Officer's Representative (COR) for managing this contract.

1.1.1 The Contractor shall comply with the procedures, standards and quality control criteria in Engineer Manual (EM) 1110-2-1003 in performing hydrographic surveys for this contract.

1.1.2 If there is a conflict between these specifications and EM 1110-2-1003, the more stringent requirements shall apply.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referenced within the text by the basic designation only. U.S. Army Corps of Engineers (USACE) publications are available online.

USACE EM 1110-2-1003 (latest version) Hydrographic Surveying
USACE EM 1110-1-2909 (latest version) Geospatial Data and Systems

1.3 SUBMITTALS

As prescribed in Section 01305 SUBMITTAL PROCEDURES, Government approval is required for submittals with a "GA" designation. "FD" submittals are for information only and do not require government approval.

1.3.1 Surveying Equipment Data (Para 1.5.5) - FD and Surveying Software Data (Para 1.6) - FD. The Contractor shall submit data on surveying equipment and software prior to the start of dredging.

1.3.2 Basic Survey Documentation (Para 3.3.1) - FD. The Contractor shall submit data for each Contractor-performed survey within two (2) working days of survey completion.

1.3.3 Progress Payment Survey Documentation (Para 3.3.3) - GA. The Contractor shall submit progress payment survey documentation within five (5) working days of survey completion.

1.4 RESPONSIBILITIES

The Contractor shall provide all resources necessary to perform all contract-required surveys and to process and use the surveying data.

1.5 SURVEY EQUIPMENT

The Contractor shall furnish and utilize ample, adequate surveying equipment and controls to provide assurance that all material existing within the required excavation area has been removed and the disposal area shaped, as required. Hydrographic surveying equipment will include, but not be limited to, echo sounding, motion sensing, horizontal positioning, tide monitoring and velocity probing equipment as prescribed in EM 1110-2-1003 Table 9-6 or as appropriate.

11-2,

1.5.1 Sounding. The Contractor shall perform echo sounding for depth with an integrated hydrographic survey system utilizing a standard to the industry depth sounder adjustable for speed of sound corrections. The manufacturer's stated precision for the depth sounder shall be 0.1 foot or less.

1.5.2 Positioning. Positioning shall be accomplished by a fully integrated and automated hydrographic survey system utilizing a standard to the industry Differential Global Positioning System (DGPS) with a manufacturer's stated positional accuracy of one (1) meter or less. DGPS corrections shall be obtained from the same geostationary satellite station or base station for all surveys.

1.5.3 Tide Monitoring. The Contractor shall provide an approved tidal level monitoring system. This system shall be adjusted to correspond with the dredging area tidal zone and shall be located as indicated in the contract documents, within 2500 feet of surveying operations.

1.5.5 Equipment Data. Prior to the start of dredging operations, the Contractor shall submit data on the surveying equipment to the Contracting Officer, for information only. Typical information shall, as a minimum, include the name, model, and year of manufacture of the electronic equipment, the electronic frequencies of the horizontal positioning and depth finding equipment, and the manufacturer's stated positioning accuracy and capability of the equipment proposed for usage. The vessel/equipment that performs a survey shall be recorded in the Survey QC Log, Attachment 1 to this Section.

1.6 SOFTWARE

The Contractor shall use site design or survey software in the integrated hydrographic survey system. The software shall support the varied Corps dredging templates outlined in Chapter 15 of EM 1110-2-1003 and shall be capable of computing dredged quantities using the Triangulated Irregular Network (TIN) volume technique. Prior to the start of dredging operations, the Contractor shall submit data on the surveying software to the Contracting Officer, for information only.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 SURVEYING PROCEDURES

The Contractor shall perform surveys using the line files provided by the Government and the vertical and horizontal controls specified in the contract documents. The hydrographic surveying procedures, including, but not limited to positioning modes, electronic position system calibration, accuracy requirements, depth measurements calibration, and data reduction, adjustment, processing and plotting shall conform, at a minimum, to the procedures specified in EM 1110-2-1003 and the procedures specified herein.

3.1.1. QC Surveys. The Contractor shall conduct QC surveys at least once per week during weeks in which there is dredging or disposal but may schedule surveys more frequently to maintain the quality of the dredging and disposal. The Contractor shall also conduct QC surveys when directed by the Contracting Officer.

3.1.2 Progress Payment Surveys. The Contractor shall use 200-210 KHz survey data to measure quantities for payment requests. The top of the return signal trace shall be the point of interpretation of soundings. Progress payment survey shall include a separate longitudinal profile for correlation with the cross-line surveys.

3.1.3 Government Observers. The Contractor shall furnish, upon request of the Contracting Officer, suitable transportation from all points on shore designated by the Contracting Officer to and from the various pieces of plant, and to and from the dredging and disposal areas. Should the Contractor refuse, neglect, or delay compliance with these requirements, the specific transportation 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.

3.1.3.1 The Contractor shall keep the Government informed about Contractor surveying activities, including provisions for onsite Government observers. The Government will have the option of accompanying the Contractor on these surveys.

3.1.3.2 The Contractor shall notify the Government two (2) days prior to performing a progress payment survey.

3.1.4 Onsite Quality Assurance (QA). When directed by the Contracting Officer, the Contractor shall perform QC surveys and provide cross-sectional views of the edited, tide-level-adjusted survey data to the Government on site. When directed by the Contracting Officer, the Contractor shall provide print outs of the cross-sectional plots on site.

3.1.5 Calibration and Controls.

3.1.5.1 Calibration. The Contractor shall determine how often to calibrate taking into account time on station, size and variability of the area being surveyed, weather, tides, marine traffic, etc. The

Location/position/time of velocity probes and/or bar checks shall be recorded in the Survey QC Log.

3.1.5.2 Onsite Vessel-to-Vessel Calibration. If requested, the Government survey vessel will participate in one vessel-to-vessel onsite calibration session with the Contractor's survey vessel. The Government in conjunction with the Contractor will schedule the calibration session.

3.1.6 Survey Line Integrity. Survey soundings shall not deviate more than plus or minus 10 feet off station alignment. Obstructions, such as docks, wrecks and docked ships, shall be identified and the Contractor shall conduct additional soundings on the backside of obstructions, where possible, to complete sounding lines. Incomplete and inaccurate data, such as, lines outside survey position limits, shall be resurveyed, preferably on the same survey day.

3.2 GOVERNMENT SURVEYS

The Government will use 200-210 KHz survey data to measure quantities for payments. Government surveys may be performed by the Government or may be procured from an independent surveying firm by the Government.

3.2.1 Pre-dredge Survey. The bathymetric drawings in the contract are believed to accurately represent conditions existing at the time indicated on the plans but the depths shown thereon will be updated, as required, by a pre-dredge Government survey taken prior to the start of dredging of a dredge element. The Government will perform the survey for all dredge elements, which are identified in Section 02325 DREDGING. The Government will provide the Contractor copies of the pre-dredge survey electronic point (x,y,z) files and/or Hypack files.

3.2.2 Post-dredge Survey. As soon as practicable after completion of a dredge element, the completed work will be thoroughly examined at the Government's cost and expense by soundings. The Government will provide the Contractor copies of the post-dredge survey electronic point (x,y,z) files and/or Hypack files.

3.2.2.1 Request for Survey. The Contractor shall notify the Government 7 days in advance of completing a dredge element. The Contractor shall ensure that the dredge element is ready for a final acceptance survey before requesting the Government to perform the post-dredge survey of the Dredge Element. The Contractor shall submit in writing a Request for Government Acceptance Survey (in Attachment 2 to this Section) when the dredging requirements for a Dredge Element have been completed.

3.2.2.2 Acceptance of Dredge Element(s) will be based on the Government post-dredge survey data. Determination of quantities removed, and to be paid for, in the areas specified, after once having been made, will not be reopened, except on evidence of collusion, fraud, or obvious error.

3.2.2.3 Dredge Element Rejection. If the Government post-dredge survey finds the Dredge Element to be unacceptable, the Contractor shall resume dredging until the work is complete.

3.2.2.3.1 The Contractor is responsible for time required for

dredging to remove shoals, lumps or other lack of contract depth and for the time required to resurvey the rejected Dredge Element.

3.2.3.2 When the dredging is complete, the post-dredge survey process, starting with the Contractor's written Request for Government Acceptance Survey, is then repeated except that the Contractor is liable for subsequent Government survey costs. The Contractor shall be assessed \$7,000 per day that the Government spends on post-dredge surveys of a Dredge Element that is rejected after the first Government post-dredge survey. The Government's efforts include time spent on station waiting, surveying time and post-survey data processing and reporting. A partial day of survey efforts by the Government will be billed as a full day.

3.2.3 Contractor Survey Certification.

3.2.3.1 Contractor's Representative. The Contractor shall provide a representative on board the Government survey vessel for all pre- and post-dredge surveys. The representative shall be knowledgeable of hydrographic surveying (EM 1110-2-1003 and this contract) procedures, techniques, equipment, calibration methods and accuracy limitations. The representative shall observe and review, in progress, the adequacy and accuracy of the survey for payment purposes and for the potential existence of collusion, fraud or obvious error in the data.

3.2.3.2 Survey Certification. Immediately upon completion of a Government pre- or post-dredge survey, the Contractor's representative shall attest to an acceptable survey by signing the Certification of Government Survey, Attachment 2 to this section. This certification will be based on the representative's onsite review of the survey and determination that the survey contains no evidence of collusion, fraud or obvious error.

3.2.3.3 Unacceptable Survey. In the event the Contractor's representative observes (and quantifies) specific documentary evidence of collusion, fraud or obvious error, the survey will be immediately rerun. The resurvey will be run over the full Dredge Element and will supersede previously run surveys in their entirety. If the resurvey is unacceptable, the Contractor shall meet with the Contracting Officer to expeditiously resolve the issue(s) causing rejection of the survey. The Contractor shall be liable for the Contractor's costs, including but not limited to standby costs, for the time required to resolve acceptability of the survey.

3.2.3.4 Reinstating Unacceptable Survey. The Contractor may certify a survey previously judged unacceptable; however, the Contractor shall reassess/reevaluate within 24 hours after the unacceptable survey was performed and prior to the initiation of a resurvey based upon identified collusion, fraud or obvious error.

3.2.3.5 Refusal To Certify. This paragraph describes the consequences should the Contractor refuse to attest to the acceptability of a Government survey without identifiable collusion, fraud or obvious error.

3.2.3.5.1 Uncertified Pre-dredge Survey. The Contractor shall not commence dredging until the Contractor and the Contracting Officer have met and resolved the basis for the refusal to certify. The Contractor shall be liable for any dredging performed prior to obtaining an acceptable survey. If a resurvey is performed and accepted, prior

dredging will not be measured, estimated or paid for.

3.2.3.5.2 **Uncertified Post-dredge Survey.** The Contractor's work will not be accepted and the contract completion date will not be extended. The Government will not measure, estimate or paid for any material accretion, which might occur over time. If the work has not been accepted as complete on or before the contract completion date, the Government will assess liquidated damages until the post-dredge survey is certified and the work is accepted as complete and in compliance with contract requirements.

3.2.3.5.3 **Certification Costs.** The Contractor shall be liable for the Contractor's own costs, including but not limited to standby costs, for the time required to resolve the refusal to certify when there is no evidence of collusion, fraud or obvious error and the resultant delays shall not be the basis for a time extension of the contract.

3.2.4 **QA Surveys.** The Government may perform surveys to assure the quality of the dredging and disposal operations.

3.3 SURVEY DATA

3.3.1 **Basic Survey Documentation.** The Contractor shall submit raw and edited electronic point files and/or Hypack files, the field notes and the Survey QC Log for all Contractor-performed surveys.

3.3.1.1 **Survey QC Log.** The Contractor shall complete a Survey QC Log for all Contractor-performed surveys. The Survey QC Log shall include, as a minimum, the survey personnel, equipment, controls, layout, calibrations, the weather/sea conditions, survey soundings accomplished and the names of the files with the survey data. The Survey QC Log shall be attached to the daily CQC Report. In addition, for progress payment surveys, the Contractor, or a designated representative, shall sign the Certification of Progress Payment Survey (Block 3) and attach a copy to the payment request.

3.3.1.2 **Electronic Submission.** Within two working days of the completion of a survey, the Contractor shall provide the Basic Survey Documentation on write-once CD-ROMs to the Government. **The Contractor shall submit the XYZ data in a .dat file with only three columns X, Y and -Z for importing into Microstation InRoads. The Z column is negative (below MLLW) and in feet.** The Contractor will, if possible, also provide the survey data in an email attachment, usually in a zip file. The Government will provide email addresses at the Pre-construction Conference.

3.3.2 **Field Data.** The Government may require additional information as described below.

3.3.2.1 **CAD Drawings.** If required by the Contracting Officer to support the weekly review of the Dredging and Disposal Plan, the Contractor shall submit an updated work plan for dredging as a CAD drawing in hard and electronic (dwg) form. The drawing shall contain project channel data and show the areas dredged, over time, and the areas to be dredged in the next week.

3.3.2.2 **Cross-section Plots.** The Contractor shall provide cross-sectional plots as directed by the Contracting Officer. Each cross-section will show the project template including project depth, side slopes extending from the project depth line, and the contract pay lines. A legend with the dates of each survey shall be included.

3.3.2.3 Other Data. The Contractor shall provide survey data comparisons, usually hard copies of cross-sectional overlays, or other survey material/data as directed by the Contracting Officer.

3.3.3 Progress Payment Survey Documentation. Within five (5) working days of a progress payment survey, the Contractor shall submit the documentation described below in electronic (Para 3.3.3.3) and printed (Para 3.3.3.4) copy.

3.3.3.1 Tabulations. The Contractor shall submit the calculations and a tabulation of quantities in accordance with paragraph 3.4.1.

3.3.3.2 Cross-sectional Plots. The Contractor shall provide the cross-sectional plots, one cross-section per 8½ X 11 sheet, in hard copy and in electronic pdf files. Each section will show the project template including project depth, side slopes extending from the project depth line and the maximum pay line. The pre-dredge and progress payment survey lines will be shown on the same section and shall be clearly discernible from each other.

3.3.3.3 Electronic Record. Electronic copies of surveys performed including point files and/or Hypack files, calculations and a plot of the soundings shall be provided. The electronic point file and/or Hypack file shall be the same file that the Contractor uses for volume computations. The raw, unedited data, along with all files and associated data used for editing, along with a copy of the survey documentation listed in paragraph 3.3.1, updated as necessary, shall be submitted on write-once CD-ROMs to the Government. The Contractor shall provide a description of any changes that have been made to the originally submitted (paragraph 3.3.1) survey documentation. The Contractor will, if possible, also provide the survey data in an email attachment, usually in a zip file.

3.3.3.4 Printed Record. Printed copies of volume tabulations and the cross-sectional plots shall be submitted with the Contractor's payment request. The Contracting Officer will reject payment requests for dredging that are not supported by verified survey data and calculations.

3.3.3.5 Data Review. The Government will review the survey documentation at the Section 01320 (Para 3.6) "Periodic Progress Meetings" for clarity, completeness and accuracy before approving dredging activity progress for the Periodic Schedule Updates that precede progress payment requests.

3.3.4 Final Payment Survey Documentation. The survey documentation to be submitted with a final payment request is identical to the requirements for Progress Payment Survey Documentation (Para 3.3.3) except that the Contractor shall use the Government post-dredge survey data instead of the Contractor's progress payment survey data.

3.4 QUANTITY CALCULATIONS

3.4.1 Volume Calculations. The Contractor shall calculate the volume of material dredged **with MicroStation InRoads using the Contour Method of the TIN volume technique in paragraph 15-5a of EM 1110-2-1003 as illustrated in Figure 15-11 with payment for the material above the side slope template. Using Figure 15-12 of EM 1110-2-1003, just to clarify the payable material, the following quantities will be payable: V1, V1L, V1R and V2P.** The Contractor shall submit the calculations and

a tabulation of the quantities described below with each payment survey.

3.4.1.1 Available Material. The material available before dredging will be calculated from the Government pre-dredge survey data.

3.4.1.2 Payable Quantity. The payable quantity is the difference between the available material (Para 3.4.1.1) and the quantity remaining to the maximum pay line. Material quantities shall only be computed over the dredged areas.

3.4.1.3 Progress Payment Quantity. The Contractor shall not request a progress payment for a completed Dredge Element. Payment for completed Dredge Elements will be made in accordance with paragraph 3.4.2. The material quantity for progress payments will be the payable quantity calculated using the Contractor's progress payment survey and the Government's pre-dredge survey, less any previously paid quantities.

3.4.2 Final Payment Quantities. The final payment quantities will be the payable quantity (Para 3.4.1.2) calculated from the Government pre-dredge and post-dredge surveys. The Government surveys shall be used unless there is evidence of collusion, fraud, or obvious error, documented in accordance with Para 3.2.3.3.

3.5 SURVEYING PAYMENTS.

No separate payment will be made for the work specified under this section. Payment for performing QC and payment surveys, including furnishing data, quantity computations and drawings, shall be included in the applicable contract unit prices for dredging.

Survey Quality Control (QC) Log	
Contract Name.	Contract #.
Block 1 – Personnel and Equipment	
Surveyor.	Vessel Name/Length.
Survey Technician.	Vessel Operator.
Survey Assistant, if any.	Other Personnel, if any.
Surveying SW/Version.	Line File ID.
Depth Sounder.	Motion Compensator.
Tidal Level Recording Unit.	Velocity Probe.
DGPS.	
Other Equipment.	
Block 2 – Survey Parameters	
Survey Date.	Survey Purpose.
Survey Location.	Weather/Sea State.
Tide Gauge Location.	DGPS Location.
Survey File ID.	Stations Surveyed.
Calibration Time/Location: Bar Check and/or Velocity Probe.	Calibration Notes:
Obstacle Locations.	
Observations.	Remarks, if any.
Block 3 – Certification of Progress Payment Survey	
<p>I certify that the payment survey was performed by me or under my direct supervision and that the survey was conducted in accordance with the systematic/procedural methods and techniques described in the contract documents. The observed, recorded and edited data are fully and finally acceptable for determining and measuring contract performance and payment. Any exceptions are noted in the box to the right.</p> <p>Signed. _____</p>	Exception(s) to the Certification
Block 4 – Government Observations	
Government Observer, if any.	Government Observations, if any.

Contract #. _____
Survey of Dredge Element #. _____
Survey Date. _____

Certification of Government Survey*

I have fully observed the performance of the Government survey and have determined, based on my review of EM 1110-2-1003, 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 in the contract documents. All known and unknown systematic and random errors have been minimized consistent with: (1) the relative precision errors 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 system, procedures, and related variables. As such, the observed and recorded data are fully and finally acceptable for determining and measuring contract performance and payment.

Signature. _____
Name. _____

* After onsite observation and review – Para 3.2.3.

Contract #. _____

Request for Government Acceptance Survey**

The dredging requirements for Dredge Element # _____ have been completed and the Dredge Element is ready for a final acceptance inspection by the Government. I hereby request that the Government schedule a Government Acceptance Survey on the following **Date** _____. It is understood that if the Government post-dredge survey finds the Dredge Element to be unacceptable, the Contractor shall resume dredging until the work is complete and the post-dredge survey process is then repeated except that the Contractor is liable for subsequent Government survey costs.

Signature. _____
Name. _____

** Para 3.2.2.1

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01525

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 DEFINITIONS
- 1.4 REGULATORY REQUIREMENTS
- 1.5 DRUG PREVENTION PROGRAM
 - 1.5.1 General
- 1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS
 - 1.6.1 Personnel Qualifications
 - 1.6.1.1 Site Safety and Health Officer (SSHO)
 - 1.6.1.2 Crane Operators
 - 1.6.2 Personnel Duties
 - 1.6.2.1 Site Safety and Health Officer (SSHO)/Superintendent
 - 1.6.3 Meetings
 - 1.6.3.1 Preconstruction Conference
 - 1.6.3.2 Weekly Safety Meetings
 - 1.6.3.3 Work Phase Meetings
- 1.7 TRAINING
 - 1.7.1 New Employee Indoctrination
 - 1.7.2 Periodic Training
 - 1.7.3 Training on Activity Hazard Analysis (AHA)
- 1.8 ACCIDENT PREVENTION PLAN (APP)
 - 1.8.1 EM 385-1-1 Contents
- 1.9 ACTIVITY HAZARD ANALYSIS (AHA)
- 1.10 DISPLAY OF SAFETY INFORMATION
- 1.11 SITE SAFETY REFERENCE MATERIALS
- 1.12 EMERGENCY MEDICAL TREATMENT
- 1.13 REPORTS
 - 1.13.1 Floating Plant and Mobile Construction Equipment
 - 1.13.2 Accident Reports
 - 1.13.3 Accident Notification
 - 1.13.4 Monthly Exposure Reports
 - 1.13.5 Regulatory Citations and Violations
 - 1.13.6 Crane Reports
- 1.14 CERTIFICATES
 - 1.14.1 Certificate of Compliance
 - 1.14.2 Third Party Certification of Barge-Mounted Mobile Cranes
 - 1.14.3 Equipment Certification
 - 1.14.4 Tug and Scow Operator Certification
- 1.15 FIRE CONTROL
 - 1.15.1 General
 - 1.15.2 Fire Extinguishers
- 1.16 Equipment Inspection
 - 1.16.1 Equipment Inspection
- 1.17 ANCHOR DISCHARGE LINES
- 1.18 FUEL OIL TRANSFER OPERATIONS
- 1.19 NAVIGATION
 - 1.19.1 Navigation Aids

- 1.19.2 Dredging Aids
- 1.19.3 Notice to Mariners
- 1.19.4 Signal Lights
- 1.20 AERIAL OBSTRUCTION LIGHT
- 1.21 RADIOLOGICAL SAFETY
- 1.22 MARINE TRANSPORTATION SAFETY

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

- 3.1 CONSTRUCTION AND/OR OTHER WORK
- 3.2 SITE REQUIREMENTS
- 3.3 EQUIPMENT
 - 3.3.1 Material Handling Equipment
 - 3.3.2 Weight Handling Equipment
 - 3.3.3 Equipment and Mechanized Equipment
- 3.4 HOUSEKEEPING
 - 3.4.1 Clean-Up

SECTION 01525

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

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 within the text by the basic designation only.

ASME INTERNATIONAL (ASME)

ASME B30.5 (2000) Mobile and Locomotive Cranes
 ASME B30.8 (2000) Floating Cranes and Floating Derricks
 ASME B30.22 (2000) Articulating Boom Cranes

FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1 (Rev J) Obstruction Marking and Lighting

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10 (1998) Portable Fire Extinguishers
 NFPA 241 (2000) Safeguarding Construction, Alteration, and Demolition Operations

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 Occupational Safety and Health Standards for General Industry
 29 CFR 1915 Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
 29 CFR 1919 Gear Certification
 29 CFR 1926 Safety and Health Regulations for Construction
 33 CFR 80 COLREGS Demarcation Lines
 33 CFR 95 Operating a Vessel While Under the Influence of Alcohol or a Dangerous Drug

U. S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2003) Safety and Health Requirements Manual

UNITED STATES COAST GUARD (USCG)

COMDT INST M16672.2D (1999 Mar 25) Navigation Rules, International - Inland

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals not having a "GA" designation are for information only or as otherwise designated. When used, a designation following the "GA" 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 Preconstruction Submittals

Accident Prevention Plan (APP); GA

Activity Hazard Analysis (AHA); GA

Crane Critical Lift Plan; GA

Crane Work Plan; GA

Proof of Qualification for Crane Operators; GA

SD-09 Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Floating Plant and Mobile Construction Equipment; FD

Accident Reports; FD

Monthly Exposure Reports; FD

Regulatory Citations and Violations; FD

Crane Reports; FD

SD-13 Certificates

Certificate of Compliance (Crane); FD

Third Party Certification for Barge Mounted Cranes; FD

Equipment Certification; FD

Tug and Scow Operator Certification; FD

Attach revised or renewed certificates to the daily CQC report when issued so the Government has a copy of the latest certifications.

1.3 DEFINITIONS

a. Multi-Employer Work Site (MEWS). A multi-employer work site, as defined by OSHA, is one in which many employers occupy the same site. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors.

b. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

c. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

- (1) Death, regardless of the time between the injury and death, or the length of the illness;
- (2) Days away from work;
- (3) Restricted work;
- (4) Transfer to another job;
- (5) Medical treatment beyond first aid;
- (6) Loss of consciousness; or
- (7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

d. Site Safety and Health Officer (SSHO). The superintendent or other qualified or competent person who is responsible for the on-site safety and health required for the project. The Contractor quality control (QC) person [cannot be the SSHO, even though the QC has safety inspection responsibilities as part of the QC duties.] [can be the SSHO on this project.]

e. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

f. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1, and all federal, state, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria,

ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 DRUG PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employee uses illegal drugs or consumes alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test shall be made available to the Contracting Officer upon request.

1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Site Safety and Health Officer (SSHO) shall be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The SSHO shall meet the following requirements:

Level 1: (Not Used)

Level 2: (Not Used)

Level 3: (Not Used)

Level 4:

A minimum of 10 years safety work of a progressive nature with at least 5 years of experience on similar projects.

30-hour OSHA construction safety class or equivalent within the last 5 years.

An average of at least 24 hours of formal safety training each year for the past 5.

Level 5: (Not Used)

Level 6: (Not Used)

1.6.1.2 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, crane operators shall be designated as qualified by a source that qualifies crane operators (ie., union, a government agency, or an organization that tests and qualifies crane operators). Proof of current qualification shall be provided.

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)/Superintendent

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily quality control report.
- b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
- c. Maintain applicable safety reference material on the job site.
- d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
- e. Implement and enforce accepted APPs and AHAs.
- f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.
- g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSHA, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

- a. The Contractor will be informed, in writing, of the date of the preconstruction conference. The purpose of the preconstruction conference is for the Contractor and the Contracting Officers representatives to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall projects Accident Prevention Plan (APP) before the initiation of work.
- b. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
- c. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officers representative as to which phases will require an analysis. In addition, a schedule for the

preparation, submission, review, and acceptance of AHAs shall be established to preclude project delays.

d. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Work shall not begin until there is an accepted APP.

1.6.3.2 Weekly Safety Meetings

Conduct weekly safety meetings at the project site for all employees. The Contracting Officer will be informed of the meeting in advance and be allowed attendance. Minutes showing contact title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily quality control report.

1.6.3.3 Work Phase Meetings

The appropriate AHA shall be reviewed and attendance documented by the Contractor at the preparatory, initial, and follow-up phases of quality control inspection. The analysis should be used during daily inspections to ensure the implementation and effectiveness of safety and health controls.

1.7 TRAINING

1.7.1 New Employee Indoctrination

New employees (prime and sub-contractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

1.7.2 Periodic Training

Provide Safety and Health Training in accordance with USACE EM 385-1-1 and the accepted APP. Ensure all required training has been accomplished for all onsite employees.

1.7.3 Training on Activity Hazard Analysis (AHA)

Prior to beginning a new phase, training will be provided to all affected employees to include a review of the AHA to be implemented.

1.8 ACCIDENT PREVENTION PLAN (APP)

The Contractor shall use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. The first page of the APP shall have a detailed scope and magnitude of work to be used by reviewing authority reference to contract. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Preparation of Accident Prevention Plan". Where a paragraph or subparagraph element is not applicable to the work to be performed indicate "Not Applicable" next to the heading. Specific requirements for some of the APP elements are described below at paragraph 1.8.1. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the

Contractors overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CH.

Submit the APP to the Contracting Officer 10 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. The Contracting Officer reviews and comments on the Contractor's submitted APP and accepts it when it meets the requirements of the contract provisions.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any unforeseen hazard become evident during the performance of work, the project superintendent shall inform the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment.

Copies of the accepted plan will be maintained at the resident engineer's office and at the job site. The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they are discovered.

1.8.1 AAP Contents

In addition to the requirements outlined in Appendix A of USACE EM 385-1-1, the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be used. The duties of each position shall be specified.

b. Qualifications of competent and of qualified persons. As a minimum, competent persons shall be designated and qualifications submitted for each of the following major areas: excavation; demolition; pile driving; fall protection; hazardous energy; confined space; health hazard recognition; evaluation and control of chemical,

physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders.

d. Health Hazard Control Program. The Contractor shall designate a competent and qualified person to establish and oversee a Health Hazard Control Program in accordance with USACE EM 385-1-1, Section 6. The program shall ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical and biological agents and that necessary controls and protective actions are instituted to ensure health.

e. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. The plan shall be submitted 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.c.18. and the following:

(1) For lifts of personnel, the plan shall demonstrate compliance with the requirements of 29 CFR 1926.550 (g).

(2) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. The amount of list and trim shall be within the crane manufacturer's requirements.

f. Alcohol and Drug Abuse Plan

(1) Describe plan for random checks and testing with pre-employment screening in accordance with the DFAR Clause subpart 252.223-7004, "Drug Free Work Force."

(2) Description of the on-site prevention program

g. Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, vehicle operator, forklift operators, personal protective equipment); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

h. Crane Work Plan. The contractor shall provide a crane work plan to the Contracting Officer for acceptance. The crane work plan shall include the specific model of each crane and a drawing identifying

their locations (exact), the dimensions, wheel sizes, number of wheels, wheel spacing, tire pressure(s), number of axles, axle spacing, minimum wheel load to be exerted during operations and maximum outrigger load to be exerted during operations. The Contractor shall allow at least 10 working days for acceptance/non-acceptance of the crane work plan. No crane operations shall begin prior to written acceptance of the crane work plan by the Government.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) form shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 10 calendar days prior to the start of each phase. Form for subsequent AHA as amendments to the APP. An AHA will be developed by the Contractor for every operation involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or subcontractor is to perform work. The analysis must identify and evaluate hazards and outline the proposed methods and techniques for the safe completion of each phase of work. At a minimum, define activity being performed, sequence of work, specific safety and health hazards anticipated, control measures (to include personal protective equipment) to eliminate or reduce each hazard to acceptable levels, equipment to be used, inspection requirements, training requirements for all involved, and the competent person in charge of that phase of work. For work with materials handling equipment, address safeguarding measures related to materials handling equipment. For work requiring excavations, include requirements for safeguarding excavations. An activity requiring an AHA shall not proceed until the AHA has been accepted by the Contracting Officer's representative and a meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activity, including on-site Government representatives. The Contractor shall document meeting attendance at the preparatory, initial, and follow-up phases of quality control inspection. The AHA shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Activity hazard analyses shall be updated as necessary to provide an effective response to changing work conditions and activities. The on-site superintendent, site safety and health officer and competent persons used to develop the AHAs, including updates, shall sign and date the AHAs before they are implemented.

1.10 DISPLAY OF SAFETY INFORMATION

Within 10 calendar days after commencement of work, erect a safety bulletin board at the job site. The following information shall be displayed on the safety bulletin board in clear view of the on-site construction personnel, maintained current, and protected against the elements and unauthorized removal:

- a. Map denoting the route to the nearest emergency care facility.

- b. Emergency phone numbers.
- c. Copy of the most up-to-date APP.
- d. Current AHA (s).
- e. OSHA 300A Form.
- f. Hot work permit.
- g. A sign indicating the number of hours worked since last lost workday accident.
- h. Safety and Health Warning Posters.

1.11 SITE SAFETY REFERENCE MATERIALS

The Contractor shall maintain at the construction site safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturers manuals.

1.12 EMERGENCY MEDICAL TREATMENT

Contractors shall arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.13 REPORTS

1.13.1 Floating Plant and Mobile Construction Equipment

Using Checklist in Appendix 2, an inspection shall be completed for each piece of floating plant and the completed checklist shall be furnished to the Contracting Officer prior to plant use.

1.13.2 Accident Reports

- a. For recordable injuries and illnesses, and property damage accidents resulting in at least \$2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the USACE Accident Report Form 3394 and provide the report to the Contracting Officer within 3 calendar days of the accident. The Contracting Officer will provide copies of any required or special forms.

1.13.3 Accident Notification

The Contractor shall notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the

Government investigation team arrives on-site and Government investigation is conducted.

1.13.4 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer shall be attached to the monthly billing request. This report is a compilation of employee hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.13.5 Regulatory Citations and Violations

Contact the Contracting Officer immediately of any OSHA or other regulatory agency inspection or visit, and provide the Contracting Officer with a copy of each citation, report, and contractor response. Correct violations and citations promptly and provide written corrective actions to the Contracting Officer.

1.13.6 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

1.14 CERTIFICATES

1.14.1 Certificate of Compliance

The Contractor shall provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). Certificate shall state that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance shall comply with 29 CFR 1926 and USACE EM 385-1-1 section 16 and Appendix H. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. The Contractor shall also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). These certifications shall be posted on the crane.

1.14.2 Third Party Certification of Barge-Mounted Mobile Cranes

Barge-mounted mobile cranes shall be certified in accordance with 29 CFR 1919 by an OSHA accredited person.

1.14.3 Equipment Certification

Before any Contractor, Sub-Contractor or Vendor, plant or equipment, including hydrographic survey equipment and crew boat, is put into use on the job, it shall be inspected and tested by the Contractor's operator of the plant or equipment or the manufacturer's representative, in the presence of the Contractor's Safety Officer. The Contractor shall furnish certification in writing that the plant or equipment is operating within manufacturer's tolerances and specifications, is in safe operating condition, and complies with the applicable safety requirements of the contract. All floating plant or dredges shall have a current Coast Guard certification, ABS classification, or marine survey by a NAMS or SAMS surveyor.

1.14.4 Tug and Scow Operator Certification

Tug and scow operators shall be licensed masters. Prior to dredging or construction operations, the Contractor shall submit certification of this requirement.

1.15 FIRE CONTROL

1.15.1 General. The Contractor shall supply all fire fighting equipment, supplies and personnel and perform all work required by Federal, State and local laws and regulations. Delays due to fire will not be the basis of claim by the Contractor for additional compensation.

1.15.2 Fire Extinguishers. The following policy applies to fire extinguishers for the Contractor's equipment.

1.16 EQUIPMENT INSPECTION

1.16.1 Equipment Inspection. After receipt of the certification required in subparagraph "Equipment Certification" and the Checklist in subparagraph "The Floating Plant and Mobile Construction Equipment" above, a Government Inspector shall be given eight hours to inspect to determine conformance with the manufacturer's specifications furnished by the Contractor and with requirements of the manual, "Safety and Health Requirements," EM 385-1-1, dated 3 November 2003. The Contractor shall not use any plant or equipment on the work under this contract until the Government has been allowed the opportunity for inspection during normal working hours and necessary repairs made for deficiencies found on the Checklist. Any delay by the Contractor for any reason of this pre-inspection will not serve to excuse any noncompliance with safety regulations or the justification of a time extension.

1.17 Anchoring Discharge Lines. The Contractor shall anchor all discharge lines in a manner that will prevent damage to vessels. Prior to commencing dredging, the Contractor shall submit an "anchoring plan" for review by the Contracting Officer. No work under this paragraph will be allowed until the Contractor has answered all comments from the review. After the review and finalization of the anchoring plan, the Contractor shall perform, by an independent contact survey, a pre-anchoring hydrographic survey of the pipe alignment. The following survey procedures shall apply: (1) cross-sections shall proceed along centerline at 100' (30.5 m) intervals and extend 100' (30.5 m) each side of the pipe centerline; (2) cross-sections and soundings shall be plotted at 1"=100' (30.5 m). Thereafter, surveys shall be performed once each month for the life of the contract and shall be submitted to the Contracting Officer through the Contractor Quality Control program. If any survey reflects mounding caused by leakage from the discharge line, the Contractor shall immediately remove the mound materials and dispose of them at the disposal site. If the Contractor elects to place the discharge line within the project dredging limits, both top of anchors and top of discharge line shall be below project standard depth. If alignment of the discharge line is outside the project dredge limits, the Contractor shall visually mark pipe and anchors as required for safety of all users of the area.

1.18 Fuel Oil Transfer Operations. Shall conform to U.S. Coast Guard design regulations. (33CFR 156.120)

- 1.19 Navigation. The Contractor's operations shall conform to the U.S. Coast Guard publication "Navigation Rules, International-Inland, COMDT INST M 16672.2D," dated 25 MAR 1999.
- 1.19.1 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 to navigation. The Contractor shall notify the Group Commander, 11th Coast Guard District, Aids to Navigation Office, Building 50-6, Coast Guard Island, Alameda, California 94501-5100, Telephone (510) 437-2976, 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.
- 1.19.2 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 covered or placed in a manner that they will obstruct or be confused with navigation aids.
- 1.19.3 Notice to Mariners. Upon receipt of notice to proceed, the Contractor shall contact the U.S. Coast Guard in writing in sufficient time in advance of dredging operations so that the Coast Guard can include the dredging time and locations in its Notice to Mariners. A copy of the written notice to the Coast Guard shall be provided to the Contracting Officer.
- 1.19.4 Signal Lights. The Contractor shall display signal lights and conduct his operations in accordance with the General Regulations of the Department of the Army and of the Coast Guard governing lights and day signals to be displayed by towing vessels with tows on which no signals can be displayed, vessels working on wrecks, dredges, and vessels engaged in laying cables or pipe or in submarine or bank protection operations, lights to be displayed on dredge pipe lines, and day signals to be displayed by vessels of more than 65 feet in length moored or anchored in a fairway or channel, and the passages by other vessels of floating plant working in navigable channels, as approved by the Secretary of the Army (33 C.F.R. 201.1-201.16) and the Commandant, U.S. Coast Guard (33 C.F.R. 80.18-80.31a and 33 C.F.R. 95.51-95.70).
- 1.20 Aerial Obstruction Light. The Contractor shall furnish and install a continuous red light at the highest point on the dredge as a warning to aircraft in the vicinity of the dredge area. The aerial light shall meet the requirements of FAA Publication Advisory Circular 70/7460-1J, Appendix 12.
- 1.21 Radiological Safety. If the Contractor intends to use any radiological source on the project such use shall be reported by letter to the Contracting Officer. The letter shall state the type or radioactive material in the source, serial number of the equipment, manufacturer, licensee, and the purpose for which the equipment will be used. A copy of the last safety certification(s) from the appropriate Federal and State agencies shall be included with the letter. No radiological materials shall be stored, handled or used on this contract without the prior approval of the Contracting Officer. The storage, handling and use of radioactive

materials shall comply with EM 385-1-1, Section 06 E requirement **s and all** pertinent State and Federal safety regulations.

1.22 Marine Transportation Safety. During dredging, disposal and construction operations, the Contractor shall implement the following U.S. Coast Guard provisions to ensure marine transportation safety:

1.22.1 All Contractor's vessels operating in or near a navigation channel shall monitor VHF-FM Channel 14.

1.22.2 In the event that the Contractor's vessels restrict or affect navigation of other vessels, Contractor's vessel operators shall transmit and confirm their intentions and any other necessary information via Channel 14 to promote safe navigation for all vessels in the project vicinity.

1.22.3 U.S. Coast Guard shall be contacted via radio (S.F. Bay Traffic on Channel 14) each time when: (1) A Contractor's vessel moves a scow between the dredge and the disposal sites; (2) The dredge plant commences dredging operations; and (3) The dredge operators change dredge location. Upon notification, S.F. Bay Traffic will advise affected shipping traffic.

1.22.4 U.S. Coast Guard shall be contacted via radio (S.F. Bay Traffic on Channel 14) each time when: (1) A Contractor's vessel moves a scow between the dredge and the disposal sites; (2) The dredge plant commences dredging operations; and (3) The dredge operators change dredge location. Upon notification, S.F. Bay Traffic will advise affected shipping traffic.

1.23 PAYMENTS

No separate payment will be made for the work covered under this section of the specifications, and all costs in connection therewith will be considered a subsidiary obligation of the Contractor.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

The Contractor shall comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA, Federal and/or State OSHA regulations, and other related submittals and activity file and safety regulations. The most stringent standard shall prevail.

3.2 SITE REQUIREMENTS

All personnel who enter the Work Site shall wear mandatory personal protective equipment (PPE) at all times. All personnel shall also comply with PPE postings of shops both inside and outside the Work Site. PPE shall be governed in all other areas by the nature of the work the employee is performing. They will also use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Mandatory PPE includes:

- a. Hard Hat
- b. Safety Glasses

c. Safety Toed Boots

3.3 EQUIPMENT

3.3.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.3.2 Weight Handling Equipment

a. Cranes must be equipped with:

(1) Load indicating devices (LIDs) and a boom angle or radius indicator,

(2) or load moment indicating devices (LMIs).

(3) Anti-two block prevention devices.

(4) Boom hoist hydraulic relief valve, disconnect, or shutoff (stops hoist when boom reaches a predetermined high angle).

(5) Boom length indicator (for telescoping booms).

(6) Device to prevent uncontrolled lowering of a telescoping hydraulic boom.

(7) Device to prevent uncontrolled retraction of a telescoping hydraulic boom.

(8) Wind indicating device.

(9) Drum rotation indicator.

(10) Barge mounted mobile cranes shall be equipped with a load indicating device, a wind indicating device and a marine type list and trim indicator readable in one-half degree increments.

b. The Contractor shall notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.

c. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person (as defined in ASME B30.5). All testing shall be performed in accordance with the manufacturer's recommended procedures.

- d. The Contractor shall comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.
- e. The presence or lack of presence of Government personnel does not relieve the Contractor of an obligation to comply with all applicable safety regulations. The Government will investigate all complaints of unsafe or unhealthful working conditions received in writing from contractor employees, federal civilian employees, or military personnel.
- f. Each bad shall be rigged/attached independently to the hook/master-link in such a fashion that the bad cannot slide or otherwise become detached. Christmas-tree lifting (multiple rigged materials) is not allowed.
- g. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.
- h. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11 and ASME B30.5 or ASME B30.22 as applicable.
- i. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.
- j. A fire extinguisher having a minimum rating of 10BC and a minimum nominal capacity of 5lb of extinguishing agent shall be available at all operator stations or crane cabs. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.
- k. All employees shall be kept clear of bads about to be lifted and of suspended bads.
- l. A weight handling equipment operator shall not leave his position at the controls while a bad is suspended.
- m. The Contractor shall use cribbing when performing lifts on outriggers.
- n. The crane hook/block must be positioned directly over the bad. Side lading of the crane is prohibited.
- o. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.
- p. A substantial and durable rating chart containing legible letters and figures shall be provided with each crane and securely mounted onto the crane cab in a location allowing easy reading by the operator while seated in the control station.

q. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.

r. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.

s. The Contractor shall certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.3.3 Equipment and Mechanized Equipment

a. Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review.

b. Manufacture specifications or owners manual for the equipment shall be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Such additional safety precautions or requirements shall be incorporated into the AHAs.

c. Equipment and mechanized equipment shall be inspected in accordance with manufacturers recommendations for safe operation by a competent person prior to being placed into use.

d. Daily checks or tests shall be conducted and documented on equipment and mechanized equipment by designated competent persons. Ground Fault Circuit Interrupters (GFCI) are to be installed in all wet location areas. A daily check to ensure operability is to be made before applying power to equipment. A centralized GFCI located in a function box will not suffice in marine work (see EM 385-1-1 dated 3 November 2003, Section 11.C.05).

3.4 HOUSEKEEPING

3.4.1 Clean-Up

All debris in work areas shall be cleaned up daily or more frequently if necessary. Construction debris may be temporarily located in an approved location, however garbage accumulation must be removed each day.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE CONSTRUCTION

SECTION 02325

DREDGING

PART 1 GENERAL

- 1.1 WORK COVERED BY CONTRACT PRICES
- 1.2 SUBMITTALS
- 1.3 MOBILIZATION AND DEMOBILIZATION
 - 1.3.1 Mobilization
 - 1.3.2 Demobilization
- 1.4 SITE CONDITIONS
- 1.5 DEBRIS
- 1.6 ESTIMATED QUANTITIES
 - 1.6.1 Standard Dredging
 - 1.6.2 Overdepth Dredging
- 1.7 PERMIT
- 1.8 CHARGES
- 1.9 ENVIRONMENTAL PROTECTION REQUIREMENTS
- 1.10 TIME DELAY DUE TO POWER OUTAGE

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

- 3.1 GENERAL
 - 3.1.1 General
 - 3.1.2 Dredging and Disposal Plan - Turning Basin
 - 3.1.3 Debris
 - 3.1.4 Dredge Data Logging System (DDLS)
 - 3.1.5 Overflow, Spillage and Leakage
 - 3.1.5.1 Overflow From Barges and Scows
 - 3.1.5.2 Spillage and Leakage
 - 3.1.6 Survey of Barge Filling Area
 - 3.1.7 Horizontal Position Monitoring of Dredge
 - 3.1.8 Tidal Control During Dredging
 - 3.1.9 Inherent Delays
 - 3.1.10 Survey of Barge Filling Areas Located Outside Project Limit
- 3.2 DISPOSAL OF DREDGED MATERIAL AT MIDDLE HARBOR ENHANCEMENT AREA (MHEA)
 - 3.2.1 General
 - 3.2.2 Site Management and Monitoring Plan (SMMP) for MHEA Disposal Area
 - 3.2.3 Disposal of Debris
 - 3.2.4 Misplaced Material
- 3.3 DISPOSAL OF DREDGED MATERIAL AT BERTH 10, PORT OF OAKLAND
 - 3.3.1 General
 - 3.3.2 Rehandling Facility Requirements
- 3.4 DDLS BACKUP SYSTEM

- 3.5 HYDROGRAPHIC SURVEYS
- 3.6 OVERDEPTH AND EXCESSIVE DREDGING
 - 3.6.1 Overdepth
 - 3.6.2 Excessive Dredging
- 3.7 REPORTING REQUIREMENTS
- 3.8 GOVERNMENT PRE-DREDGE AND POST-DREDGE SURVEYS
 - 3.8.1 General
 - 3.8.2 Methods of Soundings
- 3.9 MONTHLY PARTIAL PAYMENTS
 - 3.9.1 Monthly Partial Payments
- 3.10 Shoaling

-- End of Section Table of Contents --

SECTION 02325

DREDGING

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT PRICES

The contract price per cubic yard for dredging shall include the cost of removal and disposal of all materials as specified herein or indicated on the drawings. The work under this Section consists of providing of all labor, plant, equipment, supplies and materials necessary to excavate, dredge, haul, and dispose of materials including but not limited to Young Bay Mud (YBM), San Antonio Formation (SAF), Old Bay Mud (OBM), old concrete piles at the wet basin and along the inner bulkhead, obstructions, sunken vessels, and rubble along the project bulkhead wall, and any accompanying subsurface debris resulting from the project demolition to the locations and elevations shown on the drawings and as follows:

- A. Dredge and transport YBM to the Berth 10 rehandling facility.
- B. Dry the YBM such that the Berth 10 rehandling facility is able to handle the throughput without impeding the project schedule.
- C. Transport and dispose of the dried YBM from the Berth 10 rehandling facility to an approved landfill in accordance with local, State and Federal laws and regulations.
- D. Dredge and transport SAF and OBM to Middle Harbor Enhancement Area (MHEA). This material includes material from dredging key for rock buttress.

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals not having a "GA" designation are for information only. When used, a designation following the "GA" 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

Dredging and Disposal Plan - Turning Basin; GA
 Spill Response Plan; GA
 Survey of Barge Filling Area; GA
 Survey of Barge Filling Areas Located Outside Project Limit; GA
 Site Management and Monitoring Plan (SMMP) for MHEA Disposal Area; GA
 Reporting Requirements; FD

1.3 MOBILIZATION AND DEMOBILIZATION

1.3.1 Mobilization

Mobilization shall consist of all work required in preparing the Contractor's dredging plant and equipment for shipment, moving plant,

equipment, labor, supplies and incidentals to the job site, and making ready for dredging. The Contractor's plant and equipment to be used in performing the work shall be of sufficient size and efficiency to meet the job requirements and will be subject to approval by the Contracting Officer.

1.3.2 Demobilization

Demobilization shall consist of all work required to prepare plant and equipment for return trip and removing all plant, equipment, labor and unused supplies and incidentals from the job site at the completion of the contract work, including cleaning up any land based staging site used in the prosecution of the work.

1.4 SITE CONDITIONS

The material to be removed within the limits shown on the drawings is composed of Young Bay Mud (YBM), San Antonio Formation (SAF), Old Bay Mud (OBM), shoreline excavation and any accompanying old existing subsurface obstruction and debris resulting from the project demolition to the locations and elevations shown on the drawings.

1.5 DEBRIS

Part of Pier 2 and Pier 5 catwalk and dolphins are to be demolished in the area to be dredged under this contract. Also, the sheet metal shop building, Piers 1,2,3 and 4, and marginal wharf were once located in the area to be dredged. It is possible that debris remaining will be encountered from these structures. It is also likely that small sunken vessels and other objects may exist in the project area. Disposal shall be the responsibility of the Contractor and shall be outside the limits of government property. In case the actual conditions differ from those stated or shown, or both, an adjustment in contract price or time of completion, or both, will be made in accordance with "FAR 52.236-2, Differing Site Conditions."

1.6 ESTIMATED QUANTITIES

The estimated quantities shown in the bidding schedule for dredging includes material to be removed to the maximum limit of overdepth dredging.

1.6.1 Standard Dredging

The total estimated quantities of material to be removed in the required dredging prism (exclusive of allowable overdepth), are shown in the Bidding Schedule. The Bid Items and Material Types are shown below.

<u>Bid Items</u>	<u>Material Type</u>
0016	YBM
0017	SAF & OBM
0019	Debris

Quantities shown in the Bidding Schedule will be used in determining adjustments, if any, under the terms of Special Clause "VARIATIONS IN ESTIMATED QUANTITIES - DREDGING".

1.6.2 Overdepth Dredging

Overdepth dredging will be allowed to the limits specified in Paragraph "OVERDEPTH AND EXCESSIVE DREDGING". The total estimated quantities of material to be removed are shown in the Bidding Schedule. The Bid Items and Material Types are Shown Below:

<u>Bid Item</u>	<u>Material Type</u>
0018	SAF + OBM

1.7 PERMIT

The Contractor shall comply with conditions and requirements of the Corps of Engineers Permit and other State or Federal permits. See Section 01005 SUPPLEMENTARY CONDITIONS, Paragraph 1.3, for Permit Requirements.

1.8 CHARGES

The Contractor will pay no charges for disposal of material in the Berth 10 Rehandling Facility and MHEA reuse areas.

1.9 ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor shall provide and maintain during the life of the contract, environmental protective measures. At a minimum, the Contractor shall provide containment booms in areas of dredging wooden piling or other debris in order to contain floats. To reduce turbidity plumes, at a minimum, the Contractor shall use and maintain turbidity curtains and floating absorptive booms around dredging, excavation, and filling activities in water shallower than EL -20 feet. Suspended solids shall not exceed 1,500 mg/l more than 100 feet beyond the project lines. In addition, the Contractor shall at a minimum, deploy turbidity curtains and booms around all dredging of YBM material. The Contractor shall submit a Spill Response Plan as a submittal for responding to and cleaning up visible releases of contaminants prior to commencement of any construction activities. The Contractor shall comply with Federal, State, and local regulations pertaining to water, air, and noise pollution. The Contractor shall comply with the Waste Discharge Requirements (WDR) for all dredging work. The WDR is included in Appendix 18. In the event that the discharge does not meet the water quality requirements, the Contractor shall suspend operations. The Contractor shall comply with the waste discharge requirements which may include suspension of operations or modification of disposal operations at no additional cost to the Government. The Contractor shall dispose of dredged and excavated materials not retained on-site by the Government at a properly licensed off-site location.

1.10 TIME DELAY DUE TO POWER OUTAGE

The project vicinity including City of Oakland, Port of Oakland and City of Alameda is on the power grid system that from time to time may experience rolling blackouts. The power outage during working hours may affect dredging operation using electrically powered equipment as described in Paragraph 3.1.1. The Contractor shall coordinate with Contracting Officer and the Utility Company to obtain the block number at the power source, and, in case of rolling blackout, adjust the dredging operation accordingly.

No additional payment will be made for delays due to power outages. Extension to the contract time shall be granted. The Contractor shall document each outage and notify the Contracting Officer. Time extension shall be granted at the following rates:

One calendar day for every power outage of 3 hours and longer.
 One half of one calendar day for every power outage of less than 3 hours. If the power outage is longer than one day, time extension shall be coordinated and agreed by the Contracting Officer.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

3.1.1 General

The dredging for this project is located in a primary shipping lane (a turning basin) serving the Port of Oakland and other marine activities. All waterborne dredges used for both dredging or excavation shall be electrically powered. Power and other facilities required are the responsibility of the Contractor. The Contractor shall schedule dredging operations so as to avoid any interference with marine traffic or terminal operations. Unless otherwise authorized, all dredging shall be performed in the presence of the Contracting Officer. Dredging of the YBM shall be performed by clam shell dredging using an approved environmental bucket. Dredging of the SAF, and OBM shall be performed by either, or a combination of, hydraulic dredging, clam shell dredging, or other approved method. Dredging of all other material shall be performed by clam shell dredging. The pipeline discharge for hydraulic dredges shall meet all water quality requirements. All discharge pipelines that would cross, block or impede navigation, or create a hazard shall be trenched and installed in channel bottom below currently maintained depth. The Contractor shall obtain all permits and approvals for constructing submerged pipelines and shall bear all of the risk and costs for maintenance and potential damage to pipeline. Dredged material shall be placed at the Government approved locations as discussed herein and shown on the Plans. Transport of all clam shell dredged material for disposal shall be by barge or dump scow.

The Contractor shall coordinate with Pacific Gas and Electric (PG&E) or Alameda Power and Telecom (AP&T), depending where the power source for the dredging operation is, to supply power to the site. The Contractor has the option to bring power for dredging from the north (Port of Oakland) side or from the south (Alameda) side of the Inner Harbor Channel. Cost of bringing electricity to the project site and power consumption for dredging and other work shall be borne by the Contractor.

The Contractor shall manage the Berth 10 rehandling operations and shall coordinate the use of Berth 10 by other contractors, such as the Oakland 50 Foot Phase 3B/3C contractor.

3.1.2 Dredging and Disposal Plan - Turning Basin

Prior to any dredging work, the Contractor shall submit a dredging and disposal plan for review and comment. Dredging shall not commence until all comments on the Dredging and Disposal Plan have been answered to the satisfaction of the Contracting Officer. The plan shall show barge anchoring locations; hydraulic pipelines; pipe anchoring locations;

instrumentation used; coordinates and land elevations of all control points for electronic positioning system and the vertical control monument information; Dredge Elements ; estimated daily dredge advances; quality control survey procedures; anticipated problem areas of project involving poor access due to boat traffic congestion or boat docking; procedures to assure that dredging will proceed within the contract template and performed in the most economical manner; and method for tracking placement of dredged material within the MHEA. The Contractor shall coordinate the plan with the demolition and construction work associated with this project - and shall specify and schedule, considering the construction phasing, the Dredge Elements for Government Acceptance Surveys. The plan shall be updated on a weekly basis to allow notification to harbor and boat owners of dredge progress.

The Dredge Element(s) in front of the sheetpile wall which is to receive the rockfill buttress is a temporary construction phase. The time duration between the completion of the dredging operations in front of the sheetpile wall and the installation of the rockfill buttress shall be kept to a minimum. This duration of wall exposure without rockfill buttress shall not exceed 3 months.

3.1.3 Debris

Material dredged by the clam shell method to be disposed at the MHEA area shall be banded on barges and scows at the dredge site by passing the material through a grid with openings of not more than 10 inches in any dimension. If it is evident that the material is free of debris the Contractor may request in writing to the Contracting Officer that the grid be removed. Contracting Officer has the option to have the debris grid re-positioned if deemed necessary by the Contracting Officer. Collected debris shall be disposed of as specified in Paragraph "DEBRIS".

Screening of hydraulically dredged material for disposal in the MHEA shall follow the same procedure for the clam shell dredging.

3.1.4 Dredge Data Logging System (DDL S)

The Contractor shall acquire, install, calibrate, operate and maintain a dredge data logging system as specified in Appendix 10 of the specifications. Per Appendix 10, the Contractor shall submit equipment methods information.

3.1.5 Overflow, Spillage and Leakage

3.1.5.1 Overflow From Barges and Scows

No overflow of dredged material or water will be allowed from the receiving barges or dump scows during dredging operations, except as follows: Overflow will be allowed only under the following combined conditions: (1) the material is dredged with a clam shell, power shovel, or hydraulic dredge (cutterhead, suction, or vortex type); and (2) only dense, clean sands are dredged, as approved by the Contracting Officer. Where overflow is allowed, overflow time shall be limited to 15 minutes once the barge or dump scow is full and the discharge shall be below the water surface.

3.1.5.2 Spillage and Leakage

Leakage or spillage of water or dredged material from barges during transit to the MHEA disposal area shall be minimized. Barges or dump scows which

exhibit an average loss in vessel draft in excess of 1 foot between the loaded barge draft recorded at the dredging site and the predisposal draft recorded at the disposal site, will be taken out of service for this project until repaired. The Contractor shall record draft of hull for each scow load as specified under quality control. If applicable, no loss in draft or volume will be permitted from containers transporting dredged materials for land disposal.

3.1.6 Survey of Barge Filling Area

Receiving barge or dump scow shall be located in an approved anchor site. The Contractor shall perform both a pre-dredge and a post-dredge survey of the anchor and shall remove any shoals attributed to his operation at no additional cost to the Government. Surveys shall comply with the requirements in Section 01331.

3.1.7 Horizontal Position Monitoring of Dredge

The Global Positioning System (GPS) utilizing the Coast Guard Point Blunt D-Beacon shall be used.

3.1.8 Tidal Control During Dredging

To establish dredging depth to the MLLW datum, the Contractor shall install an automatic recording tide gage with water level sensor placed at the closest Government-furnished tide gage site, or as otherwise approved. The tide gage shall provide a continuous recording of tidal change for every 15-minute interval or each 0.1 foot change, whichever occurs first. Tidal changes shall be recorded in MLLW datum, with these changes visually provided to the dredge operator at all times during the dredging process to allow proper adjustment of dredge depth. A printed record of the tidal changes shall become part of the Contractor's daily quality control report.

3.1.9 Inherent Delays

The Contractor shall anticipate inherent delays while dredging around obstructions such as cable, pieces of metal, chains, etc., that may foul the cutterhead or clam shell and require removal. The contractor shall insure that free and clear navigation is maintained within the project limits. The bid prices shall include allowances for such inherent delays.

3.1.10 Survey of Barge Filling Areas Located Outside Project Limit

If the receiving barge or dump scow is located outside of the dredging limits during dredging operations, the Contractor shall perform pre and post condition surveys to determine change in volume of bottom material in cubic yards. Drawings shall be prepared at a scale of 1:2400. Soundings shall be plotted with proper orientation/reference to an "X-Y" grid system, precision to the nearest one-tenth of a foot, and at intervals not greater than 10 feet. The interval between sections shall not be greater than 30 feet. Depths depicted shall be based upon Mean Lower Low Water Datum at the locality. Drawing sheets shall have appropriate titles, notes, tidal reference data, control survey dates, and other standard drafting details.

3.2 DISPOSAL OF DREDGED MATERIAL AT MIDDLE HARBOR ENHANCEMENT AREA (MHEA)

3.2.1 General

Dredged material shall be transported by dump scows or barge and deposited by open water dumping at the Government-furnished disposal area within the MHEA at specific location provided by the Contracting Officer. See Paragraph 1.10 for suspended solids limits. Each load drop shall be identified by "X" and "Y" coordinates on the daily Quality Control Report for that day. Dredged material placement operations must meet approval of the Contracting Officer. No debris or material other than natural mud, sand or silt shall be deposited in the MHEA disposal area. The Contractor shall coordinate material placement in the MHEA with the Oakland 50 Foot Phase 3B/3C contractor that will be managing the MHEA fill operations.

3.2.2 Site Management and Monitoring Plan (SMMP) for MHEA Disposal Area

The Contractor shall adhere to the following SMMP provisions for disposal of dredge material at the MHEA disposal area.

1. Leakage or spillage of water or dredged material from barges during transit to the MHEA disposal area shall be minimized.
2. The maximum tow speed shall be 5 knots over the bottom for banded barges or as approved by the Contracting Officer.
3. Tug boats are required to use an electronic positioning system (i.e., a miniranger system with at least two transponders or a Global Positioning System (GPS) with a minimum accuracy and precision of 10 feet for disposal operations. If the positioning system fails, all disposal operations shall cease until the navigational capabilities are restored.
4. No more than one disposal vessel shall be present within the permissible dumping target at any time.
5. When dredged material is disposed, no portion of the barge shall be outside the limits of the disposal area.
6. The dredged material shall be placed and evenly distributed within the limits of the MHEA reuse site as shown on the Plans at specific location provided by the Contracting Officer where the local bathymetry is now shallower than El. 18 ft MLLW.
7. The Contractor shall maintain daily records of dredging operations, transportation schedules, barge load volumes disposed, and exact location and time of disposal. A "Disposal Site Verification and Summary Log" form provided in Appendix 9.
8. Each tug boat shall maintain a computer printout from GPS or other approved navigation system showing transit routes and disposal coordinates, including the time and position of the disposal barge when the barge doors open and close.
9. The Contractor's quality control staff shall observe all dredging operations and submit reports containing a description of operations for each barge load, a checklist, a transit route map, a printout of coordinates from each waypoint and release point, a record of radio transmission and facsimile from the tug captain on

a weekly basis.

10. The Contractor shall report any violation to the Contracting Officer within 24 hours. In the event of a violation, the Contractor must make all necessary changes to bring disposal operations into compliance before making another trip to the disposal area.
11. Development and implementation of more sophisticated surveillance systems, which can be demonstrated to the Contracting Officer to be effective and capable of being audited, may be substituted pending approval from the Contracting Officer for one or more of the above provisions.

3.2.3 Disposal of Debris

Debris, man-made objects, timber, chains, anchors, flotsam, miscellaneous metal objects and other foreign material removed during dredging shall not be disposed of in the Government-furnished disposal areas. Such material shall be disposed of outside the limits of the work and on a land disposal site in accordance with local, State and Federal laws and regulations at the responsibility of the Contractor.

3.2.4 Misplaced Material

Any material that is intentionally or unintentionally deposited elsewhere than in places designated or approved by the Contracting Officer will not be paid for and the Contractor shall remove such misplaced material and deposit it where directed at his expense.

3.3 DISPOSAL OF DREDGED MATERIAL AT BERTH 10, PORT OF OAKLAND

3.3.1 General

The Contractor shall comply with the Waste Discharge Requirements (WDR) for use of the Berth 10 Dredge Sediment Rehandling Facility. This WDR is included as Appendix 17, "California Regional Water Quality Control Board, San Francisco Bay Region, Order No. 98-019". Dredged material shall be transported by sealed barges and placed inside the Berth 10 Rehandling Facility using mechanical dredging equipment only. There shall be no spillage or leakage during unloading of the scows at the Berth 10 Rehandling Facility.

The Contractor shall also comply with the findings (Items 1 through 16) and the orders (Item A through E) in their entirety of the RWQCB Order No. 98-019, as an agent of the Contracting Officer and a representative of the "discharger" which is defined as the Port of Oakland. Specifically, the Contractor shall coordinate with the Contracting Officer and the Port of Oakland in the following compliance:

- Finding No . 5 - Review by Dredged Material Management Office (DMMO)
- Finding No . 7 - Notification and Monitoring Program to the Executive Officer
- Finding No . 8 - Monitoring Reports
- Order Item A. Prohibitions
- Order Item B. Discharge Specifications
- Order Item C. Effluent Limitations
- Order Item D. Receiving Water Limitations
- Order Item E. Provisions

3.3.2 Rehandling Facility Requirements

The Contractor shall adhere to the following requirements for disposal of dredge material at the Berth 10 Rehandling Facility:

1. The Berth 10 Rehandling Facility is owned by the Port of Oakland. The Contractor is responsible for maintaining and operating the facility during the life of the project. Any damage caused to the facility and all associated clean-up and repair work is the responsibility of the Contractor.
2. Contractor is responsible for the dredged material load placed on Berth 10 so as to not overload the deck. A report titled "Structural Analysis of Berth 10 at Port of Oakland, Berth 10, Oakland, CA" dated July 2001 is available from the U. S. Army Corps of Engineers, San Francisco District. The report summarizes the condition of the structure and concludes with recommended maximum allowable uniform loads to be placed on the deck. The report indicates a maximum allowable load of 440 lb/sf. There are areas on the underside of the deck that have spalled. Those areas will require the Contractor to patch or place a steel plate on the deck prior to use. The Contractor is responsible for reviewing the report and taking responsibility for the load placed on the berth. There is one location (approximately 6 feet by 10 feet) where a steel plate on the deck or patching of the slab soffit is required.
3. Leakage or spillage or water from barges during transit to the Berth 10 Rehandling Facility shall be minimized.
4. The maximum tow speed shall be 5 knots over the bottom for loaded barges or as approved by the Contracting Officer.
5. The Contractor shall employ trained workers and shall use appropriate Personal Protective Equipment (PPE) at the rehandling facility.
6. The Contractor shall suspend excavation and grading activities when winds (instantaneous gusts) exceed 25 mph.
7. The Contractor shall sweep daily (with water sweepers) all paved access roads, parking, and staging areas at the rehandling facility to prevent material from being carried onto adjacent Port property and public streets.
8. The Contractor shall comply with all applicable landfill requirements when transporting dredged material to the landfill. Disposal activities should be scheduled to occur during minimum traffic times.
9. The Contractor shall wash off the tires and tracks of all trucks and equipment leaving the site. Minimum freeboard of 2.0 ft. shall be satisfied at all times.
10. Cover all trucks hauling dredged material, regardless of loading freeboard on trucks.

3.4 DDLS BACKUP SYSTEM

Any failure of the DDLS system, components and sensors shall be repaired within 48 hours of the failure in accordance with Appendix 10 subparagraph "Sensor Performance Requirements". During the 48 hour failure period, the Contractor shall continue dredging and disposal operations utilizing his DDLS backup system. The DDLS backup system must be approved by the Contracting Officer and shall be in place and operational prior to dredging and disposal operations.

3.5 HYDROGRAPHIC SURVEYS

The requirements for hydrographic surveys are provided in Section 01331 -- HYDROGRAPHIC SURVEYING.

3.6 OVERDEPTH AND EXCESSIVE DREDGING

3.6.1 Overdepth

The overdepth dredging shown on the drawings is being allowed only to assure removal of a sufficient amount of material to reach project depth and width, and is included in payment provisions. No payment will be made for materials removed from beyond the neat line template payline shown on the drawings. Overdepth dredging will not be allowed under side slopes.

3.6.2 Excessive Dredging

Dredging shall not be performed below the allowable overdepth. The Contractor may be subject to sanctions by Federal, State and local agencies for excessive dredging.

3.7 REPORTING REQUIREMENTS

The Contractor shall prepare and submit daily reports of operations on quality control forms as directed and/or accepted by Contracting Officer. The daily reports which may be supplemented with survey cross-sections shall document dredging operations for all shifts in a 24-hour period. Further instructions on the preparation of the reports will be furnished at the pre-dredging conference.

3.8 GOVERNMENT PRE-DREDGE AND POST-DREDGE SURVEYS

3.8.1 General

The Government will perform a pre-dredge survey of each Dredge Element prior to the start of dredging. Dredge Elements are the areas to be dredged as described in Section 01005 SUPPLEMENTARY CONDITIONS, in paragraph Milestone Schedule, and as shown on the Contract Drawing titled "Construction Phasing". The Contractor shall identify and schedule the Dredge Elements in the Dredging and Disposal Plan. The Contractor shall notify the Government 7 days in advance of completing a Dredge Element. Upon completion of a Dredge Element, the Contractor shall request a Government Acceptance Survey as described in Section 01331 HYDROGRAPHIC SURVEYING. The Government will schedule the post-dredge survey and the Contractor shall observe and certify this survey. If the Dredge Element is not acceptable, the Contractor shall resume dredging or take other corrective actions that are acceptable to the Government. Subsequent Government Acceptance Surveys for the same Dredge Element will be at the Contractor's expense as described in Section 01331. The Government will

also schedule the pre-dredge survey for the next Dredge Element and the Contractor shall observe and certify this.

3.8.2 Methods of Soundings

Final acceptance of the whole or a part of the work (each of the Dredge Elements) and the deductions or corrections of deductions made thereon will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error, and the acceptance of a completed section shall not change the time of payment of the retained percentages of the whole or any part of the work.

3.9 MONTHLY PARTIAL PAYMENTS

3.9.1 Monthly Partial Payments

Monthly partial payments will be based on approximate quantities determined by electronic hydrographic soundings as specified in Section 01331, "HYDROGRAPHIC SURVEYING". Copies of all original field notes, quantity computations and drawings performed by the Contractor for the purpose of layout and progress shall be furnished to the Contracting Officer at the site of work for use by the Contracting Officer to the extent necessary in determining the proper amount of progress payments due the Contractor.

3.10 Shoaling

Shoaling occurring within project limits prior to acceptance of any reach shall be removed by the Contractor and no additional payments will be made by the Government for dredging and disposal of this material. Shoaling occurring within the project limits after acceptance of any reach and prior to the completion of the contract shall be removed at the contract unit price for dredging, within the limit of available funds, if agreeable to both the Contractor and the Contracting Officer.

-- End of Section --

SECTION TABLE OF CONTENTS
DIVISION 02 - SITE CONSTRUCTION
SECTION 02464
METAL SHEET PILING

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 DELIVERY, STORAGE AND HANDLING

PART 2 PRODUCTS

- 2.1 METAL SHEET PILING
- 2.2 Special Interlocking Pile Sections
- 2.3 TESTS, INSPECTIONS, AND VERIFICATIONS
 - 2.3.1 Materials Tests
 - 2.3.2 Interlocked Joint Strength in Tension Test
- 2.4 HANDLING HOLES
- 2.5 LIQUID SEALANT
 - 2.5.1 Expansion Coefficient by Volume
 - 2.5.2 Mass Change Percentage

PART 3 EXECUTION

- 3.1 INSTALLATION
 - 3.1.1 Pile Driving Equipment
 - 3.1.1.1 Driving Hammers
 - 3.1.2 Piling and Driving
 - 3.1.2.1 Piling
 - 3.1.2.2 Driving
 - 3.1.2.3 Noise Control and Limitations
 - 3.1.3 Inspection of Driven Piling
 - 3.1.4 Cutting-Off and Splicing
 - 3.1.5 Pulling and Redriving
 - 3.1.6 Special Interlocking Pile Sections
- 3.2 REMOVAL
 - 3.2.1 Pulling
- 3.3 CORROSION PROTECTION

-- End of Section Table of Contents --

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 Grade 60	(1998) General Requirements for Structural Steel Bars, Plates, Shapes, and Sheet Piles
ASTM A 572/A 572M Grade 60	(1999) High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals not having a "GA" designation are for information only. When used, a designation following the "GA" 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

Metal Sheet Piling; GA.

Three copies of 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. Special corner sections, corner piles, and/or arcs and circles interlock swing piles shall be used to conform to the configuration shown on the drawings. The metal sheet pile shop drawings shall include manufacturer's section number, the designated angle (bending and/or corner) pile positioning, Contractor's established bearings for tangents, and repetitive pattern of the new sheet pile wall. These plans shall also incorporate the locations for the new battered H-pile tension piles and the existing landward pier piling and any other observed interference that may exist. The Contractor is responsible for participating in the pre-bid conference and/or site inspection. The Contractor shall verify the existing site conditions and positioning of the landward existing piles.

SD-07 Schedules

Pile Driving Equipment; GA.

Three copies of 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.

SD-08 Statements

Noise Control and Limitations; GA.

Three copies of the proposed method of construction noise reduction and noise control limitations shall be submitted and approved prior to driving metal sheetpiling.

SD-09 Reports

Materials Tests; **FIO**

Three copies of the 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 Grade 60.

Interlocked Joint Strength in Tension Test; GA.

Three copies of the procedure for testing sheet piling interlocked joint strength in tension shall be submitted and approved prior to testing piling.

Method of Pulling Piling; GA.

Three copies of the proposed method for pulling piles shall be submitted and approved prior to pulling piles.

SD-18 Records

Driving Record

Three copies of 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. The format for driving records shall be as directed by the Contracting Officer.

The special corner sections, corner piles and/or arcs and circle interlock swing piles shall be identified in these pile driving records.

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. Sheet piling over 80 feet in length shall be handled using a minimum of two pickup points.

PART 2 PRODUCTS

2.1 METAL SHEET PILING

Metal sheet piling shall be hot-rolled steel sections conforming to ASTM A 572/A 572M Grade 60, interlocked joint strength in tension as shown. 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 full-length sections of the dimensions shown. Fabricated sections shall conform to the requirement and the piling manufacturer's recommendations 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. These holes must be located within the top 9 inches of the sheet pile so that the holes are encased in the concrete cap beam. Metalwork fabrication for sheet piling shall be as specified and in Section 05055 METALWORK FABRICATION, MACHINE WORK, AND MISCELLANEOUS PROVISIONS.

2.2 Special Interlocking Pile Sections

Special corner sections, corner piles, and/or arcs and circle interlocking swing piles shall be used to conform to the configuration shown on the drawings. The Contractor shall be responsible for establishing survey backsites for the required tangent lengths of sheet pile wall.

2.3 TESTS, INSPECTIONS, AND VERIFICATIONS

Requirements for material tests, workmanship and other measures for quality assurance shall be as specified and in Section 05055 METALWORK FABRICATION, MACHINE WORK, AND MISCELLANEOUS PROVISIONS.

2.3.1 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 Grade 60.

2.3.2 Interlocked Joint Strength in Tension Test

The interlock joint strength in tension test shall conform to the piling manufacturer's standard test, include testing at least two 3 inch long coupons taken randomly from different as-produced pilings of each heat and must be approved.

2.4 HANDLING HOLES

Handling holes if used shall be located within the top 9 inches of the sheet pile. This requirement is to ensure that holes do not occur below the concrete cap beam.

2.5 LIQUID SEALANT

Liquid type hydrophilic water stop (poured in-place rubber gasket) to be

used at Wet Basin Bulkhead. The product shall have the minimum performance standard of:

<u>Property</u>	<u>Test Method</u>	<u>Minimum of</u>
Hardness	ASTM D 2240	20
Tensile Strength	ASTM D 412	300
Elongation %	ASTM D 412	1000
Specific Gravity	ASTM D 792	1.05
Expansion	See Paragraph 2.5.1	+ 0.05
Mass Change %	See Paragraph 2.5.2 (D 3575, Suffix G)	5

2.5.1 Expansion Coefficient by Volume

Test performed by independent laboratory by the following method:

- Determine the volume of dry sample
- Immerse the sample in water for 10 days
- Determine the volume of the sample after immersion
- Calculate the volume expansion coefficient

2.5.2 Mass Change Percentage

Mass change percentage measures the durability of the product. It reflects the amount of hydrophilic agent that is lost through repeated cycles of hydration and dehydration. Test performed by independent laboratory to determine mass change percentages by the following method:

- Determine mass of sample (mass x)
- Immerse sample in water at 70 °C for 72 hours
- Follow by 168 hours of continuous drying at 50 °C
- Determine mass of sample (mass y). If there is no mass change, continue to dry until a change in mass is observed
- Use the following formula to calculate mass change:

$$\text{Mass Change \%} = (100 - (\text{Mass } y / \text{Mass } x)) * 100$$

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 sufficient to drive the sheetpiles to the tip elevations specified in the plans. Note that other projects performed in the vicinity have encountered hard driving conditions.

3.1.2 Placing and Driving

3.1.2.1 Placing

Any excavation required within the area where sheet piling are to be installed shall be completed after placing sheet piling. Piling shall be carefully located as shown or directed. Piling 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 piling 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. Piling properly placed and driven shall be interlocked throughout their length with adjacent piling to form a continuous diaphragm throughout the length or run of piling wall.

3.1.2.2 Driving

Prior to driving piling 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 piling and potential problem areas can be identified by abrupt changes in its elevation. Piling shall be driven with the proper size hammer and by approved methods so as not to subject the piling 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 bading 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 piling. Piling damaged during driving or driven out of interlock shall be removed and replaced at the Contractor's expense. Adequate precautions shall be taken to insure that piling 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 piling 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 piling. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length. Piling 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 piling 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. If the Contractor demonstrates that removal or penetration is impractical the Contractor shall make changes in the design alignment of the piling structure as directed to insure the adequacy and stability of the structure. Piling shall be driven to depths shown and shall extend up to the elevation indicated for the top of piling. A tolerance of 3 inches above the indicated top elevation will be permitted. Piling shall not be driven within 100 feet of concrete less than 7 days old.

3.1.2.3 Noise Control and Limitations

Pile driving will not be permitted at night (7:00 PM to 7:00 AM on weekdays and 8:00 PM to 9:00 AM on weekends or Federal Holidays).

Contractor shall implement noise controls to reduce pile driving noise levels to meet City of Alameda construction noise standards. Contractor shall submit a noise control plan to the Contracting Officer.

3.1.3 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.

3.1.4 Cutting-Off and Splicing

Piles extending above the required top elevation in excess of the specified tolerance shall be cut off to the required elevation. Splicing of pilings is not allowed. The Contractor shall cut holes in pilings as shown on the Drawings. 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 items to be inserted.

3.1.5 Pulling and Redriving

The Contractor shall pull selected pilings after driving to determine the condition of the underground portions of pilings when directed. 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.

3.1.6 Special Interlocking Pile Sections

Special corner sections, corner piles, and/or arcs and circle interlocking swing piles shall be used to conform to the configuration shown on the drawings. The Contractor shall be responsible for establishing survey backsites for the required tangent lengths of sheet pile wall.

3.2 REMOVAL

3.2.1 Pulling

The method of pulling pilings must be approved. Extractors shall be of suitable type and size. Care shall be exercised during pulling of pilings to avoid damaging piling interlocks and adjacent construction. If the Contracting Officer determines that adjacent permanent construction has been damaged during pulling the Contractor will be required to repair this construction at no cost to the Government. Pilings shall be pulled one sheet at a time. Pilings fused together shall be separated prior to pulling unless the Contractor demonstrates to the satisfaction of the Contracting Officer that the pilings cannot be separated. The Contractor will not be paid for the removal of pilings damaged beyond structural use due to proper care not being exercised during pulling.

3.3 CORROSION PROTECTION

Coat piling in accordance with Section 09967, COATING OF STEEL STRUCTURES.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 03 - CONCRETE

SECTION 03307

CONCRETE FOR STRUCTURES

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 DESIGN AND PERFORMANCE REQUIREMENTS
 - 1.3.1 Strength
 - 1.3.2 Construction Tolerances
 - 1.3.3 Concrete Mixture Proportions

PART 2 PRODUCTS

- 2.1 MATERIALS
 - 2.1.1 Cementitious Materials
 - 2.1.1.1 Portland Cement
 - 2.1.1.2 Pozzolan
 - 2.1.2 Aggregates
 - 2.1.3 Admixtures
 - 2.1.3.1 Air-Entraining Admixture
 - 2.1.3.2 Accelerating Admixture
 - 2.1.3.3 Water-Reducing or Retarding Admixture
 - 2.1.4 Water
 - 2.1.5 Curing Materials
 - 2.1.5.1 Impervious Sheet Materials
 - 2.1.5.2 Membrane-Forming Curing Compound

PART 3 EXECUTION

- 3.1 PREPARATION
 - 3.1.1 General
 - 3.1.2 Embedded Items
 - 3.1.3 Formwork Installation
 - 3.1.4 Production of Concrete
 - 3.1.4.1 Ready-Mixed Concrete
 - 3.1.4.2 Concrete Made by Volumetric Batching and Continuous Mixing
 - 3.1.4.3 Batching and Mixing Equipment
- 3.2 CONVEYING AND PLACING CONCRETE
 - 3.2.1 General
 - 3.2.2 Consolidation
 - 3.2.3 Cold-Weather Requirements
 - 3.2.4 Hot-Weather Requirements
 - 3.2.5 Concrete Placement in Steel Pipe Piles
- 3.3 FINISHING
 - 3.3.1 General
 - 3.3.2 Finishing Formed Surfaces
 - 3.3.3 Finishing Unformed Surfaces
 - 3.3.3.1 Flat Finish

- 3.3.3.2 Broom Finish
- 3.4 CURING AND PROTECTION
- 3.5 TESTS AND INSPECTIONS
 - 3.5.1 General
 - 3.5.2 Inspection Details and Frequency of Testing
 - 3.5.2.1 Preparations for Placing
 - 3.5.2.2 Air Content
 - 3.5.2.3 Slump
 - 3.5.2.4 Temperature
 - 3.5.2.5 Strength
 - 3.5.2.6 Consolidation and Protection
 - 3.5.3 Action Required
 - 3.5.3.1 Placing
 - 3.5.3.2 Air Content
 - 3.5.3.3 Slump
 - 3.5.4 Reports

-- End of Section Table of Contents --

SECTION 03307

CONCRETE FOR STRUCTURES

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.

ACI INTERNATIONAL (ACI)

ACI 308	(1992) Standard Practice for Curing Concrete
ACI 318/318R	(1992) Building Code Requirements for Reinforced Concrete
ACI 347R	(1994) Formwork for Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 31	(1991) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1997) Concrete Aggregate
ASTM C 39	(1993) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 94	(1994) Ready-Mixed Concrete
ASTM C 143	(1990a) Slump of Hydraulic Cement Concrete
ASTM C 150	(1995) Portland Cement
ASTM C 171	(1992) Sheet Materials for Curing Concrete
ASTM C 172	(1990) Sampling Freshly Mixed Concrete
ASTM C 231	(1991b) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(1994) Air-Entraining Admixtures for Concrete
ASTM C 309	(1994) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 494	(1992) Chemical Admixtures for Concrete
ASTM C 618	(1994a) Coal Fly Ash and Raw or Calced Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

ASTM C 685	(1994) Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C 1064	(1986, R1993) Temperature of Freshly Mixed Portland Cement Concrete
ASTM D 75	(1987; R 1992) Sampling Aggregates
CORPS OF ENGINEERS (COE)	
COE CRD-C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals not having a "GA" designation are for information only. When used, a designation following the "GA" 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

Air-Entraining Admixture; **FIO**

Accelerating Admixture; **FIO**

Water-Reducing or Retarding Admixture; **FIO**

Curing Materials; **FIO**

The Contractor shall submit three copies of the manufacturer's literature for the above items from suppliers which demonstrates compliance with applicable specifications for the above materials.

SD-09 Reports

Aggregates; GA

Aggregates will be accepted on the basis of certificates of compliance and test reports that show the material(s) meets the quality and grading requirements of the specifications under which it is furnished.

Concrete Mixture Proportions; GA

Ten days prior to placement of concrete, the contractor shall submit three copies of the mixture proportions that will produce concrete of the quality required. Applicable test reports shall be submitted to verify that the concrete mixture proportions selected will produce concrete of the quality specified.

SD-13 Certificates

Cementitious Materials; GA

Three copies of the certificates of compliance attesting that the concrete materials meet the requirements of the specifications shall be submitted in

accordance with the Special Clause "CERTIFICATES OF COMPLIANCE". Cementitious material will be accepted on the basis of a manufacturer's certificate of compliance, accompanied by mill test reports that the material(s) meet the requirements of the specification under which it is furnished.

Aggregates; GA

Aggregates will be accepted on the basis of certificates of compliance and tests reports that show the material(s) meet the quality and grading requirements of the specifications under which it is furnished.

Batching and Mixing Equipment; GA

1.3 DESIGN AND PERFORMANCE REQUIREMENTS

The Government will maintain the option to sample and test compression bearing, joint sealer, joint filler material, aggregates and concrete to determine compliance with the specifications. The Contractor shall provide facilities and labor as may be necessary to assist the Government in procurement of representative test samples. Samples of aggregates will be obtained at the point of batching in accordance with ASTM D 75. Concrete will be sampled in accordance with ASTM C 172. Slump and air content will be determined in accordance with ASTM C 143 and ASTM C 231, respectively, when cylinders are molded. Compression test specimens will be made, cured, and transported in accordance with ASTM C 31. Compression test specimens will be tested in accordance with ASTM C 39. Samples for strength tests will be taken not less than once each shift in which concrete is produced. A minimum of three specimens will be made from each sample; two will be tested at 28 days (90 days if pozzolan is used) for acceptance, and one will be tested at 7 days for information.

1.3.1 Strength

Acceptance test results will be the average strengths of two specimens tested at 28 days (90 days if pozzolan is used). The strength of the concrete will be considered satisfactory so long as the average of three consecutive acceptance test results equal or exceed the specified compressive strength, ft, and no individual acceptance test result falls below ft by more than 500 psi.

1.3.2 Construction Tolerances

A Class "C" finish shall apply to all surfaces except those specified to receive a Class "D" finish. A Class "D" finish shall apply to all surfaces which will be permanently concealed after construction. The surface requirements for the classes of finish required shall be as specified in ACI 347R. The horizontal top surface of the sheet pile concrete pile cap shall be cast to a construction tolerance not to exceed 0.25 inches in 10 feet.

1.3.3 Concrete Mixture Proportions

Concrete mixture proportions shall be the responsibility of the Contractor. Mixture proportions shall include the dry weights of cementitious material(s); the nominal maximum size of the coarse aggregate; the specific gravities, absorptions, and saturated surface-dry weights of fine and coarse aggregates; the quantities, types, and names of admixtures; and quantity of water per cubic yard of concrete. All materials included in

the mixture proportions shall be of the same type and from the same source as will be used on the project. Specified compressive strength f_c shall be 5,000 psi at 28 days (90 days if pozzolan is used) for all cast-in-place concrete. The maximum nominal size coarse aggregate shall be 3/4 inch, in accordance with ACI 318/318R. The air content shall be between 4.5 and 7.5 percent. The slump shall be between 2 and 5 inches. The maximum water cement ratio shall be 0.40. Cast-in-place pile cap concrete shall contain an accelerating admixture; produced by W. R. Grace & Co, DCI Corrosion Inhibitor, or equal proportioned in accordance with the manufacturers recommendations.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Cementitious Materials

Cementitious materials shall conform to the appropriate specifications listed:

2.1.1.1 Portland Cement

ASTM C 150, Type II.

2.1.1.2 Pozzolan

Pozzolan shall conform to ASTM C 618, Class F.

2.1.2 Aggregates

Aggregates shall meet the quality and grading requirements of ASTM C 33.

2.1.3 Admixtures

Admixtures to be used, when required or approved, shall comply with the appropriate specification listed. Chemical admixtures that have been in storage at the project site for longer than 6 months or that have been subjected to freezing shall be retested at the expense of the contractor at the request of the Contracting Officer and shall be rejected if test results are not satisfactory.

2.1.3.1 Air-Entraining Admixture

Air-entraining admixture shall meet the requirements of ASTM C 260.

2.1.3.2 Accelerating Admixture

Cast-in-place pile cap concrete shall contain an accelerating admixture; produced by W. R. Grace & Co., DCI Corrosion Inhibitor, or an approved equal. This accelerator shall meet the requirements of ASTM C 494, Type C.

2.1.3.3 Water-Reducing or Retarding Admixture

Water-reducing or retarding admixture shall meet the requirements of ASTM C 494, Type A, B, or D. High-range water reducing admixture Type F may be used only when approved, approval being contingent upon particular placement requirements as described in the Contractor's Quality Control Plan.

2.1.4 Water

Water for mixing and curing shall be fresh, clean, potable, and free from injurious amounts of oil, acid, salt, or alkali, except that unpotable water may be used if it meets the requirements of COE CRD-C 400.

2.1.5 Curing Materials

Curing materials shall conform to the following requirements.

2.1.5.1 Impervious Sheet Materials

Impervious sheet materials, ASTM C 171, type optional, except polyethylene film, if used, shall be white opaque.

2.1.5.2 Membrane-Forming Curing Compound

ASTM C 309, Type 1-D or 2, Class A.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 General

Construction joints shall be prepared to expose coarse aggregate, and the surface shall be clean, damp, and free of laitance. Ramps and walkways, as necessary, shall be constructed to allow safe and expeditious access for concrete and workmen. Snow, ice, standing or flowing water, loose particles, debris, and foreign matter shall have been removed. Spare vibrators shall be available at the CQC Preparatory Phase Meeting. All equipment needed to place, consolidate, protect, and cure the concrete shall be at the placement site and in good operating condition. The entire preparation shall be accepted by the Government at the CQC Preparatory Phase Meeting.

3.1.2 Embedded Items

Reinforcement shall be secured in place; joints, anchors, and other embedded items shall have been positioned. Internal ties shall be arranged so that when the forms are removed all metal will be not less than 2 inches from concrete surfaces permanently exposed to view or exposed to water on the finished structures. Embedded items shall be free of oil and other foreign matters such as loose coatings or rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed.

3.1.3 Formwork Installation

Forms shall be properly aligned, adequately supported, and mortar-tight. The form surfaces shall be smooth and free from irregularities, dents, sags, or holes when used for permanently exposed faces. All exposed joints and edges shall be chamfered, unless otherwise indicated.

3.1.4 Production of Concrete

3.1.4.1 Ready-Mixed Concrete

Ready-mixed concrete shall conform to ASTM C 94 except as otherwise

specified.

3.1.4.2 Concrete Made by Volumetric Batching and Continuous Mixing

Concrete made by volumetric batching and continuous mixing shall conform to ASTM C 685.

3.1.4.3 Batching and Mixing Equipment

The contractor shall have the option of using an on-site batching and mixing facility. The facility shall provide sufficient batching and mixing equipment capacity to prevent cold joints. The method of measuring materials, batching operation, and mixer shall be submitted for review.

3.2 CONVEYING AND PLACING CONCRETE

Conveying and placing concrete shall conform to the following requirements.

3.2.1 General

Concrete placement shall not be permitted when weather conditions prevent proper placement and consolidation. When concrete is mixed and/or transported by a truck mixer, the concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours or 45 minutes when the placing temperature is 85 degrees F or greater unless a retarding admixture is used. Concrete shall be conveyed from the mixer to the forms as rapidly as practicable by methods which prevent segregation or loss of ingredients. Concrete shall be in place and consolidated within 15 minutes after discharge from the mixer. Concrete shall be deposited as close as possible to its final position in the forms and be so regulated that it may be effectively consolidated in horizontal layers 18 inches or less in thickness with a minimum of lateral movement. The placement shall be carried on at such a rate that the formation of cold joints will be prevented.

3.2.2 Consolidation

Each layer of concrete shall be consolidated by internal vibrating equipment. External vibrating equipment may be used when authorized by the Contracting Officer. Internal vibration shall be systematically accomplished by inserting the vibrator through the fresh concrete in the layer below at a uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1.5 times the radius of action of the vibrator and overlap the adjacent, just-vibrated area by a few inches. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the layer below, if such a layer exists. It shall be held stationary until the concrete is consolidated and then withdrawn slowly at the rate of about 3 inches per second.

3.2.3 Cold-Weather Requirements

No concrete placement shall be made when the ambient temperature is below 35 degrees F or if the ambient temperature is below 40 degrees F and falling. Suitable covering and other means as approved shall be provided for maintaining the concrete at a temperature of at least 50 degrees F for not less than 72 hours after placing and at a temperature above freezing for the remainder of the curing period. Salt, chemicals, or other foreign materials shall not be mixed with the concrete to prevent freezing. Any concrete damaged by freezing shall be removed and replaced at the expense

of the contractor.

3.2.4 Hot-Weather Requirements

When the rate of evaporation of surface moisture, as determined by use of Figure 1 of ACI 308, is expected to exceed 0.2 pound per square foot per hour, provisions for windbreaks, shading, fog spraying, or covering with a light-colored material shall be made in advance of placement, and such protective measures shall be taken as quickly as finishing operations will allow.

3.2.5 Concrete Placement in Steel Pipe Piles

Concrete placement in the steel pipe piles upper section shall be by means of an "elephant trunk", pump flex pipe, or tremie pipe. Height shall not exceed 6 feet to prevent segregation.

3.3 FINISHING

3.3.1 General

No finishing or repair will be done when either the concrete or the ambient temperature is below 50 degrees F.

3.3.2 Finishing Formed Surfaces

All fins and loose materials shall be removed, and surface defects including tie holes shall be filled. All honeycomb areas and other defects shall be repaired. All unsound concrete shall be removed from areas to be repaired. Surface defects greater than 1/2 inch in diameter and holes left by removal of tie rods in all surfaces not to receive additional concrete shall be reamed or chipped and filled with dry-pack mortar. The prepared area shall be brush-coated with an approved epoxy resin or latex bonding compound or with a neat cement grout after dampening and filled with mortar or concrete. The cement used in mortar or concrete for repairs to all surfaces permanently exposed to view shall be a blend of portland cement and white cement so that the final color when cured will be the same as adjacent concrete.

3.3.3 Finishing Unformed Surfaces

All unformed surfaces that are not to be covered by additional concrete or backfill shall be float finished to elevations shown, unless otherwise specified. Surfaces to receive additional concrete or backfill shall be brought to the elevations shown and left as a true and regular surface. Exterior surfaces shall be sloped for drainage unless otherwise shown. Joints shall be carefully made with a jointing tool. Unformed surfaces shall be finished to a tolerance of 3/8 inch for a float finish and 5/16 inch for a trowel finish as determined by a 10 foot straightedge placed on surfaces shown on the plans to be level or having a constant slope. Finishing shall not be performed while there is excess moisture or bleeding water on the surface. No water or cement shall be added to the surface during finishing.

3.3.3.1 Float Finish

Surfaces to be float finished shall be screeded and darbyed or bullfloated to eliminate the ridges and to fill in the voids left by the screed. In addition, the darby or bullfloat shall fill all surface voids and only

slightly embed the coarse aggregate below the surface of the fresh concrete. When the water sheen disappears and the concrete will support a person's weight without deep imprint, floating should be completed. Floating should embed large aggregates just beneath the surface, remove slight imperfections, humps, and voids to produce a plane surface, compact the concrete, and consolidate mortar at the surface.

3.3.3.2 Broom Finish

A broom finish shall be applied to exterior deck slab. The concrete shall be screeded and floated to required finish plane with no coarse aggregate visible. After surface moisture disappears, the surface shall be broomed or brushed with a broom or fiber bristle brush in a direction transverse to that of the main traffic or as directed.

3.4 CURING AND PROTECTION

Beginning immediately after placement and continuing for at least 7 days, except for concrete made with Type III cement, at least 3 days, all concrete shall be cured and protected from premature drying, extremes in temperature, rapid temperature change, freezing, mechanical damage, and exposure to rain or flowing water. All materials and equipment needed for adequate curing and protection shall be available and at the site of the placement prior to the start of concrete placement. Preservation of moisture for concrete surfaces not in contact with forms shall be accomplished by one of the following methods:

- a. Continuous sprinkling or ponding.
- b. Application of absorptive mats or fabrics kept continuously wet.
- c. Application of sand kept continuously wet.
- d. Application of impervious sheet material conforming to ASTM C 171.
- e. Application of membrane-forming curing compound conforming to ASTM C 309, Type 1-D, on surfaces permanently exposed to view and Type 2 on other surfaces shall be accomplished in accordance with manufacturer's instructions.

The preservation of moisture for concrete surfaces placed against wooden forms shall be accomplished by keeping the forms continuously wet for 7 days, except for concrete made with Type III cement, 3 days. If forms are removed prior to end of the required curing period, other curing methods shall be used for the balance of the curing period. During the period of protection removal, the temperature of the air in contact with the concrete shall not be allowed to drop more than 25 degrees F within a 24 hour period.

3.5 TESTS AND INSPECTIONS

3.5.1 General

The individuals who sample and test concrete as required in this specification shall have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the ACI minimum guidelines for certification of Concrete Field Testing Technicians, Grade I.

3.5.2 Inspection Details and Frequency of Testing

3.5.2.1 Preparations for Placing

Foundation or construction joints, forms, and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor to certify that it is ready to receive concrete.

3.5.2.2 Air Content

Air content shall be checked at least twice during each shift that concrete is placed for each class of concrete required. Samples shall be obtained in accordance with ASTM C 172 and tested in accordance with ASTM C 231.

3.5.2.3 Slump

Slump shall be checked twice during each shift that concrete is produced for each class of concrete required. Samples shall be obtained in accordance with ASTM C 172 and tested in accordance with ASTM C 143.

3.5.2.4 Temperature

The temperature of the concrete shall be measured when compressive strength specimens are fabricated. Measurement shall be in accordance with ASTM C 1064. The temperature shall be reported along with the compressive strength data.

3.5.2.5 Strength

- (1) Frequency of Testing. Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, nor less than once for each 150 c.y. of concrete, nor less than once for each 500 s.y. of surface area for slabs or walls. If this sampling frequency results in less than 5 strength tests for a given class of concrete, tests shall be made from at least 5 randomly selected trucks or from each truck if fewer than 5 truck loads are used. Field cured specimens for determining form removal time or when a structure may be put in service shall be made in numbers directed to check the adequacy of curing and protection of concrete in the structure. The specimens shall be removed from the molds at the age of 24 hours and shall be cured and protected, insofar as practicable, in the same manner as that given to the portion of the structure the samples represent.
- (2) Testing Procedures. Cylinders for acceptance tests shall be molded and cured in accordance with ASTM C 31. Cylinders shall be tested in accordance with ASTM C 39. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days or at another specified test age.
- (3) Evaluation of Results. Concrete specified on the basis of compressive strength will be considered satisfactory if the averages of all sets of three consecutive strength test results equal or exceed the specified strength and no individual strength test result falls below the required strength by more than 500 psi.

3.5.2.6 Consolidation and Protection

The Contractor shall ensure that the concrete is properly consolidated,

finished, protected, and cured.

3.5.3 Action Required

3.5.3.1 Placing

The placing form shall not permit placing to begin until he has verified that an adequate number of acceptable vibrators, which are in working order and have competent operators, are available. Placing shall not be continued if any pile is inadequately consolidated. Placement of concrete in the pile cap shall not begin until the preformed expansion joint filler (form foam) has been installed at the designated expansion joints.

3.5.3.2 Air Content

Whenever a test result is outside the specification limits, the concrete shall not be delivered to the forms and an adjustment shall be made to the dosage of the air-entrainment admixture.

3.5.3.3 Slump

Whenever a test result is outside the specification limits, the concrete shall not be delivered to the forms and an adjustment should be made in the batch weights of water and fine aggregate. The adjustments are to be made so that the water-cement ratio does not exceed that specified in the submitted concrete mixture proportion.

3.5.4 Reports

The results of all tests and inspections conducted at the project site shall be reported informally at the end of each shift and in writing weekly and shall be delivered within 3 days after the end of each weekly reporting period. All concrete reports, including compressive strengths, concrete temperatures, ambient temperatures, slump, air content, mix design number and location of concrete placement shall be submitted in a spreadsheet format and on computer disk(s) to the Contracting Officer. The Contracting Officer has the right to examine all Contractor quality control records. See Section 01451 CONTRACTOR QUALITY CONTROL.

— End of Section —

SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05055

METALWORK FABRICATDN, MACHNE WORK, MISCELLANEOUS PROVISIONS

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 METALWORK AND HANDRAIL WORK DETAIL DRAWINGS
- 1.4 QUALIFICATION OF WELDERS AND WELDING OPERATORS

PART 2 PRODUCTS

- 2.1 MATERIALS
 - 2.1.1 Materials Orders
 - 2.1.2 Materials List
 - 2.1.3 Shipping Bill
- 2.2 FABRICATDN
 - 2.2.1 Structural Fabrication
 - 2.2.1.1 Dimensional Tolerances for Metal Work
 - 2.2.1.2 Metal Fabrication
 - 2.2.2 Welding
 - 2.2.2.1 Welding of Steel
 - 2.2.2.2 Welding of Steel Studs
 - 2.2.2.3 Steel Connection Material For Studs
 - 2.2.2.4 Steel Plate for Attachment of H-Piles to the Sheet Pile Wall
 - 2.2.3 Patterns
 - 2.2.4 Miscellaneous Provisions
 - 2.2.4.1 Metallic Coatings
 - 2.2.5 Shop Assembly
- 2.3 TESTS, INSPECTIONS, AND VERIFICATIONS
 - 2.3.1 Inspection of Welding
 - 2.3.1.1 Visual Examination
 - 2.3.2 Structural Steel Welding Repairs
 - 2.3.3 Inspection and Testing of Steel Stud Welding

PART 3 EXECUTION

- 3.1 INSTALLATDN
 - 3.1.1 Alignment and Setting
 - 3.1.2 Blocking and Wedges
- 3.2 TESTS
 - 3.2.1 Workmanship
 - 3.2.2 Production Welding

-- End of Section Table of Contents --

SECTION 05055

METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS

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 108	(1999) Steel Bars, Carbon, Cold - Finished, Standard Quality
ASTM A 123	(1989a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 572	(1998) Standard Specification for High Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A 780	(1993a) Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(1996) Structural Welding Code - Steel
----------	----------------------------------------

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals not having a "GA" designation are for information only. When used, a designation following the "GA" 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

Detail Drawings; GA

Detail drawings for metalwork and handrail work shall be submitted and approved prior to fabrication.

SD-07 Schedules

Shipping Bill; **FIO**

Three copies of shipping bill shall be submitted with the delivery of finished pieces to the site.

SD-08 Statements

Welding Procedures for Structural Steel; GA

Three copies of schedules of welding procedures for steel structures shall be submitted and approved prior to commencing fabrication.

Structural Steel Welding Repairs; GA

Three copies of welding repair plans for steel shall be submitted and approved prior to making repairs.

SD-09 Reports

Tests, Inspections, and Verifications; **FIO**

Three copies of certified test reports for materials shall be submitted with all materials delivered to the site.

SD-13 Certificates; GA

Qualification of Welders and Welding Operators

Three copies of certifications for welders and welding operators shall be submitted prior to commencing fabrication.

Application Qualification for Steel Studs; GA

Three copies of certified reports for the application qualification for steel studs shall be submitted and approved prior to commencing fabrication.

1.3 METALWORK AND HANDRAIL WORK DETAIL DRAWINGS

Detail drawings for metalwork and handrail work shall include catalog cuts, templates, fabrication and assembly details and type, grade and class of material as appropriate. Elements of fabricated items inadvertently omitted on contract drawings shall be detailed by the fabricator and indicated on the detail drawings.

1.4 QUALIFICATION OF WELDERS AND WELDING OPERATORS

The Contractor shall certify that the qualification of welders and welding operators and tack welders who will perform structural steel welding have been qualified for the particular type of work to be done in accordance with the requirements of AWS D1.1, Section 5, prior to commencing fabrication. The certificate shall list the qualified welders by name and shall specify the code and procedures under which qualified and the date of qualification. Prior qualification will be accepted if welders have performed satisfactory work under the code for which qualified within the preceding three months. The Contractor shall require welders to repeat the qualifying tests when their work indicates a reasonable doubt as to proficiency. Those passing the requalification tests will be recertified. Those not passing will be disqualified until passing. All expenses in connection with qualification and requalification shall be borne by the Contractor.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Materials Orders

The Contractor shall furnish 3 copies of purchase orders, mill orders, shop orders and work orders for all materials orders and items used in the work.

Where mill tests are required purchase orders shall contain the test site address and the name of the testing agency.

2.1.2 Materials List

The Contractor shall furnish 3 copies of the materials list of the materials to be used in the fabrication of each item.

2.1.3 Shipping Bill

The Contractor shall furnish a shipping bill or memorandum of each shipment of finished pieces or members to the project site giving the designation mark and weight of each item, the number of items, the total weight, and the car initial and number if shipped by rail in carload lots. Duplicate copies of shipping bills shall be mailed promptly to the Resident Engineer (RE).

2.2 FABRICATDN

2.2.1 Structural Fabrication

Material must be straight before being laid off or worked. If straightening is necessary it shall be done by methods that will not impair the metal. Sharp kinks or bends shall be cause for rejection of the material. Material with welds will not be accepted except where welding is definitely specified, indicated or otherwise approved. Bends shall be made by approved dies, press brakes or bending rolls. Where heating is required, precautions shall be taken to avoid overheating the metal and it shall be allowed to cool in a manner that will not impair the original properties of the metal. Proposed flame cutting of material other than structural steel shall be subject to approval and shall be indicated on detail drawings. Shearing shall be accurate and all portions of the work shall be neatly finished. Corners shall be square and true unless otherwise shown. Re-entrant cuts shall be filleted to a minimum radius of 3/4 inch unless otherwise approved. Finished members shall be free of twists, bends and open joints. Bolts, nuts and screws shall be tight.

2.2.1.1 Dimensional Tolerances for Metal Work

Dimensions shall be measured by an approved calibrated steel tape of approximately the same temperature as the material being measured. The overall dimensions of an assembled structural unit shall be within the tolerances indicated on the drawings or as specified in the particular section of these specifications for the item of work. Where tolerances are not specified in other sections of these specifications or shown, an allowable variation of 1/32 inch is permissible in the overall length of component members with both ends milled and component members without milled ends shall not deviate from the dimensions shown by not more than 1/16 inch for members 30 feet or less in length and by more than 1/8 inch for members over 30 feet in length.

2.2.1.2 Metal Fabrication

Metal may be cut by mechanically guided or hand-guided torches, provided an accurate profile with a surface that is smooth and free from cracks and notches is obtained. Surfaces and edges to be welded shall be prepared in accordance with AWS D1.1, Subsection 3.2. Where structural steel is not to be welded, chipping or grinding will not be required except as necessary to remove slag and sharp edges of mechanically guided or hand-guided cuts not exposed to view. Hand-guided cuts which are to be exposed or visible shall be chipped, ground or machined to sound metal.

2.2.2 Welding

2.2.2.1 Welding of Steel

a. Welding Procedures for Structural Steel - Welding procedures for steel shall be prequalified as described in AWS D1.1, Subsection 5.1 or shall be qualified by tests as prescribed in AWS D1.1, Section 5. Properly documented evidence of compliance with all requirements of these specifications for previous qualification tests shall establish a welding procedure as prequalified. For welding procedures qualified by tests, the test welding and specimen testing must be witnessed and the test report document signed by the Contracting Officer. Approval of any welding procedure will not relieve the Contractor of the responsibility for producing a finished structure meeting all requirements of these specifications. The Contractor will be directed or authorized to make any changes in previously approved welding procedures that are deemed necessary or desirable by the Contractor Officer. The Contractor shall submit a complete schedule of welding procedures for each steel structure to be welded. The schedule shall conform to the requirements specified in the provisions AWS D1.1, Sections 2, 3, 4, 7 and 9 and applicable provisions of Section 10. The schedule shall provide detailed procedure specifications and tables or diagrams showing the procedures to be used for each required joint. Welding procedures must include filler metal, preheat, interpass temperature and stress-relief heat treatment requirements. Each welding procedure shall be clearly identified as being prequalified or required to be qualified by tests. Welding procedures must show types and locations of welds designated or in the specifications to receive nondestructive examination.

b. Welding Process - Welding of steel shall be by an electric arc welding process using a method which excludes the atmosphere from the molten metal and shall conform to the applicable provisions of AWS D1.1, Sections 1 thru 7, 9, 10 and 11. Welding shall be such as to minimize residual stresses, distortion and shrinkage.

c. Welding Technique

(1) Filler Metal - The electrode, electrode-flux combination and grade of weld metal shall conform to the appropriate AWS specification for the base metal and welding process being used or shall be as shown where a specific choice of AWS specification allowances is required. The AWS designation of the electrodes to be used shall be included in the schedule of welding procedures. Only low hydrogen electrodes shall be used for manual shielded metal arc welding regardless of the thickness of the steel. A controlled temperature storage oven shall be used at the job site as prescribed by AWS D1.1, Subsection 4.5 to maintain low moisture

of low hydrogen electrodes.

(2) Preheat and Interpass Temperature - Preheating shall be performed as required by AWS D1.1, Subsection 4.2 and 4.3 or as otherwise specified except that the temperature of the base metal shall be at least 70 degrees F. The weldments to be preheated shall be slowly and uniformly heated by approved means to the prescribed temperature, held at that temperature until the welding is completed and then permitted to cool slowly in still air.

d. Workmanship - Workmanship for welding shall be in accordance with AWS D1.1, Section 3 and other applicable requirements of these specifications.

(1) Preparation of Base Metal - Prior to welding the Contractor shall inspect surfaces to be welded to assure compliance with AWS D1.1, Subsection 3.2.

(2) Temporary Welds - Temporary welds required for fabrication and erection shall be made under the controlled conditions prescribed for permanent work. Temporary welds shall be made using low hydrogen welding electrodes and by welders qualified for permanent work as specified in these specifications. Preheating for temporary welds shall be as required by AWS D1.1 for permanent welds except that the minimum temperature shall be 120 degrees F in any case. In making temporary welds arcs shall not be struck in other than weld locations. Each temporary weld shall be removed and ground flush with adjacent surfaces after serving its purpose.

(3) Tack Welds - Tack welds that are to be incorporated into the permanent work shall be subject to the same quality requirements as the permanent welds and shall be cleaned and thoroughly fused with permanent welds. Preheating shall be performed as specified above for temporary welds. Multiple-pass tack welds shall have cascaded ends. Defective tack welds shall be removed before permanent welding.

2.2.2.2 Welding of Steel Studs

The procedures for welding steel studs to structural steel, including mechanical, workmanship, technique, stud application qualification, production quality control and fabrication and verification inspection procedures shall conform to the requirements of AWS D1.1, Section 7, except as otherwise specified.

a. Application Qualification for Steel Studs - As a condition of approval of the stud application process, the Contractor shall furnish certified test reports and certification that the studs conform to the requirements of AWS D1.1, Subsections 7.2 and 7.3, certified results of the stud manufacturer's stud base qualification test, and certified results of the stud application qualification test as required by AWS D1.1, Subsection 7.6, except as otherwise specified.

b. Production Quality Control - Quality control for production welding of studs shall conform to the requirements of AWS D1.1, Subsection 7.7, except as otherwise specified. Studs on which pre-production testing is to be performed shall be welded in the same general position as required on production studs (flat, vertical, overhead or sloping). If the reduction of the length of studs becomes less than normal as they

are welded, welding shall be stopped immediately and not resumed until the cause has been corrected.

2.2.2.3 Steel Connection Material For Studs

Carbon-Steel Headed Studs: ASTM A 108, Grades 1010 Thru 1020 Cold Drawn, Low Carbon Steel; AWS D1.1, Type A or B, with ARC Shields.

2.2.2.4 Steel Plate for Attachment of H-Piles to the Sheet Pile Wall

ASTM A 572, Grade 50.

2.2.3 Patterns

Care shall be taken to avoid sharp corners or abrupt changes in cross section and ample fillets shall be used in the construction of patterns.

2.2.4 Miscellaneous Provisions

2.2.4.1 Metallic Coatings

a. Zinc Coatings - Zinc coatings shall be applied in a manner and of a thickness and quality conforming to ASTM A 123. Where zinc coatings are destroyed by cutting, welding or other causes the affected areas shall be regalvanized. Coatings 2 ounces or heavier shall be regalvanized with a suitable low-melting zinc base alloy similar to the recommendations of the American Hot-Dip Galvanizers Association to the thickness and quality specified for the original zinc coating. Coatings less than 2 ounces shall be repaired in accordance with ASTM A 780.

2.2.5 Shop Assembly

Structural unit furnished shall be assembled in the shop to determine the correctness of the fabrication and matching of the component parts unless otherwise specified. Tolerances shall not exceed those shown. Each unit assembled shall be closely checked to ensure that all necessary clearances have been provided. Assembly in the shop shall be in the same position as final installation in the field unless otherwise specified. Assembly and disassembly work shall be performed in the presence of the Contracting Officer unless waived in writing. Errors or defects disclosed shall be immediately remedied by the Contractor without cost to the Government. Before disassembly for shipment each piece of a structural unit shall be match-marked to facilitate erection in the field. The location of match-marks shall be indicated by circling with a ring of white paint after the shop coat of paint has been applied or as otherwise directed.

2.3 TESTS, INSPECTIONS, AND VERIFICATIONS

The Contractor shall have required material tests and analyses performed and certified by an approved laboratory to demonstrate that materials are in conformity with the specifications. These tests and analyses shall be performed and certified at the Contractor's expense. Tests, inspections, and verifications shall conform to the requirements of the particular sections of these specifications for the respective items of work unless otherwise specified or authorized. Tests shall be conducted in the presence of the Contracting Officer if so required. The Contractor shall furnish specimens and samples for additional independent tests and analyses upon request by the Contracting Officer. Specimens and samples shall be

properly labeled and prepared for shipment.

2.3.1 Inspection of Welding

The Contractor shall maintain an approved inspection system and perform required inspections in accordance with Contract Clause CONTRACTOR INSPECTION SYSTEM. Welding shall be subject to inspection to determine conformance with the requirements of AWS D1.1, the approved welding procedures and provisions stated in other sections of these specifications. Nondestructive examination of designated welds will be required. Supplemental examination of any joint or coupon cut from any location in any joint may be required.

2.3.1.1 Visual Examination

All visual examination of completed welds shall be cleaned and carefully examined for insufficient throat or leg sizes, cracks, undercutting, overlap, excessive convexity or reinforcement and other surface defects to ensure compliance with the requirements of AWS D1.1, Section 3 and Section 9, Part D.

2.3.2 Structural Steel Welding Repairs

Defective welds in the welding repairs shall be repaired in accordance with AWS D1.1, Subsection 3.7. Defective weld metal shall be removed to sound metal by use of air carbon-arc or oxygen gouging. The surfaces shall be thoroughly cleaned before welding. Welds that have been repaired shall be retested by the same methods used in the original inspection. Except for the repair of members cut to remove test coupons and found to have acceptable welds costs of repairs and retesting shall be borne by the Contractor.

2.3.3 Inspection and Testing of Steel Stud Welding

Fabrication and verification inspection and testing of steel stud welding shall conform to the requirements of AWS D1.1, Subsection 7.8 except as otherwise specified. The Contracting Officer will serve as the verification inspector. One stud in every 100 and studs that do not show a full 360 degree weld flash, have been repaired by welding or whose reduction in length due to welding is less than normal shall be bent or torque tested as required by AWS D1.1, Subsection 7.8. If any of these studs fail two additional studs shall be bent or torque tested. If either of the two additional studs fail all of the studs represented by the tests shall be rejected. Studs that crack under testing in either the weld, base metal or shank shall be rejected and replaced by the Contractor at no additional cost.

PART 3 EXECUTION

3.1 INSTALLATION

All parts to be installed shall be thoroughly cleaned. Packing compounds, rust, dirt, grit and other foreign matter shall be removed. Holes and grooves for lubrication shall be cleaned. Enclosed chambers or passages shall be examined to make sure that they are free from damaging materials. Where units or items are shipped as assemblies they will be inspected prior to installation. Disassembly, cleaning and lubrication will not be required except where necessary to place the assembly in a clean and properly lubricated condition. Pipe wrenches, cold chisels or other tools

likely to cause damage to the surfaces of rods, nuts or other parts shall not be used for assembling and tightening parts. Bolts and screws shall be tightened firmly and uniformly but care shall be taken not to overstress the threads. When a half nut is used for backing a full nut the half nut shall be placed first and followed by the full nut. Threads of all bolts, rods, nuts and screws shall be lubricated with an approved lubricant before assembly. Threads of corrosion-resisting steel bolts and nuts shall be coated with an approved anti-galling compound. Driving and drifting bolts or keys will not be permitted.

3.1.1 Alignment and Setting

Each structural unit shall be accurately aligned by the use of steel shims or other approved methods so that no binding in any moving parts or distortion of any member occurs before it is fastened in place. The alignment of all parts with respect to each other shall be true within the respective tolerances required.

3.1.2 Backing and Wedges

All backing and wedges used during installation for the support of sheet pile cap parts shall be tack welded as necessary to maintain alignment. Backing and wedges left in the completed work, with approval shall be of steel or iron.

3.2 TESTS

3.2.1 Workmanship

Workmanship shall be of the highest grade and in accordance with the best modern practices to conform with the specifications for the item of work being furnished.

3.2.2 Production Welding

Production welding shall conform to the requirements of AWS D1.1 as applicable. Test and production stud welding will be subjected to visual examination or inspection. If the reduction of the length of studs becomes less than normal as they are welded, welding shall be stopped immediately and not resumed until the cause has been corrected.

— End of Section —